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## Recent and new taxonomic acquisitions in some native genera of *Asteraceae* from southern Italy and Sicily

### Abstract

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After a brief review of the recent acquisition in some native genera of family *Asteraceae* from southern Italy and Sicily, a new endemic species of *Anthemis* (sect. *Hiorthia*) is described from Sicily and named *Anthemis parlatoreana*. The locus classicus of the new taxon, falling in the NW Tyrrhenian coast of the island (Castellammare del Golfo, Trapani), coincides with that of *Ptilostemon greuteri*, another endemic very rare species of the Sicilian flora. Data on the morphology, distribution, ecology and conservation status of the new species are provided. The taxonomic relationships with the other Sicilian taxa of the same section, in particular *A. cupaniana*, are also analyzed. The simultaneous presence in the same site of other endemic plants enriches the area of the limestone reliefs of Castellammare del Golfo and all of north-western Sicily with biogeographic significance and biogenetic importance.

*Key words:* Italian flora, *Anthemis*, *Centaurea*, *Hieracium*, *Pilosella*, *Ptilostemon*, *Taraxacum*.

### Introduction

In Sicily, as in the other Italian regions, the *Asteraceae* family is very rich of genera and species (see Bartolucci & al. 2018; Pignatti 2019). Some of this are very complex and still contain critical groups within them. In the Mediterranean flora, this condition occurs particularly in the genera *Anthemis*, *Centaurea*, *Hieracium* and *Taraxacum* (Greuter 2008). Several taxa belonging to these genera have recently been described or rediscovered in the flora of southern Italy and Sicily.

In this regard, for *Anthemis* can be mentioned 2 species; for *Hieracium* 7 species and 9 subspecies; for *Taraxacum* 9 species; for *Pilosella* 1 subspecies and for *Ptilostemon* 1 species.

With referring to *Anthemis*, the investigations on the vascular flora of the coastal reliefs of North West Sicily, allowed us to identify a new species in the sect. *Hiorthia* (DC.) R. Fernandes.

In this article, after a brief review of the taxa recently described or rediscovered for the southern regions of Italy and Sicily in the family *Asteraceae*, the new Sicilian species of *Anthemis*, here proposed with the name of *Anthemis parlatoreana*, is finally presented.

### Review of recent acquisitions

#### *Anthemis* L.

In this genus were described:

*A. messanensis* Brullo [from Sicily (Brullo 1994)];

*A. pignattiorum* Guarino, Raimondo & Domina [from Sicily (Guarino & al. 2013)].

#### *Centaurea* L.

In this genus were described:

*Centaurea poeltiana* Puntillo [from Calabria (Puntillo 1996)];

*C. aspromontana* Brullo, Scelsi & Spampinato [from Calabria (Brullo & al. 2001)];

*C. ionica* Brullo [from Calabria (Brullo & al. 2001)];

*C. pentadactyli* Brullo, Scelsi & Spampinato [from Calabria (Brullo & al. 2001)];

*C. scillae* Brullo [from Calabria (Brullo & al. 2001)];

*C. brulla* Greuter [from Apulia and Basilicata (Greuter 2003)];

*C. erycina* Raimondo & Bancheva [from Sicily (Raimondo & Bancheva 2004)];

*C. saccensis* Raimondo, Bancheva & Ilardi [from Sicily (Raimondo & al. 2004)];

*C. sarfattiana* Brullo, Gangale & Uzunov [from Calabria (Brullo & al. 2004)];

*C. giardiniae* Raimondo & Spadaro [from Sicily (Raimondo & Spadaro 2006)];

*C. lacaitae* Peruzzi [from Campania (Peruzzi 2008)];

*C. sicana* Raimondo & Spadaro [from Sicily (Raimondo & Spadaro 2008)];

*C. tyrrhena* C. Brullo, Brullo & Giusso [from Sicily (Brullo C. & al. 2011)];

*C. calabra* G. Caruso, S.A. Giardina, Raimondo & Spadaro [from Calabria (Caruso & al. 2013)];

*C. aegusae* Domina, Greuter & Raimondo [from Sicily (Domina & al. 2017)];

*C. heywoodiana* Raimondo, Spadaro & Di Grist. [from Sicily (Raimondo & al. 2020)].

