



The name to remember: Flexibility and contextuality of preliterate folk plant categorization from the 1830s, in Pernau, Livonia, historical region on the eastern coast of the Baltic Sea

Raivo Kalle^a, Renata Sõukand^{b,*}

^a University of Gastronomic Sciences, Piazza Vittorio Emanuele II 9, Pollenzo, Italy

^b Ca' Foscari University of Venice, Via Torino 155, Mestre, Venice, Italy

ARTICLE INFO

Keywords:

Nature and culture
Historical ethnobotany
19th century
Ethnopharmacology
Europe
Ethnoveterinary

ABSTRACT

Ethnopharmacological relevance: Research on the folk categorization of nature in preliterate societies in Europe is complicated due to the fragmentation of the information available and is rarely undertaken. Yet the data is valuable and may provide, in certain circumstances, important insights, if not into novel medicines, then into the historical logic of selection and memorisation of plants useful from a medicinal perspective.

Aims of the study: We aim to understand the ethnobotany of a preliterate society by analysing the emic (derived from people) perspective on nature-related culture of one of Europe's smaller nations, whose written language and culture was shaped in the 18th-19th centuries by other, larger nations of Europe, and thus from the etic (academic) perspective. We attempt to identify how folk categorization is reflected in the relationships between plant names and uses and to map the structure of those relationships.

Data and methods: We base our analysis on one of the oldest ethnobotanical manuscripts and herbaria of the Baltic governorates, compiled in 1831 by an amateur botanist, Baltic German Pastor Johann Heinrich Rosenplänter (1782–1846), which was derived from conversations with his parishioners from the tiny Pärnu parish. The historical dataset was critically analysed from an ethnobotanical perspective in light of recent identifications of the herbarium specimens.

Results: Although the Rosenplänter collection is fragmentary, the logic of plant categorization by non-literate peasants at that time is clearly seen in the data. Plants preserved in the herbarium were predominantly used for ethno-medicinal, food or ethno-veterinary purposes, such as treating chronic skin and joint diseases as well as severe acute diseases in humans and animals. Among 129 folk taxa analysed, more than one third had apparent purpose-related plant names providing clear links to their use, whereas a few multifunctional plants had several names reflecting diverse uses. For example, *Hypericum* spp., which was used in three different ways, had three semantically distinct names. However, among the plants that Rosenplänter collected, there were also some that were simply named and described by people but lacked any usability data (e.g., *Trollius europaeus*), meaning that use as such was not the primary criterion for recognising a plant. The web-like structure of preliterate thinking in plant-related knowledge reveals a deep relationship with the environment and the interpretation of new elements through familiar natural objects.

Conclusion: Our findings demonstrate that historical ethnobotanical data, if thoughtfully analysed, can be used not only for comparative purposes, but also for understanding the logic of preliterate thinking. We encourage future in-depth studies of historical ethnobotanical data in Europe in order to understand the relationship between nature and culture of native European populations.

1. Introduction

Historical ethnobotanical collections have been (re-)discovered and

presented to the public from time to time, yet their applicability in the modern world is not always clear. One application of historical ethnobotany has been to allow for later diachronic research (Kujawska et al.,

* Corresponding author.

E-mail addresses: raivo.kalle@mail.ee, r.kalle@unisg.it (R. Kalle), renata.soukand@unive.it, renata.herba@gmail.com (R. Sõukand).

<https://doi.org/10.1016/j.jep.2020.113254>

Received 11 March 2020; Received in revised form 3 August 2020; Accepted 4 August 2020

Available online 14 August 2020

0378-8741/© 2020 The Author(s). Published by Elsevier B.V. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

2015, 2017). However, diachronic research using historical data might be complicated due to a variety of factors, such as the limited availability of details regarding collection methodology, fragmentation of the data and, in the case of the absence of herbal specimens, potentially misleading identifications. For the same reasons, the use of historical data as a source of pharmacological bioprospecting can be problematic. However, the existence of comparative data from later periods, historical local names published by other authors, precisely identified regions of data collection with well researched modern and historical ecology and botany, can help in interpreting the data and raise its credibility and value.

Early manuscripts and herbaria have already been used in Mesoamerica to reconstruct and understand the emic (people-based) perspective of the pre-Columbian perception of nature by indigenous people, nearly five centuries after the area was viewed from an etic (science-based) perspective (Bye and Linares, 2016). On the basis of local plant names in historical herbaria, attempts have also been made to reconstruct the nature-related culture of extinct ethnic language groups (Svanberg et al., 2019). Therefore, in-depth biocultural analysis of ethnobotanical collections can potentially become an important contribution to the understanding of the culture and scientific history of a region.

Since the second half of the 20th century, there has been extensive research on the vernacular classification of nature in ethnobiology, particularly in non-Western societies. A tree-like structure, based on the phylogenetic tree in biology, has been proposed (Berlin et al., 1973). However, this rigid model has not been fully justified, and later studies have looked at popular names in a broader sense, from the perspective of species use, and have proposed that individual species may have been less important than their “functional equivalent” in adaptive folk categorization (Hunn, 1982; Hays, 1982) and within “utilitarian” folk biology (Hayes, 1991). Drawing a parallel to biology, this is best explained by the concept of a “functional group” (e.g. Tilman, 2001), where the diversity of species in a community depends on their function there. Ethnobiologists working on folk classification have thus far mainly studied non-Western societies, where so-called “outside scientists” often face difficulties understanding a foreign culture: “In the tradition of ethnoscientific methodology, we should first seek to understand a particular cultural system in its own terms, then seek to generalize” (Hunn, 1982). Ellen (1986) suggested paying more attention to the flexibility and contextuality of folk categorization, while stressing that the hierarchical structure is linked to literacy and the scientific approach. “In the preliterate society you can thus claim that memorising was a functional and completely necessary form of knowledge. It was (and still is in quite a few cultures) one of the few opportunities people had to save experiences and common stories” (Säljö, 2004). The so-called “reading revolution” in Estonia and Livonia only began in the 1840s, due to the rise of a national awakening, when secular literature started to emerge more widely and many peasants learned to read (Talts, 2013).

Although by that time German-language Floras had already appeared in the area, like the one written by historian Wilhelm Christian Friebe (1761–1811) (Friebe, 1805), there were no such books in Estonian. Nevertheless, the local plant names that had appeared in print only covered a small portion of the existing local plant names. As in other places, local plant names overlapped and several different genera were called by the same name. An outsider could not understand what kind of plant villagers were actually talking about. Since local plant names in Estonian did not convey any meaning for Germans, their writings contained many grammatical errors. Incorrect names were also added by later authors, who misread previously published names (for example, the work of botanist Johann Gottlieb Fleischer (1797–1838) (Fleischer, 1830)), and these errors were reproduced in subsequent works. In addition, amateur botanists had no botanical training and local plant books did not exist, and thus local plant names were often assigned to the wrong species or to a species not growing in Estonia (see Vilbaste,

1993 for details).

The vascular plant Herbarium of the Natural History Museum of the University of Tartu (TU), Estonia, holds loose handwritten field notes, a field book and loose leaf herbarium vouchers from 1831. These were collected and written by pastor, Estophile and amateur botanist Johann Heinrich Rosenplänter (1782–1846) (Rosenplänter, 1831a), which until today have remained nearly unexplored scientifically as they do not contain any data on specific plant collection sites. In addition, the Estonian Cultural History Archives of the Estonian Literary Museum holds an unfinished manuscript dated 1831 (Rosenplänter, 1831b), written by the same person in an attempt to illustrate the richness of local plant use in his parish, then Pernau, now Pärnu, Estonia, situated at the border with current Latvia. “Speaking purely linguistically about the history of the literary language, the problem or peculiarity of Estonians (and Latvians) compared to other present-day peoples of Europe is that Estonian written language was created [in the 18th–19th century] by people of other languages” (Ross, 2019). In this context, those sources are a promising historical ethnobotanical collection, undeservedly left ignored. Therefore, Rosenplänter’s collection, originating from the preliterate period, may serve as a good source for investigating the logic of plant use in preliterate societies.

We aim to understand the historical plant knowledge in the preliterate society of one of Europe’s smaller nations, whose written language and culture was shaped in the 18th–19th centuries by other, larger nations of Europe, and thus from the etic perspective, by analysing the emic perspective on nature-related culture. We attempt to identify how folk categorization is reflected in the relationships between local plant names in Southern Estonian (thereafter local plant names) and uses and to map the structure of those relationships. We also describe in detail the preparation phase preceding the analysis in order to demonstrate how errors can occur in historical data analysis and how to avoid them. We argue that historical ethnobotanical sources can serve as a good basis for understanding the nature of the preliterate ancestors of currently literate nations.

2. Data and methods

2.1. History of the scientific context

The history of ethnobotany is closely linked to the history of biology. During the Enlightenment era in 18th-century Europe, Baltic Germans were the best naturalists and explorers in the Russian Empire, leaving their mark on science. However, world-famous naturalists (e.g. Karl Ernst von Baer (1792–1876), Alexander Theodor von Middendorff (1815–1894), Alexander von Bunge (1803–1890), Johann Friedrich Eschscholtz (1793–1831)) who lived at the same time as Rosenplänter were primarily interested in describing the nature of areas that were not yet explored (Asia, America) (also see Pütsepp and Veersalu, 1989). As a result, no serious scientific attention was given to the so-called “backyard”. Thus, until the middle of the 19th century, amateur botanists were the most important researchers in the region of the Baltic governorates (Kukk, 1999).

Baltic German Estophiles sought to understand local language and culture, but they also wanted to educate and share new knowledge with the indigenous people. When Pastor Anton Thor Helle (1683–1748) began the first complete translation of the Bible there was insufficient local vocabulary. To solve this problem, he started to edit the first extensive German-Estonian dictionary and grammar handbook, published in 1732, which included botanical terminology and more than 200 local plant names in Estonian (Helle, 1732). However, the completely translated Bible did not appear in print until 1739. At that time, present-day Estonia had two linguistic regions: northern Estonian in the Estonian Governorate with its centre in Reval (now Tallinn) and southern Estonian in the Livonian Governorate with its centre in Riga. The publication of Helle’s dictionary and Bible made northern Estonian the standard written language, displacing the southern Estonian

language (Ross, 2009).

The subsequent Livonian and Estonian topographical description, compiled by pastor August Wilhelm Hupel (1737–1819), contained for the first time a list of wildlife (plant as well as animal) species (in Estonia and Livonia) (Hupel, 1777). It became the most important botanical source of the region in the 18th century. Hupel also published a revised German-Estonian dictionary (Hupel, 1818), which also contained many previously unpublished local plant names. Thus, subsequent authors based their work mainly on the local plant names and plant identifications provided by Hupel.

Baltic German by origin, Rosenplänter was the pastor of Pärnu parish (Fig. 1) and one of the most important Estophiles of the beginning of the 19th century. Rosenplänter was born in Valmiera, Livonia, which is now part of Latvia. He studied at Tallinn Gymnasium and Riga Dome School and graduated in 1806 from the Faculty of Theology at the University of Tartu. From 1809 until his death, he worked in the Elisabeth congregation in Pärnu. His greatest contribution to Estonian culture was the scientific journal “*Beiträge zur genauern Kenntniß der ehstnischen Sprache*”, for which he published, at his own expense, 20 issues between 1816 and 1832 (Kalle and Sõukand, 2011). All Estophiles and Estonian intellectuals of that time contributed to this magazine. Many articles in *Beiträge* published new local plant names, which were not in Hupel’s dictionary. For example, articles from parishes like Saaremaa (Luce, 1813, 1818), Kadrina (Knüpfper, 1816; Knüpfper, 1817) and Rõuge, from where the list of the first southern Estonian local plant names were sent (Bornwasser, 1814). Although Rosenplänter was not educated in botany, he was one of the first to understand the need to compile Estonian botanical vocabulary of vegetation covering the whole of the country.

Therefore, in the summer of 1830, Rosenplänter began asking his parishioners about local plant names. As he was also interested in linguistics, he asked for explanations for such names. The aim was to publish a book in Estonian describing the plants used by locals, as well as their properties, from the perspective of the people (Vilberg, 1932). Thus, it would have been based primarily on emic perceptions of the locals, as opposed to the etic approach of classical botanical works. At the same time, Rosenplänter also started collecting specimens for his herbarium, picking plants within the parish. His goal was to collect 1000 specimens from all over Estonia for the herbarium, for which he had prepared 11 folders, and he wanted to systematise these according to the classification of Carl Linnaeus.

It seems that initially Rosenplänter categorised the plants himself, but later some Latin names were added in another’s handwriting. According to Vilberg (1931) these names were written by the best botanist of the time in the region: Johann Wilhelm Ludwig von Luce (1750–1842), who identified many plant specimens and made a large contribution to the preservation of Saaremaa’s heritage (Luce, 1823, 1829). Luce’s book on folk medicine is considered to be the first pioneering work on medical-ethnobotany in Europe that systematically describes a particular area (Pardo-de-Santayana et al., 2015).

