TRAMES, 2008, **12**(**62/57**), 1, 29–39

HOW THE NAME *ARNICA* WAS BORROWED INTO ESTONIAN

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Abstract. The name of the classical medicinal plant, mountain arnica (*Arnica montana*), was well known among Estonians at the end of the 19th century, although mountain arnica itself does not grow in Estonia. The folklore collection of the Estonian Folklore Archives indicates that the name was used to denote locally growing plants. The impulse for such renaming of local plants obviously came from popular medical books and almanacs published in Estonian in the 18th–19th centuries. The article discusses a particular example, arguing that foreign names were probably given to folk medicinal plants that were already effectively used. Many of them, however, had not received attention so far by pharmacological research.

DOI: 10.3176/tr.2008.1.02

Keywords: folk medicine, *Arnica montana*, arnica, terminology, ethnobotany, influence of literature, Estonia

1. Introduction

Mountain arnica (*Arnica montana* L.) does not grow well in Estonia even if cultivated, as it prefers warmer climate. The name *arnica* (Estonian *arnika*), however, is known in Estonian folk medicine, and information on its use for healing various diseases can be obtained from numerous folklore reports, which makes arnica one of the thirty most popular plant names in Estonian herbal folk medicine. Although some of the records refer to the herb purchased form from a pharmacy, most of them point to locally growing plants. Collected Records indicate that at least 19 local plants were known by the name of *arnica* among Estonians at the turn of the 20th century (Vilbaste 1993).

How did arnica become known in Estonia? Which plants were most often called by this name? Was it just an external similarity of the local plants to *A. montana* that caused them to be used as a substitution for it? The paper addresses those questions and seeks to find an explanation for the phenomenon.

2. Research background

To write this paper, two massive databases have been used, the latter of which is still in its initial phase:

1) The collection of Estonian plant names, which was started by the pioneer of Estonian ethnobotany Gustav Vilbaste (1885–1967) and finished by his colleagues after his death. It contains several thousand folk plant names registered in different parishes of Estonia and their Latin equivalents as well as information on folk plant names gathered from botanical literature on Estonian flora (Vilbaste 1993).
2) The database of Estonian traditional medicinal plants HERBA is based on data from the Estonian Folklore Archives. The material preserved there has been collected over a period of 150 years[1]. The database is still being completed and has gone through several structural changes. The current paper refers to its two different parts that are located at separate addresses at present. The so-called old version (HERBA 2006) contains more data, but the texts presented there have not been checked or edited. Nonetheless, this database is quite a good resource for following tendencies in herbal folk medicine. This version contains mostly materials originating from the 20th century, while the new version (HERBA 2007) contains checked and edited texts from the end of the 19th century.

Both databases were searched in order to find data relevant to the name *arnica*. An overview is also given of what was written about arnica in popular medical publications.

2.1. Arnica in popular medical books, almanacs and folklore before 1900

Mountain arnica was first mentioned in Estonian botanical literature in 1777 by the Baltic German writer and linguist August Wilhelm Hupel (1737–1819), who mentions mountain arnica among local plants (Hupel 1777:519). The young Estonian botanist Toomas Kukk states in his reference book on Estonian flora that mountain arnica seldom grows cultivated in Estonia, and there are no proofs of its growing wild in earlier times (Kukk 1999:99). No present-day researchers have found any trace of mountain arnica in Estonia. Gustav Vilbaste admits that, although people have reported that arnica was growing in the local forest, they have meant different local plants from such genera as *Leontodon, Hieracium, Crepis, Solidago* (Vilbaste 1993:174).

