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MEDICINAL PLANTS IN SCIENCE AND CULTURE

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THE MATERIALS WERE MADE AVAILABLE FOR THE PURPOSE OF POPULARIZING THE EFFECTS OF THE CONFERENCE FINANCED BY THE MEIN GRANT DNK/SP/548108/2022

DR HAB. IWONA ARABAS, PROF. PAN,

HEAD OF THE LABORATORY OF THE HISTORY OF NATURAL AND MEDICAL SCIENCES LUDWIK AND ALEKSANDER BIRKENMAJER INSTITUTE OF THE HISTORY OF SCIENCE OF THE POLISH ACADEMY OF SCIENCES, POLISH ACADEMY OF SCIENCES,

Opening speech of the conference "Botany and pharmaceutical sciences"

Robert Księżopolski, Secretary of the Conference, Vice-President of Societas Scientiarum Klukoviana et Jablonovianae, Laboratory of the History of Natural and Medical Sciences of the Polish Academy of Sciences: I would like to thank the members of the Scientific Committee who helped organize this conference: Professor Iwona Arabas, Professors Zbigniew Libera and Adam Paluch, who is absent but we hope that he connected online, and who actively participated in the work of the Scientific Committee, Ludwik Frey, Professor Joanna Partyka, Professor Jaromir Jeszke.

I would also like to thank the patrons of the conference: the Committee on the History of Science and Technology of the Polish Academy of Sciences, the State Ethnographic Museum in Warsaw, as well as the organizers. The main logistic, but also conceptual organizer is the Institute of the History of Science of the Polish Academy of Sciences, with which the Institute of Ethnology and Cultural Anthropology of the Jagiellonian University, the Krzysztof Kluk Museum of Agriculture in Ciechanowiec cooperated, the Polish Pharmaceutical Society, especially the section of the history of pharmacy and the Kluk and Duchess Jabłonowska Social and Scientific Society.

The co-organizers of the event are also the phytotherapy section of the Polish Medical Association, the Botanical Society, especially the History of Botany section of the Polish Botanical Society, as well as the Carpathian Society.

Dr hab. Iwona Arabas, prof. PAN, head of the Laboratory of the History of Natural and Medical Sciences IHN PAS: Thank you very much. I will share a few thoughts that came to

my mind during the preparation for this conference. We organized it in a hall that is considered one of the most representative in the Staszic Palace. On the first floor there is the Hall of Mirrors, with which this room corresponds in décor, even the floor, but the room in which we are located is perhaps even more beautiful. It has a symbolic character for me: although this is how it was designed by Corazzi, its architectural implementation did not come to fruition and only after the reconstructions – there were several different reorganizations on the third floor – was the original idea returned. For some time there was not even this floor due to the fact that there was a gymnasium church here.

We are in a room under the dome, named after Erazm Majewski. It was the name of the patron of the place that gave me many associations that are associated with what – I hope – we will listen to with the greatest pleasure and what will happen in this room. Just before the outbreak of World War II, the Erazm Majewski Prehistoric Museum was opened here. The collections that were found here were donated by the patron of the Museum with the reservation that they should be named after him and not allowed to be divided. It happened as Mr. Erazm Majewski wished.

The museum belonged to the Warsaw Scientific Society, referring to the idea of the earlier Society of Friends of Sciences, which occupied many offices in the Staszic Palace. There were very interesting collections: a mineralogical cabinet, archaeological and numismatic collections, and even militaria. The collections of shells, skulls, bones of mammoths, rhinoceros and elephants made a great impression on the visitors. They were provided by researchers, archaeologists: Polish researchers from Polish research works that were carried out not only in the country.

The combination of the activities of thematic museums with the developing science has been an important trend of thinking of scientists since the times of dreams of complete cognition, when natural collections guaranteed the possibility of inventorying the world. We go back to the moment when the first thematic museums were actually created. Of course, I think back to the times of Princess Anna Jabłonowska – to one of the most valuable European cabinets of natural history, which was located in Siemiatycze. Natural history cabinets with gardens and parks belonging to the estate were synonymous with a collection of knowledge, a kind of encyclopedia. In this spirit, I would like to look at our activities today, allowing us to confront historical and social research in

the field of herbal studies and herbal medicine with experimental sciences such as phytochemistry and pharmacology. Similar research was initiated in Poland thanks to the work of Professor Barbara Kuźnicka – here, in the Staszic Palace, the laboratory of the history of pharmacy was located at that time. The professor began to conduct seminars in this field, and also began to publish publications under the common title *Medicinal plants in science and culture*. Professor Kuźnicka already pointed out that it was necessary to cooperate with representatives of various disciplines: historians of science, ethnographers, sociologists, florists, linguists and art historians. That's how it was written in the documents she left behind. Publications edited by the professor have been published since 1986. They were most often the aftermath of conferences on medicinal plants in the history of natural medicines. We refer to the title of the series as the theme of our conference *Medicinal plants in science and culture*. The initiator and main organizer of the event is the Laboratory of the History of Natural and Medical Sciences of the Ludwik and Aleksander Birkenmajer Institute of the History of Science of the Polish Academy of Sciences, whose team is a direct heir to the work of Professor Kuźnicka.

I and Anna Trojanowska, who is present here, worked with Professor Kuźnicka, and there are several people in the room who participated in her seminars and cooperated with us at that time. I hope that, in addition to listening to the fascinating papers we are waiting for, we will have a chance for discussions that may allow us to adopt ... And here I will stop. I read in the works of the professors present in the room a lot of information on how this field of science developed, and I found many definitions in them. It was at that moment that I started to have very big doubts whether we want to define something or just name it, because it is not the same. I'm in favor of naming.

The first definition I encountered was formulated by the International Society of Ethnopharmacology, published in the Journal of Ethnopharmacology as early as 1979. I perceive subsequent definitions as proposed by naturalists. And where is the activity of – I called it – anthropologists? You can correct me here, maybe you need to list more precisely other areas. However, there is a feeling of underestimating what the humanities give us. Well-known definitions suggest that the humanities are basically at the service of the natural sciences and provide material, and naturalists can conduct their experiments only on the basis of this material. This should not be the case. Naturalists are focused

only on efficiency, rationality and on drawing strict boundaries between what is practical and what is myth. They do not take into account the cultural context, which in my opinion is not the right direction, and I hope that during the conference I will either hear a polemic with my opinion, or we will establish some common view.

The problems resulting from the fact that a certain field of science is underestimated, although we work in an interdisciplinary way, began much earlier. I will quote a short text that most reminds me of being corresponding to our tasks today. This is the problem presented by Jean-Jacques Rousseau, who believed: "Something else helps to divert the attention of people of good taste from the plant kingdom, namely, the habit of looking only for medicines and medicines in plants. Medicine has so taken possession of plants turned into herbs that one sees in them only what is not seen at all, namely the supposed properties that someone likes to attribute to them. Stop only on the colorful meadow to examine the flowers shining on it. Those who see you doing this will take you for a barber, ask you for herbs to treat scabs in children, scabies in humans, or glanders in horses. This odious prejudice was partly overcome in other countries, especially in England, thanks to Linnaeus, who drew botany to some extent from the schools of pharmacology in order to restore it to natural history and economics. But in France, where this science has become less permeated to the people of society, they will remain at such a level of barbarism in this field that the beauty of Paris, looking at the collector's garden in London, full of trees and rare plants, will exclaim in a tone of supreme praise: "What a beautiful garden of an apothecary!" So even if I believed in medicine, and even if its medicines were pleasant, I would never take care of them with the delight of pure and disinterested contemplation. My soul would not be able to rise and soar above nature without losing consciousness of its relationship with the body."

I hope that the humanities, like biology and botany in the past, will not be treated as auxiliary sciences. We are equal and only cooperation can, in my opinion, give the results truly expected by everyone. I wish you fruitful deliberations in a place certainly endowed with a *genius loci.* Thank you very much for your attention.

1.**PROF. DR HAB. LUDWIK FREY,**

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"Plants, villains, treasures"

The road that man had to go through to learn the medicinal values of herbs was long, arduous, full of ambushes and not always successfully completed experiments. Some plants, however, were valued for their qualities of a different kind, equally important, although not from a medical point of view. These were properties referred to as magical.

Magical power was to be given to herbs by appropriate words, spoken by initiates, of course, at the right time, place and with strict observance of the applicable rules. In herbal medicine or, more broadly, herbalism, sometimes it is difficult to separate knowledge that brings significant benefit from magic. In *the Polish Herbarz* by Marcin of Urzędów we read: "because there is no herb so bad that it does not have any peculiar help". I want to tell you about just such a peculiar help of a dozen or so medicinal plants, which occur mainly in the Polish, with an emphasis on their non-medicinal values, so the magical ones.

We are talking about plants that were useful for treasure hunters, but also for thieves, also looking for, although in a slightly specific way, treasures. I will also mention the plants that helped detect evildoers, and those that possessed the power to punish wicked thugs, even at a distance.

Let's start with plants that were helpful in the search for treasures. They were most often hidden in caves, caves in the mountains, especially in the Tatras, Beskidy and Sudetes. In their search, various types of instructions were used, compendiums of knowledge on this subject, of which the so-called conspiracies were particularly appreciated. One of the most famous conspiracies, which I also used and in which you can find information about plants of magical significance, was the conspiracy of Chrościński published in 1905.

At the beginning it is worth mentioning the species of mugwort god tree from the Asteraceae family, sometimes called cypress or Virgin Mary's tree. In the Polish flora, mugwort is relatively rare. She gained the title of the mother of all herbs, and the poem *De viribus herborum undoubtedly contributed to this*. It is probably the first printed coat of arms, published in 1477 in Naples, and attributed to Macer Floridus, under which pseudonym wrote Odo of Meung on the Loire, living in France at the end of the eleventh century.

The herb of the mugwort helped those looking for an unusual fairy-tale fern flower, if the collector went to the forest on the eve of St. John the Baptist, of course naked, but girded with mugwort branches. Most importantly, the mugwort was supposed to help in dangerous expeditions, and thus facilitate reaching hidden treasures.

Another of the plants of interest to us is common hazel from the birch family. It can make a man rich in at least two ways, either with his flower or with his twig. The first method, recorded in the vicinity of Ropczyce in the present Podkarpackie Voivodeship, consisted in obtaining a miraculous hazel flower, which usually blooms at midnight on Christmas Eve. This guaranteed immediate possession of the treasure. Unfortunately, it was not easy at all, because after unfolding, the flower immediately fell and disappeared. The second way was to make a wand called a wirgula from a hazel twig. It had the extraordinary property of pointing out and searching for places of hidden treasures. Of course, it is best if it was a "double-branched wand, cut out for March 25, which has the property that where there is money or treasures buried always shows, persuading".

White willow, the next plant of interest to us, is of course a native species, common throughout the territory. In folk culture, willow was rather considered a bad, cursed tree, but on the other hand, due to its development, it also symbolized vital strength and a kind of joy of life. In the Carpathians, it was believed that willow twigs, as well as hazel wands, tied together, but necessarily sacrificed, help in the search for hidden treasures.

Very mysterious and important, especially for treasure hunters, the plant was called in the conspiracies lunaria. To tell the truth, it is not very clear what kind of plant it is, because its descriptions are imprecise and often confusing. It is impossible to determine whether it is *Lunaria rediviva*, i.e., perennial menstruation from the cabbage family. It has, of course, several folk names. Was it also hunted by treasure hunters? The

aforementioned Michał Chrościński writes: "and here you will go out into one, cheerful, green meadow with great herbs, decorated. Also here is the *lunaria major* (as he called it – ed. L. F.) – the most respectable herbs in their nobility." This is how he characterizes it: "the root is white or yellow, as a carrot. It has a stick (i.e., a stem – L. F.) and sometimes two for a high cubit, one (i.e., about 60 cm – L. F.) or less as oats. The leaves are round as shillings (that is, about 4 cm in diameter and – note here – L. F.) blue or green with a fiery color". Chorościński continues: "The flower is as a fijałka (i.e., violet – L. F.), it smells as a balm, and its seed in the shell grows as vetch in pods".

The botanical description of the monthlies, only in very general outlines, agrees with the characteristics of this *lunaria major*. Particularly surprising is the unusual fiery color of the flowers and the color of the leaves and their round shape. In addition, it is really difficult to identify psoriasis, the fruit of real menstruation, with a pod of magical lunaria.

This plant was best harvested on an autumn night, especially on September 30, because it blooms in the new moon, as Chorościński said, of that month. If the treasure hunter was brought to court for some reason, it was enough for him to put herb leaves in his shoe or put them on his head, and he won all the cases. And if he has already been thrown into prison, "though he be bound with a chain, with dibows, with ropes, or with a fitting, everything falls from him, as he will have this herb with him." The most important advantage of lunaria, however, is that it shows the way to the treasure, because: "The flower of this herb, whoever puts it in his mouth, all treasures will reveal themselves to him", and if the treasure was protected, even with fancy closures: "all locks with this herb you can open". It is surprising that apparently the thieves were not interested in lunaria.

Ferns were also included among the plants that were attributed magical properties. Oskar Kolberg mentioned the male fern, which he referred to as *Aspidium filix*. Perhaps it is about the male nerecznica. The fern was to bloom every year for an hour at midnight on the eve of St. John the Baptist. It was supposed to shine with a bright light and thanks to this, as Kolberg said, it allowed us to get to know the interior of the Earth with the treasures hidden in it. Fairy tales about the fern flower were quite widespread, for example, in Gorce. In Łopuszna on the Dunajec River, a fern was to bloom once a year, which was called florencyna, and which after flowering produced seeds that changed into

gold in the hand of man. The name of the plant was to be created from the combination of the term from Podhale ferecyna – fern, with the word florin – golden money or ducat. According to Zofia Radwańska-Paryskia, however, ferecin was supposed to refer to all ferns with double or triple pinnate leaves.

It is also worth mentioning the opium poppy, or white, which was part of an unusual ointment used, as it was written: "when someone wants to see in the ground, what treasures or money". The recipe was simple, the ingredients needed were white poppy oil, saltpeter, white salt, attention: snake fat and skin of a lazy snake. It was enough to smear this ointment on your hand, and then: "holding a pipe in your other hand (I really do not know if it is a cinquefoil or any other herb – L.F.) and nettle, you will see everything in the ground as in a mirror".

We come to a less glorious way of getting money and talk about thieves and their plant collaborators, which include the woodpecker white-tailed. It is an annual weed from the nightshade family, common in Poland. It has a lot of funny folk names, such as stupid oak, turnip, pinderynda or angelic trumpets. Bieluń found himself in the group of plants-thieving helpers thanks to priest Krzysztof Kluk. In the *Plant Dictionary,* Father Krzysztof included a particularly interesting statement, which could not be confirmed in other authors: "this is the plant that thieves used to put the watchmen to sleep so that they could steal safely".

It is also worth mentioning the ash diptame from the rutaceae family, which is a relatively unpopular medicinal plant. Due to the unusual properties of the root, both thieves and treasure hunters tried to enter its possession. This was mainly because "locked locks without a key open, shackles, fetters break". No wonder that the diptam was urgently sought, interestingly, in the Tatra Mountains, as mentioned in the conspiracy of Michał Chrościński. How to find how to extract this dream root? Well, writes Chrościński, "when you go out to one cheerful green meadow, you will find the root of a diptame. And to invent you are to have the art of the deer horn, which will attract him to you like a magnet." And how to dig it? Well, using a stick from the jasieniowy tree. Where did Chrościński get the information about the occurrence of diptams in the Tatras? After all, this plant was neither there, nor is it there. In Poland, four diptam habitats are

currently known, and not in the mountains, but beyond the northern border of the compact range of the species.

In the light of these data, the statement of Father Kluk, who wrote: "that it grows between the mountains, I know about it, and that he has a place to grow wild in the middle of the country, as I was assured, I still doubt it". Could it, I think so, priest Krzysztof Kluk based on the information of Marcin from Urzędów, who wrote that the real diptam grows only in Crete, on the rocks? But the plant from the rocks of Crete is not at all interesting to us *dictamnus,* as Marcin from Urzędów said, but Cretan lebiodka. It is therefore endemic to this island, one of forty more or less species of the genus Lebiodka. Why was diptam included among the plants that help with their unusual properties in extracting treasures? It's not very clear. I think that this is the result of a wrong interpretation of the text of the old coats of arms.

Let us now devote attention to the most famous representative of the mandrake genus, which does not grow in Poland, which is the medical mandrake. It is often mentioned as a magical plant in both European and Polish literature. Of course, the most desirable part of the mandrake was a strongly thickened, branched root, called alrunik or alrauna, which was supposed to resemble the shape of a human figure. It was considered an amulet and used in magical practices. As for the search and extraction of it, there were different versions, but it was always pointed out that it was a dangerous undertaking that could cause madness and even death. To avoid misfortune, it was necessary to obtain the root with the help of a dog. The poor animal, of course, died, but the man came out unscathed.

In one of the stories, I came across, about the extraction of this wonderful root without the participation of a dog, there are two people, one of whom is engaged in the extraction of the root, saying appropriate formulas, and the other, which was a surprise to me, is to sing, I would say, frivolous or even lewd songs. The extracted root was cleaned, he was not spared caresses, and even fed several times a day. Then, of course, he returned the favor, revealed all secrets, ensured health, happiness, wealth and, of course, helped to find and extract hidden treasures, open all doors.

Because in Poland the mandrake did not occur in the wild state, and strongly stimulated the human imagination, the need to find its substitutes was felt. One of them

was, for example, the wolf berry, and even more or less at the turn of the nineteenth and twentieth centuries, the mandrake was identified with the kraińska lulecznica or szalej pospolity.

Of course, sometimes it was very difficult to clearly determine the species of the magical plant and, as in the case of thieving grass, chance was supposed to help in finding it. If, for example, during haymaking a blackbird came across this particular herb, it cracked and fell to pieces. To make sure it was thieving grass, you had to throw hay on the water. If it was swimming against the current, it meant that a magical plant had undoubtedly been found.

The lucky finder sewn this plant "by the claw", as it was called, that is, in his hand, or let go of its juice. When its properties were activated—which usually happened at midnight, as some claimed, though others said that the thieving grass had power at any time of the day—he could of course use it to look for treasures or hidden money. Why else was it important to get such grass? Because she "broke the chains, the iron cracked under her touch, tore and loosed the bonds, fetters, and opened all the locks."

In some places it was Polish called a cleaner, or a cleaner, and it was associated, quite unexpectedly for me, with the common tart pint. Kolberg wrote: "the herb famous for the fact that everything that is tied, even with an iron lock or a strong padlock, at midnight at the touch of it will come off and open, untie and fall, and because thieves carry this herb with them."

Finally, it is worth mentioning the role of plants in detecting crime, punishment and protection, that is, mentioning how plants helped to detect the offender and even punish him at a distance, and sometimes even protected people from thieves. For example, flax acquired apotropaic properties when ropes were twisted from it, wrapped in the Easter palm and blessed in the church. Then he drove away evil spirits, defended against charm and against all misfortunes. The most important thing, however, was that the rope from linen sticks should be twisted in such a way that it would help, as it was believed, to detect the thief, that is, so to speak, to become a real whip against criminals.

However, when it comes to the aspen poplar, common in Poland, it was generally considered to be a bad, cursed tree. Not only that, they were associated with evil powers, and the Hutsuls considered them simply as a devil's tree, calling the devil an aspen.

Therefore, it is necessary to say about the positive properties of aspen. It helped in spells directed against thieves. In Mazovia, there was a belief that if the villain could not be caught red-handed, you could take revenge on him at a distance, drilling a hole in the aspen, into which one of the things that the thief tried to steal was inserted, and then, as it was said, the thief was shaking.

The fir tree also had a certain magical power, especially in the Carpathian shepherd's magic, which, although neither favored treasure hunters nor villains, but was attributed to it a completely different action, almost expiatory. The robbers willingly buried the money "under Jedlicka", as they called it, because they believed that then all the evil with which they were marked would be driven away.

Finally, mugwort was a plant that collaborated neither with treasure hunters nor with thieves. On the contrary, it had a protective function in the literal sense of the word. According to stories from the Kielce region, in the past property was not secured against thieves with solid fences, but – in quotation marks, of course – with mugwort fences. Her action was effective if she was planted on St. John.

As can be seen from these few examples, the man using plants in magical treatments treated them on the one hand quite emotionally, and on the other in a sense instrumentally and for practical purposes. He trusted that they would help him achieve his goal of acquiring material goods.

Let me finally repeat what I said at the beginning: in herbal medicine it is difficult to separate knowledge that brings significant benefit from magic. This is such an interesting issue that I have taken the liberty of occupying your time with it. Thank you very much.

2. **MGR JUSTYNA MAKOWSKA-WĄS, DR HAB. IRMA PODOLAK, PROF. UJ,**

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"Blue and medicinal plants – a few words about indigo and more"

Justyna Makowska-Wąs: It seems that the reproduction of blue was one of the greatest desires of man, because it was possible quite early – several thousand years ago. This is all the more surprising because the process of obtaining this color is not at all simple.

Traces of the use of blue dyes can be found in the art monuments of different cultures on different continents. The most spectacular are, of course, the paintings on sarcophagi or papyri of ancient Egypt, but also monuments of Mayan culture, as well as numerous works of art in later periods. This dye was especially highly valued in the Middle Ages, the Renaissance and also in the Baroque period. It was used, among other things, to illuminate books.

However, it should be remembered that all this time equally important was the usual use value of the dye, i.e., the use of fabrics for dyeing. Blue was eagerly used to dye fabrics in the production of kimonos, especially during the Edo period, and the modern indigo-colored hero when it comes to clothing is denim fabric.

Regardless of the functional meaning, it must be remembered that the blue dye also had another cultural function. It was used, among other things, to paint the body, especially the face. Julius Caesar already mentioned that the Gallic warriors painted their faces blue, believing that it would provide them with immortality, and in any case that it would have a protective function. We also find similar thinking in various rituals, especially in West Africa.

Speaking of blue dyes of natural origin, it should be mentioned, of course, that not only their plant but also mineral sources were used. The most characteristic example of the latter is lapis-lazuli, which powdered reached a value higher than gold, especially during the Middle Ages.

Another example of a dye is Egyptian blue, otherwise known as Egyptian blue. The Egyptians were able to obtain it already around 1000 BC, although it is a complex product that it required processing, because it is the result of repeated calcination of mixtures of copper, sand and limestone rocks in the right proportions. It is considered by many authors to be an example of the first synthetic dye. It was, of course, much cheaper than lapis-lazuli and therefore gained more popularity.

As far as plant sources are concerned, a relatively large number of plants from various families and quite botanically distant genera provided blue dye, especially in the shade we call indigo. The most famous are the various species of the genus *Indigofera*, but not only. In Europe, the plant *Isatis tinctoria* was very famous, and in Central America *Haematoxylum campachianum*.

It is worth adding that this dye, in any case in the past, when no more sophisticated analytical methods were known, was referred to by the common name indigo. Its various commercial sorts appeared, which referred mainly to the area of occurrence, which Dr. Irma Podolak will talk about in more detail.

Nowadays, analysis is possible thanks to various techniques. I would like to briefly present to you one of the works that appeared relatively recently, and concerns attempts to recreate or identify what dye, from which botanical source was used to dye various parts of historical fabrics and whether it was used as a pigment in painting.

The authors recreated traditional methods of obtaining dyes from several of the most basic species, namely Indigofera tinctoria, *Isatis tinctoria and* Indigofera suffruticosa*, and then* analyzed the signals using mass spectroscopy, processing them through more sophisticated statistical methods and trying to extract their characteristics. Later, IT specialists were also involved in the cooperation and finally a model for the analysis of unknown samples was developed. The next stage of the work was to test historical samples and it was indeed identified that some of them came from *Indigofera tinctoria*, which was the so-called indigo true, and some from official dye.

As I have already said, in virtually every part of the world quite quickly identified a plant that was later used to produce blue dyes. They were significant elements of traditional medicine of those regions. For example, Chrozophora tinctoria, a species

growing in the Mediterranean, was used in folk medicine of both the Iberian Peninsula and North Africa.

The most detailed is probably the medicinal use of the dyeing office. This plant occurs in Europe, but it is also known in Chinese medicine, and its traditional use, especially as an anti-inflammatory drug, has been confirmed by modern pharmacological research. It is worth noting that in 2011 it appeared in a European monograph.

It is also necessary to briefly mention the Kampechian blue. It is a heavily exploited species, which was imported to Europe due to hematoxylin used to stain cell structures, i.e., it is used in cytology.

Referring to this particular thread, it was quite surprising to me that all these plants are now being studied very intensively. In the last few years, a number of works have appeared, both original, concerning some directions of activity, as well as review publications. This also applies to the main character of today's story, the genus Indigofera*, and especially the species* Indigofera tinctoria.

This shrubby plant from the *Fabaceae* family probably originates from West Africa, but the most famous in terms of the area of occurrence is in India, hence it often occurs under the name Indian indigo. It has been cultivated for many centuries, so in principle it is not found in the wild. Its cultivation was also introduced to the countries of the New World.

Indigofera tinctoria is a medicinal plant used in the traditional medical system, rooted in India, namely in Ayurvedic medicine. It is mentioned as an important medicine in the oldest texts of Ayurvedic medicine, i.e., Charaka Samhita and *Sushruta Samhita*, *dating* back to about 600 and 800 years BC. Leaf preserves, freshly squeezed juice, as well as root preparations were used in a very wide range of indications. However, one should be aware that every Ayurvedic drug is a complex preparation, so it is difficult to say unequivocally whether *Indigofera* is responsible for a specific activity.

He points out that many contemporary in vivo pharmacological studies confirm some traditional research directions. It seems particularly interesting that antidiabetic or hypolipidemic activity is noticeable in animal models.

When it comes to the phytochemical profile, there is surprisingly little research. Most descriptions characterizing extracts are simple phytochemical tests. There are fewer

insulation works that aim to determine the structure, but I wanted to draw attention to a group of flavonoids that has been very widely studied, and especially very rare in terms of structure. Pharmacognostics and phytochemists are particularly interested in furan flavonoids and pharmacological activity is also attributed to them.

In relation to the dye called indigo, however, the most important is the tryptophan derivative. It is a glycosidic compound called turkey, which is the main target of further alterations, as a friend will tell you about.

Dr. Irma Podolak: The previous speaker mentioned that the process of obtaining dyes is complicated. This is the first stage. The next, equally complex stage was the use of indigo as a dyeing raw material, i.e., dyeing fabrics.

In a nutshell: in the plant there is a simple precursor in the form of glycosides called turkey. In the other plants mentioned by my friend, this precursor may have a different structure. It is important that the processing process leads to the formation of one, the same structure, sometimes in versions of certain derivatives, which may affect the final color of the product.

The initial process of processing the plant consists of fermentation, which usually takes from a few to twelve hours. Plants are soaked in different-looking vats, at this stage there is an enzymatic cleavage of the sugar molecule and a compound called indoxyl is formed, which does not yet have the right color, is yellow-green, while in the next stage, by introducing a large amount of oxygen into the solution, a properly colored compound is formed, i.e., indigo, or indigo carmine.

This is a compound that does not dissolve in water. It settles on the foam, then sinks to the bottom of the vat. Therefore, the dyeing process requires another treatment. It is necessary to reduce this structure with additives, which happens in an alkaline environment. The additives were varied, various bases were used, most often inorganic, and oxidized animal urine. It was also a feature of good quality fabrics that could smell urine.

The fabric is soaked in such a colorless solution, in the reduced indigo version, it is called leukoindigo. After dyeing, the fabric is slightly greenish or colorless, while exposed to air it begins to take on a blue color and this process is reversed again. Oxidation of the dye occurs.

What was indigo? We do not know for sure, but most likely the first mentions of this dye come from 13 BC from the work of Vitruvius (*De architectura* 7.14) and *from Pliny's Natural History* (35.27), where we talk about a product from India – indigo, which in principle we can identify with the product from the *plant Indigofera tinctoria*, which my friend was talking about.

The influx of indigo to Europe was also quite complicated. It is known that it was thanks to the Arabs that it came to our continent, and the spread of Indian dye was initially tried to counteract. It was considered a devilish substance and banned because it threatened the indigenous production of indigo ex officio, even though indigo indigo has a higher dye content in the raw product. Initially, it was thought to be a mineral dye, but Marco Polo reported that it came from plants.

Sorts that appeared in the trade were marked depending on the region of origin. The most commonly used and considered the most valuable was Bengal indigo. In the eighteenth and nineteenth centuries, Guatemalan indigo was used. It is a very delicate, light, floating substance, with a break of a very fine grain, which after rubbing, for example, with a fingernail should take on a metallic or golden or copper-golden shade. In powdered form, it is downright black. In various sorts, the content of the right dye ranges from 10 to 90%. However, in the sorg available in the nineteenth century, the best quality products contained up to 50% dye.

In the 1st half of the eighteenth century, crops were established in Jamaica and South Carolina, in 1777. The British began large-scale cultivation in India, primarily in Bengal. Referring to the culture, the cultivation of indigo both in North America and on the Indian peninsula also has its dark side, i.e., the development of slavery, the exploitation of producers who grew indigo under the auspices of large planters in India. This oppression even contributed to the outbreak of the uprising in India in 1859. Later, the situation improved somewhat.

Today, we are returning to natural methods of obtaining dye, and one of the reasons is the sustainable development of poorer regions of the world, for example, quite recently, in 2010, crops were established in South Asia. It is also a process that can be considered ecological, because today oil derivatives are mainly used for indigo synthesis, which is associated with a whole range of problems.

The end of the nineteenth century marked a change in the situation all over the world. The successful synthesis of indigo – not the first, but subsequent methods of obtaining it – led already in 1890 to the widespread production of synthetic indigo, which in a very short time caused the collapse of plantations and the replacement – certainly in Europe, but also in many regions of the world – of the use of a natural product with a synthetic product.

The Department of Pharmacognosy can boast of numerous sorts of indigo from the pharmacognostic, didactic collection, founded in the years 1825–1857 by Florian Sawiczewski, professor of pharmacy and lecturer of pharmacognosy at the Jagiellonian University in Krakow. Thank you very much.

3. **DR MAŁGORZATA JEZIOREK, PROF. DR HAB. AGNIESZKA PIETROSIUK,**

DEPARTMENT OF PHARMACEUTICAL BIOLOGY AND BIOTECHNOLOGY OF MEDICINAL PLANTS, MEDICAL UNIVERSITY OF WARSAW

"Traditional medicinal applications and current research directions of species of the genus Arnica L"

The protagonist of the presentation is *Arnica, and more broadly* – species of the genus Arnica, which served us to present the cognitive process we are going through, planning further research also in the field of plant biotechnology, i.e. in vitro cultures and tissue studies of plant organs in this formula. Therefore, we will present how we collect the knowledge base to plan possible research or answer the questions that are posed to us as pharmacists or pharmaceutical botanists: what the current state of knowledge about a specific species or genus is, also when it comes to its practical application in medicine and what are the directions of research in which our field is currently heading.

The genus *Arnica*, found in the northern hemisphere in both the subarctic and temperate regions, belongs to the family *Asteraceae*, andmore recently complex – *Compositae*. It is worth mentioning the characteristic features that accompany this family. As for the flower, there is an inflorescence of the basket type, on which we notice both uvular flowers and tubular flowers. Then the fruit is formed – achenes are lifted on the cup fluff, thanks to which arnica spreads. It contains 31 species.

The first research that we usually perform, checking the state of current knowledge, is the analysis of the occurrence of the term we are interested in in the summary database of international scientific publications. In this case, I used the Scopus database and analyzed the term "*Arnica*" appearing in the titles, abstracts or keywords of publications. This gave the result of 1402 publications since 1828. Of course, these are only those publications that are in the Scopus database. If they are not cataloged, the result is not included. In the aforementioned database, you can also carry out a detailed analysis, which is illustrated in the form of a graph – on its basis it can be seen that over

1100 publications on arnica are in the field of medicine, pharmacology, toxicology, pharmacy in general.

There are 50 Polish publications on the subject we are interested in. The first place in terms of the number of works on arnica is occupied by Germany, followed by the United States, and Poland is in sixth place with the mentioned number of publications from our research centers.

Interesting facts: in 2012 a record was set, because according to the Scopus database, 77 publications meeting the criteria for arnica were published. The oldest work included in the list comes from 1828 and was written in German. In free translation the title is *Notes on the preparation of arnica root extract according to the fourth edition of the Prussian Pharmacopoeia*. Subsequent publications appeared many times in the journal "The Lancet".

The most recent studies, which actually concern the genus of arnica – the keyword also appears in publications concerning plants belonging to another genus, but bearing colloquial names containing the word we are interested in, such as Mexican arnica – concern phytochemical, detailed studies, talking about the chemical composition of individual organs, not only arnica flowers, or about the activity of toxic m.in of its individual components.

The first traces of the traditional use of arnica, according to the literature, come from the twelfth century. Arnica decoctions were usually rubbed into sore spots: joints, bruises, hematomas, boils. Ointments were also prepared. Increased use in treatment was noted in the eighteenth century. In Northern Europe, arnica after pulverization was used instead of snuff. It was also considered a magical herb, which was supposed to protect against lightning strikes, charms of witches. Such uses of arnica are also mentioned in sources.

As for the current state of knowledge and current uses in preparations that have the status of over-the-counter medicines, such as some ointments, arnica is used very often. These preparations are obligatorily accompanied by the wording: "the drug is intended for traditional use in the listed indications, and its effectiveness is based on a long period of use and experience". The most common indications occurring on arnica

preparations, i.e. bruises, hematomas, bruises, are a continuation of the tradition of using arnica that we have dealt with in the past.

These drugs are dosed up to several times a day, most often on altered places, excluding places where the continuity of the skin or damaged mucosa is broken. Side effects such as inflammation and possible allergic reactions may occur, especially if the recommended dose is exceeded, it may be associated with quite strong skin complications. Contraindication, which always occurs in the case of arnica preparations, is hypersensitivity to any plants or products containing extracts from the asteraceae family – complex, i.e., also to chamomile.

We also always check what preparations are currently on the market, in what form extracts or individual compounds are used. Of course, there is an arnica flower, occurring, as in old pharmacopoeias, under the name arnica basket, i.e., arnica inflorescence, from which infusions and decoctions for compresses are recommended. There are also products containing arnica extract as the only ingredient and these are primarily arnica ointments, arnica tinctures and homeopathic preparations for both external and internal use.

There are many multi-component preparations, I will mention just a few to show that these are both external preparations, applied to the skin, such as Arcalen, Hemoro gel, mucous membranes – such as Dentosept, or even oral preparations, where one of the ingredients is arnica flower.

There are many care products and cosmetics, which I would like to draw attention to, because in a moment I will present two species that occur primarily in the discussed preparations. Not always the manufacturer declares from which species the extracts that he uses for the production of his preparation come. Among those that appear most often are, of course*, Arnica montana*, or mountain arnica, and *Arnica chamissonis* – arnica Chamissa.

Arnica montana is otherwise known as mountain kupalnik, pomornik or mountain trank, and its region of occurrence covers Europe up to Greenland. It belongs to the Asteraceae family, of course, it grows up to 60 cm. In Poland it is very rare and belongs to endangered species. Therefore, it is under strict protection, and the herbal raw material *from Arnica montana* can only come from crops.

Arnica chamissonis , on the other hand, originates naturally from North America, covering its subarctic part, the northwestern and central-western regions of the USA and eastern Canada. Naturally found there preparations are, unlike those in Europe, obtained from this species.

According to a literature review, research is currently focused primarily on detailed phytochemical analysis of plant material, also from organs other than flowers. It turns out that some of the biologically active compounds, thanks to which arnica has gained and established its medical application, occur in satisfactory, and sometimes even in higher concentrations in organs other than the flower.

The second direction of research, which we can observe on the basis of published publications, are those that concern the biological activity of either full multicomponent extracts in the case of arnica or isolated single compounds. Very detailed studies are also carried out on the mechanisms of action of single fractions or single compounds and their toxicity.

Optimization of chromatographic and spectroscopic techniques in phytochemical analysis always accompanies plants that have practical medical application. This is due to the search for methods that are the cheapest, as well as the most effective and quickly able to confirm the quality of the raw material used for preparations.

Also, in our plant biotechnology department we are interested in the development of in vitro cultures of Arnica organs and tissues. We also closely follow emerging discussions or research works on the effectiveness of homeopathic preparations, in which arnica is widely used.

As far as the scope of phytochemical research is concerned, arnica – or perhaps arnica basket, arnica flower – is now considered a sesquiterpene raw material. The main profile of action of the extracts is due to ester derivatives of helenaline and 13-dihydrohelenalins, which are multi-component. Other components of these extracts are flavonoids, essential oils, phenolic acids, coumarins, also pyrrolizidine alkaloids, which are very strongly hepatotoxic and always arouse interest and anxiety in the use of preparations due to their toxic effects on liver cells. On the other hand, the contents for arnica flowers that have appeared in publications so far do not seem to pose a toxic risk when used externally.

The already documented activity concerning arnica is the antiseptic effect of extracts derived from its flowers, antioxidant and anti-inflammatory effects, where the mechanisms of the process and the immunomodulatory effect for which the polysaccharide fraction is responsible are already very thoroughly studied.

As for in vitro cultures of species of the genus *Arnica*, it was possible to obtain both shoot cultures, callus, suspension, and capillary root cultures, obtained by agrotransformation. These are roots that are genetically transformed and in which we are looking for attractive features due to the increase in the quality of the raw material, i.e., those that produce as many valuable biologically active metabolites as possible.

Whether arnica can be obtained on a larger scale in vitro cultures is still a matter of future research. I have not been able to find such reports that it is already used on an industrial scale, as in bioreactors.

Why such a situation? When it comes to the in vitro culture *of Arnica species, especially* Arnica montana*,* we are most interested at the moment, apart from the issue of cognitive work on phytochemistry and activity of individual compounds, the preservation of the species, which is protected and occurs very rarely, m.in. in the region of Polish. Therefore, in vitro micropropagation of arnica shoots and their subsequent acclimatization in the soil and reintroduction to natural sites is one of the tasks of biotechnology and in vitro cultures. Its aim is to recover natural plant sites that are threatened with extinction or have completely disappeared from their natural sites.

The use of arnica in homeopathic preparations now appears in publications, but as always in similar cases, this issue is accompanied by a discussion about the formula of homeopathic medicines itself, and not only arnica *sensu stricto*.

On the example of arnica, I presented the course of our research work, the initial identification of topics, when we try to discern the issue of traditional use, current needs and research directions that we can undertake, also using in vitro cultures, support the preservation of endangered species or obtain material containing active biological metabolites in a way that is safe for natural sites of valuable and medically used plants. Thank you very much.

4. **PROF. DR HAB. MIROSŁAWA KRAUZE-BARANOWSKA**,

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"Genus Arnica – a source of raw materials of various compositions and its application in medicine"

I focused mainly on topics related to the pharmacognostic and pharmaceutical approach to Arnica raw materials, which are used in medicine. As my predecessor mentioned, we can talk about the allopathic and homeopathic use of the raw materials of the genus *Arnica*. This is a very important context for the use of raw materials obtained from species of the genus *Arnica*, all the more so because we see some analogies when it comes to directions of action.

Since today's conference is devoted to ethnopharmacy, we will start with the historical use of Arnica raw materials. As my predecessor pointed out, in the early Middle Ages arnica was considered a protective plant against witchcraft, hail, lightning strikes and was used as snuff. St. Hildegard of Bingen in her work *Physica*, in which she compiled about a thousand vegetable and mineral raw materials, drew attention to arnica, describing its use in the following way: "when spots and blisters occur between the skin and the body of a person, it is necessary to boil the herb in water on warm wounds for that time, and it will be healed". In folk medicine, arnica was used already in the sixteenth century in injuries, contusions, inflammation of the skin. In the eighteenth century, it was already used in the treatment of rheumatic diseases and this is a very interesting aspect that corresponds to the present day, when we pay attention to the possibilities of using arnica preparations in rheumatoid diseases. Of course, arnica was used and used at that time in edema and subcutaneous haemorrhages caused by the impact. An interesting fact is that arnica extract was given as the last medicine to the dying Goethe.

When it comes to herbal raw materials obtained from the genus arnica, flowers are used above all, since the monograph *Pharmacopoeia Poland* V they have been standardized for the content of flavonoids. Standardization is fundamental when it comes to the therapeutic efficacy of plant raw materials, while currently the standardization of

arnica flowers is carried out on the basis of sesquiterpene lactones, which should not be less than 0.04%.

As for flavonoids, the content is higher than 0.4%. For homeopathic preparations, the raw material is not the flower, but the whole plant. The chemical composition of the flower has been widely described, the mechanisms of action are also known, of course, developed on the basis of very extensive literature data presented in publications, the number of which was presented by my predecessor. Meanwhile, in relation to the whole plant, there is no such literature data, i.e., generally we do not have information about the composition of the whole plant. In the Department of Pharmacognosy of the Medical University of Gdańsk, we have introduced such studies, and I will present their results to you briefly in a moment.

Mountain arnica, or mountain arnica, occurs in the mountainous regions of Central Europe, meadows, high-mountain glades above 800 m above sea level. In Poland, it is found on limited sites, these are: the Sudetes, Western Bieszczady, the Świętokrzyskie Mountains, Lower Silesia and also in the lowlands, for example in Masuria. It is, of course, a species threatened with extinction, hence it is on the red list of plants and fungi.

In European countries, mountain arnica is obtained mainly from crops, while for the production of homeopathic medicines it is collected from natural sites. Such a collection is, of course, controlled and takes place according to certain rules. As a raw material, I emphasize once again, in homeopathy the whole plant is used. The difference in the preparation of pharmaceutical preparations from mountain arnica flowers and from the whole plant is that for homeopathic purposes we use fresh raw material, while for physiotherapeutic purposes we use dried flowers. There are several medicinal, vegetable and homeopathic products with arnica on the market, there are not too many of them. These are tinctures, ointments and, above all, gels.

As for homeopathic products, first of all, granules are available, which contain different potencies of the mother tincture, obtained from the whole plant. I would like to draw attention to an important aspect of the naming of homeopathic medicine and plant medicine. Both are medicinal products and are separated only by the adjective 'vegetable' or 'homeopathic'. In any case, these are medicinal products, just like synthetic drugs.

I would like to talk a little bit about the view of a herbal medicinal product in general, present the current state of knowledge about a herbal medicinal product and, against this background, discuss arnica flowers and the whole plant. First of all, the drug of the plant is a mixture of chemical compounds and differs from a synthetic drug in that it is a multicomponent mixture of chemical compounds. In the case of silymarin, i.e., milk thistle extract, flavonoids, including silybin, are responsible for pharmacological properties. Therefore, we know the structures of these compounds that determine the final therapeutic effect – they are separated from plant raw materials and determined based on detailed structural studies. Subsequently, the effect is evaluated in pharmacological studies. The next stage is clinical trials, which are also evaluated based on systematic reviews and meta-analyses. Meta-analysis is therefore the ultimate tool to determine whether a given plant medicine is effective for a given clinical indication. She also evaluates the safety of using plant medicines.

We know the mechanism of action of plant medicines at the biochemical, molecular level, we also know their side effects, although they are few: compared to synthetic drugs, we can actually talk about only one percent. The problem is the plant-synthetic drug interaction when we use synthetic drug therapy and include a plant medicine. This is a hot topic, and against the background of this characteristic of a plant medicine, I would like to present arnica.

Let's start by discussing the composition of chemical compounds. Arnica flowers, but also the whole plant, as basic compounds contain sesquiterpene lactones of the type of helenaline and dihydrohelenaline. Helenaline as sesquiterpene lactone is primarily a compound with very strong anti-inflammatory properties. It exhibits this effect in micromolar concentrations; Sesquiterpene lactones derived from helenaline also have anti-inflammatory properties. Most often these are various types of ester derivatives. Helenaline itself has properties that slow down the heart rate, lower blood pressure, allergenic, irritate the mucous membranes of the gastrointestinal tract. For this reason, among other things, arnica has been withdrawn from internal oral use.

In addition to sesquiterpene lactones, an important group of compounds are flavonoid compounds from various subgroups, i.e., flavonols, flavones, in the form of various combinations, m.in glycosidic. Then we have polyacetylenes, an essential oil

whose main ingredient is thymol, and it is also present in the form of ester, carotenoids that are important as components of plant raw materials because they exhibit antioxidant properties, just like flavonoids, to which carotenoids join in arnica. We have phenolic acids, which are also antioxidants. In addition, in another compound, iridoids can be distinguished. The second species from which the raw material – flowers is obtained is *Arnica chamissonis*. Although currently *Arnica chamissonis* does not have a monograph of the *Polish Pharmacopoeia*, work is underway to introduce such a monograph, which would enable the use of meadow arnica flowers as a medicinal raw material.

Plant raw material – a plant medicine, is characterized by the so-called synergism: the fact that it contains mixtures of different groups of chemical compounds causes that these compounds interact with each other and often the final therapeutic effect is stronger than, for example, the sum of the effects of individual components. This is what characterizes the plant medicine.

I have just presented the chemical composition of compounds that will also interact with each other, and their pharmacological effects will add up. The pharmacological activity of arnica flower is presented in various models – both in vitro and in vivo. It is manifested by inhibition of edema in animal studies, anti-inflammatory effect, to which I will return, analgesic, inotropic positive, stimulating the respiratory center, that is, analytical and antimicrobial action. Due to the positive and stimulating inotropic properties, arnica was administered to the respiratory center Goethem. Increasing the strength of contraction of the heart muscle and stimulation of the respiratory center at the biochemical level is primarily inhibition of the activity of enzymes and pro-inflammatory mediators, that is, inhibition of cycloxsedanase, inhibition of hyaluronidase as an element of the wall of the epithelium of blood vessels, that is, inhibition of elastase. At the molecular level, we will talk here about inhibiting the activation of the transcription factor NF-κB – I will return to this – stimulating the transcription of pro-inflammatory protein genes. It's about proteins of various kinds, cytokines, acute phase proteins, inflammation.

Also, in terms of composition, pharmacological activity, mechanism of action at the biochemical level, at the molecular level, arnica flower is well recognized. The

molecular mechanism of anti-inflammatory activity of helenaline and its ester derivatives consists primarily in the inhibition of the transcription factor NF-κB. It is related to the unit IκB. This unit determines the activation of NF-κB through postcorrelation and degradation, while helenalin will affect blocking and release here, and then we can talk about an inhibitory effect on the transcription of genes initiating an inflammatory response. So here we are talking about the cytokines I mentioned, acute phase proteins, adhesion proteins, immunoreceptors. The second element that is important in the anti-inflammatory effect of helenaline is the selective alkylation of the p65 subunit and its inactivation, i.e., it acts as if on two pathways, inhibiting NF-κB, i.e. inhibiting the inflammatory process – this is very important. Not only helenaline itself is involved in this, but also all its ester derivatives, which are dominant compounds in the team. Helenaline itself is not much, but ester forms dominate.

The anti-inflammatory effect of arnica extracts is the sum of the helenaline effect, but also flavonoid compounds that inhibit the activity of hyaluronidase, elastase, inhibit the formation of pro-inflammatory mediators COX, 5-LOX. It is also important that a stronger inhibitory effect of ester derivatives was observed in relation to helenaline itself. First of all, these are ester derivatives, such as helenaline methacrylate and tigliniate, not only in vitro models, but also in vivo in the mouse ear model. We also have in the mechanism of action of helenaline inhibition of 5-lipoxygenase, LTC synthase$_4$, inhibition of chemotactic migration of human multinucleated neutrophils. It all adds up to this anti-inflammatory effect. For arnica extract alone, a decrease in extracellular matrix metalloproteinase mRNA levels was observed in particular chondrocytes, dose-dependent and in a low concentration range, and this suppression was presumably related to the inhibition of the transcription factor NF-κB, which justifies the use of arnica flower extracts in rheumatoid diseases.

Other directions of action of arnica preparations include, first of all, anti-edematous effect, strengthening the walls of vessels, preventing plasma penetration, stimulating the absorption of exudative fluid, causing an increase in fibrinolytic activity, preventing the formation of venous clots, antioxidant effect. All this is associated with the beneficial effect of arnica preparations in situations where we have injuries, where

swelling occurs, extravasation and bruising. These symptoms are eliminated as a result of the use of topical arnica preparations.

In phytotherapy, arnica baskets or flowers are used externally in edema, blunt injuries resulting from bruises, sprains, fractures, it will accelerate the absorption of subcutaneous haemorrhages, petechiae, post-traumatic edema, in inflammation of the skin, but where there is no skin damaged after insect bites, boils, phlebites, varicose ulcers after long muscle and joint pains, and just in rheumatic diseases as a supportive therapy.

However, a new indication are reports from this year – 2022 is the use of arnica preparations in cutaneous leishmaniasis – 70% ethanol flower extract is used (and this is how it is described in publications). This is a new indication with very interesting results of penetration through the skin of the components of arnica flowers.