2.2. Herbarium and manuscript analysis

The first preparations began in 2016, when the authors started to transcribe the texts on plant uses and names from Rosenplänter’s manuscript (Rosenplänter, 1831b) located in the Estonian Literary Museum as well as the herbarium specimens, drying notebook and loose

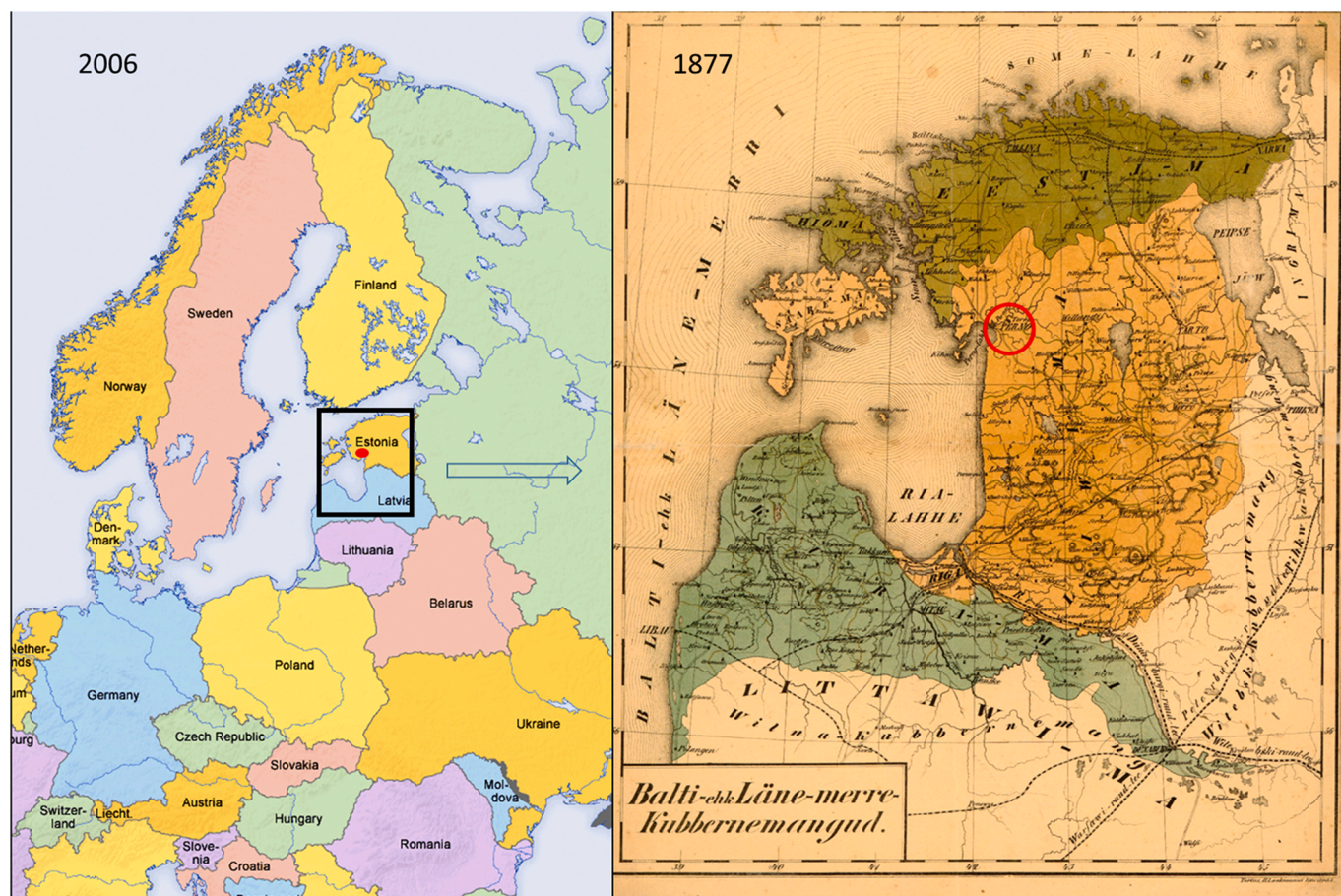


Fig. 1. The Baltic governorates (Estonia, Livonia, and Courland) in the 1870s (right). The location of Pernau (currently Pärnu) parish, where Rosenplänter collected his data, on the map of Europe today (left). The map of Europe was retrieved from https://commons.wikimedia.org/wiki/File:Europe_countries_map_en_2.png, and the historical map was retrieved from: <https://www.digar.ee/arhiiv/nlib-digar:47060>.

leaves from the Herbarium (Rosenplänter, 1831a), the latter done with the assistance of curators of Tartu University Herbarium, Kai Vellak and Ülle Reier. Foreseeing great interest in the collection, Rosenplänter's Herbarium was digitized and specimens identified by botanists of Tartu University, Ülle Reier, Kai Vellak, Kaili Orav and Maie Poom, as a part of the Herbarium digitalization protocol, entering the plants into a database hosted by the Estonian Herbarium of Tartu University (<https://elurikkus.ee>) (Fig. 2). Scans of the specimens are available through the above database and the originals are stored in the Botanical Collection of the Natural History Museum of the University of Tartu (folders 1 and 2 and loose plant specimens were used for analysis: TU306134-TU306275; TU314600-TU314707). As the identifications found in the elurikkus.ee database are based on Latin plant names used in Estonia, the authors adjusted the Latin plant names presented in the article to follow The Plant List database (2018) and the European Flora (Tutin et al., 1964–1980); family assignments follow the Angiosperm Phylogeny Group (APG) IV (Stevens, 2017).

The authors entered the transcribed textual data into an Excel spreadsheet and Kai Vellak supplied the herbarium number and current identification for every specimen analysed for the present research. For ethnobotanical analysis, we included species with an explanation of the plant name, use of the plant, or some specific description. If there was only a local name or a description of the plant without clear connection with the herbarium specimen, they were not analysed, as these were obviously chapters that had not yet been properly started.

The manuscript of Rosenplänter (1831b) contained two sets of numbers, one of which was correlated with the numbers in the Herbarium (Rosenplänter, 1831a). However, not all the chapters of the manuscript had a herbarium number and some referred plants were not found in the expected place (probably lost during historical inventories) or, in a few exceptional cases, the corresponding herbarium specimen was clearly wrongly collected. Therefore, the final table contains some plants that have been identified by their local name and description or only the description given in the manuscript, and such plants are marked accordingly.

The information from both sources was combined, literally translated (for presentation in the table) and further analysed based on emic categories. The emic disease categories were conditionally adapted to the ICPC-2 (2003) categories in order to make the data more

comprehensible, presenting the results using RAWGraphs (Mauri et al., 2017). Culturally important diseases, which cannot be univocally interpreted, were presented in the results with their Estonian name, yet the meaning of the every term was explained on the basis of the available literature.

We also present the original identification in the Rosenplänter Herbarium, if it is different from the current one (except if it was a synonym), as well as Latin names added to the Herbarium in another person's handwriting. The Rosenplänter herbarium and manuscript was first reviewed in 1931–1932 by botanist Gustav Vilberg, later Vilbaste (1885–1967). He was interested in local plant names and explanations for their origin, and his work was finally published in the posthumous monograph *Nomina vernacula plantarum Estoniae* (Vilbaste, 1993). Vilbaste refers directly to the Rosenplänter manuscript and herbarium in his book only when some local plant names are explained or if the name in the manuscript is its first mentioning. There are also Latin names written in his handwriting on the herbarium sheets (marked as V in Table 1).

To aid identification based on the local name or detect a wrongly collected specimen, we crosschecked all local names and uses with the historical data on Estonian ethnomedicine and wild food plants: the repository of folkloric texts HERBA (Sõukand and Kalle, 2008) contains over 19,550 records on the names and uses of medicinal plants from 1868 to 2006 and a review of the wild food plants used in the territory of present Estonia from 1777 to 2015 (Sõukand and Kalle, 2016). To determine if the plant use is still known, we compared the results with those of our recent fieldwork on wild food plants on Saaremaa Island (Kalle and Sõukand, 2016) and in Setomaa and Võromaa (Kalle et al., 2020). We also compared the obtained information with the work of Luce (1829) conducted on Saaremaa Island a few years before Rosenplänter's work. Given the complexity of folk terminology where it is not possible to univocally relate local plant names or diseases in HERBA (Sõukand and Kalle, 2008) and the fact that Rosenplänter's collection was gathered from a very specific and limited geographical location, where no comparable ethnobotanical studies have been conducted, we can only outline the tendencies of change.



Fig. 2. Herbarium specimens from Rosenplänter's collection with examples of handwritten notes on use.

Table 1
The plant use analysis in Rosenplänter's herbarium and manuscript.

Latin name (voucher specimen number); family	Local name(s) in Southern Estonian	Identification in manuscript, if different	Our summary of Rosenplänter's manuscript and herbarium data. Emic diseases are given in <i>Italics</i> .
<i>Achillea millefolium</i> L. (TU314619; TU306173); Asteraceae	raudheina rohhi, raud hein, raudria rohhi, raud rea rohhe		This herb is boiled and drunk to treat <i>joosja</i> . The leaves are applied to a wound to stop bleeding. The plant is boiled and the water is used to bathe swellings. Flowers are used for the treatment of <i>rinnahaigus</i> .
<i>Actaea spicata</i> L. (TU306134); Ranunculaceae	nõia-kollad^U	<i>Chelidonium majus</i> L. ^V	One component of the fumigation mixture against witchcraft. This smoke is used to treat the sick.
<i>Agrimonia eupatoria</i> L. (TU314649); Rosaceae	maarja-lepp, maarja-leppad		Grows in meadows. If a cow's milk has a bad aftertaste, then these plants are boiled and both the water and herb are given to the cow.
<i>Agrostis gigantea</i> Roth (TU314615); Poaceae	kaste-hein	<i>Molinia caerulea</i> (L.) Moench ^R	Blooms at the same time as rye. Together with rye grain, these seeds are edible. It is called <i>Kastehein</i> [dew grass] because when a person walks in this grass, it covers them with dew.
<i>Alchemilla vulgaris</i> auct. (coll.) (TU314632, TU314633, TU314634, TU306184); Rosaceae	korts-rohhi, käo-kördid, ma alluse rohhe		Boiled covered; <i>ma allused</i> are washed with this water, hence the name <i>ma alluse rohhe</i> . Also used for animal feed.
<i>Allium schoenoprasum</i> L. (TU314690; TU306147); Amaryllidaceae	murrulauk, murrolauk		Grown in the garden and propagated by dividing the sod. The leaves and stems are used to top fresh fish soup.
<i>Angelica sylvestris</i> L. (TU314662); Apiaceae	heinputk, hein putked		The plant roots are extensively used by pharmacies.
<i>Antennaria dioica</i> (L.) Gaertn. (TU314606, TU306159); Asteraceae	kassi-käppad, kassi-käp		The plant looks like a cat's paw, which is why it is called "cat's paw".
<i>Arctostaphylos uva-ursi</i> (L.) Spreng. [#] ; Ericaceae	weikse kopso-tõbbe-rohhi^U, weikse kopso tõbbe-rohhi^U, lojuse kopso-tõbbe-rohhi^U, lojuse kopso tõbbe-rohhi^U		If cattle have lung disease, or cough, they are thought to have bugs in their lungs. This plant is then very good. The plant is boiled with its roots and leaves and given to the cattle to drink.
<i>Armoracia rusticana</i> P.Gaertn., B.Mey. & Scherb. (TU314681); Brassicaceae	mädada-reigas, reigas	<i>Raphanus raphanistrum</i> subsp. <i>sativus</i> (L.) Domin ^V	Root vodka is very good against <i>paistetus</i> - the swelling goes down and the water is expelled from the body. The roots are chopped and added to vodka. Let the person with <i>sullo tõbbe</i> inhale it, and drink it too.
<i>Artemisia absinthium</i> L. (TU314665); Asteraceae	koi-rohhi		Various uses; for example, given to turkey chicks, added to vodka, used in protecting clothes from the moth, etc.
<i>Artemisia vulgaris</i> L. (TU314657, TU314704); Asteraceae	pujuserohhi, pujusse rohhe, pujusse-rohhe		The plant roots are used by women to treat women's diseases.
<i>Avena sativa</i> L. (TU314643); Poaceae	kaer		The grain is fed to cows and horses if only straw is given to them. Gives strength to animals.
<i>Brassica oleracea</i> L. (TU314685); Brassicaceae	kaapsas		Grown in garden-beds. Good food plant.
<i>Briza media</i> L. (TU314636, TU306157); Poaceae	wärrisemise-rohhi^U, werrisemise rohhi^U, värisemise rohhe^U	<i>Briza media</i> ^H	If there is a <i>külmavärisaja</i> , the room must be fumigated with it. In the case of diseases from outside, both humans and animals are fumigated.
<i>Bromus secalinus</i> L. (TU314674); Poaceae	lustjad	<i>Poa pratensis</i> L. ^R , <i>Bromus secalinus</i> ^H	If there is a lot of it among the rye grain, then the bread will not be nutritious.
<i>Calluna vulgaris</i> (L.) Hull (TU314601); Ericaceae	nõmme kammaras, nõmme-kammaras		Rye sowing is predicted with the flowering of this plant. If it starts to bloom from the below, rye is sown on Laurence Day [August 10]; if from the middle then on the Assumption of Mary [August 15]; if from the top then on St. Bartholomew's Day [August 24].
<i>Caltha palustris</i> L. (TU314653); Ranunculaceae	warsa-kabja lehhed		It grows in wet soil and is the first plant to emerge from the soil in spring.
<i>Campanula patula</i> L. (TU306178); Campanulaceae	sinnise rosi rohhi		Plant is boiled and <i>roos</i> are washed with the water. There are three different types of <i>roos</i> : blue, red and white. Hence the plant name "herb of blue <i>roos</i> ".
<i>Campanula persicifolia</i> L. (TU306174); Campanulaceae	põie rohhe		When young children have bladder disease, the plant is boiled and given to drink. That is why the plant has this name.
<i>Capsella bursa-pastoris</i> (L.) Medik. (TU314640); Brassicaceae	sappi-rohhi^U		The plant is used when animals have gallbladder disease.
<i>Carex hirta</i> L. (TU314608); Cyperaceae	sone rohhi^U, wee-sone rohhi^U	<i>Carex</i> sp. ^{R,V}	Where these plants grow there are water courses underground. One can dig a well there. If there is a big floret, then the water course is deep underground; if there is a small floret, then the water course is near the surface. There are three types of similar plants ⁴ , but they showed me only that plant.
<i>Carex leporina</i> L. (TU306171); Cyperaceae	luhha hein ^U	<i>Carex</i> sp. ^{H,V}	Grows in wetlands. Livestock animals do not want to eat this.
<i>Carlina vulgaris</i> L. [?] ; Asteraceae	iwerselli-rohhi		Its root is boiled with beer and then taken with vodka to treat <i>rinnahaigus</i> and internal diseases.
<i>Carum carvi</i> L. (TU314646); Apiaceae	köömlid, köemlid		Used with all types of food.
<i>Centaurea jacea</i> L. (TU306185); Asteraceae	punnase rosi rohhe		The leaf of the plant is applied to red <i>roos</i> . Hence the name "herb of red <i>roos</i> ".
<i>Chenopodium album</i> L. [#] ; Amaranthaceae	malts¹		Weed in fertile soil. In spring, young plants are cooked in soup. By autumn, they become tough and unfit to eat.

