

CLASSIFICATION OF REMEDIES AND MEDICAL PLANTS OF ESTONIAN ETHNOPHARMACOLOGY

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Abstract. This article reflects folk medicine material collected over the last 120 years. There are approximately 30 000 texts on the subject stored in the Estonian Folklore Archives. The research material was compiled to ascertain the rate of use of different forms of remedies (plants, food, natural resources, chemical substances, animal remedies, etc) and their relative use in healing different types of diseases. The results show that the most frequently used remedies were medical plants: from 43 to 92%, depending on the disease to be cured. Plants used in Estonian folk medicine are classified by botanical, functional, pharmacognostical and pharmacological characteristics. The material is described according to reliability and profundity of reports. In Estonian folk medicine around 400 medical plants were known, but during the Soviet Union (1940–1991) the amount of officially allowed herbs decreased several times (over 100). Nowadays the number of medical plants used in Estonia is twice as much as used in folk medicine (over 800).

Keywords: Estonia, ethnomedicine, ethnopharmacology, remedies, medical plants, classification

1. Introduction

There are around 300 000 species of Chromophyta in the world, but only about 5% of the species have been thoroughly tested pharmacologically and pharmacognostically (Sõukand, Raal 2005). One of the most important criteria for planning research and choosing its objective is the empirical experience of humankind and ethnomedicine that has been derived from it (Evans 1998). Ethnomedicine can be defined in many ways; one is the transfer of knowledge from generation to generation using oral and literary tradition (Kõivupuu 2000). Stored folkloristic data on Estonian culture and more specifically on folk medicine and pharmacology can therefore be viewed as a very important source for future review and analysis on the subject.

The collection of Estonian folklore found at the Estonian Folklore Archives consists of 19th century material studied from the ethnomedical point of view and is one of the most expansive collections in the world. Something comparable can only be found in Finland and Sweden but the material there is more difficult to handle since the geographical area covered by the reports is considerably wider (Tillhagen 1962–1963). So far no remarkable systematical analysis has been made on the stored material. The authors presented a thorough overview of the research done so far, as well as on the collection of the material itself and its origins in the article “Data on medicinal plants of Estonian folk medicine: collection, formation and overview of previous researches” (Sõukand, Raal 2005).

The aim of this work is to offer the first overview of material reflecting Estonian ethnomedicine of the 19th century. The authors are analyzing the material represented in the above-mentioned files and classifying the material concerning medical plants according to pharmacological and pharmacognostical quality starting from quantitative analysis. Also, the folk medical data is compared to the usage of medical plants in the Soviet period and nowadays. Based on this research, the authors hope to find potential medical plants to continue to work on.

2. Materials and methods

The first task in the analysis of “Folk Medicine” and “Folk Botany” files was to determine the relative importance of medical plants among the remedies and healing methods used in Estonian folk medicine. Remedies and methods were divided into 5 groups. The diseases or disease categories that were represented with the largest amount of labels in the “Folk Medicine” file were used as research material (Table 1). Separately, the largest group in the “Folk Medicine” file (skin diseases) was studied. Here 500 consecutive labels were analyzed, excluding texts that reflected magical healing methods.

For the classification of the use of medical plants in Estonian folk medicine, information from the files of the Estonian Folklore Archives and from the Pharmacy department of Tartu University was used. The name of the plant and its use was registered and the species identified as indicated in the file or where needed by the folk botanical name (Wallner 1929, Vilbaste 1993). Appropriate sources were used for botanical classification and the number and range of species (Eichwald et al. 1970, Laasimer 1965, Raudsepp 1981, Leht 1999). The table consists of phanerogam families containing at least ten species. Classification by genus could be more detailed, but it is too large – there are more than 500 genera of Magnoliophyta in Estonia (Leht 1999). Classification by pharmacognostical characteristics is based on the officinal division of drugs /materia medica or on the known chemical structure of the agent (Tammeorg et al. 1984, Samuelsson, 1992 Evans, 1998, Bruneton 1999, Murav’eva et al. 2002, Herbal ATC index 2002). This approach, however, has several shortcomings: 1) the drug contains several groups of agents, 2) the classification depends on the part of the plant used, and 3)

the information on non-official medical plants is often unilateral or lacking. Classification by pharmacological characteristics (Petkov 1988, Barnes et al. 2002, Herbal ATC index 2002, ESCOP Monographs 2003) has similar shortcomings. The definition of official medical plants is based on the division used during the Soviet period (Tammeorg et al. 1984), because currently there is no official register of medical plants in Estonia. However, during Soviet times, marketed medical plants belonged to the same register as medicaments.

