Three new *Centaurea* species for Albania

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Abstract. During fieldwork in Korça district (S Albania) between 2019 and 2022, *Centaurea devasiana*, *C. marmorea* and *C. thracica* were collected and documented as new additions for the flora of Albania. *Centaurea devasiana* was collected in limestone pastures on Ivani Mt, Prespa National Park, c. 14 km distant from its *locus classicus* on Mt Devas, Greek Prespa. It had previously been considered a Greek endemic. *Centaurea marmorea* was found on the western rocky limestone slopes and pastures of Dry Mt (Mali i Thatë) above Bletas village, at 1400–1750 m. It is a Balkan endemic with a restricted distribution in North Macedonia (Prilep area) and North eastern Greece (Mts Orvilos and Falakro). The new locality in Albania extends its distribution westwards. The third species, *C. thracica* was observed and collected in openings of *Quercus* woodland in Qafa e Qarrit, a serpentine area between Korça and Kolonja municipalities. Its population comprises less than 30 mature plants. Notes on the habitat, ecology and variation in each species are provided.

Key words: *Centaurea*, Albania, Balkan Peninsula, new records, distribution, variation

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Introduction

The genus *Centaurea* with a total of 36 species and 56 intraspecific taxa in Albania is one of the larger genera for the flora, and Korça district in southeastern Albania is particularly rich in members of this genus (Barina & al. 2018, Wagenitz & al. 2018). The National Park of Prespa lies in the area and its territory includes several narrow endemics such as *Centaurea epirota* Halácsy, *C. galicicae* Micevski, *C. graeca* Griseb., *C. shumkana* Kit Tan, Shuka & Wagenitz, *C. soskae* Hayek and *C. triniifolia* subsp. *campylacme* (Bornm.) Wagenitz (Shuka & Tan 2013, Wagenitz & al. 2018, Shuka & al. 2021). The serpentine massifs in the area are home to a dozen or so endemic and relict *Centaurea* species with a restricted distribution

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(Shuka 2009, Mahmutaj & al. 2015, Słomka & al. 2015, Brullo & al. 2019, Damo & Icka 2020). According to Shuka & Jahollari (2007), Shuka & Tan (2009) and Meço (2019), the serpentine area of Lugina e Gjergjevicës and the mountains of Valamara, Morava and Qarri represent the southwesternmost limits of *C. candelabrum* Hayek & Košanin (Lugina e Gjergjevicës), *C. deustiformis* subsp. *ptarmicifolia* (Halácsy ex Hayek) Dostál, *C. pindicola* Griseb. and *C. vlachorum* Hartvig (Valamara Mt), and the northernmost limits of *C. drenovensis* Pils (Morava Mt) or its westernmost limits in Qarri Mt.

We now include *Centaurea devasiana* Bergmeier & Strid, *Centaurea marmorea* Bornm. & Soška and *Centaurea thracica* (Janka) Gugler, as three additional species for the flora of Albania. They are so far known only from Korça district. *Centaurea devasiana* had been described based on just one population from Mt Devas, Greece. The Albanian plants c. 14 km across the border are more or less identical to Greek plants. In the case of *C. thracica*, some deviation from the original description was noted.

Material and methods

Korça district is located in the southeastern part of Albania. The eastern part of the region borders Greece and North Macedonia. The district includes five municipalities, viz., Devoll, Kolonjë, Korçë, Pogradec and Pustec, altogether covering a total area of c. 3,711 km^2. It is an area where serpentine and limestone predominate.

Within a three year period from 2019 to 2022, we carried out extensive fieldwork in Korça district focusing on the territory of the Prespa National Park, and other mountainous parts of the region such as Mali i Thatë (Dry Mt), Mali i Valamarës, Mali i Qarrit and the Ostrovica range. The aim of the study was to investigate the floristic richness of the region, identification of the taxa collected, and monitoring threatened taxa in different habitat types and ecosystems. The *Centaurea* material collected was identified using literature as well as by comparison with other herbarium specimens in B, GOET, E, K & W (herbarium acronyms according to Thiers 2019, continuously updated). The specimens are deposited in TIR and duplicates kept in the private herbarium of D. & L. Shuka (herb. Shuka).