(continued on next page)

Table 1 (continued)

Latin name (voucher specimen number); family	Local name(s) in Southern Estonian	Identification in manuscript, if different	Our summary of Rosenplänter's manuscript and herbarium data. Emic diseases are given in <i>Italics</i> .
<i>Cota tinctoria</i> (L.) J.Gay (TU314706); Asteraceae	karikakrad		Yellow flowers are used for dyeing yarn yellow.
<i>Cyanus segetum</i> Hill (TU314639, TU306151); Asteraceae	rukki-lill, rukki-lilles, rukki lill	<i>Cyanus segetum</i> ^H	Grows together with rye in the field, hence the name "ryeflower". If there are a lot of these seeds in bread flour, then the taste of the bread will be bitter.
<i>Dryopteris carthusiana</i> (Vill.) H.P. Fuchs (TU314609); Dryopteridaceae	lane sõnajalg ²	<i>Dryopteris cristata</i> (L.) A. Gray ^V	It grows in large mixed greenwood forest.
<i>Elymus repens</i> (L.) Gould [#] ; Poaceae	leik-hein, orras-rohhi, maawädid, sea-höödid		Pigs dig roots up in spring and eat them, hence the name <i>sea-höödid</i> . Roots are boiled to treat <i>ma allused</i> . Troublesome field weed.
<i>Epilobium angustifolium</i> L. (TU314666); Onagraceae	solika rohhe ^U	<i>Epilobium hirsutum</i> L. ^R	The seeds are given to children when they have stomach worms.
<i>Equisetum arvense</i> L. (TU314624); Equisetaceae	rebbase-händ, rebbasehänd	<i>Equisetum fluviatile</i> ^V	Coarse grass, cows do not eat it, but horses and sheep do. It grows out of the ground like rye sheaves and resembles a fox's tail.
<i>Equisetum fluviatile</i> L. (TU314623); Equisetaceae	konna-ossi	<i>Equisetum arvense</i> ^{R,V}	In winter, pigs eat the hay, which has been mowed where this plant grows.
<i>Equisetum sylvaticum</i> L. (TU314625); Equisetaceae	rebbasehänd		Coarse grass, cows do not eat it, but horses and sheep do. It grows out of the ground like rye sheaves and resembles a fox's tail.
<i>Eriophorum angustifolium</i> Honck. (TU306170); Cyperaceae	must pea, valge pea		Livestock animals do not want to eat this. The plant has a black head in spring that changes to white in summer, hence the name "white head, black head".
<i>Filipendula ulmaria</i> (L.) Maxim. (TU314703, TU306165); Rosaceae	worm-rohhi, worm	<i>Filipendula ulmaria</i> ^H	Good honey plant. The leaves are shaken onto the floor of rooms [? as an air freshener].
<i>Filipendula vulgaris</i> Moench (TU306191, TU314695); Rosaceae	wina rohhe, angerpistid		Peasants put [?] into vodka, hence the name of this plant.
<i>Fragaria vesca</i> L. (TU306167, TU314618); Rosaceae	masik, masikas, masika õis		The red berries are very sweet. That is why it is called <i>masikas</i> , because it is sweeter than other berries.
<i>Fragaria moschata</i> (Duchesne) Duchesne (TU314617) < <i>Fragaria vesca</i> L.>; Rosaceae	masik	<i>Fragaria vesca</i> ^R	Very tasty berries, also very good for making jam.
<i>Frangula alnus</i> Mill. (TU306136, TU306146); Rhamnaceae	paaks-pu, paasupu	<i>Frangula alnus</i> ^V , <i>Rhamnus catharticus</i> ^V	Wood is burned into charcoal which is used to make gunpowder. Bark is used for dyeing yarn red. [?] is boiled and given to children when they have worms.
<i>Fumaria officinalis</i> L. (TU314652); Papaveraceae	tulli maa-alluse rohhi ^U		The plant is boiled and used to treat <i>maa-allused</i> . You can also rub the plant between the hands making it moist and then place it on urticarial lesions.
<i>Galeopsis speciosa</i> Mill. (TU306176, TU314621); Lamiaceae	himmikas, immikad, messi-lilled	<i>Galeopsis tetrahit</i> L. ^{R,V}	Good honey plant, which is why it is named "honey-flower". Children pick the flowers to suck the sweet nectar. That is the reason for "such a plant" name.
<i>Galium album</i> Mill. (TU314692); Rubiaceae	hobbo-maddar	<i>Galium verum</i> L. ^V	People use the roots to dye yarn red, but they put in more than <i>G. boreale</i> roots.
<i>Galium boreale</i> L. (TU314660, TU306155); Rubiaceae	wärw-maddar ^U , wärw maddaras ^U , maddaras		Roots are boiled and women then dye yarn a very beautiful red color.
<i>Galium uliginosum</i> L. (TU306192); Rubiaceae	kõma rohhe ^U	<i>Galium</i> sp. ^H	When skin flakes off, it is boiled covered and is used to wash the area. Hence the name "dandruff herb".
<i>Geranium palustre</i> L. (TU314700); Geraniaceae	püsti-rohhud ^U , püsti-rohhi ^U	<i>Anemone pratensis</i> L. ^R	The plant produces a pointed fruit that is eaten when a person is struck by <i>pist</i> .
<i>Geranium pratense</i> L. (TU306203, TU306264); Geraniaceae	püsti-rohhud ^U , püsti-rohhi ^U	<i>G. sylvaticum</i> L. ^{R,V} ; <i>G. pratense</i> ^V	The plant produces a pointed fruit that is eaten when a person is struck by <i>pist</i> .
<i>Huperzia selago</i> (L.) Bernh. ex Schrank & Mart. (TU314686); Lycopodiaceae	anne-tõbbe-rohi, hanne tõwwe rohhi		Pharmacies buy and sell it. It is used in several medications and is used against various diseases.
<i>Hypericum maculatum</i> Crantz (TU306162); Hypericaceae	punned ^U , punnane rohhe ^U	<i>Hypericum perforatum</i> ^V , <i>Hypericum</i> sp. ^R	The flower buds are placed in vodka and turn the vodka red. This vodka is drunk like that, and women also use it "vere kinnitamiseks" (for reducing the blood low, literally fixing the blood). Hence the name "red herbs".
<i>Hypericum perforatum</i> L. (TU314600); Hypericaceae	wina-lill ^U , wina-punna ^U , naeste-punne ^U , ollankad, emmase rohhi ^U , jani-rohhi ³		The flower buds are placed in vodka and turn the vodka red. This vodka is drunk like that, and women also use it for medicine.
<i>Juncus alpinoarticulatus</i> Chaix (TU314607); Juncaceae	sone-rohhi ^U , wee-sone rohhi ^U	<i>Juncus articulatus</i> L. ^V	Where these plants grow there are water courses underground. [One can dig a well there.] If there is a big floret, then the water course is deep underground; if there is a small floret, then the water course is near the surface. There are three types of similar plants ⁴ , but they showed me only that plant.
<i>Knautia arvensis</i> (L.) Coult. (TU314691); Caprifoliaceae	tõnnise-rohhi		Peasants boil it and give it to cows.
<i>Lathyrus pratensis</i> L. (TU306180); Fabaceae	kana warwas		"Chicken toe" is the name of the plant because the leaves and stalks look like chicken toes.
<i>Ledum palustre</i> L. (TU314613); Ericaceae	kailud		All domestic animals are given this against cough.
	kanna-persed		

(continued on next page)

Table 1 (continued)

Latin name (voucher specimen number); family	Local name(s) in Southern Estonian	Identification in manuscript, if different	Our summary of Rosenplänter's manuscript and herbarium data. Emic diseases are given in <i>Italics</i> .
<i>Leucanthemum vulgare</i> (Vaill.) Lam. [#] ; Asteraceae			The flower of the plant resembles a chicken's butt when the wind blows the feathers apart and hence the name "chicken's butt".
<i>Lolium remotum</i> Schrank [#] ; Poaceae	hein-lustjad		If one has a lot of them as weeds in a flax field, it will make the cultivation of flax very troublesome.
<i>Lonicera xylosteum</i> L. [#] ; Caprifoliaceae	kukkepuu		In autumn there are red berries, which are not edible. The teeth for looms are made from the wood.
<i>Lycopodium clavatum</i> L. (TU306141); Lycopodiaceae	kuse raiaid		The leaves of the plant resemble spruce thorns, but softer. These evergreen stems are used by people in winter to decorate rooms and houses, especially in the city.
<i>Lysimachia vulgaris</i> L. (TU314648); Primulaceae < <i>Thalictrum flavum</i> L.; Ranunculaceae>	äkkilise rawwanduse rohhi ^U , äkkilise rabbanduse rohhi ^U , äkkilise rabbanduse-rohhi ^U		Used when a person or animal has <i>äkiline</i> . The juice obtained from rubbing this plant between your hands is very good for applying to carbuncles or anthrax sores and the person will get better right away.
<i>Lythrum salicaria</i> L. (TU306168); Lythraceae	rebbase häänd		The plant is shaped like a fox's tail, hence the name "fox's tail".
<i>Maianthemum bifolium</i> (L.) F.W. Schmidt (TU314637); Asparagaceae	orrawa marjad, orrawa-marjad, bibi leht		In the autumn its red berries are edible, but they have a bland taste.
<i>Malus domestica</i> Borkh. (TU314629) < <i>Malus sylvestris</i> (L.) Mill.>; Rosaceae	mets õuna-puu;	<i>M. sylvestris</i> ^V	Young trees are used as rootstocks for apple varieties. Its apples are very sour.
<i>Matricaria chamomilla</i> L. (TU314645); Asteraceae	kummelid		They bloom for a very long time. Used in pharmacies as an herb. It is also used for making tea, as an alternative to black tea.
<i>Melampyrum nemorosum</i> L. (TU306177, TU314663); Orobanchaceae	kuu-päwa-rohhi ⁵ , kuu pea rohhi, jani-rohhi		The name of the plant comes from the fact that the top leaves are like moonlight. This herb is boiled and given to cows when butter is white [milk low in fat] and also when milk begins to stretch like slime. This plant is fed to cows as the first food after calving.
<i>Melilotus albus</i> Medik. (TU314675); Fabaceae	maarja-maltsad ⁶	<i>Melilotus diffusa</i> ^R	Mixed with tobacco for pipe smoking.
<i>Mentha arvensis</i> L. (TU314683, TU314701); Lamiaceae	wessimündid, pippar mündid	<i>Mentha aquatica</i> ^{R,V} ; <i>M. piperita</i> ^R	A bad smelling plant. Pigs do not want to eat hay containing it.
<i>Mentha longifolia</i> (L.) L. (TU314664); Lamiaceae	krusemündid	<i>Mentha crispata</i> ^R	Cultivated in gardens; it has a good aroma.
<i>Menyanthes trifoliata</i> L. (TU314655); Menyanthaceae	ubba-lehhed, ubba-leht, hubba leht		Good plant to treat diseases in pigs. It is simply boiled and drunk when "a sick person is passing blood" [blood in diarrhea], and it is good for cough.
<i>Nardus stricta</i> L. (TU306169); Poaceae	sea arjas, sea-arjase hein		A hard grass like "pig bristles", hence the name of the plant. Livestock animals do not want to eat this grass.
<i>Odontites vulgaris</i> Moench (TU314602); Orobanchaceae***	põllo kammaras, põllo-kammaras		Rye harvest time is predicted according to the flowering of the plant. When the flowering of the plant reaches the top it is the right time to cut rye.
<i>Ononis arvensis</i> L. [#] ; Lamiaceae	joosia rohhe ^U		Used to treat <i>joosja</i> . Boil the plant and let the ill person drink this very warm water; 0.3 L ("korter") at a time.
<i>Origanum vulgare</i> L. (TU314651); Lamiaceae	maa-alluse rohhi ^U		The herb is boiled until soft. The water is used to wash <i>maa-allused</i> , if one has pimples and scabs. The scabs dry out and disappear.
<i>Pedicularis palustris</i> L. (TU306182, TU314642); Orobanchaceae	sookuusk, maarja lepp		Grows in meadows. "Mire spruce" is the name of the plant because it resembles spruce and grows in mires. If a cow's milk has a bad aftertaste, then these plants are boiled and both the water and herb are given to the cow.
<i>Persicaria lapathifolia</i> (L.) Delarbre (TU314612); Polygonaceae	hundi-hambad	<i>Polygonum aviculare</i> L. ^R	The stem is segmented and resembles the teeth of predators, hence the name. It has a bitter taste and that is why it kills fleas.
<i>Phleum pratense</i> L. (TU314620, TU306160); Poaceae	ussi-rukkid, horrawa häänd, orrawa häänd		It is called <i>ussi-rukkid</i> [worm rye] because the top of the plant is shaped like a worm. It is called <i>orrawa häänd</i> [squirrel tail] because the top of the plant is shaped like a squirrel's tail.
<i>Phragmites australis</i> (Cav.) Trin. ex Steud. (TU314673); Poaceae	pilliroog		The flower buds are used for dyeing yarn green.
<i>Pilosella officinarum</i> Vaill (TU314705); Asteraceae	amba wallu rohhi	<i>Gnaphalium uliginosum</i> L. ^R , <i>Pilosella praealta</i> (Vill. ex Cochn.) F.W.Schultz & Sch. Bip. ^V	If a person's teeth hurt then this plant is used. Dry, as long as it can be crushed; then it is put in a pipe and smoked. If that does not work, the plant is put directly on the tooth.
<i>Plantago media</i> L. (TU314614); Plantaginaceae	tee-lehhed, tee-leht ⁷		Hence the name "toothache herb" Leaves are applied to wounds and abscesses, reducing inflammation and cleansing infected wounds. Young leaves can be used to make a good soup.
<i>Platanthera bifolia</i> (L.) Rich. (TU306163, TU306148, TU306215); Orchidaceae	nawtsär, kurradi käpp;	<i>Orchis</i> sp. ^{H,R} , <i>Dactylorhiza</i> sp. ^V	White-flowering plant, blooms in June, has a very good smell. The root has the shape of a hand, hence the name "Devil's Hand".
<i>Polygonatum multiflorum</i> (L.) All. (TU314658); Asparagaceae	luu-tõbbe rohi ^U	<i>Polygonatum odoratum</i> (Mill.) Druce ^V	If a person has a bone-disease, these plants should be boiled and drunk. Chewing the roots of this plant also helps.

