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# *Ptilostemon greuteri (Compositae),* a new species from Sicily

**Abstract**

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The rare *Ptilostemon greuteri* from NE Sicily is described as a species new to science and illustrated. It belongs to *P.* sect. *Ptilostemon* due to its non-spiny leaves and the corymbose synflorescence. From the two other species of this section, *P. chamaepeuce* and *P. gnaphaloides,* it differs strikingly by the larger size of the whole plant, the flat, lanceolate leaves and the absence of peripheral male flowers. The species, of which about 250 individuals are known, is restricted to a single locality and must be classified as endangered.

Key words: *Asteraceae, Cardueae,* taxonomy, endemism, Mediterranean region.

## Introduction

The genus *Ptilostemon* is a characteristic member of the Mediterranean flora. According to Greuter (1973) it includes 14 species occurring in restricted areas scattered over wide parts of the Mediterranean: *P. strictus* (Ten.) Greuter on the Italian and Balkan peninsula; *P. niveus* (C. Presl) Greuter in S Italy; *P. afer* (Jacq.) Greuter in the Balkan Peninsula and Anatolia; *P. diacantha* (Labill.) Greuter in Lebanon and S Anatolia; *P. chamaepeuce* (L.) Less. in the E Mediterranean from Greece to Lebanon and Israel; *P. gnaphaloides* (Cyr.) Soják in Calabria, Greece and Libya; *P. leptophyllus* (Pau & Font Quer) Greuter in Morocco; *P. echinocephalus* (Willd.) Greuter in the Crimea, Caucasus and Anatolia; *P. hispanicus* (Lam.) Greuter in S Spain; *P. abylensis* (Maire) Greuter in Morocco; *P. rhiphaeus* (Pau & Font Quer) Greuter in Algeria and Morocco; *P. dyricola* (Maire) Greuter in Morocco; *P. casabonae* (L.) Greuter in S France and in Sardinia, Corsica and Elba; and *P. stellatus* (L.) Greuter in S Italy, Dalmatia, Albania, Greece and Crete. In Sicily (Pignatti 1982, Werner 1976) the genus is represented by *P. niveus,* a hemicryptophyte strictly confined to the Madonie Mts, and *P. stellatus,* a therophyte on the Madonie, Nebrodi and Peloritani mountains.

The floristic exploration of W Sicily has intensified in the last 20 years. Our careful investigation of the coastal mountains near Trapani (Mt Erice, Mt Cofano, Mt Passo del Lupo, Mt Inici, etc.) has already resulted in the discovery of several new taxa (*Limonium todaroanum* Raimondo & Pignatti, *Brassica villosa* subsp. *bivonana* (Mazzola & Raimondo) Raimondo & Mazzola,