Results and Discussion

Centaurea devasiana Bergmeier & Strid [*Centaurea* sect. *Acrolophus* (Cass.) DC.; syn.: sect. *Centaurea*] (Figs. 1a & 3)

SE Albania: Korça district, Devolli municipality, on southern ridge of Ivani Mt, small grassy patches in *Carpinus* forest with *Buxus* scrub, on limestone, c. 1360 m, 40°43'E, 20°54'E, 08.07.2022, *D. Shuka* s.n. (TIR).

— Pusteci municipality, NE slopes of Ivani Mt, semi-open grassland in mixed *Carpinus–Quercus–Acer* forest, on limestone, c. 1410 m, 40°44'N, 20°53'E, 10.07.2022, *D. Shuka* & *A. Diku* 2954 (herb. Shuka); *loc. ibid*., 31.07.2022, *D. Shuka* obs.

Centaurea devasiana is a recently described species from Mt Devas in northwest Greece and considered a Greek endemic. It is now collected on Ivani Mt, c. 14 km from its *locus classicus.* In the first locality a fine population of more than a hundred individuals was found on the western limestone slopes of the southern ridge above Burimas village, in mixed forest with *Buxus sempervirens* scrub. The locality is just a few metres outside the official borders of the Prespa National Park. Approximately 1.65 km to the northwest of this locality it was noted in openings of mixed *Carpinus orientalis*, *Quercus* and *Acer* woodland (including a few *Acer heldreichii* individuals). This locality had only a few individuals and is included within the borders of the National Park.

The plants of *C. devasiana* in the new localities in Albania are more or less identical to those from the *locus classicus* in Greece (Bergmeier & Strid 2019). The indumentum in plants growing in shady places on the northeastern slopes of Ivani Mt is more dense than in plants exposed to full sun.

Habitat and Ecology

Based on classification of habitat types in NATURA 2000 (2013) the locality on the southern ridge

Fig. 1. a) *Centaurea devasiana* and b) *Centaurea marmorea* showing habit, capitulum and achenes.

of Ivani Mt belongs to habitat type code 5110 Stable xerothermophilous formations with *Buxus sempervirens* on rock slopes (*Berberidion* p.p.), with the calcareous substrate vegetated by sub-Mediterranean and temperate scrub. The second locality belongs to habitat type code 9180 *Tilio-Acerion* forests of slopes, screes and ravines.

In this region winters are harsh and cold and summers hot and dry. Herbaceous vegetation is represented by species adapted for growing in shallow soil. Most abundant in the grassland together with *C. devasiana* are *Alkanna pindicola* Hausskn., *Anthemis cretica* L., *Artemisia alba* Turra, *Asperula aristata* L.f., *Astragalus angustifolius* subsp. *balcanicus* Brullo & al., *Campanula persicifolia* L., *Comandra elegans* (Rochel ex Rchb.) Rchb.f., *Dianthus haematocalyx* subsp. *pindicola* (Vierh.) Hayek, *Erodium absinthoides* subsp. *guicciardii* (Boiss.) Maire & Petitm., *Eryngium amethystinum* L., *Fritillaria* sp., *Hypericum rumeliacum* Boiss., *Iris attica* Boiss. & Heldr., *Lilium chalcedonicum* L., *Onobrychis alba* (Waldst. & Kit.) Desv., *Potentilla detommasii* Ten., *Scorzonera mollis* M. Bieb., *Sempervivum marmoreum* Griseb., *Sedum* sp., *Sideritis montana* L., *Stachys plumosa* Griseb., *Stipa* sp., *Thesium divarica-*

tum Mert. & W.D.J. Koch, *Thymus boissieri* Halácsy and *Xeranthemum inapertum* (L.) Mill.

Centaurea marmorea Bornm. & Soška [*Centaurea* sect. *Phalolepis* (Cass.) DC.] (Figs. 1b & 3)

SE Albania: Korça district, Maliqi municipality, on western slopes of Dry Mt (Mali i Thatë), above Bletas village, on rocky limestone slopes along path towards pastures of Dry Mt, c. 1530 m, 40°50'N, 20°48'E, 05.07.2021, *D. Shuka* s.n. (TIR).

— *loc. ibid.,* rocky slopes in subalpine pastures of Dry Mt, above the tree line of *Carpinus* forest, c. 1700 m, 40°50'N, 20°48'E, 29.07.2022, *D. Shuka* & *A. Diku* 2719 (herb. Shuka).

