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## First record of *Euphorbia graminea* (*Euphorbiaceae*) in Italy

### Abstract

Scafidi, F., Raimondo, F. M. & Domina, G.: First record of *Euphorbia graminea* (*Euphorbiaceae*) in Italy. — Fl. Medit. 26: 25-30. 2016. — ISSN: 1120-4052 printed, 2240-4538 online.

*Euphorbia graminea* Jacq. (*Euphorbiaceae*), a species native from Central America through northern South America, from Northern Mexico to Peru, has been found naturalized near Palermo (Sicily). This is the first record for Italy and Europe.

*Key words*: xenophytes, alien flora, *Euphorbia* subgen. *Chamaesyce*, Sicily.

### Introduction

The genus *Euphorbia* L. s. l. (*Euphorbiaceae*) is the third largest genus of flowering plants, with almost 2000 species (Ernst & al. 2015). It is well known for the remarkable diversity of succulent and non-succulent plants that are avidly grown by horticultural enthusiasts (Yang & al. 2012). Despite this large variability of life forms, the entire genus is characterized morphologically by the presence of a cyathium (Prenner & Rudall 2007).

In the vascular flora of Italy, *Euphorbia*, includes 88 specific and infraspecific taxa (Conti & al. 2005), 14 of which are considered non-native (Celesti-Grapow & al. 2009, 2010). In Sicily, according to Raimondo & al. (2010), 38 specific and subspecific taxa are present; the alien species are: *E. humifusa* Willd., *E. maculata* L., *E. nutans* L., *E. prostrata* Aiton, *E. heterophylla* L., *E. valerianifolia* Lam. (= *E. akenocarpa* Guss.). Three additional species were recently recorded: *E. hyssopifolia* L. from Vittoria (Ragusa) and Pantelleria island by Banfi & Galasso (2014), *E. serpens* Kunth, from the territory of Aci Trezza (Catania) by Ardenghi & Cauzzi (2015) and *E. hypericifolia* L. from the Taormina territory (Messina) Sciandrello & al. (2016).

In December 2015, during floristic research in the territory of Palermo (NW Sicily), a considerable population of an unknown species of *Euphorbia* subgen. *Chamaesyce* was discovered. On the basis of literature and herbaria studies it was referred to *E. graminea* Jacq., an alien species not previously reported from Italy and Europe (Euro+Med 2006 -; DAISIE online Database; Celesti-Grapow & al. 2009, 2010).

## Material and Methods

Plant material was collected in the field. Herbarium specimens were deposited in the *Herbarium Mediterraneum Panormitanum* (PAL).

The morphology of the species is described on the basis of material collected in Sicily, in agreement with relevant descriptions (Webster & Bruch 1967; Herndon 1994; Yang et al. 2005; Vincent 2013).

Data about the habitat and the population size of *E. graminea* are based on personal observations in the field. Nomenclature of the species found together with *E. graminea* follows Euro+Med (2006 -).

## Results and Discussion

*Euphorbia graminea* Jacq., Select. Stirp. Amer. Hist. 151, 1763

≡ *Adenopetalum gramineum* (Jacq.) Klotzsch & Garcke, Abh. Königl. Akad. Wiss. Berlin 1859: 47, 1860

≡ *Agaloma graminea* (Jacq.) D.B.Ward, Phytologia 89: 226, 2007

≡ *Eumecanthus gramineus* (Jacq.) Millsp., Publ. Field Mus. Nat. Hist., Bot. Ser. 2: 413, 1916

≡ *Euphorbia graminea* var. *lancifolia* Millsp., Publ. Field Columb. Mus., Bot. Ser. 1: 372, 1898

≡ *E. graminea* var. *virgata* Millsp., Publ. Field Columb. Mus., Bot. Ser. 1: 372, 1898

Annual or perennial herb, 15-80(-150) cm tall, stem ascending or erect, often branching from the base and dichotomously branched distally. Leaves alternate below, opposite above (around the cyathia); petioles 8-13(-30) mm long, pubescent; lamina ovate-rounded to oblong, 17-40 (-50) × 10-20 (-25) mm, acuminate to acute at apex, acute to obtuse at base, entire, pubescent on both surfaces. Cyathia in short to long pedunculate cymes; leaf opposite, linear or lanceolate, 20-30 × 4-7 mm; involucre turbinate, 1-1.6 mm long, pubescent outside; petaloid appendage white, obcordate at apex, 2-4(-5) mm long. Capsule 2-3 mm, exserted from the cyathia; seeds angular, ovoid, rugose, 1.5 × 1.3 mm, grey or whitened (Webster & Bruch 1967; Herndon 1994; Yang & al. 2005; Vincent 2013).