Table 1. Frequency of use of different remedies and medical plants in Estonian folk medicine based on the example of the most represented groups.

Individual disease or Disease categories	Remedy or healing method (% of the labels)				
	Herbal	Animal	Chemical	Magic	Other
Nephro- and cystic diseases	43.0	2.1	2.1	50.7	2.1
Headache	39.7	6.2	5.5	17.8	30.8
Infections	91.7	4.6	2.8	–	0.9
Gynaecological diseases	84.6	4.8	3.8	–	6.8
Stomach ache	77.8	2.0	9.1	4.0	7.1
Disease of the heart and coronary system	63.9	9.3	9.3	10.3	7.2
Diarrhoea and constipation	80.0	3.1	15.4	–	1.5
Hepatic diseases	53.8	21.5	–	9.2	15.5
Intestinal parasites	82.8	8.6	8.6	–	–
Average	68.6	6.9	6.3	10.2	8.0

The comparison of the number of medical herbs in Estonian folk medicine and today was made according to the pharmacognostical and pharmacological data. The latest originate from the Estonian State Agency of Medicines and consist of medical plants registered until the beginning of 2002. From the whole number of species (842) only 630 could be exhaustively classified. Those plants are used in Estonia also as crude drugs or herbal preparations. The active substances of the plants and their usage were determined using newer scientific literature (Bruneton 1999, Barnes et al. 2002, Heinrich et al. 2002, Weiss, Fintelmann 2000, Murav'eva et al. 2002, ESCOP Monographs 2003).

3. Results and discussion¹

3.1. Remedies and healing methods

To ease the researchers' access to the collected material, the original sources were copied into two files. In the file "Folk Medicine" (around 20 000 file cards) the texts are systematized by diseases which were cured. The classification consists of folk disease categories (e.g. general illness, children's diseases, contagious

¹ The most noticeable results of the analysis of folkloristic data are presented in Tables 1, 2 and 3.

diseases, etc.) that are subsequently divided into separate diseases (such as diarrhoea, cold, fever, etc.). The file "Folk Botany" (ca 13 000 file cards) reflects all kinds of information related to the use of plants: from cultivation and weather forecasts to healing with the help of plants. The material is systematized according to phyla and life forms (Algae, Fungi, Bryophytes, trees, bushes, etc.) and also by vegetal genus and/or species. Where possible, the officinal botanical name is added to the widely used folk name. All the texts are in Estonian, mostly in one of the three most widespread dialects. The files contain reports bearing dates from 1878 to 1988.

None of the files gives an inexhaustible overview of the collected material (because the copying process has not always been constant and systematic) and different files often contain identical texts, duplicating the information presented in another file. But they give at least an approximate vision of Estonian folk medicine and can be used for planning future research, especially in the case of the collections of Hurt and Einsen, where originals are no longer accessible to researchers.

The frequency of use of medical plants is, depending on the disease healed, 43–92%, of the average 70% of all healing methods (Table 1). The use of animal remedies is relatively frequent for liver diseases (22%), but otherwise remains between 5–9%. On average, the use of animal and chemical remedies is clearly secondary when compared to medical plants (6–7%). The use of magical healing methods depends on the disease: for example for nephro- and cystic diseases they form half of all healing methods, but usually there is no use for magic in healing infections and gynaecological diseases.

In addition, a more profound observation was undertaken with the group consisting of the largest amount of reports in the "Folk Medicine" file – skin diseases were observed excluding texts reflecting magical healing methods. It became clear that different remedies were used in the following amount: medical plants 39%, food (butter, bread, salt, yeast, sour cream, flour etc) 20%, other natural resources (ashes, coal, clay, mud, tar, lime etc) 11%, the combinations of the above-named 9%, chemical substances (silver, sulphur, copper (II) sulphate, copper, alkali, sulphuric acid, etc.) 6%, animal remedies (frog, frog spawn, fish skin, mouse fur, pork, seal blubber, etc.) 6%, excretion (urine, saliva, earwax, faeces, dung of different animals, etc.) 4%, different substances (alcohol, soap, gasoline, shoe wax, petroleum, etc.) 4% and a combination of different remedies and healing methods (for example: skin was greased with butter and given to the dog to lick) 1%. The following Estonian proverb elaborates on the above-mentioned healing: "A dog's tongue has 9 remedies, a cat's one 9 poisons". Around 70% of reports on skin diseases concerned external use of the remedy which is expected or even too low a percentage. It also explains the use of food-medicine.