(continued on next page)

Table 1 (continued)

Latin name (voucher specimen number); family	Local name(s) in Southern Estonian	Identification in manuscript, if different	Our summary of Rosenplänter's manuscript and herbarium data. Emic diseases are given in <i>Italics</i> .
<i>Potentilla anserina</i> L. (TU314638); Rosaceae	hobbose kõhha rohhi ^U , hobbuse kõhha-rohi ^U		The plant is boiled and given to horses if they have a cough.
<i>Potentilla argentea</i> L. (TU314693); Rosaceae	salla kõi rohhi ^U , salla-koi-rohhi ^U , joosja-rohhi ^U , halli rabbanduse-rohhi ^{#U}		The flowers are rubbed and applied to <i>salakoi</i> . The flowers are boiled and used to treat <i>joosja</i> . If a person suddenly falls ill, it is called <i>rabandus</i> . In this situation several herbs are burned together. This plant is one of them.
<i>Potentilla erecta</i> (L.) Rausch. (TU314667); Rosaceae	tedre maddar , tedre madaras		Livestock animals eat hay with this plant. The roots of the plant are placed in vodka, which turns the vodka red and gives the vodka a good taste.
<i>Primula farinosa</i> L. (TU306142); Primulaceae	jani lil		The blue flowers smell good. The plant grows abundantly in wet grasslands.
<i>Primula veris</i> L. (TU314654); Primulaceae	sõrm-lill		Used in pharmacies for various medications. Flowers on the end of the stem are like fingers, hence the name "finger flower".
<i>Prunus padus</i> L. (TU306194); Rosaceae	tommingas		Black berries have stones inside, but people eat them, although not very willingly. Because this tree is very soft and easy to bend, horse collar bows and the wooden details on sledges and horsecars, as well as wood barrel hoops are made of it. The wood does not rot easily, so whip stalks and walking sticks are also made of it.
<i>Pteridium aquilinum</i> (L.) Kuhn (TU314610); Dennstaedtiaceae	põllo sõnnajalg		Livestock animals do not eat this plant. The leaves are used to eliminate bugs. Once the manure is removed from the barn, the plant is placed on the floor of the barn.
<i>Pyrola rotundifolia</i> L. (TU314659); Ericaceae	wina-lill ^U		The plant is used in vodka.
<i>Ranunculus acris</i> L. (TU314605, TU306183); Ranunculaceae	tulli-hein , tulli-mulla-lill, willi-lill , tuli lill	<i>Ranunculus sceleratus</i> L. ^{R,V} ; <i>Ranunculus acris</i> ^V	The plant burns the skin, hence the name "fire flower". When the plant is put on the skin for one day, it creates a fluid-filled blister as if the skin was burned with fire. The roots are harvested, dried and ground to be added to a medication for scabies, but it is not known if it should be applied topically or ingested.
<i>Ranunculus polyanthemos</i> L. (TU306143); Ranunculaceae	tulli-hein, tulli-mulla-lill , tulli-mulla lil, willi-lill;	<i>Ranunculus flammula</i> L. ^{R,V}	If one rubs its flowers and then touches one's skin, the skin will blister, hence the name "fire flower". It is a very good painkiller. Rubbing the plant very fine and then applying it to carbuncles or anthrax lesions will alleviate pain in just 2 h.
<i>Rubus caesius</i> L. (TU306145); Rosaceae	põldmarjad	<i>Rubus saxatilis</i> L. ^R	Blue berries are very good for eating.
<i>Rubus chamaemorus</i> L. [#] ; Rosaceae	käbbalad		The berries ripen in the autumn and are very good for food.
<i>Rubus idaeus</i> L. (TU314689, TU314707); Rosaceae	waargas		Very thorny plant. The berries are very tasty.
<i>Rumex acetosa</i> L. (TU314676, TU306156); Polygonaceae	happo-oblikas , happu hoblikas, happo-hoblikas	<i>Rumex</i> sp. ^H	Sour tasting plant, hence the name. In the spring, when the leaves are young, they are boiled in soup.
<i>Rumex aquatilis</i> L. (TU314699); Polygonaceae	hobbo-oblikas	<i>Rumex conglomeratus</i> Murray ^{R,V} , <i>Rumex crispus</i> L. ^V	Seeds are used to treat diarrhea. Roots are boiled in water until a juice-like jam is formed, which is used to treat scabies and <i>Karpa disease</i> .
<i>Scrophularia nodosa</i> L. (TU314688); Scrophulariaceae	sea lõua rohhi ^U , sea lõu tõbbe rohhe ^U	<i>Scrophularia auriculata</i> L. ^R	The flowers and stalk have a very bad odor. If pigs have a swollen jaw, they are treated with this plant. The plant is boiled and given to the pigs while still warm, and their jaws are also washed with this water.
<i>Scutellaria galericulata</i> L. (TU306166); Lamiaceae	joosja rohhe		Used to treat <i>joosja</i> , hence the name. The plant is boiled and the water given to an ill person to drink.
<i>Secale cereale</i> L. (TU306149, TU314687); Poaceae	rukki, rukkid		Grown in fields as winter rye, and then dried and cleaned in drying barns.
<i>Sedum acre</i> L. (TU314694); Crassulaceae	kukke kannused		Plants are boiled and given to cows so they produce good milk.
<i>Sestera caerulea</i> (L.) Ard. [#] ; Poaceae	lipshein, orras lipshein		Difficult to mow because it is very flexible and thus "runs through the scythe". However, livestock animals eat it more than <i>Nardus stricta</i> L.
<i>Silene flos-cuculi</i> (L.) Greuter & Burdet (TU306179) < <i>Silene viscaria</i> (L.) Jess.>; Caryophyllaceae	tõrwa lil		The plant is named "tar flower" because the stem is tarry.
<i>Silene viscaria</i> (L.) Jess. (TU314656); Caryophyllaceae	tõrwa-lill		The plant is boiled and given to cattle if they <i>pee red</i> . The stem is tarry and smells of tar.
<i>Silene vulgaris</i> (Moench) Garcke (TU314647); Caryophyllaceae	põielill ^U , põielilles ^U , põierohhi ^U		The seeds are broken and given to young children [in the case of bladder disease].
<i>Sinapis arvensis</i> L. (TU306153); Brassicaceae	telg ⁸		Troublesome weed.
<i>Solanum dulcamara</i> L. (TU306187); Solanaceae	maa-witsad ^U , ma-alluse rohhe ^U		The plant is boiled and then areas covered with <i>maa-allused</i> lesions are washed. It is also used in several pharmacy medicines.
<i>Solanum tuberosum</i> L. (TU314671); Solanaceae	kartuhwel		Grows in cultivated lands. An important staple food that comes with every meal. Starch is also made from it.
	walge selja lehhed	<i>Crepis praemorsa</i> (L.) Turcz. ^V	The leaves are placed between inflamed toes.

(continued on next page)

Table 1 (continued)

Latin name (voucher specimen number); family	Local name(s) in Southern Estonian	Identification in manuscript, if different	Our summary of Rosenplänter's manuscript and herbarium data. Emic diseases are given in <i>Italics</i> .
<i>Solidago virgaurea</i> L. (TU306186) < <i>Cirsium helenioides</i> (L.) Hill>; Asteraceae			
<i>Sonchus arvensis</i> L. [#] ; Asteraceae*	piim ohhakas		Grows in fields. When a plant is broken, milk comes from it, hence the name "milk thistle". The plant is boiled in soup.
<i>Sorbus aucuparia</i> L. (TU314631); Rosaceae	pihlakas, pihhelkas		Berries are suitable for eating. Wood is used for many purposes.
<i>Stellaria media</i> (L.) Cirillo (TU314697); Caryophyllaceae	wirn rohhi, wirn-rohhe	<i>Silene nutans</i> L. ^R	Animals eat this grass.
<i>Taraxacum officinale</i> F.H.Wigg. (coll.) (TU314616); Asteraceae	wõilill		They are fed to cows.
<i>Tilia cordata</i> Mill. (TU314680); Malvaceae	pärn, pärna-puu, nine-puu, lõhmus, lõhmuse-puu	<i>Tilia × europaea</i> L. ^R	Soft wood [for carpentry]. Ropes are made from the liber as well as very beautiful horse sleighs. Young trees are called <i>lõhmus</i> .
<i>Trifolium medium</i> L. (TU314611); Fabaceae	härja pea⁹ hein, härja pea-rohhi	<i>Trifolium pretense</i> ^V	The soil is very fertile where this plant grows. Good honey plant. A valuable hay plant, as animals readily eat hay containing it.
<i>Trifolium montanum</i> L. (TU306138, TU314661, TU306152); Fabaceae	pimarohhud^U, rist hein, sõnni rohhi	<i>T. album</i> ^R , <i>T. montanum</i> ^H	When raw milk goes bad in wood-barrels, women boil the plant inside wood-barrels [for disinfection]. Also given to animals for food. It is called <i>ristikhein</i> [cross hay] because the leaves are cross-shaped.
<i>Trifolium pratense</i> L. (TU306181); Fabaceae	härja mun	<i>Trifolium</i> sp. ^R	They are sown in fields. Livestock animals like to eat this plant the most.
<i>Trollius europaeus</i> L. (TU306154); Ranunculaceae	kuller kup		Nothing is known about it.
<i>Typha latifolia</i> L. (TU314669); Typhaceae	hundi kurrikas	<i>Typha angustifolia</i> L. ^{V,R}	Hatters make black slouch hats from its dark brown velvety cylindrical heads.
<i>Urtica dioica</i> L. [#] ; Urticaceae**	nögges	<i>Lamium album</i> L. ^V	The seeds are boiled with oats and given to horses to gain strength. The plant was boiled and the water given to a mare to drink, so there is enough milk for the foal.
<i>Vaccinium myrtillus</i> L. [#] ; Ericaceae	mustikamarjad		The berries are very good for eating.
<i>Vaccinium uliginosum</i> L. (TU314622); Ericaceae	sinnikad		Good berries, but if too many are eaten, they make a person sick, especially when picking them among <i>Ledum palustre</i> .
<i>Vaccinium vitis-idaea</i> L. [#] ; Ericaceae	poolgad		The berries are cooked into a good jam.
<i>Verbascum nigrum</i> L. (TU314650); Scrophulariaceae	punnase tõbbe rohhi^U		If cattle pee red, they are treated with this plant. The plant is boiled until almost half of the water is gone. About 1.2 L of water is given to cows and 0.3 L to calves and bulls.
<i>Veronica serpyllifolia</i> L. (TU314672); Plantaginaceae	audumise-rohhi^U	<i>Veronica arvensis</i> L. ^R	The leaves are placed between inflamed toes.
<i>Veronica officinalis</i> L. (TU314668); Plantaginaceae	jooksja rohhi^U, jooksja-rohhi^U, maa-alluse rohhud^U		This plant is boiled with beer. If a person has <i>joosja</i> somewhere in the body (for example, in the eye), they should wash the affected area with it as hot as they can tolerate. Drinking this also helps treat <i>joosja</i> . The leaves are boiled and the boiled water is used to treat <i>maa-alluse</i> (d).
<i>Viburnum opulus</i> L. (TU306137); Adoxaceae	õispuu		The berries are inedible and the wood is not used.
<i>Vicia cracca</i> L. (TU314670, TU306144); Fabaceae	kurre hernes¹⁰, kurre herved	<i>Pisum sativum</i> L. ^R	Its peas can be eaten.
<i>Vicia faba</i> L. (TU306150); Fabaceae	ubba		Grows well in fields. Very good crop for cooking.
Unidentified sp.	kiliterrohhi		If a domestic animal cannot urinate, then they should be treated with this herb. Boil the plants covered so that the water barely covers the plants. After that, both the water and the plants are given to the animal. Repeat as many times as needed until the animal is healthy again.