2.1.1. Popular medical books and almanacs

In the Estonian language, arnica was first mentioned in a popular medical book by pastor Otto August Jannau (1800–1865). His book was reprinted six times in 12,500 copies in total. The plant name *arnica* appears in a separate chapter among

[1] For further information on collecting and storing of materials of Estonian folk medicine, see Sõukand & Raal 2006:175–182.

many other local plants and one of the indications for its use is straining of the stomach[2] (Jannau 1857:32). The text actually describes St. John's wort (*Hypericum perforatum* L.), and indeed, the plant is initially named *naiste puna*, which is the most common Estonian equivalent for *H. perforatum*. The name *arnica* is only of secondary importance here. However, this was sufficient reason for the name and the description to appear together next time almost forty years later in the translation of a book by the German pastor and founder of hydrotherapy Sebastian Kneipp (1821–1897) (Kneipp 1895:112–113). The book was translated from the German original *Meine Wasserkur* and published in Estonian in 1895 (nine years after the publication of the first printing of the original) in 3000 copies. The name *arnic*a appears here alongside its Latin name, but the description of the plant and the suitable time for its gathering have been copied from Jannau's book. Again, it is St. John's wort that is described[3]. The translator seems to have been trying to make things too easy for the reader and has transferred the foreign plant into local surroundings, borrowing the description from Jannau's book that used the same name for it. Moreover, if we compare this translation with the reprint of the original (Kneipp 1894), an important detail emerges – the translator has also added new descriptions of plants' appearance and habitats in many other chapters of the book.

The almanacs and especially their medical supplements were always popular among their target group as they were cheap, and interesting to read (Martsoo 2007). As the authors of most articles in the almanacs are unknown, we cannot speculate much about their sources (and the precision of translations in them). An exception is *Pärnu Almanac* that recommends *arnica* for healing bruises, adding that information has been taken from a Russian almanac for the year 1880 (PK 1879). Indeed, the *arnica* mentioned there is not local – but who can be sure that the reader noticed it? *Almanac of S. W. Haynberg's shop* for the year 1896 describes *arnica* as one among many *drop-medicines* – medicines so potent that they have to be administered in drops only (SWHKK 1895). Later, in the *Almanac of Estonians* for 1899, the use of the medicinal herbs is addressed more critically. *Arnica* is mentioned there amongst *strong medicines* the reader must be *familiar* with and compared to *Kusmitsh's herb* which is sold in drugstores at a high price (SL 1898). Such a formulation gives us reason to conclude that by the end of the 19th century at least one plant named *arnica* was well known and growing locally, so that it needed no introduction, at least in the opinion of the author[4] of the almanac article.

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[2] Straining (*venitus*) is a folk name for pain in the stomach region, and its possible etiology in folk medicine is overworking or lifting too much weight. Almost every problem associated with the stomach area (except severe diarrhea) could be called by this name.

[3] In the same book we find another description of the same plant family, this time in the right chapter and also having a Latin equivalent that suits its description (*Hypericum perforatum*, named *Jaani puna* [John's red] in Estonian), although actually the paragraph describes another species of the same plant family (*H. maculatum)* (Kneip 1895:118). As these species are very similar, it is difficult for the untrained eye to differentiate between them.

[4] Who remains unknown to us.

2.1.2. Folklore

The description of how *arnica* was used in the 19th century is given according to HERBA 2007, which contains 833 texts on herbal healing from the collection of the famous Estonian folklorist and linguist Jakob Hurt. The name *arnica* appears in five texts (thus, it is amongst the 40 most popular plants). None of the texts explicitly points to the usage of a non-local herb.

The first text compares the usage of arnica with that of puffball (*Bovista nigrescens* Pers.), which has usually been applied to heal wounds and to stop bleeding (H II 12, 170 (40)). All the other plants mentioned by this informant are local (H II 12, 168–171), but in his report he also speaks about some medicines that originate from a pharmacy or druggist, such as saltpeter (H II 12, 169 (32)) and saffron (H II 12, 169 (31)). That probably required some knowledge of popular medical texts.

The second text (H II 16, 560 (7)) suggests that arnica should be used against stomach ache if other homemade medicines listed before (*a tablespoon of ashes or powdered brick, coal, rust or iron dust with water or vodka* (H II 16, 558 (3)) did not help. That makes us think that the informant may be describing the use of arnica originating from the pharmacy, especially because the text mentions two medicines that can be purchased only there.

