








Original Scientific Paper

A nomenclatural and taxonomic re-evaluation of neglected *Centaurea candelabrum* Hayek & Košanin (sect. *Acrocentron*, Asteraceae) and related serpentine endemics from the Balkan Peninsula

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ABSTRACT:

Centaurea sect. *Acrocentron* comprises several taxonomically intricate groups of taxa, including the Balkan endemic obligate serpentinophytes: *C. melanocephala*, *C. candelabrum* and *C. albertii*. Despite its distinctive morphological characteristics, *C. candelabrum* was considered conspecific with *C. melanocephala*. A similar situation pertains to *C. albertii*, which has largely been considered a synonym of *C. melanocephala*. Considering that several recent floristic works treat these taxa as separate species distributed in different serpentine areas of the Balkans, the main objectives of our study were to analyse the taxonomic and chorological relationships between them, and to propose a new taxonomic concept. Our study was based on an extensive revision of herbarium material, including the type specimens, personal field data and observations of living plants. Our comprehensive study showed that the plants previously recognised as *C. melanocephala* from the Stolovi mountain in central Serbia and those previously recognised as *C. candelabrum* from northern Albania deserve the rank of distinct species. These species can be easily distinguished from each other by a number of characters, including their general habitus, the dimensions and shape of the basal leaves, and the indumentum of the involucre bracts. Given the only slight differences observed between the populations in Kosovo and Albania, the question of whether *C. albertii* is conspecific with *C. candelabrum* or deserves an independent taxonomic status remains unresolved until further detailed integrative studies are conducted. In view of the clear differences in morphological and ecological characteristics which exist within this group compared to other representatives of sect. *Acrocentron*, we propose the separation of the studied taxa into a separate *C. melanocephala* complex, as outlined in this paper.

Keywords:

Centaurea melanocephala complex, lectotype, overlooked taxa, typification

UDC: 582.998.1:581.961(497.11)

Received: 01 July 2024

Revision accepted: 21 September 2024

INTRODUCTION

The genus *Centaurea* L., which comprises more than 250 species, belongs to the subtribe Centaureinae (Cass.) Dumort., tribe Cardueae Cass. from the family Compositae Giseke (SUSANNA & GARCIA-JACAS 2007). In regard to the total number of species and the number of endemics, it is one of the most species-rich genera on the Balkan Peninsula (STEVANOVIĆ *et al.* 1995). The taxonomy of this genus is highly complex due to the significant morphological variability observed among its constituent taxa and their hybridisation (FONT *et al.* 2008; KOUTECKÝ *et al.* 2011; WAGENITZ *et al.* 2018).

The first division of the genus *Centaurea* into sections was proposed by DE CANDOLLE (1838), a proposal which was subsequently accepted by numerous synanthrologists (e.g. DITTRICH 1968; WAGENITZ 1975). Dostál reduced the broadly defined genus *Centaurea*, which had been divided into a large number of sections, to 15 subgenera (DOSTÁL 1976). Subsequent research has led to the classification of the genus into three subgenera, which are distinguished by their morphology, pollen types, karyology and DNA sequences: *Centaurea*, *Cyanus* and *Acrocentron* [*Lopholoma*] (GARCIA-JACAS *et al.* 2001; SUSANNA & GARCIA-JACAS 2007).

Centaurea sect. *Acrocentron* (subgen. *Acrocentron*) is one of the largest sections of the genus, comprising approximately 100 species. It has a wide distribution, primarily in the Mediterranean region (FONT *et al.* 2002). The presence of the following characteristics allows for the clear distinction of this section: very large capitula, the absence of staminodes in the sterile marginal flowers with achenioides, spiny, long decurrent appendages and the pollen type *Centaurea scabiosa* (GARCIA-JACAS *et al.* 2001). A significant number of species within this section are endemic, with some comprising a single population (e.g. NOVAKOVIĆ *et al.* 2018). The first attempt to subdivide this section was made by HAYEK (1901), who proposed the division into eight subsections. The subsequent division was suggested by DOSTÁL (1976) and was based on Hayek's subsections, which were elevated to the level of section. However, in consideration of the proposal to establish a subsectional classification within this section, as previously suggested by HAYEK (1901) and DOSTÁL (1976), molecular data has offered limited insight because of the intense introgression and gene flow which often confound the delimitation of species on a DNA basis and hinder the reconstruction of phylogenetic affinities through molecular means. In addition, the pronounced homogeneity of morphological characters renders the prospect of infrasectional classification a challenging undertaking (FONT *et al.* 2009; NOVAKOVIĆ *et al.* 2022).

The sect. *Acrocentron* encompasses several taxonomically intricate groups of taxa which are morphologically well-defined. One such group includes the Balkan

endemic species which are obligate serpentinophytes: *C. melanocephala* Pančić, *C. candelabrum* Hayek & Košanin and *Centaurea albertii* Rexhepi.