[#] - The plant was identified by its local name and description. [?] - The plant was identified only by its description. ^R - The original plant identification in the Rosenplänter Herbarium, if it is different from the current identification. ^H - Latin name added in another person's handwriting. ^V - Plant identification provided by G. Vilbaste (1993), if it is different from the current identification. ^U - The name refers to its use (unless Rosenplänter himself had already specified the name in the description).

¹ - The same local plant name was used for *Artiplex* sp.

² - *Laane sõnajalg* means "fern growing in mixed greenwood forest".

³ - Rosenplänter also refers to *jani rohhi* as *Valeriana officinalis* L. (TU306164).

⁴ - Vilbaste specifies in his book that those taxa are *Juncus*, *Carex* and *Blysmus* (Vilbaste, 1993).

⁵ - Along with the herbarium specimen there was a note that *kuu päwa rohhi* is also the name for *Solanum nigrum* L. Both species were known all over Estonian with the same local name (Vilbaste, 1993).

⁶ - Rosenplänter also associated the local name *maarja-maltsad* with *Melilotus officinalis* (L.) Pall. (TU314702).

⁷ - Rosenplänter also associated the local name *tee-leht* with *Plantago major* L. (TU314696).

⁸ - Rosenplänter also associated the local name *telg* with other agricultural weeds with yellow flowers, like *Erysimum cheiranthoides* L. (TU314626) ja *Raphanus raphanistrum* L. (TU314627).

⁹ - Rosenplänter also associated the local name *härja pea* [bull head] with *Prunella vulgaris* L. (TU306175).

¹⁰ - Rosenplänter also associated the local name *kurre hernes* [stork pea] with *Vicia sylvatica* L. (TU306172). * We did not accept the specimen of *Pilosella* sp. (TU306161), which was erroneously harvested by Rosenplänter, associated with the text on *Sonchus arvensis* in the herbarium.

** We did not accept the specimen of *Lamium album* L. (TU314635), which was erroneously harvested by Rosenplänter, associated with the text on *Urtica dioica* in the herbarium.

*** Initially this herbarium sheet contained two more specimens, which were identified as *Euphorbia* sp. (TU314603, TU314604). We did not add those to this table, as they were obviously mistakes.

<Latin binominal > – the plant that was more likely to have actually been used, based on a synthesis of the information provided in Vilbaste (1993) and Sõukand and Kalle (2008).

Local plant names in bold represent the names used in the manuscript (Rosenplänter, 1831b).

Emic disease: *joo(k)sjä, jooksva* – a disease which runs (from “*jooksmä*”) all over the body, in later folklore related to rheumatic diseases (Vilbaste, 1993; Sõukand, 2004); *Karpa disease* - is an itchy scabby disease mostly occurring on the neck of pigs and rarely in humans (Vilbaste, 1993); *külmaväriseja* - in later folklore also *külmätõbi, hall, väriseja* – refers to the disease currently known as malaria (Vilbaste, 1993; Paal, 2014); *maa-alluse(d)* – various kinds of skin diseases (often pimples and scabs) believed to originate from the land (anger of the land) or river, in earlier folklore also connected with the dead (Vilbaste, 1993; Kivari, 2008); *paistetus* - local swelling, oedema (Vilbaste, 1993); *pist* - a sudden, sharp pain inside the body (*stixis, pleuritis*) (Vilbaste, 1993); *rabandus* – sudden heart failure or apoplexy (Vilbaste, 1993); *rinnahaigus* – pain in the chest, for example, stenocardia, angina pectoris, several respiratory diseases (Vilbaste, 1993); *roos* – erysipelas (Vilbaste, 1993); *salakoi* – chronic eczema (Vilbaste, 1993); *sullo többe* - most likely stuffy nose, but no certainty.

3. Results

The manuscript, with the title page dated 1831, contains 100 local plant names on the numbered pages, most of which include a description of the plant and its use. Of the 11 herbarium folders, only the first folder was completely organised, containing 100 samples, which were linked through numbers to chapters in the manuscript. In addition to Estonian, plant names were also provided in the other languages he knew: Latin, German, Latvian and sometimes Russian. The second folder (100 specimens) already contained notable omissions with regard to the names of plants. The third folder consisted mainly of garden plants and had many

blank sheets. Folders 4 and 5 contained Poaceae taxa and had almost no written information. In addition, there was a bound folder in the herbarium, in which Rosenplänter dried the plants, and there were still around 50 specimens inside. Besides the manuscript and the herbarium, there are also about fifty loose paper tags on which Rosenplänter wrote down direct conversations he had with people (although he had not yet copied them into the manuscript). These notes were mostly related to drying plant samples.

Table 1 presents 129 folk taxa, belonging to 40 families, including one unidentified folk taxon. Of these, the most well represented were Asteraceae and Rosaceae (15 taxa each), Poaceae (11 taxa), Ericaceae

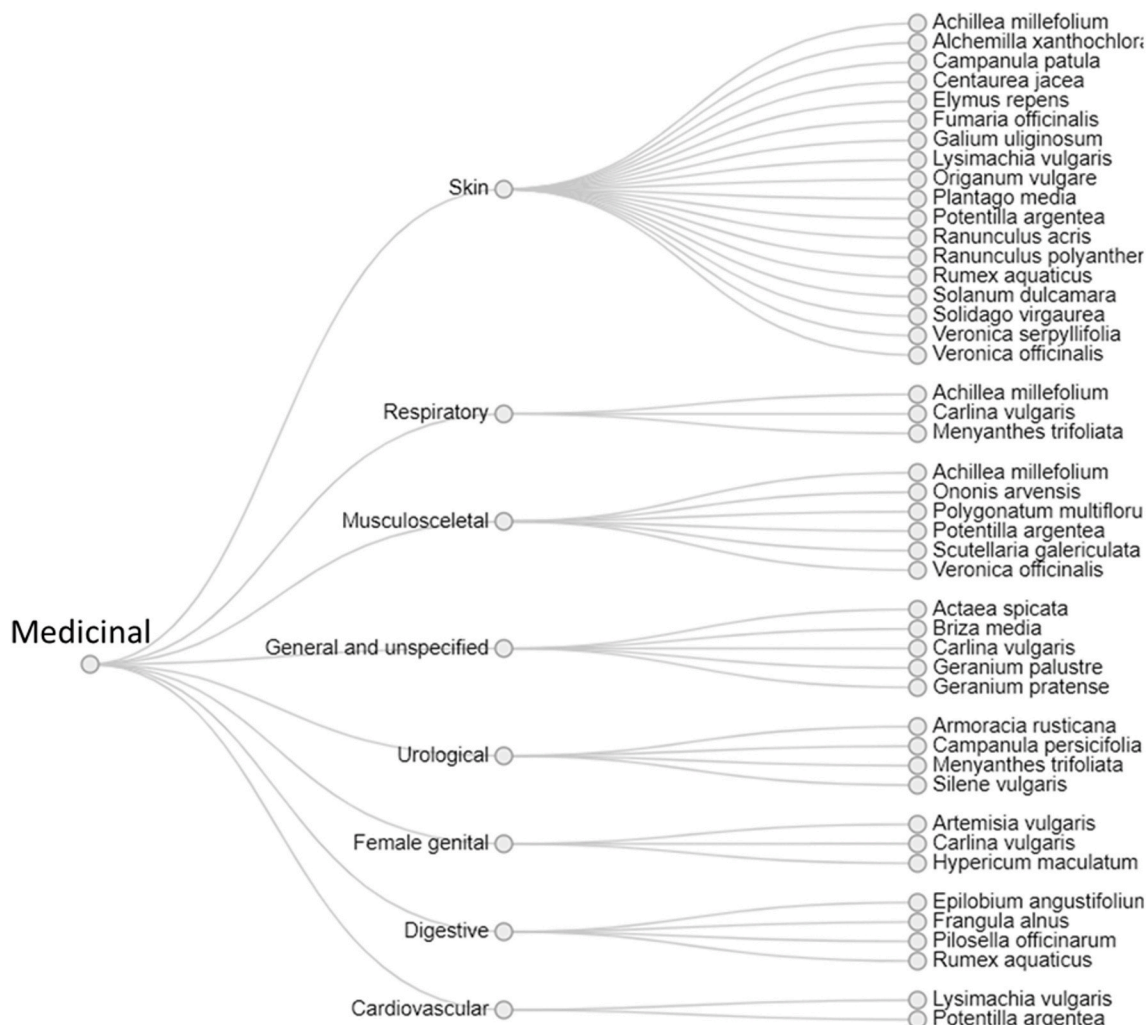


Fig. 3. Cluster diagram of used plants translated into ICP-2 standard disease categories for medicinal uses.

and Fabaceae (7 taxa each), Lamiaceae (6 taxa) and Orobanchaceae, Caryophyllaceae and Brassicaceae (4 taxa each). The highest number of uses among the 165 use records (UR) was medicinal (54), followed by wild food (24), household (23), fodder for animals (18) and ethno-veterinary uses (16). Of the specified medicinal uses, the largest number of plants was used to treat skin diseases, followed by musculoskeletal and general diseases (Fig. 3).

3.1. Comparison with earlier studies of the herbarium and manuscript and typology of possible mistakes in plant collection and identification

When we compared the identifications provided by Vilbaste (1993) it became apparent that quite a few did not overlap with those of Rosenplänter or Luce, or even recent identifications made by herbarium curators. Below we outline several possible reasons for the discrepancies in identification and provide some examples. A majority of the mistakes were related to taxa of the same family, while another big factor was unfinished work.

3.1.1. Mistakes within a single genus

3.1.1.1. Several representatives of one genus collected as one specimen. In some cases, the description of the plant, as well as its use, local name and habitat, provided in Rosenplänter's manuscript refer to one species of the genus but another species was identified in the herbarium. Presumably, Rosenplänter did not recognise the species in nature and he collected two taxa instead. For example, both the popular name "konnaossi" [frog-equisetum] and the description of the habitat as "meadow or swamp" refer directly to *Equisetum fluviatile* (TU314623). However, both Rosenplänter (1831a) and Vilbaste (1993) identified it as *Equisetum arvense*.

3.1.1.2. Mistakenly collected specimens. Conversely, in the case of *Malus domestica* (TU314629), the popular name "mets õunapuu" [forest apple tree], the description of the apples and the use of the tree as a graft for cultivated species refer directly to *Malus sylvestris* (also referred to as such by Rosenplänter and Vilbaste). Apparently, instead of collecting *Fragaria vesca*, Rosenplänter collected *Fragaria moschata* (TU314617). *F. moschata* could not have been growing well then, as it was first found in Estonia at the beginning of the 19th century (Kukk, 1999). Although the plant blooms abundantly, it rarely produces fruit in Estonia. Therefore, it is not the plant whose "berries are used to make jam". Vilbaste also introduced some additional identification errors; for example, he identified *Polygonatum multiflorum* (TU314658) as *P. odoratum*, *Hypericum maculatum* (TU306162) as *H. perforatum*, and *Typha latifolia* (TU314669) as *T. angustifolia*, etc.

Sometimes mistakes were made with regard to rather different plants. For example, *Silene flos-cuculi* (TU306179) is known by its popular name "tõrwa lil" [tar flower]. However, both the description of the plant and the habitat refer to the species *Silene viscaria*. In addition, the name of the specimen of *S. viscaria* (TU314656) in the herbarium was also listed as "tõrwa-lill". The plants are very similar in appearance, but the unique feature, the sticky stem, is present only in the latter one.

3.1.1.3. Generalizing the popular name of a genus. Rosenplänter stated, in the preface to his manuscript, that several Estonian names, like "madar" [*Galium*, *Potentilla*], "malts" [*Atriplex*, *Chenopodium*], "münt" [*Mentha*], etc., refer to the whole family (Rosenplänter, 1831a). This explains why he collected the species *Mentha arvensis* (TU314683), described it as such, but referred to it as "wessi-mündid" [water mentha]. The name "wessi münt" has not been confirmed by later sources, and it is obviously the name of *M. aquatica* [Vilbaste also identified it as *Mentha aquatica*]. We have also identified a specimen (TU314701) of the species *Mentha arvensis* called "pippar müntid" [peppermint]. This name, according to tradition, belongs to the species *Mentha x piperita*.

Thus, Rosenplänter probably picked up the first *Mentha* plant he encountered.

3.1.1.4. Too general a description provided by peasants. Rosenplänter also recorded some plant descriptions that can be used to identify several species in a genus. For example, a specimen (TU314605) which is now identified as *Ranunculus acris* was identified by Rosenplänter and Vilbaste as *Ranunculus sceleratus*, while specimen TU306143 which is now identified as *Ranunculus polyanthemos* L. was earlier identified as *Ranunculus flammula*. However, the description of the plant and habitat, as well as the local name, can refer to all four species. The same is true for species of the *Geranium* genus where the description, usage and popular names in the manuscript are similar for *G. pratense*, *G. palustre* and *G. sylvaticum*.

3.1.2. Cross-genera mistakes

While there are rather few cross-genera mistakes, they illustrate the following issues.

