

***Euphorbia helioscopia* subsp. *helioscopioides*
(Loscos & J. Pardo) Nyman,
a new addition to the native flora of Cyprus**

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Abstract. – *Euphorbia helioscopia* subsp. *helioscopioides* is recorded from Cyprus for the first time. A morphological description and information on its distribution and habitat are provided. It is provisionally classified as Near Threatened.

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Introduction

The genus *Euphorbia* is represented in Cyprus by 31 indigenous and alien taxa on species level (Hand & al. 2011). Of these, 21 belong to subgenus *Esula* and nine of them belong to section *Helioscopia*, namely *E. altissima*, *E. arguta*, *E. berythea*, *E. dimorphocaulon*, *E. hirsuta*, *E. lemesiana*, *E. sintenisii*, *E. valerianifolia* and *E. helioscopia* (Riina & al. 2013: 316–342), the last one being described by Linnaeus in 1753. In the protologue it is stated: “umbella quinquefida, dichotoma, involucellis ovatis, foliis cuneiformibus serratis”. It is widely distributed in Macaronesia, throughout Europe, North Africa and West Asia (Radcliffe-Smith 1985; Benedí & al. 2000). Hundred and ten years later Loscos & Pardo (1863) described *E. helioscopioides* from Spain, which is an annual, related to *E. helioscopia*. It is many-stemmed from the base, branches slender, about 10 cm long, decumbent, leaves dense; inflorescence with five rays, repeatedly dichotomous, seeds destitute of caruncle. A few years later Willkomm (1881–1882: 40–41 & tab. 28), notes that the branches are 5–15 cm long, simple, inflorescence is with 3–5 rays, repeatedly dichotomous, seeds destitute of caruncle. Nyman (1881) was the first who treated the taxon as subspecies of *E. helioscopia*, a combination which was overlooked by de Bolòs & Vigo (1974) and Greuter & al. (1986).

Concerning Cyprus, Radcliffe-Smith (1985) in his note under *E. helioscopia* refers to the specimen 2344, which has been collected by Meikle from Diorios (Division 6) and states that “it is a dwarfish, prostrate, many-stemmed form of *helioscopia*, with seeds only 1 mm long. It approximates closely to *E. helioscopioides* Loscos & Pardo, described from Spain, which is probably best treated as a variety of *E. helioscopia*; G. E. Atherton 1175 from Templos (7) also belongs here”. A duplicate of Meikle’s specimen 2344 is deposited in ARI herbarium (Cyprus). It is named as *E. helioscopia* and it has been collected on 25.3.1962. The locality of collection is near the Rest House of Diorios Forest Station, on sandy ground. The stems are prostrate and the flowers are green. Unfortunately, the locality of collection is for the time being inaccessible.

In 2015, a few *Euphorbia* specimens, which have some relations with Meikle's specimen, have been collected in Cyprus. However, they usually have a chiefly erect or suberect, rarely decumbent, distinct main stem, much longer than the basal branches, the flowers are purple or tinged purple and several other characters that are different from those of Meikle's specimen. It is noted that the locality of collection of Meikle's specimen is found in an area covered with *Pinus brutia* forest, and perhaps the plants were in a shady place, a factor that supports the occurrence of green flowers. From Spain, it is well known that habit and some morphological characters can be modified by ecological factors (Benedí & al. 2000), indumentum as well as seed size are mentioned as diagnostic characters.

The descriptions, the herbarium material (Berlin) and the photographs available online show that *E. helioscopia* subsp. *helioscopioides* is a variable subspecies. Still, however, the Cypriot plants have some characters not mentioned or differing from those stated in the descriptions, such as in: (a) rays (constantly 3 vs. 3–5), (b) the colouration of cyathia (purple to greenish flashed-purple vs. yellowish-green), (c) the involucre (glabrous all over internally vs. hairy beneath the glands internally, glabrous elsewhere), (d) the lobes (purplish to greenish-purplish, vs. yellowish-green to green), and (e) the seeds (1.0–1.5 mm vs. 1.5–2.0 mm long). However, some other characters match to some degree those of the aforementioned taxon, consequently it was considered more appropriate to publish the detailed description based on the Cypriot material. Characters and measurements were obtained from the field and the cited specimens.