In homeopathy, we have similar indications for use, with arnica used both externally and internally, from specific potentials, m.in. arnica 9CH. Here we see an analogy between use in phytotherapy and in homeopathy. We are also talking about general local injuries resulting from bruises, sprains, fractures, pre- and postoperative treatment, scanty or moderately heavy bleeding, muscle fatigue as a consequence of physical exertion, capillary changes, vascular fragility, painful varicose veins of the lower limbs. We can also talk about muscle pain, joint pain, so we have similar scopes of application of the raw material, but the difference is that we use sufficiently high dilutions of the mother tincture itself, where in phytotherapy we simply use the processing, i.e., the mother tincture without diluting it.

As for penetration through the skin, we are dealing with it when, using arnica externally, topically, we can expect a therapeutic effect, primarily anti-inflammatory, associated with the presence of sesquiterpene lactones. Indeed, studies have observed that sesquiterpene lactones penetrate the skin very well when they are found in the extract, in the arnica process. However, when used individually, the penetration is weaker.

Tests are also performed for the treatment of leishmaniasis, which show that helenalina and dihydrohelenalina are absorbed and pass into the skin at very high levels.

This is a positive effect in the treatment of skin diseases, as it allows the accumulation of active compounds in the skin.

On the other hand, sesquiterpene lactones after topical administration are absorbed into the blood and distributed to the liver, m.in. metabolized to glutathione forms. The rapid formation of conjugates with glutathione is thought to significantly reduce the likelihood of toxicological hazards associated with sesquiterpene lactones.

When characterizing a plant medicine, we should determine at what level we have defined the therapeutic efficacy of a plant medicine. In the case of arnica, there are clinical trials in osteoarthritis indicating some benefits that a patient using drugs with arnica topically can see. A clinical trial of 174 people with osteoarthritis of the hands describes moderate evidence. They indicate that treatment with arnica extract gel brings similar benefits as treatment with ibuprofen, a non-steroidal anti-inflammatory drug, with a similar number of side effects. The second clinical trial concerns rheumatoid lesions in the knees. There was a statistically significant decrease in pain, stiffness and limitation of knee function in a multicenter 6-week study of a gel containing 50 g of arnica tincture and administered in the morning and evening: 3/4 of patients confirmed that they would like to use this product again as an analgesic effect A randomized, double-blind arnica gel study was also conducted. It showed a similar potency as ibuprofen gel in the treatment of osteoarthritis of the fingers. Of course, further clinical trials are necessary and are also necessary at a later stage of the meta-analysis of such studies. Meta-analysis is the ultimate tool confirming the therapeutic efficacy of a plant product.

Returning to the phytochemical issue, which is closely related to the therapeutic effect, in our department we conducted research assessing the quality of raw materials obtained from arnica and preserves, primarily the quality of flowers that are on the market as arnica. The manufacturer actually often does not distinguish between meadow arnica and mountain arnica. We have also carried out phytochemical studies of pranatinces, i.e. those preparations that are used in the production of homeopathic medicines. As for sesquiterpene lactones, we analyzed them by high-performance, liquid chromatography at a concentration with a mass spectrometer. It turned out that in the pranatuture of the whole plant there are very high concentrations of sesquiterpene lactones, next to helenalin, which, according to literature data, occurs in lower

concentrations. In these sesquiterpene lactone complexes, ester forms dominate. We detected 13 compounds in the content and showed some kind of differences that occur in the sesquiterpene lactone complexes of both mountain arnica and meadow arnica, as well as mother pranatincture from the whole plant. First of all, it was the mother tincture of the whole plant that was characterized by a high content of helenalina esters, dihydrohelenalina. In HPLC chromatographic tests, we did not notice the presence of esters in the flowers of both species, but helenalina itself was present in them, which of course was also present in the mother tincture. Therefore, the sum of sesquiterpene lactone esters and sesquiterpene free lactones was higher for the mother tincture. It is worth emphasizing that it is mainly these compounds that determine the anti-inflammatory effects when it comes to arnica. They exhibit differentiated anti-inflammatory activity also associated with different inhibition power of the transcription factor NF-κB. Compounds that strongly inhibit also include, for example, helenaline 2-methylbutyrate. At this level, therefore, we also have well-characterized sesquiterpene lactones again present in the raw material – not only helenaline, but also individual compounds.

The separation by thin-layer chromatography of sesquiterpene lactones and lipophilic fraction in general shows that the content of these sesquiterpene lactones is much higher than in raw materials – flowers – in mother tinctures. We continue our research, wanting to determine these compounds also by quantitative thin-layer chromatography.

As I said, not only sesquiterpene lactones, but also flavonoids are involved in the anti-inflammatory effect. Complexes of flavonoid compounds and phenolic acids were analyzed by us in both arnica and meadow arnica flowers, as well as in the mother tincture. These bands are similar, differing only in content.

Some compounds that we observed in HPLC separations in conjunction with a diode array detector and mass spectrometer were recognized as new. These are primarily caffeoylquinic acids, as well as such flavonoid compounds, e.g., patuletin, 6-methoxykempherol or quercetin, also caffeoylquinic acid. We have determined their content, and you can see the difference between individual raw materials in the content of 3,5-dicavoylquinic acids, 1,5-dicavoylquinoic acids, as well as differences in the content

of chlorogenic acid, which occurs in high concentrations in flowers, while in the processing itself from the whole plant its concentration is much lower. Similarly, other caffeoylquinic acids dominate *Arnica Chamissonis* and *Arnica montana*. It is mainly 1-methoxy-oxy-oxylalyl-3,5-dicavoylquinic acid. Also, these products, i.e. raw material preparations and mother tincture, differ in the content of flavonoid compounds. As a researcher of these raw materials, we see the importance of the relatively high content of caffeoylquinic acids, which have antioxidant properties, but also anti-inflammatory properties and can be treated as the third element of the chemical composition that determines the anti-inflammatory effect of arnica raw materials. It should be emphasized that antioxidant activity is one of the elements of anti-inflammatory activity, because in the inflammatory process the level of free radicals increases significantly and all chemical compounds that occur in plants, and are natural antioxidants, will suppress this inflammatory reaction by scavenging and blocking the formation of further free radicals.

Arnica, therefore, provides vegetable raw materials used mainly externally for phytotherapy, allopathy, with the exception, of course, of homeopathic products, also intended for internal use. The basic direction of action remains anti-inflammatory activity and impact on the condition of blood vessels, which is of course related to the presence of sesquiterpene lactones, flavonoids and, as I said, probably caffeoylquinic acids. The traditional use of arnica, i.e., ethnopharmaceutical knowledge, in rheumatoid diseases is confirmed based on the recognized mechanism of action of the raw material, but also based on the results of clinical trials. Preparations from the whole plant, i.e., mother tinctures, homeopathic tinctures, seem to be a richer source of helenaline esters and also dihydrohelenalin.

Thank you for your attention.

5. **DR INŻ. KATARZYNA POPIOŁEK-BARCZYK,**

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"Pyrethrum maruna – an ancient remedy for modern diseases"

Good morning to you, my name is Katarzyna Popiołek-Barczyk. I am an employee of the Department of Neurochemistry at the Institute of Pharmacology of the Polish Academy of Sciences in Krakow. I would like to thank the organizers for the opportunity to give a lecture on pyrethrum maruna, which is an ancient cure for modern diseases.

Pyrethrum maruna is a plant of the Asteraceae family. Initially, it occurred in the mountainous regions of the Balkans. Currently, it is found throughout Europe, also in both Americas, Asia, Australia, as well as in North Africa. This plant can be found on roadsides, wastelands, fields or forest edges. It is a strongly aromatic perennial with a characteristic, spicy smell. It grows to a height of up to a meter, and its small flowers resembling chamomile have a diameter of about 2 cm. It blooms from July to October. In the literature on pyrethrum maruna we can meet with several related names. The Latin name that we use in Poland is *Tanacetum parthenium*, but there are also several particularly English-language names that are also used in Poland, including *feverfew*, *midsummer daisy* or *nosebleed*.

The name *Tanacetum parthenium* is explained by a legend from ancient times. It says that during the construction of the Parthenon one of the workers suffered and was miraculously cured with infusions of pyrethrum maruna. Records of the effectiveness of this drug can already be found in ancient Greece at the doctor Dioscorites, who recommended its use in all kinds of inflammations and fevers.

Also, in the Polish lands we find numerous information on the use of this herb in medicine. By Stefan Falimirz it was called the mother of all herbs, and in the herbarium from the eighteenth century found in the Ossoliński National Works in Wrocław we find a number of information on what this herb was used for at that time. And so, m.in. was a rescue "for fever, fevers from love, for all kinds of pains, aching legs, aching breasts,

relieving pain in the ears or cruel tearing in sausages". Also, in home medicine cabinets we can find information on how to consume the drug. Most often it was brewed in wine or juices were extracted from it and administered to patients, mainly as an antipyretic and anti-inflammatory drug.

Pyrethrum maruna was used not only in Polish. Very intensive research was carried out in Great Britain. Already in the eighteenth century, Dr. John Hill recommended the use of pyrethrum extracts for severe headaches and fever, hence the English name of this perennial *feverfew*, i.e., a fever-reducing substance. Nowadays, research has been conducted on the chemical composition of pyrethrum extracts. The main component is sesquiterpene lactones, and the most important among them parthenolide is found in the leaves of the plant, and its content in them reaches as much as 85%. Other substances are flavonoids or essential oils.

As I mentioned, in previous centuries, extracts from pyrethrum maruna were mainly used to treat fevers or various types of inflammation. Current research mainly concerns migraine headaches, cancer, various types of pain and many, many others. They focus not only on the pyrethrum extract itself, but also on the effects of its main active ingredient, parthenolide, which I would like to present to you. The best known action of pyrethrum maruna concerns migraine headaches. Already in the last decade, clinical studies have been conducted on the effects of pyrethrum extracts in patients suffering from migraine headaches, but they have not given clear results as to whether these extracts are actually effective. Only a larger clinical trial, summarizing the previous and published in 2015, allowed to clearly state that pyrethrum extract reduces the intensity and frequency of migraine headaches, including those of high severity, and additionally reduces the adverse symptoms observed during migraine, such as nausea or aura, which accompanies some types of migraines.

Importantly, it has been observed that the extract from gilding must be standardized for the amount of parthenolide that is found there. Based on these studies, a dose of 600 micrograms of pure parthenolide per day was acceptable. Currently, there are various types of preparations on the market derived from pyrethrum: tablets, extracts, you can also use juices, because it is quite a popular plant, as well as infusions of dry leaves. For the preparation of such an infusion, it is recommended to use from 2

to 3 leaves per day. In the 90s of the twentieth century, pyrethrum preparations were the most sold pharmaceuticals of plant origin in the United States, which shows how important this plant is. Current research is already *strictly* related to the active ingredient isolated from gilding, i.e., parthenolide, and concerns various types of cancer. These are studies conducted both in vivo and in vitro, in animal models or in various types of cancer cell cultures. The main mechanism of action of parthenolide is the inhibition of activation of transcription factors, primarily the NF-κB transcription factor mentioned today, but also factors from the STAT family. Inhibition of these transcription factors leads to the induction of programmed cell death, so-called apoptosis, cell cycle inhibition, reduction of migration and invasiveness of cancer cells or the proliferative potential of these cells. Importantly, parthenolide has been shown to sensitize cancer cells to the use of radiotherapy and chemotherapy, as well as to the use of other stimulants leading to the killing of the cancer cell, such as cytokines. Parthenolide hits the signaling pathways inside the cancer cell, i.e. the entire complex of NF-κB transcription factor and STAT proteins. Another mechanism of parthenolide's anti-cancer action focuses on activating the p53 protein, called the guardian of the genome, which also stimulates cancer cell death. Sesquiterpene also enhances the activation of reactive oxygen species in the cell, which also leads to the death of cancer cells. It also affects the activation of the mitochondria-dependent intracellular signaling pathway and leads to the release of numerous anti-apoptotic factors, such as cytochrome C or SMAC/Diablo proteins. This also leads to the killing of these cells. Since there are not many clinical trials conducted in patients and showing directly the effects of parthenolide, I would like to present one of them, which was conducted in Poland by Dr. Piotr Kruk. A 62-year-old patient, a heavy smoker with prolonged chest pain and an intense cough after infection, came to the hospital. Computed tomography and X-ray of the lungs showed cancerous changes in the lung region and liver metastases. Bronchoscopy confirmed the original diagnosis that it was small cell lung cancer. The patient received six cycles of standard chemotherapy. Suspicious lymph nodes were also removed metodą Gamma Knife with a gamma knife. Then Dr. Kruk introduced additional therapy with various types of plant extracts, including parthenolide. The dose of parthenolide exceeded the recommended 600 µg per day for migraines. The patient had remission of the disease and on the day of publication

of the tests, i.e., in 2018, the patient was in very good condition. It has been 7 years since the diagnosis of the disease, so we cannot say unequivocally that parthenolide acted directly here, but it certainly contributed to such a good prognosis in this type of cancer.

In my own experience with parthenolide, it has a broad analgesic effect. On a daily basis, I deal with pain that may be atypical, which is neuropathic pain, and I would like to bring this subject a bit closer. Many times, in lectures I hear the question whether pain is really our friend or maybe an opponent. I answer that yes and yes.

Pain is a multidimensional sensation. In the place of some pain stimulus, specific receptors called nociceptors are stimulated. The impulse is then conducted to the central nervous system, initially to the medulla, then to the higher levels of the nervous system, to the brain, and there, in turn, it is propagated to various brain structures. The body receives feedback and thus reacts to the pain stimulus. According to the International Society for the Study of Pain, pain is an unfavorable, sensory and emotional experience associated with a current stimulus or tissue damage. We can distinguish several types of pain, including nociceptive pain, which we observe as a result of a dangerous stimulus. It can be heat, cold, some mechanical force, irritation with a chemical agent. This type of pain is adaptive, protective, the early warning system is activated, and we are able to protect ourselves from potential danger. Another type is inflammatory pain, which develops as a result of tissue damage or ongoing inflammation. This type of pain is also adaptive, promotes repair systems in the body, tissue healing and also has a protective effect.

However, there is another type of pain that is the result of damage to the sensory schema of the nervous system. It is a neuropathic pain. This type of pain develops as a result of cancer infiltration on the nerves, untreated diabetes or multiple sclerosis, shingles, hypoxia, stroke, it is also observed after surgical procedures, when nerve damage occurs, or after traffic accidents, when the person suffered severe injuries and nerves were destroyed. This type of pain no longer has an adaptive function. It loses its protective function and actually becomes a disease in itself. It is long-lasting, protracted and in its course, we observe several symptoms that characterize it, such as hypersensitivity to analgesic stimuli, or allodynia, otherwise known as hyperesthesia.

Patients with neuropathic pain hurt even the slightest touch, clothing that should not irritate, patients feel as pain.

Another symptom of neuropathic pain is hyperalgesia, i.e., an increase in hypersensitivity to pain stimuli. In 2018, an American group published such an epidemiological study showing the frequency of this pain. Oddly enough, as many as 10% of the general population may suffer or have suffered from neuropathic pain, more often women. Unfortunately, this type of pain makes life very difficult for patients, because it causes sleep disorders, depressive states, it raises the cost of social care, employment costs, patients are not able to function normally. The problem faced by doctors in the case of neuropathic pain is the lack of effective therapy. Currently, the first-line drugs are antidepressants, anticonvulsants and opioids are on the next rung of the analgesic ladder. Unfortunately, only some patients get a satisfactory analgesic response, while some of them do not achieve satisfactory analgesic effects at all. Therefore, a therapy for this condition is still being sought. I conducted research using an animal model of neuropathic pain. For these studies, it was a rat model, the Bennett model, which involved loose, unilateral ligation of the sciatic nerve in rats. In animals after surgery, they develop symptoms of neuropathic pain that are observed in humans, i.e., hypersensitivity to pain and non-pain stimuli. Thanks to this, we can measure these stimuli with two types of behavioral tests. Thermal stimuli are examined using a cold plate test. The plate on which the animal is placed has a constant temperature of 5 ° C and a sick animal, with a damaged nerve, lifts this diseased paw very quickly, in a characteristic way. In this way, we measure the intensity of the pain that occurs in him. The second test to check the influence of mechanical stimuli is von Frey's. The animal is placed in a plastic cage on a special wire mesh and von Frey filaments of different intensity are used. Animals that experience pain already react to the low value of these filaments. This test is also used in patients in the clinic. In the studies, I used pure parthenolide, which is commercially available at a dose of 5 µg per 5 µl. It was administered subarachnoid using specially implemented cannulas that brought the drug to the lumbar spinal cord to the L4 L5 level. The aim of my work was to determine in a pain model the neuropathic effect of parthenolide on the nociception process, the effectiveness of morphine and the activation of nuclear factor κB and other pro- and antinociceptive factors.

As I mentioned, parthenolide was administered at a dose of 5 µg subarachnoidically for 7 consecutive days. The animals were subjected to behavioural tests on days 3, 5 and 7. At all-time points in both the von Frey test and the cold plate test, compared with the control that received the solvent, parthenolide significantly reduced the symptoms of neuropathic pain in these animals.

Knowing from the experience and research conducted on cancer cells and knowing the molecular mechanism of parthenolide action, we decided to determine its effect on the activation of nuclear factor κB, because also the literature on neuropathic pain shows strong activation of this transcription factor and related proinflammatory factors – cytokines, pro-inflammatory chemokines. We took the lumbar spinal cord from neuropathic animals. According to the literature, we observed a high increase in phosphorylation, activation of this nuclear factor κB, and repeated administration of parthenolide to these animals caused a significant decrease in its activation.

Encouraged by this result, we decided to check whether repeated administration of parthenolide would affect factors known to have analgesic effects and are associated with expression, activate the NF-κB factor. We have shown that repeated administration of parthenolide reduces the level of IL-Iβ, IL-18 and iNOS, i.e., induced nitric oxide synthesis. Going forward, we decided to check whether if parthenolide inhibits pronocyceptive factors, it will activate antinociceptives. And so, it happened. For the study, we chose IL-10 and TIMP1, which is an inhibitor of metalloproteinases, and these factors have analgesic effects. We observed a statistically significant increase for both of these factors.

In subsequent studies, I analyzed the effect of parthenolide on the effectiveness of morphine. I mentioned that there is no effective treatment. Unfortunately, both in the clinic and in basic research in animals, we observe that opioids lose their effectiveness. This is associated with a significant increase in the dose of these drugs compared to, for example, the dose for inflammatory pain, which leads to an increase in the side effects of the use of these drugs.

Therefore, nowadays, the therapy of pain, especially neuropathic pain, is multimodal, that is, created from the combination of several drugs with different molecular targets to reduce the doses of these drugs and thus their adverse effects. I,

too, have attempted to determine whether parthenolide could become a coanalgesic, for example when used with opioids. Parthenolide was administered in the same pattern as before – subarachnoid, for 7 days. On the last day, one hour after the last administration of the drug, morphine was also administered subarachnoid, at a low dose of 5 micrograms. We have observed that the simultaneous administration of morphine and parthenolide enhances the analgesic effects of this opioid, which gives us hope that parthenol may become a coanalgesic in the treatment of neuropathic pain in the future. Of course, this requires further research.

Summarizing this part of my lecture and the conclusions contained in my doctoral thesis, parthenolide in the neuropathic pain model in rats showed analgesic effects, inhibited the activation of nuclear factor κB, thus reducing the expression of pronocyceptive factors, but also increased the expression of antinociceptive factors and intensified the energy effects of morphine. Returning to the pyrethrum maruna, it is worth presenting that it also had an analgesic effect in menstrual pains. These are the messages of folk medicine. Current studies (preclinical of course) correlate this observation with the inhibition of prostaglandin production, which is known to be strongly produced during menstruation. Also, folk medicine provides information about the prospasmodic effect of pyrethrum extract maruna on the muscles of the uterus. This drug was used for difficult births as a uterine decongestant after childbirth, but it was also used as an abortifacient substance. In 1987, anti-allergic effects were demonstrated by inhibiting the release of histamine from mast cells on the periphery, as well as anti-inflammatory effects in skin infections, psoriasis, as well as anti-atherosclerotic effects, which was associated with inhibition of serotonin release from platelets and thus prevention of platelet aggregation. As for the studies of parthenolide itself, its antiparasitic and protective effects in rats were demonstrated, where it lowered liver markers, cholesterol, blood glucose levels. What is very important in the whole pharmacy and the use of herbs, these substances can of course have side effects. Last year, the first paper appeared showing the case of a 36-year-old woman who used pyrethrum extract in migraine headaches and went to the doctor with bleeding from the genital tract and blood clotting disorders. This fact is correlated with the pyrethrum therapy used in her, so special attention should be paid to people using this therapy, who are planning surgical

procedures, or have problems with blood clotting, or are taking anticoagulants to correlate this with pyrethrum therapy and of course the use of pyrethrum should be considered for women who are pregnant, Because – as I mentioned – it causes strong uterine contractions. Other side effects that were observed in migraine studies were a bitter taste, mouth ulcers in some patients, or an allergic reaction. Thank you for your attention.

6. **DR HAB. JOLANTA MARCINIUK, DR INŻ. KATARZYNA KOWALCZE,**

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"Dandelion (Taraxacum) in European and Asian phytotherapy"

First of all, thank you very much for the opportunity to take part in this wonderful conference. I welcome you on behalf of Professor Jolanta Marciniuk, who represents the Faculty of Exact and Natural Sciences and the Institute of Biological Sciences. I represent the Faculty of Medical Sciences and Health Sciences, Institute of Health Sciences of the same University of Natural Sciences and Humanities in Siedlce. By joining our forces, this speech was created. We also promise publication in the near future. We will talk about dandelions in European and Asian phytotherapy. I will try to present this issue on the basis of a review of current literature.

As for the species that could be included in the genus *Taraxacum*, 54 sections have been described at the moment. It is believed that the cradle of this genus is located in the high mountains of Central Asia. From Central Asia, the dandelion has spread well to virtually all continents, except for Antarctica. They are not there yet, but we suppose that they will not find good environments to live.

As far as European species are concerned, common monks are used in herbal medicine and dietetics, belonging to the collective species *Taraxacum officinale,* which includes as many as 1000 species, mainly the type section of *Taraxacum*, but also other, usually indistinguishable sections. As for Asian species, which are used in herbal medicine and nutrition, in Asia, especially in the high mountains, there is a center of diversity of this genus with numerous sections and species. Most of them have been used by the local population for centuries as edible and medicinal plants, while in the scientific literature on the medicinal properties of dandelions there is information on only four species: *Taraxacum officinale*, *mongolicum*, *coreanum* and *japonicum*.

As for the genus *Taraxacum* in European medicine, the first uncertain mentions of dandelions are already found in the works of Pliny and Theophrastus. Also in the Middle Ages, in the first edition of the *Canon of Medicine* in 1025, Avicenna mentioned dandelion

juice as a medicine for the eyes, so one could half-jokingly, half-seriously say that these are the foundations of ophthalmology.

In the thirteenth and fourteenth centuries, dandelion was available in pharmacies as a medicine used in febrile conditions, also in infectious diseases, but also in stomach and liver diseases. European folk medicine also used nuns as a medicine to improve metabolism, but also in skin diseases. In the twentieth century, however, the syrup from dandelion inflorescences gained great popularity, moreover, to this day widely used as a good antitussive drug.

The genus *Taraxacum* in traditional Chinese medicine was described as early as 695 BC and was then used as a medicine for liver and stomach diseases, to remove toxins from the body – its diuretic properties were used, but also used to treat ulcers. It was also considered one of the best herbal remedies for acute mastitis. In combination with other herbs also used to treat various types of abscesses, jaundice, eye diseases and to relieve pain.

As for the scientifically proven medicinal properties of dandelions, more than 2,000 papers on biological activity have been published so far. Various types of extracts are obtained from different parts of plants or from isolated substances. Most of the research actually involves animal models and, less frequently, human cells in vitro. When it comes to human clinical trials, there is a lack of information about them in the literature. Perhaps this is the beginning of a certain path and an encouragement to think about such research.

So far, the choleretic effect of dandelion has been demonstrated: it turns out that it improves the secretion of bile and facilitates its flow. This is a very important aspect in the context of working with patients. I am a clinical nutritionist and patients ask me what herbs, generally speaking, they can use to improve liver functionality, for example, and even ask, like one of the patients recently, if any dandelion preparations can be used to improve liver functionality. The answer is not simple and depends on the context. For example, the patient in question had a cholecystectomy, so it would not be a good idea to increase his bile secretion. Therefore, the interview must be carried out, as always, very precisely and thoroughly.

In European and Asian herbal medicine, dandelion is also used as a means of improving the secretion of pepsin, gastric juice and the aforementioned bile. Studies on animal models have shown that decoctions from fresh roots or leaves increase bile secretion by as much as 40%, so this is really a significant value. However, I remind you that these are animal models that we cannot extrapolate one-to-one to human models if they were created. Everything is ahead of us.

The diuretic effect of dandelions is also scientifically proven. They have long been used in European herbal medicine, but also in Asian as diuretics. In animal studies, it has been shown that dandelion leaf extracts have the greatest diuretic activity. In such a situation, we are always worried about the loss or escape of potassium ions. It turns out that although it has been observed that there are losses of potassium ions, they are compensated even with a surplus by a very high content of this element in dandelion leaves.

Dandelions also have an anti-inflammatory effect. In animal model studies on induced dropsy of animal feet, oral administration of ethanolic dandelion extract resulted in a reduction in swelling by as much as 25%. This confirms the anti-inflammatory effect of dandelions, which has already been recommended in traditional Chinese medicine.

The anti-cancer effect is also proven, although we have studies that are even contradictory on some points, so you have to be very vigilant. A number of studies on the activity of dandelion extracts on human cancer cells concern in vitro conditions. Dandelion extracts have been shown to inhibit the growth and invasion of breast cancer and prostate cancer cells. They also selectively induce apoptosis of human pancreatic cancer cells, which seems to still know the least about, and skin cancers, melanoma.

In addition, many studies have shown that nuns have antibacterial, antioxidant activity, can also lower the level of cholesterol, have a protective effect on the liver and blood vessels and can prevent kidney stones. However, I would like to remind you that this is mainly about research on animal models.

At the same time, dandelions are among the most tolerated medicinal plants by man, which allows us to treat them as very valuable functional foods. Historically, dandelion is classified by the World Health Organization as a medicinal plant that can be used in the production of medicines. Long before it was entered on the list of dandelions,

common was widely used in folk medicine. We can find such reports even in ancient Rome or in ancient Greece. Leaf infusions were then used as a medicine for various types of skin diseases.

In the Middle Ages, also in Arabia, dandelion extracts were used to treat various liver or spleen ailments. In China, on the other hand, medics used dandelions for rheumatism and various types of inflammation, which confirms its anti-inflammatory effect. Research by a German botanist from the sixteenth century indicates that dandelion was used as a herb used to treat diarrhea, but also bladder and liver ailments.

Polish folk medicine, in turn, documents the use of dandelion to treat skin inflammation and various gastrointestinal problems, as well as in the case of typically viral, catarrhal infections or colds. It was used as an auxiliary agent during the treatment of uterine and breast cancer in women, I will return to this topic in a moment.

What exactly works, dandelion? Dandelion herb with root contains many biologically active compounds, and the most important of them in alphabetical order are, m.in.: triterpene alcohols – various types of raw materials, in particular, I would like to draw attention to the probiotic effect of inulin, whose content in autumn in dandelion roots reaches 40%, but also flavonoids, phytosterols, various types of phenolic glycosides, bitterness, carotenoids with particular emphasis on lutein, Hence this ophthalmic thread in our presentation, but also coumarins, phenolic acids, sesquiterpene lactones, pectins, gums, resins, polyphenolic acids, taraxesterols of various types and triterpenes or pentacyclic triterpene alcohols.

As for the chemical composition of the species studied so far, they differ quantitatively and qualitatively. This also applies to *Taraxacum officinale* from different regions of the world. It is assumed that the research was conducted in different environmental conditions, hence such diversity.

As for dandelion, it is used as a choleretic, choleretic, diuresis-enhancing agent, stimulating metabolism. However, it should not be treated – in the context of spring and perhaps the search for a new miracle diet – as a slimming drug. It has some detoxifying and digestive properties. Dandelion flowers are used in menstrual disorders, they eliminate premenstrual tension. Infusion, decoction or dandelion juice have a relaxant effect on smooth muscles, regulate bowel movements, support the treatment of skin

diseases, have hypoglycemic effects, which is why they are recommended in phytotherapy of diabetes and carbohydrate metabolism disorders. I think this is an interesting direction of research when it comes to patients with insulin resistance, for example. Dandelion also has a pronounced anti-atherosclerotic effect.

Dandelion root due to the content of inulin has prebiotic properties, while young dandelion leaves are suitable for consumption raw in the form of spring salads, detoxifying – and I will use this term with a pinch of salt – cleansing, although we know that the liver and kidneys are responsible for cleansing.

I will refer to four studies that particularly caught our attention, m.in. from an ethnopharmacological perspective. We know that most studies are in animal models, but when the dandelion was dealt with ethnopharmacologically, it was often treated as a harmful weed in some industrial crops, which was largely unfair. I think that only after obtaining pure and highly reactive compounds on an economic scale, clinical trials on humans will be really very interesting – they will test efficacy, safety and allow to position nuns as an important commercial source of natural medicines.

Another study looks at aqueous and organic extracts from various plant parts that show promising in vitro antimicrobial activity suitable for both fungi and gram-positive and gram-negative bacteria, as described by the authors of this multicenter study.

The nuns represent a potential source of bioactive ingredients with a very broad spectrum of antimicrobial activity, but to date we do not have clinical trials and we are waiting for support for this knowledge.

Many studies have documented the anticancer effects in vitro or in vivo of several plant phytonutrients contained in dandelions. The most confirmed research line concerns the treatment of breast cancer, but also the area of infertility, since some components showed estrogenic effects. In 2015, a publication was published by Chinese researchers who hypothesized that *Taraxacum mongolicum* could act as a selective estrogen receptor modulator and therefore could be effective in hormone replacement therapy in postmenopausal periods in women. We are also waiting for confirmation of these studies.

Another study looks at inhibiting the proliferation of gastric cancer cells using dandelion root extract. Dandelion root extract has been shown to inhibit the proliferation

and migration in human cancer cells of stomach cells, without inducing toxicity in cancer cells, which seems particularly important. Of course, we are waiting for the verification of these studies.

Another scientific report concerns the effectiveness of dandelion root extract in inducing apoptosis in drug-resistant human melanoma cells. It turns out that dandelion root extract specifically and effectively induces apoptosis in human melanoma cells without inducing toxicity in non-cancerous cells. This is exactly the situation I was talking about in the context of stomach cancer. Interestingly, the relatively resistant human melanoma cell line also responded very positively to dandelion root extract in combination with the diabetes drug, the internationally widely used metformin, which has been successfully used in diabetic patients for six decades. Treatment with this common first-line drug, until recently in hypoglycemic therapy together with a strong extract of natural compounds, turned out to be very innovative and devoid of toxicity for healthy cells. Of course, we are waiting for further studies that will confirm this effectiveness.

The next study looks at the use of *Taraxacum mongolicum* as a dietary and medicinal plant. Dandelion was used for the production of m.in wines, candies, drinks, also energizing, but also other functional foods due to the wide range of active phytonutrients, including flavonoids, triterpenoids or phenolic acids, but also coumarins and sterols.

It turns out that we can also use this raw material in the treatment of various types of inflammation, in the treatment of constipation or stomach disorders, but also in hyperlipidemia.

I tried to present a fairly wide range of possibilities for the use of dandelions. Is dandelion good for everything? One could get that impression, but no. First of all, it should be remembered that dandelion extracts inhibit tumor necrotic factor, TNF-alpha and inhibit the production of interleukin one. Despite these promising preliminary studies on cancer lines, extreme caution should be exercised in the use of dandelions in cancer. And it is worth refraining from using dandelion in viral infections, although in the past they were recommended by folk medicine.

Dandelion can, like any plant raw material, cause an allergic reaction, which must be remembered in particular in the spring period. Dandelion preparations can interact with medications, also in the context of inhalation allergies this danger exists. Exercise extreme caution and consult your doctor or pharmacist.

It is also important that dandelion is not used by people with various types of biliary tract dysfunctions, in particular with their obstruction or, as I have already mentioned, by patients after cholecystectomy, in whom bile secretion should not be enhanced. Contraindications are also various types of intestinal obstruction or cholelithiasis in the history, peptic ulcer disease or inflammation of the stomach.

In Europe, especially in our western neighbors – in Germany, but also even more to the west, in France, dandelion is really a very attractive addition to the spring diet. Since I am a clinical nutritionist, I also recommend you use dandelion in a salad in a very simple way. This raw material is currently available, but when composing a salad, it would also be worth using the benefits of rapeseed blooming at the moment in the form of rapeseed oil, because then we have a combination with omega-3 acids with strong potential, m.in anti-inflammatory. With a dandelion, we can really use absolutely everything we can. In this way, we will be in line with new dietary trends – *zero waste*.

Thank you very much.

7. **PROF. DR HAB. IRENA MATŁAWSKA,**

PHYTOTHERAPY SECTION OF THE POLISH MEDICAL ASSOCIATION

"The role of phytotherapy in Covid-19"

My lecture is devoted to the role of phytotherapy in COVID-19. This is a fairly topical topic, but at the moment it is not so hot because we have other problems. Currently, we are no longer talking about a pandemic, but about the state of epidemic threat, and may it continue.

The origins of the pandemic, which was caused by the virus called by the WHO acute respiratory syndrome coronavirus 2, or SARS COVID 2, date back to December 2019. It turned out that this coronavirus was more dangerous than previous infections caused by coronaviruses, for example SARS and MERS. The pandemic it caused was the deadliest after the 1918 flu pandemic.

Risk factors are older age, male sex, smoking and concomitant diseases, i.e., generally speaking, diseases: metabolic syndrome, i.e. obesity, hypertension, diabetes, heart disease, cardiovascular disease, chronic kidney disease or respiratory diseases. The more risk factors and associated with the factors of pathology, the greater the risk of poor prognosis. What I will tell you today, of course in a nutshell, has been partially published in "Advances in Phytotherapy", in the last issue of 2021.

Coronavirus is composed of various types of proteins that we can affect in some way. When it comes to the virus that causes COVID 19, it can actually colonize and attack our entire body, it often begins, for example, with conjunctivitis, i.e., it attacks the eyes, but the most important organ, because there are the most possibilities of penetration, is the respiratory system. Symptoms are dry cough, shortness of breath, fever, followed by acute typical pneumonia and acute respiratory distress syndrome with multiple organ dysfunction syndrome. Such a condition can even lead to death. The virus also attacks the nervous system. Of course, the pathways of entry into the nervous system are described, i.e., various symptoms, headache, nausea, feeling of confusion, disturbances of consciousness, cerebrovascular diseases. A typical symptom for this virus is attacking

olfactory and taste receptors, i.e., loss of smell and taste, which can persist for a very long time. People who had undergone the disease reported that even for more than half a year they did not know what they were eating. The virus also affects the digestive system, that is, diarrhea, nausea, vomiting, abdominal pain may occur. As for the urinary system – the virus can damage the kidneys, but this is rather the result of complications of the disease. In addition, it affects the heart and blood vessels, that is, acute heart failure may occur, there is also a tendency to coagulation, clot formation, increased vascular permeability and microcirculation disorders. An excessive response of the immune system and an increase in the levels of various types of cytokines are characteristic. We are talking about the so-called cytokine storm, which causes inflammatory reactions leading to damage to important organs, i.e., attacking the heart, lungs or kidneys, or systemic infection, or sepsis, may also occur. Sometimes the symptoms are mild and may go away on their own, without any special treatment. There are also asymptomatic infections.

When it comes to treatment, there is actually a lack of typical medications that can be used in COVID 19. The therapy is supportive, alleviating the symptoms of the respiratory and digestive systems, but also strengthening the body or alleviating the symptoms of anxiety. Antiviral drugs, antibiotics, heparin, anti-inflammatory drugs are administered. There have been attempts to administer plasma from convalescent patients who have COVID 19, but it has not been very effective. Also, the vaccines showed little immunity to the disease and people who were vaccinated even several times could have been infected with the virus and sick with COVID 19. Anti-inflammatory drugs that prevent the cytokine storm and worsening of the disease are also important. In the group of these anti-inflammatory drugs, one should remember about plant raw materials, about natural preparations, which very often give such an effect. Prevention is very important, which is the only way to reduce the transmission of this virus, limit its spread. For example, there were few such recommendations to supplement vitamin D3 deficiencies, and it is known that patients were deficient. It is known that in all infections there are deficiencies of vitamin C, but little was said that the body should be supported in this way. They began to look for effective drugs that could be used in COVID 19, i.e. some new substances, but this is a long-term process. You can also use existing drugs on

the market, including extractions and natural compounds that are intended for the treatment of other diseases. The research used the popular *in silico* method, i.e., molecular docking was performed with the help of computer programs and the interaction with the COVID 19 virus was quickly analyzed. It takes a short time, the costs are also not very high, but it should be remembered that viruses have the ability to quickly adapt, mutate, that is, you have to look for new therapeutic substances. Recall that at first there was talk of Delta, then a virus appeared. Omikron, however, each virus causes slightly different symptoms. When it comes to herbal medicines, they have the advantage that they show multidirectional activity and are safe to use.

A group of compounds that may be potential substances in the fight against the SARS COVID 2 virus causing COVID 19 are polyphenols with a very broad spectrum of activity. They have antiviral activity, affect the glycoproteins of the spine, i.e., this protein S, and the receptors of host cells, i.e., the angiotensin-converting enzyme. Such a connection is a kind of gateway of entry into the host's organism; There is also an inhibition of replication by various natural substances of the various proteases needed for the replication of this virus. These substances also have antioxidant and anti-inflammatory effects, which prevents redox imbalances, inflammatory processes caused by virus infection, that is, an increased susceptibility of patients to severe organ damage. It is very important to improve dysbiosis, which is caused by infection – already Hippocrates around 400 BC drew attention to the important role of the intestines in health. According to him, "death sits in the intestines" and "bad digestion is the root of all evil."

Polyphenols have an immunomodulatory effect, that is, they reduce the infectivity of viruses. They also counteract metabolic disorders such as dyslipidemia, insulin resistance, hypertension, obesity. They are very helpful in the case of existing cardio-metabolic ailments, which result in a worse prognosis in the case of infections. There is also a proven anticoagulant effect of polyphenols, neuro-, hepato- and nephroprotective.

I collected the most important compounds belonging to different chemical groups. Most compounds come from the group of polyphenols, especially various types of flavonoids, but also phenolic acids, anthocyanins, catechins and other compounds with properties acting against the virus causing COVID 19. I wanted to draw attention to

quercetin, which is one of the most active compounds, and is very common in the plant world, both as an aglycone form and as part of glycosides that are often found in plants. Quercetin is also very often recommended together with vitamin C prophylactically in high-risk populations, in the treatment of respiratory infections, and therefore it is possible to use it in patients with COVID 19 as a complement to the drugs used. However, I have not found any publication that would recommend discontinuation of conventional drugs and the use of only herbal medicines. Always herbal medicines have simply been mentioned as an adjunct to conventional therapy. For example, in one of the publications, the authors propose the following therapy: orally 2 times a day for 7 days prophylactically and in mild states of the disease from 250 to 500 mg of quercetin and 500 mg of vitamin C, and in acute states 500 mg of quercetin and 3 g of vitamin C.

There was quite an interesting clinical trial done on natural substances in the treatment of COVID 19, which I would like to mention. Of course, studies of Chinese mixtures have also been carried out, and China has generally done very well thanks to combining conventional and plant therapy, although at the moment there is some breakdown, and they also have a problem with the disease. Conducted in Pakistan, the study involved 313 patients who were in moderate or severe condition. This was a randomized clinical trial using placebo. Patients used a mixture of honey and black cumin seeds: honey 1 g and black cumin seeds 80 mg per kilogram of body weight per day in divided doses up to 13 days. In addition, they were covered by standard care with conventional drugs. Parameters were examined, i.e., the time needed to relieve symptoms. Patients were in moderate and severe condition. Compared to the placebo group, symptoms improved about half as fast, and the time it took to clear the virus – also depending on the moderate or severe condition – was also much shorter than in the placebo group. Most patients taking honey and black cumin returned to normal activities on the sixth day of the disease – as opposed to the placebo group. Deaths were observed only in serious condition.

In the treatment group there were about 3% of deaths, while in the placebo group almost 19%. Also, here you can see that this combination of conventional and unconventional therapy, i.e. with the administration of simple things, had a great effect. In addition, the therapy was very affordable, the authors calculated its cost at less than $

5 for the entire course of treatment. There were no side effects. Thymoquinone is probably responsible for the activity, although there is certainly a synergy of action of all components. Honey is known to have antiviral properties and is also recommended for other infections caused by viruses.

After being ill, a "post-covid syndrome" may occur. It is referred to as long-term COVID, which can persist for a long time, reducing the quality of life of patients. Mainly neurological symptoms are observed. A number of these symptoms of the acute phase may persist after its completion. Also, neurological sequelae, which are caused by damage to neurons, glia, damage to cerebral vessels, persist in about 30% to even 60% of patients. In general, the symptoms resemble chronic fatigue, it is such fatigue, diffuse weakness, muscle aches, non-restorative sleep, mental health disorders, depression, emotional and cognitive disorders, brain fog, which manifests itself in difficulty concentrating, memory impairment, cognitive deficits, which can even lead to dementia.

Which of the plants can be used in case of similar symptoms? Of course, one raw material in particular comes to mind, namely ginkgo biloba leaves. They are effective at various stages: from infection with the virus that causes COVID 19 to "post-covid syndrome". One study tested 80 herbs. It turned out that ginkgo leaf extract had the strongest effect on the virus that causes COVID 19 by inhibiting protease and inhibiting its replication. The compounds were isolated, and it was investigated that gycolic acids and biflavonoids were the most active. Of course, gycolic acids are in the group of toxic compounds and their amount in the extract is limited, but the authors suggest that some external preparations could be developed to combat viruses. Ginkgo therefore reduces the risk of infection – quercetin, other components, flavonoids, other polyphenolic interfere with attachment, penetration into the host cell, viral replication, anti-inflammatory effect, i.e., the concentration of proinflammatory cytokines decreases, the risk of asthma, sepsis and lung damage is reduced. In addition, *Ginko biloba* relieves respiratory symptoms in tobacco smokers. Besides, in China, ginkgo is mainly used in respiratory diseases. The extract has an antiviral effect, as evidenced by the use of extracts locally for changes caused by a virus, for example, chickenpox and herpes. Polyphenol complex, but not only, because there are also compounds of polysaccharide nature, improves dysbiosis caused by infection, increases the response of the immune

system, relieves metabolic disorders, has anticoagulant neuro-, hepato-, and nephroprotective effects.

Ginkgo leaf is also one of the few raw materials that have the status of a drug with well-established medical use. Of course, such an extract must meet the appropriate parameters. These are the parameters for flavonoids. The leaf is standardized, while the dry extract, purified and quantified from ginkgo leaves, must have an appropriate content of flavonoids, bilobalid, sum of ginkgolides and not more than 5 ppm of ginkgolic acids with potential toxic effects.

The activities that are characteristic of ginkgo leaves, i.e., antioxidant and anti-inflammatory, can be helpful in COVID 19 and in the post-covid syndrome. Polyphenols and ginkgolides scavenge free radicals, increase the level of antioxidant proteins. As a result, lipid oxidation is inhibited. Cell membranes are less permeable, polyphenols and ginkgolides protect brain neurons from oxidation and free radical damage after ischemia. As for the anti-inflammatory effect, ginkgolides are active, but especially ginkgolide B, which blocks the platelet activating factor. It is one of the mediators of the acute and chronic form of inflammation, that is, it is responsible for inflammatory reactions, thrombotic reactions. Also in this case, ginkgolide B effectively inhibits these factors. Gingcolides also inhibit phospholipase A2, which affects the anti-inflammatory effect because it reduces the level of arachidonic acid and pro-inflammatory prostanoids and leukotrienes formed from this acid, which affect the immune system. This extract inhibits phosphodiesterase, selectively the PDE4 isoform, which is present in endothelial cells, and phosphodiesterase isoforms 4 and 5 have already been used to treat clinical symptoms similar to those after COVID 19, i.e., when thrombosis, inflammation or fibrosis occurred. It is known that fibrosis also affects the lungs in the case of people suffering from COVID, i.e., in the post-covid syndrome the extract can be used as much as possible.

It is also worth paying attention to the neuroprotective effect and improvement of cognitive functions. As for the standardized extract, it is the most commonly used plant medicine in diseases of the central nervous system. Different mechanisms contribute to clinical effectiveness, with a number of randomized, double-blind, placebo-controlled studies conducted. An improvement in memory, selective attention, some executive functions was observed. The extract is recommended, for example, in dementia and

Alzheimer's disease. Ginkgolids counteract brain malnutrition, damage to the blood-brain barrier, which is necessary to maintain the proper environment of the central nervous system, which protects against pathogens and toxins. Ginkgolides reduce endothelial permeability, increase the expression of proteins that form close connections with each other: 240 mg of this extract standardized once a day for 24 weeks is significantly more effective than placebo in treating patients with dementia and neuropsychiatric symptoms.

An ailment that also occurs in people who have had COVID is tinnitus. This extract has been found to provide an evidence-based tinnitus treatment option. Randomized clinical trials using placebo were also conducted, in which the effectiveness was confirmed in patients in whom tinnitus was the main complaint, but also in patients in whom it was accompanied by cognitive impairment or dementia. The mechanism that may be helpful here is to increase perfusion in the brain and inner ear, anxiolytic effects, antidepressant effects, effects on neuroplasticity, including neurogenesis and synaptogenesis. One study compared the effects of ginkgo extract with pentoxifylline in patients with tinnitus. The effect was comparable, except that, in general, patients tolerated ginkgo extract better than the synthetic compound. The effects were more pronounced in patients with depression and anxiety. The effectiveness of hearing aids was also compared with the use of G. biloba extract in tinnitus. It turned out that hearing aids were slightly effective when tinnitus was present for a short time, while ginkgo extract was effective regardless of their duration.

The antidepressant effect and improving intestinal dysbiosis was the subject of relatively recent research, during which a polysaccharide was extracted from ginkgo leaves on the one hand reducing depression, and on the other improving intestinal dysbiosis states. Here, the research was carried out on mice. The antidepressant effect of ginkgo extract was comparable to the antidepressant paroxetine. This polysaccharide increased serotonin and dopamine levels in the mouse brain – of course, this was compared to the control group – and in the feces an increased number of *Lactobacillus species was observed*, which is what Hippocrates knew that evil is in the intestines. This work confirms that the antidepressant effect has a cause-and-effect relationship with

intestinal microorganisms, and therefore in depression it is worth paying attention to the condition of the gastrointestinal tract.

Another issue is to improve erectile function in patients after COVID 19 and pulmonary fibrosis due to hypoxia, hypoxia – oxygen saturation, which is necessary for the production of nitric oxide, decreases, and this condition has a negative effect on erection. Numerous studies confirm the effect of ginkgo leaf extract on erectile dysfunction and sexual dysfunctions by, for example, inhibiting phosphodiesterases mainly PDE5. The effect is the relaxation of the corpora cavernosa due to vasodilator action through nitric oxide, increased expression of nitric oxide synthase and dopaminergic activity. In a study on rats, it was proved that ginkgo leaf extract (the effect was dose-dependent) facilitated the repair of the cavernous nerve and restored erectile function by electrostimulation of the cavernous nerves after radical prostatectomy in rats, so it is certainly well proven.

Dosage, toxicity, interactions – 240 mg once a day or 120 mg 2 times a day is recommended, sometimes up to 320 mg per day. Administration should be long-term, because the receptors must be saturated for metabolic pathways to be properly regulated. The drug in recommended doses is well tolerated, safe, does not have mutagenic and carcinogenic properties, but theoretically, preparations from ginkgo leaves can prolong bleeding and coagulation time with simultaneous administration of anticoagulants and antiplatelet agents. There may also be an interaction with non-steroidal anti-inflammatory drugs, i.e., the irritating effect on the gastric mucosa may increase. They can reduce the effect of drugs used in stomach ulcers, for example with omeprazole, raise blood sugar levels in patients with diabetes, i.e., sugar levels should be monitored.

Some COVID 19 patients experience long-term neurological symptoms. These symptoms of long-term COVID are different from the weakness caused, for example, by severe illness and the sequelae after treatment in intensive care units.

It is worth emphasizing that preparations with the status of a medicinal product should be used and we have just tested three medicinal products: Ginkofar, Bilobil and Tanakan, which met the pharmacopoeial requirements. Of the dietary supplements, only

one was comparable to these preparations. Thank you for your attention, I wish you health.