3.1.2.1. Unifying name. Rosenplänter stated that all plants bearing the name "maarja-lepp" have a similar use. He harvested *Agrimonia eupatoria* (TU314649) but the habitat ("water meadow") and plant description refer to *Pedicularis palustris* (TU314642), whereas the description and habitat ("dry meadow") of the second plant refer to the first species.

3.1.2.2. Wrongly collected similar specimens. "Kurradi käpp" [Devil hand] is also clearly not a local name for *Platanthera bifolia* (TU306163). Instead, both the common name and the description of the plant refer to the species *Dactylorhiza maculata* (L.) Soó, which was also collected by Rosenplänter (TU306261, TU306214), although he did not complete these herbarium pages. Vilbaste associated the information with the taxa *Orchis* sp. and *Dactylorhiza* sp.

We also doubt that specimen TU306186 was the plant to which the informant was referring; rather, it is likely that Rosenplänter himself picked up the wrong plant later, based on the description provided by the informant. The specimen has only the root-leaves, which has now been identified as *Solidago virgaurea* [Vilbaste identified it as *Crepis praemorsa*]. Rosenplänter stated that these plants grow on ridges and in heaths, which, therefore, describes the habitat of *Solidago* species. The local plant name "walge selja lehhed" [white back leaves] has never been used either for *Solidago* or *Crepis* species. However, both the local plant name and usage refer to *Cirsium helenioides* (L.) Hill (Soukand and Kalle, 2008).

Similarly, specimen TU314648, now identified as *Lysimachia vulgaris*, does not have such a popular name (*äkkilise rawwanduse rohhi*) or folk use (stroke) in the later literature or traditional medicine. However, both the use and name refer to the species *Actaea spicata* and *Thalictrum flavum*. *L. vulgaris* is similar in appearance (yellow flowers) to *T. flavum*, so perhaps Rosenplänter wanted to collect this plant instead.

3.1.3. Unfinished work

That Rosenplänter's work was suddenly interrupted is also evidenced by the fact that a large number of later culturally important plants were collected, yet they lack a local name or use. Thus, the herbarium contains wild food plants, common all over Estonia, without a name or use, such as *Oxycoccus palustris* L. (TU306250) and *Oxalis acetosella* L. (TU306234). It also contains no data, despite the existing herbarium specimens, on widely known medicinal plants such as *Acorus calamus* L. (TU306233), *Valeriana officinalis* L. (TU306273), *Rosa canina* L. (TU306271), *Tanacetum vulgare* L. (TU306201), and *Thymus serpyllum* L. (TU306139). Cultivated medicinal plants and vegetables were also present in his herbarium, including *Melissa officinalis* L. (TU306212), *Asparagus officinalis* L. (TU314682), *Anethum graveolens* L. (TU314641), *Cucumis sativus* L. (TU314678), and *Daucus carota* L. (TU314679), yet their use was not described. As we cannot be certain which chapters

Rosenplänter considered finished, we cannot be sure if the observed inconsistencies are due to mistakes or unfinished work.

3.1.3.1. Loose herbarium. Some of the confusion seems to be related to the fact that not all plant specimens were permanently attached to the herbarium sheets. For example, the plant now identified as *Pilosella officinarum* (TU314705) was identified by Vilbaste as *Hieracium piloselloides* and by Rosenplänter as *Gnaphalium tomentosum* Hoff, which is clearly different from *Pilosella* or *Hieracium* species. The plant has probably been moved to the wrong place within the herbarium or the mistake had already been made during collection, which is the case for several other plants. For example, *Geranium palustre* (TU314700) was identified by Rosenplänter as *Anemone pratensis*. *Anemone pratensis* has a different appearance and its popular name and usage does not correspond to the local plant name provided, “püsti-rohhud”. We also did not accept the connection of specimen TU306161 (identified as *Pilosella* sp.) to the name “piim ohhakas” [milk thistle]; instead, we have associated both the use and name with *Sonchus arvensis* L. It was also incorrect to relate *Lamium album* (TU314635) to the name “nõgges” and its use, as both unequivocally refer to *Urtica dioica* L. In a later publication, Rosenplänter himself also mentioned “nõggesed” as a name for *U. dioica* by teaching peasants to make soup with this plant (Rosenplänter, 1845).

3.1.3.2. Loose notes. Since Vilbaste worked on Rosenplänter’s manuscript and herbarium, some of the loose notes with local plant names and uses, as well as loose plant samples present in the 1930s, have disappeared. Of these, we have only the references in the Vilbaste book; for example, *Geranium pratense* “suhkrolil”, *Rumex crispus* L. “hobbo-oblikas”, *Crepis paludosa* (L.) Moench “wõi-lilled”, *Galium molluga* L. “hobbo-maddar”, *Rhamnus cathartica* L. “paaks-puu”, *Mentha crispa* “Rusemündid”, *Sonchus arvensis* “piim ohhakas”, *Dryopteris carthusiana* “lane sõnna-jalg”, and *Lysimachia vulgaris* “mets kannep” (Vilbaste, 1993). Over time, some herbarium specimens have also been lost, including *Arctostaphylos uva-ursi*, which retains the formatted identification page with traces of adhesive, but not the specimen itself.

3.2. Cultural importance reflected in local names and the categorical web

When we analyse the local plant names, we can observe the wide variety and cultural significance attributed to many of them by their name. Rosenplänter was trying to standardize botanical terminology in his manuscript and therefore he listed mainly one name per plant (with only a few exceptions), whereas for the herbarium specimens there are up to five local plant names for one taxon, most likely all the names he encountered. Therefore, the scarcity of local plant names in the manuscript does not indicate that they were not in circulation at the time, but rather the choice of Rosenplänter himself. He primarily chose names that referred to the use of the plant, and in particular medicinal uses.

In fact, the name of the disease was very often reflected in the plant name. For example, “rheumatism herbs” (joosja rohhi) were used to treat rheumatism (joosja), “erysipelas herbs” (rosi rohhi) were used to treat erysipelas (roos), etc.

Functional diversity was present, but not widespread outside of medicine: plants used for vodka had the prefix “vodka-”, while plants used for dyeing had the prefix “dye-”.

The resemblance of a plant to some culturally more relevant object was often reflected in the name. For example, all species with a spruce-like appearance had the prefix “spruce-”, and plants that had leaves resembling bean leaves were named “bean leaf”. Likewise, plants whose flowering was associated with Midsummer’s Day (June 24) were called “Saint John’s Day herb”, and plants resembling an animal tail were called “squirrel tail” or “fox tail”. In addition, plants whose rhizomes were eaten by pigs had the prefix “pigs-”; plants growing along water courses were referred to as “water course grasses”; plants growing in a rye field were called “rye flowers”; plants growing in or near a field had

the prefix “field-”; plants growing in the forest had the prefix “forest-”, etc. This indicates that a well-known species (e.g. spruce, bean) or habitat (e.g. field, forest) was linked to the name in order to better remember the plant.

The cultivated plants in Rosenplänter’s herbarium have mainly names of foreign origin, adapted from German: *Matricaria chamomilla* “kummel” (Kamille), *Solanum tuberosum* “kartuhwel” (Kartoffel), *Mentha longifolia* (L.) L. “krusemündid” (Krauseminze), *Brassica oleracea* “kaapsas” (Kaps) and others. We found only one taxon belonging to the local flora that has a name originating from a foreign language: *Platanthera bifolia* “nawtsär”, which is believed to be an adaptation of the German *Nachtschatten*.

Although the overview of the plant-related knowledge of Rosenplänter’s parishioners is not complete or exhaustive, and thus we cannot draw definite conclusions, we can outline tendencies based on the data available. If we exclude cultivated foods, medicinal plants sold in pharmacies and species without a specific/known use, we can build a web-like structure in which some multifunctional plants represent nodes of interrelations between different use-groups, supported by names related to use (Fig. 4). While only approximately 20 plants had more than one application, for all but 10 applications there was more than one plant that could be used as an alternative.

Therefore, we propose considering a web-like categorization as the most suitable to describe preliterature plant use. At its core is need, surrounded by solutions, which are marked distinctively for every separate need. For example:

- 1) if *Hypericum* sp. is placed in vodka, it is called “vodka flower”;
- 2) if it is needed as a women’s medicine, it is referred to as “women’s red [menstrual] herb” or “female herb”;
- 3) and if it is used for making phenological observations, it is called “Saint John’s Day herb” (even if it is not referenced as a use by Rosenplänter).

Remarkably, Rosenplänter named four other taxa as not suitable for anything and four more as nuisance weeds. In addition, he provided explanations of the names of eleven plants whose uses were not reported.

For some plants, their unsuitability for a particular purpose was also mentioned. For example, *Pteridium aquilinum* was used to get rid of bugs, for which it was put on the floor of the barn once the manure had been removed, but it was noted that cattle did not eat this plant.

4. Discussion

Polish ethnobotanist Łukasz Luczaj (2010) compared the plant species in the published Polish literature with the plant vouchers on which they were based and found that in 9.2% of cases the species was wrongly designated, of which two thirds were within the same family. A large portion of the incorrect identifications were among the *Thymus*, *Rumex* and *Rubus* genera. In addition, he found that 6.2% of other plant identification errors in the literature did not involve voucher specimens. The biggest mistakes were related to habitat and erroneous interpretation of local plant names (Luczaj, 2010). When we compared the identifications provided by Vilbaste, it was evident that many did not overlap with those of Rosenplänter or Luce, or even recent identifications made by the herbarium curators. As Rosenplänter was an amateur botanist, he could have made some mistakes collecting his herbarium samples. In fact, he did not distinguish between similar species, as demonstrated by the presence of multiple duplicates in the herbarium, or always collect a specimen corresponding with the description. While we need to bear in mind that 100% certainty cannot be obtained with any such re-identifications, it is quite plausible that the discrepancies with earlier or later sources were mistakes, and not local anomalies, as such instances are quite systematic.

In the herbarium there was a very poorly dried specimen

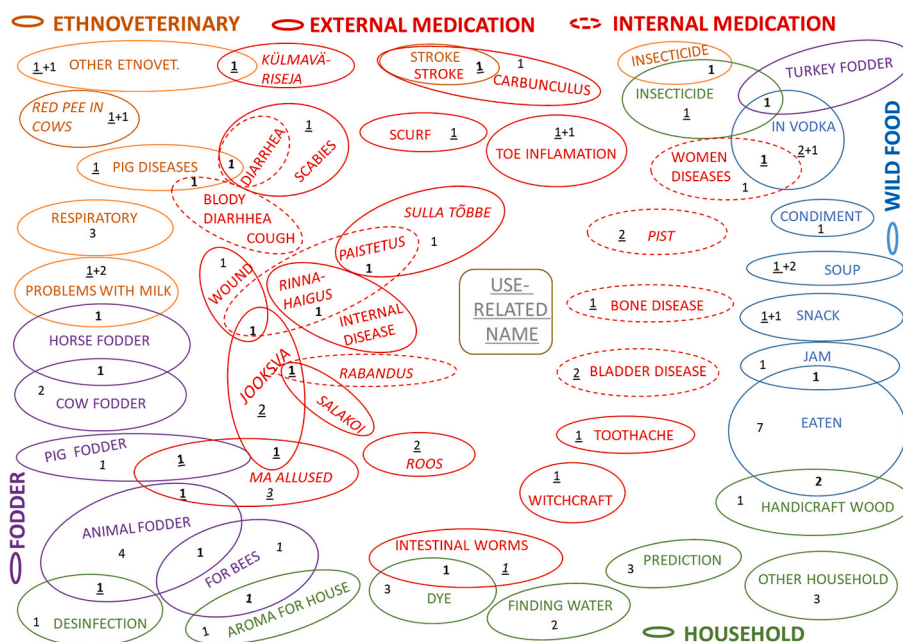


Fig. 4. Schematic map of the specified uses of plants outlined in Rosenplänter's herbarium. Multifunctional taxa used for more than one purpose are in **bold**, while taxa having one or more apparent names related to function are underlined. Explanations of disease names in Estonian are given in the legend of Table 1.

(TU306134), with the local name “nõia-kollad” [witch clubmoss], which was identified as *Actaea spicata*. Rosenplänter stated that it grows in mixed greenwood forest. As the specimen lacks clear features for identification, one might suppose that Vilbaste identified the species as *Chelidonium majus* by its local name, based on the identification given in Hupel, 1818 dictionary to the popular names “anne töwwe rohhi”, “noia kuld”, “noja kallad”, “noja rohhi”, and “noja kuld” (Hupel, 1818). Since all of these names belong exclusively to clubmoss (*Huperzia selago* or *Lycopodium clavatum*), we were interested to know how Vilbaste came to the wrong identification. In particular, he identified the names in Hupel on the basis of the German name ‘Goldwurz’. However, in the early 19th century, this name was primarily associated with *H. selago* or *L. clavatum* in Livonia (Gliwa, 2009) and is based on golden spore powder used in medicine (Höfler, 1911). *Actaea spicata* was widely used in the past for smoking to protect against magic caused by sorcery (Sõukand and Kalle, 2008), thus confirming the current identification of specimen TU306134.

Such mistakes can only be recognised when the data is put into a larger context. At the time, this was simply not possible due to the lack of comparative data. Yet, as Rosenplänter (1831b) stated in the preface to his manuscript, his aim was to record exactly everything that a person said and to publish this information in the book, which was done according to the best possible options he had available. As can be seen, Rosenplänter's herbarium is not free of mistakes in earlier identification or interpretation, but in addition it also has erroneously collected specimens, which can only be spotted by means of local names and descriptions. This indicates that historical plant collections, especially when collected by non-botanists, need to be interpreted with special care.