#### *Hieracium* L.

In this genus were described or rediscovered:

*Hieracium pignattianum* Raimondo & Di Grist. [described from Sicily (Raimondo & Di Gristina 2004)];

*H. madoniense* Raimondo & Di Grist. [described from Sicily (Raimondo & Di Gristina 2007)];

*H. pallidum* subsp. *aetnense* Gottschl., Raimondo & Di Grist. [described from Sicily (Gottschlich & al. 2013)];

*H. hypochoeroides* subsp. *montis-scuderii* Di Grist., Gottschl., Galesi, Raimondo & Cristaudo [described from Sicily (Di Gristina & al. 2013)];

*H. busambarensense* Caldarella, Gianguzzi & Gottschl. [described from Sicily (Caldarella & al. 2014)];

*H. terraccianoii* Di Grist., Gottschl. & Raimondo [described from Calabria (Di Gristina & al. 2014)];

*H. barrelieri* Gottschl., Raimondo, Greuter & Di Grist. [described from Campania (Gottschlich & al. 2015)];

- H. hypochoeroides* subsp. *peracutisquamum* Di Grist., Gottschl. & Raimondo [described from Basilicata (Di Gristina & al. 2015a)];
- H. hypochoeroides* subsp. *lucanicum* (Arv.-Touv.) Di Grist., Gottschl. & Raimondo [rediscovered from Campania (Di Gristina & al. 2015b)];
- H. hypochoeroides* subsp. *cilentanum* Di Grist., Gottschl. & Raimondo [described from Campania (Di Gristina & al. 2016a)];
- H. schmidtii* subsp. *nebrodense* (Tineo ex Lojac.) Di Grist., Gottschl. & Raimondo [rediscovered from Sicily (Di Gristina & al. 2016b)];
- H. pollinense* Zahn [rediscovered from Basilicata (Gottschlich & al. 2017a)];
- H. umbrosum* subsp. *abietinum* (Boiss. & Heldr.) Greuter [rediscovered from Basilicata (Gottschlich & al. 2017b)];
- H. jurassicum* subsp. *serrapretense* Di Grist., Gottschl. & Scafidi [described from Basilicata (Di Gristina & al. 2018)];
- H. racemosum* subsp. *lucanum* Di Grist., Domina, Gottschl. & Scafidi [described from Basilicata (Di Gristina & al. 2019)].

***Taraxacum*** F. H. Wigg.

In this genus were described:

- T. carthusianorum* Aquaro, Caparelli & Peruzzi [from Calabria (Aquaro & al. 2008a)];
- T. lilianae* Aquaro, Caparelli & Peruzzi [from Basilicata (Aquaro & al. 2008b)];
- T. calabricum* Aquaro, Caparelli & Peruzzi [from Calabria (Aquaro & al. 2009)];
- T. cescae* Aquaro, Caparelli & Peruzzi [from Calabria (Aquaro & al. 2009)];
- T. garbarianum* (Peruzzi, Aquaro, Caparelli & Raimondo [from Sicily (Peruzzi & al. 2009)]);
- T. kirschneri* Aquaro, Caparelli & Peruzzi [from Calabria (Aquaro & al. 2009)];
- T. optimae* Aquaro, Caparelli & Peruzzi [from Calabria (Aquaro & al. 2009)];
- T. pollinense* Aquaro, Caparelli & Peruzzi [from Calabria (Aquaro & al. 2009)];
- T. annalisae* Carlesi & Peruzzi [from Campania (Carlesi & Peruzzi 2012)].

***Pilosella*** Vaill.

In this genus was described only:

- Pilosella hoppeana* subsp. *sicula* Di Grist., Gottschl. & Raimondo [from Sicily (Di Gristina & al. 2016c)].