The species *Centaurea melanocephala* was discovered by Josif Pančić on the serpentine slopes of Stolovi mountain, situated in the vicinity of Kraljevo in Serbia. Despite its valid description (PANČIĆ 1874), this species was overlooked for a considerable period of time and consequently not mentioned in key publications such as Flora of Serbia (GAJIĆ 1975) and Flora of Europe (DOSTÁL 1976). An alternative hypothesis proposed the plant to be a hybrid between *Centaurea alpina* L. (*C.* sect. *Centaurea*) and *C. fritschii* Hayek (*C.* sect. *Acrocentron*). This hypothesis of hybridogenic origin was initially proposed by WAGNER (1911) and subsequently adopted by HAYEK (1931) without further interpretation. However, a comprehensive examination of the original herbarium material by WAGENITZ (1981) corroborated Pančić's assertion that *C. melanocephala* is endemic to central Serbia. He also provided an extended diagnosis and presented compelling arguments against its hybridogenic origin. His arguments can be summarised into the following points: the only parental species present in Serbia is *C. alpina* in one locality (Ograđenica) approximately 80 km to the west. The other parental species does not occur in Serbia. Furthermore, the leaves, flower colour, and involucre characteristics do not correspond to those expected from a hybrid species between the two sections. Additionally, there are notable differences in involucre structure, pollen morphology and seed anatomy, as well as chemical characteristics (WAGENITZ 1981). This resulted in the acceptance of the independent status of this species by key botanical publications and checklists (NIKETIĆ 2014; BARINA 2017; NOVAKOVIĆ *et al.* 2022; POWO 2024). However, in contrast to the conclusions drawn by WAGENITZ (1981), who considered *C. melanocephala* to be an endemic of central Serbia, WRABER (1993) proposed including *C. albertii* Rexhepi into the synonymy of *C. melanocephala*, thus expanding its distribution range to include northern Albania. Additionally, he suggested that the subsequently described taxa *C. candelabrum* Hayek & Košanin (HAYEK 1931) should be regarded as conspecific with *C. melanocephala*, arguing that the two taxa exhibit identical characteristics to those observed in *C. melanocephala* (WRABER 1993).

The species *Centaurea candelabrum* was described by Hayek and Košanin based on the material collected by N. Košanin from serpentine rocky grounds in northern Albania. Despite its distinctive morphological characteristics, the species has been largely overlooked in contemporary databases and relevant botanical literature and has been considered to be conspecific with *C. melanocephala* (STEVANOVIĆ 1991; GREUTER 2006+; POWO 2024). It is worth noting that this plant is considered a good species only in the relevant papers of local botanists (SHUKA 2009; MAHMUTAJ *et al.* 2015; SHUKA *et al.* 2023).

The species *Centaurea albertii* was described by Rexhepi on serpentine rocky grasslands in Kosovo. Although *C. albertii* is accepted in the main contemporary databases (GREUTER 2006+; GBIF 2024; POWO 2024), a certain degree of ambiguity remains regarding this species. Some authors have questioned its distinctness, claiming that its characteristics are fully consistent with those of *C. melanocephala*. This would mean that *C. albertii* would fall under the synonymy of *C. melanocephala* (WRABER 1993; NIKETIĆ 2014). Some author, however, propose an alternative hypothesis, suggesting that this species is also widespread in the serpentines of Albania, and that it is likely to have been previously described as *C. candelabrum* (KRASNIQI 2013).

Given that recent botanical literature includes several relevant references which recognize *C. candelabrum* (SHUKA 2009; MAHMUTAJ *et al.* 2015; SHUKA *et al.* 2023) and *C. albertii* (MILLAKU *et al.* 2008; KRASNIQI 2013; MIMOZË *et al.* 2023) as separate endemic species distributed in serpentine areas in Albania and Kosovo, the main aims of our study were to analyse the taxonomical and chorological relationships between *C. melanocephala*, *C. candelabrum* and *C. albertii* and to propose a new taxonomic concept within this group of Balkan endemic serpentophytes.

MATERIALS AND METHODS

The study is based on a revision of the herbarium material deposited in BEO, BEOU, BP, GB, LJU, HMN, and WU (abbreviations follow THIERS 2024), as well as in the Herbarium Moesiacum Niš (HMN), the National Herbarium of Tirana (TIR), the Herbarium of the Faculty of Natural Sciences - University of Prishtina (Herb. Univ. Prisht. - UP) and the Shuka private collection (Herb. Shuka). Additionally, it draws upon personal field data and observations of living plants. Coordinates are provided in the World Geodetic System 1984 (WGS 84), and in UTM grid squares of 10 km × 10 km, based on the Military Grid Reference System (MGRS) projection (LAMPINEN 2001). All UTM grid squares fall within the UTM grid zone 34T. Coordinates with a precision of 100 m were registered using a GPS device, while those with a precision of 5000 m were secondarily georeferenced based on the data on the localities where the occurrences were registered. Articles from the International Code of Nomenclature for algae, fungi, and plants (hereafter ICBN) cited in the text refer to the Shenzhen Code (TURLAND *et al.* 2018).

RESULTS AND DISCUSSION

Typification of the names

Centaurea melanocephala Pančić, Fl. Serbiae: 443 (1874)

≡ *C. × melanocephala* Pančić (= *C. alpina* L. × *C. fritschii* Hayek), Magyar Bot. Lapok 10: 301 (1911), pro hybr. sensu Wagner.

= *C. orientalis* subsp. *stolensis* Pančić ex Nyman, Consp. Fl. Eur.: 428 (1879) [*C. stolensis* Pančić ex Wagner, Magyar Bot. Lapok 10: 301 (1911), nom. inval. (pro syn. of *C. × melanocephala* Pančić, pro hybr. sensu Wagner)].

– “*C. coriacea*” sensu Pančić, Verh. Zool.-Bot. Vereins Wien 6: 555 (1856) [non Waldst. & Kit., Descr. Icon. Pl. Hung. 2: 214 (1805)].

– “*C. rigidifolia*” sensu Pančić, Oesterr. Bot. Z. 17: 209 (1867) [non Besser ex DC., Prodr. 6: 587 (1838)].