The third text (H I 9, 40 (12)) indicates that there might be several kinds of arnica: yellow (*kollane*) and white (*valge*) forest-arnicas (*metsarnikad*). That leaves space for speculation that there may be also non-forest (e.g. grassland) arnicas alongside wild and cultivated arnicas[5]. The colour of arnicas may indicate the colour of their flowers, and if the equivalent for *white arnica* might be meadowsweet (*Filipendula ulmaria* (L.) Maxim.) (Vilbaste 1993: 317–318), then *yellow arnica* can denote at least ten plants. In the text, those two arnicas are mentioned among ten other local plants as a medicine for a bewitched child. The text also includes a very detailed description how the medication should be prepared as well as a discussion of its numerous magical features alongside rational treatment.

The fourth text describes a specific use for arnica – inside pain (*seest valu*), which is comparable to straining. It also provides an instruction for drying the plants, which indicates exactly that the plants must be local or at least domesticated.

The last text (H II 7, 883 (2)) describes the use of arnica to heal straining. This text also indicates the need for drying the plant.

In 20th-century Estonian folk medicine arnica was used (according to HERBA 2006) for 25 indications. The most popular disease treated with arnica is straining (27 texts), which is followed by stomach ache (5 texts). Rheumatism, cold and *inside pain* have been mentioned twice. Other indications are named only once. It is interesting to note that the later texts are mostly succinct and give no hint about the origin of the plant.

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[5] The Estonian word *mets* means both ‘forest’ and ‘wild’ (non-cultivated).

3. Ethnopharmacology of arnicas

In Estonian ethnomedicine, arnica was mostly used to treat straining, being mentioned among medicines for straining by O.A. Jannau as early as in 1857 and in the almanac for 1880. Was it just a placebo effect supported by the name? If, however, we take a closer look at the local plants known by the name of arnica here, a different picture appears. According to Gustav Vilbaste (1993), the most popular plants known by the name of *arnica* were six species from the *Asteraceae* family. Two species from genus *Leontodon* – *Leontodon autumnalis* L. and *Leontodon hispidus* L. – could not be distinguished by local people. Other popular species were: mouse-ear hawkweed (*Pilosella officinarum* F.W.Schultz et Sch.Bip.), narrowleaf hawksbeard (*Crepis tectorum* L.) and goldenrod (*Solidago virgaurea* L.). Willow-leaved inula (*Inula salicina* L.) was also quite popular**.** The other 13 plants named *arnica* are represented only in few reports and are not included in the current study.

If five of the six listed plants are quite similar to mountain arnica, then one (goldenrod) resembles arnica only by the colour of its flowers. All of them are common in Estonia, but are not significant culturally. Vilbaste's (1993) analysis of plant names gives us the following results:

Crepis tectorum was mostly known as *arnica* and possessed no other names indicating its usage in folk medicine. *Inula salicina* was also called by names of other species first introduced in Estonia as medicinal plants (*ingver, alant*). *Alant* was a name used for *I. helenium*, the 'big brother' of *I. salicina* (see also Kalle 2007). The other four species were occasionally called by names that indicated their use for healing straining or other conditions associated with the stomach area. The names used were:

Leontodon spp. – *venituse-tee* (straining-tea), *jooksvarohi* (rheumatism herb)

Solidago vigaurea – voolmerohi (colic herb)

Pilosella officinarum – voolmerohi (colic herb), *jooksvarohi* (rheumatism herb) and also *kärnarohi* (scab herb), which may be another initial indication of mountain arnica (Jannau 1857).

The following gives an overview of the use of mountain arnica and the other plants mentioned in folk medicine of other nations and/or their phytochemical components.

3.1. Arnica montana

From mountain arnica, mostly its flowers (*Arnicae flos*) are used. Arnica is used mainly externally for treatment of bruises, sprains, and inflammation caused by insect bites, gingivitis; also for symptomatic treatment of rheumatic and angial complaints; for mild cardiovascular complaints or as a haemostatic in gynaecology (ESCOP 2003, Weiss and Fintelmann 2000, Yakovlev and Blinova 2004).