In order to draw a conclusion of the presented data, it can be said that medical plants are the most used means in Estonian folk medicine. This leads us to the next step: the exploration and classification of folkloristic material concerning medical plants.

3.2. Classification of medical plants

The analysis shows that in Estonian folk medicine more than 400 species of plants were used. 354 of them were identified and assigned a Latin name. Around a quarter (87 plant species) has also been in use in Estonian official medicine during the last 50 years. It is noteworthy that of the 117 officinal medical plant species growing in Estonia, almost 25% are not recorded as folk medicine plants. 29 plant species known in folk medicine were removed from the official register (as toxic, non-effective, etc.) or were in use outside the former Soviet Union. In fact since 1991, when Estonia regained independence, some species (such as *Filipendula ulmaria*, *Sambucus nigra* and others) are back in use after many years of suspicion. In the Soviet period (1940–1991) only ca ¼ of the medical plants known in folk medicine were used, whereas after regaining the independence the amount of officially allowed herbs exceeded the number of folk medicinal plants more than twice. The Soviet regime thus obstructed the usage and research of nonofficial, but well known medical herbs used for centuries. It is interesting to note that in the Soviet region it was forbidden to discuss those herbs in scientific and even regular literature. The knowledge of them could be only conveyed through older books and oral tradition.

The only species of Algae represented in Estonian folk medicine is bladder wrack (*Fucus vesiculosus*), in the Lichen group – Iceland moss (*Cetraria islandica*) and in the Bryophyta group – hair moss (*Polytrichum*). But there are more than 3600 species of named phyla in Estonia (Laasimer 1965). The use of fungi and Pteridophyta is also very modest (Table 2). Flowering plants are most commonly used in our folk medicine – around 95%, that is ca 1/5 of all flowering plants of Estonia.

Of the naturally growing *Gramineae* and *Brassicaceae* families every tenth species was in use, even less of the *Cyperaceae* and *Orchidaceae* families. On the other hand, for families such as *Rosaceae*, *Ranunculaceae*, *Apiaceae*, *Asteraceae*, *Polygonaceae* and others with numerous species, the ratio is 1/3. Nowadays in official medicine, families such as *Apiaceae*, *Ranunculaceae*, *Fabaceae*, *Gramineae*, *Brassicaceae*, *Rosaceae* and *Asteraceae* are quite rarely used. Pharmacognostically those families are interesting as a source of coumarin, glycosides and essential oils, as well as tannins, organic acids and vitamins. Species whose chemical composition is still not well researched belong mostly to the *Asteraceae*, *Scrophulariaceae*, *Brassicaceae* and *Rosaceae* families. Pharmacological classification is mostly applied to officinal plants. There is little information available for example about herbs containing essential oils and flavonoids, despite the fact that the effects of those compounds are quite well researched. Most known in folk medicine are plants having either protective or irritative effects on sensory nerve-ends and those having an expectorative effect. Considering the climatic conditions and heavy work of peasants in Estonia in the 19th century, the results are close to what you would expect.

Table 2. Botanical and functional classification of plants used in Estonian folk medicine.