4.1. "Similar-to-similar" principle

Finnish folklorist Ilmari Manninen (1894–1935), one of the first modern researchers of Estonian folk medicine of the early 20th century, said that Estonian folk medicine was based on three principles: a) the remedy should be from the same place as the disease; b) the remedy must be similar to the symptoms of the disease or the affected area; and c) the remedy must be stronger than the disease (Manninen, 1925). Several subsequent researchers and publications popularizing Estonian

ethnomedicine have repeated on these principles (see, for example, Tupits, 2009; Kõivupuu, 2013). Durant (2017) points out that the American anthropologist Daniel E. Moerman thinks that the Doctrine of Signatures is a “European idea”, which has a written origin. However, Bennet (2007) has demonstrated that the doctrine of signatures functions as a memory aid, while Durant (2017) has suggested that this is one of the tools for reading nature and thus this teaching should no longer be rejected. We can observe several similar-to-similar plant uses in Rosenplänter's collection. A portion of them refer to colour, followed by shape of flowers or fruits and finally general appearance:

- *Trifolium montanum*, with its white flowers, was used for boiling milk containers when milk went bad (white flower - white milk);
- the blue-flowered *Campanula patula* was used to treat blue erysipelas,
- the red-flowered *Centaurea jacea* was used to treat red erysipelas;
- red-flowered *Silene viscaria* was used with cattle that urinated red;
- species of the *Geranium* family have ripe fruits with a pointed tip that were used to cure acute pain in the body;
- *Silene vulgaris* capsules and the flowers of *Campanula persicifolia* resemble the bladder and were therefore used to treat bladder diseases in children;
- *Briza media* was used to treat tremors (malaria) (trembling flowers and seed heads - trembling infirm individuals).

As there were very few species used on the basis of the “similar-to-similar” principle, which has been accepted as one of the dominating principles in traditional Estonian medicine (Manninen, 1925), the similarity principle cannot guide our understanding of the role of those rather numerous “unused” plants. While quite often the plants were named after their specific use, utilitarian categorization was still quite common (Hays, 1982) and “functional diversity” (compare also de Albuquerque and de Oliveira, 2007) seems to be more important than the taxon behind the functional name. However, utilitarianism was not the most important criterion for knowing and naming plants, as Rosenplänter noted species that seemingly had no application at all. It could be that they were kept “for reserve”.

4.2. The influence of outside knowledge

It is difficult to assess to what extent Estonian folk medicine at that time was influenced by doctors and pharmacists, as there are no baseline data. Peasants, who in the time of Rosenplänter were, although officially free, still de facto the objects of serfdom, could not buy land or move away from their home parish. Given that peasants were illiterate and the doctors and pharmacists of that time were predominantly of German origin, some mediation could have certainly occurred, yet the number of doctors per person in rural areas was too low to have a profound influence. In 1826, there were 70 doctors in Livonia, in addition to an unknown number of travelling doctors (Viies, 1992). While in Pärnu town the first pharmacy had already been established by 1623, it was available mainly to wealthy city folk (Gustavson, 1989). The few plants listed by Rosenplänter as having a pharmacy origin (*Angelica sylvestris*, *Hyperzia selago*, *Primula veris* and *Matricaria chamomilla*) clearly indicate that the peasants were aware of pharmacy drugs, but they were clearly outlined as such and had no local use, except for *M. chamomilla*, which was described as being used for making tea. *M. chamomilla* is also the only record of a tea consumed with food, without any medical indication, whose popularity has been growing exponentially in Estonia, starting at least from the end of the 19th century (Sõukand and Kalle, 2012). Also, Luce (1829) indicates that Estonians learned about the plant and its usage from Germans, indicating that it is “a home remedy used for various needs”.

Some earlier pharmacy drugs may have already been integrated into the local knowledge, or might have been affected by Rosenplänter's background knowledge. For example, “wina lill” [vodka flower] *Pyrola rotundifolia* (TU314659) was recorded by Rosenplänter as being used in vodka. From a traditional perspective, this seems an obvious mistake, as this species lacks any cultural importance or local plant names. In the earlier literature, however, “vina lillid” refers to *Convallaria majalis* L. (e.g. Friebe, 1805) and in oral tradition it refers to *Maianthemum bifolium* (Vilbaste, 1993). The plant description of Rosenplänter corresponds most closely to *C. majalis*. According to Estonian traditional medicine, vodka made with this plant can be used to treat heart diseases (Sõukand and Kalle, 2008). The herbarium also has the local name “wigi leht” [tapeworm leaf] associated with specimens of *C. majalis* (TU306158) and states that it is not used for anything. It is remarkable that Vilbaste also accepted the local plant name “wina lill” for *Pyrola rotundifolia*; he most likely did so because of its pharmacy origin and the fact that Luce (1823) referred to its use in vodka to alleviate bone pain (hence the local name provided in Luce: *lu haige rohhi*). Indeed, at that time vodka was not available to peasants and the folk remedies described by Luce (1829) were made with beer, not with vodka, which was accepted pharmacy practice.

If we compare the currently discussed work of Rosenplänter with that of Luce (1829), the overlaps are minimal. In addition to the similarities in two earlier outlined plants (*Matricaria* and *Pyrola*), only in the use of *Hypericum perforatum* (sharing also the name *emmas(t)e rohhi*) do some elements overlap (being used for women's problems). While there are a few more overlaps in plant names, like *jooksja rohhi* for *Veronica officinalis*, *paaks pu* for *Frangula alnus*, *kailud* for *Ledum palustre*, *raudrohhi* for *Achillea millefolium* and *köömlud* for *Carum carvi*, there is no similarity in uses in the two works.

The influence of outsiders is also reflected in local plant names. Rosenplänter explained in the preface of his manuscript (Rosenplänter, 1831b) that some plant names begin with the prefix “Maarja-” [Mary-]. He suggested that these names came into existence under the influence of priests in order to oust the local deities believed to be supporting the healing effects of plants. With the clergymen's consistent explanation that it was Mary, the Mother of Jesus, who actually cured individuals, these names eventually entered into popular use, yet remained few in number. Even in later Estonian tradition, very few plants were named after saints (Vilbaste, 1993).

4.3. Comparison with later sources – tendencies

The work of Rosenplänter can also help us to understand changes in ecology. Of the three recorded “honey plants”, namely *Trifolium medium*, *Galeopsis speciosa* and *Filipendula ulmaria*, the latter two are considered insignificant honey plants with low nectar productivity which may indicate that the term “honey” could have referred to the sweet (*mesine*) smell of the plants. Also, the flower of *T. medium* is too long for bees to obtain its nectar (Riis and Karise, 2015). However, at that time, the bee race common in Estonia was predominantly the European dark bee (*Apis mellifera*), which was much larger and had a longer proboscis than today's breeds, and so it was able to gather nectar from both *T. medium* and *G. speciosa*.

Obvious changes in the seasonal activities of farming are also evident. According to Rosenplänter, a few taxa were used for signalling the start of seasonal tasks. For example, reaching the peak of flowering of *Odontites* sp. was perceived as a sign for the harvesting of rye, which was the main bread crop of that time. Now *Odonites vulgaris* is still a widespread nuisance weed in Estonia, yet as the principles of rye harvesting have changed, its relation to rye has been long forgotten. Remarkably, the flowering of the bog plant *Calluna vulgaris* also signalled the sowing of rye, which could have been connected to the end of seasonal work outside the field (like bogberry or bilberry picking) and the switching back to farming activities. Rosenplänter's parishioners also noticed that *Agrostis gigantea* begins to bloom at the same time as rye. This fact is seemingly unimportant from a farming perspective, yet it may indicate that rye fields may not have always been near peasants' homes and therefore the growth of crops could have been monitored through plants growing closer to home.

Among the plants that have completely lost their importance today is *Potentilla argentea*, which was a highly multipurpose herb in the past. Remarkably, it had the largest number of local names (three) referring to different diseases. On the one hand, this demonstrates the importance of the plant in medicine, but on the other it may indicate that the taxon was associated only with medicinal use and had no other cultural importance (cf. Berlin, 1992), as those various names were present in a small area.

While there are few uses still common in current Estonian society, we can outline several well known plants. One of them is *Achillea millefolium*, which has retained a similar application according to folklore records available since the end of 19th century as a blood-stopping agent for wounds and as a tea to alleviate cough. Rosenplänter named one more multifunctional plant, which is still of cultural importance in the 21st century: *Artemisia absinthium* is added to alcohol for flavour or as medication and put into clothing to control moths. Both species, however, were known medicinal plants previously mentioned by Dioscorides and were an important part of Soviet pharmacological nomenclature. Among the plants still used today are the leaves of *Plantago media* [or *P. major*] used to treat wounds and swellings (Sõukand and Kalle, 2008; unpublished fieldwork results).

Outside of therapeutic uses, there were also a few multifunctional plants which have little importance today. For example, the use of *Frangula alnus* was limited to a pharmacy-driven constipation remedy already in 20th century (Sõukand and Kalle, 2008). *Prunus padus*, which is characterized by soft wood that rots quickly, has also lost its importance nowadays and is mainly known for its fruits used as a snack for children (Kalle and Sõukand, 2013). Also, *Tilia cordata* was claimed to have soft wood (and thus necessary for carpentry), and its bark was used to make ropes and sleighs (hence the name “nine puu” [liber tree]). Today, wild linden trees have almost disappeared; however, these trees are planted in urban landscapes and courtyards, where the flowers are harvested for making tea. In the case of *Sorbus aucuparia*, Rosenplänter also emphasized the multipurpose use of its wood. Today, the wood of this tree is no longer of economic importance.

The diseases treated with largest number of species were various dermatological problems originating from the earth (like *maa-alused*, literally “those who live underground”). Historian Andra Veidemann

(born 1955), who has studied *maa-alused* extensively from the emic perspective, has highlighted that the majority of earlier scholars as well as popularisers have not written anything about *maa-alused* (Veidemann, 1990). This resonates with the comments of the founding father of embryology Karl Ernst von Baer (1792–1879), who was the first to describe endemic diseases of Estonians in 1814 (Baer, 1976). Of the eleven deadly infectious diseases common in the region in the 18th–19th centuries (Rootsmäe, 1987), only malaria can be more or less univocally identified in Rosenplänter's data.

Surprisingly, the treatment of cold-related illnesses, which are now one of the predominate conditions treated with folk medicine in Estonia (Raal et al., 2013), was mentioned very rarely. For example, only one plant (*Menyanthes trifoliata*) was used to alleviate cough according to Rosenplänter. However, this plant was a multifunctional herb as water boiled with this plant was also administered when “a sick person passes blood” [bloody diarrhoea] and to pigs when they become ill. By the second half of the 20th century, *M. trifoliata* lost its importance in folk medicine in Estonia (Sõukand and Kalle, 2008).

HERBA (Sõukand and Kalle, 2008) contains 28 different folk taxa reported to be used for treating *maa-alused*, yet this is not univocal, as both under- and over-differentiation are represented in those names. Indeed, one name can potentially refer to 9 different taxa (Kivari, 2008). The use of *värihein* (most likely *Briza media* as well in folkloric texts) against malaria has been widespread all over Estonia, although folklore collections do not have reports from Pärnu parish (Paal, 2014). Among the numerous taxa referred to by variations of *jooksjarohi* in Vilbaste's (1993) manuscript, all five taxa given by Rosenplänter are represented; and of them only *Scutellaria galericulata* is unique to Rosenplänter (Sõukand, 2004). Yet, all three diseases had disappeared from the worldview of Estonians by the start of the 21st century, based on recent fieldwork of the authors (unpublished).

5. Conclusion

Rosenplänter's herbarium and manuscript analysed here represent the first and most comprehensive ethnobotanical collection of early 19th century Estonia. It contains a lot of original data in terms of both local plant names and usage. Rosenplänter conveyed a great deal about human attitudes towards plants through uses and vivid examples in the plant descriptions. His work also gives an idea of how plants were described without prior botanical knowledge, and this data provides a good basis for describing the nature-related culture of preliterate societies. An analysis of local plant names reveals that a single plant species was not as important as a “plant use group”. The “plant use group” consisted of species that could be functionally interchangeable, whereas popular categorization is adaptive to needs. However, utilitarianism has not been the most important criterion for knowing and naming plants, as Rosenplänter noted species that seemingly have no application at all. It could also be that they were kept “for reserve”. We also show that instead of a tree-based categorization a web-like categorization may be more appropriate to describe the ethnobotanical perceptions of that time. We encourage future in-depth studies of historical ethnobotanical data in Europe in order to understand the relationship between nature and culture of native European populations.

Funding

Research was partially supported by the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (Starting Grant project “Ethnobotany of divided generations in the context of centralization”, grant agreement No. 714874).

Authors' contributions

RS and RK designed the study, RS compiled the initial database, RK analysed the identification mistakes, RS and RK analysed the data, RK

wrote the first draft, RS edited and contributed to the discussion, all authors read and approved final manuscript.

Acknowledgements

The authors thank Roy Ellen and Kai Vellak for thorough comments on an earlier version of the manuscript.

