

Further comments on the problem of *Antennaria carpatica*

Další poznámky k problematice druhu *Antennaria carpatica*

Jindřich Chrtek and Zdeněk Pouzar

CHRTEK J. et POUZAR Z. (1985): Further comments on the problem of *Antennaria carpatica*. — Preslia, Praha, 57 : 193—198.

A new study of the problem of *Antennaria carpatica* (WAHLENB.) BLUFF et FINGERH.-complex revealed that the North-European and the Asiatic populations belong to a species of its own which is called here *Antennaria lanata* (HOOKER) GREENE (= *A. villosifera* BORISS.). Botanists considered *A. lanata* (HOOKER) GREENE a North American species, but we were able to establish that the original basionym of this name is based on Scandinavian material of Wahlenberg and not on any North American specimen. As there is no name for *A. lanata* in the sense of North American and some other botanists we are proposing the name *Antennaria lanatula* CHRTEK et POUZAR spec. nova. The Central and West European populations belong to a single species *Antennaria carpatica* (WAHLENB.) BLUFF et FINGERH. which is divided here into three subspecies: The Carpathian *A. carpatica* subsp. *carpatica*, the Alpine *A. carpatica* subsp. *helvetica* (CHRTEK et POUZAR) CHRTEK et POUZAR and the Alpine and Pyrenean *A. carpatica* subsp. *amphilanata* CHRTEK et POUZAR.

National Museum, třída Vítězného února 74/1700, 115 79 Praha 1, Czechoslovakia.

During the years 1958—1960 we have been engaged in a revision of the *Antennaria carpatica* (WAHLENB.) BLUFF et FINGERH. — complex in Europe (see CHRTEK et POUZAR 1960, 1961, 1962). We examined a large material from nearly all important European herbaria containing specimens of this complex. Thanks to the wealth of specimens preserved in the about 20 herbaria we were able to acknowledge a great richness of the diversity of this plant not only in Europe but also in North Asia and to compare it with some North American species. Thanks to richness of the material we were able to take into account various morphological characters, especially leaf hairness, length and breadth of leaves, we compared also the involucrel phyllaries, their shapes, colours etc. as well as the length of bristles of pappus, the scarious appendages on stem leaves (their colour, length etc.) and some other features. Great attention has been paid also to geographic distribution of various morphotypes. Unfortunately cytological data were only very scarce at that time and we were not able to incorporate them into the evaluation of the taxa studied. The consideration of all characters in dependence to geographic distribution lead to a new taxonomic concept, where the delimitation of taxa was then founded on a completely new basis.

Antennaria carpatica (WAHLENB.) BLUFF et FINGERH. was restricted solely to the Carpathian populations. Plants coming from the Alps were classified as two species: the endemic *Antennaria helvetica* CHRTEK et POUZAR a species closely allied to *A. carpatica* and the more widely distributed *Antennaria lanata* (HOOKER) GREENE, in our concept a species distributed in Pyrenees

and Alps as well as in arctic Eurasia. Results of our studies were criticized in last years by several specialists as well as authors of floras (URBAŃSKA-WORYTKIEWICZ 1970, HESS et al. 1972, HALLIDAY 1976, PIGNATTI 1982). They refused our concept from the taxonomic as well as nomenclatural viewpoints.

In what follows, we should like to explain and elucidate the ideas published in our articles (CHYTEK et POUZAR 1960, 1961, 1962) as well to propose some new concepts which we reached during the study of new data.

1. The nomenclatural status of the name *Antennaria lanata*

BORISOVA (1960) described the North European and North Asiatic populations of *A. carpatica* as a new species *A. villifera* BORISS. We have been able to confirm this separation of Carpathian plants from the Nordic ones (CHYTEK et POUZAR 1961) but we concluded that a part of the Alpine populations of *A. carpatica* and all the Pyrenean plants belong to *A. villifera* too. Analysing, however, the nomenclatural status of the name *Antennaria lanata* (HOOKER) GREENE we found that the name of this species was originally based really on specimens of Scandinavian origin. The introduction of the name *A. lanata*, a species considered an American one, for the European plants was in no way motivated by the identification of the American species with the European one. This change of name was based solely on the nomenclatural grounds and in no way on taxonomic identification of the American plant with the European one. This idea was evidently misunderstood by authors who criticized our work (URBAŃSKA-WORYTKIEWICZ 1970, HESS et al. 1972, PIGNATTI 1982).