***Ptilostemon*** Cass.

In this genus was described only:

- Ptilostemon greuteri* Raimondo & Domina [from Sicily (Raimondo & Domina 2006)].

**New acquisition**

In *Anthemis*, to the two species mentioned above and described from Sicily, today we add a new species with the name of *Anthemis parlatoreana*.

*Anthemis parlatoreana* Raimondo, Bajona, Spadaro & Di Gristina *sp. nov.* (Fig. 1).

*Diagnosis*

*Planta caespitosa perennis, suffruticulosa, viridis-cinerea, cum scapis ramosis, prostratis-ascendentibus, pluricephalibus. Folia petiolata, laciniata; inferiores virides et gradatim cinerea. Capitula fere 3-5, receptaculum insigniter conicum. Squamae externae sub-triangulares, acutae, canescentes, cum marginibus brunneis, scariosis et pilosis; internae cartilagineae. Flores radii 18-22; ligula alba, cum apice denticulato; flores disci tubulosi, flavi, cum petalis acutis, curvatis ab exteriori parte; antherae intense flavae. Fructus cuneatus, granulatus in longitudinem costatus, oblique coronatus.*

*Typus* – Sicily: Castellammare del Golfo (Trapani), northern slopes of Pizzo Stagnone (Inici Mount), on calcareous rock, ca.400 m (a.s.l.), 10 june 2020, *Raimondo & Bajona* (holo PAL-Gr; iso PAL and FI).

*Description* (Figs 1-3)

Perennial plant, suffruticose, bushy, ashy-green, with branchy scapes, lying down-ascending, (20)30–60(70) cm long, hairy, with numerous capitula. Leaves green and gradually ashy, lacinate; basal leaves 7–10.5 cm long, with obtuse to acute lacinies; median leaves lacinate, 6–10 cm long; the apical leaves lacinate to entire, 1.5–2 cm long; petioles of the basal and median leaves 3–6 cm long; petioles of the cauline ones 2–3 cm long; the apical leaves sessile. Capitula (1)3–5(7); receptacle markedly conical, 1.5–1.8 cm wide at the base, high 0.7–0.8 cm. Involucral bracts outermost sub-triangular, acuminate, greyish subtomentose, brownish, scarios and sparsely hairy at the edges, 1.2–1.5 mm wide, 3 mm long; the innermost cartilaginous, lanceolate and sharp, 1 mm wide, 3.5–4.5 mm long. Ray florets (16)18–22(25), female; ligule white, with dentate apex, (12)13–14(15) mm long; disc florets tubular, golden yellow, with 6–7 mm long pointed petals, curved on the outside; anthers intense yellow. Achene cuneate, 2.5–3.0 × 1 mm long, granulated, longitudinally costate; corona obliquely truncated.

*Flowering*: April–June.

*Etymology*: The epithet of the name of the new Sicilian species commemorates one of the most famous Italian botanists of the 19th century: Filippo Parlato (Palermo 1816–Firenze 1877).

*Distribution*: Plant is currently known only from the northern coastal reliefs of Castellammare del Golfo in the Trapani province (NW Sicily). It is believed that the new species is however localized in this important carbonate sector of western Sicily (Fig. 4).

*Biology and Ecology* (Figs 5 and 6): Chamaephyte suffruticose (Ch suff). Ligulate flowers unisexual, female and frequently abortive.

*A. parlatoreana* is a robust and competitive plant. From the ecological point of view it is a very plastic species. It prefers the rocky habitat but also colonizes stony ground, rocky soils and, in general, inconsistent substrates in open places. The seeds have a high germinative power (Fig. 5b) and the plants spread the seeds widely even at medium dis-