According to Gamal-Eldin & Wagenitz (1991) and Doumas & al. (2022), *Centaurea marmorea* is a Balkan endemic with a restricted distribution range in the Prilep area (North Macedonia) and mountains of Orvilos and Falakro (northeastern Greece). There is little morphological variation in the species. It was noted on the rocky western limestone slopes of Dry Mt, above Bletas village, from 1400 to 1750 m. The new locality in Albania extends the total distribution westwards to some extent.

The closest affinities of this species are probably with *C. vandasii* Velen. (Tan & Kofinas 2022) and *C. drenovensis* Pils, the latter a serpentine species recently described by G. Pils (2016). The differences between *C. marmorea* and *C. vandasii* are mentioned by Gamal-Eldin & Wagenitz (1991: 506). *Centaurea marmorea* differs from *C. drenovensis* by its more greyish-floccose, tomentose leaf segments and stems, longer capitula and nearly orbicular appendages with narrow, denticulate hyaline margins, as well as the shape of achenes and longer pappus.

Habitat and Ecology

The habitat type of *C. marmorea* may be classed as code 8210 Calcareous rocky slopes with chasmophytic vegetation and code 8130 Western Mediterranean and thermophilous scree, with a low cover vegetation on dry shallow soil. Accompanying taxa include *Aethionema saxatile* (L.) R. Br., *Artemisia alba* Turra, *Asperula aristata* L.f., *Chamaecytisus pseudojankae* Pifkó & Barina, *Dianthus haematocalyx* subsp. *pindicola* (Vierh.) Hayek, *Euphorbia myrsinites* L., *Eryngium amethystinum* L., *Helianthemum canum* (L.) Baumg., *Leontodon crispus* Vill., *Rhamnus orbiculatus* Bornm., *Saxifraga aizoides* L., *Saxifraga paniculata* Mill., *Sedum* sp., *Sideritis raeseri* Boiss. & Heldr., *Silene saxifraga* L., *Stipa* sp., *Thymus boissieri* Halácsy, etc.

Centaurea thracica (Janka) Gugler [*Centaurea* sect. *Microlophus* (Cass.) Dostal] (Figs. 2 & 3)

SE Albania: Korça district, Kolonja municipality, Qarri pass (Qafa e Qarrit), S-facing serpentine slopes in open *Quercus cerris* – *Pinus nigra* woodland and *Juniperus oxycedrus* scrub, c. 30 m along the right side of the road to Erseka, c. 1165 m, 40°28'N, 20°40', 13.07.2019, *D. Shuka* s.n. (TIR) & 2132 (herb. Shuka); *loc. ibid*., 14.08.2020, *D. Shuka* & *L. Shuka* s.n. (TIR).

Centaurea thracica is widely distributed in the Balkan Peninsula (Bulgaria, Greece, Romania and Turkey). In Greece it occurs in N and S Pindos, North Central, North East and W Aegean islands (Evvia), mainly on serpentine (Gamal-Eldin & Wagenitz 1991). According to Psaras & Constantinidis (2009) it is a nickel hyperaccumulator plant. In Albania, it was noted in openings of *Quercus cerris* woodland in Qafa e Qarrit, a few metres below the pass, in a serpentine area between Korça and Kolonja municipalities. There were fewer than 30 mature individuals.

We noted that the Albanian plants have branched, long-pilose stems and leaves, and thick rhizomes with several tuberous roots (Fig. 2a), characters not mentioned in the description of the basionym *Serratula thracica* Janka (1872) and Hayek (1931).

Habitat and Ecology

The small open patches of grassland in Qarri pass belong to habitat type code 91M0 or Pannonian-Balkanic turkey oak – sessile oak forest. Within the oak woods the soil layer is deeper than in the surroundings areas. Accompanying plants in the same habitat are *Allium cupanii* Raf., *Allium moschatum* L., *Alyssum* sp., *Asperula aristata* L.f., *Brachypodium retusum* (Pers.) P. Beauv., *Centaurea drenovensis* Pils., *Chamomilla recutita* (L.) Rauschert, *Dianthus haematocalyx* subsp. *pindicola* (Vierh.) Hayek, *Echinops ritro* L., *Haplophyllum boissieranum* Vis. & Pančić., *Galium corrudifoli-*

um Vill., *Lathyrus niger* (L.) Bernh., *Melampyrum heracleoticum* Boiss. & Orph., *Ononis spinosa* L., *Scabiosa ochroleuca* L., *Scilla autumnalis* L., *Taraxacum* sp., *Verbascum* sp., *Xeranthemum inapertum* (L.) Mill.