8. **DR HAB. ANNA TROJANOWSKA, PROF. PAN,**

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"Strongly smelling plants used to combat epidemics – plague air"

I will tell you about the research on strongly smelling plants, which were used in combating epidemics in the sixteenth and seventeenth centuries, as well as in the early eighteenth century classified as plague air. It is, of course, about epidemics of infectious diseases, the main cause of which was then considered air, especially in the sixteenth century, this was the main subject of my interest.

As a reminder: in 2004, two American medical scientists – Linda Brown Buck and Richard Axel, received the Nobel Prize for research on olfactory receptors and the olfactory system of animals. It seems to me that since then, interest in fragrances, not only fragrances – of plant origin, but also animal and artificial – has increased. However, these studies will not answer the question of what role smells play in human life, how they affect his emotions. The perception of smell is a very individual matter, according to one definition: "it is a subjective representation of an objective event". It is culturally conditioned, the thresholds of olfactory tolerance are different with age, they change with the cultural circle, in different historical systems.

Some odors are considered bad by most people, especially unpleasant odors, which include the smell of corpses. For example, I will say that it consists of about thirteen compounds, but in other odors of natural origin of substances that cause smell, there may be even several hundred. Some fragrances are considered pleasant by most people, and these were often used in temples, e.g. as incense or fragrant oils.

Looking through materials on plague air diseases, I noticed a similar opposition between the causes of diseases and drugs, basically measures to prevent these diseases. In the fifteenth, sixteenth and seventeenth centuries, there was no idea of the active substance, so the properties of medicinal raw materials were determined completely differently. This situation lasted from antiquity, from the works of Dioscorides, then Galen. Then, attempts were made to refine considerations on the properties of medicinal

raw materials, taking into account smell, taste, color, consistency – in this way it was determined whether a given substance, a given raw material is warm or cold, or moist or dry, and this in turn was contrasted with diseases that could arise either from excess heat or just cause heat; They could also be of a moist nature, so on the one hand the nature (also referred to as nature or virtue) of the medicinal raw material was determined, and on the other hand, attempts were made to determine the nature of the disease, and in this way the remedy was selected on the basis of opposition. Of course, the effect of these drugs was taken into account, but in many newspapers, you can find information about the nature of medicinal raw materials.

I reached for examples from two old prints, i.e. *Antoni Schneeberger's Book on Maintaining Human Health* from 1569, from which I took most of the examples, and Sebastian Petrycy's *Instruction or Learning How to Act on the Time of Plague*.

From these two works, I chose examples of how bad smells were contrasted with raw materials that had a pleasant, grateful smell. Such terms were used. At that time, it was believed that the main cause of plague diseases were bad odors. They could be various types of venomous pairs, which were also referred to as "lewd dullness". First of all, the fumes from rotten human corpses were taken into account, which were not cleaned up, not buried, especially when there were many victims – in the case of plague, natural disasters, in the case of war. A little less harmful were animal corpses. They were also afraid of fumes from swamps, i.e., humid air, which if it was warm, was considered extremely harmful, the stench of venomous beasts – both those alive and those already dead, e.g., snakes or locusts. In order not to let such unpleasant odors into the houses, it was necessary to burn dry wood in them. Fuel should primarily come from coniferous trees, i.e., resinous trees, which had a pleasant smell: larch, fir, pine, and besides, from those that grew nearby (the works were compilations). So it happened that cypress or lavender or aloe vera tree was recommended. This, however, was not enough to properly clean the atmosphere, to prevent the stench from entering the room, it was necessary to add something smelling to the fire, e.g., flowers that were commonly grown in gardens, especially roses, cloves, but also roots from the garden or from pharmacies, besides herbs grown in gardens, i.e. available to almost everyone, but also pharmacy herbs. All of them were characterized by a graceful, good smell. Another group that I have

distinguished here are raw materials that we would currently consider spices: lemon peels, orange peels or nutmeg. These graceful smells were supposed to stop the morbid air from reaching the room, and even if it did enter it, they were somehow to inhibit its access to people.

Often used for this purpose fragrances were fragrant resins, which are also mentioned in the Bible: styrax, myrrh, incense and bdellium and many others. A similar function was also performed by things that were then believed to be born in the ground: camphor (camphor is not a resin, but a solid fraction of camphor oil) and amber. The medic recommended oriental amber, but it is known that Baltic amber was and still is commonly used for incense.

If someone wanted to leave the house during the plague air, he had to protect himself more. First of all, he should have covered the openings through which the air carrying venoms, diseases, could enter the body, so the nose and ears, and sometimes the skin, because the skin was also exposed to such air. They had to be protected with spices. So, they smeared themselves around the nose with some nicely smelling oil. The already mentioned raw materials are listed here. They could be shredded, wrapped in a cloth – a piece of silk, and worn around the neck. For the rich, so-called aromatic apples were prepared. They were jewelry ornaments, sometimes made of gold, into which balls emitting a nice smell were inserted. Not only substances of plant origin were added, but also of animal origin, such as musk. The rich carried such things with them, chasing away bad smells, I think not only during the plague air. They had to be sniffed frequently, especially if you ministered to the sick, it concerned doctors or people performing other functions among the sick. Then it was good to protect yourself and cover your nose with a sponge soaked in vinegar, vinegar containing some fragrance additives was often used, but the smell of vinegar alone was already sufficient. The role of the sponge was played by a properly prepared hub, because smells persisted in it for a long time. There are known drawings depicting plague doctors who have a bird's nose – it was in such a mask that a tinder soaked in smells was placed, which were to prevent plague air from reaching the doctor or gravedigger.

Amber was also used not only in the form of incense, but also in the form of beads that were carried with them. There were different ways to protect yourself, especially if

someone had the right funds, so they could use many different means. There were also ways to which poor people could resort – they were primarily recommended garlic and onions, not necessarily at the same time. They could be eaten with bread, which was recommended mainly to gravediggers, although special pills were made for them, which were to protect from the plague air. In addition, it was recommended to chew the root – ordinary, not specially prepared – it could be the root of angelica, poor fruit, lovage, white diptame, those that were available either collected from the natural state or acquired in a pharmacy. They could also be prepared with sugar, and such were recommended especially for children. In addition, other plants were used, which gave off a characteristic, but most often pleasant smell.

This was the case in the sixteenth and seventeenth centuries, which is mentioned by sources from this period. I also reached for later works, e.g., a publication from 1737, in which Camuset included information about the thick fever prevailing in Warsaw at that time. The city was depopulated, there were many victims, many people fled. In addition, there were also floods, so the cause of the plague air was still suspected just smells or fetors from decomposing corpses, but also vapors coming out of the ground and as a result of the sun transferred to the air. They were supposed to cause plague diseases, here referred to rather as plagues.

What measures were used? Fragrant herbs were also used to protect themselves from bad air. A slightly smaller selection of these remedies was recommended by the doctor Camuette. He drew attention, m.in, to juniper, which could be used for incense, but also powder was made from it, as well as boxes in which sponges soaked in vinegar containing some additional ingredients could be stored. Vinegar appears more and more often, it is said that it kills bad odors and is still used for this purpose in the household, but a handkerchief or sponge soaked in vinegar was supposed to stop harmful air, prevent a person from choking on it.

The situation changed in the 2nd half of the eighteenth century. Franciszek Kurcyusz, who is the author *of the Description of Diseases of Rapid Rescue of the Needy,* devotes one of the chapters of his work to the plague and no longer talks about bad odors that cause plagues, but about miasmas/miasmas. These were invisible particles, seeds of diseases. One can notice the development of sciences, such as knowledge about the

human body, about its functioning. The humoral theory of four fluids that are responsible for the functioning of the human body is still valid, but it is quite capacious and there are references to other substances: saliva, lymph, stomach fluid and pancreatic fluid are taken into account. Studies of these fluids taken from the sick or from the deceased during the autopsy, give such conclusions that under the influence of miasma in these fluids there is some alkalization and then rotten substances are formed that are responsible for the formation of the disease. So, we're no longer talking about smell here, we're talking about alkalization. In this regard, salvation is seen in acids, and such fevers, rotten pestilence are also treated with incense, but already sour, and as before, vinegar is used. Mineral acids were also used for rubbing hydrochloric acid, sulfuric acid. Herbs, resins or other fragrant substances could be added to them, but the time when fragrances were the main means to protect people from plague air is over. Thank you very much.

9. **DR HAB. ALDONA MUELLER-BIENIEK,**

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"Connections between Central Europe and the Far East through the prism of archaeobotanical finds (millet – Panicum miliaceum, turnip – Xanthium strumarium)"

The topic of the speech concerns the first manifestations of globalization, which we can read in archaeobotanical data. To illustrate this point, only two taxa, two plants, have been selected.

Let us briefly refer to the history of science. The first approach to the question of domestication centers – the fact that plants were domesticated in certain centers – took place almost 100 years ago and was authored by Nikolai Ivanovich Bawilov. It operated in the Soviet and Stalinist times, its competitor was Lysenko. Bawiłow fell into disgrace, in 1941 he was sentenced first to death, then the punishment was changed to 20 years in a labor camp. He ended up in prison, where he did not even survive two years. He died quite young. The concept of centers of domestication or the origin of cultivated plants was refined by Bawiłowo. It was over 100 years ago, when ecology used completely different methods than now. There was not much radiocarbon dating, so Nikolai Ivanovich can undoubtedly be considered a visionary.

Currently, archaeology and archaeobotany use tools that make it easier to track the evolution or formation of crops in general. We obtain data in the form of fossilized plant remains from archaeological excavations. These can be both larger debris, the so-called macroremains, visible to the naked eye, and microdebris. I will not talk about the method itself: where what remains can survive, what we study, what seeds belong to the bank... This is a broad topic that develops over time.

The fossilized remains allow us to determine which plants were used by humans, making taxonomic identification possible. Most of the fossilized remains are not fully charred specimens that have been exposed to high temperatures in the past. In this form, they can last forever, as long as they are not mechanically damaged. In fruits and seeds, it is very common to notice the features of domestication. Of course, it depends on the

type of plant – in the case of root or deciduous plants, the features of domestication will not be visible in fruits and seeds. However, the main crops, such as cereals: wheat, barley, millet or corn, have domestication features visible in the ear or inflorescence. Specific remains from the past can (apart from the identification of the plant to which they belonged) be objectively dated using the physical, radiocarbon method, and also carry out a number of other chemical or geophysical analyzes.

So, what has changed in the 100 years since the creation of Bawilov's concept? First of all, we have better specified places, centers whose range on the map is not so large. The fertile crescent is from our point of view the most important center of plant domestication. Also important is the time counted in thousands of years back, to the early Holocene period, i.e., the period after the last glaciation. About 12,000 years ago, the Holocene warming occurred. The first part of it ended about 8,200 years ago. It is known that these are not sharp boundaries, they are given only for comparative purposes, e.g., in stratigraphic tables. It was a big so-called climate event that lasted for a long time. The next climate event was quite significant cooling, and a large climatic fluctuation took place about 4,200 years ago. This divides the Holocene into two parts. At the same time, we see that the centers of domestication located at higher latitudes are associated with the early Holocene. The North Chinese center is also such a center. We have more and more radiocarbon dating. This time is being pushed back more and more. Plants – or rather people – are spreading. Plants encountered various types of barriers, one of which they also encountered in Poland. However, let us concentrate on the centers of domestication, among which there are the Levant, or fertile crescent, where m.in, several species of wheat and barley were domesticated, and northern China, where m.in millet was domesticated.

The domestication of these plants in the Middle East took place relatively early, actually at the beginning of the Holocene, and even at the end of the Pleistocene, i.e., the last glaciation. Agriculture arrived in Polish a little later, about 7,500 years ago. In contrast, the Bronze Age was crucial for the movement of crops from East to West and from West to East, which was related to this climatic fluctuation about 4,200 years ago.

Millet is grass, like wheat and barley, but belongs to a different subgroup of grasses. It is exclusively a spring plant, resistant to drought, very fertile, the grains are

small, but one panicle can give up to 3000 grains. Importantly, although perhaps not in this context, it is a gluten-free plant, unlike wheat and barley, whose grain contains gluten. Millet grain is quite firmly enclosed in chaff, and it is said that it can easily survive more than 50 years capable of germination and consumption. Cleaning with home methods is not easy. Certainly, most of us have come into contact with millet, that is, with millet already cleaned. Archaeological finds of charred millet grain from various periods have been preserved, e.g., from early bronze from Lipnik near Przeworsk, charred and torfiałe from Krakow's medieval layers. Very often millet occurs in a mixture with another grass from the group of millets – trichinosis *Seteria glauca*. The charred millet grain was analyzed, radiocarbon dating. Millet, when charred, often forms lumps that are quite easily tracable during excavations.

Where did domestication occur? As I mentioned earlier, in East Asia, in the early Holocene, which is about the same time as the domestication of cereals in the Middle East, perhaps a little later. Since the dawn of archaeobotany, millet finds from Europe have been known, dating back to the beginning of the Neolithic, i.e., over 7,000, and certainly 5,000 years ago.

In 2013, for the first time, a slightly larger publication summarizing radiocarbon dating of Neolithic European millet finds from objects considered by archaeologists to be Neolithic appeared. Few sites were located, m.in. in Germany and Hungary, it was the beginning of research, the method of radiocarbon dating was developing. Initially, carbon, i.e., research material, had to be quite a lot, and one grain of millet is tiny, so it was also a matter of developing the laboratory method itself, which at some point allowed for dating individual millet grains. All these originally considered Neolithic finds were not older than 1500 years ago. Many people disagreed with the results of these studies, some even took offense.

The results of another millet dating project appeared in 2020. They were conducted at the University of Kiel by a team led by two archaeobotantes. A total of 165 dates from 96 archaeological sites were obtained. They were presented at conferences and published in a multi-author article. The invitation to join the research was sent widely, we also received information with a form to fill in regarding the sites from which the material was sent for analysis, just for radiocarbon dating. Dating itself is not an

archaeobotanical method, but a physical one, although the material that is subject to dating is obtained as a result of archaeobotanical, archaeological research. Unfortunately, there is not much data from the area north of the Black Sea. Most of them are in the region of north-eastern Germany, near Kiel, from Polish still few finds have been dated. What did the dating show? The earliest date – it is worth remembering that the method allows to determine the dates only as varying degrees of probability – was attributed to finds from the sites of Winohradny and Sad: XVI century B.C. In the fifteenth century, millet begins to appear in the region of Europe, but more to the south. It moves quite quickly in a northwesterly direction. It also comes to the southern Polish relatively early. In northern Poland, it appears much later. The last cut is in the eleventh century BC.

A little earlier, from 2016, is a publication summarizing the data on millet from Asia so far. Millet finds date back to 1500 B.C., and sites from this period are not very numerous. However, it was a period of very intensive movement of millet to the West. This grain did not get much into Southeast Asia, m.in. because it is adapted to the continental climate. It spread north of Tibet to the west, while wheat and barley moved east at about the same time to Tibet, Iran and Central Asia. This barrier was at some point broken through quite quickly and wheat made its way from the northwest to China – this was in the second millennium B.C., probably not earlier. Of course, there may be some more research, more data, but this is the current state of knowledge in a nutshell. It was a dynamic second millennium B.C., the beginning of the Bronze Age, in which many cultural changes took place.

Millet is a completely different grass, requiring different processing than plants – cereals that have been grown in Europe so far – it can taste, it may not taste. Its spread must have been associated with a very large cultural change. It is worth paying attention to the course of the Silk Road, of course, it is believed that the Silk Road was – let's say – opened, discovered, established, in the first century or at the end of the second century BC, i.e., 2000 years later. However, its course is very similar to the path of millet. The Héxī region is crucial for this movement.

What was happening to the climate, what exactly happened? Mainly paleoecological studies are conducted, but the youngest Holocene, i.e., the time when

millet probably moved, was characterized primarily by large climate fluctuations. Previously, the climate was definitely more stable than in the youngest Holocene.

The second plant I wanted to talk about is turnip, for years considered the so-called kenophyte. Two charred specimens come from the site in Lutomiersk, near Łódź, from where millet was also given for dating. The millet date came out consistent with turnips. In paleological analyses, turnip in Europe appears in the tip of bronze. This specimen was dated after calibration with a probability of 95% to X/IX century BC.

The mentioned site near Łódź is located on infertile sands, but apart from turnip, which was found in total 4 or 3 seeds, without any traces of fruit, a number of plants were found. Mainly millet and peas were grown, but also harvested plants such as quinoa or room rainwater, which at the same time are quite frequent weeds, moreover, ergot, plantain, valerian, as well as a mallow type plant (it is impossible to determine to the level of the species), some cornflower, probably common hogweed, henbane, hug – with two specimens, and a szelężnik were probably found. All seeds are charred and have not been dated. Many of these plants can be medicinal in nature.

Colleagues from China also took care of the turnover. Originally, these seeds in China were labeled as barley. It turned out that there are quite a lot of turnip seeds at archaeological sites. Here is a map showing all the positions. One of the publications concerns the site of extremely dry terrain from the basin or Turpan valley, the earliest finds also come from about north-eastern and eastern China. The authors elaborated on the medicinal nature of the plant. The dating of the finds is not very old, but they bear traces of evident use, opening very hard fruits and obtaining seeds from the inside, which contain quite a lot of oil and are very important in Chinese medicine. Quite old written sources and Chinese engravings concern turnip and what a given part of the plant could be used for.

The route, which was later called silk (silk came to us much later) existed long before the appearance of silk in Europe. Millet and wheat traveled along with the people, certainly many other goods, etc. There was a lot of contact between Europe and East Asia and certainly climate change, possibly leading to major disasters or destabilization, had something to do with it. I don't know if this was due to the fact that, for example, the glacier moved, or the terrain became somehow more accessible due to the fact that there

were big changes – primarily the humidity of the climate. The problem, however, was not so much the moisture as the large fluctuations. It is known that at that time there was certainly a weakening of the monsoons, there are studies of how it manifested itself in Central Asia, but they are difficult for me to read. It was then that medicinal plants, and certainly turnips, came to us from East Asia. Thank you very much for your attention.

10. **LEK. MED. ROBERT KSIĘŻOPOLSKI,**

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"Rhodiola rosea *in traditional applications and scientific research*"

Rhodiola rosea is a well-established plant, but it is not widespread and perhaps that is why it is not so popular. Its natural occurrence is limited to the kosówka floor, the halne floor in the Karkonosze and Carpathian Mountains. The sites of the rhodiola are wet rocks – it does not need much ground to cope in the mountains.

Herbal raw material occurs under several synonymous Latin names Rhodiola rosea, Rhodiola arctica, Sedum roseum, *Sedum rosea,* Sedum rhodiola. All of them concern the raw material known as Rhodiola rosea, which in Polish is also called rodiola pink, golden root, pink root, and in the past was called rose root.

It is used in folk medicine, it is used for medicinal and culinary purposes. It is also in the French pharmacopoeia, it was already in the first Swedish pharmacopoeia. It is also used in cosmetics, in the past also in dyeing.

As a raw material, flower, herb and for medicinal purposes primarily the root is used. In historical sources, Rhodiola rosea *already appears in Dioscorides as* Sedum rhodiola. The name of the medicinal raw material was *Rhodia radix* (from the Greek *rhodia* – rose). The indication for him was headaches, that is, he was recommended to "the victim of a headache". In the Polish writing tradition, the rosary was found in the *Siennik's Herbarz as a horn, rosary and* Radix rhodia, as well as in the *Polish Herbarz* of *Marcin of Urzędowo as* Rhodia radix – rose root. The author notes, of course, the use described by Dioscorides, Galen, Paulus. At the same time, he is probably the first to give the location of the harvest places: "it grows in Macedonia and in our Tatra Mountains, near Sącz". It can be seen that Nowy Targ in the sixteenth century was not yet a topographical term.

In his herbarium, Sirenius expands the location of habitats and writes about the places where the raw material is collected: "on the high mountains there is a place between rocks, where there is little land near it. On the Macedonian and Coritan

mountains, in the Tatras and Babia Góra". We can only speculate whether he relied on herbalists from kleparz, or actually visited any of these sites, but the description "between rocks, where there is little land near each other" seems to characterize the site well in natural conditions.

The mountain rhodiola is described and is also included in *the Herbarium* of Brother Cyprian of the Red Monastery. The herbarium was created in the years 1766-1768, so it can be said that in the times of the Spiš starosty, but judging by the term Korien rasowe, brother Cyprian was probably Czech. This is what a.o. Zofia Radwańska-Paryska says.

The name pink root was mentioned by Rostafiński and Waga. Linde used the term rose root, and Majewski used both. In the *Multiplication of the Plant Dictionary by* priest Kluk, as well as in Dziarkowski and Siennicki we find quite an extensive and interesting botanical description of the rosary, one can also find here a mention of the use of this raw material: "It grows in the Alps in Switzerland, Lapland, most abundantly in the Carpathians", the author gives the use of rosarya: "from washing hair with a decoction of these roots, the hair grows significantly. In Greenland how much for food, and in the Carpathians against diarrhea they use." The use of rhodiola for food purposes is repeated in many other countries.

It is used by the Sami and Sami people, also by the Finno-Ugric people of the Komi in Russia – it is a subarctic zone, including the north-eastern ranges of the Ural Mountains. The collection of rhodiola for the Komi people is associated with rituals and can indeed be compared almost to a mandrake in the Middle Ages.

Rhodiola is used in the Arctic countries of North America, mi.in. by the Inuit in northern Quebec, by the Nunatsiavut people on the Labrador Peninsula, Newfoundland, where it is used for medicinal purposes, but also for food. It is one of the eight most commonly used wild medicinal plants in these regions. This popularity is due, firstly, to action, secondly, to the fact that the prevalence in the arctic regions of plants is not so obvious, especially those popular, edible, acceptable, which are characterized by good taste and availability.

In traditional Chinese medicine, rhodiola is widely used both for diseases of the lungs, respiratory system and disorders of the nervous system. The indication is the

stabilization of various conditions related to the system, diseases, diseases, prevention of diseases of the nervous system, also improvement of mood. It is used in states of weakness after infections, in female diseases, in altitude sickness. Here, the use of rhodiola and *Rhodiola kirilova* is quite interesting, because in the Pamir region there are several species that are used for medicinal purposes. Traditional Chinese medicine prefers Rhodiola crenulata, while the official Chinese medicinal pharmacopoeia also uses chińska *Rhodiola crenulata*.

In the Great Tatra Encyclopaedia by Zofia Radwańska-Paryskia, the mention of rhodiola was included in the description of the occurrence of stonecrop, because at that time it was still included in this subfamily: "In the Tatras grows several species of stonecrops, among which we can distinguish, among others, rosary (pink in highlander), with blue, serrated leaves and inconspicuous yellowish-reddish flowers". It also mentions dioeciousness – male flowers have a more developed crown.

However, in the Podhale dialect itself or in field reports there are not many mentions. Thanks to Professor Frey's indication, I found one report, a description of the use of a black rose – this is probably a local name. Mrs. Regina Stopka from Ratułów is quoted *in the Zakopane Memoirs of* Professor Konstanty Stecki Senior, a botanist from the Adam Mickiewicz University in Poznań: "in the pastures grows (...) on the eve of St. John's Day to collect them, it is from them that you will brew medicines for a great disease very effective." Further description shows that this great disease is probably epilepsy – the complaints of the patient in whom the drug was used were mentioned. "Healers give what under oath only to peasants, because it is not lawful for women and girls to give them." This is a mention from 1912. The name black rose could be associated with the fact that the plant had a rose smell and was dug out of the ground.

Rhodiola rosea is described in Linnaeus'es *Materia medica* as a rose root recommended for the treatment of headaches, hysteria, nervous disorders and as an astringent. The use of the root is also described in Icelandic herbal literature, where there is such a term for rhodiola: "an infusion of dried rhizome acts as an astringent". I will talk about the characters used today.

Rhodiola was used for severe skin lesions, to improve the intellect, restore nervous strength – these are all Icelandic indications. In French folk medicine – I give *Histoire*

naturelle des médicamens, des alimens et des poisons by Julien Josph de Virey – rhodiola was used as a stimulant, and also eaten in the form of a salad. In folk medicine of Ukraine, especially the Hutsul region, the mountain rhodiola is known as the golden root. Dr. Nesteruk mentioned that it had actually been overexploited. These sites are still exploited, but he was described, among others, by Professor Mamchur from Ivano-Frankivsk, who as a urologist conducted field research with ethnologists in the Verkhovyna and Chornohora regions. The research has been popularized in several books by Professor Mamczur and Mrs. Bołtarowicz, which are devoted to folk medicine of the Carpathians and the treatment of Ukrainians at the turn of the nineteenth and twentieth centuries.

The raw material and indications were relatively wide among the Hutsuls, but also primarily dominated by applications in the case of fatigue, physical and mental exhaustion, as a stimulant, in states of stress, to regain balance after infections. *Золотий корінь*, which can still be purchased, in the Hutsul region was bought at fairs.

During the field observations that I have made there since 2000, I noticed an interesting phenomenon. The characteristics of local raw materials began to be dominated by medical descriptions of the golden root, which – I have the impression – were a form of popularization of the medicinal indications of the plant given by Professor Mamczur, who disseminated his research both in the form of scientific publications and in a few, five popular books devoted to m.in rodiola and folk medicine of the Carpathians. After nearly 20-25 years, we begin to find indications that Professor Mamczur, as a pharmacologist, urologist described, developed and rationalized in the Hutsul region.

The main herbal raw material in the case of rhodiola is the root, as described in *the Encyclopedia of Herbalism and Herbal Medicine* by Professor Strzelecka and Professor Kowalski. We dry cut in natural conditions, in the shade, in the air. Professor Strzelecka describes the use of young leaves and stems for salad also here, not only in Iceland, but also in Western Europe, probably in Alpine countries above all.

The rhizome has characteristic nodular thickenings, there are also finer roots. The problem is that plants that are at least three years old, preferably above five, are primarily obtained. Ten-year-old plants – it is a matter of fairly slow development in such climatic, arctic or mountain conditions – have rhizomes weighing even about a kilogram. However,

in the face of considerable demand for this raw material, even if we would have many ten-year-old plants, the availability of this raw material from natural sites, for example in Ukraine, is worrying. Fortunately, rhodiola is primarily imported from Siberia, where it is much more common, so there are no such reservations when it comes to its exploitation.

Alcohol tincture is made from the rhizome of rhodiola: alcohol 40-70 percent in a ratio of 1 to 10. Alcohol tinctures are used, of course, primarily in folk medicine of Ukraine and Russia, while in phytotherapy mainly dry extracts are used.

Rhodiola rosea is in the European Medicines Agency's herbal medicines monograph. Standardized extracts, i.e., concentrated 1.5-5 times, are used in sleep disorders, anxiety states caused by stress, in mood disorders primarily in adults. There are no experimental data on children, so they can be used primarily in people over 18 years of age. They are available without a prescription with the reservation, it is also included in the monograph that over 2 weeks a medical consultation is required.

The main substance, the main active ingredients, especially when it comes to states of anxiety, depressive states on which I would like to focus, are salidroside and a group of compounds that are referred to as rosavins and were isolated quite early, in the 80s. At the beginning of the 2000s, it was established that the ratio of rosalins to salidrosides, which determines the quality of the raw material, is also important, and it should be 3:1, i.e., here we are talking about a lot of standardization. The number of research publications on *Rhodiola rosea* is very large and reaches several thousand.

I would not like to focus on biological activity, although it is the source of the mechanism of action. We have in vivo, in vitro studies that have confirmed biological activity: antioxidant, anti-inflammatory, neuroprotective, cardioprotective, antidepressant, antidiabetic effects. I would like to focus on clinical trials that have also shown anti-cancer activity in vitro and in animal studies, anxiolytic and central nervous system stimulatory effects.

As for the mechanisms of central action and possible mechanisms of antidepressant action, there are at least a few of them. They partly overlap with certain groups of drugs that we use in psychiatric therapy. First of all, there is inhibition of one of the enzyme systems that break down serotonin, i.e., MAO A, it is a matter of modulation, reduction of transmission, noradrenergic secretion, normalization of serotonergic

transmission, but also – as if as a result – an increase in serotonin in the central nervous system or in the hypothalamus, or in neurons and in the spaces between synaptic ones. This results in, m.in, antidepressant effects, stabilizing mood, improving intellectual performance and reducing stress. Serotonin is one of the neurotransmitters that affect the mechanisms related to the regulation of blood pressure, it may be related to headaches, also here there is a whole range of vascular mechanisms that can be confirmed.

We have several randomized clinical trials that, firstly, confirm some beneficial effect in people with mental and physical exertion. Some of these studies are of very good quality. A systematic review, including more than 200 publications, confirms more decisively the effectiveness in combating the symptoms of fatigue. Finally, we have a review that includes the results of two randomised and several non-randomised open-label studies with a total of more than 800 patients. The results of these studies confirm the antidepressant effect in adult patients.

Studies on antidepressant effectiveness have been conducted since the early 2000s, there are several of them. Some of them can no longer be repeated because they compare the effectiveness of rhodiola to placebo or compare the effectiveness of rhodiola to sertraline. This is unethical because the depressed patient was not given the active drug and a placebo was used. This is no longer accepted by the Ethics Committee.

However, we have studies, observations that confirm the use of *Rhodiola rosea in* a standardized dose, in which we have a setralin-placebo, sertraline-rodiola and sertraline-other higher dose of rhodiola, which makes us very happy. The 2020 publication in the Journal of Affective Disorders cannot be accused that the study protocol does not meet modern ethical principles. The results were compared in groups of about 30 people, under standard conditions, i.e., on the Beck scale, Hamilton scale and clinical improvement. They were unequivocally positive for Rhodiola, proving that it is effective in treating depression. The effect depends on the dose, i.e., the higher the dose of rhodiola used, the better the clinical effect.

The voice of practitioners is also important, e.g. it is worth mentioning the book The *Rhodiola Revolution from 2004. Two professors of psychiatry from the United States describe m.in cases of bipolar disorder and PTSD treated with rhodiola.*

Despite the positive results of clinical trials, the use of rhodiola also in depression should be described as a therapeutic choice of a *label* nature, or, as it is called, quite confirmed. We have experimentally confirmed actions, pharmacological premises, but this is not a standard of evidence-based medicine. It can be said that doctors can use it, although international bodies, unfortunately, do not yet recommend it for use in some specific form of depressive syndrome, depression.

We have a very wide application of rhodiola. I limited myself only to some selective indications, but interestingly, it is a tasty, salad herb. Its leaves are really delicious – especially in mid-May, while the root of Rhodiola has a number of applications, actions and over 140 biologically active substances.

11. **DR HAB. JACEK DROBNIK,**

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"The merits of Carl Linnaeus for the plant medicine"

I would like to present a story from the past concerning the evolution of scientific knowledge about medicinal plants, and more specifically from the life of Linnaeus. What are its merits for the plant medicine? We know well – and this is taught – that Linnaeus is the author of binominal nomenclature and plant systematics, an artificial system based on the number of stamens and pistils. He gave an exposition of the system in the fundamental work *Species plantarum*, where we see in red the binominal name proposed for the species and its assignment to the class as well as to the order. But it is necessary to know the practical value of these proposals: the fact that we can count the pistils and stamens and thus choose the group of plants to which the species belongs is probably the most useful part of Linnaeus' invention. Proposing new names in practice does not add anything – these are further names that need to be assimilated, so there is no benefit for either the doctor or the pharmacist, unless there is something more behind it, so you would have to think about it.

What are the merits *of Species plantarum* for the development of botany? First of all, Linnaeus abandoned the idea of collecting all the multi-word names that had been used up to his time and considered as synonyms of his binominal names only some, so-called good, that is, those that he understood, for which he could vouch, which came from authors who had some greater authority for Linnaeus. It is very important that he wrote about the species he saw, and the names matched not pictures, but the plants he had in his hand. In addition, the placement of the plant in the system of species also necessitated knowledge of the characteristics of the genera. This means that *Species plantarum refers to earlier works, namely to* Genera plantarum, the *first edition of which is the 30s of the eighteenth century – 1737, the second – 1742, the fourth 1752, so it forced the use of generic features as well.*

The binominal nomenclature was accepted, at least in pharmacy, very reluctantly, because it did not carry a novelty of species in itself. It was only with time, when a certain community of traits began to be attributed to genera, that attitudes changed. The uniform criterion of the structure of the flower was certainly the most useful from the point of view of the practice of plant recognition.

It is also worth saying that in rich genera, where there were a lot of species, Linnaeus inserted subheadings and introduced division into sections to facilitate the designation of the species according to a certain group of features within the genus.

An earlier work, *Materia medica*, became the foundations of new thinking in pharmacy. It was published in 1749. Linnaeus collected in it primarily medicinal species. He applied the layout according to his artificial system, which is a very practical thing. About 500-800 plants were collected, depending on how you look at it, but those that were actually medicinal in his time. Information is given such as: what is a medicinal raw material, what are its properties – smell, taste, color, what are its pharmacological effects according to the beliefs of the time. Diseases that a particular plant can help with are also listed.

The merit of this work is the inclusion of synonyms, which Linnaeus considered valuable. These are multi-word synonyms, descriptive phrases, having an additional practical value, that is, it is a combination of something old with something new. In the introduction, however, he pointed out that he writes only about species that are in pharmacies in Stockholm, in the Stockholm pharmacopoeia, and about those used by more famous doctors, and it was a shame not to include them in this work.

This work refers to the characteristics of genera, i.e., Linnaeus' botany at the generic level had to be known in order to be able to determine the medicinal species. A uniform taxonomic criterion was adopted, and above all, in a very ostentatious way, Linnaeus summarized sometimes multi-volume, very literary works on medicinal plants to dry facts. These dry facts were sometimes limited to one or two words describing the raw material or denoting the action. In many cases, when he had no knowledge, he left an empty space, and here and there he put question marks and showed that little was really known, which was a certain stimulus for further research.

Sometimes Linnaeus could not give a species name, or there was very little information about the plant and only the raw material was known. It was impossible to use his method of counting pistils and stamens at that time, because, well, the plant reached Europe in the form of a piece of wood or bark, it had only a pharmaceutical name.

Linnaeus' work instilled such a belief that it would now be necessary to try to add species to medicinal raw materials, and this is exactly what happened. Linnaeus encouraged one of his doctoral students, Niels Gahn, to do research and a dissertation entitled *Dissertatio medico-botanica exhibens plantas officinales was* written, written shortly after completing *Species plantarum.* The dissertation described species, medicinal plants. We have the following arrangement in it: on the left in the column pharmacy names of raw materials, in the middle of the names of species – there are empty spaces, and on the right side a morphological description of what is a medicinal raw material.

It was a revolution, because everyone started thinking let's fill in these gaps. Not only: let's extend the list of species, maybe some new ones will be found, but also: let's fill these gaps in knowledge. I wanted to investigate whether Linnaeus' influence was really that much. It turns out that yes. For example, a doctor of Austrian origin, but practicing in France – Swediaur, immediately began, like many other imitators, to write books under the title *Materia medica*, where there was already more information that could be collected about plants. Knowledge was expanded in a summarized and very concrete way, because Linnaeus loved concrete.

Svetiaur testifies that for 50 years, since Mr. Linnaeus delivered in a beautiful and elegant language all that we know about medicinal plants, knowledge has advanced greatly, and many species that Linnaeus knew in outline, sometimes from the raw material itself, are already very well known. New species have also been added, but the use of well-known species has been established. At the end, he gives something more interesting: he also began to collect information – he went to various places, cataloged plants, gained new knowledge about them. An experimental approach is also born, which characterized botanists studying medical matter, to complete the missing properties, features, details of appearance. Knowledge grew in this way.

Finally, let's focus on the most frightening thing of those times. Swediaur writes that pharmacists sometimes do not collect plants. It was the norm of those times that the apothecary was in charge of supplying his pharmacy and it was only his thing, his concern, but when he did not have time for it, he bought the raw material. It turned out, however, that he bought plants that he sometimes did not know, that women came, exactly the word *muliercule* is used there – it's so with pity for a woman – herbalists and they sell a bunch of plants to the pharmacist, and he just gives credence to what the woman said. There is even a Latin word used*, promiscue*, that is, uncritically or as it goes, one by one, he buys what they bring him under the names for which the pharmacist is accustomed to simply vouch. What were the consequences? It's not hard to imagine and I'll talk about it in a moment.

The compilation of information was of great practical importance for the development of knowledge about the drug. Linnaeus sensed this, and he was not the first, because he had predecessors such as Morison at the end of the seventeenth century, and then Tournefort, who *in the Institutiones rei herbariae* in 1700 arranged plants according to the morphological system, but he had not yet chosen what best to rely on, although he already sensed that on flowers. Then some correlations start to come out. Linnaeus wrote very early that plants which agree in genus also agree in medicinal properties, those which agree in order approach each other in kinds, and those which agree in class also correlate with each other. Thus, going down to the lower levels of systematics, we obtained a tool that allowed us to predict something, as well as to build knowledge about healing effects, and consequently about applications, as well as about replacing something – one species with another species, if something was missing.

Then Linnaeus wrote that the *methodus naturalis* – as he finally called it – that is, the system of stamens and pistils brings disappointment. He saw this only fragmentarily, but he felt that where he relied on a larger group of traits, such as the structure of the flower and the foliage, and the structure of the fruit, which can be repeated within families, there he began to discover deeper correlations. And here he showed such a fragment in botanical philosophy and wrote that one *studiose inquirenda sunt,* that is, they are worth remembering, further study.

Yes, *Species plantarum was well suited for recognizing plants, but this method – a system of stamens and pistils – is imperfect. For example, sage has two stamens, while the other species in its family have four, so that sage was several dozen pages earlier in* Species plantarum than representatives of such closely related species as mint and thyme. What if inside the genus there are species with different numbers of pistils and stamens? For example, the class *Dioecia diandria*, i.e., two-rod, two-pistil – we have a kind of willow, but we see that there is *Salix triandra – three-stamens willow, and also* Salix pentandra – five-rod. Linnaeus saw this and must have felt bad about it, and because he knew willows well, he had to break his artificial system so that the willows would be within one genus.

Another example – class *Diandria monogyna,* two-rod, single-pistil, in the genus verbena suddenly there is a subgroup of four-rod verbenas. At the same time, you can see how it divides certain types into sections.

Linnaeus was aware that features such as the structure of the flower, the number of stamens, pistils would not be found so consistently given in older works. In Tournefort they may be, in Morrison they may be, but in Bauhin, for example, there is not. A horse with a row to whoever finds it, for example, in *the Pinax theatri botanici* from 1623. People did not deal with such details as the construction of the flower.

Linnaeus therefore relied on the plants he saw, because he could see for himself what he was interested in. The first postulate of 1736 is that in the study of natural sciences the foundations of truths should be tested experimentally, that is, perhaps not by experiment, but by experiment: go, check, count, then you will know. Linnaeus, therefore, did not write about medicinal plants that were not used, that no one saw. It happened that hundreds of species were described from China, from America, although they were not imported to Europe, which can be traced and studied on the basis of sources.

Finally, in *Species plantarum*, he wrote the fundamental words *non visas plantas heic omisi – plants not seen here I have omitted*, so often deceived, misled by the authors he read.

What were the repercussions? One of the authors, who also wrote about medical matter, the otherwise eminent botanist Gleditsch, is very angry and nervous: "the doctor prescribes the means, the pharmacist must prepare them. Fortunately for the sick, such

an institution was not trusted anywhere (..). But without botany, is it possible for a physician to distinguish between what is poisonous, what is ineffective and what is effective?" Well, when plants are arranged in a system – even artificial, sometimes edible with poisonous, so the importance of accurate knowledge is simply very necessary has begun to be appreciated. "And is the doctor to rely on a pharmacist? And if he had to rely again only on his herbalist, or on the root digger? Unfortunately, such cases happen often enough." This is the year 1788 and it is a testimony to a certain practical drama. He gives the example *of the plant Conium maculatum* – spotted sorrel, introduced into therapy around the 60s or 70s of the eighteenth century, namely in Vienna representatives of the so-called older Viennese school experimented therapeutically with plants that had been considered poisonous so far, selected the dose, carefully looked at the healing effect and some of them were actually introduced into therapy, but as dangerous drugs. Gleditsch is very upset that so many times the spotted sorrel has been confused *with Chaerophyllo sylvestri, i.e., Anthriscus sylvestris* with *Chaerophyllum temulum, i.e*., the hanging scabbard, *Chaerophyllum bulbosum* – tuberous *scabbard.* All these plants are very poisonous, and a few other plants could be indicated. So, there was something to learn, but in that case the pharmacist was practically left with nothing, because just imagine: the doctor got to know the plant from literature or he went to the trouble and had some raw material with which he clinically experimented, then he wrote the name of the species on the prescription and worry, apothecary, right? Of course, the patient suffered dramatically from this.

A postulate was put forward that in pharmacy a herbarium should be used as a model for a pharmacist, which should be arranged according to the natural system. I found it in the Swiss pharmacopoeia of 1771, when Linnaeus was still alive. Another source, from 1788, recommends that the pharmacist make a herbarium and learn the natural system and use such materials to confirm the identity of plants about which he has doubts.

These are very early testimonies. The natural system, in which 100 families were distinguished quite well, arose slightly after the first of these sources, it was described by Antoine de Jussieu *in Genera Plantarum*, a work published in Paris. Later it turned out that if medicinal plants are substituted into the natural system, such correlations emerge that

pharmacists felt as if they had a Mendeleev tablet in their hands. It was a revolution, but it happened at the beginning of the nineteenth century.

Finally, I just want to show you that an Italian wrote a book *called Institutiones pharmaceuticae* with the subtitle *Pharmaceutical Philosophy*, and this is an obvious allusion to *Linnaeus' Botanical Philosophy*. Unfortunately, almost no one quoted it, because it was not written in such a convincing and concise language as Linnaeus used. The conclusion is that in those days the drug was standardized only by indicating the species of the parent plant. There were no methods of analytical chemistry – neither quantitative nor even qualitative – to confirm the identity, the composition of the raw material. The natural system, however, revealed a certain order and made it possible to actually predict the characteristics of medicinal plants. The worst thing is that the pharmacist had to learn all this, poor man.

Thank you for your attention.

SESSION II. ETHNOGRAPHY

1. **DR HAB. DANUTA PENKALA-GAWĘCKA,**

INSTITUTE OF ANTHROPOLOGY AND ETHNOLOGY, ADAM MICKIEWICZ UNIVERSITY IN POZNAŃ

"Peganum harmala L. ***in the traditions of the peoples of Central Asia and its popularity in the era of the COVID-19 pandemic – the perspective of medical anthropology"***

The hero of my speech is the rutaceous pagan, or *Peganum harmala*. At the beginning I would like to focus on its traditional uses in the peoples of Central Asia based on literature and my own field research that I conducted in Afghanistan, Kazakhstan and Kyrgyzstan, and then I will focus on examples of the use of this plant in the era of COVID-19 also in Central Asia and point out the factors that clearly influenced the increase in popularity.

Rutowaty pagan is otherwise called chojnorostka or hoynorostka, it is also called steppe or Syrian rue. It is found in Central Asia, India and China, the Middle East, North Africa and the Mediterranean. Mainly seeds are used, but also the whole dried plant.

Poganek has various local names. Here I give primarily those local names that are used in Central Asia, so *esfand, isfand*, which is used in Iran, but also in Tajikistan, or *in the espand* version in Afghanistan, and in Kazakhstan *adiraspan* and *adrasman* in Kyrgyzstan. According to *the Encyclopaedia Iranica,* the name *esfand* comes from the Proto-Iranian term *svanta*.

The name *Peganum harmala* was also mentioned in old medical works: *Materia medica* Dioscoridesa, in the works of Galen, At-Tabari, and finally in the Canon of Medicine Abu Ali ibn Sina, or Avicenna. According to these scholars, pagan has a diuretic, emetic effect. They also recommended it for throat diseases, menstrual disorders, infertility, epilepsy, mental illnesses.

According to the classification of plants and other medicinal products into hot and cold, espand was defined as hot and used against diseases that were considered cold. Also in Afghanistan, espand was widely considered a hot drug according to the classification that was adopted in Greek-Arab-Persian medicine, called *yunáni in Afghanistan*. This was the name of espand not only by traditional doctors, called hakims or tabibs, but also by non-specialists. It was recommended for abdominal pain, joint pain, helminthiasis, lack of milk in lactating women, menstrual disorders – those diseases and ailments that were considered cold. For example, a woman after childbirth, which, it is believed, cools the body a lot, should be given a few grains of the plant to swallow.

Espand was commonly used as an apotropaic agent. It was burned because it was believed that the smoke of burned seeds was to drive away evil spirits, djinns, protect against the evil eye. It should be incensed primarily by the obstetrician and newborn, so people who are most exposed to harmful forces. I would like to add that espand is still very popular in Afghanistan, which I know from various sources.

I will present the results of my research in Kazakhstan, which I conducted in the second half of the 90s and in Kyrgyzstan in 2011-2013, and which shows how the rutaceous pagan is used in post-Soviet Central Asia. I will discuss collectively the most important ways of using *Peganum harmala*, especially since they are very similar in the area in question.

First of all, incensing with burnt seeds, twigs of the plant are used for protection and cleansing purposes, to ward off evil spirits and protect against the evil eye. I also encountered explanations that pagan smoke kills microbes. Incensing is mainly used by women at home, at the bazaar, during family gatherings and holidays. Then, when it is believed, it is necessary to clean the house and its inhabitants. It is also part of healing practices.

Seeds are sometimes placed in amulets, bundles of dried plant are hung at home or above the door, also to protect against evil forces. Much less frequently, however, you can find therapeutic recommendations, for example, using a bath with a pagan for joint pain, using it for inhalation or gargling. Such an indication was noted by researchers in Uzbekistan in rural areas. I, on the other hand, conducted research in large cities, in Almaty and Bishkek, where I did not meet such recommendations.

I now turn to the career *of Peganum harmala* during the COVID-19 pandemic. In March 2020, the President of Turkmenistan, G. Berdimuhamedov, ordered the Yuzirlik plant to be dusted with smoke to protect against all infectious diseases. At that time, and for a long time, it was not yet acknowledged that the COVID-19 pandemic had appeared in Turkmenistan, but it was ordered to wear masks to protect against desert dust. It has become obligatory to regularly incense shops, offices, other workplaces, including school premises or universities.

Officially, it is maintained that the effectiveness of dusting with juzirlik is scientifically proven. Also, in Kazakhstan and Kyrgyzstan the demand for adiraspan or adrasman has increased significantly. The prices of raw material have increased significantly. Also in Tajikistan, incensing with espandem was commonly used to protect against coronavirus. There were also other plant medicines for microbes, as it was called in Turkmenistan, or against COVID-19, as it was called where it was considered that COVID had already occurred. Among other things, President Berdimuhamedov propagated licorice root. He called licorice the treasure of Turkmenistan, ordered Turkmen scientists to study its antiviral properties. It was at the end of 2020 and still not a single case of COVID-19 has been confirmed, although various restrictions were applied.

In turn, the President of Kyrgyzstan, S. Japarov, recommended the use of anti-COVID-19 tojad. In Kyrgyzstan, there are the jungle eater and the Karakol tojad, two species. The Minister of Health publicly drank tincture of tojad during a press conference in May 2021 and announced that the treatment according to this recipe has already been used for many months in hospitals with a positive result, but under the strict supervision of doctors. Although severe poisoning was reported, according to official information, these were only cases of self-medication at home without medical supervision.

The socio-economic and political context of *Peganum harmala's career during the* pandemic in Central Asia is very important. The pandemic has exposed very clearly the weakness of local health care systems in Central Asia, for example, in Kyrgyzstan there was a complete collapse of the system, especially in the summer of 2020 – to this day we talk about Black July. When vaccines appeared, their availability was very limited, and they were only Chinese and Russian preparations in small quantities.

In the situation of the system's inefficiency, representatives of the authorities began to recommend traditional means of plant origin and not only plant, but I will not mention them. The rut pagan was somehow entangled in politics, and the recommendations and appeals of the authorities met with social acceptance. Pagan was, as I have shown, known and popular before the pandemic and was used not only against evil spirits, but also against microbes, so it could gain more popularity during the pandemic.

This example shows that it is necessary to study what anthropologists, and in particular representatives of pharmaceutical anthropology, call the social life of medicines. They postulate the study of drugs in a very broad context – not only social, but also political and economic. It should be added that, of course, the availability of pagan, even when it became more expensive during the pandemic, was much greater than that of some biomedical drugs.

From the perspective of medical anthropology, it is also important to take into account the context of medical pluralism and the impact of emotions related to the pandemic. Medical pluralism is based on the coexistence of biomedicine with complementary and alternative medicine and self-medication. During the pandemic, the importance of self-medication has increased, especially in the absence of effective pharmaceuticals. Self-medication was carried out with the use of pharmacy drugs, as we know, hydroxychloroquine or amantadine were used. Non-biomedical means, including traditional herbal medicines, were also used. It is important to influence these behaviors with emotions such as uncertainty, fear, and hope.