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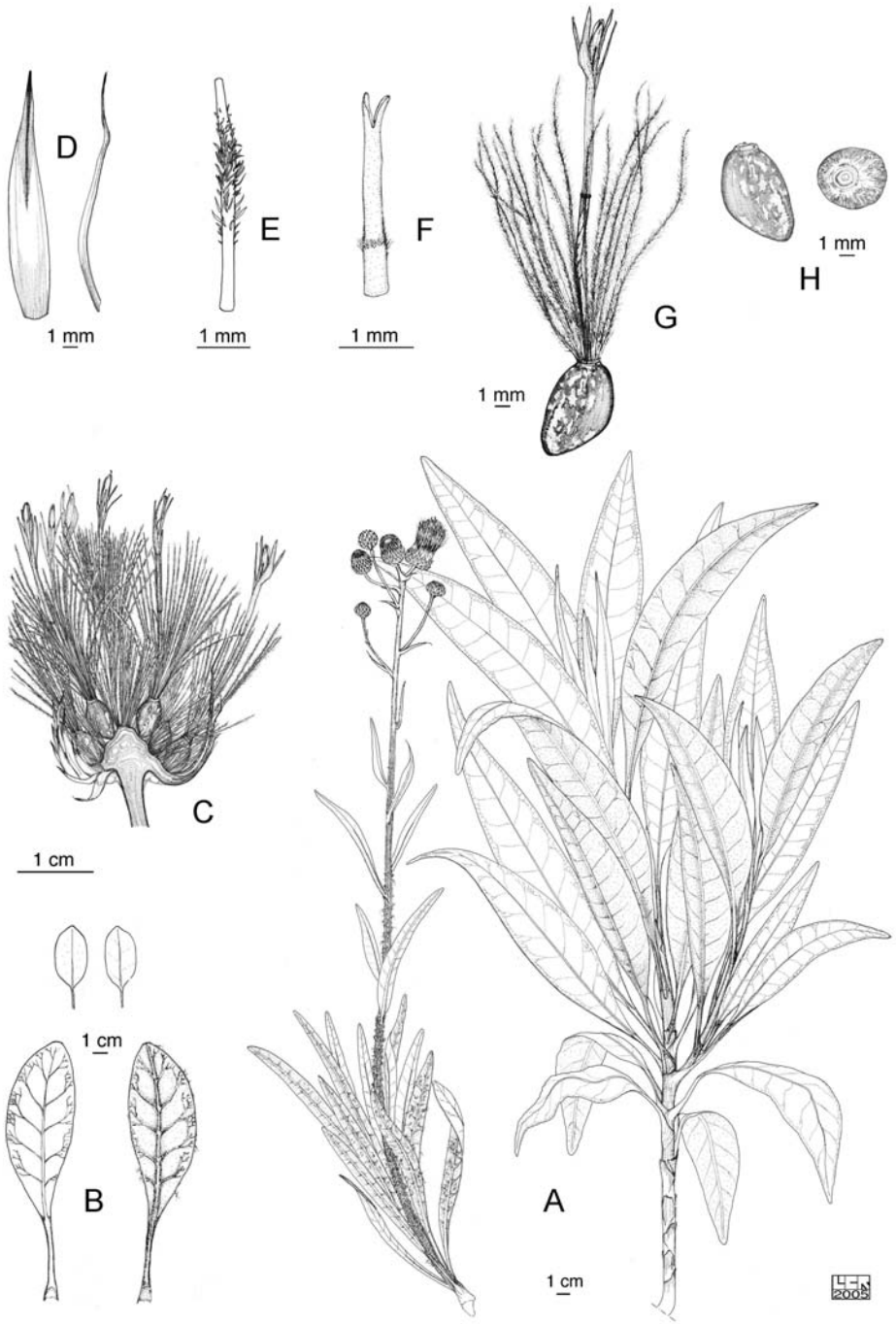



Fig. 1. *Ptilostemon greuteri* – A: flowering and vegetative stems; B: cotyledons and young leaves; C: longitudinal section of a capitulum; D: involucral bract in front and side view; E: filament; F: style; G: fruit with pappus and flower; H: fruit in side and top view. – Drawn by L. Raimondo.

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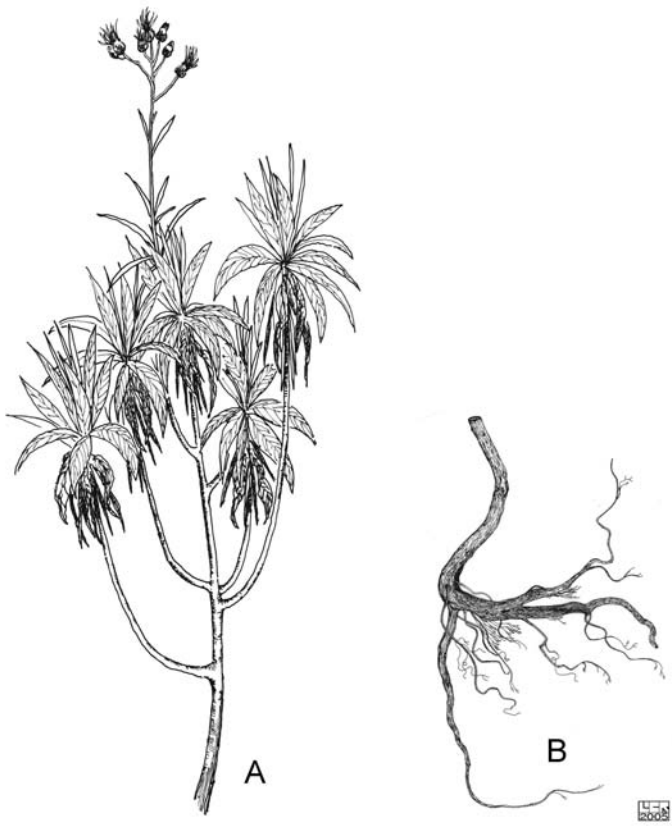