tances, thus managing to colonize the suitable spaces below the rock environment or, in any case, close to it. *A. parlatoreana*, primarily inhabits the calcareous rocks (Figs 4a, 5b, 5c & 5e) facing to north and north-east, between 250 and 750 m (a.s.l.). It adapts to different habitats and competes well with the corresponding phytocoenoses. On the rocks, it is associated with *Allium subhirsutum* L., *Antirrhinum siculum* Miller, *Asplenium trichomanes* L., *Ballota rupestris* (Biv.) Vis., *Brassica villosa* subsp. *bivonana* (Mazzola & Raimondo) Raimondo & Mazzola, *Centaurea panormitana* subsp. *ucraiae* (Lacaita) Greuter, *Ceterach officinarum* DC., *Coronilla valentina* L. (Fig. 5h), *Cymbalaria pubescens* (C. Presl) Cufod., *Dianthus rupicola* Biv. subsp. *rupicola*, *Elichrysum rupestre* subsp. *stramineum* (Guss.) C. Brullo & Brullo, *Euphorbia bivonae* Steudel, *Hyoseris radiata* L., *Iberis semperflorens* L., *Lithodora rosmarinifolia* (Ten.) Johnston, *Lomelosia cretica* (L.) Greuter & Burdet (Fig. 5g), *Matthiola incana* subsp. *rupestris* (Raf.) Nyman, *Melica minuta* L. subsp. *minuta*, *Micromeria fruticulosa* (Bertol.) Silić, *Ranunculus rupestris* Guss., *Seseli bocconi* Guss., *Silene fruticosa* L., *Umbilicus rupestris* (Salisb.) Dandy; further down also with *Asparagus acutifolius* L., *Chamaerops humilis* L., *Coronilla valentina* L. (Fig. 5h), *Erica multiflora* L., *Euphorbia dendroides* L., *Galium aetnicum* Biv., *Malva arborea* (L.) Webb & Berthel., *Prasium majus* L., *Ptilostemon greuteri* Raimondo & Domina (Figs 5d and 5h), *Ruta chalepensis* L., *Teucrium flavum* L. (Fig. 5h), *Urginea maritima* (L.) Baker., and *Valantia muralis* L. In more mesophilous conditions it also associates with *Odontites bocconei* (Guss.) Walpers subsp. *bocconei*.

From the phytosociological point of view, due to its high frequency and coverage, the new species has a differential role in the phytocoenosis attributable to the *Dianthion rupicolae* Brullo & Marcenò 1979 alliance (*Asplenietalia glandulosi* Br.-Bl. & Meier 1934).

*Taxonomic remarks:* *Anthemis parlatoreana* is well distinct from the species of the *Anthemis* sect. *Hiorthia*. It is very close to the taxa of *Anthemis punctata* group, which in Sicily includes *A. cupaniana* Tod ex Nyman and *A. pignattiorum*. However, *A. parlatoreana* differs from these as it is a more robust and developed plant, very thermophilous, with a short vegetative stasis in mid-summer and early vegetative restart in autumn (Fig. 6a) rather than spring. Due to the ecology and the shape of the receptacle, *A. parlatoreana* is related to *A. pignattiorum* of the southern eastern coast of Sicily. However, it differs from *A. pignattiorum* by the greater length of the floral scapes, by the greater number of capitula per scape, by the greater number of ray florets, by the prominent conical receptacle and to have achenes with corona, rather than devoid of corona as in said species. Furthermore, it is related to *A. cupaniana*, from which, however, it differs by its ecology – as a more thermophilous plant – by the even longer scapes and with more capitula, as well as for the richer number of peripheral flowers of the capitula. It also differs in the markedly conical shape and the larger diameter of the receptacle, in the larger size and pubescence of the external involucreal scales (Fig. 2d).

From *Anthemis cretica* subsp. *columnae* occurring in Sicily, the new species differs by its longer and with more capitula scapes, by capitula with a greater number of ray florets, and by the conical rather than subglobose receptacle.

