

## *Crepis guioliana* (Asteraceae) in the Balkan Peninsula

Donald Shuka<sup>1</sup>, Petrit Hoda<sup>2</sup> & Kit Tan<sup>3</sup>

<sup>1</sup> Department of Biology, University of Vlorë “Ismail Qemali”, Bulevardi Vlorë-Skelë, Vlorë, Albania and Department of Biology, FNS, University of Tirana, Bld. ZOG 1, Albania

<sup>2</sup> Research Centre of Flora and Fauna, FNS, University of Tirana, Albania

<sup>3</sup> Institute of Biology, University of Copenhagen, Universitetsparken 15, 2100 Copenhagen Ø, Denmark, e-mail: kitt@bio.ku.dk (author for correspondence)

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**Abstract.** *Crepis guioliana* (Asteraceae) had previously been considered a serpentine endemic restricted to a few localities in NW Greece. It is now reported for the first time as a Balkan endemic from the serpentine massif of Lenie-Valamara in SE Albania. The total distribution of the species is mapped and the Albanian plants illustrated by several photographs. Several serpentine species from the Lenie-Valamara massif with southern extensions to NW Greece are listed.

**Key words:** Albania, Balkan endemic, *Crepis*, distribution, Greece, new record, serpentine

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### Introduction

*Crepis guioliana* Bab. [sect. *Berinia* (Brign.) Bab.] was described in 1947 based on a collection made by F.G. Guiol on 29 July 1931 from Mt Smolikas in N Pindos, NW Greece. Since then, the plant has been reported from serpentine rocks and screes at 1500–2550 m in several localities in N Pindos and the species was considered a Greek endemic. Recent collections by D. Shuka from SE Albania matched the Greek plants and are identified as *C. guioliana*, a new species for the Albanian flora and now treated as a Balkan endemic.

Very little is known about the collector F.G. Guiol. He was apparently resident in Athens, probably of French nationality, and known to be botanically active in the 1920s to the end of 1930s. He collected in all floristic regions of Greece except the N Aegean islands. His numbered collections approximate nearly 2500, in Greece mainly from Attiki, Epirus and Kriti. His herbarium material is distributed among several herbaria worldwide including ATH, B, BM, C, FI, G, GB, HUJ, JE, K, LD, M and UPS (herbarium acronyms according to Thiers 2023, continuously updated). In an annual report from

Berlin Botanic Garden and Museum (anonymous 1933) it is documented that he had sent c. 430 herbarium specimens including 17 *Galium* to Dr Friedrich Markgraf, Oberassistent and Privatdozent at the University. A large number was also deposited at the Natural History Museum, London (BM) or perhaps they have been searched for more thoroughly there. *Crepis guioliana*, however, seems to be the only plant commemorating his name.

The Lenie-Valamara mountain range represents the highest serpentine massif in Albania. It has three main summits of which Lenie (2013 m) and Valamara (2373 m) are the highest. This massif lies between the northern Pindos serpentinite block and the large serpentine Albanides. From a floristic point of view, it is fairly unexplored as compared with the surrounding mountains of Tomorri, Ostrovica and Shebeniku. Scant information on its flora was gathered during the period of ‘The Albanian Autonomous Republic of Korça’ during the years 1916–1920 (Bourcart 1922).

The Lenie-Valamara range was not investigated by Baldaccii (1925) during his exploration of the flora of S Albania between 1892–1896. In 1928 Friedrich Markgraf explored the flora and vegetation of Tomorri Mt and the serpentine areas of Kamja and Guri Topit at the northeastern edge of Valamara Mts but he did not visit Valamara in the south, going further north towards the serpentine massifs of Bukanik-Shebenik. The latest attempt before the Second World War to explore the flora of Lenie-Valamara Mts was undertaken by Alston & Sandwith (1940) during the summer of 1935; this was unsuccessful due to “...a serious revolutionary disturbance started in the middle of August”. The flora of the Lenie-Valamara massif also did not attract the attention of Albanian botanists even when the country was isolated (1945–1992) with the exception of the forester Mitrushi (1955) who made a careful study of trees and shrubs in the area. During the summer of 1959 and 1961, Meyer (2011) collected in Ostrovica, Tomorri and the Devolli river valley which separates these two mountains from Lenie-Valamara. The most recent investigation on the mountain range was by Meço & al. (2018), resulting in a publication of 307 new taxa for the area.