Lectotype (designated here): SERBIA. Mt. Stolovi: “In declivibus M. Stol. S[erbia] merid[ionalis]”, Aug., Pančić *s.n.* (GOET001281! sub *Centaurea stolensis* m., Fig. 1A). <https://www.gbif.org/occurrence/1638363597>

Other original material

SERBIA. – Mt. Stolovi: “In declivibus M. Stol. S[erbia] merid[ionalis]”, Aug., J. Pančić, *s.n.* (GOET001282!, sub *Centaurea stolensis* m.); Mt. Stolovi: “Stol”, Jul 1864, J. Pančić *s.n.* (BEOU 10884!, sub *Centaurea stolensis* m.); Mt. Stolovi: “Stol, in declivibus herbicidis”, Jul 1868, J. Pančić *s.n.* (BEOU 10885!, sub *Centaurea stolensis* m.); Mt. Stolovi: “ad pedes m Stol. (circ. Užicensis)”, 17-Jul-1886, J. Pančić *s.n.* (BEOU 14938!, sub *Centaurea melanocephala* Panč.); Mt. Stolovi: “Stol, ispod Stola”, 17. Jul 1886, J. Pančić *s.n.* (BEOU 14939!, sub *Centaurea melanocephala* Panč.); Mt. Stolovi: “na Ibru u Čačanskoj”, 17. Jul 1886, J. Pančić *s.n.* (BEOU 15047!, sub *Centaurea melanocephala*); Mt. Stolovi: “Mt Stol in Kr.[eise] Čačak”, 17. VII 1886, J. Pančić *s.n.* (BP 428367!, sub *Centaurea melanocephala* Panč.); Mt. Stolovi: “Mt. Stol in Kreise Čačak”, 17. VII 1886, J. Pančić *s.n.* (WU 87-150/61!, sub *Centaurea melanocephala* Panč.); Mt. Stolovi: “Mt. Stol in Kreise Čačak”, 17. VII 1886, J. Pančić *s.n.* (WU 87-150/62!, sub *Centaurea melanocephala* Panč.); Mt. Stolovi: “Mt. Stol in Kreise Čačak”, 17. VII 1886, J. Pančić *s.n.* (WU 87-150/63!, sub *Centaurea melanocephala* Panč.).

Note. The species *Centaurea melanocephala* was described by Josif Pančić based on the material collected on the serpentine slopes of Stolovi mountain. Prior to describing the new species, Pančić had already collected the first specimens, which he labelled “*Centaurea stolensis* m. (mihi)”. This indicates that although he considered it to be a new scientific discovery at the time, he did not publish the name (unpublished named, “in sched.”). The specimen selected here as the lectotype is not labelled as such by Pančić (the original label was transcribed), but is the most well-preserved and contains the most important diagnostic characteristics. The specimen was verified by Wagenitz and is linked to both names, namely *C. stolensis* and *C. scabiosa* var. *coriacea*.

Centaurea candelabrum Hayek & Košanin, Repert. Spec. Nov. Regni Veg. Beih. 30(2): 746 (1931) [Prodr. Fl. Penins. Balc. 2]



Fig. 1. Lectotypes of the names: A) *Centaurea melanocephala* (GOET001281); B) *Centaurea albertii* (LJU10143489); C) *Centaurea candelabrum* (GB-0636419 - vegetative parts); D) *Centaurea candelabrum* (GB-0636418 - generative parts).

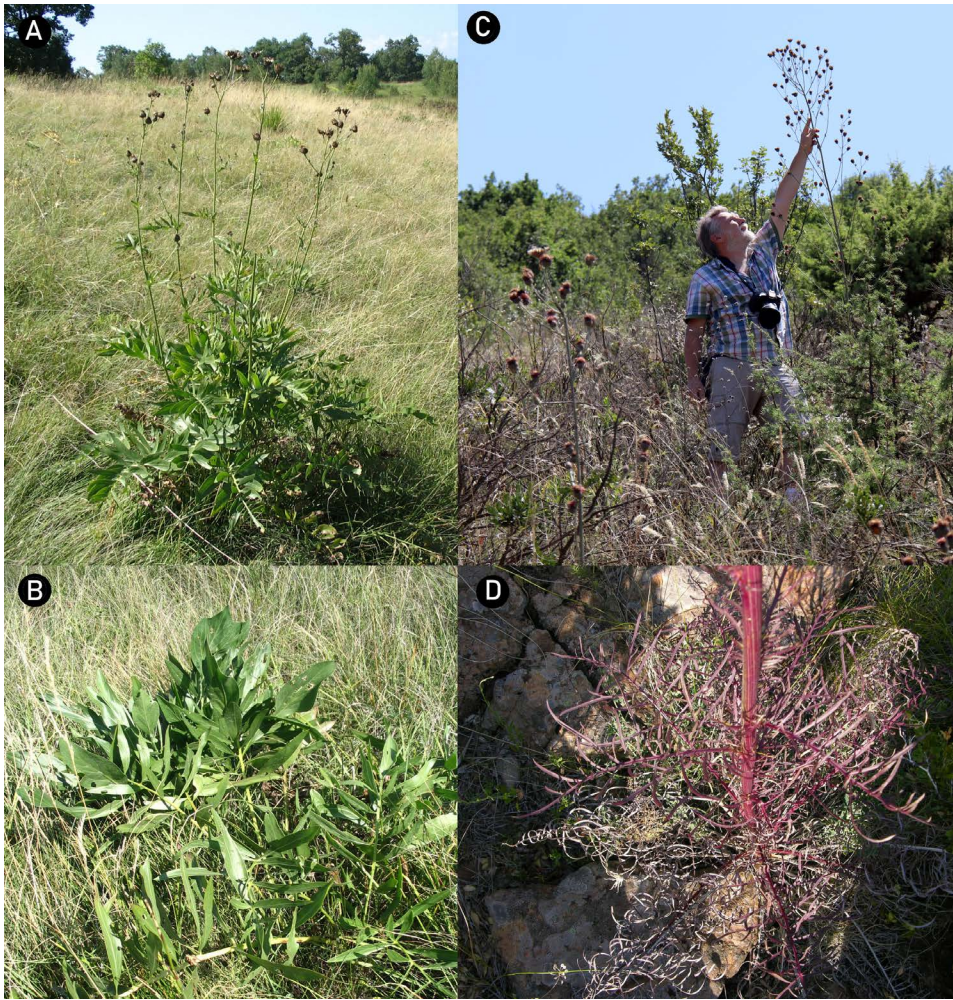


Fig. 2. *Centaurea melanocephala* Pančić (A - habitus, B - basal leaves – photo B. Zlatković); *C. candelabrum* Hayek & Košanin (C - habitus – photo N. Kuzmanović, D - basal leaves – photo L. Shuka).

