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Studies on the genus *Euphorbia* (*Euphorbiaceae*) in North Africa: First records of the invasive weed *Euphorbia hypericifolia* (*E.* subsect. *Hypericifoliae* Boiss.) in Tunisia

Abstract

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Euphorbia hypericifolia L. (*Euphorbiaceae*) a neophyte native to tropical and sub-tropical Americas with scattered occurrences as alien in many countries within the Mediterranean area is here reported for the first time from several localities in Tunisia. An abbreviated morphological description with original photographs, ecological features with a first map distribution and taxonomic notes, considering comparisons with commonly misidentified related species, are presented.

Key words: *Anisophyllum*, Chorology, floristic records, *Euphorbia* Subgen. *Chamaesyce*; xenophytes.

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Introduction

Spurges with mainly small procumbent to erect annual habit bearing stipules and asymmetrical leaf base were formerly included in the genus *Chamaesyce*, reclassified later (Yang & al. 2012) under the genus *Euphorbia* L. subg. *Chamaesyce* Raf. sect. *Anisophyllum* Roeser subsect. *Hypericifoliae* Boiss. Being drought-tolerant plant and naturally adapted to survive even in arid regions with minimal water availability, several species of this group are naturalizing and even more recently becoming invasive throughout many countries of the world (see e.g., Kao & Chaw 1987; Somlyay 2009; Bátori & al. 2012; Verloove 2015; Taylor & Terry 2015; Geltman & Medvedeva 2017; Atha & al. 2018; Sirbu & Şuşnia Tone 2018; Abaas Aliwy 2022) and within the Mediterranean (see e.g., Roux 1992; Kervyn & Lambinon 2000; Sutorý & Verloove 2015; Sciandrello & al. 2016; Spadaro & Raimondo 2017; Mifsud 2018; Mugnai & al. 2021; Khamar & al. 2021, 2024; Mahklouf 2023), amongst them we find notably, the graceful spurge (*Euphorbia hypericifolia* L.). It is native to the New World

(including the southern United States, the Caribbean, and South America) but has become a common and widespread weed of the warm temperate, tropical, and subtropical countries (Chen & Wu 2004, *sub Chamaesyce hypericifolia* (L.) Millsp.; Atha & al. 2018; POWO 2025a[+]). Far away its native range, *E. hypericifolia* has been recorded as a weedy or invasive plant in many areas of the Old World, including the Mediterranean Basin, Western Europe (Belgium), tropical Africa, the Mascarene Islands, and certain parts of Asia (including China, India, Iraq, Oman, Pakistan, Taiwan) (Coode & al. 1982; Li & al. 2008; CABI 2025[+]). The species is considered to be a pantropical weed in disturbed areas, on irrigated grounds near cultivation, sandy soils, hillsides, and sea shores, at altitudes up to 1700 m (Pahlevani 2017). Moreover, the graceful spurge was listed among the top 20 invasive plants on Guam island, where despite that its occurrence do not causing serious damage to wild ecosystems, is certainly not a very welcomed species (Reddy 2011). In North Africa, the species is known only from Morocco and Libya with very recent records (Dobignard & Chatelain 2013; Mahklouf 2023; Khamar & al. 2024; POWO 2025a[+]).

In continuity to further updating the list of the Tunisian vascular flora and it surrounding countries within North Africa mainly Euphorbiaceous taxa (see e.g. El Mokni 2023; El Mokni & al. 2024; El Mokni 2025), specimens of annual erect little-branched (sub-shrubby like) spurge from several distant populations, within coastal regions of Tunisia, of an unknown/unfamiliar species of *Euphorbia* subgen. *Chamaesyce* sect. *Anisophyllum* subsect. *Hypericifoliae* were collected since 2021. On the basis of literature and herbaria studies it was referred to *E. hypericifolia*, an alien species not previously reported from Tunisia. It is here its third record to North Africa.

Material and Methods

Plant material collected in the field was conserved in the personal Herbarium of the author (Herb. R. El Mokni) deposited at the Faculty of Pharmacy of Monastir (Monastir University). The morphology of the species is described on the basis of material collected in Tunisia, in agreement with relevant descriptions (Mifsud 2018; Mugnai & al. 2021; Mahklouf 2023; Khamar & al. 2024). Data about the habitats and the population size of *E. hypericifolia* are based on personal observations in the field. Nomenclature of the species found together with *E. hypericifolia* follows POWO (2025b[+]).

