

Asperula tymphaea (Rubiaceae) – a new species from Northern Pindus, Greece

Thomas Gregor¹, Lenz Meierott² & Thomas Raus³

¹ Forschungsinstitut und Naturmuseum Senckenberg – Abteilung Botanik und molekulare Evolutionsforschung, Senckenberganlage 25, 60325 Frankfurt am Main, e-mail: thomas.gregor@senckenberg.de (corresponding author)

² Am Happach 43, 97218 Gerbrunn, e-mail: lenz.jutta.meierott@t-online.de

³ Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität Berlin, Königin-Luise-Straße 6-8, 14195 Berlin, Germany, e-mail: t.raus@bgbm.org

Received: February 22, 2016 ▷ Accepted: April 29, 2016

Abstract. *Asperula tymphaea* T. Gregor, Meierott & Raus is described as new to science and is compared to the sympatric *A. aristata* subsp. *thessala* (Boiss. & Heldr.) Hayek. The new species inhabits high-mountain calcareous screes and so far appears to be endemic to Mt Timfi (NW Greece), although its total range needs to be studied.

Key words: *Asperula*, Greece, new species

Introduction

During a botanical survey in NW Greece near the Albanian border in 2009, Thomas Gregor and Lenz Meierott found an unknown *Asperula* in the calcareous screes on the eastern slope of the Astraka massif of Mt Timfi (Fig. 1). The plants are nearly totally covered by a dense indumentum which differentiates them clearly from *Asperula aristata* L. f. subsp. *thessala* (Boiss. & Heldr.) Hayek, also co-occurring in the Timfi area. During a visit in 2010, Thomas Gregor found the plants in the original locality again, while searches in adjacent areas of the scree in a wider area were unsuccessful. Since screes are common in the Timfi area but partly difficult to access, further populations of the taxon under discussion might exist.

Fig. 1. Habitat of *Asperula tymphaea* in the screes of Mt Astraka in the Timfi massif, (photo T. Gregor, 17 July 2010).

Results

The single known and sampled population is described here as a species new to science:



***Asperula tymphaea* T. Gregor, Meierott & Raus, sp. nov.** (Figs. 2, 3)

Habitu *Asperulae aristatae* subsp. *thessalae* similis sed tota planta (cum floribus) pilis patentibus crispis ad 0.3 mm longis glandulosisque subsessilibus intermixtis dense puberula. Corolla rosea tubo laciniis obscure appendiculatis 2–3-plo longiore.

Holotype: Griechenland: Nomos Ioannina, Timfi: Osthang Astraka-Massiv, 39°57'50"N, 20°46'55"E, Kalkfels und-schutt, 2083–2116 m. ü. NN, 31.07.2009, Gregor 5616 & Meierott (FR-0036776) (Fig. 2). Additional collections: *ibid.*, 16.07.2010, Gregor 6370 (FR); *ibid.*, 17.07.2010, Gregor 6402 (FR).

A subshrub forming 30–40 cm tall clumps, with a freely branching woody basal part of >15 cm length in mature plants; flowering stems wither in winter, producing lateral sterile short-shoots with narrowly lanceolate leaves 1.5–4 mm long in autumn, persistent but dry in the next season. Stems of current growth are terminal to the short shoots, tetragonous, unbranched below the inflorescence, without visible innovations at flowering time. Indumentum of the whole plant (stems, leaves, bracts, corollas – but not ovaries) of dense, straight, patent hairs *ca.* 0.2 mm long, resulting in a characteristic greyish velutinous appearance, intermixed with subsessile, glandular hairs. Leaves in whorls of 4, straight, acicular but not pungent, 7–15 × 0.5 mm, erecto-patent (at an angle diminishing upwards), crowded and about as long as the next internode in the lower part but widely spaced (by up to 7 cm long internodes) below the inflorescence; apical hair-like appendage 0.2–0.5 mm long. Inflorescence (upper 1/3 of the stem) mostly branched at the lower 1–3 nodes, with erecto-patent branches about equaling or slightly exceeding the next internode and bearing 1–3(4) flower clusters; terminal portion spiciform, overtopping the lateral branches. Bracts and bracteoles ovate-lanceolate, exceeding the ovary, narrowed into a membranous tip.