≡ *Colymbada candelabrum* (Hayek & Košanin) Holub, Folia Geobot. Phytotax. 7(3): 315 (1972).

Lectotype (designated here): ALBANIA. “Nordalbanien: Serpentinhalde unterhalb der Ćafa Pogas 700 m, (oberhalb der Uva Vezirit (Vezir’s Briücke)”, 22. Juni 1913, N. Košanin s.n. (GB-063418 (generative parts) and GB-063419 (vegetative parts), sub *Centaurea albanica* Košanin [nomen ineditum non *C. albanica* Hal. Ap. Bornm.] (Fig. 1C & D).

Note. In the paper in which he analysed the chorology and taxonomic position of Košanin’s taxa, STEVANOVIĆ (1991) stated that he had analysed the type material held at BEOU („In rupestribus serpenticis Šimširovo brdo (Albania) ca. 700 m.s.m., leg. Košanin, BEOU“). Unfortunately, this specimen seems to have been lost, as it was not located during a detailed examination of the herbarium material deposited at BEOU. The specimen selected here as the lectotype was collected by N. Košanin in 1913 on serpentine slopes above the Vezir’s Bridge (Ura e Vezirit) on the Drin near Kukës. During the summer of 1913, Košanin was stationed in northern Albania, where

he served as a soldier during the most difficult and critical period of the Balkan wars. Despite the challenging circumstances, he was able to collect the material he determined as *C. albanica* Košanin. Nevertheless, he never published this name, leaving it unpublished (in sched.). The selected specimen deposited in GB consists of two sheets registered under two distinct accession numbers. However, these sheets belong to a single gathering. The first sheet (GB-063418) contains the upper part of an individual with inflorescences and heads, while the second (GB-063419) contains the lower part of the same individual with leaves.

Centaurea albertii Rexhepi, Fl. SR Srbije 10: 351 (1986)
Lectotype (designated here): KOSOVO. “Devë (Gjakovës) - Kosovë, kullosa në serpentin”, 18.07.1977, F. Rexhepi s.n. (LJU10143489!, Fig. 1B).

Note. There has been some confusion regarding the valid publication dates of *C. albertii*, as it has been published more than once as new to science. The first publication was invalid due to the absence of a Latin diagnosis (REXHEPI 1986a), while the second was valid including both a

Table 1. The main morphological differences between *Centaurea melanocephala*, *C. candelabrum* and *C. albertii*.

	<i>C. melanocephala</i>	<i>C. candelabrum</i>	<i>C. albertii</i>
Habitus	stems usually numerous, up to 100(–150) cm tall.	stems usually single, up to 200(–300) cm tall.	stems usually single, up to 150 cm tall.
Basal leaves	subcoriaceous, very big, up to 50 cm long and 20 cm wide, leaf segments lanceolate, 15–20 mm wide	non-subcoriaceous, big, up to 25 cm long and 10 cm wide, leaf segments linear to linear-lanceolate, (1,5) 2–4 mm wide	non-subcoriaceous, big, up to 27 cm long and 10 cm wide, leaf segments linear, 1.5–2.5 mm wide
Involucral bracts	dark shiny green, glabrous or sparsely arachnoideo pubescent	greyish yellow-green, floccose-pubescent	yellow-green, floccose-pubescent

Latin diagnosis and type designation (REXHEPI 1986b). A more detailed discussion of this issue can be found in (VASIĆ & DIKLIĆ 1996).

When the new species was validly published, Rexhepi cited a holotype (REXHEPI 1986b). However, in the first publication of the name (REXHEPI 1986a) he stated that the description was based on the extensive study of material collected in 1977, 1978, and 1979. This means that the holotype he cited was in fact a lectotype (an error to be corrected, Art. 9.10, ICBN). Following a detailed search of the Herbarium of the Natural Sciences - University of Prishtina, the original material cited in the protologue (*Holotypus: Jugoslavia — SAP Kosovo — Deva (Djakovica) Leg. et det. F. Rexhepi. In Herb. PMF Prishtina*) could not be located. Due to the well-founded suspicion that this material has been lost, here we designate a lectotype (Art. 9.11., ICBN), which belongs to the original material and fully corresponds to the original description of the species.

Taxonomic treatment

Based on a detailed examination of the original material, insight into the general habitus and fine morphological features of individuals in populations from classical localities, and a study of the herbarium material collected throughout the range of the three taxa studied, significant morphological differences were found between the species examined. This suggests that the plants described as *C. melanocephala* from the Stolovi mountain in central Serbia and the plants described as *C. candelabrum* from northern Albania should be considered as distinct species. These two species can be easily distinguished from each other based on their general habitus, dimensions and the shape of the basal leaves, as well as the indumentum of the involucral bracts (Table 1, Figs. 2 & 3). Furthermore, the results of our study show that

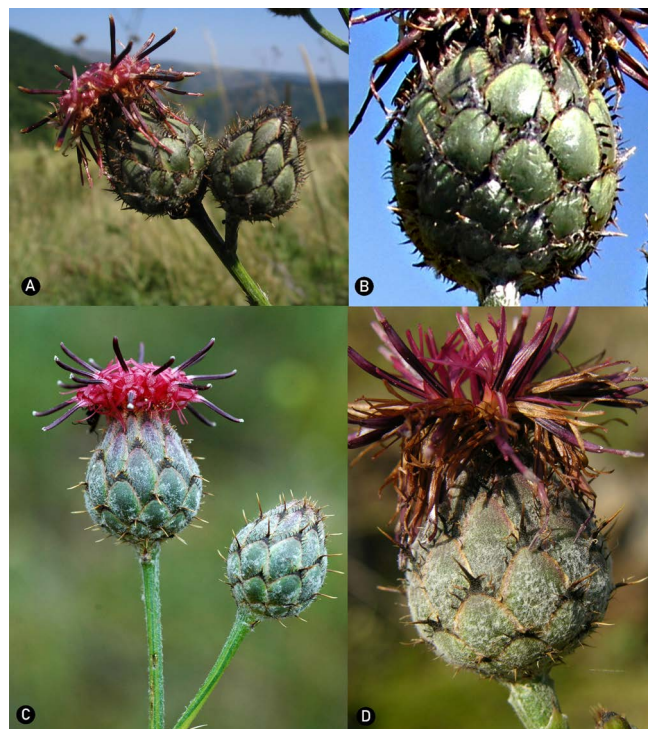


Fig. 3. *Centaurea melanocephala* Pančić (A-capitulum with flowers, B- involucrum – photo B. Zlatković); C-D: *C. candelabrum* Hayek & Košanin (C- capitulum with flowers, D - involucrum – photo L. Shuka).