References

- Baer, K.E. von, 1976. Eestlaste Endeemilistest Haigustest. Loomingu Raamatukogu Nr 33. Tallinn.
- Bennett, B.C., 2007. Doctrine of signatures: an explanation of medicinal plant discovery or dissemination of knowledge? *Econ. Bot.* 61 (3), 246–255.
- Berlin, B., 1992. *Ethnobiological Classification: Principles of Categorization of Plants and Animals in Traditional Societies*. Princeton University Press, Princeton.
- Berlin, B., Breedlove, D.E., Raven, P.H., 1973. General principles of classification and nomenclature in folk biology. *Am. Anthropol.* 75 (1), 214–242. <https://doi.org/10.1525/aa.1973.75.1.02a00140>.
- Bornwasser, P.F., 1814. *Namen etlicher Gewächse, wie sie im Dörptschen Dialekt, sonderlich im der Gegend des Kirchspiels Rauge, gewöhnlich sind*. Beiträge. 3, 131–134.
- Bye, R., Linares, E., 2016. Ethnobotany and ethnohistorical sources of Mesoamerica. In: Lira, R., Casas, A., Blancas, J. (Eds.), *Ethnobotany of Mexico*. Springer, New York, pp. 41–65. https://doi.org/10.1007/978-1-4614-6669-7_3.
- de Albuquerque, U.P., de Oliveira, R.F., 2007. Is the use-impact on native caatinga species in Brazil reduced by the high species richness of medicinal plants? *J. Ethnopharmacol.* 113 (1), 156–170. <https://doi.org/10.1016/j.jep.2007.05.025>.
- Durant, O., 2017. Cataloguing nature's 'library': the doctrine of signatures in Western thought and practice. *Pharmaceut. Historian* 47 (4), 95–98.
- Ellen, R.F., 1986. Ethnobiology, cognition and the structure of prehension: some general theoretical notes. *J. Ethnobiol.* 6 (1), 83–98.
- Fleischer, J.G., 1830. *Systematisches Verzeichniss der in den Ostsee-Provinzen bis jetzt bekannt gewordenen Phanerogamen, mit Angabe der gebräuchlichsten deutschen, lettischen und ehstnischen Benennungen*. E.D. Schabert, Mitau.
- Friebe, W.C., 1805. *Oekonomisch-technische flora für Liefland, Ehstland und Kurland*. Hartmannsche Buchhandlung, Riga.
- Gliwa, B., 2009. Pflanzennamen mit präfix *pa-* und angrenzendes im Litauischen und Lettischen. *Baltistica* 44 (1), 77–90. <https://doi.org/10.15388/baltistica.44.1.1298>.
- Gustavson, H., 1989. Eesti vanemate apteekide avamisaeгу (establishment of the earliest pharmacies in Estonia). In: Arak, Elmar (Ed.), *Eesti Farmatseutide Seltsi Meelespea*. Tallinn: Eesti Farmatseutide Selts, pp. 15–19.
- Hays, T.E., 1982. Utilitarian/adaptationist explanations of folk biological classification: some cautionary notes. *J. Ethnobiol.* 2 (1), 89–94.
- Hays, T.E., 1991. Interest, Use, and Interest in Uses in Folk Biology. Faculty Publications, p. 316. <https://digitalcommons.ric.edu/facultypublications/316>.
- Helle, A.T., 1732. *Kurtzgefazste Anweisung Zur Ehstnischen Sprache*. S. Orban, Halle.
- Höfler, M., 1911. *Volkmedizinische botanik der Kelten*. *Archiv für Geschichte der Medizin* 1 (1/2), 1–35.
- Hunn, E., 1982. The utilitarian factor in folk biological classification. *Am. Anthropol.* 84 (4), 830–847.
- Hupel, A.W., 1777. *Topographische Nachrichten von Lief-und Ehstland, vol. 2*. J.F. Hartknoch, Riga.
- Hupel, A.W., 1818. *Ehstnische Sprachlehre für die beiden Hauptdialekte, den revalischen und Dorptschen: nebst einem vollständigen ehstnischen Wörterbuche*. J.F. Steffenhagen und Sohn, Mitau.
- ICPC – 2, 2003. ICPC-2. Accessed. <http://3cgp.docpatient.net/communications-publications/>. (Accessed 1 February 2020).
- Kalle, R., Sõukand, R., 2011. Collectors of Estonian folk botanical knowledge. *Baltic J. Eur. Stud.* 1 (9), 213–229.
- Kalle, R., Sõukand, R., 2013. Wild plants eaten in childhood: a retrospective of Estonia in the 1970s–1990s. *Bot. J. Linn. Soc.* 172 (2), 239–253.
- Kalle, R., Sõukand, R., 2016. Current and remembered past uses of wild food plants in Saaremaa, Estonia: Changes in the context of unlearning debt. *Econ. Bot.* 70 (3), 235–253. <https://doi.org/10.1007/s12231-016-9355-x>.
- Kalle, R., Sõukand, R., Pieroni, A., 2020. Devil Is in the Details: Use of Wild Food Plants in Historical Võromaa and Setomaa, Present-Day Estonia. *Foods*, 570. <https://doi.org/10.3390/foods9050570>.
- Kivari, K., 2008. *Maa-alused Eesti rahvapärismused: inimkeha ja looduse piirjooni*. In: Master's Thesis. Manuscript Is Storage: Tartu Ülikool, Filosoofiateaduskond, Eesti Ja Võrdleva Rahvaluule Osakond.
- Knüpfper, A., 1816. *Eiliter Beitrag von ehstnischen Wörten und Redensarten, Zu Hupel's ehstnischen Wörterbuche*. Beiträge. 5, 89–131.
- Knüpfper, A., 1817. *Wörter und Redensarten, die in Hupel's Wörterbuche nicht stehen*. Beiträge. 9, 33–141.
- Kõivupu, M., 2013. *Igal Hädal Oma Arst, Igal Tõvel Ise Tohter: Sissevaade Eesti Rahvameditsiini*. Tallinn: Varrak.
- Kujawska, M., Łuczaj, Ł., Typek, J., 2015. Fischer's lexicon of Slavic beliefs and customs: a previously unknown contribution to the ethnobotany of Ukraine and Poland. *J. Ethnobiol. Ethnomed.* 11 (1), 85. <https://doi.org/10.1186/s13002-015-0073-8>.
- Kujawska, M., Klepacki, P., Łuczaj, Ł., 2017. Fischer's plants in folk beliefs and customs: a previously unknown contribution to the ethnobotany of the polish-Lithuanian-

- Belarusian borderland. *J. Ethnobiol. Ethnomed.* 13 (1), 20. <https://doi.org/10.1186/s13002-017-0149-8>.
- Kukk, T., 1999. Eesti Taimestik. Teaduste Akadeemia Kirjastus, Tallinn.
- Luce, J.W.L., 1813. Neue Wörter und Redensarten. Erster Beitrag von ehstnischen Wörtern und Redensarten wie sie auf der Insel Oesel gebräuchlich sind zu Hupels ehstnischem Wörterbuche. Beiträge. 1, 24–53.
- Luce, J.W.L., 1818. Sechzehnter Beitrag von Wörtern und Redensarten, wie sie auf der Insel Oesel gebräuchlich sind. Beiträge. 10, 134–139.
- Luce, J.W.L., 1823. Topographische Nachrichten von der Insel Oesel. In: *medizinischer und ökonomischer Hinsicht*. W.F. Häcker, Riga.
- Luce, J.W.L., 1829. Heilmittel der Ehsten auf der Insel Oesel. G. Marquardt, Pernau.
- Luczaj, L.J., 2010. Plant identification credibility in ethnobotany: a closer look at Polish ethnographic studies. *J. Ethnobiol. Ethnomed.* 6 (1), 36. <https://doi.org/10.1186/1746-4269-6-36>.
- Manninen, I., 1925. Üldjooni meie rahvameditsiinist. *Eesti Kirjandus* 11, 453–459.
- Mauri, M., Elli, T., Caviglia, G., Uboldi, G., Azzi, M., 2017. RAWGraphs: a visualisation platform to create open outputs. In: *Proceedings of the 12th Biannual Conference on Italian SIGCHI Chapter, Cagliari, Italy, 18–20 September 2017*, vol. 28, pp. 1–5. <https://doi.org/10.1145/3125571.3125585>.
- Paal, 2014. Halltõbi. Eesti muistendid. Mütoloogilised haigused. *Monumenta Estoniae antiquae II*. In: *Tartu: Eesti Kirjandusmuuseumi Folkloristika Teaduskirjastus*.
- Pardo-de-Santayana, M., Quave, C.L., Sõukand, R., Pieroni, A., 2015. Medical ethnobotany and ethnopharmacology of Europe. In: Heinrich, M., Jäger, A.K. (Eds.), *Ethnopharmacology*. Wiley-Blackwell, Oxford, pp. 343–356. <https://doi.org/10.1002/9781118930717.ch29>.
- Baltisaksa loodusteadlased Eestis ja nende tööd bioloogia teooria alal. In: Püttsepp, J., Veersalu, A. (Eds.), 1989. *Schola Biotheoretica*, vol. XV. Eesti Teaduste Akadeemia, Tartu.
- Raal, A., Volmer, D., Sõukand, R., Hratkevits, S., Kalle, R., 2013. Complementary treatment of the common cold and flu with medicinal plants – results from two samples of pharmacy customers in Estonia. *PLoS ONE* 8 (3), e58642. <https://doi.org/10.1371/journal.pone.0058642>.
- Riis, M., Karis, R., 2015. Mesilaste Korjetaimed Ja Taimede Tolmeldamine Mesilaste Abil. Eesti Mesinike Liit, Tallinn.
- Rootsmäe, L., 1987. Nakkushaigused Surma Põhjustena Eestis 1711-1850. Tallinn, Valgus.
- Rosenplänter, J.H., 1831a. Flora Esthonica. Pernau. Herbarium Stored in the Herbarium of the University of Tartu. TU TAA.
- Rosenplänter, J.H., 1831b. Õppetuse katse maa Rohtudest ja pudest, mis J. H. Rosenplänter kirjutand. Pernau. Manuscript stored in the Estonian Literary Museum. EKLA f 192, m 151:1(M.A).
- Rosenplänter, J.H., 1845. Leikuse-pühha Jutlus, Ja Monned Õppetussed Waese Aia Ja Mõnne Haiguse Päärast. F.W. Borm, Pärnu.
- Ross, K., 2009. Eesti keel henrikust Anton thor helleni. *Keel ja Kirjand.* 52 (8/9), 553–558.
- Ross, K., 2019. Meie ja teie eesti kirjakeel. *Keel ja Kirjand.* 62 (1/2), 57–68.
- Säljö, R., 2004. Educational conversations and information technological revolutions in human history. *Folkbildning.net – an Anthology about 'folkbildning' and Flexible Learning*. The second revised edition. The Swedish National Council of Adult Education, Stockholm, pp. 211–227.
- Sõukand, R., 2004. Jooksvaerohud" eesti rahvameditsiinist. *Akadeemia* 11, 2475–2493.
- Sõukand, R., Kalle, R., 2012. The use of tetaimed in Estonia, 1880s–1990s. *Appetite* 59 (2), 523–530. <https://doi.org/10.1016/j.appet.2012.06.017>.
- Sõukand, R., Kalle, R., 2016. Changes in the Use of Wild Food Plants in Estonia: 18th–21st Century. Springer International Publishing, New York.
- Sõukand, R., Kalle, R., compilers, 2008. HERBA: historistlik eesti rahvameditsiini botaaniline andmebaas. E-Book. EKM teaduskirjastus, Tartu. <http://herba.folklore.ee>.
- Stevens, P.F., 2017. Angiosperm Phylogeny website. Version 14. Available at: <http://www.mobot.org/MOBOT/research/APweb/>.
- Svanberg, I., Hällzon, P., Ståhlberg, S., 2019. Glimpses of loptuq folk botany: phytonyms and plant knowledge in sven hedin's herbarium notes from the lower tarim river area as a source for ethnobiological research. *Studia Orientalia Electronica* 7, 96–119. <https://doi.org/10.23993/store.76475>.
- Talts, M., 2013. The role of popular science literature in shaping Estonians' world outlook. *Историко-биологические исследования*. 5 (2), 59–83.
- Tilman, D., 2001. Functional diversity. In: Levin, S.A. (Ed.), *Encyclopedia of Biodiversity*, vol. 3. Academic Press, pp. 109–120. <https://doi.org/10.1006/rwbd.1999.0154>.
- Tupits, A., 2009. Käsitlusi Rahvameditsiinist: Mõiste Kujunemine, Kogumis-Ja Uurimistöö Kulg Eestis 20. Sajandil. Doctoral Dissertation. Tartu University.
- Tutin, T.G., Burges, N.A., Chater, A.O., Edmondson, J.R., Heywood, V.H., Moore, D.M., Valentine, D.H., Walters, S.M., Webb, D.A. (Eds.), 1964-1980. *Flora Europaea*, vols. 1 – 5. University Press, Cambridge. Retrieved on-line. <http://www2.bgbm.org/EuroPlusMed/query.asp>.
- Veidemann, A., 1990. Maa-alused eesti rahvameditsiinist. Jakob Hurt 150. In: *Eesti Rahva Muuseumi Aastaraamat*, vol. 38. Tallinn, Valgus, pp. 86–104.
- Viies, A., 1992. Rahvameditsiin. Arstiabi [17. Sajandist 19. Ajandi kesk-paigani] [folk medicine. medical care from the 17th century to the mid-19th century]. In: Kahk, J., et al. (Eds.), *Eesti Talurahva Ajalugu*, vol. 1. Tallinn, Olion, pp. 530–531.
- Vilbaste, G., 1993. Eesti Taimenimetused = Nomina Vernacula Plantarum Estoniae. Eesti Teaduste Akadeemia, Tallinn.
- Vilberg, G., 1931. J. H. Rosenplänter taimeteadlased. *Olion* 5/6, 227–228.
- Vilberg, G., 1932. J. H. Rosenplänter taimeteadlased. *Olion* 5/6, 41–43.