The opening of the country after 1992 attracted

both Albanian and foreign botanists especially for investigations of rare and endemic plants but the lack of botanical support is evident from the low number of resulting publications and the few rare taxa documented such as *Bornmuellera baldaccii*, *Centaurea candelabrum*, *C. pindicola*, *C. vlachorum*, *Cerastium smolikanum*, *Dichoropetalum stridii*, *Festucopsis serpentina*, *Fritillaria macedonica*, *Heliosperma pusillum* subsp. *albanicum*, *Hypericum haplophyloides* subsp. *devollense*, *Minuartia baldaccii* subsp. *baldaccii*, *Narthecium scardicum*, *Oxytropis dinarica* subsp. *weberi*, *Silene caesia*, *S. damboldtiana*, *S. parnassica* subsp. *pindicola*, *Taraxacum pindicum*, *Viola albanica* and *V. dukadjinica* (Shuka & Tan 2009; Słomka & al. 2015; Meço & al. 2018; Shuka & al. 2022, 2023). This can be compared with the high number of endemic and rare taxa recorded from other ophiolitic areas in the Balkans (Stevanović & al. 2003).

## Material and methods

The flora of Lenie-Valamara Mts was investigated for three years during the summers of 2021–2023. The mountain massif has the shape of an inverted ‘T’ with a length of 10.5 km stretching from north to south, and a maximum width of 5.2 km. The mountain ridge forms the natural border separating the two districts of Korça to the east, and Elbasani to the northwest. *Crepis guioliana* and its accompanying taxa were collected in five localities above 2000 m on the serpentine eastern slopes of the mountain and identified using literature (Tutin & al. 1976; Kamari 1991) as well as by comparison with herbarium specimens from Greece. The morphological characters of the Albanian populations were obtained from twelve herbarium specimens and c. 50 living plants in the field. Achenes and indumentum type in leaves and phyllaries were examined using a LEICA stereo-binocular microscope M205C, supplied with a Flexacam C3 camera and measured using Leica Application Suite X software. The herbarium specimens are deposited in TIR with duplicates kept in the private herbarium of D. and L. Shuka (herb Shuka).

## Results and discussion

### Description of Albanian plants (Fig. 1)

A few differences were noted in the Albanian plants as compared with the Greek plants.

Rootstock short, woody with 2–7 mostly unbranched stems 29.3 ( $\pm 2.2$ ) cm tall, but in 50% there were 1–3 flowering stems which are 2–3 branched. Basal leaves 9 ( $\pm 5.23$ )  $\times$  1.65 ( $\pm 0.6$ ) cm, smaller than in Greek plants which are up to 15–17  $\times$  2–3 cm, sparsely canescent-tomentose, with minute greyish-white hairs 0.307 ( $\pm 0.136$ ) mm long, brown or orange-glandular, rarely non glandular. Bracts absent or if small, similar to outer involucre phyllaries. Capitula with more flowers (37–50) than in Greek plants (c. 40). Involucre broadly cylindrical-campanulate or cylindrical, 9–12 mm diam. at anthesis; outer involucre phyllaries unequal, narrowly ovate, 2.63 ( $\pm 0.69$ ) mm long, acuminate, dark green, tomentose; inner involucre phyllaries lanceolate, 10.6 ( $\pm 1.85$ ) mm long, acute, dark green, pubescent to tomentose outside with greyish-white, unicellular or multicellular hairs 0.34 ( $\pm 0.17$ ) mm long, intermixed with a few minute glandular hairs, adpressed-pubescent on inner surface with hairs 0.19 ( $\pm 0.07$ ) mm long. Achenes fusiform, attenuate towards pappus, 6.95 ( $\pm 0.48$ ) mm long, 16–20-ribbed, yellowish-brown at maturity. Pappus white, 7.22 ( $\pm 0.3$ ) mm, slightly longer than in Greek plants.

### Habitat and ecology of Albanian plants (Fig. 2)

*Crepis guioliana* is an obligate serpentine species occurring on steep rocky slopes, scree and ridges, even in crevices of small ledges with shallow soil. In general serpentine habitats are subject to fairly low air temperature, strong wind, physiological drought and high concentrations of heavy metals in the soil (Ni, Cr, Fe, Mg) and plants adapt to these harsh, stressful conditions and low nutrient level by a number of morpho-anatomical modifications such as developing xeromorphic leaves, thick cuticle, dense indumentum, etc. The study area is dominated by serpentine taxa such as *Viola albanica*, *Alyssum montanum* subsp.

*montanum*, *Sesleria robusta* and *Bornmuellera baldacci* and in the rock crevices, *Myosotis alpestris* subsp. *suaveolens* and *Saxifraga taygetea*. The plants flower from the second half of July until August, continuing into fruit.