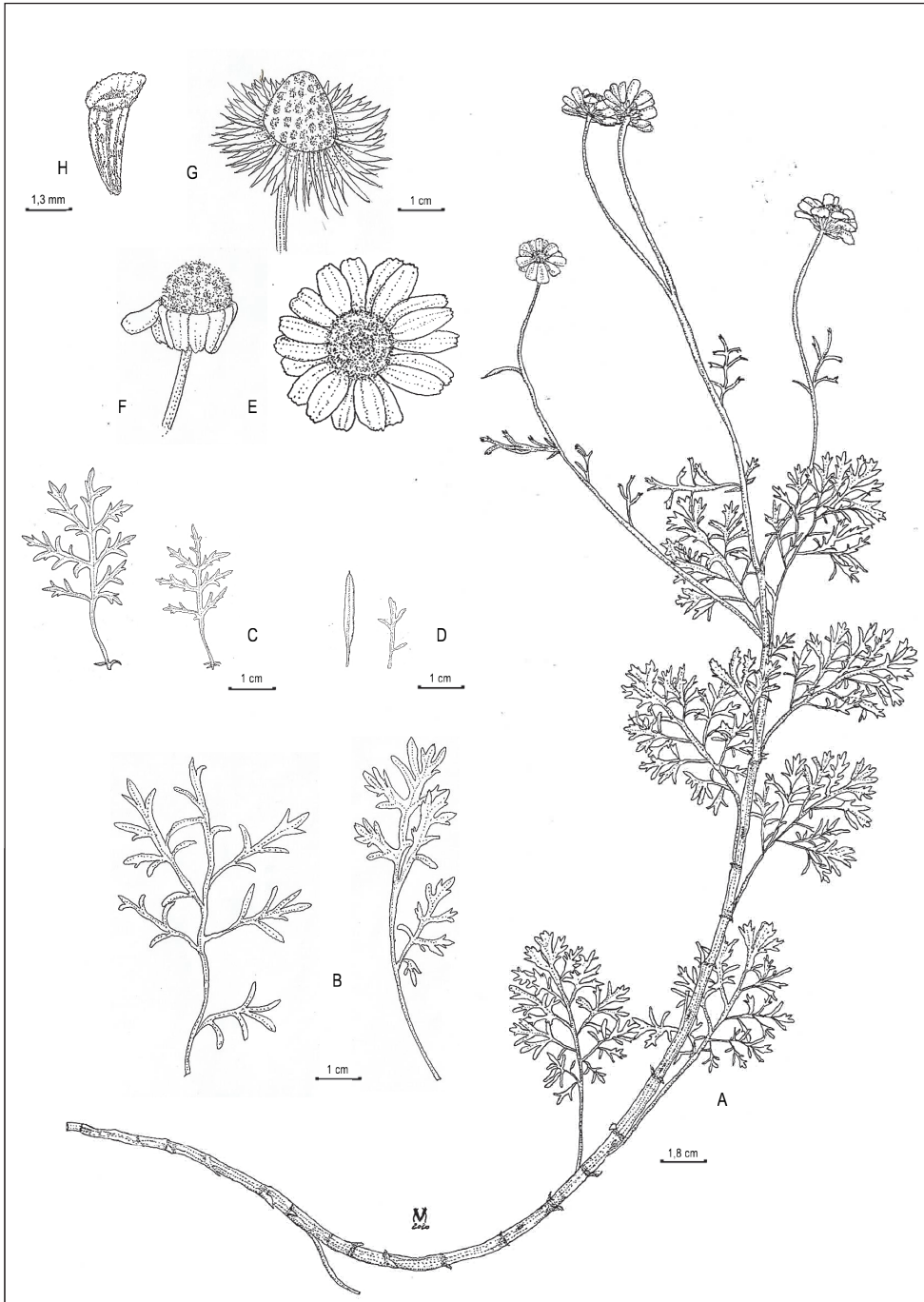


Fig. 1. Iconographic plate of *Anthemis parlatoireana*: a) plant; b) basal leaves; c) cauline leaves; d) apical leaves; e) capitulum in flower; f) receptacle; g) mature achene.



Fig. 3. Details of representative organs of the plant of *Anthemis parlatoreana*: a) mature capitula on the plant *in situ*; b-c) shape and size of the mature capitulum; d-f) shape and size of receptacle in mature capitulum; f) mixture of achenes and internal scales of the capitulum at maturity.



Fig. 4. Overall view of the coastal relief system of Castellammare del Golfo (Trapani) (from Google Earth).