The problem of *Antennaria lanata* (HOOKER) GREENE is unfortunately complicated by the fact that HOOKER (1840) even when writing a book on North American flora based his basionym of this name (viz. *Gnaphalium carpaticum* β *lanatum* HOOKER) on the Scandinavian plant, quoting the Wahlenberg's *Gnaphalium carpaticum* β as the basis of his β *lanatum*. Our argumentation was as follows: WAHLENBERG (1824—1826) p. 515 (Tomus II.) says: „912. *Gnaphalium carpaticum* β : foliis inferioribus lanceolatis trinerviis subtus (supraque) lanuginosis, caulibus simplicissimis cymosis, calycinis squamis basi lanuginosis acuminatis serrulatis: pappo masculorum clavato. Laestadius Vet. Ac. H. 1822. p. 336, Zetterstedt res. 2. p. 160“.

WAHLENBERG (l. c.) reports the taxon from the Carpathians: “*G. carpaticum* α (fol. supra glabrat.) Wahlenb. carp. n. 843. t. 3. Regensb. bot. Zeit. 1822 p. 652” and gives the name “*G. alpinum* Decand. fl. franc. p. 3124 aliorumque” as synonym of his taxon α . He remarks about the distribution of his taxon β : “Hab. in lateribus praeruptis aqua nivali irrigatis alpium Lulensium a Virihjaur meridie versus positarum pone Kabrinoivi, ad Pallaure alibique satis copiose; etiam in alpiis supra Alten Finmarkiae”. He mentions his taxon, as can be seen, only from Scandinavia.

HOOKER (1840) takes over completely in his *Flora Boreali-Americana* the Wahlenberg's system of this species, he only designates by names both taxa (α and β) described but not named by Wahlenberg. He calls Wahlenberg's taxon α “ α . humilis” with the diagnosis: “foliis supra glabratis”; and named taxon β as “ β . lanata; foliis utrinque lanatis”. HOOKER (1840) brings only the name for Wahlenberg's taxon. This can be seen from two facts: first of all Hooker refers to Wahlenberg's *Flora Suecica*: “ β . lanata; foliis utrinque lanatis. Wahl. Fl. Suec. v. 2. p. 515. — *Gnaphalium alpinum* De Cand. Fl.

Fr. p. 3312. (aliorumque fide Wahl.)". He describes further this taxon as Wahlenberg's one in his notes on the distinguishing characters: "The var. β . of Wahlenberg differs very slightly from α ". From this it is quite clear that Hooker's taxon is nomenclaturally based on Scandinavian material and that, when typifying it, it is necessary, to use Wahlenberg's description as a protologue.

HOOKEER records both the taxa α *humilis* as well as β *lanata*, also from North America and by this he extends the area of the *A. carpatica* also to the New World. Besides the two Wahlenberg's taxa he also describes his own taxon γ *pulcherrima* HOOKEER, distributed only in North America.

It follows from the above facts that no legitimate name exists for the North American species called *Antennaria lanata*, e. g. by URBANSKA (1983a, b) and that this plant should be renamed. This is a tetraploid species ($2n = 28$) distributed in Western North America in Canada (British Columbia and Alberta) and in the United States (Washington, Oregon, Idaho, Montana and Wyoming) — see the distributional maps in URBANSKA 1983a, b.

As the North American plant named by URBANSKA (1983a, b) *Antennaria lanata* (HOOKER) GREENE is now without a name we propose one for it:

Antennaria lanatula CHRTEK et POUZAR, species nova

Syn.: *Antennaria lanata* auct. non orig.

Planta perennis, saepe laxe caespitosa, rhizomatibus sparse ramosis, stolonibus absentibus. Folia rosularia 30–60 mm longa et 2–8 mm lata, oblanceolata, acuta, trinervia, margine integra, utrinque distincte lanata. Caules saepissime recti, 8–17 cm alti, lanati. Folia caulina 4–7 gradatim ad cacuminem decreseunt et e oblanceolatis ad lanceolatos mutantur, superiora cum appendicibus scariois cca 3 mm longis dilute brunneis.