It is worth saying a few words about the healing potential of *Peganum harmala*. I can only point out this because, firstly, it is not the main subject of my speech and, secondly, I do not feel competent in this area. I cannot judge how reliable the results of research on the medical uses of pagan are.

It contains alkaloids – harmine, harmaline and a number of others. It has hallucinogenic properties. The possession and use *of Peganum harmala* is illegal, among others, in France, Canada, Australia, and in Poland this plant has been on the list of narcotic drugs since 2009.

Research is being conducted on the activity of substances and medicinal applications of pagans, especially in China, probably on the largest scale, also in Egypt, Pakistan and Kazakhstan. A Chinese study, the results of which were published in 2021, showed, among other things, anti-inflammatory, antiparasitic, antibacterial, anticancer, hypoglycemic and antioxidant properties of the compounds contained in the seeds of this plant. The authors of these papers emphasize the great therapeutic potential of *Peganum harmala*. Research conducted in Kazakhstan concerned harmine. It has been shown to have an antidepressant effect and can also be used to treat parkinsonism. In turn, Iranian researchers compared the bactericidal effect of smoke of burned espand seeds and perhydrol used for disinfection and found their analogous effectiveness. I don't know how reliable these studies are.

How can biomedicine collaborate, and does it work with traditional medical systems in the fight against COVID-19? The first anthropological research on the role of traditional Asian medicine, i.e., traditional Chinese, Tibetan and Ayurvedic medicine, in the fight against COVID-19 was published in 2020. Anthropologistic researchers emphasized the underuse of the potential of large medical systems during the pandemic. This is mainly due to the resistance of representatives of biomedicine, who insist on conducting studies that comply with the principles of *evidence-based medicine*. Hence, they are reluctant to include non-biomedical methods in treatment. However, it is known that these biomedical pharmaceuticals also did not work very well during the pandemic. A cure against COVID was sought, which resulted in disappointments very often. Moreover, as anthropologists emphasize, in a crisis situation cooperation would be advisable, and as the Chinese experience has shown, it can bring good results. The WHO's position on this subject was expressed in *the Traditional Medicine Strategy* for 2014-2023 and there it tried to indicate possible directions, supporting the cooperation of biomedicine with various types of traditional medicine.

Recently, a meeting of WHO experts was held, which concerned the evaluation of methods and means of traditional Chinese medicine in the treatment of COVID-19. Its achievements and potential in the fight against the pandemic were recognized, recommending further clinical trials. Perhaps these postulates of cooperation between

biomedicine and traditional and complementary medicine will begin to be implemented on a larger scale.

Nevertheless, it must be remembered that here it is not only the effectiveness of scientifically proven medicines that is important, but also a number of other factors that I tried to indicate in my speech, i.e. various socio-economic, political and cultural factors, which in different specific contexts, in different places and at different times also affect whether a traditional medicine will be accepted, or not. Thank you very much.

2. **PROF. DR HAB. ELŻBIETA SZOT-RADZISZEWSKA**,

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"Trees in the folk image of the world. Knowledge, beliefs, treatment"

The keynote of my speech will be the words of the eminent scholar of religion Mircea Eliade: "the way of being of the cosmos, and above all the ability to be reborn endlessly, finds a symbolic expression in the life of a tree". I would like to present some of the results of my ethnographic research (other materials will be in the book I am working on), which I have been conducting for several years with my students in the villages of the Kielce region.

Research concerns trees as important elements of the human environment, both in the practical and utility plan, i.e., in therapeutic therapies, as food, economic wood, as well as mythical-religious. I will focus on the latter plan as a lesser-known issue.

These studies aimed to reconstruct, analyze the cultural image of the tree, which in turn would allow us to learn about the way people think about trees, how they perceive them and with what beliefs they connect them. In the research, both the species of tree distinguished by the villagers, as well as its specific location in the village space and connections with other significant elements of the environment, such as a spring, a mountain or a stone, turned out to be important.

One of the aspects determining the place of the tree in the folk image of the world is the personification of trees and identifying them with people. In folk myths and stories in various cultures there are numerous threads about mystical relationships between trees and people, about the origin of people from trees or people enchanted in trees. Peasants in the Kielce region commonly believed that a man as a result of a spell or a sudden interruption of life could still live in the form of a tree, especially young people.

Father Władysław Siarkowski in the 2nd half of the nineteenth century noted such a report also in the Kielce region that trees in the forest have souls, a tree has such a feeling as a man and when they are cut down, they tremble in pain that there are males

and females among the trees. A similar belief was noted by the excellent Kazimierz Moszyński, who writes that when a man dies, his body is buried, and birch, sycamore and other trees grow out of the grave. When you cut down with an axe or a knife, and this is a very important thread, such a tree, blood flows from it and sometimes a human voice comes out.

It turned out that these ancient belief threads can still be found in contemporary accounts of older villagers. For example, a resident of the village of Księża Niwa said that souls can live in a tree, because it is a memorial, and later, when this tree is cut down, this soul of the deceased does not give peace to the living.

The image of the tree as a guardian and home of souls is also associated with the custom of hanging shrines and holy pictures on selected trees. Zygmunt Gloger wrote that this custom replaced the much older ritual of offering sacrifices under oaks and other trees. Gloger emphasized that these customs are associated with folk beliefs that in rotten oaks dwell evil and good spirits, for whom these gifts were intended.

To this day, in the Kielce villages, there is a common belief that every tree on which a passionate, picture or chapel hangs is sacred, similarly to one that will be struck by lightning. Whoever dares to cut them down brings a curse upon himself and, at best, becomes blind or dies.

A few dozen years ago, another outstanding ethnographer, Tadeusz Seweryn, wrote in this way: "in folk priests, there are distant remnants of ancient beliefs in the demonic character of some old trees. In these stories, trees behave like people – they demand respect for themselves when they are hurt – they cry or take revenge for harm. (...) Among the Slavs, linden and oak were sacred trees, peculiarly, when in odziomek they grew into three trunks. In the groves of the saints grew oaks. Courts were held under the linden tree. (...) From linden wood, grave crosses were hewn. It was noticed that lightning does not strike in the linden tree, (...) the right of inviolability was granted to trees on which chapels were hung".

It turns out that in many of the studied villages traces of these seemingly ancient beliefs have survived in the memory of the interlocutors to this day. Numerous old trees have also been preserved in the studied villages – unusual pines, oaks, lindens, birches

and of course magical elderberry, which unfortunately I will not have time to talk about. With them these beliefs are still associated.

Extremely folkloregenic turned out to be old pines, often bifurcating into several trunks, growing in border areas, which is important, i.e., in the mediation space, in no man's space. Their extraordinary lives were intertwined with the fate of the inhabitants of the studied villages. It was on the example of selected pines that I decided to present a folk image of trees.

Pine belongs to the feminine principle of the universe and as such is associated with fertility, woman, moon, moisture, but also with death and rebirth. In recorded beliefs, pines show strong mediating properties, appear to us as guardians of the souls of the dead and as apotropeions. Pine, as the villagers said, "does not let the plague air through and drives away unclean spirits".

The first of this combination of trees that I wanted to present here is an old, spreading pine, which the inhabitants call the bleeding pine. It grows in the village of Nadworów, by the road, on the border, at the exit from the village. The term bleeding pine is explained by various threads of legends remembered to this day. One of them says that the bride and groom were driving in the morning, returning home, hitting this pine tree and dying. After another such accident, the village administrator ordered to cut down the tree, but when trying to cut down, blood gushed from the pine. Another legend says that someone under this tree was executed and then the inhabitants nailed a cross there. In the memory of the inhabitants survived fragments of other, older stories and older beliefs that near this pine appears the king of the forest, in other threads, in other villages it was the devil, who in the form of a hare lures people that in this forest scares and captures.

An absolute sensation when it comes to these beautiful old trees that we managed to find in the area, focusing many belief threads, is a huge, forked pine in the village of Pakuły, called by the inhabitants a thick bush or bleeding pine. It grows in a completely mysterious place, because on the so-called Pakulska Góra, at the fork in the road, near a miraculous spring, in addition in the forest where it haunts, and which is guarded according to one of the versions of the legend by wolves.

Residents said that once a peasant tried to cut down this tree to burn in the oven, but the saw broke down. Then he had a warning dream that he would die if he repeated his attempts, but he did not listen. And he died in two weeks. Another version says that when the same or another peasant tried to cut down this pine, blood began to flow from it, and then people began to bring sacred images to this place, which successively grow into this pine, as if the pine were devouring them. In addition, people say that spruce trees are scared there, that is, sinful, penitent souls of geometers. The thread about how peasants in the countryside geometrists, the so-called surveyors, cheated is widely known. Now their souls repent in the swamp. Here these penitent souls live in a thick bush – in this pine. In addition, ghosts of suicides are scared there. Recently, people have been hanging there and their ghosts are deceiving drivers who die there.

So, we have an accumulation of threads in one tree that stands on the border. The local population has long believed that this pine has a supernatural power, thanks to which no one could cut it down, and instead of juices blood flows in it. A very interesting thread, rarely seen in ethnographic research, is the ingrowth of sacred images into a tree. I will risk a hypothesis that in the symbolic plane, the images absorbed by the tree were probably spiritual food for the souls of penitent geometers living in this tree. They replaced prayer, and perhaps so that the tree would not wither, they also renewed the energy of the pine itself, which the souls of sinners had sucked. There are so many of these threads here that I quoted only the most important.

In research, pine trees also appear to us as guardians of souls. In many villages we have noticed a very interesting phenomenon that families in which children were dying, hung small chapels in the forest on trees so that the children would stop dying. Such a chapel hangs near Kielce in the village of Dąbrowa, on a pine tree. At the bottom it is burnt or chopped up. Perhaps if we had gone further in the research, we would have found out that someone had tried to behead her.

A very interesting custom is in the village of Szałas, located in the forests near Zagnańsk, near Kielce. Also there, when children died, in the nearby forests near the village, chapels were hung on pines, on oaks. We found five such shrines that people take care of.

In Zagnańsk grows a 700-year-old oak Bartek, which – one can say – is an icon. In the village there are also many crosses and chapels on trees in the nearby forests, mainly on pines and oaks, which were hung during the war to commemorate the fallen. Chapels and passions are decorated with flowers, fresh branches of fir. This is a sign that someone remembers this place. The custom of hanging chapels is very interesting. It resembles an ancient custom from Podlasie, practiced in the Knyszyn Forest, where until recently, after the death of their loved ones, the population hung the so-called tykło in the forests on sacred pines. It was a board with a carved cross and a request for help for the soul of the deceased in the journey to the afterlife.

In many villages in the Kielce region, it was believed that trees guarded roads, crossroads and borders. The interlocutors said that in such border places, where there was a crossroads, there was always a haunting, that's why people hung chapels on these trees.

The first of such unusual pines, with an unusual shape, standing on the border, is – as people called it – a sacred pine tree that grows in the village of Miłkowska Karczma in the municipality of Kunów. As one of the interlocutors said, "this chojok has always been there, for as long as I can remember, there was a picture of the Mother of God hanging there. Now it has grown into a tree. People said that this tree was sacred, because lightning often struck there. Every year there was a picnic here, because pine grows on the border."

Another sensation that we were able to find is an extremely impressive pine from the village of Kierz Niedźwiedzi, which branches into five trunks, on which several chapels were hung, and several crosses were carved. Pine stands at the crossroads of three roads, on the border. One of the roads used to be a border and separated, as the interlocutors said, human from yours, that is, it marked the border between the forest and the fields belonging to the village of Kierz Niedźwiedzi.

As I suppose, this fear and the need to secure borders, and especially intersections, are probably also related to the ancient custom practiced in the Kielce region and not only, where at the beginning of the twentieth century at the crossroads of roads, by roads outside the village, under old trees on the hills people were buried who

died an unnatural death, sudden death, suicides, unbaptized children whose souls were feared, so that they do not return to villages, victims of wars and uprisings.

Some accounts also emphasized the protective, apotropaic power of pine against late blight. This is very interesting, because usually such a function was performed by aspen, and here I met with reports about pine. One of the inhabitants of the village of Psary-Stara Wieś said that during the plague pine does not let bad air, plague air is not permeable. During the plague in the village, as she said, many people were dying, they were buried on hills, in choleric cemeteries and there they put plague crosses. More crosses, or so-called caraviks, caravans, had two crossbars, one shorter, the other longer. They also put them by the road to the village and, as the aforementioned interlocutor said, "godajo, that the pine did not let the bad air through. Even when they made a cross from this pine, it must have been very simple and could not touch the ground, because then the earth would take away its power and could not ward off the plague."

A few words, because of course we also asked about the use of pine in folk therapies. It is common to make syrup from pine catkins to this day, which is given when coughing, colds, whooping cough, to cleanse the lungs, as you have a snort in your breasts. When the breasts hurt, the essence of the buds of young pine is used. Adults drink pine tincture for pulmonary diseases. Amazingly, people also believe that cuddling with pine trees, as well as breathing pine air, cures pulmonary diseases. An interesting fact is that children were bathed in the infusion of needles, who – today it is a rarer phenomenon – did not walk, i.e., suffered from rickets. In the past, tar was produced from pine carp, as well as from birch bark, the only proper and extremely effective remedy in the treatment of scabies.

The most important aspect that determines the place of the tree in the peasant image of the world, as I said, is its personification and attribution to it the mediating features of the cosmic tree and the tree of life. Such features were acquired by trees important for the inhabitants, which, as a link between three worlds, were a good place to make sacrifices, a way of communication between man and the otherworld, and also had a significant impact on the fate of man. They also became the path of souls to the afterlife, a symbolic ladder to heaven. Like the cross later. The trees that the villagers talked about – selected, special, are signs of memory and signs of space, archetypal

elements of the human environment. They are also a record of the history of local communities, their beliefs, ideas about the world, as evidenced by emotional relationships and bonds of people with these trees about which they spoke.

It would be necessary to say about the elderberry, about the symbolism of birch, willow – trees of the female principle of the universe, associated with fertility, linden – the sacred tree of the Slavs. However, I wanted to signal the topic through a lesser-known tree, which is a pine. Thank you very much for your attention.

3. **DR HAB. EDYTA RUDOLF,**

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"The magic of wreaths – between culture and healing"

Wreaths are primarily a recreation in nature of the most perfect figure, the closing and opening figure, a figure that in its symbolic meaning, as Kopaliński or Piotr Kowalski wrote, means passage, entry, letting someone in, but also closure. We can let ourselves into the circle, we can take refuge in the circle and prevent us from being – and so the meanings of the circle are extremely vast.

This is a very broad topic, so I will skip the ancient part – laurel wreaths and giving wreaths to significant people. I will only mention that wreaths were of course placed in graves: to children, nuns. Wito special wreaths associated with the symbolism of death, which were usually dead, that is, they were either dried flowers or dried twigs.

However, I wanted to focus primarily on wreaths woven from plants considered magical and I will be interested in the period from the 2nd half of the nineteenth century to modern times, which will help show the metamorphoses of wreaths that took place in culture.

The plants that will be most often discussed are lily, lovage, lemon balm, hyssop, chamomile, mint, daisy, tansy, motherwort, periwinkle, elderberry, god's tree, cornflower, clover flower, swamp, stonecrop and others used in various rituals and rituals. The history of the wreath is very complicated.

Interesting rites associated with Saint Lucia are widespread mainly in the countries of the North, e.g., in Sweden, where the eldest daughter on the night of the memorial of St. Lucia usually puts a wreath made of blueberry leaves, in which candles are built. Various rituals take place then, accompanied by singing and this custom is cultivated to this day, still being a very important holiday. Ethnographic researchers, who have looked at where Lucia – an Italian saint, got to Sweden, direct attention to the holiday falling on December 12 to 13, when a demonic being called Lusse appeared in the world, and she

was also in a wreath. She went out into the world with a pack of wolves and ghouls, kidnapped children and women. On that night women and children were forbidden to leave the house, infants were guarded closely, houses and barns were covered with herbs and specially blessed wreaths. This indicates how complicated this tradition is.

Another issue is the group of wreaths associated with the wedding. It probably includes the most beliefs and rites related to the wreath and nowadays it is assumed that the red wreath, used for the wedding rite, is a symbol of virginity, virtue, the bride, who offers herself to the groom in the marriage certificate. Meanwhile, the matter is more complicated. Ruciane wreaths have been known since the Middle Ages, when the bride was woven both red wreaths and periwinkle wreaths. Periwinkle is still used today in wedding wreaths, which I will mention at the end, while rue is quite debatable. The first mentions of red wreaths appear already in the Middle Ages, and they have an interesting meaning, because rue was originally not a symbol of virtue and virginity. It was believed that, on the one hand, the smell of rue is an aphrodisiac for women, and on the other, it attracts men to them. The rue itself, however, since the times of ancient Rome has been used as an abortifacient, so at the wedding we received a whole set of meanings to use immediately, as if in practice. Today, this symbolism has been greatly simplified.

The fashion for artificial wreaths appeared in the nineteenth century. In the richer version, these were wreaths made of wire, it could be silver wire. The flowers were made of silk, pearls or mother-of-pearl were used. In the poorer version, casts of flowers and wax ornaments appeared and the fashion for these wreaths spread throughout Western Europe. They were very fashionable in France and Germany as well during the fin de siècle period.

Of course, the wreaths are associated with Kupala night, which I must say disappointed me a bit, because the herbs that were used to weave wreaths were primarily supposed to have a strong smell. They were supposed to fulfill their basic role, i.e. to be an aphrodisiac in rituals that in the original assumption were – let's put it bluntly – orgiastic.

In the case of Kupala night, variously called – for example, Ivan Kopała's sobótka, wreaths were worn by everyone, that is, both women and men. Regardless of age, everyone adorned themselves with them. I will not talk about wreaths as fortune telling,

because it is widely known, but an important element was jumping over the fire and swimming in the river. The ordinances, of course, ranged in scale, from jumping over small bonfires so that everyone could do it. In this way, they paid tribute to the fire, but at the same time it was possible to cleanse oneself and protect oneself for the next year from all evil, m.in. from diseases. You also had to jump into the water, but you could also douse it with it. However, to gain the most power, you had to jump naked through the fire, immediately jumping into the flowing water.

Kupala's night almost disappeared at some point. In Polish culture in the 90s or 80s, it was said as an ethnographic curiosity about customs. Recently, however, this rite is becoming more and more attractive, and this is also interesting in it.

Therefore, kupałowe wreaths were not used for treatment, they were used only in magical rites, where they served as an aphrodisiac. Of course, the fern flower was also sought.

On subsequent holidays, that is, the harvest festival, of Our Lady of Herbs, it was important to collect and weave herbs into wreaths, dry them, but first they had to be blessed. Blessed wreaths had a special meaning and special power, e.g., they helped with headaches. If a wreath of mint was worn, it worked better when it was dedicated at this time of ceremonial. If you wanted to secure the house or the ambulatory, wreaths were braided from the herbs mentioned at the beginning, blessed them, and then hung on the walls of cottages, on the door. They were supposed to protect, were used for incensing and had purifying, healing powers. In the case of diseases of cows, for example, a wreath of myrtle was used, which had to be blessed either on the occasion of the feast of Our Lady of Herbs or Corpus Christi. The cow was not incensed, only if it was sick, had problems with milk production, it was milked through a wreath.

Such were the uses of wreaths, which was possible because the wreaths after drying could be stored for a long time. Today we are returning to these customs.

Wreaths are a significant element and mark the zone of uniqueness. In other words, all fairies, strange wives, goddesses – if they appear to lose travelers – are recognized by one of their main attributes, the wreath. The most famous story on this subject is Sabala's story about how he met a beautiful girl by the stream. He was glad that a great adventure awaited him, but he began to get a closer look, and it did not surprise

him that the stranger was naked and beautiful, but two things disturbed him: that she could throw her breasts over her shoulders, and that she had a wreath.

Therefore, the wreath, if it is on the head, has not only a healing meaning, but also a magical one, indicating that a given figure belongs not only to the real world, but also can belong to another world, the spiritual one. Hence the whole series of reproductions, borrowings also by high culture, highly artistic culture – this culture that sets the boundaries of artistry, where artists transform, of course borrowed from folklore, threads and they begin to live their own lives. The attribute of wreaths appears in many realizations, both painting and literary.

In the nineteenth century. *Mickiewicz's ballads and romances* begin to set a new trend of magic or interest in folk, the world of beliefs and the world other, far from the real. One of the attributes is precisely the appearance of a wreath. There is no simple translation that the wreath means a virgin, because it appears on the heads of supernatural beings, such as strange wives, fairies or others. It also becomes a kind of determinant of the status of a given character in a literary text, that is, this non-belonging only to the real world. This attribute is not used only in Polish literature, it also appears in world works, where a wreath on a girl's head or weaving a wreath in general also means, m.in, constant contact with another reality, which of course redefines the functioning of the character.

Folk culture for many decades has been modified, not to say idealized and stylized. It is also associated with the – today pejorative – term cepeliada, used in relation to the implementation of the Mazowsze band, where the costumes were stylized, refined. There were also wreaths, which seemed to have lost their meaning both magical and healing and had only artistic meaning.

The wreath at some point disappeared from our culture. He went to the children's zone, appearing at the performances of "Krakowian" in kindergarten, dressed for the first communion. Even during weddings, it was replaced by a veil. In the last decade, the situation has changed, as more and more people are interested in folk culture, and modified folk culture returns to modern popular culture.

Wreaths appear in groups of specific social interests, for example, fantasy lovers, groups that recreate old customs, old traditions. They appear in popular literature, such

as A. Sapkowski in the *Hussite Trilogy*. In addition, they are coming back as a form of design and as an element of fashion, even *haute couture*. Again, the scheme is broken to connect the wreath only with a young girl and only a virgin. It appears in a completely new form.

Finally, unfortunately, the issue of the last days, when the wreath gained the status of an element of a sign and a political symbol, there were a lot of related projects, e.g., a mural in Paris. The wreath has become an element of identity building, but also a political sign.

The wreath gained such popularity that it entered the symbolism of the tarot, which – as we know – is very conservative when it comes to symbols and signs. Replacing the empress with a crown, a tiara with a wreath or adding a wreath in the empress card triggers additional meanings.

The wreath returned in a different form, it is no longer used for healing, although I learned that in the Lviv district there is still a custom of blessing wreaths and using them for healing, for incensing. They are also crushed and eaten in various forms, which has conflicted the community, because in some churches in Lviv priests or clergy do not want to bless wreaths. Fruits and bouquets are blessed, but this shape of the circle so disturbs the clergy that they refuse to bless wreaths. I leave it without comment, because it is like the last novelty, my last catch from the last days. Thank you very much.

4. **DR LIDIA CZYŻ,**

POLISH PHARMACEUTICAL SOCIETY

"Wild plants in the treatment of everyday ailments of Lasowiaks (based on research by Franciszek Kotula)"

The most important person I want to present in the context of folk medicine of the Lasowiak group was Franciszek Kotula. I do not know if you have met this figure, in our area he is a very well-known cultural activist. Born in 1900, he has been dead for 20 years. However, he made a huge contribution to the consolidation of topics related to folk medicine, but not only, because he dealt with the study of groups that inhabit the former area of the Rzeszów Voivodeship – not so much Podkarpackie, but Rzeszów, and I emphasize this because the Rzeszów Voivodeship was one of the youngest provinces created in 1944 and survived relatively stable until the changes in the 80s and 90s.

Lasowiacy were a very interesting group of people living in the former Sandomierz Forest, which stretched on the left bank of the San River. Because I really like the forest (I grew up in the forest myself, but in Mazowieckie, slightly different), I became interested in all related beliefs or folk medicine. Due to my pharmaceutical education, I have always been interested in herbs that grew there.

Let's go back to Franciszek Kotula – this very interesting man graduated from a teachers' seminar in the 20s of the twentieth century and started working in primary schools in Rzeszów and the surrounding area. My father, who went to school in Rzeszów, but lived about 7 km from the city, came into contact with this character. As a result, my memories are a bit sentimental. My father emphasized that the teacher said: "Don't throw away anything that your grandmothers want to burn or put somewhere in the attic. Bring it all to me." And indeed, already in the 30s, even before World War II, he began to collect all collections related to the culture – as he emphasized – the culture of the countryside. He hated the term folk culture. He had a saying that "People's can only be Poland, and at this moment Poland has nothing to do with culture". Therefore, he was a bit on the index, but nevertheless he was able to establish a lot of contacts with his colleagues, with the

authorities of the Rzeszów Voivodeship and had the title of associate professor. This is a very interesting thing, because Franciszek Kotula did not have a higher education. Formally, he had completely different interests and absolutely did not want to start education even at the Jagiellonian University, where he was offered a master's degree quite quickly. The point was that he was the director of the District Museum in Rzeszów and therefore he needed a scientific title. He did not study, but already in the 40s and early 50s he was so well known in museological circles that Professor Lorens tried to get his scientific achievements recognized, without formal higher education. It was a sensation, but since then nobody really said anything about Kotula in Rzeszów or in the villages where he conducted his research, but "Our docent has come". He was even presented in such a way by priests from pulpits, so that people would not be afraid that he was a stranger, that he would pull out some secrets, that nothing could be told to him. This title has been held by Franciszek Kotula since 1954. He died in 1983.

He had a very interesting hobby. Almost every Sunday or also on some holiday he went to the countryside. He went where he had already made contacts, where he hoped to find new exhibits, gain new information and take his son Bogusław with him. Franciszek's son, still alive, remembers his father very fondly, although he says that when his father pulled him out of bed at 6.00 in the morning to go somewhere, he rebelled a bit. To this day, Bogusław is also a well-known writer from Rzeszów, he is a regionalist, a great expert on those areas, as if he had taken over all his knowledge from his father. The two of them collected in the villages, took notes of what they could, and finally recorded them, because Franciszek Kotula got the first tape recorder in the area from his American family. It was a very big achievement, because it was possible to record folk songs, and he usually persuaded his interlocutors to sing. He himself played the violin very well and sang as people said, that cones fell from the trees when Franek began to sing. Well, but these are such curiosities.

In any case, his greatest merit is that one day, as his son writes, his father came up with the idea of organizing ethnographic camps. It was a good move, because how much material could he collect? The aim was to gather as much information as possible from the often living, oldest inhabitants of a given region.

He would never do what he did with a group of a dozen people. Students, museum workers even from Poznań, Wrocław, Warsaw. Everyone, when they found out about the camps of docent Kotula, wanted to come here. For them, culture, traditions passed on orally (and it is very important that all this was actually passed orally) by the inhabitants, Rzeszowiaks, Lasowiaks, Pogórzans, these were revelations, because when my father invited, or rather strictly speaking, qualified 30 people for such a camp, and everyone dispersed around the area, a lot of materials were collected every day.

Besides, the participants of the camps had everything for free and this was an important matter, because the funds were transferred from the Voivodship Office, they were transferred from various places. Franciszek Kotula had a unique ability to raise this money. Therefore, it was indeed almost a free holiday for these academics. That was what was talked about. Materials were collected by everyone, dispersing around the village, everyone received a topic that they could choose, modify, but they had to work it all out with their informants, rewrite it, pass it on to the lecturer, i.e., the docent, who collected all kinds of interviews, notes in special folders, still stored in the Ethnographic Museum in Rzeszów. The thing is so interesting that these camps began at the end of the 50s of the twentieth century. They lasted several years, more or less. The youngest folder is probably dated to the 70s, so it is already over 50 years old. Each informant was written with a name, surname and age. Indeed, when you look at all these materials now, you can see that the age varies: there are six-, seven-year-old children, but these are only two cases, and besides, they are people over 50 years of age at least, 60, 70. We can imagine what these people remembered, describing their information about folk medicine (however, a lot of different topics were discussed, there were folk embroidery, there was folk construction, there was some magic, because magic always occurred in healing). Kotula in the 60s captured the state of knowledge about health care as such, dating back to the late nineteenth and early twentieth centuries.

The problem was always whether the collected information came from people who had actually gained knowledge about the effects of a wild plant that grew somewhere in their surroundings with their experience over the years. Indeed, all these villages, these human settlements were almost closed enclaves. We say *Lasowiacy*, but the Lasowiacy themselves do not consider this term to be correct – they called themselves

Lesioki. Lasowiaków were glued to them by ethnographers and apparently this is rather a pejorative term, not a correct one. In any case, there is this isolated group. To this day, you can meet with folk groups from Lasowice, although they should not be described as such, in the vicinity of today's Tarnobrzeg, Stalowa Wola, Kolbuszowa, and above all Raniżów. Interestingly, Kotula was born in Głogów Małopolski and always identified his place of origin with the Lasowice area, although it was not entirely correct. Lesioki, as they said about themselves, were quite an interesting group composed of settlers who had been coming to the Sandomierz Forest since almost the early Middle Ages, but they were not only voluntary settlers. It was partly emigration from Mazovia, from Lesser Poland, but also their Polish kings imprisoned prisoners after all the wars won. Therefore, to this day you can meet with the name of the Royal Maidan – there were Tatar prisoners of war. There were Rusyns and Wola Rusinowska, where people from the East were imprisoned. There are other terms, e.g., Raniżów, which actually even has features (apparently, I will not enter this area here) indicating the foreign origin of the inhabitants of this area. Therefore, the Lesiocy cleared the forest, settled down, the villages were single, they were not compact, as we can see today. They lived in a semi-wild area, and by collecting all these plants, they collected them for themselves, because they had to have them in order to somehow secure the possibilities of treatment of these or other diseases.

You can talk for a long time how it all was shaped, but I would like to return to the question whether it was really the experience of grandmothers-herbalists, witch doctors, even wizards, because it was also called – sorcerers, or whether it came from somewhere else. Podkarpacie and the current area of the Podkarpackie Voivodeship were – contrary to appearances – quite an interesting place. There were a lot of manors of high families and mansions with one or two villages. Did not the medicine cabinet maidens who practiced in these courts carry information from important books, from herbarias? Such a flagship example is the herbarium of Syreniusz also kept in the District Museum in Rzeszów, coming from one manor house near Rzeszów. It was the achievement not of Franciszek Kotula, but of the previously living Franciszek Moskwy, a very well-known bibliographer who during the war bought, with various results, book collections. It was from these collections that Syreniusz found his way to the Rzeszów Museum. To this day, one can immerse oneself in its content and compare it with the collections from the files

collected during Franciszek Kotula's field research. We were so interested in these matters that together with my friend, a painter by the way, we will create something that may allow us to capture also – whether people really still heal in this way.

The third source of information about herbal medicine were schools created specifically for rural housewives. One of the most famous institutions of this type was Albigowa between Łańcut and Kańczuga, where a lot of young girls from nearby villages studied at annual courses. Another, very interesting thing were also schools that were located in Przemyśl – the Przemyśl school of rural housewives had rather an eastern deviation (and very well, because that area was inhabited by Ruthenians). The most famous school, where graduates of Maria Disslowa courses could also be found, was the school in Lviv. So, did the news about folk medicine really come from my own experience, or was it something completely different? Was it simply the knowledge acquired by the girls during their education, which they carried from schools to their own roof and tried to accumulate in some way? There is no longer the Sandomierz Forest – and this is a terrible thing – because a sulfur mine was established in this area and most of the trees unfortunately died.

Let's move on to specific examples of what the Lasowiacs treated. This is a very interesting thing. Chicory traveler, which was called *hard, was* used when the child was weak on his legs – he was bathed in a hardliner. Ointment for ulceration was used – I also made it myself: I took some wax, resin, cooked some non-salty butter, mixed, strained through a linen cloth and the ointment was ready. I met stories about an oak: in the Podkarpacie region there is an oak, which was a European tree, and in it escapees from the Rzeszów ghetto were hidden. Mullein was used in case of leg or finger disease. Young cream was collected, and flowers were fried, and the wounds were smeared with this ointment. Dried St. John's wort was, of course, recommended for shortness of breath. It was quite popular. Mustard, or as it was said here – from goszczyca, oil was made, which was used to treat abdominal pain, even the twist of sausages. Cabbage and potatoes as such were a hit. Anyway, it can be seen to this day in the Lasowiacka kitchen, where we can find a lot of dishes from these vegetables and various others – cacapoły with cheese, cabbage with peas, tincture of black berries. In any case, potatoes and cabbage in this

area grew great, because the soils were so-called light. To this day, people who want to have nice potatoes, so to speak, to eat, go to those areas. Thank you very much.

5. **DR INŻ. ELŻBIETA PIÓRO-JABRUCKA,**

WARSAW UNIVERSITY OF LIFE SCIENCES, DEPARTMENT OF VEGETABLE AND MEDICINAL PLANTS,

"Bouquets of Our Lady of Herbs"

I would like to present the effect of my many years of work. It is not related to ethnobotany, ethnography *sensu stricto,* because it concerns field trips aimed at identifying and assessing natural stands of herbal plants, because in Poland on a commercial scale, so to speak, about a hundred species of herbal plants are obtained. For comparison, there are about 60 of them in cultivation. Hence, the natural resources of herbal plants, their assessment and protection – which I deal with – still seem to be a very important matter. On the occasion of this research in the field of biodiversity and the assessment of natural sites, it seemed to me that there would be an interesting and interesting evaluation of bouquets of Our Lady of Herbs, i.e., bouquets that are brought to the church on August 15.

Wreaths blessed in the octave of Corpus Christi consist of plants that bloom at the beginning of summer. Wreaths of motherwreath, stonecrop, jasmine are brought, while bouquets of Our Lady of Herbs are made of herbs from the end of summer, which close the summer season and vegetation. This is also how this holiday is treated – as a harvest festival, which we colloquially call Our Lady of Herbs, also simply Zielna. However, officially it is the feast of the Assumption of the Blessed Virgin Mary – a permanent feast celebrated on August 15, which derives from an old Christian legend saying that three days after the death of the Blessed Virgin Mary, the apostles went to her tomb and did not find a body in it, but only beautiful flowers in full bloom and miraculous, aromatic herbs. Christians believe that the body with the soul of the Blessed Virgin Mary was taken to heaven, therefore there is no grave of her, and no body has been found.

As I said, it is a harvest festival. It is associated with the end of the harvest, to which many different wisdoms and folk sayings refer – for example*, At the Assumption the reaping ends,* and therefore the harvest is coming to an end, fruits begin to ripen, the first harvest

of fruits and vegetables takes place. It is also the full flowering of plants from the end of summer and the beginning of autumn, including various herbs. In Poland – and not only in Poland – the Mother of God is the patron of people, the patron of the earth, which is why everything that the earth gives birth to is brought to the Church in the form of bouquets. On the one hand, to symbolically sacrifice plants so that the crops would be better stored, and on the other, to thank for this year and for the crops. Such are the meaning of these herbaceous bouquets.

These studies, which were actually in the form of a report, concerned a specific place. The opportunity for them was this field research conducted for many years. For five years, in the period 2015-2019, I observed the parish of Gartatowice, which is located in the municipality of Kije in the Pińczów poviat. This is the area of the Świętokrzyskie Voivodeship, formerly Kielce, and the Kije commune covers about 16% of the entire Pińczów poviat. It is located in Ponidzie and has a typical agricultural character. About 70% of the area is arable land, while about 19% is covered by forests. Gartatowice is a very old village. Jan Długosz m.in. mentioned that it belonged to the property of the monastery in Miechów. It is surrounded by closed gypsum mines. There is also a historical mound, a burial mound. There are very nice stands of primrose, as well as spring primrose – at the beginning of May, so in the full flowering of these plants, this mound can be seen from afar, because it is simply intensely yellow due to these two species.

The church is not large, it is a relatively young parish. As a result of the efforts of the inhabitants of Gartatowice, Janów and neighboring towns, in 1985 it was possible to separate an independent pastoral center. The then vicar in the church in Kiev (it is a very old church and an old parish, they have existed since the twelfth century) Rev. Henryk Rusak was the builder of the new church, the parish was established in 1992. I would like to present the bouquets brought by the people to this church.

The church is small, one can say – modest, but it has very interesting wall paintings. In the presbytery on the right side St. Francis is painted, making a gesture with his hand, as if calming, perhaps blessing, a dog and a wolf. On the other side there is John the Baptist, while the painting on the main wall behind the altar is beautiful, which depicts the scene of the Ascension of the Lord, which is already a movable feast, this year it will be celebrated on May 26. Why did you choose this church? For several reasons. The

church is dedicated to St. Florian. Although it is the patron saint of firefighters and has little to do with herbs and bouquets, recently even an indulgence was celebrated in this church – May 4. However, something that captivated me is how subtly the cult of Mary can be seen there, which is particularly strong in Poland. When one looks at the painting from the presbytery from a distance, it is as if enclosed in Mary's face, one can see her face, in the central part of which there is the scene of the Ascension.

Such a subtle element that was found in this church caused that for several years I archived bouquets, conducting conversations with people, with specific hosts, and keeping a record of what was in the bouquets. I determined the genus or species of the plant in a total of 175 bouquets, and I chose 100 bouquets to present the results. It is not very much, but I conducted the study myself, and each description was accompanied by a long conversation – an interview, so it was quite time-consuming. I will not tell you about everything that was found in these bouquets, but only about those plants that I thought were worth showing. I divided them into flowers, meaning ornamental plants, cultivated for decorative qualities, grain, herbs, that is, implicitly herbal plants, medicinal plants, fruits, vegetables. Gladiolus appeared in 78 bouquets out of 100, aster in 62, zinnia in 58, sunflower – both oily and various ornamental varieties – 48, phloxes – 43 (various varieties), mallow – 40, garden dividers – 37, marigold – 31. When it comes to cereals, millet dominates among cereal crops – 53 out of 100, wheat 49, oats 31, triticale 24, barley 11, rye 8. From herbs in bouquets were placed primarily tansy, field mint, yarrow, wormwood, chamomile, bloodsucker, adjective white, sorrel kobylak – under this name there are various species of sorrel, but we approach this species as a collective species when it comes to obtaining herbal raw material, which is the root, large-flowered mullein. These are not bouquets too abundant in medicinal plants. I was surprised that out of 100 bouquets of mullein was used in only 11. What is the reason for this? There are very poor soils on which mullein often grows, so people who make bouquets have access to it. There is even a saying: *Where mullein grows, there is a poor maiden,* because she will not bring fertile soil into dowry. It is added that this lady is also beautiful, because many different preparations from mullein, especially from crown petals, are used in natural cosmetics.

From fruit trees in bouquets appears apple tree as an apple of choice, nice, well colored, shapely, of course without scab, on a stick, most often impaled in the central part

of the bouquet. Opium poppy is also used, i.e., poppy seed, which has a specific fruit – a dry bag, here counted as a fruit, then mountain ash and coral viburnum. There are very few vegetables. I put fennel here, because it was dominant – it was in 33 bouquets out of 100. It is an herbal plant, also medicinal. The raw material is the fruit of this plant, but I treated it as a vegetable plant. In 7 bouquets there are carrots, usually located in the central part with the cut down, i.e., it is tied with a notch, while the root is in the bouquet. Similarly, the garlic is arranged upwards so that the head can be seen in the bouquet, but it was only in 5 out of 100 bouquets. Canadian goldenrod or also giant, late goldenrod is an invasive plant, but I mentioned it because it was already in 30 bouquets. It is treated as an ornamental plant and as such goes to bouquets. Cosmos, or onętek – 26, rudbekia – 15, roses, various varieties, types of roses (decorative not wild rose), geraniums, from pots, boxes, from window sills – ladies join the bouquets with flowers that look beautiful because they want these bouquets to be aesthetic, which is why surfinas happen and geraniums, up to 10 out of 100. Garden amaranth in 7, spurge edged in 2, hemp, zatrwian also appeared in 2 out of 100 bouquets. When it comes to herbs, there were: knotweed, garden lovage – little aromatic herbs – common lebiodka, cuddle, comfrey from others. I also introduced the oily category, but there are not many bouquets with these plants, because only in 2 out of 100 there was flax, already in the bag phase, and camelina recorded in only one bouquet. There were also various grasses – gladiolus and stokłosa, but they were also found only in individual bouquets. Some of the bouquets I called ornamental, because they included mainly ornamental plants, e.g., a bouquet of a resident of Chruścice, a bouquet with a centrally located rose, rudbeks, tansy, Canadian goldenrod – first of all, they are to look beautiful and are composed of ornamental plants. The bouquet of the Chekhov resident included field mint, but also a whole range of ornamental plants growing in the home garden. The subject of research was also a bouquet with two varieties of geraniums, dahlia, dividing and other plants, but also millet, mint, dill, as well as the aforementioned cereals – wheat, there is fennel or garden, sunflower and other plants. It is already such – I would say – a herbal bouquet, it also has an apple inside. Another example of a herbal bouquet in the central part had a bloodsucker with opium poppy seeds. Among the interesting bouquets there was a rather poor composition with wheat, triticale, barley, but also with camelina. It was very

consciously made from a plant that is grown on the farm in order to dedicate it to these plants. Rice oil is produced there; hence this plant was found in the bouquet. The saying: *better rice than nothing*, is also related to the fact that flaxseed grows on very poor soils, where other plants would yield very poorly. In contrast, this oil is very valuable, rich in essential fatty acids.

What happens to the herb after the sacrifice? This is a holy herb, blessed. There is a lot of literature that, from a historical perspective, presents what happened to this herb. Currently, no one ever throws it away. Bouquets hang on the terrace, on the porch, in the hallway, on the veranda, they are hung at the entrance to the door in outbuildings, in the windows. They are to protect against evil eyes, against all misfortune, above all against lightning strikes, they are to bring good luck. Even young people who bring bouquets for dedication, if they do not share these beliefs or do not know them, do not throw away the bouquets. The bouquets are then kept in the attic, in the barn or burned the following year. Older people confirm that it was customary to scatter ashes after burning bouquets. At the moment there are already other furnaces, boilers, heating systems – it would be difficult to extract and scatter ash. None of the people I've talked to do that anymore. The bouquet is therefore burned, as it should never end up in the trash.

The variety of bouquets I presented may not be big when it comes to herbal plants, about my domain. It is hoped that the tradition of bouquets will not die, and we will continue to see them in churches. Thank you very much for your attention.

I will not speak anymore, but I will show selected photos. This young person is Łucja, whose patron was mentioned today – little Lucia without a wreath on her head, but with a bouquet of herbs. Herbs hung on the veranda in front of the house. Modest, but very interesting, extremely thoughtful bouquet. A bouquet of a resident of Janów, which included garlic and an apple in the central part, a lot of wild grass, aromatic herbs from the garden. Another bouquet with an apple. In very many bouquets, millet is repeated. Bouquets were made on Saturday, stood in water, then were wrapped in plastic bags, so that water would not drip from them on the way, and during the mass – ordination, the bags are removed. These bouquets are dominated by ornamental plants. I would like to draw attention once again to the painting in the church, to its form and to the shape of

the wall – it is to resemble the face of the Blessed Virgin Mary. St. Florian on the left was painted by a folk painter.

Chairman of the Session Prof. Ludwik Frey: Beauty is always welcome, as evidenced by *the vox populi*. Thank you very much both for the content and for the form, for the beautiful photos. There were *only* 175 bouquets – I think it was *as much*, especially if you did this study yourself. I was interested in millet, because after all, it is not a common cereal. It can be assumed that in this area it is heavily grown. When it comes to herbal plants, it seems to me that the strongly smelling ones were the most often taken, right? Tansy or chamomile. I think this is something specific. I was amazed that garlic was only in five bouquets, so we no longer believe in the devil...

E. Pióro-Jabrucka: Garlic is not much grown in this area, probably because there was not much of it. Aromatic plants were chosen precisely because of the smell – hence tansy, sage, which smell intensely. They are connected with the Church – not only the Catholic Church, also because once they were put into prayer books so as not to fall asleep during the service, because it is such a strong smell. Millet is sown especially by some housewives, because there are strong circles of rural housewives. Now it is popular. Then the harvest wreaths are made from millet and other cereals, so that's why they are grown on a small area, so that you can, for example, make a wreath for the harvest competition. Thank you again.

6. **DR MAGDALENA WALASEK-JANUSZ, DR HAB. ROBERT GRUSZECKI, ENG. MAŁGORZATA KUŚMIERZ,**

UNIVERSITY OF LIFE SCIENCES IN LUBLIN,

"The use of dandelion in folk medicine"

Our goal was to present the applications and use of dandelion in folk medicine and to determine for what diseases it can be used, whether it was used. First of all, we focused on the area of Central and Eastern Europe, with particular emphasis on Polish. However, we have not introduced a geographical division here, nor have we thoroughly analysed the occurrence or use in relation to regions. First of all, we would like to present how dandelion was used in the first place.

Dandelion, known as dandelion – which I will explain in detail – is a plant belonging to the Asteraceae family. It occurs very commonly, almost everywhere, especially in spring. It blooms very beautifully, and I think everyone knows it because of the dandelions. It is therefore associated primarily with yellow flowers blooming in spring and with fluffy fruits. The Latin name consists of two words for inflammation and treatment. *Taraxacum* – already in this word we can look for an indication of the medicinal properties of this plant, and the second part of the name*, or officinale*, emphasizes its medical use. Why do I use two names? The name dandelion is more often passed on in rural communities, in folk culture and is considered today as an old, folk name. However, in the field of botany or the latest publications, including herbal ones, we use the name common dandelion.

Why is dandelion such a special plant? It shows a number of pharmacological activities, but it is not fully studied. There is a lot of information that we want to confirm. What distinguishes it from other plants? First of all, the richness of herbal raw materials used, because we can meet with the use of roots, leaves, flowers as individual raw materials, but we can also find information on the use of milk juice. Syrup and even coffee or dandelion wine are also very popular. Therefore, it is characterized by a very large wealth of raw materials and preserves.

In folk culture, we often meet with the name dandelion milkweed, but at the same time it is used to describe other plants. Jan wrote Father Kluk: "peasant women commonly call milkweed, like all similar milky plants that produce juice from themselves". In the literature review, we tried to include reports that suggest the use of the common dandelion. Further doubts: juice or milk, syrup or honey – this is also quite an interesting aspect, because the variety of use of preserves is very large. Such naming problems have occurred. In our work, we defined the fluid leaking from the damaged tissues of the plant generally as milk juice. In the case of syrup or honey – here today there is also quite different information – the product resulting from covering the inflorescences of dandelion with sugar, sometimes with the addition of water and lemon, we have adopted to be called syrup. This is also due to the reference to galenical preparation, in which the syrup is referred to as a product with a high sugar content. I have interesting observations from classes with students. I talked to them about dandelion and making syrup from it. Few people knew such a product at all, some of them used it at home, because it was prepared, for example, by mothers. However, when I started to explain how it is obtained, it turned out that more people know and use the syrup, only under a different name, i.e., for example as honey or jam. Nowadays, therefore, information is still passed down from generation to generation and used in folk culture is being consolidated.

According to my education, I would like to present the use of dandelion specifically for diseases. Respiratory diseases. We found a lot of information about this. What parts of the plant or preserves are or have been used? Dandelion flower flower or syrup was used to treat asthma, lung diseases, upper respiratory tract infections, also infections with cough – also persistent, with fever, but also with viral infections, e.g., flu. It was also used for shortness of breath, bronchitis or even pneumonia. We found out that it was even used to treat tuberculosis, primarily as a flower syrup. In modern folk medicine, syrup is also popular. I think that this is a curiosity that especially young scientists can mobilize to investigate what pharmacological properties it has.

Cold. According to reports, the infusion of dried flowers was used in coughing, but if there was a persistent cough, then an infusion of leaves and roots was used. Juice was also used for shortness of breath, but if there was a fever, in some areas it was recommended to drink wine from flowers.

Diseases of the gastrointestinal tract. We tried to determine exactly what ailments were described in the scientific literature. This is often problematic, because folk medicine characterizes abdominal ailments as colic or other difficult to name problems. For example, for abdominal pain, an infusion or a mood of leaves and inflorescences was used. With stomach ailments, problems with defecation, an infusion of roots and leaves was used. It is possible that this is primarily related to the root as a very good source of inulin, i.e., natural fiber.

Liver ailments – decoction of herb roots, juice, syrup of flowers. For gallbladder ailments, mainly a decoction of the roots was used, for poisoning – an infusion of the roots. Often poisoning was accompanied by nausea and infusion of roots was used to induce vomiting, but also wine from flowers. It was also recommended, for example, to eat a boiled plant. Dandelion was also used externally. Hemorrhoids are also classified as diseases of the gastrointestinal tract, although this is a debatable issue. In this case, the herb was used to prepare the infusion, which was then added to the bath or used for compresses.

Jaundice. In folk medicine we found such a report that probably due to the color of flowers, as well as the nomenclature, association with yellow, dandelion was considered effective in the treatment of jaundice – rubbed the face with juice or consumed infusion from the roots.

Urinary tract diseases. It has been proven that dandelion, common dandelion has a diuretic effect. Therefore, it had a justified use in kidney diseases as a diuretic. An infusion of herb or flowers was used for kidney stones. Interestingly, dandelion coffee was used, precisely from the roots of the plant.

