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Elatine gussonei (Sommier) Brullo et al. (Elatinaceae) in Sicily

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Short communication

Elatine gussonei (Sommier) Brullo et al. (Elatinaceae) in Sicily

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Abstract

This study reports the Sicilian occurrence of *Elatine gussonei* (Sommier) Brullo et al., a rare and endangered species previously known only from Lampedusa, Malta and Gozo. The species was found on three localities near settlements Modica and Ispica (south-eastern Sicily).

Key-words: Distribution, Mediterranean temporary ponds, section *Elatinella*, seed-morphology, wetland ephemerophyte

Introduction

The species of genus *Elatine* L. (waterworts) are small, amphibious ephemerophytes, which usually occur in temporary waters. In the Mediterranean, two recently accepted species with tetramerous flowers and opposite leaves are known: *E. macropoda* Gussone and *Elatine gussonei* (Sommier) Brullo et al. (Uotila 2009b). While *E. macropoda* has a Mediterranean-wide distribution (Popiela & Lysko 2010), *Elatine gussonei* is considered to be an endemic species of the archipelago of the central part of the Mediterranean Basin (Mifsud 2006). In the identification of the *Elatine* species seed morphology plays key role (Cook 1968; Mifsud 2006; Uotila 2009a; Uotila 2010; Molnár V. et al. 2013). *Elatine macropoda* and *E. gussonei*, are thought to be highly different in seed morphology: the former has elongated, slightly curved seed with hexagonally reticulated testa, whereas the latter has curved seeds showing long-hexagonal reticulation of testa (Mifsud 2006).

Elatine gussonei was found and described under the name *E. macropoda* Guss. by Lojacono (1885: 105.) from Lampedusa commenting also its typical habitat: “In tutte le pozzanghere sugli incavi del calcare in tutta Lampedusa copiosissima”. Later, this species has also been described as *Elatine*

hydropiper L. var. *gussonei* as a new taxon from Lampedusa by [Sommier \(1908: 76.\)](#). Flowers with long peduncles (distinguishing it from *E. hydropiper*) and its highly curved seeds (distinguishing it from *E. macropoda*) were featured as the most important distinctive characters in the protologue. [Sommier & Caruana Gatto \(1915: 105-106.\)](#) published other occurrences from the isles of Malta and Gozo. The taxon was described as *Elatine gussonei* by [Brullo et al. \(1988: 45.\)](#) emphasizing the taxonomic importance of the shape of the seeds and the pedicel of the flower. Today, *E. gussonei* is treated as a highly scarce and threatened species of the Maltese archipelago. It is known only from four localities from the island of Gozo and from 22 localities from the main island of Malta ([Mifsud 2006](#)). The species is characteristic to the endangered habitat type called Mediterranean temporary pond. Although this habitat type is well studied in Sardinia (e.g. [Bagella et al. 2009](#); [Bagella & Caria 2012](#)), the distribution, floristic and conservational aspects of this habitat type is scarcely studied in Sicily.

Our paper describes new indigenous occurrences of *Elatine gussonei* on Sicily. Although EuroMed online database reports the presence of the species in Malta and Sicily ([Uotila 2009b](#)), according to the recent Sicilian vascular plant checklist ([Giardina et al. 2007](#)) the species is mentioned only from Lampedusa, an island connected administratively to Sicily, and the record itself refers to Lojacono's first report of the species ([Lojacono 1885](#)). Therefore, we currently know two *Elatine* species from the isle of Sicily in a geographic sense, and these are *E. alsinastrum* L. and *E. macropoda* Gussone ([Pignatti 1982](#), [Giardina et al. 2007](#)). Consequently, the presence of *E. gussonei* in Sicilian main island would mean the discovery of a new species in the flora of Sicily.

Material and methods

Field researches were carried out in Sicily between 17th and 24th April 2012 to study the flora of Mediterranean temporary ponds. On all sites visited, herbarium specimens and seeds of *Elatine* were collected. Voucher specimens of *Elatine* species were deposited in the herbaria of the University of Debrecen (Hungary; DE) and University of Szczecin (Poland). The most significant, species-specific distinctive features of the seeds ([Mifsud 2006](#)), the curvature and the shape of the pits on the testa, were used to identify *Elatine* species. We compared the above seed characters of newly collected material to

that of following herbarium specimens: (1) *E. gussonei*, Malta: Mellieħa, 2010, Mesterházy, (DE); (2) *E. gussonei*, Lampedusa, 1908, Ross (BP); (3) *E. macropoda*, France: Montbrison, 1872, Le Gran (BP); (4) *E. macropoda*, Sardinia: Olmedo, 2012, Molnár V. et al. (DE), (5) *E. hydropiper*, Hungary: Tiszagyenda, 1999, Molnár V. & Pfeiffer (DE).

Results and discussion

Elatine gussonei was found on three localities in the south-eastern part of Sicily (Fig. 1). Two close localities of *E. gussonei* were found on 21st April near Modica (N 36.76914°, E 14.77805°; N 36.77242°, E 14.77682°) and one population was found on 24th April near Ispica (N 36.78928°, E 14.92355°). The habitats in all three cases were lying between 150 and 230 meters above sea level in characteristic temporary rock pools on flat limestone surfaces (Fig. 2 A). It was very similar to those habitats that we found in Malta (after Mifsud 2006) near Mellieħa (Malta) and Ta' Sannat (Gozo). We found several flowering and fruiting plants in Modica, mainly terrestrial forms. The species were also found in aquatic form in a shaded pool, creeping 6–10 cm under water. Only dried terrestrial specimens were found in Ispica, but the identification was possible based on its seeds.