Calathia 6–9(–12) subsessilia vel breviter (usque 1 cm) pedicellata, 4–6 mm longa, involucrum basi albo-lanatum, in parte media viridiuscule brunneo-atratum, in parte superiore albidum. Pappus albidus, cca 1.5 mm longior florum, setis serratis. Achaenia glabra, olivaceo-brunnea, cca 1 mm longa.

Numerus chromosomatum: $2n = 28$ (sec. URBANSKA 1983a).

Typus: U.S.A., Oregon, steep north slopes of the Willowa Mts. near the lake, 7000 feet alt., July 1928, W. C. CUSICK, ed. Eastern Oregon Plants Coll. W. C. CUSICK, no. 2265, in herbario PR asservatur (typorum collectio no. P4 T 4192).

Antennaria lanatula CHRTEK et POUZAR differt a *A. lanata* (HOOKER) GREENE foliis caulinis inferioribus oblanceolatis et setis paulisper florum longioribus (cca 1,5 mm).

The true European *Antennaria lanata* (HOOKER) GREENE was described from the North Scandinavia (Lapponia), hence the Scandinavian population of the species in question should be named *Antennaria lanata*. According to cytological data at hand (URBANSKA 1983a, b) the populations in Asiatic Arctic regions is cytologically identical with these of Scandinavia. In our studies (CHRTEK et POUZAR (1961, 1962) we identified one part of the Alpine population and the whole Pyrenean population with the Scandinavian one and named these plants *A. lanata* especially due to the villosity on both sides of basal leaves.

When writing our articles on *A. carpatica* some 25 years ago we were aware of some slight morphological differences between the population in Scandinavia and this in Central and Western Europe, but we underestimated them. Now when new cytological and morphological (especially length of achenes) data are at disposal we agree with URBANSKA (1983b) that *A. lanata* (= *A. villifera*) is distributed solely in the Eurasiatic arctical regions and that the

Central and Western European populations, which have another chromosome number ($2n = 56$) than the nordic plants ($2n = 28$ or 42) should be classified as a separate species, i.e. *A. carpatica*.

Antennaria lanata (HOOKER) GREENE (= *A. villifera* BORISS.) is not uniform species and according to BORISOVA (1960) it should be divided into locally characterized populations which are considered by her as varieties, viz. *A. villifera* var. *villifera*, the typical variety, distributed from Scandinavia to Kolgujev; *A. villifera* var. *septentrionalis* in North Siberia, Tajmyr and Jamal; *A. villifera* var. *jacutica* in Jakutia and the geographically isolated *A. villifera* var. *ircutensis* BORISS. from the mountains near the southern part of Bajkal. Further studies of the populations in field are needed to establish the status of these varieties, which well may be found to be subspecies. It may be interesting that the chromosome number in the nordic populations are either $2n = 28$ or 42 , but both these numbers co-occur in the whole geographic range of this species (see URBANSKA 1983b).

2. Notes on taxonomy of *Antennaria carpatica*

After a careful consideration of all data published in last 20 years and a new study of several herbarium specimens, we arrived at the following conclusions:

In Central and Western Europe only a single species occurs which should be called *Antennaria carpatica* (WAHLENB.) BLUFF et FINGERH. with rather uniform chromosome number $2n = 56$ and also uniform chromosome morphology (see URBANSKA 1983b). The number $2n = 56$ differs from the North European and North Asiatic numbers $2n = 28$ and 42 , which are characteristic for *A. lanata* (= *A. villifera*). Together with the North American *Antennaria pulcherrima* (HOOKER) GREENE and *A. eucosma* FERN. et WIGAND. the $2n = 56$ represents the highest number in this group (URBANSKA 1983a). The main morphological feature on which the distinguishing of *A. lanata* (= *A. villifera*) is based is in the length of achenes which are in *A. lanata* ca 1 mm long and in *A. carpatica* ca 1.5 mm long.

At present we reached the conclusion that the complex of *Antennaria carpatica* in Central and Western Europe is represented by three morphologically very well characterized subspecies. Formerly we classified one of them as a species of its own — *A. helvetica* but a new analysis of our data (CHRTEK et POUZAR 1962) given in table on p. 126 showed that there is some overlapping in basal leaf-breadth, especially when we are counting the leaves 5–6 mm broad which may well exist in both the Carpathian and in the Alpine population (called *A. helvetica*). Similarly between the Alpine populations of the plants called by us formerly *A. lanata* and *A. helvetica* there are some few examples which are of somewhat intermediate character. These facts lead to the new classification of the Central and Western European populations of *A. carpatica* as three subspecies.