Cystitis. Extract of herb or root was used.

Treatment of ascites. Ascites is a historical term for all kinds of problems that manifest themselves in the accumulation of excessive amounts of water in the body. The justification for the use of dandelion is precisely the diuretic effect, which increased the secretion of water from the body and thus reduced swelling in the body.

We also found information that dandelion was used in gynecological diseases, m.in. as a painkiller, because it was used in lower abdominal pain. The root was used to

relieve menstrual pain as a means of regulating menstruation. In some areas, it was used as an abortifacient.

Little information has been found about the circulatory system. Probably dried herb was used to treat hypertension, and flowers – as a means of supporting the work of the heart.

Sight. There are reports of the use of dandelion in eye diseases. But does it help or harm? We know for sure that milk juice was used. However, this was a moot point, as we learned that obliterating the eye with milk juice can cause vision loss or chicken blindness. There are also reports that indicate that the dandelion was used to treat blindness. The use of milk juice for eye diseases was already mentioned by priest Krzysztof Kluk already in the eighteenth century, so this is a very interesting issue that certainly requires further investigation.

Are dandelion preparations used externally or are they used only as a means of internal consumption? Dandelion is used, m.in, in the treatment of pain both internally – preserves are eaten, and externally, because, for example, whole plants were applied topically, m.in. in joint pain. So, it is a plant of very wide application.

For the treatment of headaches, tincture, infusion of leaves and flowers was used. For toothache or earache, milk juice was used and here we have information that it was consumed.

In joint pain, dandelion was used externally, but there is also information that may indicate that the preparations were used internally.

Low back pain, rheumatism – also widely used. As a curiosity, I wanted to mention that dandelion was often used as a painkiller when cupping. The skin is smeared with tincture of dandelion flowers and only then bubbles are put. This was to alleviate the pain sensation.

Dermatological diseases. Here there is also a very wide use: milk juice was used for warts, warts, roses. Warts were covered with a blooming dandelion. In addition, pulp from flowering plants was used, also as an antifungal agent, and hence folk names such as wartyl or wart.

In addition, in folk medicine, dandelion is used as a cosmetic agent, because there was a belief that drinking an infusion of herbs prevents hair loss and brings very good

results in their care. It was also recommended as a facial skin rejuvenating. If a woman wanted the old skin to come off and reveal a new one, she was advised to eat dandelion, although we did not get to the raw material that was used in this case. For the removal of freckles recommended flowers, milk juice. From the Lublin region come data that the decoction was used as a slimming agent.

Other uses of dandelion are shingles, smallpox and rabies and these are reports that indicate the use typical of Central and Eastern Europe, and above all Polish. We have not found information that there was such a use outside this area. In the case of rabies, juice was most often used. Dandelion was used in the treatment of diabetes, cancer, wounds, as a means of strengthening the body, but also as a cleansing agent of the body. For this purpose, juice was primarily used, which was also supposed to supplement vitamin deficiencies.

Dandelion is a common, easily accessible plant, widely used in folk medicine. It is characterized by the richness of raw materials used. It is used both externally and internally, and quite an interesting aspect is using it as a cosmetic agent. It is widely used in diseases, respiratory diseases or in dermatology as a tonic agent. Often, however, there is no precise definition of the raw material that was used.

The information provided by traditional folk medicine indicates a wide range of possibilities of using the plant and its raw materials in modern medicine. This may be an inspiration to set further research directions for us – pharmacists that could accurately confirm the use of raw materials or dandelion in medicine. Thank you very much.

7. **DR HAB. ŁUKASZ ŁUCZAJ, PROF. UR.,**

DEPARTMENT OF BIOLOGY, INSTITUTE OF BIOLOGY AND BIOTECHNOLOGY, UNIVERSITY OF RZESZÓW

"Project of documentation of bouquets blessed on the day of Our Lady of Herbs in Poland and medicinal plants blessed in these bouquets"

I wanted to share the results of the action that I have been running since 2008, consisting in documenting herbaceous bouquets. As the previous speaker mentioned, this is a picture of what people collect in Poland in general.

The feast of Our Lady of Herbs is not the only occasion to bless plants in churches. Let us recall the three most important circumstances: palm trees on Palm Sunday, wreaths in the octave of Corpus Christi and herbaceous bouquets. The feast of Our Lady of Herbs was strengthened theologically by the dogma of Pius XII about the Assumption of the Blessed Virgin Mary. Of course, there was an oral tradition and legend about the Dormition of Mary. Professor Rostafiński followed the history of this holiday very closely in his work *The influence of Mickiewicz's boys' experiences on the paintings of the last two books of Pan Tadeusz and on the blessing of herbs on Our Lady of Herbs*. He derives this holiday from the Jewish Shavuot – the feast of the first fruits. In ancient times, fruits, mainly grapes, were blessed. Christians took over this feast, which in Germany was combined with pagan rites of blessing medicinal herbs. It seems to me that the main centre of origin of this holiday in Europe was Germany, and from there it radiated to other countries, which is also evidenced by the fact that it is not celebrated in many Slavic countries. For example, Croats have no idea about it, even in Slovakia and the Czech Republic it was poorly widespread. It was celebrated mainly in Poland, Belgium, even in England, only there it was destroyed by the Reformation.

I collected about 4000 photos dedicated to bouquets and wreaths, mainly bouquets. They come from various parts of Polish – most of them from Podkarpacie and Małopolska – from the Silesian Beskids to the Bieszczady Mountains. I have more data

from the Carpathians, scattered data come mainly from Podlasie and Mazovia. I have prepared a photographic exhibition of bouquets on this subject in Krosno.

Bouquets blessed in the Carpathians are richer than those from the Lublin region, Kielce or Podlasie, they are larger, they often contain more medicinal plants, especially in villages, where people still use these plants. According to the interlocutors, bouquets were once huge, even servants carried them, because they were so heavy that the lady of the house was not able to carry them, the farmhand had to do it. As a rule, as many bouquets were prepared as there were cows, because the most important use was to give a decoction of a bouquet to a cow that calved. Typical elements of the bouquet were: St. John's wort, apple, viburnum, dill, common lebiodka, hemp seeder. In the collection I have a photo of a beautiful bouquet from Bartne – Lemkos also bless bouquets, although this custom in Ukraine (also in Belarus) is rather rare, and therefore some ethnic groups, which are Greek Catholic or Orthodox, adopted this custom from Poles. In Ukraine or Belarus, herbs are celebrated, for example, on St. John's. Lemko bouquets from Bartne are composed only of herbs, there are no decorative flowers in them at all. In the bouquets there were meadow cornflowers – called *micne zila,* or strong herb, because weakened children were bathed in it, in addition, yarrow, St. John's wort, mugwort, etc. Bouquets from Mazovia are often spindle-shaped, this is such an interesting difference compared to the Carpathian ones, which are very compact. One of the interlocutors said that it is very easy to distinguish a city bouquet from a rural one: "because rural is like that: you cut it with an axe, so evenly that you can put it up. It is so wide that you can put it, there must be a red ribbon or some colored ribbon. Those townspeople, it's all so loose, so loose." On the other hand, bouquets from Mazovia, of which I have photos, are usually oblong, there are a lot of vegetables in them, beets are often blessed, for example near Warsaw. In Podkarpacie vegetables are much less. In the vicinity of the Białowieża Forest, bouquets are very poor – both those blessed in Orthodox churches and in Catholic churches, mainly cereals are blessed – all kinds that are grown by the farmer, and decorative flowers, apart from that there are only mint, wormwood. As one of the interlocutors said: "Lord, now people here only believe in bison". Of course, he meant not animals, but machines. An interesting fact is the disappearance of the blessing of poppy and hemp. Hemp only once I saw in a bouquet, and poppies are transferred, i.e., people

are afraid to grow poppy seeds and keep dried poppy seeds at home for a bouquet, then pull it out and use it again. This is such an innovation caused by the outlawing of poppy cultivation.

Why study these bouquets? Because many medicinal plants are used for them. This is a great opportunity to talk to people. Often, they do not remember about medicinal plants and remember them only when talking about a bouquet. I've come across situations where grandmothers made bouquets, granddaughters sat next to them and listened to different stories, so this is a great opportunity to educate the community to pass on these traditions. These bouquets, of course, have at the moment mainly apotropaic meaning, but also various plants are pulled out of them. I could list their applications for a very long time, e.g., in the Low Beskids, in Polish villages, when broad beans are sown, viburnum fruits are planted so that broad beans are born better. When grain is sown, the first grains come from the bouquet. There are a lot of different, small, often locally different customs. This has a mnemonic meaning. People also remember the order in which they collect herbs. An interlocutor from the vicinity of Frysztak told me that "first we go for the step, which grows at the railway embankment. Then we go for the wind weed, which grows on the hill. Then we go for it..." – So, people even create a mental map of the order of movement in the area. That is why the displacements are so tragic, for example, some of the Lemkos from Bartne were displaced to the village of Zimna Woda near Wrocław and – interestingly – I also have bouquets from Zimna Woda in my collection, which fortunately are identical to those from Bartne. People were therefore able to transfer this tradition and keep bouquets in the conditions of Lower Silesia.

Several publications were created, one of them concerns the changes of consecrated bouquets to Zielna. I compared the data published by Seweryn Udziela and collected at the end of the nineteenth century in the form of a herbarium, which was then critically developed and corrected by Professor Keller. This is a wonderful, beautiful herbarium. He gave what was celebrated in which villages near Krakow, what was used. It is one of the greatest, in my opinion, monuments of European ethnobotany in general. This herbarium is kept in Krakow. In 2009, more than 100 years after Udziela's research, I gathered volunteers and we visited several masses in 13 towns near Krakow, where

bouquets were blessed. We took pictures of all the bouquets after almost all the masses and compared them with what was at Udziela's. The bouquets are still very nice. An interesting fact is a very strong tradition of blessing the medical bloodsucker, called the lambs of Jesus. People don't use it for anything anymore, but they even go to Balice to the meadows to collect blood. Of course, the share of cultivated plants increased – the list given by Udziela was dominated by wild species. Now, however, cultivated species dominate. As far as ecological groups are concerned, the plants of meadows and pastures have suffered the most, so people still sanctify ruderal plants, such as tansy or yarrow, which is such a ubiquitous species, but the sanctification of rarer taxa has disappeared because people cannot find them. I believe that the main reason for the disappearance of some traditions is the lack of plants, not the reluctance of people to cultivate traditions.

Udziela gave a ranking in the nineteenth century of commonly blessed plants. There were 26 of these plants. There was no goldenrod among them, but there was tansy, there were no dahlias, but there was a bloodsucker. Fennel – mentioned by Udziela – replaced fennel. It could have been a mistake, although there is indeed a specimen of fennel in the herbarium. Mint is also present today, once there was no zinnia, so certain species have entered the ordination.

Another publication concerns the areas of Krosno and Jasło, where in several churches, apart from photos, we also did interviews. We also used archival materials from the vicinity of Krosno and Jasło. So, a comparison of *emic* and *etic was also made*. Emic informs how people see what they celebrate, what they give in interviews, what is important to them. Etic is about what is in the bouquet indeed. The differences were small, but there were. Some species were mentioned more frequently, others were more often present – e.g., garden species, which were not mentioned. The most frequently mentioned plants were very similar to those used in Krakow. We have the core of the idea of a bouquet, which is widespread in areas from the Bieszczady Mountains to Silesia and to Kielce, where there are very similar bouquets. Viburnum is of great importance, but for example in the vicinity of Krakow ferns and mountain ash are blessed. I come from Podkarpacie, in our country no one ever saints ferns or mountain ash, but there must be viburnum, so there are some local differences.

Finally, I would like to give a curiosity about one plant – myrrh. The biggest discovery of the action documenting bouquets was finding a plant that is blessed near Rzeszów and is called *Dysphania schraderiana*. It is very rare in Poland, it occurs wild only between Rzeszów, Przeworsk and Łańcut. It gives off a very strong smell. We have two similar taxa – quinoa and musk quinoa, this one is called smelly, but it smells very nice. All three taxa are wildly recorded in Poland. I was amazed that this plant is blessed and revered, that it is the most important plant, considered the queen of all herbs. Just as in Krosno it is considered the king of herbs of hemp, the queen lebiodka, in Jasło the queen of herbs is mugwort, in Rzeszów the queen of herbs is myrrh. It is cultivated and occurs very often in a semi-feral state as present in the chamo, there it is protected. We did a series of interviews, what it was used for. It was used mainly against moths, insects and headaches, and was put under the head of the dead on the final road, when they were already exposed in the coffin. It is interesting that this species comes from Africa, and we do not have any ethnobotanical record from all over Europe and we do not know how it got near Rzeszów. The related species *Dysphania botrys* is found in old books, herbariums, among antiquities. Perhaps there was a substitution, i.e., the use of *D. botrys* disappeared (it was used, m.in in the Hutsul region and in the highlanders). The plant is extinct, but for some reason *Dysphania schraderiana* survived near Rzeszów and is used there in a similar way as *D. botrys used to be.* There are also some similarities with the use of D*. ambrosioides*, or epazote – a species from South America.

Thank you very much.

8. **PROF. DR HAB. ZBIGNIEW LIBERA,**

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"Ethnobotany and Ethnomedicine"

The most important thing I have to say is: how does ethnobotany explain ethnoedycin and vice versa? What were the rules for selecting specific plants for specific cases of disease? Where to look for these reasons? I will not say anything entirely new in this regard, even if yesterday I heard what was said on this issue.

First, it is worth making a few general remarks relating to ethnography, ethnobotany and ethnomedicine. Interest in plants in terms of botanical or cultural arose especially in the 2nd half of the nineteenth century, and it has been variously explained where it came from. Anthropogeography has often been referred to in its scientific or non-scientific versions. Sentences such as: "The strong dependence of ancient societies on nature determined the huge role of plants in material and symbolic life" and "plants belong to the oldest and ubiquitous components of culture" were uttered. This meant that the problem or topic imposed itself. I believe that such an explanation is a naturalization of the reasons for dealing with plants. It seems to me that they have been dealt with since the 2nd half of the nineteenth century primarily under the influence of the Enlightenment, romantic and positivist cults of nature and nature. Such research would be justified by the tendency to show that the people are children of nature, so in this case they have the surest knowledge about nature and plants, proven by centuries-old experience, counted even in thousands of years. At that time, in the nineteenth century and later, there were many statements that denied folk knowledge about nature, argued that this knowledge was small and of little value, but those who dealt with ethnobotany showed otherwise. Such activities were also motivated by the belief that superstition and superstition, magic, religions obscure only what is rational in folk medicine. This something rational is mainly herbal medicine, thanks to which it is possible to recover the treasures of folk pharmacy. It was believed that in herbal medicine you can find a remedy for artificial and often harmful chemistry drugs. Such arguments are

repeated today, these are not old sentences, that all this can be used for the needs of the public. Similarly, ethnographers and florists wrote that for the good of the public, for the good of the nation, we can and must use folk literature, crafts and arts. This is the trend of this special interest in plants: discussions about folk knowledge about plants, their use is part of the discussion about folklore.

In herbal medicine or folk medicine, historical monuments of the history of the initial pagan plants were sought – as Kazimierz Moszyński described it. Glosses of medieval and renaissance herbariums, traces of concepts and practices of old Polish medicine were found. For lack of time, I will not elaborate on how these topics and problems were studied in more detail. They are important because they deepen our botanical knowledge or ethnographic knowledge, and the methods of conducting ethnographic research are of great importance.

There are not many separate works on ethnobotany in Poland. We have few synthetic works, it is worth recalling the recently published *Dictionary* of Adam Fischer, as well as the work of Adam Paluch. In the canon of ethnography sources (Kolberg and old ethnographic journals) we have an overwhelming amount of information about plants in food, folk medicine, folklore, rituals, art, material culture, etc. In addition, we use materials, sources of history, history of literature, art, linguistics. About the latter case, Jadwiga Waniakowa said: "It is so that we have materials and an unimaginably large publication for the names of plants alone."

So, we have an overwhelming amount of materials on this subject, but in all their mass they have different credibility and usefulness for the purposes of ethnology and such subdisciplines as ethnobotany, if ethnobotany is understood as a subdiscipline of ethnobiology, ethnopharmacy. The latter are more interested in rationality, effectiveness of drugs of plant origin, verification of folk knowledge, old science and modern methods of natural sciences.

Such research, of whatever kind, always raises problems of theory, methods and the subject of ethnobotany, ethnopharmacy, and becomes the source of various detailed problems. It seems to me that interdisciplinary research is needed. Meanwhile, people who regularly dealt with this issue wrote: "ethnologists botanize in a superficial way" – this is the sentence of Adam Paluch; "Biologists are not sufficiently aware of the problems

of knowledge of ethnography and folklore" – this is what Barbara Kuźnicka believed; "Linguists have a poor understanding of both biology and ethnography" – this was the opinion of Waniakowa.

The repeated postulates of interdisciplinarity are declarative in the situation of creating numerous disciplinary specializations and multiplying subdisciplines, which we are currently dealing with – or for a long time – when we do not have the opportunity to discern our own discipline and neighboring disciplines in its entirety. Out of necessity, out of natural order, we are all interdisciplinary to some extent, but what exactly would that mean? This is where the trouble begins.

One can be skeptical (the list of doubts is long, because in the case of ethnography and ethnology it concerns the way ethnobotanical knowledge is produced by ethnographers) to what principles, on what basis it was assumed that knowledge gained in the field or from any other sources adds up, that one to two can be added and in this way produce a whole that testifies to folk knowledge about the plant world.

On what grounds – I mean especially the statements of humanists and those who declare belonging to social sciences – are judgments about the objective rationality and effectiveness of folk herbal medicine and medicine judged? There were and still are a lot of such statements.

The methods of data collection themselves should also be of interest. Without going into details – the data came from very different people, from ladies from the manor (manors were pharmacies for the area), from priests, teachers, some managed to collect information from quacks or herbalists, like E. Orzeszkowa. The latter makes an interesting remark that what one herbalist knew, the other had no idea. Such messages in publications added up – one was added to the other and the impression was created that a lot was known.

According to dialect and ethnographic research, the differences in knowledge of the plant world were enormous. This is also what Jadwiga Waniakowa quoted here claims. I will cite examples: a highlander asked about some plants will not say "I do not know", but he will give the first better answer that comes to his mind. This is the common experience of ethnographers. This highlander or someone else cannot recognize the species even when the researcher shows a freshly picked plant, etc.

Fisher, when he compiled the dictionary, collected materials through questionnaires sent to sightseeing circles. He was helped by various sightseeing experts and ethnographers. To the materials thus acquired, he added what was known from press articles, from earlier publications, and in this way, he created a whole. It is interesting that the field surveys consisted in the fact that the interviewers knew a person who was best versed in these matters in the area and could say the most. Such a person was questioned, the others were not, that is, one testified for all.

Of course, these circumstances in works, publications are not disclosed or are marginalized. Somewhere by the way, from other sources it comes out how this research was conducted. It can therefore be said that Fisher practiced "mosaic" ethnography. It was once said about Kolberg's works that since they are based on such diverse sources, they are mosaic ethnography. Some saw disadvantages in this, other advantages. In the same way, collections and elaborations of folk botanical knowledge were created. Even if they came from better informed people, from various sources, they were always presented as common, general knowledge.

Such summation of detailed, fragmentary information led to calculations that in Poland, as in other European countries, about 250-400 plants were used. This is very little compared to what we know from universal ethnography, some added. Such calculations again obscure the fact that, for example, in surveys or simply ethnographic studies of Udziela, Rostafiński and others, there are much fewer plants, besides, they do not come from the field, but from the knowledge of publications. The list of 250 plants that Fisher determined were of particular interest to the Polish folklorist (he did not explain why they were) came from the fact that it was previously prepared from ethnographic, historical and botanical literature. So, it is not a testimony of something that has been anywhere. Many doctors in the provinces were the authors, it seems to me, of the finest works on folk medicine – ethnobotany was written about by Rostafiński, a botanist who had great merits for both history and ethnography. They presented the best documentation of medicine, and at the same time herbal medicine, and at the same time verification and evaluation of knowledge and folk practices from the point of view of natural sciences. These assessments were necessarily referred to by authors, amateurs in ethnography, professional ethnographers. They often consulted botanists on matters of plant marking,

because without this agreement ethnographic collections would be useless. Ethnographers also relied on the knowledge of medicine, biology, solving the problems of the reason for using plants for various purposes, the effectiveness of herbal medicine, on which folk medicine was based. On the basis of knowledge of such documentation, the researchers ruled most fully. It was expressed in the most synthetic way by Kazimierz Moszyński, once the most influential ethnologist: "folk medicine, knowledge and practices of the people in general, this is a collection of superstitions and superstitions, a weave, a Gordian knot of various things, because we have accurate observations consistent with facts, and right next to it is full of absurdities, some fantasies, things on which basis they are invented. That alongside common sense are techniques, magic, religion, etc., in essence in folk medicine herbal medicine can be considered proper medicine, but herbal medicine is derailed by magic, this bastard sister of science, and religion. Therefore, the effectiveness of herbs is reduced, because they are used at random, neither in five nor in nine. The therapeutic effectiveness of herbs, in general medicines of ethnomedicine, is therefore a matter of chance and the placebo effect, all the more so because Moszyński repeated after others: "The people are susceptible to suggestions".

I believe that an ethnologist should not solve such problems, because he does not have the competence to do so. The methods of ethnology do not provide a basis for deciding such questions. He can study them from the standpoints of cultural and historical studies – that is, he can say that the knowledge and practices of folk herbal medicine and medicine were rational and effective to the extent that there were earlier forms, systems of knowledge of learned medicine and botany, on which the former depended. I'm not saying that everything we know about folk medicine and botany comes from what we know from old Polish herbaries and the like, but at least the overwhelming part.

Szostak's observation is interesting, probably also instructive about the history of medicine, in a great book about old Polish herbarzach: "Old Polish herbal medicine was based on erroneous teachings, but it had a strangely high effectiveness". All those who measure folk medicine and ethnobotany by the measures of science or particular sciences, natural sciences, must have a problem with this. How is it possible that something works on a non-scientific basis? Where to look for an explanation here?

From an external perspective, you can watch herbal medicine or this folk knowledge about plants as such, which are the most valuable, and you can find something for us in it. For users of this botany, however, herbs are the least effective drugs. Much more effective are magic words, which freely shape the properties and usefulness of any things, plants. It is known what lovage is for, but properly ordered can arouse hatred and similar emotions.

There were also herbs called women's medicines. Waniakowa explains it so that simply by accumulating plants, processing them, etc. were taken care of by women. However, it seems to me that the meaning of the term *women's medicines* is similar to that of the compounds such as: *women's talk, women's gossip*. Again, this is about not valuing these drugs.

If we want to understand why certain processed, unprocessed plants or their fragments are used in specific cases, diseases, we must look for explanations in the rules of folk medicine and folk botany. It will not serve to attribute to cultural or social systems some orders that we know from science, from today's botany or from today's medicine. In this way, we will not explain anything, or we will do it in a limited way. We must also marginalize a lot of ethnographic and non-ethnographic material.

I will use the words of Henryk Biegeleisen, a literary historian and ethnographer, which I find very accurate: "According to the semiology of European peoples, folk medicine is based on the sciences of symptoms." Indeed, in folk medicine we have to distinguish diseases on the basis of recognized symptoms. A symptom can be a disease, or it can be part of a disease because it is accompanied by other symptoms. Recognizing the symptoms and characterizing them depended on other circumstances, which I will not talk about now. Therefore, it is necessary to take into account this and the way of classifying, ordering plants in the folk environment. Unfortunately, I didn't find a suitable job I could rely on. I know the publications of linguists who study the problem of naming plants and indicate that names are produced on the basis of environmental, morphological features. It's just about more criteria and a denser grid of detailed motivations, but this leads to the fact that each plant has many characteristics, many names, multiple motivations. We encounter the problems of polysemy and synonymy, metaphorization – creating names on metaphorical basis, and metaphors create a sense

of kinship of various things in the world, point to their similarities. Szostak pointed out that in old Polish diaries, as in ethnographic documents, we have few descriptions of what the plant looks like, what it is, but a lot of information about its use and what it is similar to, e.g., that it resembles some body parts or other objects. It is in these orders of classifying diseases in folk medicine and classifying plants in folk botany that one must look for explanations *as to why*. Dandelion is used in so many different cases and we can't find the reasons why they are so different, what's going on? Thank you.

SESSION III. PHARMACY AND UTILITY GARDENS

1. **DR HAB. NORBERT MOJŻYN, PROF. UCZ.,**

CARDINAL STEFAN WYSZYŃSKI UNIVERSITY, WARSAW

"Hortus medicus. From the medieval monastery garden to the medical book"

It will probably be a truism to say that medieval monasteries for their time were characterized by a high degree of development of medicine and horticulture. The monks copied, studied ancient medical treatises, built infirmaries, founded medical gardens, or *horti medici*.

Cassiodorus, a high official at the court of Theodoric the Great in the first half of the sixth century, that is, after the fall of Rome, founded the famous monastery in Vivarium, where he deposited the ancient books available to him. Among them were medical and horticultural books, as well as natural science books. Cassiodorus ordered his charges, monks, that those who were more capable should study Greek and Latin, and those less capable should do physical work, for example, cultivating gardens, which in Vivarium, let me remind you, was very important. I would like to add that Vivarium was a real oasis of ancient culture. Not only did science flourish there, but as we know from historical sources, mechanical devices worked, e.g., mechanical torches, hydraulic devices driven by the power of water, there were baths, infirmaries available not only to the monks themselves, but also to pilgrims and people who stayed there for various purposes.

Medieval gardens and monasteries could be organized in different ways. Since the orders had their own specifics, various gardens were created, including medical gardens. For example, eremites lived in separate houses, which we can see in Warsaw in Bielany – the hermits, were the Camaldolese Bielański near Warsaw, then also the Carthusians. The monastic style of e.g. the Benedictine faction, i.e. the Cistercians, looked different.

Hortus medicus – in the Middle Ages, this Latin name meant a closed, surrounded by the walls of the monastery garden, in which herbs and other medicinal and spice plants

were grown. Due to the presence of herbs, this garden was called *herbarium differently,* but in a broader sense all monastery gardens were called so. Why? Because in the Middle Ages, in fact, medicinal plants were grown in all the gardens that were in the monastery. What kind of gardens are these? I'll talk about that in a moment.

It should be taken into account that in the Middle Ages medicinal plants were also considered those that bring spiritual good, soothe the senses with their beauty, and magical plants, such as mandrake. Nowadays, *hortus medicus* is a separate fragment of the botanical garden referring to the form and plantings of the former herb garden.

Metaphorically, already at the end of the Middle Ages, the term *hortus* medicus or in medieval Latin *ortus medicus*, *ortus sanitatis* – or garden of health, was also called books and treatises of a natural and medical nature, which began to appear at the very end of this epoch in manuscript form. Soon, when the era of printing came, the renaissance, they exploded with a huge number of printed forms. By the way, I will only remind you that the first Polish print, using modern language – a printing hit, such a *hortus* was published by Florian Ungler in 1534. *The garden of health*, known more widely under the title *Of herbs and their power*. This work is commonly attributed to Stefan Falimirz, but we know that in reality he was rather its translator and compiler.

I would like to focus on three medieval documents, manuscripts, dealing in different degrees and in different ways with medicinal plants. First, there is the plan of the monastery of St. Gallen. Not everyone knows that it was also provided with a fairly extensive description by Heito, Abbot of Reichenau. The second medieval work of interest to us is the rhymed work of Walafryd Strabo *De cultura, hortorum ad Grimaldum monasterii Sancti Gali abbatem*, popularly known as *Hortulus*, or garden. Both of these works, i.e. the plan and *Hortulus,* come from the Carolingian era. The third work, already later, comes from the twelfth century and it is *the Causae et curae* of a learned nun – the recently very popular Hildegard of Bingen. This work is a kind of medieval medical book.

On the example of these three works, I would like (as far as possible, of course) to reconstruct the knowledge, the way of understanding the properties of medicinal plants, the ways of their cultivation and application in medieval Benedictine monasteries between the ninth and twelfth centuries: IX, because then the first two works from the Carolingian era were created, and XII, because Hildegard lived then.

The flagship example of Benedictine monastery buildings can be found in the plan of the abbey of St. Gallen, or St. Gaul. It was the design of an ideal Benedictine monastery. Has it been realized? Probably not, but for a long time it was a model plan for Benedictine monasteries. The project was created around the year 820 in the monastery of Reichenau Abbey, it came from the pen of Abbot Heito. The plan made on parchment measures 112 cm × 77.5 cm and is currently kept in the monastery library. It is, as I said, accompanied by comments and meticulous annotations. It contains 340 notes, including a description of Benedictine gardens postulated – how they should look, planted plants, explanation of the functioning of monastic establishments, buildings, rooms and even furniture.

This is a huge, even gigantic assumption. It is practically a medieval city, the heart of which is a church and a cloister, i.e., a contemplative garden, closed with cloisters leaning against the southern wall of the monastery church, adjacent to the transept, i.e., the transverse nave. The courtyard is closed by a compact arrangement of monastery buildings, necessary for living together. These included primarily a dormitory, i.e., a bedroom, a refectory – a dining room, as well as a pantry. It is worth paying attention to the solar exposure: from the south there was a refectory, from the east a dormitory and from the west, because the coldest, were cellars and pantries. There was a church in the north, so of course they could not be there.

The patio was divided axially by two cross-shaped paths, in the middle of which there was a well. It could have been in the form of a fountain, symbolizing Christ as the source of life. This garden could also symbolize the garden of Eden, from which, according to the Bible, four paradise rivers flowed. The division of the cloister into four parts referred to Christian symbolism, that is, the four evangelists, the four cardinal virtues, sometimes in the middle of the cloister instead of a well a tree could grow – it is also a Christian symbol of the paradise tree of the knowledge of good and evil or the wood of the cross on which hung the Salvation of the world, that is, the so-called *arbor vitae*.

The symbolism of the medieval monastery was concentrated on the garden with cloisters. It was a kind of microcosm governed by the laws given by the creator, where each plant was placed in a specific order and had a role to play.

The courtyard was the heart and core of the monastery, symbolizing the original paradise, and at the same time the top of the cosmic mountain. The cloisters surrounding the cloister were used for walking, reading or meditating, while the processions that took place in them can be interpreted as cyclical invocation, circling the Garden of Eden, that is, like a journey, a way to the Garden of Eden, which in fact was also the ultimate goal of monastic life. The viridary had a lawn often sheltered by a low-growing hedge or wall with shrubs, and in the corners, it was usually roses. Daisies and violets were usually planted on the lawn, symbolizing the Virgin Mary. The courtyard was often identified with Mary's garden, that is, with her spiritual virtues. Of course, it was not the only garden in the monastery, but it was, so to speak, a ceremonial garden. On the plan of St. Gallen in its north-eastern segment, next to the infirmary, we have a proper *hortulus medicus*, or herbal medical garden. Among the medicinal plants grown in it, the plan of St. Gallen mentions, among others, such as sage, rue, gladiolus, mint, cumin, dill, watercress, African plantain, lovage or poppy. The last two we know what associations they have, what they could have treated, in the monastery as well.

The plan of St. Gallen also shows a vegetable garden, which was located next to the chicken coop, opposite the gardener's house. It was divided into eighteen beds in two equal rows, nine – each bed for a specific type of plants. The beds were enclosed in fences, had access paths on both sides.

Eighteen species of vegetables are listed on the plan, including m.in leek, onion, cabbage, black cumin, parsley, chervil – a plant, as I realized, from the celery family, shallots, lettuce, garlic, radish and others. In addition to the vegetable garden, the plan of St. Gallen also provided for a place for a cemetery, which was also an orchard, where plots were designated for planting fourteen species of trees: apple, pear, plum, peach, cherry, horse chestnut, ficus, almond tree, mountain ash, hazel, laurel, quince, medlar, black mulberry.

This may seem strange today. How can a fruit orchard be combined with a cemetery? One of the historians who studied this document, Karol Heights, refers to medieval symbolism, that is, to the *arbor vitae* – the tree of life and at the same time the tree of death, which brought life or rebirth signifying new life.

The second document about which I wanted to say a few words, concerning medicinal gardening and the use of plants, is *De cultura hortorum,* that is, the cultivation of gardens, the so-called *Hortulus – garden, of the* Benedictine monk Walafryd Strabo from the first half of the ninth century. The author and the work are closely related to the plan of St. Gallen just presented, because Strabo was a pupil of Abbot Heito, the author of the plan of St. Gallen.

Strabo was educated in one of the largest scientific centers of the Carolingian era – it is worth emphasizing – in the abbey of Fulda, under the direction of Hraban Maur himself. In turn, Count Maurus was a disciple of Alcuin.

As abbot of Reichenau, Walafryd had at his disposal a large number of manuscripts, works of ancient writers, including medical works. The library's inventory from 820 included 500 titles. The learned monk combined theoretical knowledge with horticultural practice. It is believed that he was at some time in his life the main gardener of the abbey himself. In *Hortulus he* confesses – and this is a very interesting sentence, because he shows where gardening and medical knowledge was derived from at that time: "Only toil and passion allowed me to get to know this craft, which neither the view of the commoners nor the knowledge acquired in ancient books would ever reveal to me".

According to *Strabo's Hortulus* , the diet of the medieval monk consisted of about 100 plants. Most of these plants are grown to this day, so as a curiosity I will give only those that in my opinion are little known today and probably rarely used in the pharmacy and in the kitchen, although I may be wrong. These are: rue ordinary, amaranth blue, garden lobod, venomous lettuce, okrzyn (from the celery family), medlar, wszewilka górska, marzanna dywierska – used for dyeing, but not only.

The third document is *Causae et curae,* which can be translated as causes and treatment, implicitly – diseases. It is a kind of *medieval medical book par excellence*. The oldest surviving version from the thirteenth century is a 243-page manuscript, divided into five books. This work shows that Hildegard can be counted – and this is often done – among the precursors of many contemporary disciplines: natural science, aesthetics, and music theory, but probably many other fields would be found. Her views can also be described as ecological. They occur in the context of understanding the world and man

as interrelated realities. Describing the world, Hildegard used the term *Hortus Deliciarum,* or Garden of Delights, in which various plants grow, and man should get to know them, appreciate them, and then admire them for the glory of God, of course. If he does not do this, he will not see the beauty and value of the world, it means that he can only – as Hildegard bluntly put it – "bury himself in the fertilizer like a worm".

Hildegard combined theoretical medical knowledge, which she acquired from ancient and medieval treatises, with practical activity. She was a doctor in her convent. Among the favorite medicinal plants recommended by Hildegard are spelled wheat, chestnut, apple, almonds, quince fruit, dill, beans, peas, onions, garlic and chives. Hildegard's recommended diet includes numerous herbal spices, such as nutmeg, sage, sand thyme, Chinese galgant, hyssop, fennel and nettle. The dandelion recommended to use vegetable preparations, including tinctures, ointments, enemas, infusions and baths, as well as beer and wine. Her pharmacy also had psychoactive plants such as cannabis, opium, nightshade, henbane or mandrake. The fact that southern and eastern plants are included in this list should not come as a surprise, because Hildegard, as it follows directly, already knew certain things, certain elements of Salernitan medicine.

In Hildegard's medical book *Causae et curae*, one can see a continuum of thought between plant care, including gardening, and human care, or medicine. The whole world was created for man's sake, for his use and for his benefit. For animals, man is the light around whom they gather and from whom they expect love. Thanks to him, plants are refined and become more perfect. However, man can lose measure and not care about the right order in nature. This is not without consequences for him and nature. What is so obvious today, evident in relation to climate change, pollution, that we are responsible for the nature in which we grow. Thank you very much for your time.

2. **MGR KAROLINA PORADA, DR IZABELA KRZEPTOWSKA-MOSZKOWICZ, DR ŁUKASZ MOSZKOWICZ**

CRACOW UNIVERSITY OF TECHNOLOGY, DEPARTMENT OF LANDSCAPE ARCHITECTURE

"Public urban sensory gardens with aromatic medicinal plants as therapeutic places"

The previous lecture was really a very good introduction to what I will talk about as well. I also wanted to start with history, from a reference to how medicinal aromatic plants are inscribed in our European culture, to remind that they were present in medieval gardens, whether monastic or secular later, and in addition to their medicinal value, they had a large spectrum of meanings. Above all, however, I would like to focus on the contemporary introduction of gardens into a new type of public greenery, which are sensory gardens, in which aromatic, medicinal plants, as it turns out, can also play a significant role.

Let's start with the definition of a sensory garden. Together with Dr. Izabela Krzeptowska-Moszkowicz and Dr. Łukasz Moszkowicz, we have been working on this topic for several years. We consider the one developed by the British organization Sensory Trust to be a fairly good definition of this type of garden. It defines such a garden as a self-contained area that brings together a wide range of sensory experiences and, if well designed, is a valuable resource for a wide range of use, from education to creation. During the research – whether literature or local visions, we created a preliminary list of features that such a well-designed sensory garden could have. It should primarily affect all senses – not only one, i.e., the sense of sight, but it is to provide a whole spectrum of stimuli for various human senses. The insulation of such objects is of great value due to the possibility of better contemplation and reception of such a garden, they should include, in addition to plants, also other elements enabling stimulation of the senses. Animal friendliness is also a value, because the presence of insects or birds increases the range of positive stimuli that gardens provide. We very positively assess the indications appearing in these gardens regarding their use, i.e., all educational aspects such as boards that facilitate the reception of such gardens.

When it comes to herbs, they are identical with the term herbaceous plants, but they can also be defined more broadly, i.e., as plants that carry certain values for man, they can also be described as plants whose leaves, seeds or flowers are used as spices, food, are used in medicine, are used for smell, etc. At some point in our research, we focused on herbs and asked 80 residents of Krakow in a survey what they associate the term aromatic herbs with. In the vast majority of cases, we received the answer that mainly with the sense of taste or smell. The visual aspect of the plants was actually omitted, except for the associations of one person, which is quite interesting for us. When it comes to herbs, aromatic plants, undoubtedly the smell is very important for the gardens of the senses. However, we emphasize that the visual aspect plays a huge role.

I wanted to present several model sensory gardens or sensory gardens in which such plants appear. We limit our research to Polish and the UK. We have selected five Polish gardens and as many British gardens in a simplified way, we have described the positive and negative features of these gardens, we have also taken into account what specific aromatic and medicinal plants are used in them.

The first garden is located in Gdynia, it is the Labyrinth of the Senses on the Alice Trail in the Enchanted Forest at the forest botanical garden Marszewo. The advantages of the garden are its layout, interesting presentation of plants, their diversity, descriptions of plants, in which their healing properties are emphasized. Therefore, there is an educational aspect and an element characteristic of sensory gardens, i.e., an elevated flowerbed, which facilitates access to vegetation for people with disabilities or simply with some mobility difficulties. However, when it comes to negative features, we paid attention to narrow passages. We found in the garden such plants as geranium, ivy kurdybanek, mountain pine and marigold.

Another facility is located in Frombork and it is the Herb Garden at the historic building of the Holy Spirit Hospital. Its positive features include a large variety of plants, which are distributed on many beds with different, irregular shapes, different heights. Interesting is also the layout of paths, the company of trees, fruiting shrubs, lawns, the unique atmosphere of the place and the possibility of close contact with vegetation, because it meets lawns. Alternatively, increased rebates could be introduced there, which

I paid attention to earlier. Among the plants we have distinguished chamomile, mugwort tree, anise carrot and valerian.

Another garden is located in Sandomierz at the Diocesan Museum and refers to the Renaissance medical garden of Marcin from Urzędów. Also here, we consider a huge plus a nod to history consisting in the fact that the species were selected according to the juxtaposition from the Renaissance medical garden. We found interesting the fragrant path, where a motherwort was planted between the stones. Of great educational value is the garden guide – the Sandomierz Garden of canon Marcin of Urzędów. As for the negative qualities, there are few places for contemplation, and the garden itself has a small area. Among the plants, it is worth mentioning fennel, garlic and anise.

Another garden is the Garden of Fragrances in the Stanisław Lem Garden of Experiences located in Krakow. A positive feature is the large areas of fragrant plants, near which a sensory path and plant labyrinths have been designed, while the disadvantage is the lack of seating, the lack of separate interiors conducive to stopping and narrow, uncomfortable paths, which may be difficult to traverse for some visitors. The richness of plants and the interesting layout of this garden draws attention. As for plants, we have listed mugwort, tarragon, evening primrose and yarrow.

The Krakow Garden is also the Garden of Senses Synesthesia in the Piaski Nowe housing estate. It is a specific public garden, which has already been very thoughtfully designed as a *strictly* sensory one. So, we see only positives: a large variety of plants, clearly separated zones for different senses, appreciation of the influence of animals on the human senses and the creation of a friendly environment also for animals. There are isolated garden interiors, and there is also a separate part for workshop activities surrounded by the smells of this garden. Among the plants we have specified: elderberry, raspberry, fragrant violet and medicinal plants that do not stimulate the sense of smell so much, but also appear: delicioushead, common heather.

In Canterbury, Kent, there is a herb garden at the Canterbury Heritage Museum. Here we also have a reference to the medieval monastery gardens. There are many species of plants in it, the garden has a regular layout with an accentuated center, the plus is a large number of places to sit. The immediate vicinity of the street is unfavorable, which can interfere a little with the peaceful contemplation of the garden. In the middle

there is a water element, and lush flower beds around. Achieved, I think, a very interesting effect. Among the plants we found rue, borage, soft acanthus, peony and rotifers.

The second English object is a London Garden, or rather a park, at Imperial Wharf. It is a public garden composed of several parts. It introduced a division into zones dedicated to different senses, plants have been precisely selected in this respect. It is intended for residents of the city, which is also its big plus, it gives the opportunity for recreation, for example, on lawns. However, it can also be a minus, because it is a bit noisy there and we have less opportunity to calm down. Plant beds composed of perennials and herbs are separated by hedges, and among these plants, when it comes to aromatic and medicinal, we have distinguished: yarrow, rosemary, chamomile, echinacea and rotifers.

The last garden is Buckfast Abbey located at the former Benedictine abbey, very popular, extremely interesting, in which we have three parts with aromatic and medicinal plants: sensory, medicinal and lavender garden, isolated from each other, with a very large number of plants. Multi-colored discounts are designed. Interesting is the themed lavender garden. When it comes to negative qualities, there are no places to calm down and contemplate – whether religious or relaxing. Among the plants we mention marsh meadow, ożanka proper, thyme and quince.

As for the discussed urban gardens, in which there are aromatic medicinal plants, it can be said that they have a high value also due to the fact that they create an environment conducive to the regeneration of the body, e.g., through close contact with the garden, by arousing positive memories. Thanks to the direct impact of fragrance, they can stimulate contemplation and meditation. They are important related to religion, they help to awaken the sensitivity of the senses in children and adolescents, who of course can spend time in various ways. They are conducive to urban activity, which allows for close contact with nature, i.e., they create the opportunity to participate in hortitherapy classes, i.e., help in planting or growing plants. They allow observation of animals in the natural environment, as long as they have biocenotic features. They create a therapeutic environment for displaced people who had to leave home for various reasons and found themselves in an alien environment. We did not have an example of gardens for

emigrants, but they do appear in the world and can have educational value, especially for children and young people.

Medicinal aromatic plants, used as spices, and those commonly known are often used in gardens of the senses. Other medicinal plants, including aromatic ones, are found to a limited extent only in selected sensory gardens. The exceptions are herb gardens, which refer to historical gardens, e.g., at the Holy Spirit Hospital in Frombork or in Buckfast Abbey. The examples of such medicinal plants from the studied gardens presented by us indicate that this is a large group of species that can be used as plants affecting the sense of smell and other human senses. The use of medicinal plants in sensory gardens can significantly expand the impact of such a garden, especially therapeutic, by bringing specific values. Thank you very much for your attention.

3. **MGR JOANNA GRZEŚKOWIAK,**

INSTITUTE OF NATURAL FIBRES AND HERBAL PLANTS – NATIONAL RESEARCH INSTITUTE,

DR ANNA BRANDYS,

UNIVERSITY OF ARTS IN POZNAŃ

"White mulberry (Morus alba L.) in scientific and cultural terms. From silk to paper"

Joanna Grześkowiak: I am an employee of the Institute of Natural Fibres and Herbal Plants in Poznań and together with Dr. Anna Maria Brandys representing the Magdalena Abakanowicz University of Arts in Poznań we have prepared a presentation on white mulberry in scientific and cultural terms. Our presentation consists of two parts. In the first one, I will tell you about white mulberry as a research object in various fields of science. In the second, Dr. Brandys will present the cultural significance of mulberry.

The results of the records that are obtained after entering the search engine of scientific databases, entering the term *white mulberry*, indicate that this is a research object that is gaining popularity. This is reflected in the articles that appear in peer-reviewed scientific journals and are edited by scientists, researchers from various fields of science.

How did it happen that people became interested in mulberry as a research subject? Well, interest in mulberry grew with the development of silkworm breeding. Mulberry was also used in traditional Chinese medicine, and the status of this plant is also evidenced by the fact that the first paper money was made by the Chinese from the bark and bast of white mulberry.

At first, it is worth giving a brief description of the species. White mulberry is a deciduous tree, native to Southeast Asia, reaching a height of up to 15 m, whose characteristic feature is the presence of milk juice in the shoots and heterophilia, i.e., the diversity of the shapes of the leaf blade of this plant. It is a dioecious plant with inconspicuous flowers and complex fruits. I would like to point out here that Poland has a native variety of white mulberry – large-leaved turtle, which was selected in the 50s of

the twentieth century in Milanówek near Warsaw, which is the cradle of Polish silk. As far as I know, there is currently only one white mulberry plantation in Poland. It was founded several years ago and is run and maintained by the Institute of Natural Fibres and Herbal Plants in Poznań.

Mulberry is a research object in various fields of science: from medical and pharmaceutical sciences, through agriculture, horticulture, zootechnics, as well as food and nutrition technology. The fact that it finds such interest among scientists representing various scientific disciplines testifies to its various properties, which I will try to present and illustrate in a synthetic way.

The undoubted properties of white mulberry include the richness of both nutrients, macro, microelements, vitamins and substances with bioactive effects. The largest cluster of them and their largest source are the leaves of this plant. There is a multitude of various substances in them, primarily flavonoids, such as quercetin, rutin, astragalin, but also a very popular alkaloid, which is DNJ, which I would like to focus on. The alkaloid, whose full name is 1-deoxynojirimycin, is of interest to researchers from around the world, because studies show that this compound inhibits the activity of α-glucosidase, which contributes to lowering blood glucose levels. Many scientists see this compound as an opportunity to develop more effective preparations and supplements that will support the treatment of patients with diabetes. I would like to point out, however, that the DNJ content is a very variable trait depending not only on the variety, since seasonal fluctuations are observed during the growing season, and the content of this substance changes with the age of the leaves of the plant.

Mulberry is a research object for researchers dealing with agriculture, for example, due to its energy value, which is comparable to willow. In addition, it gives a high biomass yield of 14 to 17 t of biomass per hectare per year. The high content of cellulose, lignins, hemicellulose makes this plant can be successfully used in the production of pellets, briquettes, but also biogas plant feedstock. During spring pruning, bushes are formed so as to facilitate the subsequent harvest of leaves. It is from these annual shoots, but also from dried leaves, pellets are obtained with the help of a pellet maker. Mulberry can therefore be treated as a plant with energy properties.

In addition, mulberry is gaining popularity among researchers dealing with broadly understood environmental protection, because it has low soil requirements, is characterized by resistance to various pests, is successfully used in the reclamation of degraded areas, but also as a component of mid-field trees, which provide protection against wind and shelter for birds and other small animals. In addition, it is recommended to set up mulberry hedges, which was once very popular, which have a protective function against wind, exhaust fumes and dust. It should be noted that due to low soil requirements, it is a plant that can be successfully planted on wastelands, in areas that are not used, for example, for agricultural crops, and its rapid annual growth means that in a short time such a hedge will take on the right shape and will fulfill its very useful role.

Its leaves, due to the content of nutrients, vitamins, micro- and macroelements, are also eagerly tested for the possibility of using them as a component of feed, feed additive. They are most associated with the breeding of mulberry silkworms, for which the larvae of the leaves of this plant are the only source of food. However, research is also being conducted on the use of both fresh and dried mulberry leaves in the feeding of pigs and cattle. The first results show that this improves their health, and also translates into the quality of products obtained from these animals. Thanks to this resistance to all kinds of pests, mulberry does not require the use of insecticides, fungicides or other herbicides, so from such a plantation we can obtain a fully ecological raw material that is beneficial for animals, because it is not burdened with any residues, such as plant protection products.