Finally, from the others Sicilian perennial species included in the same section, the new taxon is distinguished from *A. messanensis* and from *A. ismelia* Lojac. – of the nearby coast of Palermo – in being a much more developed and competitive plant, as well as in the shape of the receptacle of the capitula, conical and not obtuse. Instead, *A. parlatoreana* is related to *A. ismelia* by the ecology and shape of the corona of the fruit. From *A. aetnensis* Schouw, it differs not only by its very different ecology, but also by its longer and with more capitula scapes, by the greater number of ray flowers and the different color of the ligules, which are totally white in the new species, while pinkish-purple, at least in the basal portion, in the Etna species (Brullo C. & Brullo 2020). With the latter, *A. parlatoreana* is related, however, to the shape of the corona of the fruit, obliquely truncated (Fig. 1H).

*Conservation status:* The new taxon is currently known only from one location not exceeding 300 hectares. However, its single known population consist of about 2500 mature individuals that produce many fertile seeds (Fig. 6b) and the renewal is evident and considerable. The recurrence of fires (Fig. 5a) is the main threat for the population, because the *locus classicus* is close to an inhabited center with a rapid urban development (Fig. 4). Although the plants grow preferably on rocks, the recurrent presence of fire could progressively reduce the number of mature individuals. Following the IUCN criteria (IUCN 2019), on the basis of criterion B, due to its restricted area (EOO < 100 km<sup>2</sup> and AOO < 10 km<sup>2</sup>), number of location (1) and declining inferred of the quality of habitat and number of mature individuals, *Anthemis parlatoreana* can be classified as *Critically Endangered* (CR): B1ab(iii,v) + 2ab(iii,v).





Fig. 2. *Anthemis parlatoireana*: a-b) plants in full bloom; c) capitulum in full bloom; d) detail of the external scales of the capitulum; e-f) plants and capitula at the end of flowering.