We accept the concept of URBANSKA (1970, 1983a) that the Central and West European complex is represented by one species — *Antennaria carpatica* (WAHLENB.) BLUFF et FINGERH. Nevertheless we still are of the opinion that there are differences between the various morphotypes in this area. Now we should like to distinguish three subspecies based mainly on basal leaf shape and hairness together with the distributional pattern:

a) *Antennaria carpatica* subsp. *carpatica*

Basal leaves glabrous on upper blade and tomentose on lower one, together with their breadth (4—)5,5—8,5(—15) mm. This subspecies is distributed only in Carpathians (Higher Tatra, Lower Tatra, Bliznica Mts. and Drago-brat in Eastern Carpathians).

b) *Antennaria carpatica* subsp. *helvetica* (CHRTEK et POUZAR) CHRTEK et POUZAR comb. nova — Basionym: *Antennaria helvetica* CHRTEK et POUZAR Novit. Bot. Praga 1960 : 21, 1960.

Basal leaves glabrous on upper blade and tomentose on lower one, together with their breadth (1—)2—4,5(—9) mm. This subspecies, characterized by leaves glabrous on upper blade and distinctly narrower than in subsp. *carpatica* is distributed solely in the Alps, with great number of localities in their western part.

c) *Antennaria carpatica* subsp. *amphilanata* CHRTEK et POUZAR subsp. nova

Folia basalia utrinque lanata cum indumento in pagina inferiore dilutiore, folia caulina angusta cum appendicibus brunneolis.

Typus: Carinthia austr. occid. Raibl, Bärenlahner ad mtem Wischberg, sol. calcar., 6000', 15. VII. 1875, HUTER, in herb. PRC (typorum collectio no. 728) asservatur.

This subspecies is distributed in the Alps and the Pyrenees.

The distribution in Alps of *Antennaria carpatica* subsp. *amphilanata* is demonstrated on the dotted map on p. 117 in CHRTEK et POUZAR (1962) as *A. lanata*. The whole area of distribution of *A. carpatica* subsp. *amphilanata* — Alps and Pyrenees — is given on the map on p. 114 in the quoted work (CHRTEK et POUZAR 1962) where the part of distribution in Central and Western Europe relates really to our new subspecies. Similarly the localities of *A. lanata* from Alps and Pyrenees enumerated in the quoted work (p. 114 to 124) really relate to *A. carpatica* subsp. *amphilanata*.

The whole problem of *A. carpatica* complex requires further studies, because especially in Alps there could be found some further local populations the taxonomy of which would need experimental and cytological studies. Especially it would be interesting to study plants with violet as well as those with strikingly straw involucreal phyllaries.

SOUHRN

V minulých letech jsme se znovu vrátili ke studiu kociánku karpatského — *Antennaria carpatica* (WAHLENB.) BLUFF et FINGERH. a zjistili jsme, že naši koncepci (CHRTEK et POUZAR 1960, 1961, 1962) je nutno podrobit přehodnocení, a to nejen na základě vlastního pozorování, ale i na základě nových studií publikovaných od té doby (URBAŇSKA-WORYTKIEWICZ 1961, 1967a, b, 1970; URBAŇSKA 1983a, b). Podle naší původní koncepce je *A. carpatica* sensu stricto druh rozšířený pouze v Karpatech a všechny populace z jiných pohoří se vztahují k jiným druhům. Tak populace s listy po obou stranách plstnatými, rostoucí v Pyrenejích, Alpách, sev. Evropě a na Sibiři jsme označovali *A. lanata* (HOOKER) GREENE (= *A. villifera* BORISS.). Nezabírali jsme však do tohoto pojetí severoamerickou populaci ze Skalistých hor, určenou jako *A. lanata* (HOOKER) GREENE, neboť jsme potvrdili její odlišnost; zjistili jsme též, že basionym tohoto jména se zakládá ve skutečnosti na skandinávské rostlině. Severoamerické rostliny, označované do-
posud jako *Antennaria lanata*, popisujeme proto jako nový druh *Antennaria lanatula* CHRTEK et POUZAR.