### Distribution of species (Fig. 3)

**SE Albania.** Lenie-Valamara, a 2200–2373 m high mountain range located between the two districts, Korça and Elbasani (specimens seen).

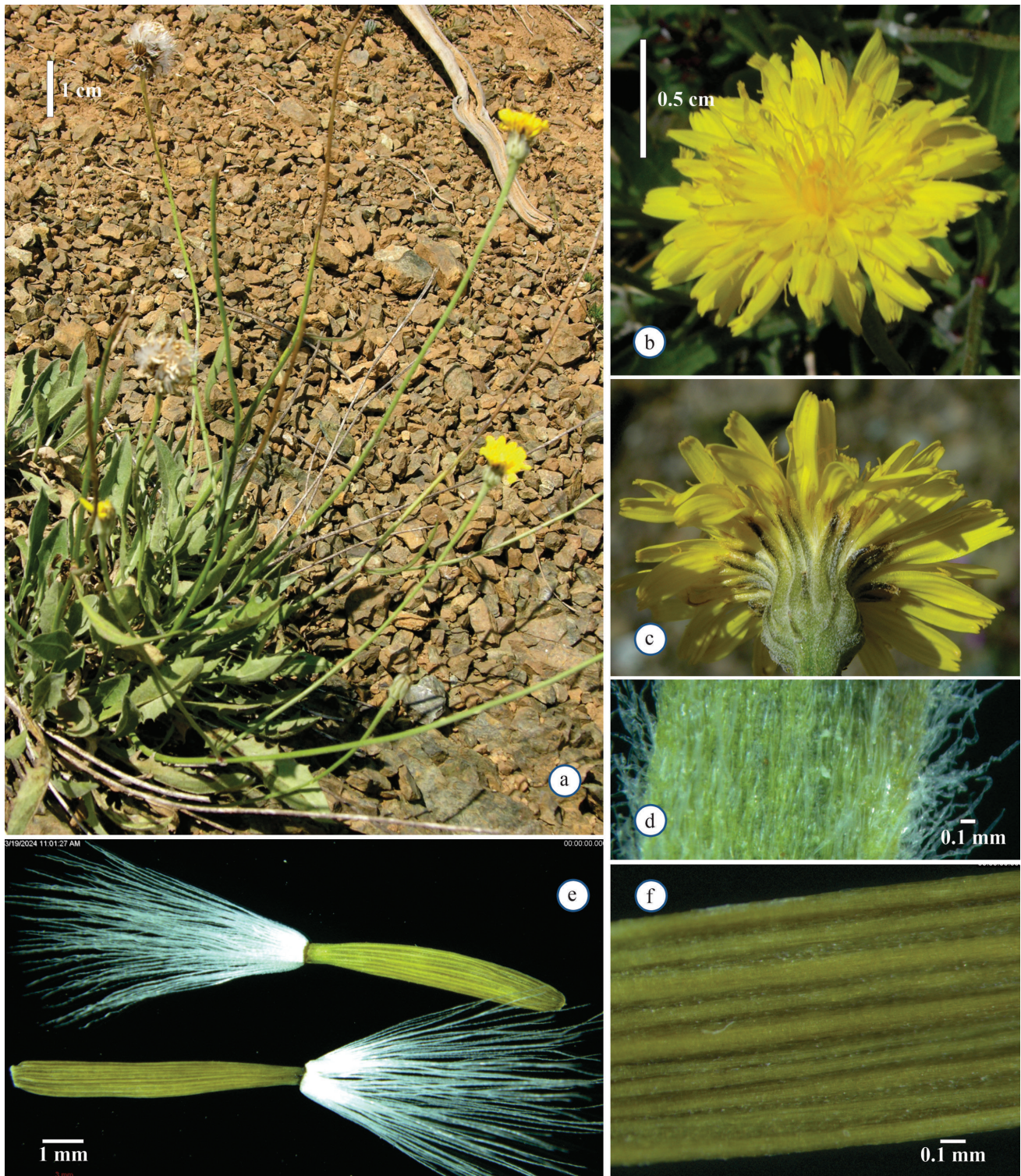
Korça district: Maliqi municipality, Guri i Nikës-Valamarë-Lenie Protected Landscape, SE serpentine slopes of Lenie Mt above Black Lake of Strelca village, 40°46'38.81"N, 20°27'45.79"E, 2030–2080 m, 25.07.2022, *D. Shuka* s.n. (herb Shuka); eastern serpentine slopes of Valamara Mt, above a dried-out lake, 40°46'55.59"N, 20°27'57.28"E, 2070–2120 m, 28.08.2023, *D. Shuka* & *L. Shuka* obs.; eastern serpentine slopes of Valamara Mt, north of dried-out lake, 40°46'56.32"N, 20°27'51.74"E, 2150 m, 25.07.2022, *D. Shuka* s.n. (herb Shuka); eastern serpentine slopes of Valamara Mt, above Valamara lakes, 40°47'31.09"N, 20°27'54.58"E, 2250–2300 m, 25.07.2022, *D. Shuka* s.n. (herb Shuka).