Classification by division	Number of species	Marks
	Total	No of species in Estonia
<i>Algae</i>	1	2500
<i>Lichenes</i>	1	677
<i>Fungi</i>	7	2500
<i>Bryophyta</i>	1	450
<i>Pteridophyta</i>	9	43
<i>Gymnospermae</i>	4	13
<i>Angiospermae</i>	331	1540
Family	Total	No of species in Estonia (world)
<i>Asteraceae</i>	41	114 (25000)
<i>Rosaceae</i>	28	71 (3000)
<i>Fabaceae</i>	17	52 (12000)
<i>Apiaceae</i>	16	38 (3000)
<i>Ranunculaceae</i>	16	38 (4000)
<i>Brassicaceae</i>	14	64 (3200)
<i>Scrophulariaceae</i>	12	38 (3000)
<i>Polygonaceae</i>	11	31 (300)
<i>Lamiaceae</i>	10	38 (3500)
<i>Gramineae</i>	10	98 (10000)
<i>Liliaceae</i>	8	24 (3500)
<i>Boraginaceae</i>	6	20 (2000)
<i>Primulaceae</i>	4	11 (800)
<i>Cyperaceae</i>	3	103 (4000)
<i>Pinaceae</i>	2	10 (250)
<i>Orchidaceae</i>	1	33 (35000)
Others	155	813 (237500)
Distribution	Total	% among species
Exceptional	22	6
Occasional	103	29
Usual	80	23
Partially frequent	26	7
Frequent	106	30
Very frequent	8	2
Other	Total	% among species
Cultivated plants	40	11
Wild plants	304	86
Under the preservation	5	1
Toxic	20	6
Function	Total	% among species
Medical plants	354	100
Food plants	76	22
Dye plants	35	10
Ligneous plants	15	4
Poly-functional plants	106	30

Of the plants known as folk medicine, more than 1/3 are rare or only occasionally distributed in Estonia, others are common or occur frequently. Most (86%) grow wild and some are cultivated. Every third species was used as a medical plant, as

well as for food or some other purpose (ligneous and dye plants). Of the officinal medical herbs, more than half are poly-functional (Tammeorg et al. 1984, Klemola 1986, Viires 2000, Masing 2002). That shows how well the plant is known. $\frac{3}{4}$ of the dye plants are known also as medical plants (Klemola 1986) and similar use indicates the presence of flavonoids in those plants. Only 1% of the plants that are in the “Red Data Book of Estonia” are known in folk medicine (Kumari 1982). Many (6%) of the species are unsuitable for use in contemporary medicine because they are poisonous, but their use was also limited in folk medicine. The most popular poisonous plant was mezeoreon (*Daphane mezereum*).

According to pharmacognostic classification (Table 3), the largest part of medical herbs used by our ancestors contains essential oils, also strong alkaloids and flavonoids. Most newcomers in a medical plant list are the species containing essential oils, alkaloids, flavonoids and saponins and originating from subtropical and tropical areas. They are mostly used today as herbal preparations. The pharmacological classification shows that medicinal plants known in Estonian folk medicine (only officinal species classified) were mostly used as expectorates, also

Table 3. Pharmacognostical and pharmacological classification of plants used in Estonian folk medicine and today.

Pharmacognostical characteristics	Number of species	
	Used in folk medicine	In use now
Essential oils	49	135
Alkaloids	26	88
Flavonoids	20	47
Vitamins	19	13
Antracens	17	11
Polysaccharides	11	23
Tannins	8	21
Saponins	6	56
Simple phenols	5	8
Lipids	5	12
Organic acids	5	16
Cardiosteroids	5	14
Thioglycosides	5	7
Coumarins	4	8
Cyanogenic glycosides	4	15
Pharmacological characteristics	Used in folk medicine and officinal in Soviet period	In use now
Expectorates	14	41
Agents protecting sensory nerve-ends	9	19
Agents irritating sensory nerve-ends	6	36
Uterine tonics	5	7
Cardiotonics	5	15
Bitters	5	25
Antiinflammatories	1	27
Laxatives	4	30
Diuretics	3	41
Choleretics	3	21

as agents protecting and/or irritating nerve ends. The most used are medical herbs and medical preparations acting as anti-inflammatory, laxatives, diuretics, choleric, but also agents irritating nerve ends and expectorates. That does not mean that non-official medical plants used in Estonian folk medicine did not have any real effect or were used just as placebos. Even today, we cannot tell of many herbs if it has a pharmacological effect, as most of the plants are not well researched. Still, the comparison of recognized effects of medical herbs and their use according to the indications of Estonian folk medicine is a research in its own right. And that is the next step to be undertaken.

Based on the experience of our ancestors, we can determine around one hundred widespread species as potential plants for official medicine. Probably this number decreases after examining phytochemical, pharmacological as well as clinical researches presented in scientific publications, and after rejecting little-represented, low-informative and clearly too imaginative cases.

4. Conclusion

In Estonian folk medicine the most widely used remedies were medical plants. As perspective herbs for official medicine, there are around hundred widespread natural species. Those species should be analyzed according to the specificity of material and published scientific researches. On the other hand, the use of well-known official medical plants could be expanded by considering the use of different parts of plants, as well as indications for new groups of diseases.

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