Description based on Cypriot material

Slender annual **herb**. **Stem** usually single, with shorter branches at the base, occasionally branched from the base, with 2- to many-primary branches and several shorter ones, 3–15(–30) cm long and 0.5–1.5(–2.2) mm in diameter, suberect or erect, occasionally decumbent, glabrous or sparingly pilose towards the top and inflorescence; plants growing within *Sarcopoterium spinosum* usually with very slender stems more than 15 cm long, whereas plants growing in the nearby open spaces with thicker stems up to 15 cm long. **Cauline leaves** alternate, lax, glabrous or sparsely pilose, obovate-spathulate, 4–12(–25) × 1.5–5(–10) mm, attenuate at the base, rounded to slightly truncated, shallowly emarginated at apex, serrulate in the upper ¼; **ray-leaves** obovate, sparingly pilose, 8–12(–25) × 4–7(–11) mm, rounded at apex, serrulate in the upper ¼; **raylet-leaves** obovate, sparingly pilose, 5–9(–18) × 2–4(–8) mm, rounded at apex, serrulate in the upper ¼. **Inflorescence** terminal, flattish, 1–3.5(–7) cm in diameter; **primary rays** constantly 3, 2–13(–40) mm, once or twice dichotomous; **axillary rays** 0. **Cyathia** purple to greenish flashed-purple, sessile or subsessile, 1.0–1.3(–1.5) × 0.4–0.7 mm, involucre campanulate, generally pilose externally, glabrous beneath the glands and all over internally; lobes purplish to greenish-purplish, somewhat oblong to broadly ovate, 0.3–0.4 × 0.3(–0.4) mm, denticulate to minutely lacerated at apex; **glands** 4, dark green, occasionally purple, deep purple when dry, rounded on the outer edge, oblong to elliptic, 0.3–0.5 × 0.2–0.3 mm. **Stamens** up to 1 mm long, bracts 0.5–0.6 mm long, anther lobes 0.1 × 0.1 mm. **Ovary** 3-celled, (0.3–)0.4–0.7 × 0.3–0.5 mm, smooth,

sparingly pilose to pilose, greenish-purplish to purplish; **pedicel** elongating in fruit, 2–5 mm long, bending outwards. **Styles** 3, purple to greenish, 0.4–0.6 mm long, distinctly united at the base forming a short stalk c. 0.1 mm, 2-branched down to the lowest $\frac{1}{4}$ of the free part of the style, the branches 0.2–0.3 mm long, bending outwards. **Regma** trilobate, somewhat compressed, 1.7–1.8 × 2–3 mm, smooth, sparingly pilose to pilose, greenish-purplish to purplish, usually not visible from above, hidden by the rayleaves, owing to the elongated and onward-bending pedicels; columella 1.4–1.6 mm. **Seeds** ovoid, 1.0–1.5 × 0.8–1.3 mm, reticulate, brown; caruncle white, sessile, somewhat lunulate, 0.6–0.8 × 0.3–0.4 mm, flattened below, rounded above.

Flowering period: February–April.



Fig. 1: *Euphorbia helioscopia* subsp. *helioscopioides*, Cyprus, between Kokkinotrimithia and Mammari, typical habit and inflorescence (inlay), 16.3.2015 – Georgios N. Hadjikyriakou.

Distribution, habitat and ecology

E. helioscopia subsp. *helioscopioides* is indigenous to Cyprus and its main area of occurrence is between the villages Mammari and Kokkinotrimithia (within and outside the Mammari – Deneia Natura 2000 site), chiefly growing in association with *Sarcopoterium spinosum* (within or at its perimeter), at 210–240 m altitude. It is a nearly flat area, with a slight inclination to the south, dominated by the Apalos-Athalassa-

Kakkaristra Geological Formation (biocalcarenites, sandstones, sandy marls and conglomerates), where prevails, the so called, kafkalla rock. (Constantinou & al. 1997). The habitat types (Directive 92/43 EEC) dominating in the area, either in pure or in a mosaic form, are: 5420 *Sarcopoterium spinosum* phrygana, 6220* Pseudo-steppe with grasses and annuals (Thero-Brachypodietea), which is of priority; also, 3170* Mediterranean temporary ponds, which again is of priority, occurs sporadically. The dominant plants are: *Sarcopoterium spinosum*, *Thymra capitata*, *Fumana thymifolia*, *Helianthemum obtusifolium*, *H. salicifolium* including *H. salicifolium* var. *glabrum*, which is restricted only to this area, *Asphodelus ramosus*, *Ornithogalum trichophyllum*, *Stipa capensis*, *Euphorbia chamaepeplus* and *Plantago lagopus*. It has been also collected from an open space in Athalassa forest.