V Alpách jsme rozlišili rostliny podobné druhu *A. carpatica*, s listy na svrchní straně lysými, avšak užšími než u *A. carpatica*, a pojmenovali jsme je *A. helvetica* CHRTEK et POUZAR.

Během dalšího studia v posledních letech jsme došli k názoru, že v západní a střední Evropě roste pouze jediný druh, *Antennaria carpatica* (WAHLENB.) BLUFF et FINGERH. Toto dnešní pojetí se zakládá na jednotnosti počtu a tvaru chromosomů a délky nážek, čímž se především liší dva evropské druhy této skupiny: středo- a západoevropská *Antennaria carpatica* (WAHLENB.) BLUFF et FINGERH. a severoevropská a severoasijská *Antennaria lanata* (HOOKER) GREENE (= *A. villifera* BORISS.).

Antennaria carpatica se rozpadá dále ve tři subspecie: subsp. *carpatica*, rozšířenou pouze v Karpatech (Vysoké a Nízké Tatry, Bliznica a Dragobrat a vyznačující se především širokými přízemními listy, které jsou na svrchní straně lysé, na spodní plstnaté; subsp. *helvetica* (CHRTEK et POUZAR) CHRTEK et POUZAR, která je velmi příbuzná subsp. *carpatica*, ale má užší listy a roste pouze v Alpách; subsp. *amphilanata* CHRTEK et POUZAR roste v Pyrenejích a Alpách a má listy po obou stranách běloplstnaté. Mezi těmito třemi uvedenými subspeciemi se vyskytují vzácně přechodné tvary, které umožňují námi navrhané taxonomické hodnocení.

REFERENCES

- BORISOVA A. G. (1960): K sistematike roda *Antennaria* Gaertn. — Bot. Mater. Gerb. Bot. Inst. Akad. Nauk SSSR, Moskva, Leningrad, 20 : 289—295.
- CHRTEK J. et POUZAR Z. (1960): *Antennaria helvetica* nov. spec., a new species of the Alpine flora. — Novit. Bot., Praga, 1960 : 20—22.
- (1961): Observations on some Scandinavian species of the *Antennaria* Gaertn. genus. — Novit. Bot., Praga, 1961 : 11—15.
- (1962): A contribution to the taxonomy of some European species of the genus *Antennaria* Gaertn. — Acta Univ. Carol. — Biol., Praha, 1962 : 105—136.
- HALLIDAY G. (1976): *Antennaria* Gaertn. In: Flora Europaea 4 : 131—132. — Cambridge.
- HESS H. E., LANDOLT E. et HIRZEL R. (1972): Flora der Schweiz und angrenzender Gebiete 3. — Basel.
- HOOKER W. J. (1840): Flora Boreali-Americana 1. — London.
- PIGNATTI S. (1982): Flora d'Italia 3. — Bologna.
- URBAŃSKA-WORYTKIEWICZ K. (1961): Badania embriologiczne nad rodzajem *Antennaria* Gaertn. L. I. Rozwój załążków *A. carpatica* (Wahlb.) Bl. et Fing. — Acta Biol. Cracov., Kraków, 4 : 49—64.
- (1967a): Badania embriologiczne nad rodzajem *Antennaria* Gaertn. IV. Mikrosporogeneza u *A. carpatica* (Wahlb.) Bl. et Fing. z Północnej Skandynawii. — Acta Biol. Cracov., Kraków, 10 : 85—98.
- (1967b): Cytological investigations in *Antennaria* Gaertn. from North Scandinavia. — Acta Boreal., ser. A., Tromsø, 22 : 1—14.
- URBANSKA K. (1983a): *Antennaria carpatica* (Wahlb.) Bl. et Fing. s.l. in North America. I. Chromosome numbers, geographical distribution and ecology. — Ber. ü. Geobot. Forsch.-Inst. Rübel, Zürich, 50 : 33—66.
- (1983b): Cyto-geographical differentiation in *Antennaria carpatica* s.l. — Bot. Helv., Basel, 93 : 123—131.
- WAHLENBERG G. (1814): Flora Carpatorum principalium ... — Goettingae.
- (1824—1826): Flora Suecica. — Upsaliae.

Received 2 August 1984