White mulberry, which was known in Poland, associated primarily with silkworm breeding, once very popular in our country, is now experiencing a renaissance. This is due to the interest of the food and herbal industry resulting from the richness of various bioactive compounds, but also due to the nutrients of micro- and macroelements. It is also an energy plant, and as will be discussed later in our presentation, it is used in the pulp and paper industry.

I cordially encourage you to plant mulberry, especially this Polish variety, which is fully adapted to our climatic and soil requirements, thanks to which you will gain a plant for your garden – whether in the form of a hedge or in the form of individual plantings –

which is a source of many raw materials, which can be used in many ways. Thank you very much.

Dr. Anna Maria Brandys: Mulberry appears in literature, its fruit – from white through pink, red to black – symbolizes the different phases of love. It appears, among others, in Shakespeare, but many creators reached for this motif. Mulberry also appears in visual arts, and the most famous image of it is Vincent van Gogh's painting *The Mulberry Tree*, painted in a typical way for the artist. The work is located in Pasadena and was created in 1889.

Due to the properties of wood, which my predecessor talked about, mulberry is used in handicrafts. It is used for weaving baskets, but also for the production of toys, dishes, devotional items and jewelry. The Croatian designer created the Sanisio brand in France, which deals with the production of sophisticated everyday products from mulberry wood. I also found Polish designers who designed furniture from mulberry wood, weaving, for example, epoxy resin into the wood structure. Mulberry is also used by Japanese design. There are 24 species of mulberry in Japan. It is boldly used to use this wood for the production of lamps or vases. In the region of the Izu Islands, mulberry trees, which are referred to by a special term *Shimakuwa*, are harvested in order to produce small everyday objects typical of that culture. Originating from island areas, wood is characterized by gloss, almost like precious stones. It produces so-called *netsuke*, which complements the kimono, a kind of tiny bag in which you could keep small personal items. Nowadays, they are made by one of the handicraftswomen, the artist Jane Jacobson.

Speaking of netsuke, it's hard not to mention kimono and silk painting. This, in turn, takes us to Milanówek, which is our native mulberry accent. In this town near Warsaw, after the privatization of the plant in 1997, the Academy of Fine Arts in Warsaw together with the Institute of Industrial Design organized workshops for artists who had been learning to paint on silk for two years. As a result, a Polish school of silk painting was formed. The main representative of this trend is Wojciech Sadley, whose work is truly unique and was appreciated at the International Triennial of Artistic Tapestry in Łódź for the series "Shrouds". In addition to Sadley and his family, whose members also create in

this technique, silk painting is practiced by, for example, Hanna Ewa Masojada, Grzegorz Pabel, Krystyna Arska-Perepłyś, Stanisław Trzeszczkowski – each of them in their own way.

On the 90th anniversary of the establishment of the experimental plant in Milanówek, the first edition of the Silk Painting Biennale took place, in which I had the honor to participate. I deeply regret that it never happened again, fortunately artists still create on silk. An example is Dora Hara from Gdańsk, who in 2019 organized an exhibition combined with a conference devoted to painting on silk; It forms delicate structures. Other noteworthy artists include Anna Janiak, Anna Banyś, Joanna Butlewska-Cofta, Teresa Grabowska. There are many of these artists, I will also recall Ludwika Żytkiewicz-Ostrowska, whose silk works are completely different, because they are no longer painted. These are the spatial forms for which he uses silk-crepine. They refer in structure to what cellulose looks like under a microscope. Cellulose was discovered recently, but in fact it has been known to mankind since the dawn of time – since we use paper. Cotton has the most cellulose, but in the past, for example, hemp banknotes were produced. Here, if you do not know this topic, I recommend reading Jerzy Vetulani, *and in hemp* fear – explains why we stopped printing money on hemp paper.

A very important thing I would like to say: in addition to *Morus alba L.*, one of the paper-bearing species is *Broussonetia*, which belongs to the mulberry family. It is most common in Japan. It is also called *goat*. There are many other fiber plants from which paper is made, however, this mulberry paper has the greatest hygroscopicity. It is very strong, durable. In Japan, walls are built from it, it is used in interior design. At the institute, we also produced paper mulberry paper – on the plantation, where white mulberry grows, paper mulberry also grows. Now, in silkworm and mulberry plants, we are working in parallel to make silk paper. Unfortunately, we also had to use flax cellulose. We did not manage to achieve it, but we know that it was achieved by conservators from the Academy of Fine Arts here in Warsaw – Anna Potocka, Marzenie Marcinkowska and Henryka Gonera. *Morus alba* has high cellulose properties and Dr. Lorenc, my university colleague from the Magdalena Abakanowicz University of Arts in the paper laboratory, created sheets directly from mulberry. Mulberry is amazing and – I repeat after the previous speaker – let us return to its cultivation. Thank you very much.

4. **DR HAB. ROBERT GRUSZECKI, DR MAGDALENA WALASEK-JANUSZ, INŻ. MAŁGORZATA KUŚMIERZ.**

DEPARTMENT OF VEGETABLE AND HERBAL MEDICINE, UNIVERSITY OF LIFE SCIENCES IN LUBLIN

"The use of white-headed cabbage in Polish folk medicine"

In Polish rural communities, mainly grain was eaten, later potatoes and peas appeared, and another element that should not be overlooked is cabbage. It is a vegetable, so it turns out that Polish rural communities ate large amounts of vegetables, mainly in the form of cabbage. The peas were dry, so it is rather difficult to determine it in this way.

On this subject, it was possible to gather some older information. Father Kluk writes: "no farmer who hides people can do without sour cabbage" So it was the basic way of eating. Wyżycki also reported that "cabbage is an important food resource for villagers, and soured cabbage gives the main mortar of the table".

Cabbage was eaten a lot. For example, we found out that one family collected more than 500 kg of cabbage a year and used it for consumption. It comes out more than a kilogram of cabbage per day. The family about which Witkoś writes had about 10 people, so for one person it was 100 g, but it is always 100 g of cabbage. Another source contains information that 2 to 5 barrels of several barks were pickled. Korzec held from 54 to 120 l depending on the region, so even if it was only 2 barrels of 150 l per family for ordinary survival, sauerkraut was the basis or at least an important element of nutrition. Whole leaves were fermented so as not to throw anything away. One of the basic things in the functioning of the farm was to provide the right amount of food.

Memoirs of peasants published in 1930–1936 have been preserved. At least in some of them you can come across mentions like: "at my house it was good, because everyone got as much bread as he wanted for the soup". The richness of food was evidenced by the fact that the slices were not secreted. There are also preserved paintings, e.g., one from 1888, on which – just in Warsaw – cabbages are also painted.

Interestingly, the oldest variety of cabbage, which today can still be bought in the seed store, appeared on the market in 1844 and is still in the market. This has been available for more than 170-180 years.

Apparently, Cato gives about 64 medicinal ways to use cabbage. However, we do not know exactly what cabbage he meant. The term for head cabbage – head, appears for the first time in Pliny the Elder. Apparently, there is no such information in earlier Egyptian writings.

As far as Poland is concerned, sauerkraut is also mentioned in the accounts of the court of Jadwiga and Jagiełło. The first medicinal confirmation of cabbage comes from 11 June 1592 and was found in Jan Bojanowski's letters to Krzysztof Radziwiłł. The mention refers to the gastric ailments of Queen Polish Anne of Austria after her marriage. If I'm not mistaken, wedding receptions lasted about a month, so after a month of feasting everyone can have gastric problems. The queen was treated m.in with sour cabbage and its vinegar.

As far as peasant culture is concerned, the earliest information we have comes from some of the first testaments. Wojciech Jewula's will from 1605 informs that there were already zagony. The will from 1562 contains a beautiful record: "I give this barrel of cabbage to my wife". A barrel of sauerkraut could therefore be an expression of marital love.

Sour, or sauerkraut, has been used for at least 400 years. We do not have older information, but it seems likely that it was known before. What raw materials were used? Fresh, pickled – these are raw materials that are used, practically speaking, equally. It is therefore an interesting medicinal plant that fermented products were very often used. Most often, herbal raw materials are used in dried form. In the case of cabbage, we found only one piece of information about dried leaves, the others said that either pickled or fermented leaves were needed. Does the description that we use cabbage leaves give us any information as to whether they were pickled or fresh? No, so we don't even know in what form the leaves were used.

For what ailments was cabbage recommended? There were many. Fresh leaves were used for burns, frostbite, bruises, swelling, various types of wounds, including purulent lesions, ulcers, varicose veins, skin diseases, canker sores, as a painkiller for

back, knee, heart, head pain, breast pain of nursing mothers – this is still used today: very often ladies or husbands go to the store and take a few leaves, they do not even take a head to relieve these ailments, further with rheumatic pains, fever.

We also have information that mothers applied leaves from fresh or sour cabbage. Sour cabbage leaves – that is, whole heads had to be soured. This is a measure that disappears. It is not possible to buy sauerkraut leaves, pickled heads, and less and less often such sauerkraut.

For a headache, fresh cabbage leaves are applied. Sometimes they also made hats from cabbage leaves, when it was hot, to protect themselves from sunstroke. Cabbage was used for heart pain – we have only one such information, when the knees hurt, compresses were made, at the shot also. Application descriptions are very often perfunctory. For ulcers, fresh leaves are baked or crushed. We adopted the term crushed, but they were crushed, churned and somehow used all the time. Leaves soaked in vinegar, brewed and even the juice itself were also used. When it comes to the use of raw cabbage juice, these are actually the last decades, because there are devices for this, the fashion for healthy eating. This remedy is developing. A decoction of dried cabbage leaves was used for female diseases.

Cabbage was also used to treat loss of speech, it was recommended when someone had a dull voice. Recommendations for ulcers were also preserved – fresh cabbage juice was used, and dosage was given: a glass in the first week, two in the second, three in the third, four in the fourth. Descriptions of exact application are quite rare.

Sauerkraut slices were used for many different things: boils, swelling, swelling, colic, constipation, headaches. We have a lot of these ailments. Also, whole pickled leaves, a remedy that is now often no longer available, was used for burns, pains, pain and dizziness. Scalded leaves, for example, were used for sore throat.

Sauerkraut was applied to the aching head – think about what it would look like now if we all applied sauerkraut to our beautiful hairstyles because of a headache. Sauerkraut wraps were recommended for colic, burns, frostbite, but for colds or sore throats, compresses were made of brewed sauerkraut. Sauerkraut was eaten to get rid of tapeworm, for hemorrhoids it was recommended to eat large amounts of sauerkraut straight from the barrel. We do not know if the cabbage was squeezed from the juice, but

as there is a recommendation to eat from the barrel, it is about the use of cabbage with juice.

Sauerkraut juice is also a raw material that has been used for many different ailments. This remedy was available all the time, when sauerkraut stood rather in warm rooms, i.e., in the room, then the barrel was taken to a room that was much cooler. It was recommended for swelling of the limbs, scabies, ulcers, toothache, gallstones, abdominal pain, fevers, even with dryness, measles or jaundice, for vermin or lice in the hair, so that the hair grew beautifully, so maybe this application of sauerkraut leaves also made the hair more beautiful, so it had a kind of double use. Juice was used for ejections and impetigo, scabies were washed off with salt water with sauerkraut juice, also juice was drunk on an empty stomach against anthelmintic – it was acid from sauerkraut, or as they say, acid from a log, because the log was used for sauerkraut, beer was kept in barrels.

The stem, or popularly deep, is a raw material that we have not come across in folk medicine anywhere outside the region we dealt with, i.e., Central and Eastern Europe. We may not have analyzed all the sources so thoroughly, but we don't think we're seeing it anywhere else. Fresh depths were used for thyroid ailments, soaking the legs in cooked ones, bathing in a decoction for dryness. Seeds were used to facilitate childbirth and at islets. Seedlings were also used, but it was not a young seedling, but one that was left in the seedbed. Plants competed with each other, so on a defensive basis they could also produce other compounds and thus they could be used for quite specific activities. That is our guess, but what did it look like? It's hard for us to say. Cabbage seedlings were used to stop the blood of obstetricians. When the legs froze, the depths were used, with rashes a decoction of cabbage seed was drunk. If there were problems with childbirth, another woman was given food with mashed cabbage seed. What were the results? It was known that a nursing mother should not eat cabbage, but the children ate it quite intensively. Eating cabbage causes different effects and sometimes, as in folk culture, it was expressed quite bluntly.

It was also in bouquets for Our Lady of Herbs. We did research on bouquets: in surveys, only 3% of people in the Lublin region indicated that they give a cabbage leaf to a bouquet, which is relatively not much. Analyzing this result, I wanted to mention Stanisław Witkoś, because he is a very interesting character, the information he gave is

also interesting. In sources, we most often meet with two, three, in review works – with eight, ten uses of cabbage. Stanisław Witkoś, on the other hand, who did his research on whether he collected information in Bajdy and Moderówka, found nine applications. However, he came from here and collected information for many, many years. It gives uses for burns, headache, heart pain, colic, pinworms, roundworms, fever, dryness and breast pain of nursing mothers. So, we have multiple uses of cabbage in two or three neighboring villages. Another thing that follows from the work of Witkoś, and for me it is surprising, is what sauerkraut is; "When starting to pickle cabbage, it was peeled only from spoiled leaves. The peeled was added to a hot baker's oven to wash, that is, softened, and then after washing it was given to a barrel, laid out thoroughly and poured with warm water. The barrel was covered with oaks (staves), on which a stone and a weight were applied".

The form of pickling is very similar as in the case of cucumbers, and yet when we sauerkraut, we pickle it only in its own juice. However, here is given information that it was flooded with warm water. And where is the salt? And this is surprising to me. Sauerkraut as we know it is made on the principle of whipping and juice. When we think about the medical raw material, in the regional use from Bajdy and Moderówka sauerkraut was completely different, it was cut only before direct use. Therefore, if we do not have an exact description, and it seems to us that we know the raw material, it may suddenly turn out that we know something completely different, because fermentation can be completely different.

Cabbage heads were chopped with a meat cleaver only when they were taken into use. Witkoś writes that sauerkraut was also pickled earlier, before the war, but it became common only later. So, what about the data from the nineteenth century? We do not know how it was pickled, so we do not know whether what we mean by sauerkraut was used at that time, and we are talking about a simple, basic plant that we all know.

A cabbage chopping knife was also attributed medicinal and apotropaic properties. It was the largest knife in the house, and it was used to treat bumps on the neck, the back of the knife. So even a cabbage knife, which is a thing that was in contact with the plant, could also have some healing properties, which was a bit of a surprise for me.

Therefore, cabbage was used not only as a food, but also as a medicinal plant for many ailments. Fresh and fermented leaves were used. We found about 227 such information, including 117 about sauerkraut. Sauerkraut is therefore not one of the raw materials, but the basic one. It is one of the few fermented products that we use in Polish folk medicine. Commonly used in folk medicine were fresh and fermented leaves, sauerkraut juice was also used, which was also an important component of folk medicine.

Thank you for your attention.

5. **MGR SYLWIA KOCZKODAJ,**

WARSAW UNIVERSITY OF LIFE SCIENCES, DEPARTMENT OF VEGETABLE AND MEDICINAL PLANTS

"Urtica dioica - nettle ordinary, but varied and variable"

I will briefly present the problem of nettle, which each of us probably knows well, but it turns out that it is not so ordinary, because it is also a very diverse and changeable plant. Probably each of us met her in his life. Maybe some people don't have pleasant memories. It comes from the *urticaceae family.* It is a naturalized plant and occurs practically all over the world, outside the tropics, outside Antarctica and outside the mountains – above 1800 m we will not find it anymore. It prefers damp, shady places. It likes wet forests or thickets the most, but it likes to occur in the vicinity of houses, where man interferes with nature, so it can be said that it is a tropical and tubular plant. In addition, it is very often used as an edible plant, which I will talk about later. Stinging nettle is a species *sensu lato*, that is, it is a species treated as collective, because there are many subspecies, but we treat them as one.

Here is a small digression, speaking of the genus, which is the genus *urtica*, because there are many plants here, including nettle sailor, which we can associate with more jagged leaves. Very interesting is *ongaonga* – nettle, which occurs mainly in New Zealand and contact with it is very dangerous. There are reports that a burn with it can result in permanent mutilation, such as blindness, or even death of people or animals. In addition, you can still talk about bad nettle, ball nettle or hempleaf.

Nettle is known to people for a very long time, as evidenced by the occurrence of this plant in many myths and legends on virtually every continent. For example, in Africa, the nettle is associated with the legend of the god Anansi, who had to find a large and stinging nettle leaf to get the hand of the king's daughter. In Asia, we have the yogi Milarepa, who lived only on cooked nettle growing on the slopes of the mountain where he meditated, and for this reason is very often depicted as a man with green skin, due to the high content of chlorophyll in this plant.

In Roman mythology, powdered nettle mixed with honey and wine was used by the goddess Venus as an aphrodisiac. Nettle very often appears in Norse mythology, because Odin himself used it as a protection against flying evil. People burned nettle to protect against Tor lightning, and Loki again used the plant to weave his magic fishing net.

Stinging nettle very often appears in Slavic culture. It is treated as a magical plant. It was used to incense homes to protect against lightning and evil powers. It was also hanged very often during Kupala night, or the so-called Midsummer Night in windows or doors, or even placed in front of windows and doors, because it was to protect the household against the intrusion of evil powers, the intrusion of witches. In addition, burning nettle was to be used to enchant the weather. Nettle was placed next to plants, next to vegetables, mainly to ensure harvest, nettle leaf was put in shoes attached to wanderers to protect against fatigue, and, as in Norse mythology, fishing nets were woven from it.

Nettle has a lot of traditional uses. For example, according to Father Klimuszko, herbal mixtures were prepared to cure people from lung diseases, bronchial diseases, colds, rheumatism – in this case, compresses or whipping with fresh twigs were recommended, but fresh juice was also supposed to treat swelling or wounds. There were many of these applications, e.g., in the newspaper of 1772, the ways of using nettle in medicine were described on two pages.

Currently, nettle is also used in many industries, for example in the food industry. It is an edible plant. In fact, it was edible from ancient times and returned to favor most often during famines, e.g., during wars. Now it is considered a so-called *superfood*, i.e., a plant that is very rich, for example, in protein, mineral salts, vitamins. There are more and more recipes using nettle, e.g., soups, salads. Recently I had the pleasure of trying nettle lemonade, which was very good. I encourage you to try this plant also in our kitchen.

In addition, nettle is used as a fodder plant. In the growing state, due to its stinging properties, it is eaten by goats, pigs and chickens, but after cutting and wilting it is also very willingly eaten by cattle or horses.

Another application is the use of nettle as a safflower plant, because due to the high content of chlorophyll it is used in the food industry to color food. It is designated as

a dye E 140, but after detaching the phytol and replacing magnesium with copper, chlorophyllin is obtained. It is also a very often used dye, which is much more stable than chlorophyll and less sensitive to light and pH changes.

Another application is cosmetic. I think that each of us has once met, for example, with nettle shampoos or other cosmetics.

Nettle is also very eagerly used in organic farming. Very famous and popular is the natural fertilizer from nettle. Pour water over the nettle, close preferably in an airtight container and leave for a few weeks. Such fertilizer before use should be diluted, because it will be too condensed, but farmers who have organic crops appreciate it very much. In addition, decoctions from this plant can be used in the protection against pests such as aphids or spider mites, and in the protection against diseases caused by fungi, such as alternariosis, gray mold, anthracnoses or fusariosis.

Nettle is also a fibrous plant. Nettle fibers were once very often used, but later they were replaced by cotton and linen. When sea transport was limited, i.e., again, for example, during war periods, nettle returned to favor and, for example, in Berlin during World War I, there was a society that kept nettle clones with increased fiber content. At that time, a lot of clothing was produced, just using nettle fiber. In addition, this fiber was often used to weave fishing nets, as in Norse mythology or in Slavic culture, because it does not rot as quickly and does not decompose in water.

The most important use of nettle is in the phytopharmaceutical industry. Currently, pharmacopoeial raw materials are nettle leaf*, or urticae folium,* and nettle root, or urticae radix.

Nettle leaves are standardized for the content of phenolic acids such as chlorogenic and coffee-malic acid. Their sum should be at least 0.3%. Nettle roots are not standardized for the content of biologically active ingredients, but they are very rich in sterols and for this reason they are used in the production of drugs to treat, for example, benign prostatic hyperplasia. In addition, we can obtain seeds from nettle, which are a very good source of essential fatty acids, as well as fiber.

Currently, nettle is obtained mainly from the natural state, which poses many problems. The demand for this plant is constantly increasing, there is a growing need for standardized raw material for pharmaceutical companies, but due to the fact that it is

collected by pickers from different places, and nettle is very genetically variable, this raw material varies significantly. In addition, factors such as the date of harvest, i.e. the development phase of the plant, different harvesting techniques, different types of raw material, because either the herb or the leaf itself can be harvested, are influenced here. Different methods of drying and storage by pickers also affect how the raw material looks: its color, smell, the presence of pesticide residues. If the collector chooses the place of harvest suboptimally, pesticide residues, the presence of heavy metals or mold in such raw material, usually occurring as a result of improper drying or storage, they already delete such raw material. We cannot use it. When we obtain raw material from the natural state, the content of biologically active compounds varies significantly and we get, for example, a batch of raw material that meets the requirements and the sum of phenolic acids will be appropriate, but the next batch may no longer meet them, and this causes many problems for such companies.

Another thing that contributes to the high variability of nettle is its gender. Until a few years ago, nettle was described as a dioecious, dioecious plant, i.e., female and male individuals were described. In recent years, my observations and those of other scientists confirm that there is also a form of collarbone, and not one, but a lot of clavicle forms, because there are individuals that have both male and female flowers on their inflorescences, there are individuals that have female flowers on the main shoot, but after cutting on these side shoots there will already be male flowers. There are individuals that have female flowers in the upper part of the shoot, and male flowers in the lower part or vice versa. It also happens that nettle during the growing season can change sex and at the beginning we will observe female flowers, then male, or change this sex from the growing season to the growing season, which I also had the opportunity to find out unpleasantly. If you assume experiments on the female form, and the next year we have a male form and there are no seeds, this experience may fail.

I wanted to show some results of my own research on the chemical variability of nettle. I analyzed the male and female monoecious forms in terms of the mass of the herb that can be obtained, but also the content of the sum of phenolic acids and chlorophylls. When we look at the averages of these forms, it turns out that the male, female or oboe form does not differentiate the raw material so much, but we can

distinguish clones that are, for example, more rich in phenolic acids or less. It is in this direction that I would like to go further with my questions, in order to select clones rich in a specific content of biologically active ingredients.

In my doctoral dissertation I deal with nettle. I plan to identify the factors that affect the yield and quality of nettle raw materials in the conditions of its cultivation, to exclude the nettle harvesting factor from its natural state and all the problems I have talked about. I will study developmental and chemical variability both between and within populations, the dynamics of herb mass gain, the dynamics of accumulation of biologically active compounds in raw material organs, i.e., in leaves and roots, as well as the potential of nettle as a source of seeds or fiber.

Finally, a curiosity: nettle also occurs in fiction. You can find many poems about nettle, and I wanted to end that. Thank you for your attention.

6. **MGR KAVANA RAJ,**

WARSAW UNIVERSITY OF LIFE SCIENCES, DEPARTMENT OF VEGETABLE AND MEDICINAL PLANTS

"Diversity of wild and cultivated forms of valerian (*Valeriana officinalis L.*)"

I am going to present the diversity of wild-growing and cultivated forms of valerian. *Valeriana officinalis*, which is also known as common valerian, belongs to the family *Caprifoliaceae*. It is one of the important medicinal plants grown in the temperate zone. Previously it was cultivated from the wild, but now it is exclusively cultivated. The cultivated plants are biennial in the nature, and the wild-growing population is relatively perennial in nature.

The cultivated roots are bigger than the wild-growing plants. In valerian underground organs that are rhizome with roots are the raw material and based on the European Pharmacopoeia. The valerian roots are standardized on the content of valerianic acids which is not less than 0.17% and the essential oil of 4 mL/kg DW.

Poland is the biggest producer and the exporter of valerian in Europe. Coming to its uses, studying from the traditional uses, the Gallen mentioned about the valerian for the insomnia that is a sleeping disorder from the 2nd century. Hippocrates also described its uses and the properties of valerian. Previously, the valerian was used for the digestive problems, and it was used for the heart palpitations, that is, for the heartbeat, to decrease the speed of the heartbeat and it was used in the nervous problem. It was also used during the World War One and Two to treat the shell shock of the soldiers.

Coming to its modern uses, it is mainly used to induce sleep, to treat insomnia and to decrease anxiety, to treat the stress disorders and to treat nervous disorders and also it is used to treat the pain, muscle pain in rheumatism. Valerian is taken either as a tablet, capsule or oral solution or as a liquid.

There are other medical uses as well. Thus, in the USA, the Food and Drug Administration has included valerian as a dietary supplement, and it can be applied as a tropical application. Valerian lotion may be used to treat rashes and acne. Previously,

valerian blossoms were used in the herb bath for the soothing effect. And of course, cats adore valerian. It is used to attract the cats.

The landrace *Lubelski* in valerian. This landrace is almost exclusively cultivated in Poland. This is also widely used in Europe in valerian cultivation. This landrace *Lubelski was selected from the Polish farmers from the wild-growing plants of valerian in the region of southern, central and southeastern part of Poland. However, this is varied in the traits. These have diversified traits. These are different from the morphological and chemical traits.*

The initial investigations were carried out in the Department of Vegetable Medicine Plants in SGGW, and it was observed that there was a diverse difference in the number of leaves per plant and the colour of the plant, the size of the plant, and the shape of the plant.

The landrace *Lubelski* which was grown in the different geographical areas, mainly Płońsk, Włodawa, Lubelszczyzna and in SGGW, differs. It was analysed for the fresh mass of rhizome, a fresh mass of roots, the content of valerianic acids, content of essential oil and percentage share of isovaleric acid in the essential oil. Alsom there was a huge variation in the wild-grown population and the fresh mass of underground organs varied from 95.65 grams to 279.13 grams per plant and the content of valerianic acids varied from 0.009 to 0.081%. The essential oil content ranged from 0.982 to 0.16 per cent in the wild population. Taking into account these findings have a basis for conducting research into the factors affecting the raw material of valerian roots.

In my doctoral dissertation (the title of my doctoral dissertation is to study the effect of development and agriculture factors on the yield and quality of the valerian roots), the aim concerns to study to determine the morphological, developmental and chemical variability within the landrace *Lubelski* and to study the influence of term of plantation establishment on the development and the quality of the raw materials. The study will also examine the influence of post-harvest treatment on the level of biologically active substances present in valerian roots and the seeds setting in the mother plants. The storage of the seeds and the quality of the seeds will be analysed in my research. Thank you.

SESSION IV. HISTORY OF MEDICAL SCIENCES

1.**PROF. DR HAB. BOŻENA POPIOŁEK,**

PEDAGOGICAL UNIVERSITY OF CRACOW

"Herbal medicines in noble shopping regesters, prescriptions and medical guides in the eighteenth century"

Historians who conduct research on the development of medicine and pharmacy in the former Republic of Poland are still struggling with a shortage of sources that would fully and clearly determine the achievements of these fields. Therefore, it is worth paying attention to an interesting group of archival materials, which are: court bills, prescriptions, medical guides scattered most often in a huge number of economic sources. One cannot omit the pharmacy inventories confirming the achievements of Polish pharmacy, including monastic pharmacy, both in the field of drug production, their dissemination and the supply of pharmacognostic raw materials from distant areas of the world, and usually obtained during monastic missions. Although most religious congregations did not provide medical services, they willingly made their pharmacy collections available to those in need. Like most economic sources – various confirmations of expenses and transactions, these materials on the one hand discourage with their accounting monotony, and on the other hand reveal to the researcher an extraordinary world of cultural and mental changes within various social groups.

Pharmacy expenses, prescriptions or herbariums and guides, although often quite enigmatic and shocking for contemporaries, give an idea of both the level of court medicine, pharmacy, as well as cultural trends in the field of health care, which were adhered to by the old society. Unfortunately, these sources are often fragmentary, undated, unsigned, scattered in various collections, which we are not able to attribute to specific people. The information contained in them is usually quite general, e.g. "for a

pharmacy for a lady" or "for medicines for Petroneelka". But there are also those on the basis of which we can be tempted to draw more far-reaching conclusions.

The latter includes, for example, the book of household expenses of Róża Krasicka, castellan of Przemyśl. It does not bring particularly valuable information about purchased medicines, but only small information, e.g., "payment to the barber for medicines in the pharmacy". The same applies to the bill for medicines issued for an unknown Marshal Rostworowski and his court, in which ointments, drops, various powders, roots and potions of unknown composition were noted. Fever pills, vomiting and eye powders, typhus powders, sulfur, vitriol and gulard water or Spanish fly powder were also ordered. The origin of only some specifics can be described as plant-based: marjoram ointment, mallow ulepek, rhubarb ulepek, camphor, camphor spirit, castor oil or a wine stone considered to be a plant medicine – crème tartre, which appears in almost all bills related to drug expenses. We will also meet pansy herb, chamomile, cumin, shunt, bobowniczek, anodyne and chocolate. These medications are repeated many times in various calculations. These data only indirectly indicate the state of health of the people of the court of Marshal Rostworowski.

It is also worth paying attention to the herbariums printed in mass since the mid-seventeenth century. In one of the examples of a home guide, there was a note with a recipe for poplar ointment. Yesterday we said that we rarely have the opportunity to obtain information on how these drugs were made or produced.

Herbariums and pharmacopoeias were printed en masse from the mid-seventeenth century, they were a kind of guide for pharmacists and medics preparing medicines and prescribing prescriptions. These books – several hundred pages long, sometimes containing descriptions of disease symptoms and recommended treatments, had a significant impact on the dissemination of various specifics, diagnosis of disease entities and treatments used. Although phytotherapeutic knowledge of this period was still based on the works of ancient authors, it was supplemented with raw materials as a result of the opening of Europe to new continents and extensive trade with Asia, Africa or both Americas.

However, the Framakopee rarely appeared in the private collections of the nobility, because their use required specialist medical and pharmaceutical knowledge, in

contrast to the various manuscript and printed guides and home herbariums, which were willingly kept in noble and court libraries. Written in an accessible language, they contained easy-to-prepare recipes based on popular plants found in the country and served as first aid. Most of them did not even contain weight values and were based on indications such as "gobie leaves of herb handful, chamomile flower pinch". Often these guides were copied in the privacy of mansions from old books or memorized household practices. Therefore, mistakes and cultivated superstitions are repeated, harmful cures, for example, for captivation, for witchcraft and terrible spells. The lack of Latin names of medicines may indicate that the guides were addressed mainly to women who watched over home medicine cabinets. An example can be a first-aid kit of home medicines published in Lublin in 1754, in which several dozen recipes were given "for the preparation of medicines for people who are very necessary, which everyone can make". This small, 56-page guide was probably inspired by Samuel Beimler, a well-known *home medic in the Republic of Poland* , transferred to the Polish by Jan Jerzy Jelonek. In most of this type of work, various plant raw materials were recommended for the preparation of medicines: roots, seeds, flowers, fruits, resins, as well as specifics of animal or mineral origin. Among the recommended treatments we find in the medicine cabinet home remedies m.in. remedies for various diseases, plague air, shortness of breath, where as a remedy there is, for example, lubrication of the breast with bitter almond oil, boiled broad beans with garlic to relieve cough, or lebiodka in honey drunk cough. The guide mentions many native herbs that are also found in pharmacopoeias, namely chamomile, swallow herb for jaundice and bloodshot eyes, plantain lanceolate, yarrow, burdock for colic, rhizome of cinquefoil, chicken herb. There is also willow bark, rue for madness, angelica or tansy. There are also Asian spices, mainly nutmeg, ginger, cinnamon and anise. For the most part, these herbs were supposed to cure all ailments, for example, rue was supposed to be an invaluable remedy for plague. Herbal preparations following the accepted customs were given in the form of powders, pills, decoctions, juices, balms and ointments, and dried herbaceous was recommended to be worn suspended on the body, for example, the root of peonies and eagle for great illness, spells and all kinds of goos. Among the recommended plant specifics with undoubtedly healing effects, we find misleading recipes in the style: "get a young raven, burn in a new pot for powder and

drink a decoction of alcohol". I also found a very interesting recipe for a specificity that was supposed to treat kidney stones – for the very desperate and suffering.

Some of these plants were grown in home and court gardens and conservatories both as decorations and for consumption or just for medicinal purposes. These were mainly: laurel, aloe vera, balsamic tree, citrus fruits, lavender or rue, and others, such as sundew, angelica or perz, were obtained from wild crops. It is known, for example, that Elżbieta Sieniawska, née Lubomirska, castellan of Kraków, recommended to the administrators of her so-called Zakraków estates to periodically harvest sundew and deliver the herb to the court pharmacy. This plant abundantly grew in humid areas near Tenczynek. The Kraków castellan manor pharmacy also used violet flowers, elderberry with diuretic, diaphoretic and antipyretic effects, which drugs were used by both she and her husband.

In turn, in the castellan gardens in Wysock, Międzyrzecz and Wilanów, herbs were grown marjoram, laurel and other herbs known in Poland at that time. However, in the gardens of Teresa Wielopolska née Sułkowska in Pieskowa Skała, the existence of nine balsam gum trees was recorded, which was used as an expectorant and bactericide. In her library, there are seven medical books in her inventory. Unfortunately, no title is given. Pharmacy exponentials clearly indicate the use of various "professional" plant medicines in the court environment. They take the form of both raw materials intended for the preparation of dried herbs, oils, juices, fruits, powdered roots, as well as gums or resins.

The recipe found in one of the home books, in a para-diary, for cough syrup for children is actually not much different from modern ones, the so-called kogla-mogla with lemon given as first aid for sore throats.

On the other hand, in the regester of medicines from 1708 taken from the Lviv pharmacist Michał Złotorowicz, the following were listed: rhubarb, Calabrian manna, red rose juice, laudanum, which was used in Poland since 1676, in any case it was noted then, but also philosophical oil used, or *antimonium crudum* used as a medicine against diarrhea, as well as *mercurius dulcis*, i.e. mercury hypochloride. So, these are not only plant medicines, but also various types of chemical products. Among the court orders for herbal medicines, various essences appear most often, e.g., lavender, pepper, orange. All

kinds of distillates and alcoholic macerates enjoyed great popularity as medicinal agents and consumed in small amounts brought temporary relief. They supported digestion, accelerated blood circulation, raised pressure, relaxed and calmed. These specifics were also eagerly used in the kitchen, e.g., "confectioner for orange vodka". Vodka was widely used for all diseases. Jadwiga Rafałowiczówna, editor of "Gazeta Warszawskie", wrote at the beginning of the eighteenth century about a doctor from Gdańsk who "treats two white-headed eyes with some kind of vodka, setting them up, and brings all moisture to ignorance". Vodka was also a basic disinfectant and medicinal agent, for example for horse wounds and abrasions, hence in the excerpts there are fixed expenses for vodka for horses or beer for washing horses' hooves. An interesting bill was issued for Jan Klemens Branicki, castellan of Kraków, who purchased a set of various vodkas made on the basis of flowers and herbs. M.in. there was orange vodka, orange extract, red and white vanilla of Lorraine, the famous water, or vodka *de la Reine d'Hongrois*, *a la bergamothe*, jasmine, lavender, violet, chypre vodka, lemon balm or tuberose water. Lavender vodka also appears constantly in almost all expenses of this period.

Ignacy Potocki's bills are also interesting, where we meet expenses for lavender and orange vodka, but also roots of perz, licorice, almond oil, unspecified balsamic drops, syrups or soap spirit, as well as sugar semolina, senna, mint pastilles and others. e.g., cinnamon, cloves and saffron. Even children were treated with this specificity, giving it to infants for colic and sedation... Laudanum was noted, among others, in the list of expenses of Aniela Zamoyska from 1833. In her pharmacy there are also other specifics: almond oil, mint essence, lycopene, goat tallow considered a good remedy for persistent cough, amber as a resin or leeches.

Amber is often found in magnate orders, and the court medicine of that time knew many of its applications. It was used for incense apartments, in aromatherapy, in headaches, toothaches, urinary tract. It was attributed strengthening, balsamic and diuretic properties, and even sealed roofs with it. Amber was used to make pills, powders and amber oil. It is also worth noting that demonstration, as we have already said here many times, was one of the methods of preventing and treating disease, although already in the eighteenth century some were skeptical about these methods. At the court of Dorota Czartoryska, at the beginning of the nineteenth century, various herbs were

eagerly used to show the rooms, e.g. "for juniper for incense" or "for vinegar for incensing", but when Tekla Róża Flemingowa née Radziwiłł fainted at the Dresden court, being heavily pregnant, she wrote to her mother with amazement that she had been "incensed, having honored Your Majesty's ears, pigeon shit."

In the regester of the medicine of the Potocka voivodship from 1798, we can find plant juices, decoctions, i.e., vegetable decoctions of herbs. For example, decoction on the enemy was recommended to take every two hours after a cup. She was offered to eat plant juices, every day before breakfast and drink whey. Wojewodzina apparently constantly suffered from stomach problems, as these orders were repeated regularly every month. Chamomile, birch flower, cumin may have been added to prepared juices are also mentioned in the regest. Stomach ailments related to digestion were one of the most common in the society of that time, hence a large part of the purchased medicines was to bring relief after hearty, sweet and hard to digest meals. The Radziwiłłowskis' expenditure on medicines included, for example, the purchase of "laxation confection" for Princess Franciszka Urszula Radziwiłłowska née Wiśniowiecki, as well as for her husband. In one of the Radziłowski regesters there are over 140 different drugs.

Her husband used "purging agents, emetic water treatments and bloodsuckers". As a laxative, balsamic pills, English salt, rhubarb extract and wine yeast, i.e. the famous crème de tartre, were used in his case. Ignacy Potocki, on the other hand, was given purging powders. In the accounts of Dorota Czartoryska we will find funds for the enemy, but the composition was not given.

Among the recommended castellan of Krakow Izabela Branicka specifics we can find various plant medicines, linden flower, lilac, chamomile, valerian root, valerian, but also yarrow. Apparently, the castellan suffered not only from digestive or respiratory ailments, but also had dental problems, because among the drugs recommended to her there are numerous astringents and accelerating wound healing, such as vitriol elixir, a mixture of concentrated sulfuric acid with alcohol, used at that time as a medicine for scurvy.

Various ointments, balms usually of a warming and pain-relieving nature, for example, cinnamon, saffron, nutmeg, various pills were also very popular at that time. An interesting example of medical and pharmaceutical sources are the post-mortem

inventories of pharmacists and medics. An interesting example is the posthumous inventory of the Krakow pharmacist Józef Gruber. It is worth noting medicines from North and South America, primarily various types of gums and resins, tragacanta, Peruvian balsam. There was also gum-resin, asafoetida used as a drug against jaundice, cardamom administered for potency, senna leaves, but also laxatives such as jujube vulgaris, bitter orange fruit and of course camphor in various forms, as an oil or camphor spirit. There are also jalapa freak, mandrake, rhubarb, ginger rhizome, cinnamon, turmeric, but also the Alexandrian mummy, which was used to treat injuries and burns.

Another preserved pharmacy regester is the regester of the Trojanów pharmacy from 1810 and apart from the characteristic medicines used in this period, there are also medical tools, bandages and even canvas caps for the dirty. In the case of the pharmacy from Trojanów, it is worth paying attention to such plant medicines as the root of the scream, i.e., the famous belladonna, aloe vera, dried elderberry flowers, opium, and even hemlock, i.e. venomous madness. The list also includes various types of oils, such as castor, tamarind paste, gentian root extract used in liver diseases, pine ears or roots for bathing.

There are many more such documents, but I will not quote them due to the scarcity of time. In general, they open up an extremely interesting world of court life, both from the medical and pharmaceutical side, as well as mental changes in the field of health care. Thank you very much.

2. **PROF. DR HAB. JOANNA PARTYKA,**

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"Is folk herbal medicine folk? On the margins of nineteenth- and twentieth-century debates around the roots of phytotherapy."

The title of my speech is clearly provocative. This is because it contains a logical fallacy. However, I decided to start with such a provocation.

Actually, for nearly three centuries, since the interest in folk culture began, its connections with the "national" culture, the issue of herbal medicine and folk or national medicine in general has bothered researchers and from time to time has often been the subject of fierce discussions. The question about the direction of the flow of information related to the treatment with the most accessible means, i.e., herbs, has therefore been posed by researchers for centuries, and the answer to it is paradoxically simple and complicated, as it often happens, depending on the point of view.

It is worth devoting some space to "influential" considerations, i.e., those consisting in inventing mutual dependencies, connections, connections. It is a term coined by literary scholars and, of course, has ironic connotations. Such considerations can be deceptive, especially when one-way solutions are sought in order to find the desired form of response, and this is simply the unidirectionality of the flow. In broadly understood cultural considerations, but not only, it seems senseless. Also, the question I posed in the title, it is.

The lack of need to look for similar flows was made clear to me when I was doing field research in Podlasie a long time ago. Then one elderly woman from a village called Różanystok told m.in about a sand cocanic. *Helichrysum arenarium* interested me. I listened, and then began to wonder if immortelle, which is supposed to treat the bile ducts, really has such values? This initiated my herbal medicine library, which included not guides, but serious books – textbooks. Fascinated by this immortelle, I searched all the textbooks I could find. It turned out that immortelle actually has such properties and is found in many preparations for the treatment of bile ducts in the most generally

understood. I began to wonder if in folk herbal medicine the awareness of the properties of this plant did not come from the fact that immortelle is yellow? Isn't that some kind of sympathetic magic?

Then I realized that it does not make sense, that an ethnographer should not ask himself such a question, because he loses sight of what the essence of folk culture is and what we were talking about. This was told to me by Zofia Sokolewicz from our department of ethnography in Warsaw. Now let me quote the sentence of Professor Zbigniew Libera, who is present here, from a text devoted to magical ways of obtaining plants: "mythology transcends the real properties of plants, sometimes ignores them, and sometimes uses them, building its ideological floors on them, but the strict delineation of the boundaries between what is practical and what is mythological exceeds the competence of an ethnologist. It seems that the assessment of the relationship between these spheres is also beyond the capabilities of representatives of natural sciences."

For similar reasons, literary scholars criticized the positivist methodology derived from evolutionism, which focused on in-depth inventing all influences between literary works. This often resulted in even ridiculous conclusions, and above all led to the squandering of what is the essence of belles-lettres. The discussion on what influenced what in literary studies was related to the definition of the concept of plagiarism and the scope of plagiarism. Among the plagiarists were mentioned, for example, Shakespeare or Aleksander Fredro. Of course, there is an obvious nonsense in all this, because we know that simply good fiction carries the so-called intertextuality – as we would call it now, and not plagiarism.

This ironic term "influencerology", which does not exist in any other language (it is not submitted), appeared in the Polish Wikipedia as a set of research practices derived from positivism in the field of literary science, and sometimes also other sciences of art, art history, musicology or historiography. On the other hand, in the *Dictionary of the Polish language* it is defined as follows: "recognizing that the factors determining the creation and form of some works are mainly the influences of other works and other artists". Thus, the question: "Is folk herbal medicine folk?" presupposes investigations of a historical, source nature and there is such an evolutionary desire to determine a one-way influence. Of course, I will not answer this question. For obvious reasons, it is badly placed, but it

opens the field for presenting the arguments that the parties used in the discussion and now I will focus on it. I will start with the remark that the idea of a self-sufficient noble manor house (here I return to the sixteenth and seventeenth centuries) and everyday contact with nature determined that these two cultures naturally interpenetrated each other. The landed gentry referred to many phenomena, affairs, just like the peasants. In the same way, for example, she spoke of witchcraft, witches, healers. Similarly, she feared the plague. Similarly, she treated numerous ailments, and I know about it, m.in from noble sylvs from the sixteenth, seventeenth and 1st half of the eighteenth century, where all this was repeated and did not differ much from what I collected in Podlasie, in the Bialystok region or in the south Polish in interviews with the inhabitants of the village.

So, these are such common elements of noble and rural culture. The material contained in the noble home silhouettes proves that these gusła and superstitions (as the enlightened called, among other things, all the healing procedures used in the countryside, and we often repeat it, although it was knowledge) are a common element of these two cultures. I know that the landowner had to treat not only his livestock, but also faced, or rather his wife faced, the need to treat himself and his family. However, we know that professional health care was used extremely rarely, precisely because of its difficult accessibility. However, the domestic methods of treatment of the nobility and the poor were very similar, and even identical.

One can conclude, according to Bohdan Baranowski, that what connected both cultures were pre-Christian remains. I quote: "elements of pagan culture had a chance to survive both among the lower strata and in the culture of the middle-landed gentry. From this we can probably derive the convergence of certain patterns, behaviors, customs and beliefs." However, the researcher continues this argument and notes that in the culture created by the magnates, we meet much less traces of the original tradition and explains this by the fact that the magnates were more cosmopolitan. It is known that the upper layers of the nobility were more open to patterns and old, and new, and this is not subject to discussion. But does this also apply to knowledge in the field of healing? Where did this knowledge come from?

In the sixteenth-century management guides, it was recommended to follow the example of litters in the field of land cultivation. For example, Anselm Gostomski writes

in 1588: "the hosts who govern themselves from wise litters are to play as a role". And how about herbal treatment? Once again, I will return to Baranowski: "under the influence of popular literature in the field of medicine or herbal medicine, extremely widespread among educated people, they got to the countryside by various routes and there all kinds of regulations, recommendations or even superstitions of Western European origin spread extremely quickly, which mixed with the applicable rules of traditional medicine and hygiene". Further, the researcher admits that "certain convergent forms of folk and noble culture could have flowed from the same common sources".

On the other hand, the ethnographer and sociologist Józef Burszta has no doubt that the influence came from below. He writes: "In this respect, the rural population certainly prevailed in knowledge. After all, it was an age-old knowledge and practice associated with direct knowledge of the plant world. From here it got from peasants to cities and manors and manors of the nobility." So, we have two different attitudes here. Let us also add that it also got into monasteries, especially Cistercian monasteries, later Benedictine monasteries. Because monastic medicine has indeed often used the treasury of folk knowledge. Probably mainly because the monks themselves often came from the lower strata and brought with them the habit of this kind of treatment. Hildegard of Bingen, educated in classical Greek medicine, also knew the specifics, which had folk roots to a large extent.

In the nineteenth century, Ryszard Berwiński questioned the independence and familiarity not only of ancient literature, but of the entire folk culture. This was part of these disputes and debates about the people. Berwiński decided that the people do not even have independent creativity of the spirit, and if they do, it is only to the extent *that mutatis mutandis* a child does. The power of his spirit, or rather imagination, is only reproductive. And such a judgment Berwiński – a poet, a romantic folklorist, presented in the second volume of the work, very often quoted, the flagship *Studies on gusłach, witchcraft and superstition and folk superstition* from 1862.

Over 20 years later, in 1886, Józef Rostafiński expressed his opinion in a completely different spirit in a paper delivered at a congress devoted to Kochanowski. The title of the paper was: *On the influence of landed gentry life on the literature of the sixteenth century*. The learned botanist argues that the representatives of the nobility living in the

countryside, overwhelmed by the melancholy of a peaceful and cheerful village – this is clearly a reference to Kochanowski – are not capable of a scientific look at the surrounding reality, and thus are closed to scientific knowledge, including medical knowledge. I quote: "For society, which is mostly settled in the countryside, cuts itself off from the ease of receiving external influences, from relations with the whole advancing world. A villager can be a poet, a rhetorician, a moralist, a reformer of morals, because for all this he finds enough material in his mind and in the immediate vicinity. For skillful and exact research, scientific collections, libraries and, above all, continuous relations with the cosmopolitan science of the universe are needed. All this cannot be found in the countryside, which is why in our country an educated society, which lives in a cheerful and peaceful countryside, gives us above all poets and writers who are exceptionally learned." It can therefore be concluded that the landed gentry took over the knowledge of medicinal plants from the people, and not vice versa. So, it would be an argument for influence from below.

Let us note, however, that in the manors and mansions of the nobility there were quite large libraries. Inventories of the sixteenth and seventeenth centuries have been preserved; libraries were equipped m.in with works in the field of management, textbooks, encyclopedias, but also hand-made extracts from various farm books, among which there were also herbariums of Syreniusz or Marcin from Urzędów. Halina Chodurska writes: "In the opinion of historians, women preparing simple medicines, *simplicia*, in noble manors were based on the same medical-herbal works used by professionals, i.e., graduates of domestic and foreign medical universities. Everyone at that time reached for the herbariums of Szymon Syreniusz and Marcin from Urzędów. The book of Haur and the writings of Chmielowski were used."