Korça district: Pogradeci municipality, Guri i Nikës-Valamarë-Lenie Protected Landscape, NE serpentine slopes of Valamara Mt, above Shkumbini river springs, 40°47'42.01"N, 20°27'56.23"E, 2290 m, 25.07.2022, *D. Shuka* obs.

**NW Greece.** N Pindos (selected specimens from serpentine massifs).

Nomos & Eparchia Grevenon: Mt Mavrovouni, 5 km NW of village of Milea, dry, stony and rocky slope facing WSW, serpentine, 2050–2100 m, 39°53'N, 21°11'E, 17 August 1974, *Aldén* 4949 (LD); summit area of Mt Milea, rocky slopes and meadows just above *Pinus heldreichii* timberline, serpentine, 1900–2100 m, 39°53'N, 21°11'E, 14 August 2016, *Strid* 58661 (G, herb. Strid); 12 km N of Metsovon, N slope in SE part of the valley Valiakanta just W of the pass between Mt Mavrovouni and Mt Milea, *Pinus* forest, by mountain stream, 1565–1600 m, 39°53'N, 21°09'E, 26 July 1976, *Hartvig* & *al.* 6336 (C, G, herb. Greuter).





**Fig. 1.** *Crepis guioliana* from Lenie-Valamara Mts, SE Albania: **a**, habit; **b**, capitulum; **c**, capitulum in lateral view; **d**, part of inner phyllary showing adpressed-pubescent inner surface; **e**, achenes; **f**, part of achene showing ribs.





Fig. 2. a, three *Crepis guioliana* sites on serpentine eastern slopes of Lenie-Valamara Mts, above Valamara lakes; b, *Stipa pennata* subsp. *pulcherrima* in a site of *Crepis guioliana*.



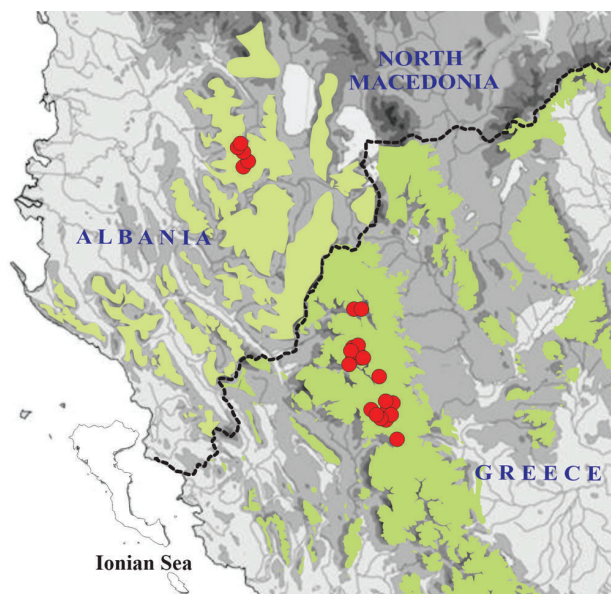


Fig. 3. Distribution of *Crepis guioliana* in SE Albania and NW Greece.

Nomos & Eparchia Grevenon: Mt Smolikas, c. 2 km WSW of Samarina, ridge with serpentine rocks and scree, 2000–2080 m, 40°06'N, 21°00'E, 11 August 1975, Hartvig & al. 4048 (C, herb. Greuter); NE part of Smolikas, 3 km W of Samarina near the peak of Bogdani (Vousion), serpentine rocks and scree, 2100–2200 m, 40°07'N, 20°59'E, 26 July 1977, Hartvig & al. 7240 (C, herb. Greuter); Mt Smolikas, 5 km W of Samarina just east of summit area, serpentine rocks and scree, 2300 m, 40°05'N, 20°57'E, 20 August 1975, Hartvig & al. 4526 (C).

Nomos & Eparchia Grevenon: Mt Avgo, 9 km W of Krania, S slope of Pirostia with *Pinus heldreichii* woodland, serpentine, 1600–1800 m, 39°55'N, 21°10'E, 11 July 1979, Hartvig & al. 7611 (AAU, C); S side of Pirostia, above Papajianni, rocky slopes with *Pinus heldreichii* and *Buxus sempervirens*, serpentine, 1650–1900 m, 39°55'N, 21°10'E, 12 July 1979, Stamatiadou 21308 (ATH).