Fig. 2. *Ptilostemon greuteri* – A: habit; B: roots. – Drawn by L. Raimondo.

*Cynara cardunculus* var. *zingaroensis* Raimondo & Domina and *Centaurea erycina* Raimondo & Bancheva). Among our findings was also a localized, healthy population of a showy *Compositae* that remained undetermined for several years. Thanks to the recent expertise of Werner Greuter, when he visited the locus classicus, this plant has been attributed to the genus *Ptilostemon*. Comparative study of material housed in the herbaria PAL and B confirmed that it represents a species so far unknown, which we here describe as new to science.

***Ptilostemon greuteri*** Raimondo & Domina, **sp. nov.**
Holotype: Italy, Sicily, Prov. Trapani, loco classico et unico, in dumetis et ad rupes calcareas clivium asperorum sylvestrium septemtriones spectantium, 4.6.2005, *F. M. Raimondo, W. Greuter & M. Aghababyan* (PAL; isotypes: B, FI; herb. Greuter) – Fig. 1-2.

*Planta* perennis, suffruticosa, parce et irregulariter ramosa. *Folia* perhyemantia, apicem ramorum versus densiora subrosulatim congesta, ad 20(-30) cm longa et ad 20(-30) mm lata, anguste lanceolata, recta, plana, marginibus integerrimis subrevolutis, apice acuminata, basi in petiolum brevem subvaginantem longe angustata, eximie discoloria nam subtus candida tomento compacto et crasso, supra indumento araneoso detersili induta cito glabrescentia atrovirentia. *Caules* floriferi simplices, ex apice ramorum orientes, 50-100(-150) cm alti, candide tomentosi, foliis anguste lanceolatis ramealibus subconformibus sed gradatim minoribus dense obsiti. *Synflorescentia* laxe corymbosa, capitulis 3-9. *Involucrum* basi truncatum, late ovoideum dein campanulatum, 15-25 mm longum; involucri phylla recta, regulariter imbricata, apice triangularia, dorso (extimis

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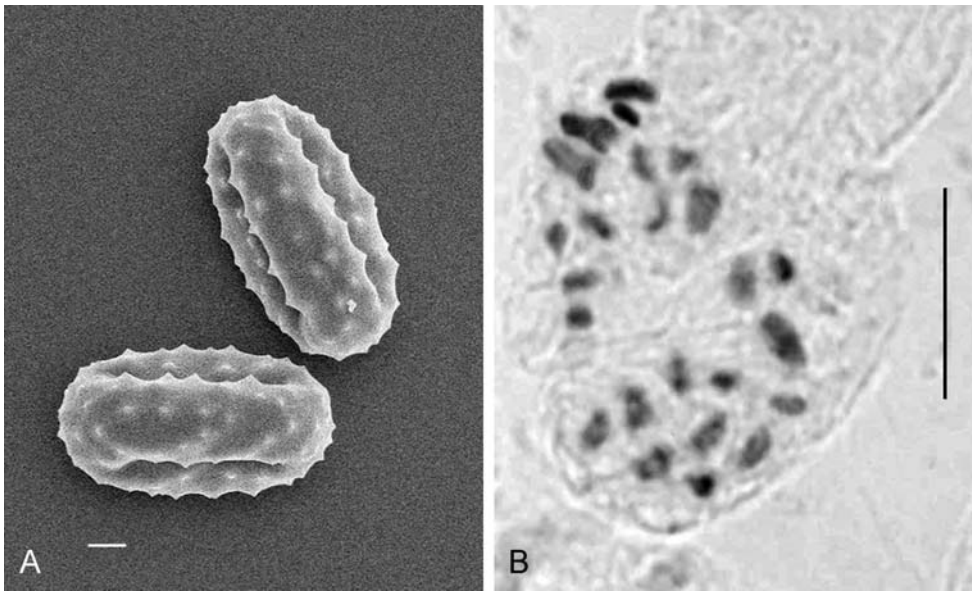