the plants identified as *C. albertii* from Kosovo share a greater morphological similarity with the Albanian *C. candelabrum* than with *C. melanocephala* from Mt. Stolovi in central Serbia. Consequently, it can be concluded that *C. albertii* should not be considered a synonym of *C. melanocephala* as proposed by WRABER (1993) and NIKETIĆ (2014). At the same time, only slight differences were found between the populations in Kosovo and Albania. Therefore, the question of whether *C. albertii* is conspecific with *C. candelabrum* or merits independent taxonomic status remains open until detailed integrative studies are carried out using material collected throughout the range of all three species belonging to this intriguing group of serpentine centaureas.

As previously stated, *C. melanocephala* and consequently *C. albertii* and *C. candelabrum* clearly belong to the section *Acrocentron*. However, their position within the section remains unclear. Namely, according to Novaković et al. (2022), *C. melanocephala* was assumed to belong to the *C. calocephala* complex (*Centaurea calocephala* Willd. (syn. *C. atropurpurea* Waldst. and Kit.), *C. chrysolepis* Vis., *C. crnogorica* Rohlena, *C. gjurasinii* Bošnjak, *C. grbavacensis* (Rohlena) Stoj. and Acht., *C. immanuelis-loewii* Degen, *C. kotschyana* Heuffel ex Koch, *C. murbeckii* Hayek, *C. orientalis* L., *C. zlatiborensis* Zlatković, Novaković, Janačković). In contrast, NIKETIĆ (2014) concluded that based on the morphology of the phyllaries, *C. melanocephala* either belongs to the

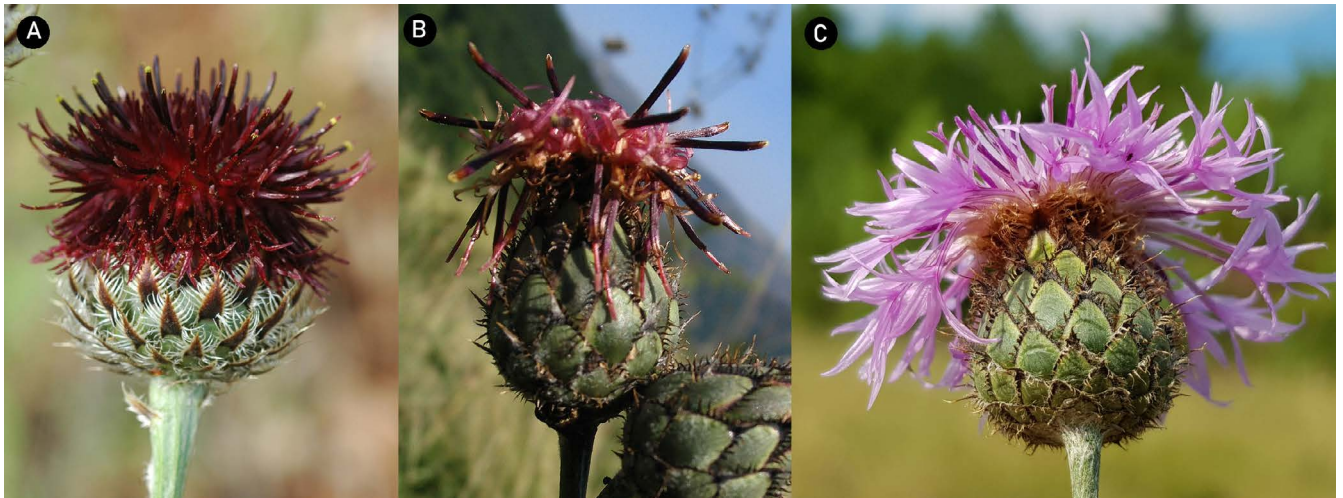


Fig. 4. Typical representatives of A: *Centaurea calocephala* complex (*Centaurea calocephala* Willd. = *C. atropurpurea* Waldst. and Kit. – photo L. Shuka); B: newly proposed *C. melanocephala* complex (*C. melanocephala* Pančić – photo B. Zlatković); C: *C. scabiosa* complex (*C. scabiosa* L. – photo D. Lakušić).

Centaurea scabiosa complex (*C. scabiosa* L., *C. sadleriana* Janka, *C. fritschii* Hayek and *C. spinulosa* Rochel ex Sprengel etc.) or that it originated by the hybridisation of the representatives of the *C. scabiosa* complex and the *C. calocephala* complex. In terms of their general habitus and floral characteristics, these three taxa exhibit similarities to species of the *C. calocephala* complex. Similarly, with regard to the morphology of the head and the involucre features, they resemble species of the *C. scabiosa* complex. Given the very specific morphological and ecological characteristics of these taxa, we propose the establishment of a separate *C. melanocephala* complex to which the three studied species should be assigned. This is consistent with the results of detailed morphometric studies which have shown that *C. melanocephala* differs significantly, morphologically, from other representatives of the *C. calocephala* complex (NOVAKOVIĆ 2019; NOVAKOVIĆ *et al.* 2024). These Balkan endemic obligate serpentinophytes are characterised by robust stems, 100 to 300 cm tall, branched in the upper half; large pinnatisect leaves (up to 50 cm long and 20 cm wide) with linear to lanceolate leaf segments; an ovoid-globose involucre with ovate glabrous to arachnoid-pubescent bracts; triangular-ovate, brown or black small appendages (2–3 mm) with dark brown fimbriae, the appendages do not cover the bracts; dark purple florets, the outer scarcely longer than the inner, outer flowers not radial (Fig. 4).