Jakub Kazimierz Haur in his landed gentry encyclopaedia entitled *Skład lub skarbiec znakomitych sekretów oekonomiej ziemiański* makes the noble reader aware of what should be done to maintain health. The book was published for the first time in Kraków in 1689, and in 1693 it was reprinted at the express request of Jan III Sobieski. It was very popular and popular, there are mentions of it in inventories and libraries. Please note how modern it is: "according to the possibility and according to one's time, not only to enjoy hunting, rides and passages to refresh and get stale (for it is certain that by these

agitations and *exercitia, appetite is good and sleep is carried out, and the* constitution of nature is well established), but also for the time of the library it is not necessary to forget and postpose, from which wit, memory and prudence are accustomed to sharpen and polish all politics." Haur gives precise instructions on how to organize such a library. He even made a beautiful drawing of what such a gentry office should look like – in the sense of a library with drawers – and clearly means what should be where. The necessity of having such a book collection is explained by the fact that it is better if necessary, and the needs could also be of a veterinary or medical nature, and we have evidence that it is in Haur's work itself that we seek advice or advice in our own books than to seek the help of a neighbor. Among these books were supposed to be – and he clearly mentions it – herbariums of various authors with economics in Polish. One can guess that it was especially about the two herbariums mentioned earlier.

The same herbariums are mentioned later, in 1830, by the often quoted Łukasz Gołębiowski: "having before him Syreniusz, Marcin of Urzędów or another herbarium, having overturned it more than once, knowing almost by heart, where it was not, because these huge books were expensive, and hence rare in the homes of the less wealthy nobility from recipes or from the application from the head of a more proficient housewife from spring until late autumn, It was on the alembic that she rushed water, vodka, fried fats, collected fats, made driaks, vinegars, dried flowers, leaves, fruits, roots".

Both positions, i.e., the conviction of influence coming from above and, on the other hand, the certainty that the people were the transmitter of herbal medicine, seem to be reconciled by Barbara Kuźnicka, who reminds that "in the circle of European culture since antiquity, the science of medicine and empirical, non-scientific knowledge have appeared simultaneously. Folk herbal medicine was based not only on traditional knowledge about the action and use of natural medicines in specific disease states. It also contained many customary attributes, such as beliefs, rites, and even superstitions."

The question arises, what is this traditional knowledge, what does it consist of? Did herbal medicine used by the people absorb in one way or another the official herbarium knowledge, or did this tradition develop in parallel, independently of each other on the principle of convergence, as is often the case, only we do not notice it, and this happened

in connection with a similar environment in which these poor women lived, on the one hand, and noble readers of Jakub Kazimierz Haur's books on the other?

Looking for material to describe these disputes around the existence, non-existence of influence and possible direction of this exchange of information, I noticed the lack of such problems in foreign literature. Actually, the only quote that I have found that could be used here and that I will conclude to make it a more cosmopolitan speech is a quote from the book *Folk Culture in Early Modern Europe* by Peter Burke: "In the face of the existence in early modern Europe of both great and small traditions – here I mean this higher and lower culture – it is quite natural, that these traditions, however different, influenced each other. The nature of these interactions has often been disputed. Swift – let me remind you that he is referring to the author of Gulliver's travels, who died in 1745 – wrote that beliefs, like customs, always descend from those of the highest social position to those of the average, and then to the commoners, where at some time they are abandoned and disappear. The discoverers of folk culture, such as Herder – let me remind you that this is a philosopher who popularized the concept of folk in Romantic philosophy – and the Brothers Grimm took the opposite view, believing that the people were the source of creativity." And now we go back to the beginning – some things will not be decided, and we have to accept it. You can determine some little things, make some small steps, but you don't really know what it was like. Thank you.

3. **DR HAB. IWONA ARABAS,**

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"Sources of knowledge of pharmacy ladies: Slavic or Mediterranean traditions?"

The previous two papers used quotes that I also wanted to use, so I will replace them with my commentary. This coincidence proves that although we are from completely different research environments, we have something in common, so maybe one day we will still commit something in common.

The title of my paper contains exactly the same question posed by Professor Joanna Partyka in her speech. Pharmacy maidens were culturally associated with a slightly lower level, because the great aristocratic courts could afford an apothecary, their own doctor. There were completely different experiences with the drug, which was hardly available in the villages, in Polish manors scattered over a huge area. Getting help to the doctor was practically unrealistic. Besides, even if the owner of the court decided to call a doctor to people from the village, they did not want it, because they asked for such help, when there was actually no rescue, so the doctor's arrival was associated with a death sentence. So, there were many problems that the court itself tried to resolve. Besides, even if a doctor came to the manor, he rarely had medication with him. Hence, first aid kits were created, which were at some point accepted by pharmaceutical legislation.

In my opinion, this is a very interesting proof that practice, need, led to the fact that medicines that were available only in pharmacies, also went to court first-aid kits, run by pharmacy maids. This need must have been very strong, since already in 1844 it was decided to introduce into the Act for pharmacists and pharmacies a chapter on home medicine cabinets and hand supplies.

Many years have passed. In 1920, a similar law was passed: *Temporary Instruction for County Physicians*. It contained a list of medicinal products that could be kept in home pharmacies. I analyzed these lists, they differed little from each other and did not contain any outstanding and powerful drugs, but they contained the most obvious means – for pain, cough, disinfectant. Therefore, when the doctor arrived, already in the nineteenth

century he was sure that the court would offer him these basic means and he did not have to take them with him.

First aid kits were an old monument, they were common, and their babysitters were called first-aid kits. The custom that in every Polish manor house there was a home first-aid kit was obvious. It often resembled a pantry. There were the most valuable things, especially since at some point it was difficult to distinguish what would be a medicinal raw material and what would only be useful in the kitchen. Both were used. It was interchangeable.

Tinctures were often used. They were common, including aromatic waters. Waters, aromatic vodkas were not alcohols. These were distillates, but based on flower petals – e.g., rose water. However, alcohol was used and in case of some gastric problems such tincture certainly helped. I will quote after Krasicki: "At noon I wake up, my head is as heavy as lead, I choke and get bored; Her majesty advises tea, but it is a nauseating liquor. Somehow, I passed by the first aid kit unintentionally, Hanyżek recommended me, a little will not hurt. So, I've had a little drink, but I can handle it." I think that such a role of the court first-aid kit was most often used and most appreciated.

Documentation of the activities of the pharmacy maidens and what they used is material that can be found in memoirs, in diaries, in letters, in sylves as well, and in witness accounts.

I was very interested in the memories of Wirydianna Fiszerowa from the eighteenth century. She was associated with the estate of Rogalin, also Winnogóra in Wielkopolska, and described what she remembers from her childhood. Her fondest memories were connected with sitting in a forbidden place, that is, in a first aid kit, which she called a pantry, a hiding room in principle. If the nurse of the first aid kit was in a good mood, she secretly gave the little girl treats. There is a passage about what the mansion looked like. Wirydianna's grandmother's house resembled all the other houses built in the area at that time. No attention was paid to adjusting the layout of the house to the needs of residents. There were first aid kits everywhere and there was similar discomfort everywhere. For lack of comparison with something better, no attention was paid to her. In the middle of a large room stood something like a cage built of planks and locked with a key. It contained all the treasures of the so-called first aid kit, which in Poland was used

to describe the destination for the composition of spices of various preserves and vodkas, as well as medicines that the ladies of the house prepared and distributed to the sick. This valuable composition was the subject of their constant concern. They kept the key themselves or gave the key to a trusted person.

Not everyone could have access there, because they kept too valuable things there to be available to everyone. On the other hand, from Karolina Nakwaska's text we learn that she greatly promoted the help that pharmacy maidens could provide, explaining that you do not have to be Hippocrates or Galen to use useful advice. Writing about the device of the manor first-aid kit or hiding room, she emphasized the Polish specificity of the farm, explaining that this first aid kit must be stocked differently than, for example, French first-aid kits. I wondered for a long time what Nakwaska meant, and I think that she compared these first aid kits with first aid kits about which Professor Bożena Popiołek spoke. She saw these beautiful and well-equipped first-aid kits in aristocratic mansions, which were completely different. Hence the fact that in France there are different than they must be in Poland.

In this storage room you will make various delicacies that do not require kitchen fire – this was a general recommendation. What required fire was done in the kitchen. Everything else could be done in the medicine cabinet. You could bring something hot from the kitchen, but you absolutely must not use fire. Nakwaska even thought that it was a very pleasant and useful experience, and you could feel like you were in a chemist's laboratory. And these are already words that are so old.

A similar image of the family manor with a first aid kit was presented by Julian Ursyn Niemcewicz. He recalled "a first aid kit full of vodkas, cordials, crushed stones, gingerbread, ayran, jam driven and fried by my mother and Miss Hajęcka". Everything is correct: the mother supervised, she also had her own knowledge, there was also a first aid kit who carried out orders.

Further memories come from the nineteenth century: "I rush to the medicine cabinet for tincture on herbs of flight, which has an outstanding calming effect." I was rushing when I got nervous.

From the same area as the previous diary comes a letter that I found here, in the Staszic Palace, in the archives of the Polish Academy of Sciences. This is a very interesting

letter from Barbara Czerwijowska to Bańkowski. The author mentions that in the village there was a well-known pharmacy lady Stefa, who came from the nobility and learned from her mother to cure various common diseases and dress wounds. Women and children from the nearest villages learned to come to Stefa, who treated them with herbs and the simplest means of medical help, and in more serious cases referred them to doctors. How many rural children she saved in this way, how many wounded she saved from amputation cannot be calculated. She always had the power of patients, she gave not only medicines, but also advice and help in life problems. People trusted her.

These medical measures testify to the use of the stock of first-aid kits, which were statutorily prepared by pharmacies and in large quantities handed over to home first-aid kits.

For me, the most interesting is the diary of Celina Treterówna from Błonia. In Lviv I found one notebook of her diary, when I was looking in the Library of Stefanyk University, later I did not find this diary. But this herbarium has been preserved thanks to the materials brought by Professor M. Kowalczyk. Celine's work is truly magnificent. She was young, she prepared a herbarium, very beautiful – with the plants she collected in Błonia. The thing worth investigating and identifying well is what she came up with. Of course, like all healing women, she reached for the most popular herbariums from the Renaissance tradition. She was a very interesting person, because she believed that treatment was her life calling. As a sixteen-year-old maiden, she experienced great disappointment, because a bachelor at the ball did not pay attention to her at all. Then she decided to devote her whole life to treatment, because she saw no other prospect in front of her, but to become a pharmacy maiden. She wrote in her diary: "in May we will have a great job, we will gather and sow a lot of herbs, but there is still great restlessness for us, how it will come to us to go after the sick. We decided to gain the trust of our princess, so that he would not only not disturb us, but also help us in visiting those needed. How it will be, I really do not know, but this is only the first step, which costs. Later it may seem to me nothing. Our intentions are the most sincere, lest we be discouraged by adversity, and having won the confidence of our good peasants, we may better pour a little thought into them, and soothe their irritated and violent passions."

Celina was really very ambitious. She left a set of medications that can be extracted from her memories. I won't go into what, but her medication was ridiculous including the wick of a candle and the ink. Most importantly, however, there were remedies for pain, for dropsy, for fever, for headache, for cuts, for scabs, for cough. This proves precisely the symptomatic effect. She did not cure colds, she did not cure tuberculosis, she gave for cough, for fever, for impetigo, for scabs, teeth, colic from lifting. These were the most common needs.

The herbariums of Syreniusz and Marcin of Urzędów were the ones that the pharmacy maidens had most willingly in front of them, as evidenced by the memories of Agnieszka Rzędzianka, who as an old spinster, probably thirty years old, went to the court of the Glogers, and there, because she was a noblewoman, she was very afraid that they would assign her some unworthy function. She wanted to be useful, so she demanded that she be allowed to be a medicine cabinet maiden as the only non-dishonorable function. Indeed, she was studying – at one point it was found that she had really impressive knowledge. Her medicine cabinet, located in three not very spacious chambers, contained whole batteries of sweet liquors, as well as all the medicinal boozes helpful for illness: alembic, alkiermes, cumin, walnut. The neighbors knew about the harvest of herbs that they are the richest in the whole Podlasie. She also invented infusions and decoctions herself. In recognition of her merits, she was given the coat of arms of Marcin from Urzędów. What was the comment? Miss Agnes threw herself on this herbarium like, with honest ears, a magpie for gold.

Was it this torch of education from the court that came to the people and there they learned these medicinal plants, or did the pharmacy maidens also use folk knowledge? And yes, and yes. Burszta wrote that these two cultures met in the chamber of servants. After all, the pharmacy maidens were exchanged, because they very often used the knowledge of women collecting herbs and bought from them.

One more remark: the village wanted to imitate the manor; it is obvious. I have information from Podlasie, from doctor M. Angielczyk, that in his area the most typical decoration of barrels for baptism and for the bride were asparagus branches. I think that they must have been imported from some greenhouse at the beginning, because it was an identified African asparagus.

Berwinski was a well-known opponent of tradition. He believed that everything had flowed to the people. His works were quoted by Kolberg: "our people believe," said Berwiński, "according to reports, that the bark of lilac used as medicine is twofold and the opposite has effects appropriate to how it was scraped from top to bottom or from bottom to top. He found the same among the people and Zieleniewski. Where did the people come to this? Here Siennik writes in his herbarium, the middle lilac bark, when it is starched down, derives water in moisture, and up the scraping is derived by returning, later he repeated the same and Sirenius adds: if anyone wants to pull the disease with vomiting and stool, then this bark and down and upwards should be scraped, adding that this prescription was taken out of Pliny".

Here I would also like to refer to Professor Libera, because there is no answer to the question that we are constantly asking ourselves. So maybe you don't have to ask it so strictly and want to answer it. I really liked the opinion of Professor Jan Kazimierz Muszyński. He claimed that many disorders and ailments were the result of improper diet, rheumatism, kidney disease, neuroses, skin diseases, are a consequence of vitamin and mineral deficiency in everyday food. Pharmacy girls in their simple ways tried to act on the symptoms and supplement primarily deficiencies that occurred in the body due to improper diet. Of great psychological importance was also the belief in their knowledge and effectiveness of home medicines, and the nursery girls very often carried chicken soup to the sick. Thank you very much.

4. **DR HAB. PIOTR DASZKIEWICZ,**

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"Medicinal plants of the Republic of Poland in the works of J.-E Giliberta"

I have been interested in J. E. Gilibert for over 30 years. In 1995 I published a book about it, and later I returned to it many times. I also translated into Polish his texts about Lithuanian forests, mineralogical, bison, zoological ones. The character is relatively well known, but there is still something to discover, to find. Briefly recalling his biography, Gilibert was born in 1741 and completed his studies in Montpellier. Here it is important to emphasize that, firstly, it was a really excellent center, secondly, it was a period of adopting Linnaeus' taxonomy in Europe. Well, in France it was very difficult to accept, because the Parisian center was against Linnaeus and even fought against him. Buffon treated him as a personal enemy. Linnaeus' taxonomy came to France thanks to the University of Montpellier, moreover, Linnaeus himself used to go there, he was a friend of Boissier de Sauvages.

It was in Montpellier that Gilibert befriended Antoine Gouan, whom he met there and who was both a botanist and a zoologist, the author of the physiology of Mediterranean fish. The meeting was decisive because later, when he was looking for a job – throughout his life Gilibert was in debt, he always put money, for example, to set up a botanical garden, but the administration never returned him, which eventually led him to personal bankruptcy, so he desperately looked for a job, a well-paid job, which coincided in the Republic of Poland with the period of reform of scientific institutions, It was the envoys of Tyzenhauz and Stanisław August Poniatowski who turned to Gouan and Albert von Haller in Switzerland with a request to find a naturalist who could establish a botanical garden, a school of midwives, veterinary and teach natural history – thanks to the recommendation of two naturalists, Gilibert received the job.

He prepared himself very carefully for his arrival in the Commonwealth. He went first to Montpellier, picked plants in the Cévennes, and came to Paris, where Jussieu

worked together on a Paris diary. Then he was in Geneva, Vienna – he stopped everywhere, got seeds, marked plants. In addition, he was well aware that his work would be very difficult, since there was no study on the Lithuanian flora. The only possibility he saw was to use an analogy to the Prussian flora. So first he studied the Prussian flora.

It should also be noted that in the period before leaving for the Commonwealth he practiced in Chazay-d'Azergues, near Lyon. Subsequently, he designed a botanical garden in Lyon and published the book *L'anarchie médicinale ou la médecine considérée comme nuisible à la santé*, or *Medicine perceived as harmful to health*. This publication brought him considerable publicity in Europe and some fame.

He spent eight years in the Polish-Lithuanian Commonwealth: 1775–1783. His merits are really enormous both for science and for the Republic of Poland. He established a medical and veterinary school in Grodno and the first cabinet of natural history, botanical gardens first in Horodnitsa, then in Vilnius. He was a professor of botany, pharmacy and natural history in Vilnius and left behind numerous scientific works in the fields of botany, zoology, medicine and mineralogy. We can also add to these political analyses of the political system of the Republic of Poland. He left suddenly in 1783, it is not entirely clear why. On the one hand, he himself gave various versions, m.in that he had health problems – he was already very tired of the Lithuanian climate, those long winters. On the other hand, there are some of his mysterious personal enemies surrounded by the king, who wanted to harm him.

He never talks about two facts. First of all, that also in the Republic of Poland he was already incredibly indebted and maybe it was just an escape from creditors. And the second thing is the family history: his wife had a lover, a Frenchman by the way, who tried to poison Giliberto. Then there was a court hearing in Vilnius, which is very well developed. The king even minted a special medal in honor of the student who saved Giliberto by knocking out his chalice with poison.

There are 18 Giliberta publications about the Republic of Poland, that's how many I counted. In addition to published works, of course, as for any botanist, the herbarium is very important. When Gilibert returned to France, he asked the king to send him a herbarium, as well as a herbarium of Antoine Gouan, which he bought when he came to the Polish-Lithuanian Commonwealth, moreover, with the money of the Polish king, of

course, as well as Belleval's botanical and zoological copperplate engravings. The king sent them back to him.

A fairly large herbarium remained in Vilnius, which after the closure of the university after the November Uprising was transported to Kiev, where it is still located. It was developed by Paczewski and m.in Professor P. Kohler and Ukrainian researchers. Let's hope that he survives despite the war. In France, on the other hand, it was believed for a long time that nothing had survived from Giliberta's legacy. As we know, he returned to Lyon, later he was politically active, he was even mayor, he had to go into hiding. Lyon was besieged by the convent troops – there were mainly Girondists – shelled, burned. It was believed that nothing remained of Belleval's plates, certainly of this Lyon version, or of the herbarium. Meanwhile, two important discoveries have been made in recent years. First in Grenoble: it turned out that many Giliberta plants, thanks to exchange and friendly relations, found themselves in the herbarium of Dominique Villars, a botanist from the Alps. The second discovery was made in 2018: at the University of Claude Bernard, 26 large, bound volumes of plants were found, which were collected by Giliberto, then were and still are the property of the Catholic University of Lyon, which deposited them in the herbarium of the University. These plants got there thanks to the gift of Gilibert's son – Stanisław, in the nineteenth century. It is about 6000 specimens, so a lot. The botanists of Lyon have identified it as most likely a herbarium that was used to write *the Histoire des plantes d'Europe*.

As for publications, *Lithuanian Flora was published in Grodno*, we have mineralogical and zoological texts and a description of diseases occurring in the vicinity of Grodno. On the one hand, Gilibert said that he was a big fan of Linnaeus, they corresponded with each other, he appreciated him very much, but on the other hand, he did not fully use his system – he tried to improve it, change the names and in this Linnaeus system there is also information about plants from Lithuania, from the Grand Duchy of Lithuania. He also tried to make flowering calendars of various plants, about 500. He compared the flowering period in the vicinity of Grodno and Lyon. The program of his lectures from Vilnius has also been preserved.

Looking through Giliberto's botanical works, it is worth paying attention to the illustrations. In Montpellier, Gilibert found several hundred copper engraving plates in an

antiquarian, which he bought again with the money of the Polish king. Pierre Richer de Belleval lived 100 years earlier and was a great botanist from Montpellier, one of the directors of the garden there. Gilibert used this type of illustration to depict plants from Lithuania. An even funnier story, although this is not a botanical remark. In the journal "Indagatores naturae" founded by him, of which only one issue was published, he described the anatomy of the pond turtle m.in. For illustration, he used Belleval's drawing – a copperplate engraving depicting a hawksbill turtle, a completely different marine species. Such were the practices. The illustrations are very nice, traceable.

In accordance with the prevailing fashion of the time, Gilibert prepared a compilation of many works on mammals, in which he presented Linnaeus' classification system. It was there that there were numerous interesting texts, e.g., chapters about bison, Lithuanian bears, elks, beavers. The chapter on bison is very important because Gilibert was the first person to breed bison. The hunters of the Polish king caught two bison in Białowieża, which they led to Grodno. He fed them goat's milk – all miracles were with this feeding – and then watched. He was the first to note, for example, the food preferences of these animals, looking at which bison plants they chose from the stack. He tried to cross bison with domestic cattle, he failed. It was not known exactly why, but bison – even when they are sexually mature, need several years to reproduce. Gilibert, however, interpreted it in the spirit of the thirteenth century that it is the hatred of a free animal, which is a bison, to a slave, which is domestic cattle.

Returning to plants and medicinal plants, thanks to the enormous and important work of Aurika Rickiene from Vilnius on Gilibert's contribution to the knowledge of Lithuanian botany, it is known that he mentioned about 1200 species of plants from the Grand Duchy of Lithuania, 850 considered new. Today we know about most of them that these are synonyms, they were not new species. Such an accurate determination is very difficult, because the information is scattered in various works, for example, in the publication about the plants of the Alps there is a note that such a plant also occurs in Grodno.

I undertook the task of checking the medicinal plants of the Republic of Poland. It is very difficult and a little beyond me. Why? Because, on the one hand, Giliberto's works are *strictly* botanical: systematics is given and a description of morphology, flowers, stems

and roots is given. He states, for example, that these are medicinal plants and the most useful, but there is no information about the species itself.

The second thing: very often Gilibert writes that a given plant is, for example, used in the Alps as a medicine, and then adds one sentence: "I also saw it in Grodno." Can it be considered a medicinal plant of the Republic of Poland in such a case? I do not know.

His remarks about wormwood are typical. This plant, very common in Lithuania, is very rare in the Lyon area, so Gilibert thinks that it is a foreign plant there. Therefore, a total of 1200 species of these plants from the Grand Duchy of Lithuania were included in the research. I managed to identify those that I would definitely consider to be medicinal from the Republic of Poland – 43 species. It should also be emphasized that the species he writes are medicinal are most often the same ones he knew in France: yarrow, common shanty, eagle, wormwood. So, you have to be very careful in the treatment of this material. Thank you for your attention.

5. **PROF. DR HAB. MAŁGORZATA BINIECKA,**

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"Essential oils in the history of medical science"

Our paper concerns essential oils in the history of medical science, but not only, because essential oils are of course used today mainly in the perfume and food industries. In any case, it is estimated that there are about 20,000 oil-bearing plants on the globe, including three hundred essential oils produced on an industrial scale, but only a few dozen is of greater importance in the pharmaceutical, medical, food and mainly cosmetic industries. As for the importance of essential oils in the medical-pharmaceutical industry, it can be said that essential oils have always been used in aromatherapy, although today it is slightly less. The science of the balance between the mental, urological, endocrine and immune systems is considered, where the principle of essential oils in aromatherapy is relevant.

Essential oils are obtained differently, depending on the part of the plant from which they are obtained, i.e., its physico-chemical characteristics, i.e., chemical composition, harvest period, etc. Of course, ways to obtain essential oils have been known since antiquity. The oldest methods are cold pressing or *enfleurage*, distillation and distillation by water or steam. Later, extraction with volatile solvents was introduced, followed by extraction with supercritical fluid.

By pressing – cold pressing, for example, an essential oil is obtained from the pericarp of bitter orange. Through *enfleurage*, that is, the cold absorption of essential oils in fats, to this day an essential oil is obtained from tuberose, mainly in India, and from rose in Bulgaria and France. This absorption has been known since ancient times. However, since it is very expensive and laborious, only oils from some flowers alone are obtained in this way. The next stages in the *enfleurage method* are: *pommade* – fat with oil is obtained and this form was already in use in Egypt and ancient Rome, *concrete* – extraction of oil with alcohol, and finally *absolute* – vaporization of alcohol.

Another of the mentioned methods of obtaining essential oils is distillation. The turning point in the evolution of this process was the discovery of alcoholic distillation, probably made by a doctor from Salerno around 1100. It was the first medical university. The first scientist to use the term alcoholic distillation was Arnold de Villanova in his De *conservanda juventute.* Fractional distillation was then described by Taddeo Alderotti, a doctor from Florence. Distillation was carried out by Catherine Sforza at the turn of the fifteenth and sixteenth centuries, and Catherine Medici was also interested in it. Leonardo da Vinci also wrote several works on this subject. The distillation of essential oils using steam became widespread in Europe only in the nineteenth century, although the first mention of this subject appeared in the descriptions of Arab scholars in the tenth century. The oldest distillation apparatus, an alembic from 3500 B.C., was found during excavations at Tepe Gawra in Mesopotamia. In the 50s of the twentieth century, it was described by Professor Ley. The evolution of distillation apparatus took thousands of years and was an important step in splitting the tube of the distillation apparatus and its external cooling.

Another method of obtaining essential oils is extraction with volatile solvents, known since 1880. Of course, these are solvents such as: petroleum ether, hexane, benzene, methyl chloride, etc.

The next extraction is extraction with supercritical fluid used at the moment quite often, because the quality yield of volatile oils obtained by this method is much higher than using steam distillation. This is due to the volatility of the components of the oil. Various oils are obtained by this method: rose, clove and cinnamon.

We chose only some oils produced in the Mediterranean area. A lot of them are produced there, m.in. all citrus oils are produced there, mainly in France, Italy or Spain.

Although oil-bearing plants come mainly from China, Asia Minor or India, we chose bitter orange because it produces *pericarpo*, i.e., oil from the pericarp, and *nerol* – oil from flowers. In addition, some oils, such as *petitgrain bigarade,* are obtained from the leaves and twigs of this plant, so you can get three types of oils from it.

The pericarp of bitter orange contains monoterpene compounds that have antibacterial and anti-inflammatory effects and are primarily used in dermatology.

However, the main and important fragrance group are aliphatic aldehydes such as octanol or decanool (0.1 to 0.2%).

These oils are also used in phytotherapy. Synethrin, which is found in the pericarp of bitter orange, was used in a slimming diet. Today it is forbidden, and you cancannot use this substance, so it cannot be used for medicinal purposes or in this case in a slimming diet. Bitter orange essential oil is mainly used in the food industry: 70% to flavor beverages, confectionery and beverages, liqueurs, while 20% is used in the perfume industry, which also uses nerol almost exclusively.

Thanks to its characteristic smell, this oil was first isolated in 1653, if I am not mistaken, by the Italian botanist De Laporta. The main fragrances in it are methyl anthranilate, 2 Phenylnitromethane and neroli aldehyde. It has a characteristic fruity citrus fragrance, as I said, it is mainly used in the production of perfumes.

The main producer of bergamot oil is Reggio Calabria. Bergamot oil probably comes from China. Bergamot is a natural mutant of bitter orange and lime. This mutation probably occurred around the seventeenth century. The mutant has adapted very well in the Calabria region, precisely in the vicinity of Reggio Calabria. It was once used in bladder infections, as a painkiller, as well as obstetrics. Today it is mainly used in aromatherapy and perfumery industry. It is part of the cologne known since 1742, which was composed by an Italian perfumer in the city of Cologne – hence the name cologne. This water is recognized by the European Union as an original product from Reggio Calabria. It has this denomination original product originating from Reggio Calabria.

Myrtle oil comes from Africa but has become a plant native to the Mediterranean region and Italy, mainly known in Sardinia. It was researched by my colleague from Sardinia, Professor Franco. He studied the oil, which is obtained from berries and is used in the production of alcoholic beverages, mainly liqueur. In any case, it is an oil that was already known in 600 BC and according to the Bible it was used during cleansing ceremonies. Greek doctors used this plant oil for lung and bladder infections. In Italy, still in home medicine cabinets, this oil is added to cough syrup for children, expectorant syrup. Thanks to its antiseptic properties, myrtle oil is also used for skin care, added to creams.

The studies I mentioned have shown that the oil can prevent the growth of *bacteria Escherichia coli*, Staphylococcus aureus*, salmonella*, *Listeria monocytogenes* and others. It is a part of aromatherapy oils and ointments for rheumatism. It also has adaptogenic properties, helpful in regulating hypothyroidism. Various works were also carried out on this subject.

Another oil, also characteristic of the Mediterranean basin, is made from coriander. It is a shrub that grows throughout Europe – Central, Eastern, in America, all over the globe, but it is characteristic of the Mediterranean basin. Its descriptions can be found in Arabic texts, Greek papers, on stone tablets from Crete. It was part of the perfume. It contains terpene compounds and – this is such a curiosity – during the carnival dried fruits were thrown during games, because these are not seeds but coriander fruits, the so-called *coriandolo*. Today they have been replaced by colorful confetti, but to this time in Italy these round papers are called *coriandolo*.

It is impossible not to mention rose oil, which has been known since the times of Confucius – it was described by him in 500 BC. It was used in China and from there it reached Greece and Italy. Of course, it is also mentioned by Pliny the Elder in *Historia naturalis*, because it was the main composition of *the rhodinon perfume.*In ancient Rome, roses were used in all celebrations. They were the favorite flowers of Nero, as well as Cleopatra. Nero, in order to make the party more pleasant for the guests, ordered to drop rose petals from the vault on them and spray essences for them, mainly roses.

In the nineteenth century, only about 1400 species of roses were known. In 1980, naturalist McFarland had already described 20,000 different species in his catalog. At the turn of the nineteenth and twentieth centuries, the largest exporter of oil was Persia. Today, this place is occupied by Turkey and Bulgaria. Roses are produced in the south of France, mainly Grasse. This production was started by Catherine de' Medici, and it was cultivated and enlarged by Coco Chanel, who used rose oil for her perfumes. It is one of the most famous oils used both for aromatherapy, and mainly for the production of perfumes today.

Essential oils have been known since prehistoric times. Scents coming from plants, thanks to the presence of oils, thrown into the fire gave well-being, strengthened interpersonal bonds, encouraged prayer. Mixtures of herbs with a beautiful aroma were

and are still used today for the treatment of diseases – mainly in aromatherapy, as well as for cosmetic procedures. Today they are mainly used for cosmetic, perfumery and food purposes. They are also used during religious ceremonies. Of course, the knowledge of aromatic plants and the method of obtaining oils developed along with the development of trade routes between East and West. The first ships from the East reached mainly the Italian ports of Venice, Naples and Genoa. Thank you very much.

6. **DR HAB. MAŁGORZATA EWA KOWALCZYK,**

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"Old Polish medical guides on the use of medicinal plants* in *beauty care and beautification"

The subject of the paper are medicinal plants in care, beauty beautification in the light of old Polish medical guides. It would be appropriate to start with the fact that in Old Polish times striking ugliness (although of course, it is a relative concept), as it was called in modern sources, which I deal with, was the cause of stigmatization. A popular trifle said: "He who loves ugly or ugly loves, has sinned in two ways – he has angered God and made people laugh." No wonder that they tried to find recipes for potions that could help and beautify or at least somehow compensate for the deficiencies of appearance.

Of course, in Old Polish times, medical literature was eagerly used. It should be emphasized in advance and noted that Old Polish medical literature is divided into two categories. The first are dissertations, which were purely scientific, and which were addressed to doctors with university education, i.e. to people with extensive knowledge and skills, above all, understanding and assimilating a fairly hermetic – let's face it – language of medicine, humoral. The reception among the inhabitants of the former Republic of Poland of this type of work was poor. The interest of a wide number of Old Polish readers enjoyed another category of publications, which includes all kinds of medical guides, prepared with the intention of popularizing methods of treating various diseases, but also being an excellent source of information on the use of medicinal plants in beauty care and beautification.

There is no doubt that those who struggled with the problems of rare, thin, falling hair or wanted to change the color of hair or beard, had problems with the skin in the form of spots, pimples, tanned too much or dreamed of smooth, wrinkle-free skin, commonly reached for popular medical guides.

It is known that she used the prescriptions and tips contained in them, among others, Konstancja Biernacka née Małachowska. She is known as an author of fairy tales

for children, an extremely interesting woman. She left notes which, unfortunately, have not yet been published, and directly complained in her notes about the lack of beauty. She mentioned that she uses various potions that she draws from medical guides from her parents' library. How she described herself is extremely interesting: "I'm 23 years old, I'm short, corpulent, disproportionately built. I have a sloppy, complexion and sparse hair. In a word, I'm ugly." In the seventeenth and especially eighteenth centuries, focusing on corporeality and judging a person through the prism of his appearance became very important.

Fryderyk Schulz, an astute observer of the Stanislavian times, stated that Poles, both women and men, focus excessively on physicality and tend to constantly evaluate it. In his memoirs from his travels around Poland, Szulc wrote about Poles: "A spot on the face or on the hand is more disturbing than a defect of the mind, and a small bodily disability is more disturbing than a disability of the heart". If there was such an atmosphere, it is understandable that recipes for improving beauty were collected.

They collected them and reached for those contained in medical guides, all men and women dissatisfied with their appearance. It has already been mentioned in previous speeches that in noble, magnate, but also bourgeois libraries we find many books, medical guides, both printed and manuscript. Those who could not afford to buy a printed book made extracts and copies from books borrowed, for example, from wealthier neighbors.

During the research, I analyzed twelve prints and eight manuscripts from domestic and foreign collections. When it comes to foreign collections, I mainly used to work that I found in Lithuanian, Ukrainian and Belarusian libraries and archives. Of course, this was only possible until the outbreak of war. The source materials I used come from the territories of the Polish-Lithuanian Commonwealth from the late sixteenth to the eighteenth century. They were written in Polish and Latin. In almost all analyzed prints and manuscripts, recipes and tips for beauty care and beauty were found.

The regulations were mostly aimed at both women and men. It seems to us that mainly women focused on beauty care, but no: the recipients of advice are both women and men. If the author wanted to limit the target group to women, he added a defining adjective, most often *white-headed*. This can be seen on the example of a very interesting

anonymous manuscript Secrets*, about decorating and treating the head,* which is kept in the Ossoliński National Institute. There is a double entry with the clarification *Białogłowski,* for example: "Uncommon medicine for the hairy whiteheads". At that time, it was known that this advice was intended only for women.

In my notes I came across a very interesting typology of the shortcomings of the human body. Quite commonly distinguished: *defects of the letkie* body and *significant defects*. Letki defects included pimples, freckles, spots, warts, scars and wrinkles. Significant were blindness, deafness, muteness, slouching, excessive thickness, excessive thinness, lack of teeth and hair.

Heavily thinning hair was commonly considered unsightly. In popular medical guides, we have hundreds of hair prescriptions. This was apparently a big problem for the people of that time. Of course, thinning, damaged hair, not to mention baldness, was considered unsightly. The latter, it was claimed, was to be a reason for shame. I noted down the note of one of the gentlemen, who in a letter to a friend stated: "Baldness disfigures a woman the most. Therefore, she should hide it as carefully as possible." An excellent camouflage were wigs, which in the discussed period gained popularity among representatives of primarily the upper social classes.

Hair problems could have occurred at virtually any time in life. For example, Henrietta Działyńska née Błędowska has been preserved that she went bald in childhood at the age of eight, because she underwent a rather complicated and serious illness. All her hair, eyelashes, eyebrows fell out. She walked around in her mother's wig. However, hair problems were tried not only to effectively cover up, but above all to solve. Guides were used, which contained tips on how to prepare various types of specifics at home to help in the care of the scalp and hair. In prints and manuscripts of a guide nature, we find dozens of recipes entitled: *How to fill a bald head with hair? What to do so that the hair grows back on the bald spot, so that it multiplies on the head, so that it grows long, decorative and beautiful.*

In the first place, the key to success, i.e., to make the hair beautiful and decorative, lush and long, was the hygiene of the scalp. This was emphasized. The bane of people of that time was lice. I omit the issue of tangles. The authors of the guides emphasized that nits and lice disfigure hair and contribute to the fact that it can be lost. First of all, they

recommend that we fight lice with a simple method: do not borrow combs, hairpins, accessories among themselves, and above all – and this is quite interesting, because indeed the nannies of small children received such instructions – not to allow the servants to comb their hair with those brushes that young noblewomen or magnates use. If someone already has lice, he should wash his head in sea water, but also in oat bran, which should be weighed together with vinegar. It was also recommended to regularly wash the head in lye and decoction of angelica root or lubricate the scalp with calendula or rue juice.

People of that time had, as the guides indicate, a big problem with the so-called scabs. This is a very capacious term, because all skin diseases accompanied by increased hair loss, such as scabies, ringworm, psoriasis or dandruff, were commonly called scabs in modern times. Of course, efforts were made to prevent the exacerbation of changes on the scalp and the development of the disease. Therefore, there were a large number of prescriptions and recipes in circulation to combat scab on the head. There were plenty of recommendations. Such the most popular methods of treating scabies, ringworm, psoriasis and dandruff, i.e., those so-called scabs, was lubricating the head with ointment from ginger vinegar and butter. Precise recipes are given, e.g. the anonymous author of the book Home *First Aid Kit* – besides, this is a very common title both in prints and in manuscripts, in which there is a lot of interesting information – recommended that five or six times, morning and evening, lubricate the places of the head with scab covered with this ointment made of ginger, vinegar and butter.

A very interesting recipe in another manuscript, which I found in the Jagiellonian Library, said that a decoction made of mustard mixed with vinegar and necessarily cat dung had to be lubricated with scab. As they say, "heals it scab, for sure." We often find a dozen or so tips in one guide, how to clean fallen hair, feathered from scab.

Of course, we find information that the juice of wormwood or mugwort of God's tree, onions, fennel worked. Apparently, great results were brought by lubricating the head with scabs, root or ointment made of the root of white-water lily and pork fat or garlic and honey or decoction of cress seeds, mustard.

It was laughed that great results are also brought by lubricating the head – this is just outside the plants – with sabaz milk. How to milk a dog? Such an answer was not given, but we also find such advice.

Much space in printed and manuscript texts was taken up by medical advice on hair care. For dry, rough, dull, simply damaged hair, oils were recommended above all. It's probably like in modern times. Then it was advised to lubricate the hair with violet, rose or willow oil. For curly hair, or curling, the juice of the elderberry root hebd grated with olive oil was supposed to work great, such a mixture had to be lubricated with the head, or rather the hair, and then put the leaves of the same plant to it and wrap it with an appropriate piece of material or scarf. It was necessary to endure in this way for several hours. After removing the scarf, the hair was to curl beautifully, that is, curl beautifully.

In the guides we have a lot of tips on how to change your hair color. Of course, the recommendations were addressed primarily to people who grayed or dissatisfied with natural hair color, but these people could only do it to a certain extent. The authors of old Polish recipes for dyeing hair yellow, black and red often assured about the effectiveness of a given preparation, without introducing any reservations as to the practical possibility of obtaining the declared color. An anonymous author of a medical guide kept in one of the libraries in Ukraine, giving a recipe for coloring hair black, stated bluntly: "Gray women and grandfathers going for the young. Good is the secret."

Meanwhile, several factors influenced the achievement of the desired color. The first was the initial shade of hair in the person undergoing coloring, the second – hair features, such as thickness or structure, the third – the contact time of the coloring mixture with the hair, the fourth – the regularity of the repeated procedure.

Of course, most of these recipes are based on ingredients of plant origin. Dyeing yellow required extracts of saffron, juniper flowers, licorice root or walnut leaves, among others. In order to obtain a black color, it was necessary to lubricate the hair with juice of sage, difoliate, łoboda and centuria, perfectly darken the hair also had a decoction of walnut shells and pomegranate bark.

Less often we meet information about coloring in red, but if someone wanted to emphasize red or as we would say, reddish hair color, you had to rinse your hair with a

decoction of walnut leaves. Of course, in order to thicken the coloring solution and thus reduce its runoff from the hair, egg yolks, honey were added. In these prescriptions we also have information that only women actually dyed blonde, i.e., the adjective *white-headed* was added to the recipes for paints, primarily brightening.

Both sexes probably dyed black. How do we know that men too? Very often it was emphasized that these are excellent recipes for dyeing hair and beard, so indeed men also used these recipes.

In old Polish medical guides we also find a lot of recipes and tips for the *defect of the letkie* body, which I mentioned, i.e. pimples, scars, birthmarks, wrinkles, freckles. Undoubtedly, the dream of many people of that time, especially from the upper social classes, was a smooth and fresh-looking complexion. For example, for unsightly scars, as it was reported, an ointment made of dried white, violet petals or rue root was supposed to help great. However, these plants had to be combined with honey and alum, and above all regularly lubricated. For pimples, spots, freckles – mainly on the face, of course – it was necessary to prepare an ointment based on the juice or powder of garden cumin or watercress, also called watercress.

According to Jan Paweł Berkowski's popular medical guide, reprinted several times until the end of the eighteenth century, water cress "freckles and other stains on the face and ugliness rubs. Apply it to them in the morning and wash it off with water until the fourth day. To do this, the face will be beautiful."

For sunburning, i.e., tan, it worked great to wipe the face with peony or black cumin juice. There were many recipes for a nice and smooth complexion, as well as for a nice, smooth body. It was recommended to use primarily two potions – from the medical isop and from the lily. In one of the medical guides, we read: "vodka from isop makes the face beautiful and beautiful, smooth. Wash in it often." In another, however, we can read: "The roughness of the body smooth makes the root of the lily with honey grated with honey, thus anointing it, as well as a wonderful and smooth beautiful face makes to take a dry root and finely fatten it, and then dissolve with rose vodka and smear the face at night, the same does vodka from the lilac flower".

These are just sample recommendations and recipes. It is interesting, however, that in many old Polish medical guides, the authors actually informed their readers how

to prepare juice or powder from plants, i.e., they did not leave them alone. In an anonymous publication – again manuscript – a *medicine cabinet of home remedies* we read: "Juice of various herbs in this way to do first: mash this herb to a pulp, squeeze the juice, add this juice in such a way as it is described. This is what the powders must be done: dry first the herb as it describes, crush it into a fine powder, give this powder as I have described."

There is no doubt that Old Polish medical guides were a mine of recommendations and tips, the effectiveness of which the authors did not have to be convinced at all. It seems that all the recipes for beauty care and beautification were shared, and only then was their effectiveness practically verified. What does this mean? First of all, in the margins, books and manuscripts there are annotations next to some recipes: good / bad, passed down from generation to generation, tried in practice. A large number of publications, their reprints and many copies of manuscript medical guides preserved to this day in archives and libraries in Poland and abroad seem to testify to the considerable range of influence of these magazines and the use of prescriptions contained therein.

Thank you so much.

7. **MGR PIOTR WOLSKI,**

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"The oldest preserved natural lexicon in Poland. From the workshop of a philologist and publisher"

From an unusual research perspective, different from that of pharmacologists, researchers of exact sciences, historians of medicine, and even historians in general, from the perspective of a classical philologist, I will present an account of the editorial work on the oldest Polish manuscript on natural sciences. I have been conducting this work for over a year, preparing my doctoral dissertation. I will not focus on one specific research problem and present its possible hypothetical solutions or solutions – my paper will be more reviewed. The linguistic analysis, as well as the codicological analysis that I will carry out, is related to my education and my scientific and professional interests. I will present general information about the monument and a lot of facts in the field of editorial work. Finally, I will present some prospects for the further development of this research. The aim of this paper will be to jointly search for an answer to the question why naturalists, why researchers of the history of science can be useful to a classical philologist or a linguist in a broader sense.

At the beginning it is worth saying a few words about the manuscript and presenting a brief codicological description of the monument. Well, it is a parchment manuscript of 220 leaves. It bears the number 225 in the collection of the Wawel Cathedral Chapter in Kraków. It is an *in folio manuscript,* bound in leather, the condition is generally good, there is little damage, it contains only one work. The whole work is written, according to my preliminary assessment, with one hand, although the glosses, as can be tentatively assessed, may have been added by the hand of another copyist, at least some of them. The leather cover has endpapers, both front and back cover, on which there are also notes. These notes on the endpapers largely come, judging by the analysis of the writing, from the time of the work's creation. On the back there are notes about the content of the book: terms, mainly referring to the whole work. On the front cover

there is a calligram, which I do not know how it ended up in this work, and a certain sentence, which I will quote at the end. The editorial annotation was left by Prof. Rostafiński, who partially edited this manuscript.

The work in the manuscript is an advanced extensive dictionary or perhaps a glossary of natural science, containing about 20,000 terms from various fields, which include botany, zoology, mineralogy, medicine, pharmacology in the field of citation of the so-called symplicia. The main language in the text is Latin, although the glossy is multilingual, I will talk about it in a moment.

The title *Antibolomenum Benedicti Parthi* can be seen on the upper part of the endpaper. We do not know whose authorship this work is, the author is considered to be Jan Stanka, the first Polish naturalist known by name. Due to the annotation in the colophon of the manuscript – *Stanko*, it is quite likely. What was *Antibolomenum Benedicti Parthi*? We don't know. It is, it is believed, lost, and I will say more about it later.

The manuscript was never published in its entirety, although Józef Rostafiński published a significant part of the Polish-language lexical material contained in the glosses. However, he did not analyze it from the linguistic point of view, he was not a linguist, but a naturalist. He was primarily interested in phytonyms – names of plants. Undoubtedly, Rostafiński quite reliably confronts the lexical material of manuscript 225 with material from other works of Old Polish medics, especially Syreniusz, the herbarium of Marcin from Urzędów and others. There is a large bibliography concerning our manuscript, although these works deal generally with very specific selected issues. At the end I will present a bibliography from which it will be possible to select it. Rostafiński, as it was said, was not a philologist, so he did not understand certain linguistic phenomena, but he belonged to a generation in which the knowledge of Latin was widespread. As a man with a reliable, higher education, he must have known this Latin well. He evaluated manuscript 225 from the linguistic side, as far as he was able, as a veritable mine of Middle Latin – this term should no longer be used in today's philology, it is said of medieval Latin. The term Latin medium certainly has a negative coloration. Rostafiński, on the other hand, highly appreciated the author of this manuscript and its contents, and a similar opinion was expressed by Aleksander Brückner, who also appreciated this text from the linguistic point of view. Rostafiński's annotation was included in Stawiński's work

entitled *Medieval Natural History in Poland*, year of publication 1900. I will, of course, refer to Rostafiński, as this is the foundation of all works concerning Jan Stanka.

Jan Stanko was a Pole of Silesian origin, as can be assumed from the surname, which is considered to be the name of the old Silesian knightly family. It has survived to this day and is worn by people in Poland, the Czech Republic, Slovakia, mainly in southern Poland. The author was an educated naturalist, most likely educated in Italy, it is often said about the Salerne school. After returning to Polish, because he probably left for a long time, around 1470 he took over the function of court doctor at the court of Casimir Jagiellon. Later, as he was also a priest, which is not surprising at that time, he took over the function of a canon of Cracow immediately after Jan Długosz. We also know that as a doctor he was supposed to cure Jan Długosz of kidney stones, as mentioned in the sixteenth-century Life of Długosz. He was undoubtedly the owner of a large library, which he gave to the chapter. Three manuscripts from it have certainly survived to this day and are now at the disposal of the Jagiellonian Library in Krakow. The fact that they belonged to Jan Stanka is evidenced by the signatures: *Liber Magistri Johan Stankowicz*. Our work was written no earlier than 1472, perhaps a little later. This is evidenced by the colophon record for 500 pages of text.

Stanko was a man of extremely broad horizons. He was fluent in at least several languages – if we assume that the lexical material that is the content of our manuscript is the original thought of Jan Stanko, as indicated by one handwriting the text. Of course, he didn't have to write it down himself, he could have a scribe who methodically transcribed everything he heard.

The position of the Polish classical philologist is quite specific here. Our academic preparation does not include medieval technical terminology, in general very little space is devoted to medieval Latin on academic courses in Poland, so all the more so in the case of studies on professional terminology we have to educate ourselves. The editing of various texts is approached slightly differently. Texts of belles-lettres seem to be different office texts and documents seem differently. Here we have a limitation, which is the existence of only one copy of the manuscript. A philologist who, for example, edits Virgil's *Aeneid*, has several codices at his disposal. He collates these codes, chooses the best lessons, sometimes emends. We do not have this comfort, but the methodology of

traditional text editing is also used here primarily by comparing the lessons and spelling of Jan Stanko with other later works or those from the same period. Classical methods, of course, have a specific application and meaning here, but we cannot stick to them in a very rigid way, and it is worth abandoning such a pursuit. To determine the best lesson, we must assume that what our copyist writes is good.