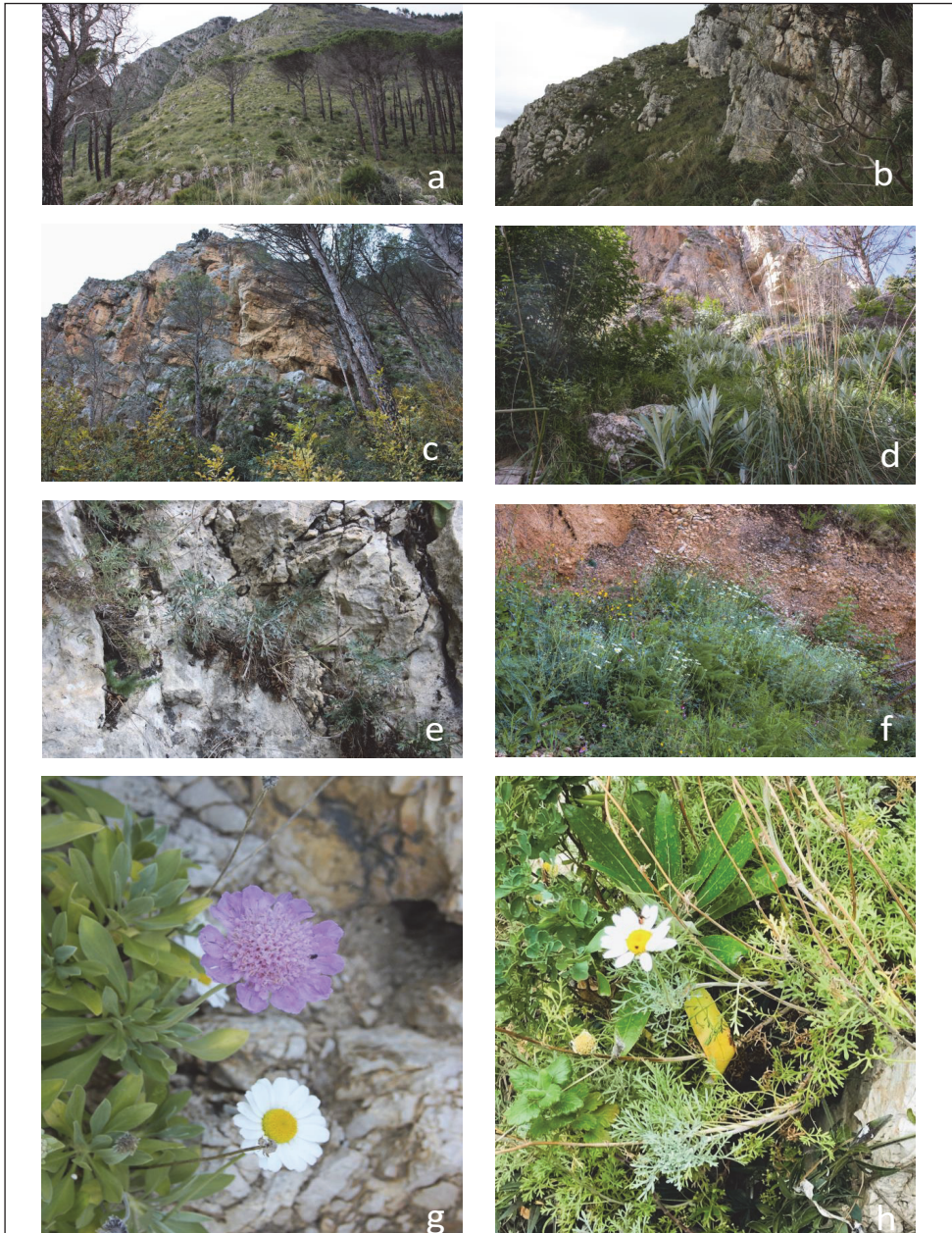


Fig. 5. *Anthemis parlatoreana*: a) habitat of on the northern summit of Pizzo Stagnone (873 m a.s.l.); b) different mesophilous habitats on limestone slopes of Pizzo Stagnone; c) termophilous rock habitats near his *locus classicus*; d) termophilous habitat on limestone debris with *Ptilostemon greuteri* and *Ampelodesmos mauritanicus*; e) chasmophytic habitus in the *locus classicus*; f) habitus of the species on detrital soil; g-h) the new species respectively with *Lomelosia cretica* and with *P. greuteri*, *Teucrium flavum*, and *Coronilla valentina*.



Fig. 6. *Anthemis parlatoresana*: a) autumn regrowth of a head in habitat; b) germination response of *A. parlatoresana* seeds 20 days after sowing in a plant pot.

### Discussion and conclusion

In southern Italy and Sicily, the *Asteraceae* family, and some of its genera in particular, has had a significant increase in specific and subspecific taxa. This increase was particularly evident in the genera *Centaurea* (16 taxa), *Hieracium* (15 taxa), *Taraxacum* (9 taxa) and *Anthemis* (3 taxa, including the new species described here for Sicily). Particularly, the Sicilian flora is enriched by another endemic species of the genus *Anthemis* (*Asteraceae*, *Anthemideae*). In detail, it is a taxon belonging to the sect. *Hiorthia* and connected to the *Anthemis punctata* group that is also present in North Africa (Oberprelier 1998) and already represented in Sicily by two other endemics localized (*A. pignattiorum*) or more widespread in the carbonate mountains of western Sicily (*A. cupaniana*). The population of the new taxon occurs in an interesting area characterized by a high level of endemism, including taxa with very local distributions and at extinction risk, as in the case of *Ptilostemon greuteri* and *Brassica villosa* subsp. *bivonana*. *Anthemis parlatoresana* is therefore added to these latter taxa. It is localized in the area that has its center on Mount Inici (1064 m a.s.l.), a coastal relief close to the town of Castellammare del Golfo (Trapani, NW-Sicily), locality previously mentioned for *A. cupaniana* (Lojacono 1903). However, unlike the other two taxa, by its biological and ecological characteristics, it is not unlikely that the presence of the new taxon goes beyond this restricted area of the Trapani province.

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