*Euphorbia graminea* is a native weed from northern Mexico to Peru (Webster & Bruch 1967). It belongs to *E.* sect. *Alectoroctonum* (Schltdl.) Baill., a taxonomically complex group that includes 115 species, characterized by the presence of tiny, mostly glanduliform stipules, petaloid gland appendages, and usually entire leaves (Yang & al. 2012).

This species is considered invasive (Randall 2002) and has been found outside its native range in Palau (Fosberg & al. 1980), Caroline Islands (Fosberg & Canfield 1980), Fiji Islands (Smith 1991), Hawaii (Stone Charles & al. 1992; Wagner & al. 1999), Taiwan (Yang & al. 2005), Galapagos Islands (Guézou & al. 2010), Nigeria (Aigbokhan & Ekutu 2012). Ward & Housel (2007) confirmed *E. graminea* as a recent introduction to the flora of Florida, previously incorrectly identified as *E. oerstediana* (Klotzsch & Garcke) Boiss. In California, this species occurs only as agricultural or garden weed (Rosatti 2011). According to Danin & al. (2009), this species occurs in Israel in nurseries and their surroundings but has no tendency to get established in semi-natural habitats.

*Euphorbia graminea* was found in the northwestern part of Sicily, in the territory of Boccadifalco near Palermo (Figs. 1, 2), along the edge of a country road (WGS84 coordinates: 38° 06' 55.03" N, 13° 18' 27.26" E).

The population consists of about 300 individuals growing in an area of 150 m<sup>2</sup> (Fig. 3). The vegetation consists of annual or perennial, ruderal herbaceous species, dominated by: *E. graminea* (with a 20% cover), *Rubus ulmifolius* Schott, *Galactites tomentosus* Moench, *Paretaria judaica* L., *Euphorbia pepus* L., *Sonchus oleraceus* L., *Ochlopoa annua* (L.) H. Scholz, *Urtica dioica* L., *Mercurialis annua* L., *Erodium malacoides* (L.) L'Hér., *Arum italicum* Mill., *Borago officinalis* L., *Dittrichia viscosa* (L.) Greuter, *Avena fatua* L. and *Piptatherum miliaceum* (L.) Coss. Other ruderal alien species occur in the same site: *Pennisetum setaceum* (Forssk.) Chiov., *Ricinus communis* L., *Arundo donax* L. and *Oxalis pes-caprae* L.

In the site studied, the species seems well-established and can be easily considered naturalized due to the production of a large quantity of seeds and abundant sexual reproduction.

The vector of introduction is uncertain. Probably, *E. graminea* was introduced accidentally, considering the fact that the growing site is located about 150 m away from a garden centre; thus the most plausible hypothesis is that it escaped from plant containers kept inside (compare with Ward & Housel (2007) and Vincent (2013)).

The status of *E. graminea* in Sicily should be permanently monitored, considering its potential spread from the site where it has been recorded.

**Specimina visa:** ITALY (SIC): Boccadifalco (Palermo), along the edges of a country road, 38° 06' 55.03" N, 13° 18' 27.26" E, 105 m a.s.l., 21 Dec 2015, *F. Scafidi s. n.* (PAL 102716!).



Fig. 1. Habit of *Euphorbia graminea* in Boccadifalco near Palermo (Sicily).



Fig. 2. Herbarium specimen of *Euphorbia graminea* from Boccadifalco (Palermo, Sicily).