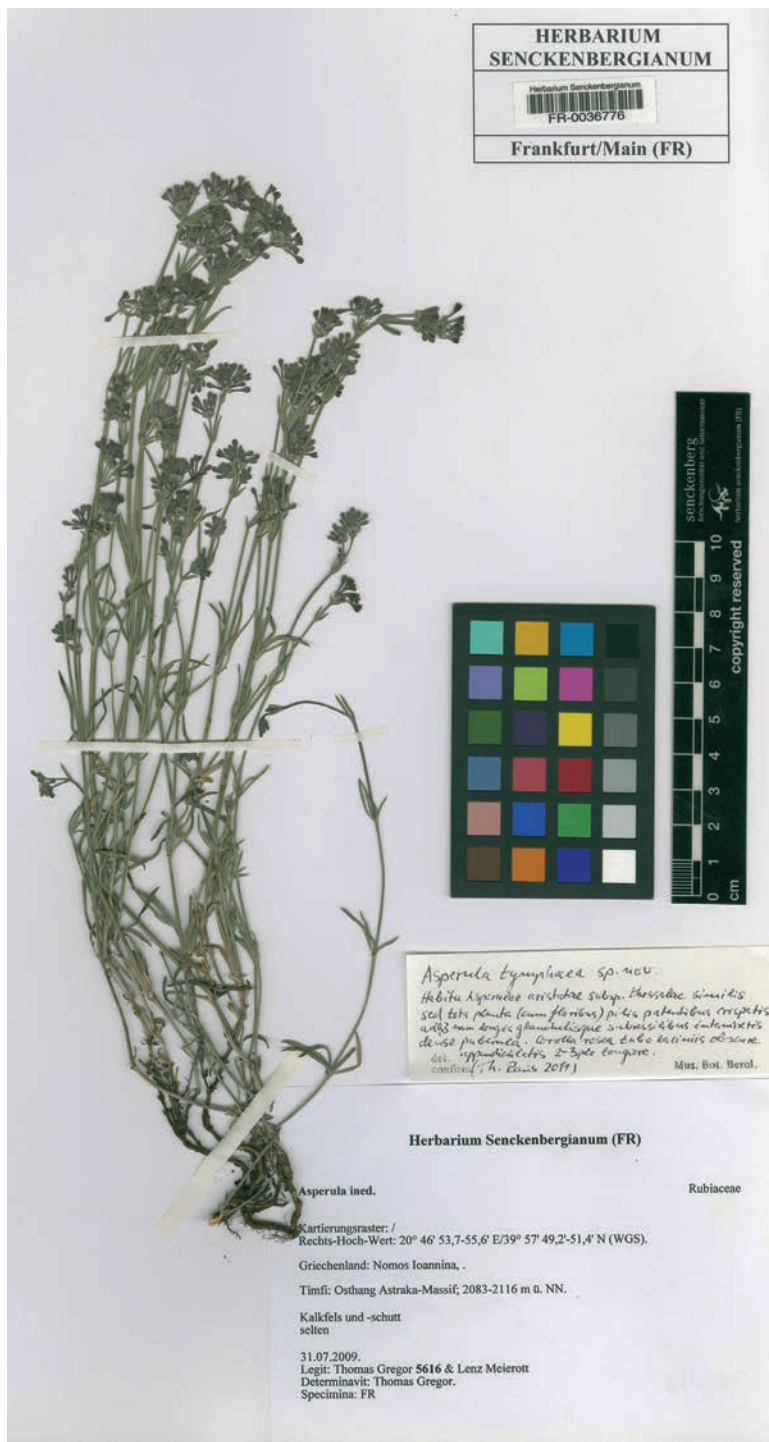


Fig. 2. Holotype of *Asperula tymphaea*, courtesy Herbarium Senckenbergianum (FR).