The drug contains sesquiterpene lactones that are quite uncommon in medicinal plants (Lyss et al. 1997, Schroder et al. 1990). Its other constituents are triterpene arnidiol, flavonoids, coumarins, tannins, pyrrolizidine alkaloids, essential oil, etc

(ESCOP 2000, Kos et al. 2005, Merfort 1992, Merfort and Wendisch 1987, Murav'eva, Samylina, and Yakovlev 2002, Yakovlev and Blinova 1999, 2004). The dried rhizome and roots of mountain arnica are also used, although seldom; their constituents are similar to those of the flowers (Evans 2000). Arnica's anti-microbial activity has been tested by Koo et al. (2000) and Iauk et al. (2002), but their results were somewhat contradictory.

Even the external use of mountain arnica may cause allergic reactions, and the application of its tincture has triggered allergic skin reactions. Arnica should not be applied to broken skin (Barnes, Anderson, and Phillipson 2002, Blumental, Goldberg, and Brinckmann 2000). Clinical tests do not suggest that homeopathic arnica is more effective than placebo to conditions associated with tissue trauma (Ernst and Pittler 1998).

3.2. Leontodon autumnalis and Leontodon hispidus

There is little information on the use of *Leontodon* spp. for medical purposes. It is a seldom used herb, the effect of which (mostly on kidneys) has been considered similar to that of dandelion (*Taraxacum officinale* F.H.Wigg. s.l.) (Grieve 1998). Sesquiterpenoids of the guaiane type (crepidiaside A and B) are isolated from the sub-aerial parts of *L. autumnalis*; they occur in all investigated members of the section Oporinia (*L. autumnalis*, *L. croceus*, *L. helveticus*, *L. montaniformis*, *L. montanus*, *L. pyrenaicus*, and *L. rilaensis*) (Zidorn et al. 2000). Chemotypes of *L. autumnalis* are found among 24 Central European drug samples (Grass et al. 2006). Later, luteolin-derivatives and caffeic acid derivatives have been identified in different *Leontodon* species (Zidorn and Stuppner, 2001). Zidorn et al. (1999) report the cytotoxic effects of three hypocretenolides from *L. hispidus* on different tumour cell lines. Flavonoids, phenolic acids and sesquiterpene lactones have been considered qualitative and quantitative chemosystematic markers in the genus *Leontodon* (Zidorn and Stuppner 2001).

3.3. Pilosella officinarum (syn. Hieracium pilosella)

Mouse-ear hawkweed has been widely used since the Middle Ages (Chevallier, 2000). The whole plant can be useful, but most often the herb alone is used without the root. The herb is known in folk medicine as an antiphlogistic and constringent; it increases biliary secretion and stops internal bleeding. As a spasmolytic and expectorant, it has been employed internally in the treatment of asthma, bronchitis, cough and externally in the treatment of wounds. It is a bitter, antibiotic herb, which reduces inflammation, increases salivation, etc (Bown 1996, Chevallier 2000, PDR 1998, Yakovlev and Blinova 1999).

Its chemical composition has not been thoroughly researched. The herb contains flavonoids, carotenoids, hydroxycoumarins umbelliferone and skimmine, also tannins, caffeic acid, fatty acids, lectins, etc (Antonyuk 2004, Chevallier 2000, PDR, 1998, Yakovlev and Blinova 1999). Sterols have been identified in the roots and herb of *H. pilosella* (Gawronska-Grzywacz and Krzaczek 2006, Karunen, Hakala, and Heinonen 1984, Krzaczek et al. 2002, Zidorn, Gottschlich,

and Stuppner 2002). Aqueous extracts of *H. pilosella* increase urine flow (Beaux, Fleurentin and Mortier 1998). The antimicrobic activity of diethyl ether extract of *H. pilosella* is more pronounced against Gram-positive and fungal organisms than against Gram-negative bacteria (Nostro et al. 2000).

3.4. Crepis tectorum

The herb of narrowleaf hawksbeard is used in Tibetan medicine for treating bronchitis, pneumonia and arteriosclerosis, and against emesis. Its infusion is effective against bone tuberculosis, some diseases of the nervous system and as a purgative. Ground drug is put on skin to soften furuncles, and the herb has been used for bathing of tired legs (Lavrenov and Lavrenova, 2003).