DISTRIBUTION AND ECOLOGY

All representatives of the newly proposed *Centaurea melanocephala* complex are endemic to the central part of the Balkan Peninsula. A review of the verified chorological data revealed that the three taxa exhibit an allopatric distribution (Fig. 5). *Centaurea melanocephala* is a local endemic, known only from the mountains of Stolovi and Studena

planina in central Serbia. *Centaurea albertii* is widespread in Kosovo, from the southern slopes of Mt. Kopaonik to Mt. Deva on the border with Albania. Finally, *C. candelabrum* is an Albanian endemic species, with a distribution divided into two parts: the northern part is limited to the Kukësi district, while the southern part is limited to the Korça district.

All taxa inhabit the ultramafic (serpentine) xeric rocky grasslands found in the submontane to supramontane belts of the continental regions of the Balkan Peninsula (*Halacsyetalia sendtneri* Ritter-Studnička 1970), or in the ultramafic (serpentine) Submediterranean thermophilous scrub of the Central Balkans (*Buxo-Syringion* P. Fukarek ex Diklić 1965), at elevations between 400 and 1200 m a.s.l.

Herbarium specimens examined and field observation

Centaurea melanocephala

SERBIA. – **CENTRAL SERBIA:** Mt. Studena planina, Cvetalica peak, on slopes toward the Brezanska reka river, serpentinite, mountain pastures and glades in an oak forest, exp. NW, *Festuco-Brometea*, [Accuracy: 100 m; UTM - DP72] N 43.54680°, E 20.6551°, 11.09.2002, B. Zlatković *s.n.* (HMN-9248!); Mt. Studena planina [Accuracy: 5000 m; UTM - DP72] N 43.55°, E 20.65°, 05.08.2015, M. Mrvaljević, A. Laudanović *s.n.* (BEOU 57485!); Mt. Studena planina [Accuracy: 5000 m; UTM - DP72] N 43.5515889°, E 20.6515944°, 964 mnv, 20.07.2017, J. Novaković *s.n.* (BEOU 38594!).

Centaurea candelabrum

ALBANIA. – **KORÇE:** Shkëmbi i Polenës, Gjergjevica valley [Accuracy: 100 m; UTM - DK69] N 40.59031°, E 20.5559°, 1105 m, 25.08.2023, D. Shuka *s.n.* (Herb. Shuka!); Sharra e Karafilit, Gjergjevica valley [Accuracy:

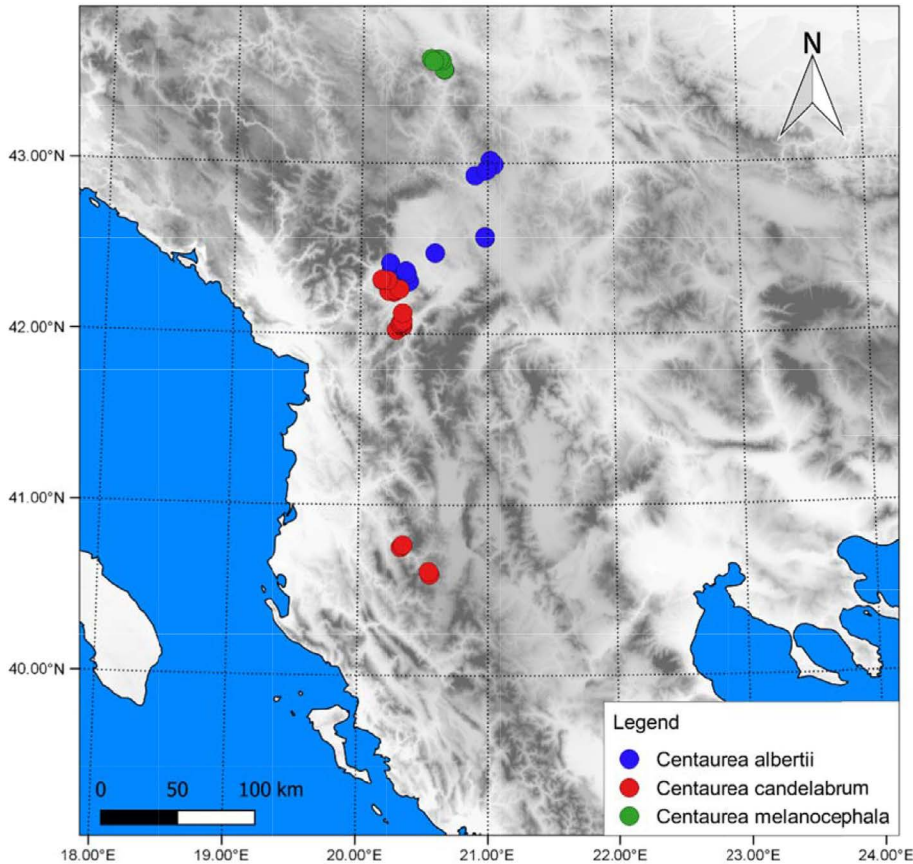


Fig. 5. The distribution of the representatives of the newly proposed *Centaurea melanocephala* complex.