Fig. 3. Inflorescence from the holotype, enlarged.

Ovary (immature) sessile, glabrous but densely covered with vesicular, subacute papillae. Corolla purplish, narrowly tubular, scarcely expanded apically, ca. 5 mm long, divided for $\frac{1}{3}$ or less into upright lobes beset with elevated conical papillae toward the minute, blunt, inflexed tip. Anthers included, purplish, linear, ca. 1.2 mm long. Flowering time: July to August; fruiting time: presumably August to September.

Discussion

Asperula aristata is an extremely polymorphous complex with different ploidy levels in South and Southeast Europe (Schönbeck-Temesy & Ehrendorfer 1991). *Asperula aristata* was recently revealed as non-monophyletic (Gargiulo & al. 2015). Ehrendorfer & Krendl (in Tutin & al. 1976) differentiate five subspecies, four of them occurring in Greece (Dimopoulos & al. 2013), viz. subsp. *aristata* (= subsp. *longiflora* auct. fl. graec., non Waldst. & Kit., = subsp. *scabra* auct. fl. graec., non Nyman), subsp. *condensata* (Heldr. ex Boiss.) Ehrend. & Krendl, subsp. *nestia* (Rech. f.) Ehrend. & Krendl, and subsp. *thessala* (Boiss. & Heldr.) Hayek. Morphological differentiation between these subspecies is occasionally vague.

Asperula tymphaea is similar to *A. aristata* subsp. *thessala*, especially regarding the growth form, inflorescence and the blunt, inflexed tips of the petals. *Asperula aristata* subsp. *thessala* occurs in rocky grassland, between rocks and in screes between 1000 and 2100 m a.s.l. in Central and North Greece, mainly in the southern and northern Pindus, and is glabrous except for the \pm puberulent base (Tan & Iatrou 2001). In comparison, *A. tymphaea* is entirely covered by a dense indumentum of straight or curly 0.3 mm long hairs intermixed with subsessile, glandular hairs. We are aware of the fact that indumentum in *Asperula* is not always reliable for differentiation of the taxa. Greuter (2011) found in *Asperula lutea* Sm. subsp. *lutea* and *A. lutea* subsp. *mungieri* (Boiss. & Heldr.) Maire & Petitm., even within populations, variable degrees of hairiness. Hayek (1931: 450-452) certainly overemphasized the importance of the indumentum as a taxonomic character in *A. aristata*. Generally, there seems to be a gradient from more hairy plants at lower elevations to more or less glabrous plants at higher elevations.

However, because of the totally unique indumentum combined with abundant subsessile glands and lack of transitional forms to the locally sympatric *A. aristata* subsp. *thessala*, we regard the homogenous population on the eastern slope of the Astraka massif as a new species. Its distribution beyond the so far single known population needs to be studied further.

The syntaxonomical affiliation of *Asperula tymphaea* is documented by a relevé: 17.07.2010; 5 × 5 m, inclination ca. 45°, exposition NE; cover of higher plants 90%, cover of mosses and lichens 3%.