Since the population in Qarri pass comprised fewer than 30 mature plants and the area is freely and unrestrictedly grazed by cattle, we plan to monitor the locality closely every three years.

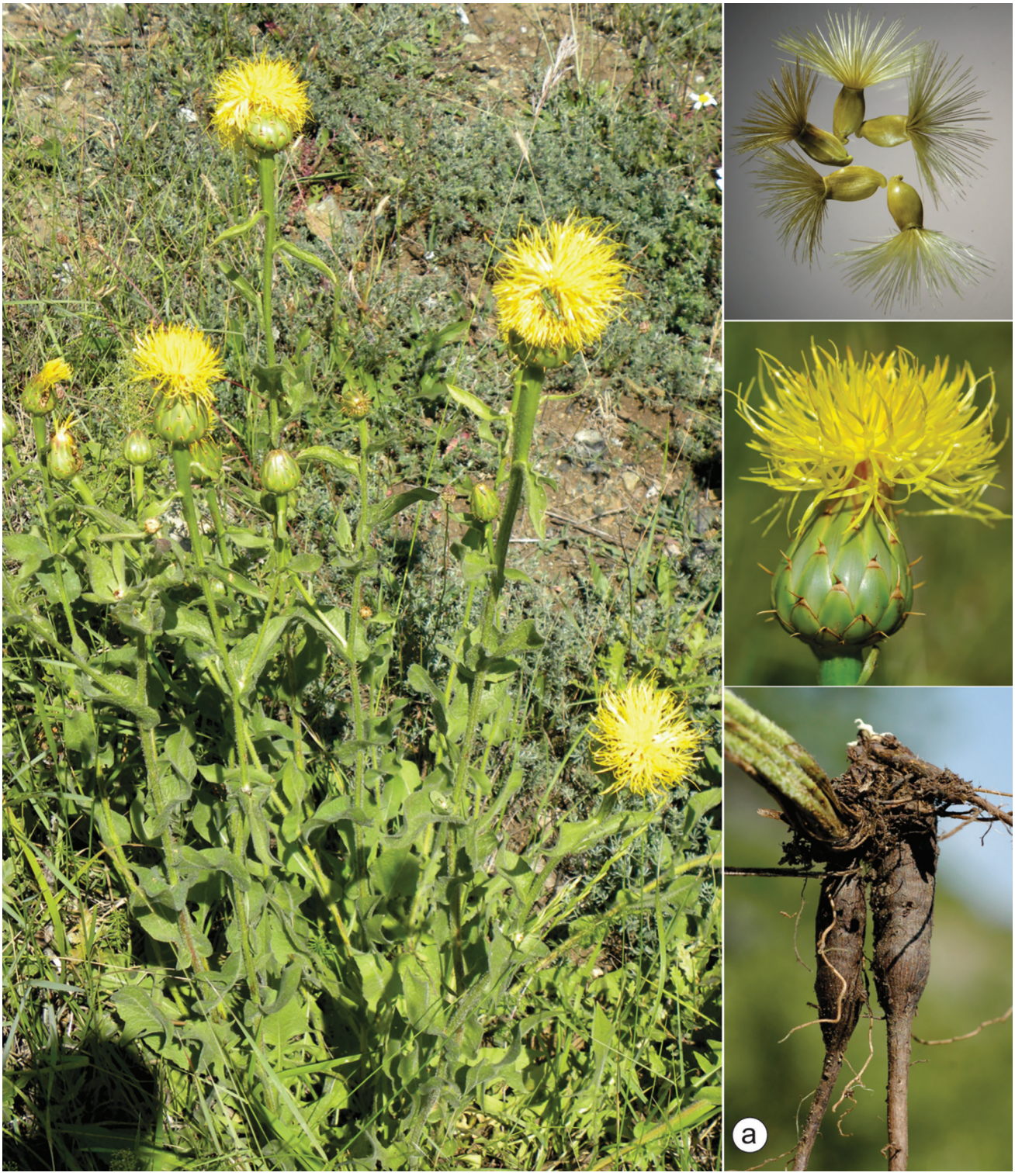

Fig. 2. *Centaurea thracica* showing habit, capitulum, achenes and tuberous roots (a).