Fig. 2: *Euphorbia helioscopia* subsp. *helioscopioides*, Cyprus, between Kokkinotrimithia and Mammari, typical habitat, 12.12.2012 – Georgios N. Hadjikyriakou.

IUCN status, threats and conservation

The distribution of *E. helioscopia* subsp. *helioscopioides* needs further investigation, but based on the potential threats particularly at the main area of collection (the environs of the villages of Kokkinotrimithia – Mammari – Deneia) it may be provisionally classified as Near Threatened (NT; following IUCN Species Survival Commission 2012). The potential threats are the rapid expansion of the urban areas and road construction/maintenance, as well as agriculture, land reclamation and fires.

Discussion

E. helioscopia subsp. *helioscopioides* is known so far from Spain, South France, Morocco (possibly) and Algeria (Benedí & al. 2000). However, it is obvious that the Cypriot populations extend its range to the Eastern Mediterranean. Although it has been searched for in other parts of Cyprus, it seems to be restricted to the Mesaoria area. In this respect, the co-occurrence in its habitat of *Ornithogalum trichophyllum* and *Euphorbia chamaepeplus* verify, to some degree, its association with typical plants of the Mesaoria plain.

Studies of Greek specimens, especially of the rich collections by Eckhard Willing (B), showed a high variability of *E. helioscopia* s. l. regarding growth-form, general habit and structure of inflorescences. *E. helioscopia* subsp. *helioscopioides* is not mentioned in the Greek checklist (Dimopoulos & al. 2013), not even as a synonym. On the other hand, some specimens from Greece, which have already been determined as *E. helioscopia* subsp. *helioscopioides* by the collectors (see list of specimens), are quite similar to Spanish and Cypriot ones. However, *E. helioscopia* s. l. is in urgent need of a pan-Mediterranean revision. The current note may help to inspire such a study.

Selected specimens

Cyprus: Div. 6 (sensu Meikle 1977), Forestry Rest House Diorios, sandy ground by side of rest house, c. 272 m, 25.3.1962, *R. D. Meikle 2344* (ARI); Kokkinotrimithia – Mammari, on kafkalla rock with phrygana, alt. c. 220 m, 12.3.2015, *G. Hadjikyriakou 7348* (herb. Hadjikyriakou); *ibid.*, within or between *Sarcopoterium spinosum*, c. 220 m, 17.3.2015, *G. Hadjikyriakou 7353* (herb. Hadjikyriakou); *ibid.*, kafkalla rock with phrygana and cereal margins, c. 220 m, 2.4.2015, *G. Hadjikyriakou 7358* (herb. Hadjikyriakou); *ibid.*, 2.4.2015, *R. Hand 7103* (B); Athalassa forest, road margins and cultivated land, alt. c. 170 m, 2.4.2015, *G. Hadjikyriakou 7359* (herb. Hadjikyriakou); *ibid.*, 2.4.2015, *R. Hand 7117* (B).

Spain: Zaragoza, pr. Osera, YM 00, in arvis incultis, 250 m, 18.3.1973, J. Fernández-Casas (B [2]). – Zaragoza, Gelsa, towards Velilla de Ebro, 30TYL18, 41°23'N 00°27'W, 3.3.1995, J. Molero & J. Vicens, *Euphorb. Mediter. Exs. 48* (B).

Greece: Nom. Lakonia, ep. Lakedhemonia, between Krokee and Hania, just W of Krokee, 36°52'50"N 22°32'20"E, 300 m, roadside, clayey schist, 2.4.1995, *W. Greuter 24254* & *B. Zimmer* (B). – Nom. Etolia-Akarnania, ep. Vonitsa-Xiromenos, N of and above Astakos, 38°32'00"N 21°03'20"E, 100–180 m, rocky slopes with *Pistacia lentiscus* phrygana, limestone, 26.3.1995, *W. Greuter 24037* & *B. Zimmer* (B).

Acknowledgements

I express my sincere thanks to Ralf Hand (Botanic Garden and Botanical Museum, Berlin) for his overall contribution in identifying the plant, to Angelos Kyrtzizis, curator of ARI herbarium, for his help and Kyriakos Demetriades (Gerani and Lefkosia) who was kind enough to make the linguistic editing of the manuscript.

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