100 m; UTM - DK69] N 40.60758°, E 20.5472°, 1060 m, 30.06.2005, *L. Shuka s.n.* (TIR!); Ura Molla e Grabovës [Accuracy: 100 m; UTM - DL41] N 40.75085°, E 20.3330°, 425 m, *M. Meço s.n.* (TIR!); Below Grabova e Poshtme village [Accuracy: 100 m; UTM - DL41] N 40.76334°, E 20.3487°, 490 m, 28.08.2020, *L. Shuka* (field obs.); KUKËS: Above Kalimashi Tunnel [Accuracy: 100 m; UTM - DM45] N 42.02269°, E 20.2898°, 876 m, 20.08.2021, *D. Shuka s.n.* (Herb. Shuka!); Arat e Totës, Near Surroj village [Accuracy: 100 m; UTM - DM45] N 42.04511°, E 20.3358°, 580 m, 07.05.2009, *L. Shuka s.n.* (TIR!); Polla e Zezë, near Surroj village [Accuracy: 100 m; UTM - DM45] N 42.04978°, E 20.3360°, 583 m, 20.08.2020, *D. Shuka, B. Hallaçi* (field obs.); To the west of Trulli village [Accuracy: 100 m; UTM - DM45] N 42.05816°, E 20.3174°, 782 m, 20.08.2021, *D. Shuka* (field obs.); Polla e Zezë, near Surroj village [Accuracy: 100 m; UTM - DM45] N 42.06365°, E 20.3301°, 625 m, 26.07.2004, *L. Shuka s.n.* (TIR!); Kolsh, Above the Reservoir [Accuracy: 100 m; UTM - DM45] N 42.06706°, E 20.3250°, 600 m, 20.08.2020, *D. Shuka, B. Hallaçi* (field obs.); Kolsh, Above the Reservoir [Accuracy: 100 m; UTM - DM45] N 42.065744°, E 20.327519°, 606 m, 11.07.2024, *D. Lakušić, N. Kuzmanović, I. Stevanoski s.n.* (BEOU 72210); Kolsh [Accuracy: 500 m; UTM - DM45] N 42.065744°, E 20.327519°, 606 m, 11.07.2024, *D. Lakušić, N. Kuzmanović, I. Stevanoski* (field obs.); Fusharë [Accuracy:

100 m; UTM - DM45] N 42.0320186°, E 20.2978461°, 795 m, 11.07.2024, *D. Lakušić, N. Kuzmanović, I. Stevanoski* (field obs.); Fusharë [Accuracy: 100 m; UTM - DM45] N 42.0357715°, E 20.3058007°, 768 m, 11.07.2024, *D. Lakušić, N. Kuzmanović, I. Stevanoski* (field obs.); Kalimash [Accuracy: 100 m; UTM - DM45] N 42.0631811°, E 20.3223106°, 710 m, 11.07.2024, *D. Lakušić, N. Kuzmanović, I. Stevanoski* (field obs.); Kolsh [Accuracy: 100 m; UTM - DM45] N 42.0640096°, E 20.3278560°, 672 m, 11.07.2024, *D. Lakušić, N. Kuzmanović, I. Stevanoski* (field obs.); Nordalbanien - Serpenthienhalden unterhalb der Čafa Pogas 700 m, (oberhalb der Uva Vezirit (Vezirs Brucke) [Accuracy: 5000 m; UTM - DM46] N 42.12°, E 20.33°, 700 m, 22.06.1913, *N. Košanin s.n.* (GB 63419); Nordalbanien - Serpenthienhalden unterhalb der Čafa Pogas 700 m, (oberhalb der Uva Vezirit (Vezirs Brucke) [Accuracy: 5000 m; UTM - DM46] N 42.12°, E 20.33°, 700 m, 22.06.1913, *N. Košanin s.n.* (GB 63418); 1.8 km before Kam village [Accuracy: 100 m; UTM - DM37] N 42.24479°, E 20.2672°, 480 m, 27.07.2022, *L. Shuka s.n.* (Herb. Shuka!); along the SH23 road near the village of Kam, by the roadside [Accuracy: 100 m; UTM - DM37] N 42.24977°, E 20.2212°, 574 m, 19.06.2017, *Z. Barina, K. Baráth, H. Mező* (field obs.); along the SH23 road near the village of Kam, by the roadside [Accuracy: 100 m; UTM - DM37] N 42.25454°, E 20.2712°, 397 m, 19.06.2017, *Z. Barina, K. Baráth, H. Mező*

s.n.(BP 35038); Oplasi Mt., Has [Accuracy: 100 m; UTM - DM47] N 42.26236°, E 20.3102°, 800 m, 16.05.2020, *L. Shuka s.n.* (Herb. Shuka!); Qafë Luzhë, near Tropoja [Accuracy: 100 m; UTM - DM38] N 42.31381°, E 20.1677°, 823 m, 23.07.2012, *L. Shuka s.n.* (TIR!); on the mounts above the village of Bytyç, in closed grassland, on serpentine [Accuracy: 100 m; UTM - DM38] N 42.31470°, E 20.2166°, 663 m, 19.06.2017, *Z. Barina* (field obs.); near the Qafa e Luzhës pass above the village of Bytyç, in grassland, on serpentine [Accuracy: 100 m; UTM - DM38] N 42.31894°, E 20.1653°, 784 m, 20.06.2017, *Z. Barina*, *K. Baráth*, *H. Mező* (field obs.).