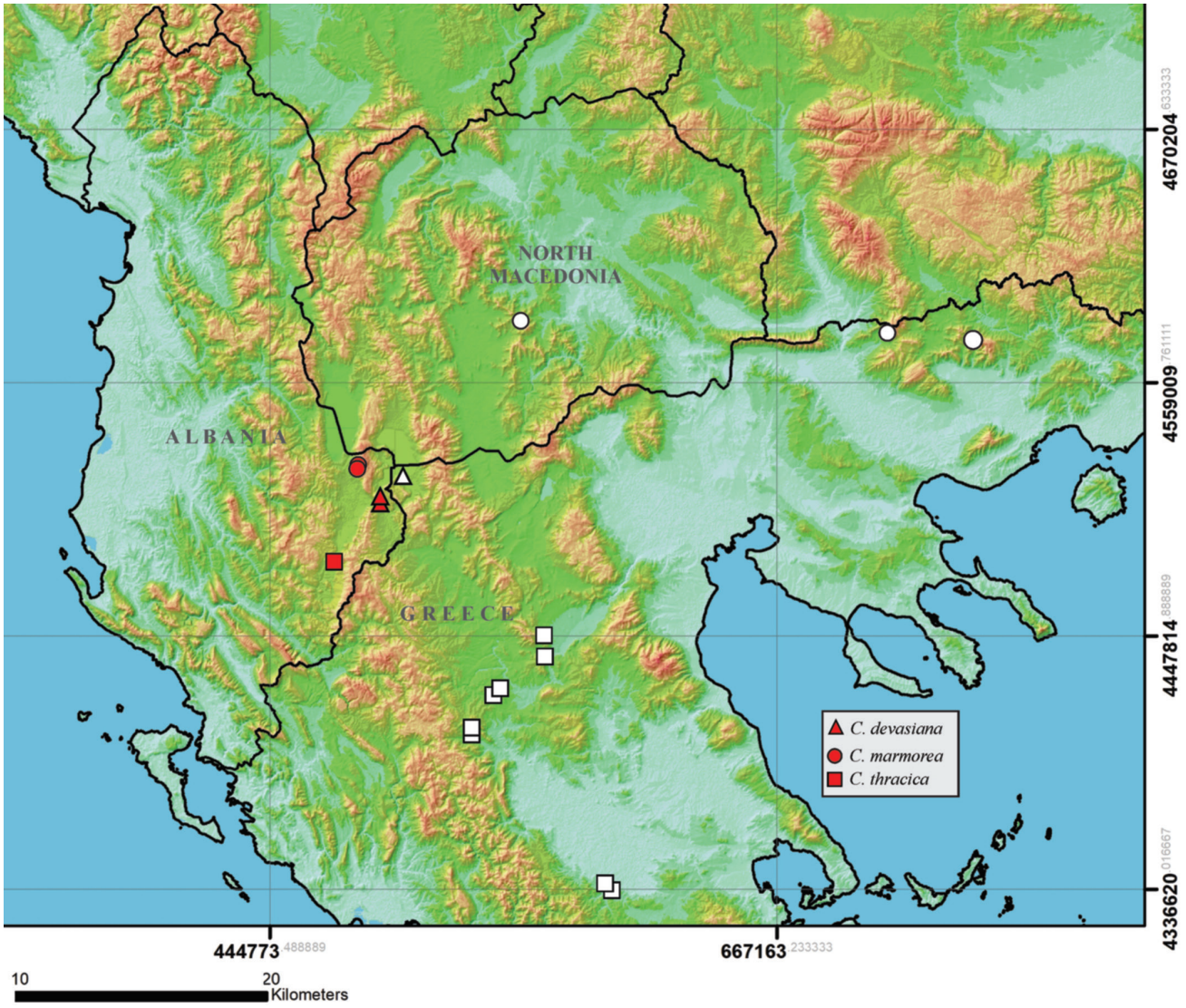

Fig. 3. Distribution of *Centaurea devasiana, C. marmorea* and *C. thracica* in Albania and adjacent parts of Greece and North Macedonia (white for existing localities, red for the new localities).

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