Fig. 3. *Ptilostemon greuteri* – A: SEM micrograph of the pollen; B: mitotic metaphase plate. – Scale bars = 10 µm.

exceptis) glabra infra pallide flavescentia superne virentia vel purpurascentia, margine candide tomentella, media lineari-lanceolata, ad mediam partem latissima, 2-2.5 mm lata. *Setae receptaculi* candidae, 5-10 mm longae. *Flosculi* cuncti hermaphroditi. *Corolla* rosea, 18-25 mm longa; tubus 8-12 mm longus; limbus 10-13 mm longus, basi campanulato-ampliatus inde tubulosus, per tertiam partem inaequaliter 5-fidus, laciniis basi 0.4-0.8 mm latis. *Staminum filamenta* post anthesin 5-6 mm longa, in media parte densiuscule mediocriter pilosa; *tubus antherarum* per 1.5 mm e corolla exsertus, 8-10 mm longus, 0.8-1 mm crassus, caudis 1.5-1.9 mm longis. *Stylus* 2.2-2.6 mm longus, lobi stigmatiferi lineari-spatulati apice rotundati, per 0.3-0.6 mm liberi. *Fructus* more generis obesus, a latere vix compressus, oblique obovoideus, 4-7 mm longus, 3-4 mm crassus, brunneus; discus apicalis diametro 1.4-1.8 mm, margine minuto 0.2-0.3 mm alto cinctus. *Pappus* 13-18 mm longus, setis 2-3-seriatis breviter vel mediocriter (ad 1.8 mm) plumosis, apice circumcirca barbellatis. – Habitat (Fig. 4) in dumetis et ad rupes calcareas clivium asperorum sylvestrium septentriones spectantium, ad 250-500 m altitudinis. Floret a Majo ad Julium mensem.

*Eponymy*. – The species is dedicated to Werner Greuter, author of an exhaustive monograph of the genus *Ptilostemon,* who has contributed in circumscribing the new taxon.

*Pollen morphology*. – Pollen prolate, ellipsoidal, 65(-70) × 35(-40) µm, tricolpate, with tuberculate exine (Fig. 3A).

*Caryology*. – The analysis of metaphase plates of root tips of three plants revealed a somatic chromosome number of $2n = 24$ for *Ptilostemon greuteri* (Fig. 3B). In *Ptilostemon,* where $2n = 32$ is common, this number is otherwise present only in the annual *P. stellatus* (Greuter 1973).

*Distribution and ecology*. – *Ptilostemon greuteri* is confined to a single locality in the province of Trapani, where it grows at 250-500 m altitude on the north facing slope of a limestone mountain (Fig. 4A-C). The locality is characterized by a thermo-Mediterranean climate (sensu Bagnouls & Gaussen 1953) with an annual mean temperature of 18 °C and an annual mean precipitation of 600 mm.

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Fig. 4. *Ptilostemon greuteri* – A-B: in the natural rocky calcareous habitat; C: detail of the synflorescence; D: in the maquis near the rocky habitat.