Centaurea albertii

KOSOVO. – **GJAKOVË:** Malësisë ë Gjakovës (Shishman-Qerret), dry rocky grasslands on serpentine substrate [Accuracy: 5000 m; UTM - DM48] N 42.36°, E 20.36°, 400 m, 07.07.2012, *E. Krasniqi s.n.* (Herb.Univ.Prisht. - UP 2007!); **Devë** (Qafë Prush – Devë) Malësia e Gjakovës, dry rocky grasslands on serpentine substrate [Accuracy: 5000 m; UTM - DM39] N 42.41°, E 20.23°, 500 m, 10.07.2010, *E. Krasniqi s.n.* (Herb.Univ.Prisht. - UP 2006!); **Koznik** (**Masivi I Koznikut**), Kaznik - “Bajrak” - dry grassy area, on serpentinite substrate, (note: very similar to the species *Centaurea candelabrum* Hayek & Košanin) [Accuracy: 5000 m; UTM - DN60] N 42.48°, E 20.59°, 1000 m, 18.06.1996, *E. Krasniqi s.n.* (Herb.Univ.Prisht. - UP 2005!); **Koznik** (**Masivi I Koznikut**), Kaznik, - “Bokat e Koznikut” - dry grassy area, on serpentinite substrate, NW [Accuracy: 5000 m; UTM - DN60] N 42.49°, E 20.59°, 800 m, 24.06.2000, *E. Krasniqi s.n.* (Herb.Univ.Prisht. - UP!); **PRISHTINA:** **Golesh**, serpentinite base grassland, dry, near a tow path, antennae comp. SE. 1017 m.asl. [Accuracy: 5000 m; UTM - DN91] N 42.57°, E 20.98°, 1017 m, 02.07.2014, *N. Berisha s.n.* (Herb.Univ.Prisht. - UP 2000!; UP 2003!; UP 2004!); **Golesh**, serpentinite base grassland, dry grassland on serpentinite substrate, at the antenna compound [Accuracy: 5000 m; UTM - DN91] N 42.57°, E 20.98°, 1017 m, 03.07.2000, *E. Krasniqi s.n.* (Herb.Univ.Prisht. - UP 2009!); **MITROVICË:** **Oštro Koplje** (inter pagum Kačandol et Bele stene) [Accuracy: 5000 m; UTM - EN06] N 42.99°, E 21.05°, 30.06.1914, *Th. Soška s.n.* (BEOU 37511! *sub Centaurea melanocephala* Panč.); **Oštro Koplje**, next to the road to Krnalevo, kameniti pašnjak [Accuracy: 5000 m; UTM - EN06] N 43.02°, E 21.02°, 29.09.1958, *L. Rajevski s.n.* (BEOU!, *sub C. atropurpurea* W.K.); **Bajgorë** [Accuracy: 5000 m; UTM - EN06] N 42.98°, E 20.99°, 2020, *P. Bledar s.n.* (Herb.Univ.Prisht. - UP!).

CONCLUSIONS

A comprehensive examination of the living plants, type material and herbarium specimens from various localities has led to the conclusion that the plants previously recognised as *Centaurea melanocephala* from Stolovi mountain in central Serbia and those previously recog-

nised as *C. candelabrum* from northern Albania deserve the rank of distinct species. These species can be easily distinguished from each other by a number of characters, including their general habitus, dimensions and the shape of the basal leaves, as well as the indumentum of the involucre bracts.

The morphological similarities between *Centaurea albertii* and *C. candelabrum* are more pronounced than those observed between *C. albertii* and *C. melanocephala*. In light of the subtle differences observed between the populations in Kosovo and Albania, the question of whether *C. albertii* is conspecific with *C. candelabrum* or deserves an independent taxonomic status remains unresolved until further detailed integrative studies are conducted, including material from the entire range of all three taxa belonging to this interesting group of serpentine centaureas.

Given the evident distinction in morphological and ecological characteristics observed between these taxa, we propose, as presented in the present paper, the segregation of the studied taxa into a separate *Centaurea melanocephala* complex within the section *Acrocentron*.

Acknowledgements - We would like to express our gratitude to Claes Gustafsson (Gothenburg) for his valuable assistance in locating Košanin’s original herbarium material from Albania and to Nejc Jogan (Ljubljana) for his help in tracing Rexhepi’s original material from Kosovo. We are also grateful to our colleagues Naim Berisha (Prishtina), Bledar Pulaj (Prishtina) and Zoltan Barina (Budapest) for providing us with valuable insights and information on the data relevant to Kosovo and Albania.

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REZIME

Nomenklatura i taksonomska re-evaluacija zapostavljene vrste *Centaurea candelabrum* Hayek & Košanin (sect. *Acrocentron*, Asteraceae) i srodnih serpentinijskih endemita Balkanskog poluostrva

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Centaurea sect. *Acrocentron* obuhvata nekoliko taksonomski složenih grupa, uključujući balkanske endemične obligatne serpentinofite: *C. melanocephala*, *C. candelabrum* i *C. albertii*. Uprkos svojim specifičnim morfološkim osobinama *C. candelabrum* i *C. albertii* se često smatraju sinonimima od *C. melanocephala*. Kako se u nekoliko novijih florističkih radova sva tri taksona tretiraju kao zasebne vrste rasprostranjene u različitim serpentinijskim područjima Balkana, glavni ciljevi našeg istraživanja bili su analiza taksonomskih i horoloških odnosa između njih i predlaganje novog taksonomskog koncepta. Naša studija se zasnivala na opsežnoj reviziji herbarskog materijala, uključujući tipske primerke, lične terenske podatke i zapažanja na živim biljkama. Istraživanje je pokazalo da biljke koje su ranije prepoznate kao *C. melanocephala* sa planine Stolovi u centralnoj Srbiji i one koje su ranije prepoznate kao *C. candelabrum* iz severne Albanije zaslužuju rang posebnih vrsta. Ove vrste se lako razlikuju po brojnim karakteristikama, uključujući njihov opšti izgled, dimenzije i oblik bazalnih listova kao i indumentum involukralnih listova. Dodatno, kako su uočene razlike između populacija na Kosovu i u Albaniji veoma male, pitanje da li je *C. albertii* sinonim od *C. candelabrum* ili zaslužuje nezavisni taksonomski status ostaje nerešeno dok se ne sprovedu dalje detaljne integrativne studije. S obzirom na jasne razlike u morfološkim i ekološkim karakteristikama koje postoje unutar ove grupe u odnosu na ostale predstavnike sekcije *Acrocentron*, u radu je predloženo odvajanje proučavanih taksona u zaseban kompleks *C. melanocephala*.

Ključne reči: *Centaurea melanocephala* kompleks, lektotip, zanemareni taksoni, tipifikacija

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