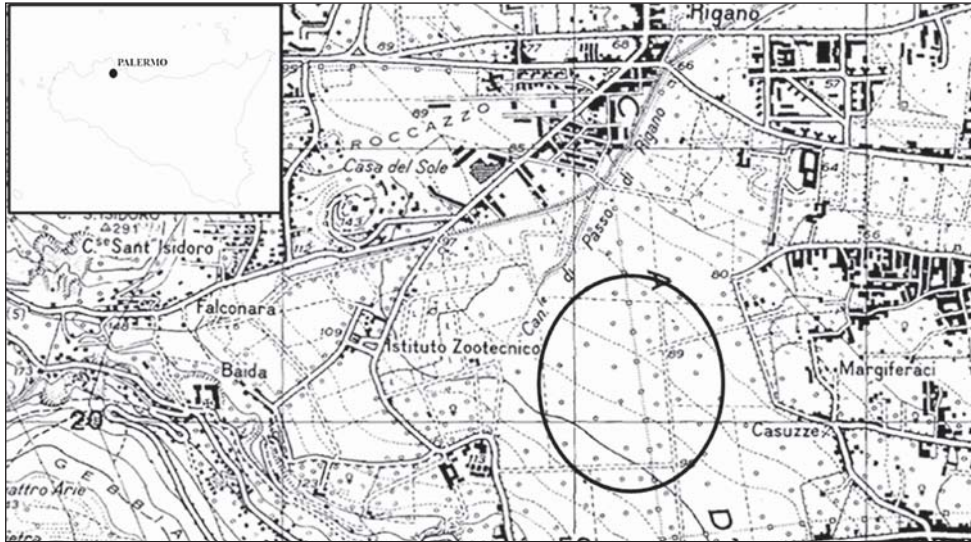


Fig. 3. Location of the population of *Euphorbia graminea* in Sicily.

### Acknowledgements

Financial support by International Foundation pro Herbario Mediterraneum is gratefully acknowledged.

### References

- Aigbokhan E. I. & Ekutu O. 2012: Aspects of the biology and ecology of *Euphorbia graminea* Jacq. (*Euphorbiaceae*) - a potentially invasive herbaceous plant in Nigeria. – *Nigerian J. Bot.* **25(1)**: 35-53.
- Ardenghi, N. M. G. & Cauzzi P. 2015: *Euphorbia serpens* Kunth. – P. 455 in: Raab-Straube von, E. & Raus T. (Eds.), *Euro+Med-Checklist notulae 5*. – *Willdenowia* **45**: 449-464.
- Banfi, E. & Galasso, G. 2014: 216. *Euphorbia hyssopifolia* L. – P. 85 in Barberis, G., Nepi, C., Peccenini, S. & Peruzzi, L.: *Notulae alla flora esotica d'Italia*: 10 (202-226). *Inform. Bot. Ital.* **46(1)**: 83-86.
- Celesti-Grapow, L., Alessandrini, A., Arrigoni, P. V., Banfi, E., Bernardo, L., Bovio, M., Brundu, G., Cagiotti, M. R., Camarda, I., Carli, E., Conti, F., Fascetti, S., Galasso, G., Gubellini, L., La Valva, V., Lucchese, F., Marchiori, S., Mazzola, P., Peccenini, S., Poldini, L., Pretto, F., Prosser, F., Siniscalco, C., Villani, M. C., Viegi, L., Wilhalm, T. & Blasi, C. 2009: Inventory of the non-native flora of Italy. – *Pl. Biosyst.* **143(2)**: 386-430. doi: 10.1080/11263500902722824
- , —, —, Assini, S., Banfi, E., Barni, E., Bovio, M., Brundu, G., Cagiotti, M. R., Camarda, I., Carli, E., Conti, F., Del Guacchio, E., Domina, G., Fascetti, S., Galasso, G., Gubellini, L., Lucchese, F., Medagli, P., Passalacqua, N. G., Peccenini, S., Poldini, L., Pretto, F., Prosser, F., Vidali, M., Viegi, L., Villani, M. C., Wilhalm, T. & Blasi, C. 2010: Non-native flora of Italy: species distribution and threats. – *Pl. Biosyst.* **144(1)**: 12-28. doi: 10.1080/11263500903431870
- Conti, F., Abbate, G., Alessandrini, A. & Blasi C. (ed.) 2005: *An annotated checklist of the Italian vascular flora*. – Roma.
- Danin, A., Cohen-Sivan, S. & Raus Th. 2009: *Euphorbia graminea* Jacq. – P. 338 in: Greuter, W. & Raus T. (Eds.), *Med-Checklist Notulae 28*. – *Willdenowia* **39**: 335-345.