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The species is part of a chasmophitic community characterized by many endemics and other biogeographically interesting taxa such as *Anthemis cupaniana* Nyman, *Athamanta sicula* L., *Brachypodium retusum* (Pers.) P. Beauv., *Brassica villosa* subsp. *bivonana* (Mazzola & Raimondo) Raimondo & Mazzola, *Centaurea ucriae* Lacaita*, Ceterach officinarum* DC., *Chamaerops humilis* L., *Cheilanthes acrostica* Tod., *Hippocrepis emerus* subsp*. emeroides* (Boiss. & Spruner) Lassen, *Dianthus rupicola* Biv., *Erica multiflora* L., *Euphorbia bivonae* Steud., *E. dendroides* L., *Helichrysum rupestre* (Raf.) DC. var. *rupestre, Iberis semperflorens* L., *Melica arrecta* Kunze, *Notobasis syriaca* (L.) Cass., *Olea europaea* var. *sylvestris* (Mill.) Lehr, *Phagnalon saxatile* (L.) Cass., *Quercus ilex* L., *Satureja fruticulosa* (Bertol.) Grande, *S. graeca* subsp. *tenuifolia* (Ten.) Arcang., *Scabiosa cretica* L., *Sedum dasyphyllum* L., *S. sediforme* (Jacq.) Pau, *Silene fruticosa* L., *Teucrium flavum* L. and *T. fruticans* L.

It also penetrates into the open Mediterranean maquis (Fig. 4D) with *Ampelodesmos mauritanicus* (Poir.) T. Durand & Schinz, *Artemisia arborescens* L., *Asparagus acutifolius* L., *Asphodelus microcarpus* Salzm. & Viv., *Blackstonia perfoliata* (L.) Huds., *Brachypodium retusum* (Pers.) P. Beauv., *Carlina sicula* Ten., *Chamaerops humilis* L., *Cistus creticus* L., *Cymbopogon hirtus* (L.) Janch. subsp. *hirtus*, *Dianthus siculus* C. Presl, *Erica multiflora* L., *Fraxinus ornus* L., *Helminthotheca aculeata* (Vahl) Lack, *Hypericum perfoliatum* L., *Inula viscosa* (L.) Aiton, *Pistacia lentiscus* L., *P. terebinthus* L., *Quercus ilex* L., *Rhus coriaria* L., *Rosa sempervirens* L., *Rubia peregrina* L., *Rubus ulmifolius* Schott, *Scrophularia canina* subsp. *bicolor* (Sm.) Greuter, *Teucrium fruticans* L., and also into plantations of *Pinus halepensis* Mill., *P. pinea* L. and *Eucalyptus rostrata* Schltdl. on degraded maquis.

*Conservation status*. – Population dynamics could not yet be monitored over a full decade. However, the small population size, estimated at little more than 250 individuals, concentrated in an area of only 0.05 km$^2$ exposed to recurrent fires, indicates that *Ptilostemon greuteri* should be classified, according to the IUCN (2001) criteria, as Endangered (EN). Several capitula were found to be affected by larvae probably of the fly *Trupanea amoena* (Frauenfeld), already reported for *Centaurea erycina* Raimondo & Bancheva, another endangered endemic Sicilian *Asteraceae* (Raimondo & Bancheva 2004), which feed on the young achenes and may seriously affect the reproductive capacity of the population.

*Relationship*. – *Ptilostemon greuteri* does not have a close relationship to its two Sicilian congeners *P. niveus* and *P. stellatus,* which belong to *P.* subg. *Ptilostemon* sect. *Platyrhaphium* and *P.* subg. *Lamyra,* respectively. According to the classification of Greuter (1973), the new species belongs to *P.* sect. *Ptilostemon* owing to its corymbose synflorescence and the leaves lacking spines. From the two other species of this section, *P. chamaepeuce* and *P. gnaphaloides,* it differs strikingly by the larger size of the whole plant, by the flat, lanceolate leaves (convolute and narrowly linear in *P. gnaphaloides* and *P. chamaepeuce*) and the absence of peripheral male flowers in the capitula. The last character state may perhaps be considered as primitive.

The chromosome number of $2n = 24$ is unique in *Ptilostemon* subg. *Ptilostemon,* in which all counts so far yielded $2n = 32$. A possible interpretation of the aberrant chromosome number of *P. greuteri* is a descending aneuploidy, as has been postulated for *P. stellatus* of *P.* subg. *Lamyra,* which also has $2n = 24$ chromosomes (Greuter 1973).

*Additional material examined.* – Sicily, Prov. Trapani, ad rupes calcareas clivium asperorum sylvestrium septemtriones spectantium, 29.11.1996, *F. M. Raimondo* (PAL).

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