Nomos Grevenon/Ioanninon, Eparchia Grevenon/Konitsis: Mt Vasilitsa, von Kataphygion des Alpine Club Grevena zur Vasilitsa-Gipfel. Trockenrasen, Bachufer, Felsschutt, Felsspalten, 1800–2349 m, 40°02'N, 21°05'E, 10 July 1982, Lippert 18578 (M, herb. Strid).

Nomos Ioanninon, Eparchia Konitsis: Mt Smolikas, Gangarantza, on SE side, peridotite and serpen-

tine, 2200–2400 m, 40°04'N, 20°57'E, 25 July 1971, Stamatiadou 13510 (ATH).

Nomos Ioanninon, Eparchia Metsovou: 4 km NE of Metsovou, E-facing slope with *Pinus nigra* and *Buxus sempervirens*, 1750 m, 39°47'N, 21°13'E, 3 July 1971, Aldén 1306 (LD).

Nomos & Eparchia Kastorias: Gramos, steep rocky east slope of Mt Bouchetsi, 6 km NW of Eptachorion, open woodland of *Pinus nigra* with few trees of *P. heldreichii*, serpentine, 1550–1650 m, 40°15'N, 20°58'E, 21 July 1979, Hartvig & al. 8203 (C, G, UPA).

### Chromosome number

The chromosome number  $2n = 10$  and karyotype details for *C. guioliana* were first reported by Kamari & Anagnostopoulos (1991: 226) based on material from Mt Mavrovouni-Flega. *Crepis guioliana* has some similarities to *C. aethiops* Boiss., which is endemic to Mt Athos. It differs by its less branched stems, broader leaves, larger capitula and longer achenes. *Crepis aethiops* also has  $2n = 10$  chromosomes (Papanicolaou, unpubl.).

### Serpentine species from Albanian Lenie-Valamara massif and N Pindos

The following taxa occur in the site-areas of *Crepis guioliana* in Albania:

*Acinos alpinus*, *Alyssum smolikanum*, *Anthemis cretica* subsp. *carpatica*, *Anthyllis vulneraria* subsp. *pindicola*, *Aquilegia vulgaris*, *Arenaria conferta* subsp. *serpentini*, *Armeria canescens*, *Asyneuma limonifolium*, *Bornmuellera baldaccii*, *Campanula rotundifolia*, *Centaurea ptarmicifolia*, *C. pindicola*, *Cerastium bannaticum*, *C. smolikanum*, *Daphne oleoides*, *Dianthus integer* subsp. *minutiflorus*, *Dichoropetalum stridii*, *Doronicum columnae*, *Draba lasiocarpa*, *Festuca varia*, *Galium anisophyllum*, *Genista hassertiana*, *Gentiana verna* subsp. *balcanica*, *Globularia cordifolia*, *Helianthemum nummularium*, *Iberis sempervirens*, *Linum capitatum* subsp. *serrulatum*, *L. punctatum* subsp. *pycnophyllum*, *Myosotis alpestris* subsp. *suaevolens*, *Onosma pygmaea*, *Oxytropis dinarica* subsp. *weberi*, *Pedicularis brachyodonta* subsp. *brachyodon-*



*ta*, *Poa cenisia*, *Rumex scutatus*, *Saxifraga taygetea*, *Sedum album* subsp. *serpentini*, *S. alpestre*, *S. atratum*, *Selaginella selaginoides*, *Sempervivum heuffelii*, *Sesleria robusta*, *Silene vulgaris*, *S. parnassica* subsp. *pindicola*, *Stipa pennata* subsp. *pulcherrima*, *Taraxacum pindicum*, *Teucrium montanum*, *Thymus longicaulis*, *T. praecox* subsp. *jankae*, *T. teucrioides*, *Trifolium pilczii*, *Viola albanica* and *V. dukadjinica*.

These taxa occur in both Lenie-Valamara and N Pindos indicating the close floristic similarity of the two areas. Exceptions are *Genista hassertiana*, *Oxytropis dinarica* subsp. *weberi*, *Pedicularis brachyodonta* subsp. *brachyodonta*, *Sedum album* subsp. *serpentini* and *Selaginella selaginoides*. Eighteen taxa are obligate serpentinophytes and ten are restricted to these two massifs or in the serpentine area in-between. It is thus likely that *C. guioliana* may also be present in the latter area.

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