- DAISIE - Delivering Alien Invasive Species Inventories for Europe. – <http://www.europe-aliens.org/> [Accessed the 23/02/2016]
- Ernst, M., Grace, O. M., Saslis-Lagoudakis, C. H., Nilsson, N., Simonsen, H. T. & Rønsted, N. 2015: Global medicinal uses of *Euphorbia* L. (*Euphorbiaceae*). – *J. Ethnopharmacol.* **176**: 90-101. doi: 10.1016/j.jep.2015
- Euro+Med (2006-): Euro+Med PlantBase - The information resource for Euro-Mediterranean plant diversity. – <http://ww2.bgbm.org/EuroPLusMed/> [Accessed 19/05/2016].
- Fosberg, F. R. & Canfield, J. E. 1980: Noteworthy Micronesian plants 3. – *Micronesia* **16**: 189-2000.
- , Otobed, D., Sachet, M.-H., Oliver, R. L., Powell, D. A. & Canfield J. E. 1980: Vascular Plants of Palau with Vernacular Names. – Washington, D.C.
- Guézou, A., Trueman, M., Buddenhagen, C. E., Chamorro, S., Guerrero, A. M., Pozo, P. & Atkinson, R. 2010: An extensive alien plant inventory from the inhabited areas of Galapagos. – *PLoS One* **5(4)**: e10276. doi: 10.1371/journal.pone.0010276
- Herndon, A. 1994. *Euphorbia graminea* (*Euphorbiaceae*) new to Florida. – *Sida* **16**: 208-209.
- Prenner, G. & Rudall, P. J. 2007: Comparative ontogeny of the cyathium in *Euphorbia* (*Euphorbiaceae*) and its allies: exploring the organ-flower-inflorescence boundary. – *Amer. J. Bot.* **94**: 1612-1629.
- Raimondo, F. M., Domina, G. & Spadaro, V. 2010. Checklist of the vascular flora of Sicily. – *Quad. Bot. Amb. Appl.* **21**: 189-252.
- Randall, R. P. 2002: A Global Compendium of Weeds. – Melbourne.
- Rosatti, T. J. (ed.) 2011: Index to California Plant Names: *Euphorbia graminea* Jacq. – Berkeley.
- Smith, A. C. 1991: Flora Vitiensis Nova: A New Flora of Fiji, **5**. – Lawai, Kauai, Hawaii.
- Sciandrello, S., Giusso del Galdo, G. & Minissale P. 2016: *Euphorbia hypericifolia* L. (*Euphorbiaceae*), a new Alien Species for Italy. – *Webbia* **61(1)**: 163-168. doi: 10.1080/00837792.2016.1152669
- Stone Charles, P., Clifford Smith, W. & Timothy Tunison, J. (eds.) 1992: Alien plant invasions in native ecosystems of Hawaii: Management and research. – Honolulu.
- Vincent, M. A. 2013: *Euphorbia graminea* Jacq. (*Euphorbiaceae*), new to the Bahamas. – *Phytoneuron* **20**: 1-3.
- Ward, D. B. & Housel, C. M. 2007: A corrected identification and a new combination for a recent Florida introduction: *Agaloma graminea* (*Euphorbiaceae*). – *Phytologia* **89(2)**: 225-227.
- Wagner, W. L., Herbst, D. R. & Sohmer, S. H. 1999: Manual of the flowering plants of Hawai'i. Revised edition. – Honolulu.
- Webster, G. L. & Bruch, D. 1967: *Euphorbiaceae*. – Pp. 333-334 in: Woodson, Jr. R. E., Schery, R. W., Webster, G. L. & Bruch, D.: Flora of Panama, 6. – *Ann. Missouri. Bot. Gard.* **54**.
- Yang, S.-Z., Chen, C.-F., Lo, K.-P. & Hsieh G.-P. 2005: *Euphorbia graminea* Jacquin (*Euphorbiaceae*), a newly naturalized plant in Taiwan. – *Taiwania* **50**: 131-136.
- Yang, Y., Riina, R., Morawetz, J. J., Haevermans, T., Aubriot, X. & Berry, P. E. 2012: Molecular phylogenetics and classification of *Euphorbia* subgenus *Chamaesyce* (*Euphorbiaceae*). – *Taxon* **61(4)**: 764-789.

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