Achillea abrotanoides (Vis.) Vis. 1, *Acinos alpinus* (L.) Moench 2, *Alyssum montanum* L. 1, *Anthyllis vulneraria* subsp. *pulchella* (Vis.) Bornm. 2, *Armeria canescens* (Host) Boiss. +, *Asperula tymphaea* T. Gregor & al. 1, *Astragalus onobrychis* L. 1, *Campanula spatulata* Sm. 1, *Carduus tmoleus* Boiss. r, *Carum graecum* Boiss. & Heldr. 1, *Cerastium decalvans* Schlosser & Vuk. +, *Cuscuta* cf. *epithymum* L. r, *Daphne oleoides* Schreb. r, *Dianthus integer* subsp. *minutiflorus* (Halácsy) Strid 1, *Erysimum microstylum* Hausskn. 1, *Festuca rubra* L. 1, *Festuca graeca* (Hack.) Markgr.-Dann. 3, *Galium anisophyllum* subsp. *plebejum* (Boiss. & Heldr.) Ehrend. +, *Galium monasterium* Krendl +, *Geranium subcaulescens* DC. +, *Hypericum rumeliacum* Boiss. +, *Leontodon hispidus* L. +, *Lotus corniculatus* L. 2, *Medicago lupulina* L. 1, *Minuartia verna* (L.) Hiern., *Myosotis alpestris* F. W. Schmidt +, *Pedicularis graeca* Bunge +, *Pilosella cymosa* (L.) F. W. Schultz & Sch. Bip. 2, *Phleum alpinum* L. 1, *Plantago atrata* Hoppe +, *Poa thessala* Boiss. & Orph. 1, *Potentilla erecta* (L.) Rausch. +, *Ranunculus sartorianus* Boiss. & Heldr. +, *Rhinanthus pumilus* (Sterneck) Pau +, *Rosa* sp. +, *Rumex acetosella* L. +, *Sagina* cf. *subulata* (Swartz) C. Presl 1, *Saxifraga taygetea* Boiss. & Heldr. r, *Sedum acre* L. +, *Sedum album* L. 1, *Sedum hispanicum* L. 1, *Sedum ochroleucum* Chaix +, *Sempervivum* cf. *marmoreum* Griseb. +, *Betonica alopecuroides* L. +, *Trinia glauca* (L.) Dumort. r, *Trisetum flavescens* (L.) P. Beauv. 1, *Veronica orsiniana* Ten. 1; *Brachythecium* sp., *Ceratodon purpureus* Hedw., *Cladonia* sp., *Polytrichum juniperinum* Hedw., *Syntrichia ruralis* (Hedw.) F. Weber & D. Mohr, *Tortula subulata* Hedw., *Trichostomum crispulum* Bruch.

Since the syntaxonomical alignment of montane and alpine grasslands in the Pindus Mts has not been surveyed so far, the relevé is tentatively aligned to the *Astragalo-Seslerion* (*Festuco-Brometea*, *Daphno-Festucetea*).

Acknowledgement: We are grateful to Wiebke Schröder (Ludwigsstadt-Ebersdorf) for determination of *Bryophyta*.

References

- Dimopoulos, P., Raus, Th., Bergmeier, E., Constantinidis, Th., Iatrou, G., Kokkini, S., Strid, A. & Tzanoudakis, D.** 2013. Vascular Plants of Greece. An annotated checklist. Berlin: Botanic Garden and Botanical Museum Berlin-Dahlem; Athens: Hellenic Botanical Society. – Englera, **31**.
- Ehrendorfer, F. & Krendl, F.** 1976. *Asperula*. – In: **Tutin, T.G. & al.** (eds), Flora Europaea. Vol. **4**, pp. 4-14. Cambridge Univ. Press, Cambridge.
- Gargiulo, R., Del Guacchio, E. & Caputo, P.** 2015. Phylogenetic reconstruction of *Asperula* sect. *Cynanchicae* (*Rubiaceae*) reveals a mosaic of evolutionary histories. – Taxon, **64**: 754-769.
- Greuter, W.** 2011. Results of the 17th Iter Mediterraneum in the Peloponnese, Greece, May to June 1995. – *Bocconea*, **25**: 5-127.
- Hayek, A. von** 1931. Prodrömus Florae Peninsulae Balcanicae. – *Repert. Spec. Nov. Regni Veg. Beih.*, **30**(2).
- Schönbeck-Temesy, E. & Ehrendorfer, F.** 1991. *Asperula*. – In: **Strid, A. & Tan, Kit**, Mountain Flora of Greece. Vol. **2**, pp. 281-300. Edinburgh Univ. Press, Edinburgh.
- Tan, Kit & Iatrou, G.** 2001. Endemic Plants of Greece. The Peloponnese. Gads Forlag, København.
-