The drug has been tested phytochemically only by a few researchers; it contains several sesquiterpene lactones, flavonoids and γ-lactones, vitamin C (in fresh offshoots), etc (Adekenov et al. 1991, Adekenov 1995, Kisiel and Kohlmunzer 1989, Lavrenov and Lavrenova 2003).

3.5. Solidago virgaurea

The herb of goldenrod (*Solidaginis virgaureae herba*) contains flavonoids, triterpene saponins, diterpenoid lactones, phenolic acids, essential oil, bisdesmosidic phenol glycosides (which are very rarely present in medicinal plants) (Bader, Wray and Hiller 1995, ESCOP 2003, Kalemba 1999). The most important is its diuretic action; it also has antiphlogistic and spasmolytic effects on smooth muscles, antihypertensive, antimicrobial, antifungal (saponins *in vitro*); anti-inflammatory, immunomodulatory and antitumoral effects (Blumental, Goldberg and Brinckmann 2000, Bruneton 1999, el-Ghazaly et al. 1992, Kruedener, Schneider and Elstner 1995, Meyer, Schneider and Elstner 1995, Plohmann, et al. 1997, Thiem and Goslinska, 2002, Weiss and Fintelmann, 2000). *S. virgaurea* is considered promising as an antineoplastic medicine with minimal toxicities (Gross et al. 2002).

3.6. Inula salicina

Willow-leaved inula is not yet used in contemporary medicine. The only extensively employed species from the genus *Inula* are *Inula conyza* (Griess.), *Inula helenium* L. and, to a lesser extent, *I. britannica* L. (Yakovlev and Blinova, 1999).

From the roots of *I. salicina* two aromatic esters of isobutyric acid and a vinylpentaacetylene have been extracted (Anthonsen and Kjoesen 1971). Other species of *Inula* contain phenoloids, eudesmanolides, germacranolides, guaianolides, sesquiterpene lactones and thymol derivatives (Bohlmann et al. 1978, Peter and Dosa 2002).

4. Discussion

Among the species discussed above, only mountain arnica and, to some extent, goldenrod are known as classical medicinal plants. In the last ten years, interest in

the chemical compounds of the other species mentioned has increased , but this is probably caused rather by the need to investigate the species with lesser-known chemical composition than interest in some particular species.

These species have little in common chemically, but most of them have at least been used in folk medicines of other nations. In this light, it seems that all the plants most often called *arnicas* could have been used for treatment of straining in one way or another , not only because of their names (or similarity to the name-provider) but also because of real biological activity.

Indeed, there seems to be good reason to undertake further research into those six species. If we assume that there are 114 species of *Asteraceae* growing in Estonia (Raal and Sõukand 2005), and a considerable number of them look like arnica, then there had to be some reasons for choosing namely these species among the many. This means that the plants that might have already been used for treating stomach-related problems were just renamed with the potent name.

There is probably another point needing clarification. If the almanacs mention arnica just as a local plant, then the popular medical books (Jannau, Kneipp) connect the name with a particular local plant – St. John's wort According to Vilbaste, there is only one report indicating that local people called St. John's wort *arnica*, although the plant itself was also occasionally used to treat straining. That makes us believe that published information was not followed exactly, but only some bits of it were incorporated into the local medical tradition. The reason for that can be the fact that St. John's wort was also a culturally significant plant – its red juice was associated with the blood of Christ and with womanhood.

5. Conclusions

The name of the classical medicinal plant *Arnica montana* definitely became known in Estonia before the mid-19th century, but it is impossible to tell when exactly the name first turned up in folklore. The name gained wider popularity when it was attached to local plants in popular medical books and almanacs. The name *arnica* was most often given to plants that had at least two of three important characteristics in common: their appearance was similar to mountain arnica; they had other names indicating their usage for healing similar diseases; they are common in Estonia and easily available, yet do not have a noteworthy meaning from the cultural viewpoint.

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