The seeds of *Elatine gussonei* (including Sicilian plants) are much more curved, than those of *E. macropoda*, but somewhat less curved than those of *E. hydropiper*. Due to their relatively high degree of curvature, the seeds of *E. gussonei* usually have apparent 'semilunar membrane' on the concave side of seeds. As for the testa, the seeds of *E. gussonei* show regular hexagonal reticulation (Fig. 3). In this respect *E. hydropiper* and *E. macropoda*, characterised by long-hexagonal reticulation on their seeds, are very distinct.

Based on the seed morphology (Fig. 3) of *Elatine* species collected near Modica and Ispica, we can report the unambiguous presence of *E. gussonei* in the Flora of Sicily. Although the species is listed as member of the flora of this island (Giardina et al. 2007), it is only reported from Lampedusa, which administratively belongs to Sicily. From a geographic point of view, however, this small island is actually located in the Mediterranean Sea close to Tunisian coasts (113 km) and Malta (140 km), whereas it is quite far from Sicily (205 km). The newly found localities are 95 km away from the well-

known population of *E. gussonei* in Malta. Our new findings together with recent discoveries of the Sicilian vascular flora (e. g. [Gianguzzi et al. 2011](#); [Cataldo et al. 2012](#); [Marino et al. 2012](#)) indicates the need of further floristic and taxonomic investigations of the island.

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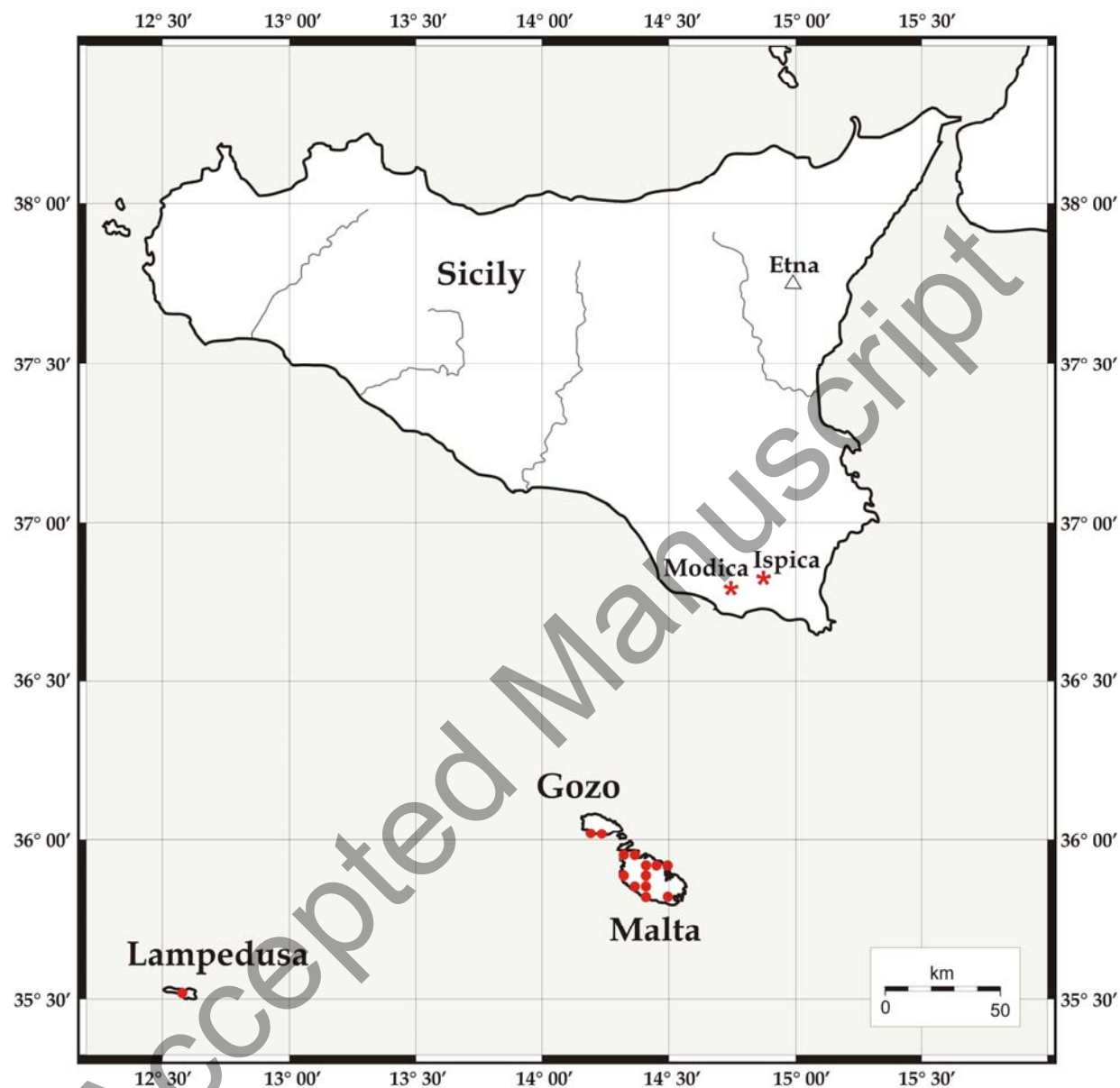


Figure 1. The distribution of *Elatine gussonei* (Maltese records based on Mifsud 2006). The newly found localities are marked with asterisks.



Figure 2. *Elatine gussonei* near Modica (Sicily). The habitat – rocky pools on limestone (A), flowering and fruiting specimen on full sun turn to reddish colour (B), seeds (C).

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