In addition to graphics, text and spelling of words, the editor examines the structure. This state of affairs fits into the general lines of development of the structure of medieval Latin dictionaries. The structures in these dictionaries were most often alphabetic, nest or contained elements of etymology. Here we are dealing with a mixed structure, although certainly not chaotic. The lexemes which our naturalist quotes in his lexicon are arranged according to an alphabetical and thematic principle. It consists in the fact that we have certain segments, certain wholes within the work, in which the first written word most often used is underlined with a red ink rubric and then in alphabetical order listed synonyms or synonymous words, or words written in various graphic and orthographic variants. This is a bit of a help for the editor, but it can also be a hindrance. In fact, there are words that, such as camphor, which is written in six variants, which proves that the copyist or the one who was the originator of the work, had access to many sources, quoted from many, processed a lot and knew many graphic variants of one word, many synonyms and tried to organize and merge everything in such segments. It is also connected with an important research question regarding the possible purpose of this work and the way in which it was created. It is important to point out that the lexicon, glossary we are talking about, does not correspond explicitly with other works that we identify as components of Stanka's library.

In addition to the list with variant spellings, synonyms, synonyms, with synonyms, we have a system, as if parallel, overlapping with the one that is *the tabula synonymorum* located at the very end of the work. At the end of the first card of this table of synonyms we have the date of the text – not very clear notation 1472 under the first column. What is the essence of this system? We know that it has precedents in other European dictionaries. Rostafiński tried to analyze it and it seems that he did not succeed precisely because of the lack of philological knowledge. The researcher writes that the system consists in the fact that for each lexeme in the synonym table we have a link to the page

of the text that contains the lexeme or its equivalents. He did not take into account that the page numbering could be secondary, and at the lexemes themselves in the text there are anchored digital links, which are probably associated with places in the table of synonyms at the end of the work.

I mentioned manuscripts signed in the possession of the Jagiellonian Library. We will use them when editing text. However, they do not reflect the structure in any way. These are texts written *in continuo*, medical treatises, m.in. Arnold of Wilanów. It is the oldest copy of this treaty in Poland, one of the oldest in this part of Europe. Other sources that we will use should be selected according to geographical, local, personal, thematic and structural, technological, geographical principles, so we will use works created in a similar area, i.e., in Southern Poland, the Czech Republic, Silesia. He could use what is in Krakow, what his library contained. This is related to the personal principle, i.e., his personal library. As far as thematically and structural matters are concerned, we will search other countries for potentially existing dictionaries and compare structures. This stage of work will take place only after transcribing the entire work of Jan Stanka. Chronological issues, of course, do not need to be explained.

It is difficult to establish an iron body of sources. We know that similar dictionaries existed, but never until then were they one large autonomous whole. Often these are glossaries to medical treatises, elements of broader dictionaries, but none is so extensive and does not constitute a compact whole. False interpretations and overinterpretations are possible here. It may turn out that when confronting these works with each other, we will come across a similarity that is accidental, or a similarity that results from the existence of a common archetype, or simply a general idea about a topic, or an accidental coincidence of subject matter or accidental coincidence of words.

Particularly important may be here: *Difenbach Dictionary* – it is a Czech-German-Latin glossary from the end of the fourteenth century, *Munich Glossary* – according to Brückner, the oldest certificate of phytonyms in general in Polish, and one of the oldest phytonim certificates in Slavic languages, Matthew Sylwatyk *Pandectae medicinae* – a synthetic medical treatise, which, according to Rostafiński, was the basis for creating copies of subsequent works or, as in our case, extensive glossaries. We will also use

dictionaries aggregating the general lexis of medieval texts – the canonical works of du Cange and Forcellini.

What could Benedict *Parthi's original Antibolomenum* be? This issue may prove to be unresolvable. No one has yet identified any manuscript containing such a work, no one really knows what it could have been about. Rostafiński gives some suggestions, but he does it intuitively. Perhaps Stanko developed *Antibolomenum Benedict Parthi*, made an extraction, reduced it to the form of a lexicon. Perhaps one day it will be possible to find this work or its fragments.

The lexis of the text is highly specialized, complicated, exceeds the competence of classical philologists, requires advice from Arabic philologists, because we know that some of these words are Latin-Arabic hybrids, some words are Greek-Latin hybrids, which is quite typical for the Middle Ages.

Many lexemes are rare, *hapax legomena* – words that appear only once, e.g., in our work. Multilingualism in the text written with one hand, and thus the breadth of gloss – the fact that they are Polish- and German-speaking, testifies to the really broad horizons of the originator of our glossary. In fact, it could discourage many philological scholars that we are dealing with a text that is not uniformly Latin – it is simply impossible to perceive and read it in a quick, clear way. An additional difficulty is that medieval specialist texts are poorly developed lexicographically. There are no so-called concordances that would aggregate vocabulary from these texts and show what statistics it has when it comes to the frequency of use, markings.

The linguistic facts from Stanko's manuscript are a testimony to the pre-Linnaean Latin terminology, but also to the interpenetration of Arabic, Greek and Latin languages in Europe and the development of professional terminology in Slavic languages. Perhaps we will find Czech influences here. I found at least a few, including the word *trocene*, which means grandmother in Polish. It is written as glossa, so this is an issue that will probably require development beyond critical editing.

What was the purpose of the text: was it something that one medic, a scholar, used in his own workshop and used, created for himself? Or was it a work for his disciples? Was it a kind of recipe? It's hard to decide. We know, for example, that it is a work created for workshop practice, as evidenced by the fact that there are no explanations to the

lexeme – there are only synonyms. It would probably be about use in the case when you need a glossary in which many names, many variants are collected and can be handled efficiently. Was it a work for disciples? It's hard to say. The notes on the endpaper indicate that someone used it, but the good state of preservation would contradict this hypothesis. We do not know what the exact degree of Stanko's dependence on sources is, and we do not know what his influence is on subsequent generations of Polish naturalists. However, it is undeniable that it is followed by a very lush flowering of medical and natural sciences in Poland. About 20-60 years later, great works appear, for example by Simon Syrenius.

Finally, I will quote a motto that could actually accompany all of us in our daily research work, especially classical philologists: *Hi sapientes non amant, qui sapientes fieri non curant!* It is written on the last page of the endpaper and translates as: *They do not love scholars, only those who do not want to become scholars themselves*. Thank you so much.

8. **DR N. FARM. ELŻBIETA RUTKOWSKA,**

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"Medicinal plants in powders for external use in the light of the nineteenth-century textbook for the recipe of Antoni Kryszko"

The title textbook *Recipe, or the science of writing prescriptions and preparing medicines according to them* appeared in 1865. I took up the review of prescriptions presented by Professor Kryszka. I wanted to determine from which plants raw materials for the production of the indicated drugs were obtained, as well as to identify the components of the preparations included in these prescription drugs.

Antoni Kryszka studied medicine in Kraków, Vilnius and Dorpat. He graduated in 1843 and in the period 1852-1880, i.e., for 28 years, he was the chief physician at the St. Roch Hospital in Warsaw, so he was an experienced practitioner. From 1858 he also worked as a teacher at the Imperial-Royal Medical-Surgical Academy in Warsaw.

He taught many subjects, m.in physiology, pharmacology, general therapy, medical matter and recipe. In 1862, the Imperial-Royal Academy of Medicine and Surgery was incorporated into the Warsaw Main School. This school functioned for a short time, in the years 1862-1869. It was closed by the tsarist authorities as part of repressions after the January Uprising. In 1865, during the school's activity, a book was also published, which I became interested in. It was addressed to students of medicine and pharmacy, but it could be useful for doctors and pharmacists who were starting their professional careers.

I was most interested in recipes and their ingredients. As far as the system is concerned, the prescription begins with the word *recipe* which means 'take', then the individual ingredients are listed: at the beginning the main drug, then the ingredients supporting the action of the main drug, then improving the taste, smell and color. In *the subscriptio section* it is written what form of the drug should be performed. In the case of powders, it is *fiat pulvis*.

In the nineteenth century, apothecary scales were used, such as: grany, scruples, drachmas, ounces and pounds. It is not about some very exact accuracy, it is assumed that 1 gran is about 64 mg, and one ounce is about 30 g. In different countries there were even significant differences in the conversion of apothecary grans into milligrams.

Powder is a form of medicine consisting of powdered mixed ingredients that may have been applied in different ways. Professor Kryszka in the textbook recorded various routes of administration and various examples of powders for external use. These were powders for the nose, for sniffing during fainting, for the skin and mucous membranes, for stopping hemorrhages, for cleaning teeth. Cosmetic powders, e.g., for washing hands.

I would like to present nasal powders as an example. It turns out that in the nineteenth century, not only nose diseases were treated with them, but also diseases of the eyes, ears, headache, fainting. With their help, foreign bodies were removed from the larynx, due to substances that were called *squiezers,* i.e., the administration of such a powder, was to cause a sneezing reflex and cause various therapeutic effects. Some authors pointed out that children should not be given powders, because they can get into the trachea or bronchi. They were recommended the so-called marjoram butter. Other authors, however, predicted the use of these powders in children. There was no coherent vision of the use of this form of the drug.

Professor Kryszka presented two prescription drugs for powders. The first ends in the subscription to *M.F. Pulvis erribinus,* and the second has at the end in the signature, i.e. in the indication of how this powder should be used, the information "take like snuff".

Most of the ingredients are vegetable raw materials, which I will present in alphabetical order. The first plant from which the raw material was obtained was *Citrus bergamia*, the already mentioned bergamot oil – *oleum bergamotae*. According to the terms from the nineteenth century, it was obtained by squeezing the juice from the peel of the fruit. From 100 fruits, about 2.5 ounces of essential oil were obtained. It was characterized by a yellow color, had a characteristic smell and taste described as spicy. Czerwiakowski, the author of medical botany, described that "it is a very pleasant smell, having various uses". The oil was also part of various pharmacopoeial preparations, and

today it is known that it acts as an antimicrobial substance and has antioxidant properties.

Another plant from which raw materials used in powders for external use were obtained was lily of the valley. In the nineteenth century, the active substances were listed as "fragrant crystalline being", glycosides such as convalarin and convalamarine. Trapp, in his textbook *Pharmacognosy*, described that "The powder of dried lily of the valley flowers in combination with others is sometimes used in sneezing powders", so he pointed out that it is one of the components of nasal powders. In contrast, the rhizome of the plant was formerly used against epilepsy.

Bearded scythe is another of the plants used. In the nineteenth century, species such as *Iris florentina*, *Iris palliola* and *Iris germanica were distinguished*. From these plants came the raw materials used for drugs made in the spiral recipe. The raw material of plants of two- or three-year-old rhizomes after debarking was dried at a temperature of about 30°. The smell of the raw material becomes more intense as it is stored, and the smell of violets comes from the essential oil component iron. The taste is slightly spicy, sweetish, slightly scratchy. It was rarely used as such, and in the nineteenth century the rhizome of the scythe was included in the so-called volatile oils, or fragrant drugs.

Narrow-leaved lavender was harvested before it was completely bloomed and dried. The scent of the flowers was described as "very pleasant, aromatic, bitterly spicy, spicy". Among the active substances mentioned in the nineteenth century were essential oil, tannins and resins. More essential oil was obtained from dried flowers. It was also possible to obtain oil from the whole plant, but it was described as of lower quality. Czerwiakowski described this raw material as a "loving" herb and noted that it is used as a slightly stimulating, usually externally. Nowadays, raw material preparations are used in the case of a runny nose, in reducing nasal congestion.

Another plant is marjoram, obtained from the natural state and from cultivation – today, of course, from cultivation. Trapp described the smell of marjoram as strongly aromatic, and the taste – spicy, camphor. In the nineteenth century, essential oil, tannins and the so-called bitter matter were mentioned as active substances. Infusions could be used to rinse the mouth and to make baths. Textbooks emphasized that it could be a component of sneezing powder. Today also in the Polish Pharmacopoeia XII, in national

monographs, there is a recipe for marjoram ointment, reduces swelling of the nasal mucosa.

The fragrant cap provided raw material in the form of whole dried flower buds. Trapp emphasized that we will probably not find another plant in nature that would provide more oil than a nail tree, because this is how it was called in the nineteenth century. The oil is characterized by the fact that fresh is colorless, but quite quickly turns yellow or even brown. Trapp described it as an oil of "pleasant fragrance, strongly aromatic, spicy and burning taste." In the nineteenth century, hydrocarbon (clove camphene) and clove acid – or eugenic acid – were mentioned as active substances. Externally used for rubbing (with a jump), as a means for sniffing (with ether) and for rinsing the mouth. It was also part of various pharmacopoeial preparations.

The most potent raw material among the prescriptions for powders for external use for the nose was the raw material obtained from white hellebore or white hellebore, the term used in the Polish Pharmacopoeia II. The powdered raw material was characterized by a grayish-yellow color and had no smell. Careful pulverization with protection of the eyes, nose and mouth was recommended. It belonged in the Pharmacopoeia Polish II to the so-called list B or to potent agents. The taste was described as extremely sharp, burning, bitter. After chewing the root, the mouth remained dry for a long time, and the active substances mentioned in the nineteenth century are veratrine, which *is in fact* a mixture of several alkaloids, irwin, resin and oil.

Professor Skopel from Cracow described this raw material as follows: "In the past, this hellebore root was used more often than today, to induce sneezing, but always with other inert agents, grated into a powder, which the patient was ordered to take like snuff or put under his nose if he was unconscious. Such powder was recommended to people affected by bright blindness, tormented by a great, persistent headache. It was also used for the fattening of the dead, that is, the seemingly dead. Now, however, doctors in general use it very rarely, for they prefer, if necessary, to prescribe veratrina to the sick instead of it, and they cannot complain about the insufficient effect of the root of hellebore."

In the nasal powders described by Professor Antoni Kryszka, most of the raw materials came from the plant world. Raw materials were mainly classified as so-called

volatile-oiled drugs, i.e., odorous drugs. Nasal powders were used not only for topical treatment, but also used to treat headaches. Thank you so much.

9. **DR KRZYSZTOF PRĘTKI,**

DEPARTMENT OF SOCIAL SCIENCES AND HUMANITIES, FACULTY OF HEALTH SCIENCES, KAROL MARCINKOWSKI UNIVERSITY OF MEDICAL SCIENCES IN POZNAŃ

"Problems of medicinal plants in the scientific activity of the pharmaceutical department of the University of Poznan in the interwar period"

I will divide my story into three parts. Firstly, I will show the genesis of the academic medical community in Poznań, secondly, I will present how the department that dealt scientifically with the issue of pharmacy was formed, and thirdly, what we are particularly interested in: what works were created on the subject of medicinal plants.

The Poznań Society of Friends of Sciences, established in 1857, aimed to cultivate sciences and skills in Polish, as well as to gather people interested in science and art living in the Grand Duchy of Poznań. At that time, there was no academic centre in Wielkopolska since the liquidation of the Jan Lubrański Academy in 1780, which was founded in 1519. After the fall of the First Republic of Poland, Poznań and Wielkopolska found themselves within the borders of the Prussian state, which tried to torpedo all attempts to establish a university in Poznań, and only PTPN became an institution within which Poles could practice science particularly actively. In this case, it was the medical community, which in 1865 created a separate medical section within the Faculty of Natural Sciences of the PTPN. The organizing committee appointed from among the members of the faculty, to which Matecki, Nieszczota and Świderski belonged, opened a general meeting in 1865, during which 25 doctors decided to establish the Faculty of Medicine. Officially, the approval of this faculty within the PTPN took place only in 1867, and the first president was Teofil Matecki. In 1887, the Faculty of Medicine already gathered 80 medics out of 457 all members of PTPN. Such a large participation of doctors in the work of PTPN was not a coincidence, because they were not only a well-educated group, but also to a large extent striving for independence from Prussian legal conditions and characterized by a coherent corporate structure, the imperative of continuous professional improvement.

The person who raised the activity of the Faculty of Medicine to a high scientific level was Dr. Heliodor Święcicki. After completing his medical studies in Wrocław in 1877 and completing numerous internships in the best German clinics, he came to Poznań in 1878, where he began his medical practice and immediately became actively involved in the activities of PTPN. During 44 years of activity in PTPN he held various positions – from librarian to president of PTPN. He was particularly involved in the activities of the medical faculty, because he was a doctor himself, where he gave lectures and presented numerous medical cases, which were presented in the pages of the "Annals of the Society of Friends of Sciences". He was also one of the co-founders of the first medical journal in Poznań, entitled "Medical News", which was created in 1888. He published articles there and was the editor-in-chief of this work from 1896 to 1906. Święcicki's scientific activity and organizational activity for the Faculty of Medicine resulted in 1896 being elected to the position of chairman, which he held until 1904. Extremely important also for the development of Poznań medicine was the scientific prestige that Święcicki achieved at that time. At the end of the nineteenth century, after the ophthalmologist Prof. Bolesław Wicherkiewicz moved from Poznań to Krakow and after the departure of the laryngologist Dr. Dembiński, Święcicki was the most outstanding Polish doctor and scholar of the Grand Duchy of Poznań. This was evidenced not only by his numerous publications or speeches at international medical congresses and the recognition of the Polish scientific community, whose representatives appointed him to the permanent commission organizing nationwide congresses of doctors and naturalists, but also by his three candidacies for the position of head of the departments of obstetrics and gynecology at the faculties of medicine in Krakow and Lviv. The Prussian state recognized Święcicki's achievements in the field of science, awarding him the title of professor in 1913. In 1907 and 1912 he was elected vice-president of the PTPN, and in 1915 chairman.

At the end of 1917, PTPN management began to think about establishing a university in Poznań. Looking for the direct genesis of the University of Poznań, it should be connected primarily with the circle of people undertaking various educational initiatives within the PTPN since the beginning of the war. They were the people most devoted to the idea of the university, but also intellectually prepared for the implementation of this project. Apart from Święcicki, this group also included the

philosopher Prof. Michał Sobeski, the archaeologist Prof. Józef Kostrzewski, as well as the linguist, Rev. Prof. Stanisław Kozierowski. In these people, the first rector of the University of Poznań, Heliodor Święcicki, found ardent advocates and devoted collaborators in the work of creating the Piast University. This group supported initiatives to conduct scientific lectures, including lectures and seminars, within the society, which from January 1918 functioned as so-called systematic two-year scientific courses. On Święcicki's initiative, in mid-1918, a group of people gathered in the PTPN secretly debated on the development of the concept of establishing a university in Poznań. In the same year, a decision was made to appoint the Organizing Committee of the Polish University in Poznań. The committee composed of: Święcicki, Sobecki, Kozierowski and Kostrzewski as secretary, recognized the Society of Friends of Sciences in Poznań as the "only competent" institution that could implement the plan to establish this university.

The spiritus movens of the project was Święcicki. As the president of PTPN, he was aware of the commercial possibilities of the scientific community in Poznań, he knew people, he had contacts with the Jagiellonian University in Krakow and with scholars working in Western Europe, especially in Germany and France. At the first meeting of the commission in 1918, Święcicki presented a plan for the creation of departments. He had no doubt that the most urgent thing was to start organizing the university with the faculty of philosophy, because in the university tradition this faculty is to be the "cradle" of the humanities and natural sciences.

He also thought about establishing a medical faculty, in which he saw the biggest problems, because in Poznań at that time there were no staff who could come to the university. Święcicki was therefore aware that it would have to be brought from other areas of the Polish rebuilding its independence. He was aware that it was necessary to provide a staff of theoretical lectures, involving scientific forces from other partitions, and to entrust the conduct of practical medicine classes to "local forces".

In 1919, the Commissariat of the Supreme People's Council established the Faculty of Philosophy, and the stabilization commission in Warsaw agreed to fill professorial positions by the university commission in Poznań. The Supreme People's Council was proposed professors for the appointment of 21 chairs of the Faculty of Philosophy, of

which 12 belonged to the humanities and 9 to the mathematical and natural sciences, and they became the foundation for the organization of the new university.

The Faculty of Philosophy began its activity in 1919 and informally inaugurated the functioning of the university in Poznań. The Council of the Faculty of Philosophy, consisting of 13 people, at its first meeting in 1919 appointed the first professors, from whom it unanimously elected Professor Sobeski as dean.

In 1919, at Sobeski's request, the university commission decided to give Święcicki the title of professor of the medical faculty, which formally did not exist. So there was an interesting situation – there was the first professor of the faculty, although the faculty itself did not exist yet. Therefore, the professor was appointed before the creation of the faculty and this procedure enabled the Council of the Faculty of Philosophy to elect Święcicki as the rector of the new university.

In 1919, on the 400th anniversary of the establishment of the Lubrański Academy, the Piast University was inaugurated. In his speech, Święcicki thanked the authorities, but also the society for their support and kindness. Characterizing the goals that the new university has to achieve, he considered the education and upbringing of the young generation of Poles to be the most important and emphasized the sense of connection with the Lubrański Academy, the ideas of the Śniadecki family, Libelt and Cieszkowski, whose efforts for the university did not remain fruitless. He also referred to the famous Poznań doctor Józef Struś, who in one of the commentaries to his translations of Galen's writings recommends young people "devoting themselves to one branch of knowledge" not to "enclose themselves in it, but also to take into account the totality and versatility of science", because only science "makes a man a man who has fully grown up to his goals". Therefore, he drew attention to what we are now trying to emphasize especially at medical universities – the humanization of medicine, interdisciplinary approach, not sealing, because unfortunately in the medical professions such a tendency often occurs. Doctors teaching medical students often say that medicine in *the strict sense* is the most important, not everything that is outside it. As people who pay attention to humanization, we want to open students' eyes also to such figures as Święcicki or Wrzosek, or a number of other people.

By resolution of 1920, the Senate changed its name from Wszechnica Piastowska to the University of Poznań. The basis of the new unit was the Faculty of Philosophy. As part of this faculty, as a result of the efforts of Wielkopolska pharmaceutical societies, as well as with the support of Rector Święcicki, the dean of the faculty, Professor Korczyński, came up with an initiative to organize pharmaceutical studies. At the request of the dean, the Council of the Faculty of Philosophy decided in October 1919 to establish a pharmaceutical college. The shortage of scientific and didactic staff meant that apart from the Department of Applied Pharmacy there were no other units at this faculty or at this study, as we would call it the term used at that time. Pharmacy students had to take their classes mainly in the departments of mathematics and natural sciences of the Faculty of Philosophy.

A step forward was the arrival from Warsaw of Dr. Biernacki, who in November 1919 took the position of deputy professor of pharmacognosy. A breakthrough for Poznań university pharmacy was the acceptance by Professor Hrynakowski in January 1920 of the proposal to take over the leadership of the newly created Department of Pharmaceutical Chemistry. Hrynakowski's arrival in Poznań in March 1920 and taking over the chair marked the beginning of teaching pharmacy within the pharmaceutical department at the Faculty of Philosophy. The pharmaceutical department consisted of five departments: Pharmacognosy and Botany, Applied Pharmacy, Pharmaceutical Chemistry, Medicine Technology, Botany and Cultivation of Medicinal Plants. It also included such units as: the Garden of Medicinal Plants, the Department of Chemical Technology of Medicinal Agents, the Department of Food Testing, the Laboratory of Physiological Chemistry.

By 1939, 886 Masters of Pharmacy had graduated from the University of Ponas, and by 1927 49 qualified pharmacists. At the beginning, the head of the Department of Botany and Cultivation of Medicinal Plants was Walery Swederski, the author of, for example, *the Project of the organization of the Institute of Medical Crops at the University of Poznań*, published in "Wiadomości Farmaceutyczne" from 1922 and the work *Sprawy hodowli i zbić roślin lekarskich*, which appeared in 1922 in the magazine "Ziemianin". His successor was Prof. Pietruszczyński, the author of the work *Department of Cultivation of Medical Plants* of the University of Poznań, published in "Wiadomości farmaceutyczne"

from 1924. In turn, his successor and author of the largest number of works on medicinal plants was Jan Marian Dobrowolski, from whose pen *came Medicinal plants growing wild in Poland. Tips for harvesting and drying, published in 1920, Cultivation of* medicinal plants, Cultivation *of medicinal plants in Slavic countries* – paper presented at the Congress of Slovenian Pharmacists in 1929*, Observations and remarks on the wintering of some medicinal plants* from 1934, *Correlation between leaves and the anatomical structure of wood*, *and* Tips for exercises in pharmaceutical botany published in 1952.

The basic, as we can see, obstacles in efforts to launch medical studies at the new university were shortage of medical staff, lack of appropriate hospital departments for clinics, high costs of training doctors. A breakthrough in the efforts to launch the Faculty of Medicine was the acquisition by Święcicki of Adam Wrzosek, a former professor at the Jagiellonian University. Professor Wrzosek agreed to accept the function of the organizer and the first dean of the Faculty of Medicine. Accepting the offer, he set several conditions, m.in. that professors of the Faculty of Medicine may be appointed to positions by the Senate only at the request of the organizer until the first 6 professors who will be constituted in the faculty are employed. At its meeting on July 24, 1920, the Senate agreed to open the Faculty of Medicine, and the minister of the former Prussian district appointed Professor Adam Wrzoska as a full professor of the Department of History and Philosophy of Medicine.

From the beginning of the establishment of the Pharmacy Study, its employees thought about autonomy and the establishment of a separate faculty of pharmaceutical sciences. Such an occasion was the division in 1925 of the Faculty of Philosophy into two faculties – Humanities and Mathematics and Natural Sciences, to which pharmacists were attached. The motion for independence of the Pharmacy Study put forward at the Council of the Faculty of Mathematics and Natural Sciences in 1925 was not approved by the Senate in 1926.

SESSION V. MEDICINAL PLANTS IN CULTURE AND ART

1.**DR HAB. MAŁGORZATA WRZEŚNIAK, PROF. UCZ.,**

UNIWERSYTET KARDYNAŁA STEFANA WYSZYŃSKIEGO, WARSZAWA

"Ave rosa peccatorum medicina" – between medicine, magic and metaphor. On medicinal plants in medieval and renaissance painting"

The topic of plant symbolism in painting is very broad. From the multitude of threads, I chose the one about plants having symbolic meaning in the Marian context. At the beginning of the conference, Professor Arabas said to appreciate the humanities, as they are not just auxiliary sciences to the natural sciences. Add that it can also be the other way around and such research is also being done.

An example of these is Piotr Kulesza's monumental, large volume of Plant Robe in the Landscape of Dutch Painting in the 15th Century, published in 2011, in which the author identified plant species. This research is the starting point for further research. Thus, the plants in the paintings' depictions are also identified, allowing further interpretation. This explains no longer only what is depicted, but also why, in a given case, the plant appears in the painting. It is worth realizing that, in fact, until the 15th century, these depictions are sometimes very schematic, and it is very difficult to recognize which plant was painted. They have, for example, very similar leaves, which creates a great difficulty. After the 15th, at the beginning of the 16th century, especially in Dutch painting, you can already clearly see the differences, so that even for a layman like me they are quite easy to perceive.

For medicinal plants with symbolic meaning, which is the content of my speech, I have coined one common term - antibasilicum. They all have symbolic overtones as a cure for snake venom, but of course in different contexts. It is not only about snake venom, physically understood as a poison, but also as the venom of the serpent-Satan in Genesis, so the talk will also be about cures for spiritual poison.

Let's use an example to show that something that appears to be something at first glance turns out to be something else on closer inspection. The British Library holds a Herbarium, which depicts a plant identified as basilisca. Some people identify it as basil, which, it seems, is a completely wrong idea. The word basil is believed to have its origin in the story of St. Helena, who was said to have found the cross of Christ in a fragrant field of basil. It was therefore believed that basil could grow under the cross. It was used against the basilisk, which is considered the king of snakes, or the ugliest of creatures. It is, however, what appears to be snakeweed. It has a snake-like root that served as an apotropaion. It was carried with it not only against demons - used in poultices, the root was said to cure possible snakebites. Other depictions confirm that it was a plant considered an apotropaion, such as one in which snake mouths illustrate this root, but you can also see a bear's paw with claws carried as protection precisely against demons in the Middle Ages. Sometimes artists depict sorrel from the knotweed family, as painted by Raphael in close proximity to the body of the dead Christ.

If a snake appears in medieval painting, it is readily recognized primarily as Satan. However, in herbaria it appears in three varieties, if it bites plants, it means that the plant is toxic, that is, it may contain snake venom. There also appear such plants among which snakes thrive, and can therefore be used as an antidote to snakebites. When the snake appears in the description, these are the plants that are supposed to alleviate the poison. Of course, the best antidote in the spiritual sense to the venom of the snake or to the basilisk is first and foremost the Mother of God, and here I will primarily use this image.

It is worth noting that plants were primarily seen as showing the power of God, goodness, beauty; they are also symbols of the virtues of the Mother of God. The symbolism of vegetation in this very general sense referred to spring, and therefore to the resurrection, as well as the entire work of salvation, in which Mary has no small share. Of course, the sources of this biblical metaphor are the Song of Songs and the writings of various medieval theologians, who use the metaphor of a flower or medicinal plant to which a particular virtue is attributed. It is also a visual story of the struggle between virtues and vices.

As for the Mother of God, we have symbols of three kinds. Of course, their source is the Scriptures. There appear such flowers as the lily among thorns, the rose without

thorns, the olive or cedar, the palm tree, but also others, such as violets, irises, lily of the valley, which glorify the Mother of God not only for their beauty, but also for their medicinal functions.

The rose we know from paintings is, of course, the Jericho rose. Since it is a very dry plant and only turns green when exposed to water, it serves as a metaphor - an image of the uniqueness of the Immaculate Conception of the Mother of God, that is, her freedom from original sin.

Other roses - such as the Damascus rose - appeared in the paintings in the sense of a heavenly or mystical rose. Above all, they are roses without thorns, that is, without original sin, as in the title of the speech Ave Rosa sine spina peccatorum medicina - Welcome, Rose without thorns, medicine of sinners. Of course, the colors of the flowers were related to specific virtues of Mary - red, for example, is associated with her complicity in the passion of Christ.

In Marian representations, the rose appears very often in various guises - red or white. It is also worth noting the rosary, which is associated with this plant. We can meet such rosary representations, where the beads consist precisely of these flowers.

The wand of Jesse, which Mary is called according to the biblical text, usually blooms with an almond blossom, but is sometimes depicted by artists as a rose tree in a combination of two symbols also related to the immaculate conception, or precisely that it is a rose unique because it is without thorns. Such symbols, which draw less on the medicinal function of the plant, include violets or pansies.

The pansies symbolically signify either the Passion of Christ because of the five petals, which were combined with the five wounds of Christ, or they are a symbol of humility, for the violet itself bows its head to the ground, so it is such a humble flower that does not raise its eyes to the sun. Of course, these interpretations are plentiful, and depending on what we relate the text to, we can try to interpret the presence of such a flower in a representation, whether Marian or any other. It is very difficult to identify a particular species or a particular plant in general, because herbaria approached this subject schematically.

Lily, rose, violet are such canonical flowers that appear in medieval and Renaissance painting in relation to Mary: they symbolize purity, chosenness, immaculate conception,

and, well, the very humility of the Mother of God or her sorrow. Often, the violet is replaced by the eagle, which is meant to express primarily the seven gifts of the Holy Spirit.

Eaglets can appear, as well as lilies, roses, and also lily of the valley, in the crown of the Virgin Mary. They are a visualization of the virtues that crown Mary's head. I very much like, for example, the depiction of the redeemed soul, who, heavy with good deeds, is on the scales' scales and looking just at the eagle symbolizing the seven gifts of the Holy Spirit. One could inquire here whether indeed the seven gifts of the Holy Spirit lead to salvation, and whether this is what the Master wanted to communicate to us.

Since the 15th century, the carnation has appeared very often in iconography as a symbol of true love and the passion of Christ. It takes over the symbolism of cloves - a spice whose shape was identified with nails, hence the very connotations of the Passion of Christ. It can be a red clove, if it is in the hands of Mary or Jesus, it indicates the passion of Christ. Often Mary hands a carnation to little Jesus. The white carnation, on the other hand, is linked to ideal marital love, hence it appears on the table of the Ten Commandments at the sixth message: thou shalt not commit adultery and is meant to indicate the right path.

Let's mention plants that have a certain and canonical medicinal meaning, but still derive their presence in iconography from more symbolic or metaphorical associations. Hildegard of Bingen believed that common plantain cures arthritis counteracts harmful aphrodisiacs, if taken by accident. Hence, it is precisely the sin of sensuality that the plantain could alleviate, which is why it appears at the feet of the Mother of God, but not only for this reason: as it grows by the side of the road and thus often trampled, it can imagine the humility of Mary or the saints, whom it also accompanies. In his Etymologies, Isidore of Seville translated its name as 'language of the lamb.' That's why the grandmother - no matter whether ordinary or lanceolate, since that was of less interest to artists - appears in various scenes as a foreshadowing of the Lord's passion. This is a reference to the fact that St. John the Baptist calls Christ the lamb of God. By these associations, this lamb's tongue, or babka, appears in many paintings - it decorates them, as it appears in the foreground quite obtrusively, and therefore it must mean something, it cannot appear only as staffage. Raphael, too, painted the grandmother near St. John

the Baptist in his famous painting Madonna with Pincushion. Very often the grandmother appears in close proximity to St. Agnes, whose attribute is a lamb - agnus. Perhaps the grandmother is just connected with this animal.

Is it always a grandmother? It is difficult to identify this especially before the 15th century Maybe it is Betonica, which was called divine purgatory. It alleviated snakebites and was an effective antidote against spells and charms. Therefore, it may appear in scenes of being laid in the grave, mourning. Violets also have leaves that are quite similar in various depictions, which at first glance raises a lot of doubts among laypeople.

Dandelion appears in pictorial representations as a bitter herb that was eaten at the Passover supper before the Israelites left Egypt, points to the Lord's passion. It does not speak of the resurrection, but precisely of death. The blower itself, may be a symbol of eternal life, but it may also represent the spread of Christ's teachings to the world. In the scenes before the Passion, nun flowers appear, but when we have a situation after or during the Passion, as in the case of Saint Veronica, who is holding a handkerchief with the imprinted image of Christ, it is the blower that appears. It's as if what was foretold by the dandelions has already been accomplished, so the blowfly, with the help of seeds that will spread with the wind, spreads the good news.

Lily of the Valley, which in the Middle Ages was used as a remedy for epilepsy, fainting, and often as a heart medicine, appears in depictions of Mary fainting at the foot of the cross. Thus, we can see them in passion scenes, but not only. Artists also placed it in the scene of the Annunciation, for it was Mary who was called the Lily of the Valleys, or lily of the valley - the flower of the humble.

Swallow herb is referred to Christ as a true physician. It was believed to restore sight, as witnessed for example by Isidore of Seville, citing a story about swallows. That's why swallowweed appears in biblical scenes concerning Christ. However, we also have examples where swallowweed, as an image of enlightenment, the proclamation of good news and knowledge, appears near preachers.

We also have examples in painting of paintings where botanists have already identified all the plants, and this opens up a field of interpretation for the art historian, who can look at the work holistically. There are many such depictions in painting, especially in Dutch painting, where you see a flower bed in the foreground and one by

one plants grow that have a specific meaning. For example, in the scene of the flight to Egypt: the lily of the valley signifies the tears of the Virgin Mary; the bayberry may symbolize the fetters with which Christ was bound during his passion, but they are also a symbol of humility; the dandelion foreshadows the bitterness of the Passover sacrifice; the plantain is again a symbol of humility. Anemones also appear, and here we enter the area when plants that have medicinal rather than symbolic significance in the context of a scene begin to become visible. Anemone has analgesic properties, induces lactation and prevents inflammation of the uterus. It was very much at home during the flight to Egypt, which happened shortly after the birth.

Plants that are medicinal or used for many ailments usually have positive symbolism. Those that are poisonous usually have negative symbolism. Such is the situation with the buttercup, which was considered poisonous. Consequently, it became a symbol of death and appears in scenes of the Passion of Christ. It grows at the feet of Christ or just at the deposition in the tomb. Then there is the nettle, which also appears very often in Dutch and early 16th century art. - even in Italy, has a negative sensual meaning. Artists do not care at all whether it is a nettle or, for example, a buttercup - these plants have the same symbolism. Among other things, nettle is painted next to the skull, which is identified with Adam's skull, and therefore with original sin. It symbolizes sin: laziness, negligence, transgressions of body and spirit, etc. However, the yarrow and the pansy also appear here, i.e., the cure for hemorrhage. No wonder, since the body of Christ being taken down from the cross is heavily bloodied.

Of course, nettles can also appear in the context of saints, as they were used as steaming for penitential practices. In the case of experiencing sensual temptations, one had to throw oneself into the nettles and immediately the person left the desire to do anything. The thistle, like everything that has thorns, is, of course, associated with and foreshadows the Passion of the Lord, hence the frequent use of thistles in Marian depictions of little Jesus.

We can divide medicinal plants in Marian representations or sacred representations of the Middle Ages and Renaissance in general into three types. First, there is the symbol derived from the Old Testament, such as the rose. Second, they have a specific medicinal meaning, such as yarrow or boysenberry. Third, it may simply be a representation of the

flora of the region, such as in Raphael's paintings parsnips are very common. In one painting, Raphael depicted them in the company of dandelion and sour sorrel, alluding to passion, while the sweet root of the parsnip foreshadows the sweet fruits of the Lord's passion.

One thing emerged during this research - no one writes about it, I present my conjecture. Well, St. Lucia, who usually as an attribute holds her eyes on a tray - gouged out during Diocletian's persecution, Francesco del Cossa depicts with a plant in her hand, which I think is simply the skylight. It is known that the skylight was already known at that time and perhaps served the very purpose it still serves today.

Arcimboldo also sometimes paints this skylight around the eyes. Can we even attempt such inquiries that the flowers Arcimboldo depicts have some medicinal reference? Perhaps they do, which is what the skylight would indicate. Also, the cabbage mentioned yesterday is in his paintings - it forms an arm of both Spring (Primavera) and Vertumnus. Doesn't this have some reference to healing practice? It would be appropriate to research this thoroughly, as I have not found any study on the subject. So for a future conference I will announce myself with cabbage. I share my discovery from yesterday: Balenciaga in 1957 presented two silk cabbage hats stored at the Metropolitan Museum. Thank you very much.

2. **DR MAGDALENA GRENDA-KURMANOW,**

FACULTY OF CONSERVATION AND RESTORATION OF WORKS OF ART, ACADEMY OF FINE ARTS IN WARSAW

"Historical herbariums as a monument. Challenges for conservators and custodians"

I have a chance to tell you about another, different perspective on the world of plants, that of the conservator, to raise the stakes of interdisciplinarity. Conservation itself is a multifaceted field, for the reason that the conservator must integrate historical knowledge, including technological knowledge, corroborate information with studies that use so-called modern analytical techniques used in the sciences, and combine all this with manual work, which is a craft and is combined with inevitable interference directly into the structure of the monument. There is no fooling ourselves, even preventive conservation and preventive preservation methods are always to some extent an interference with the structure.

I have been gaining experience for some time, starting with realizations for the Agricultural Museum in Ciechanowiec, also for the Warsaw Herbarium. In the meantime, I started conducting queries on conservation methods, for the reason that I noticed a gap when it came to knowledge on the subject. The result of these interests was a several-year project funded by NCN. In addition to the conservation of three 18th-century herbaria, it included studies of the effects of conservation materials on genetic material. Publications and a doctoral dissertation began to emerge, but these are not the activities that ended my adventure with herbaria either, for the reason that new issues have arisen that largely concern the study of biocides, which are a big problem when it comes to natural collections, including herbaria.

Herbariums are a great, invaluable source of information on a wide variety of issues, and we can extract from them news on biodiversity, species emigration, disease history, viruses, climate change, pollution, as well as information that we usually connect to the sciences associated with the humanities, that is, the traditional use of plants in various ways, including for the study of nomenclature. All the time I am thinking of a collection of

dried plants grouped in the form of herbariums - we know that the word 'herbarium' can be understood in different ways. For many of these studies, genetic material is used, which is taken from old botanical specimens. The preservation of this genetic material is a separate branch of the problem of conservation and protection by curators of collections. Genetic material thus represents an additional layer, an additional level of responsibility for the guardians of collections.

As for the care of the monument, we are also responsible for the preservation of this genetic material. It's worth recalling what time period we are talking about. We date the oldest preserved monuments district [MJ1] to the ~40s of the 16th century.

Of course, the idea of drying, flattening plants between absorbent surfaces is certainly much older, because it is so natural. Examples of older monuments of this type of plant desiccation and flattening in herbarium fashion can be found in both art and literature. On the other hand, when it comes to the deliberate, intentional creation of a collection for scientific, didactic purposes, we are dealing with this around the middle of the 16th century. Traditionally, this activity is attributed to Gerard Cibo - a didacticist, director of the botanical gardens of Pisa and Bologna. He also had a collection of plants that has not survived or has not been identified so far. On the other hand, the collections of his students are already preserved in places, so here we are talking about a practice going back up to 480 years. In Poland, the oldest monuments date back to the last quarter of the 17th century. These are the herbariums of Sylvius Boccone from Wroclaw, as well as Helwing's herbarium, kept in the National Library from the 17th/18th centuries. From the 18th century we have more herbaria - a dozen or so small objects. This is already a certain resource. There are even more later monuments. They are initially in compact form - albums or codices. This begins to change around the middle of the 18th century.

Herbariums as scientific tools were not much appreciated by the first generations of Renaissance botanists. They criticized that, for one thing, the plants are heavily distorted in terms of appearance, making them difficult to identify, as they change color, fade, become brittle, are vulnerable to insect attack, pose certain research problems, and are out of context. For this reason, botanical illustration was preferred to physical, botanical specimens themselves. In particular, early botanists such as Cusius even scoffed at herbarium specimens. By contrast, by the stage of Bauhin and Pinax - the last generation

of the first Renaissance botanists - the level of knowledge was already so extensive and had grown by such leaps and bounds that herbariums had to enter the repertoire of permanent botanical tools. They simply began to serve a mnemonic function - there were too many species to remember.

Groundbreaking in all aspects of botany was the work of Charles Linnaeus, who is credited with finally elevating the herbarium to the role of the primary tool of the botanist. He wrote in Philosophia botanica that the herbarium surpasses any illustration and is the indispensable tool of every botanist. This was later repeatedly quoted and travestied by many subsequent scholars. In the Philosophia botanica, Linnaeus gives instructions for making a herbarium. Of course, this is not the first such recipe, as we have printed sources from the early 17th century that contain such instructions. On the other hand, noteworthy is point 11, where Linnaeus recommended unica tantum in pagina, that is, to put one specimen on one sheet. Indeed, from that time onward, more and more herbariums have been gradually dated, which are collections of specimens on single sheets, as is still in use today, although, of course, compact forms also occur.

In the jargon, herbariums are very often referred to as monuments or multitechnological objects, because they are very complex objects. Of course, the most important are the dried plants and they cause the most "educational" problems. Each period has slightly different properties and each of the elements of these objects has different physical and chemical properties. The combination of all these elements creates a problem when it comes to preservation, storage conditions, conservation. For example, there are different ways of fastening - there can be threads and waxes, glues, plants can be glued spot or all over, which was a very common way. They can also be threaded through. And this is just one aspect of technology. There is a lot of variety in each aspect when it comes to facilities. The problems of degradation relate to material diversity and the fact that individual components may not be physically compatible with each other. Difficulties can also relate to the fact that, due to storage conditions or simply natural processes, an element can degrade, creating microclimates that catalyze the degradation of other elements, i.e., acid hydrolysis or oxidation, for example, which are the most common, most typical destructions of cellulose - the building material for paper and for plants. Therefore, storage conditions are crucial for genetic material as well.

Another problem is the presence of biocides, which have a destructive effect on plants, more precisely on their genetic material, but not only. They also affect human health, and as a result, the problems concern both the preservation of the facilities and their use in a safe manner. Destruction can be various, such as mechanical, but also ink corrosion can occur, which is typical because these are manuscript objects, so there are inks that corrode and also cause hydrolytic and oxidative changes in the cellulose structure.

The aforementioned conservation measures are a very broad topic when it comes to all natural collections. Such measures have been used since the very beginning of herbaria. We have the first reports just in printed sources in Adrian van den Spiegel's work from 1606. They concern mercuric chloride, which was used until the 1990s, and therefore probably the longest-used biocide in the history of herbaria. Studies of more objects show more substances. The curators of the collection very often order an external service from companies that deal with crop protection and use, for example, some industrial disinfectants that should not be used for historic collections at all. There is a history of so-called "miracle chemicals," like DDT, whose identification as a malaria agent earned its authors a Nobel Prize. Under certain restrictions, it is still used for these purposes, while it is absolutely a phased-out agent. Its traces can be found in the bodies of polar animals, so in very remote corners of the globe. Many of these agents create permanent contamination. Our love of disinfectants reached its peak during the pandemic, when there was a disinfection of a beach in a Spanish resort, where sodium hypochlorite was used, destroying everything that lived there. When it comes to biodiversity and the preservation of life - including "historic" life - unfortunately, it has to be said that as humanity we are terribly slow to learn, or we are just as naive, not to say stupid, all the time. Biocides have a very broad negative impact on various elements of natural collections. Visual assessment is important, for the reason that many of these agents leave visible traces, although this is not the rule. A big problem is the documentation of such activities, not only in Poland, but globally. Many methods of identifying biocides are known. These are mainly spectroscopic and chromatographic methods. It is possible to take dust samples, test the air in the warehouse, take layering. XRF - X-ray macrofluorescence - tests can be performed. You have to be careful not to

make a mistake in interpretation. E.g., the test brings up the presence of mercury and it is easy to get excited that mercuric chloride was used. Mercury, for example, was detected in an 18th-century herbarium from Krakow, but knowledge of the technology indicates that it is cinnabar entering the wax with which the plants were fixed. It is therefore important to know the history and technology of the objects, necessary for interpreting the results. XRF chromatography is used to study inorganics, while gas chromatography with micro-extraction to solid phase is used to detect volatile organic compounds. It is possible to perform such a test, as well as to examine dust using scanning electron microscopy.

Do we need categories to shovel issues and problems in conservation? Sometimes it is necessary, because we encounter such a variety of objects that we need to know what we are supposed to protect. We also need to know how much we can interfere with the structure of the object, because we always do to some extent. That's what our work is about, even if it's preventive maintenance. It's difficult to rank herbaria somewhere, because until recently there was no category that captured this type of object at all. Their place is somewhere between cultural and natural heritage. In fact, it was only in the 2000s that these natural collections were better captured, using the concept of specimens and their protection, conservation of a scientific tool. Also, there is such a category: documentary heritage, which should be guided by the principle of integrity, authenticity and reliability. Natural heritage is defined as "any thing, phenomenon or concept of scientific significance or that is a manifestation of spirituality." With such categories in place, and knowing all that I've mentioned, what to do with these objects? Covered in the project were objects from the 18th century, so close in time. A consistent methodology was developed for their study.

On the other hand, adopting the principle of integrity, authenticity and reliability for each of these objects actually meant something different. Among them was the herbarium of Izabela Czartoryska, very degraded. It was before conservation and in many cases the specimens were not on the card at all. The herbarium of Helwing and/or Boretius (so called because it is not clear which of them made it, whether together or separately) had specimens loosely placed between the pages, and the block was dangerously enlarged by this. This situation was dangerous for both the album and the

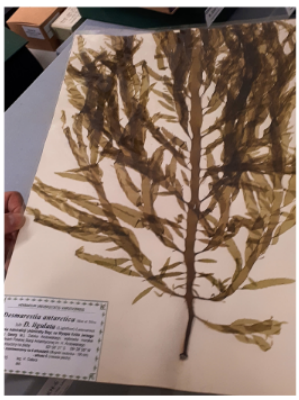
plants, of which there were roughly 300 within the block. With Dr. Maja Graniszewska, we made a delicate decision: in order to preserve each of the items safely, we took out the specimens in a permanent way and placed them on pads, and preserved the block separately. In the case of the other two herbariums, more typical repairs were made, such as filling in cavities. At the same time, they too were adapted to the nature of the objects, because the restorations here must exceptionally repeat the deformations. We had to respect all the deformations that were caused by the plants, because they are the most important in this object - the undercover specimens. In modern herbaria, everything that falls off is given to envelopes, which are placed on a page on a given card. However, it would be inadvisable for me to glue a contemporary envelope in an 18th-century herbarium belonging to Izabela Czartoryska and place plant fragments in it, especially if these fragments can be matched, placing them in a separate even factual documentation, which is attached to the object in a box, disturbs the principle of integrity. Of course, all these treatments were carried out using materials deemed safe for an object of conservation quality and safe for genetic material. Let's return to Boretius for a moment: glueless mounting was used on pads removed from the block of specimens, although these fragments could also theoretically be tucked into envelopes. However, these specimens were often so broken that in principle the entire specimen could end up in the envelope. Of course, where the hypothesis begins, my activity ended. That is, I matched only the fragments that were undisputed, while when it was uncertain, I put the specimens in envelopes.

Most things fall into the ridge area. Here you can find various treasures. During my work, for example, I found a needle and thread with which this block was sewn. It was quite touching to get in touch with the past. Thank you for your attention.







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