Taxonomic Treatment

***Euphorbia hypericifolia* L., Sp. Pl. 1: 454. 1753.**

Lectotype (designated by Fosberg & Mazzeo 1965: 191): Herb. Linn. No 630.4 (LINN) (image available at <http://linnean-online.org/4598/>).

≡ *Anisophyllum hypericifolium* (L.) Haw. In Syn. Pl. Succ.: 161 (1812)

≡ *Chamaesyce hypericifolia* (L.) Millsp. In Publ. Field Columb. Mus., Bot. Ser. 2: 302 (1909)

Morphological description – *Euphorbia hypericifolia* is an annual (pluri-annual in some Mediterranean countries), herbaceous, erect plant, with taproot. *Stems* little-branched erect to

ascending, 15–50(–60) cm high, glabrous; generally much-branched from upper parts, branches deflexed at apex. *Leaves* opposite (Fig 1.A); stipules connate, deltate, sometimes lacinate-fringed at tip, 1.5–2.2 mm, glabrous (Fig 1.C); petiole 1–3 mm, glabrous (Fig 1.A); blade obliquely oblong, 10–35 × 7–15 mm, base asymmetric, oblique, margins serrate or serrulate, especially toward apex, apex broadly acute, surfaces glabrous; palmately veined at base, pinnate distally. *Cyathia* in dense, axillary and terminal (Fig 1.A), capitate glomerules with reduced, bract-like leaves subtending cyathia; peduncle 0.5–1.8 mm. *Involute* obconic, 0.9–1.1 × 0.4–0.9 mm, glabrous; glands 4, yellow-green to brown, subcircular, 0.2 × 0.2 mm; appendages white to pink, shape highly variable, usually round to elliptic, 0.3–0.4 × 0.5–0.7 mm, margin entire. *Staminate flowers* 2–20. *Pistillate flowers*: ovary glabrous; styles 0.4 mm, 2-fid ½ length. *Capsules* 3-lobed, globose (Fig 1.E), 1.3–1.4 × 1.1–1.5 mm, glabrous; columella 1.0–1.1 mm, 3-seeded. *Seeds* ovoid, light brown, with very thin coat, ovoid-triangular, slightly 4-angled in cross section, 0.9–1.1 × 0.5 mm, with shallow irregular depressions alternating with low, smooth ridges, without caruncle.

Phenology in Tunisia – Flowering and fruiting in Tunisia (within NE & TC) were observed from June to December (within Kroumiria).

Iconography – Chen & Wu (2004: 103, Fig. 1, *sub Chamaesyce hypericifolia* (L.) Millsp.)

Habitat and ecology in Tunisia – *Euphorbia hypericifolia* can be found wild in Tunisia especially near and around nurseries, in pots planted with ornamentals and less frequently along ruderal places and railway stations within the centraleastern and northwestern parts of Tunisia. The plant occupies habitats featuring very superficial and poor soils in association with several synanthropic plants namely, *Amaranthus deflexus* L., *Digitaria sanguinalis* (L.) Scop., *Eclipta prostrata* (L.) L., *Erigeron canadensis* L., *Euphorbia serpens* Kunth, *Lythrum thymifolia* L., *Oxalis corniculata* L., *Portulaca oleracea* L. (var. *oleracea*), *Setaria adhaerens* (Forssk.) Chiov., *Solanum nigrum* L., *Tagetes erecta* L.

Distribution and alien status in Tunisia – (Fig. 1B). *Euphorbia hypericifolia* is found within northeastern Tunisia [NE]: Bizerta (Nadhour); within Kroumiria in the northwestern part [K]: Jendouba (Tabarka); in central Tunisia [TC]: Monastir (Monastir-city, Ksar Hellal, Touza). It can be considered as naturalized.

Pathways of introduction and eventual invasion – The introduction of *E. hypericifolia* in Tunisia is definitely unintentional, mainly importing potted plants for horticulture purposes. In fact, most of the areas affected in Tunisia are coastal localities (Bizerta, Monastir and Tabarka) not far away from numerous nurseries. Once introduced, the species usually spreads rapidly along the watercourses due to its high number of produced seeds and its growth rate, reproductive capacity and adaptation potential, which enables it to become easily naturalized in newly occupied areas. According to personal observations, the seeds are minute and very light and can easily disperse by water and by wind. The species was found often with the other two known introduced/naturalised spurges (*E. serpens* Kunth and *E. maculata* L.) and perhaps all are in full process of expansion in the surroundings areas thus monitoring of their dispersion range is needed in the near future.

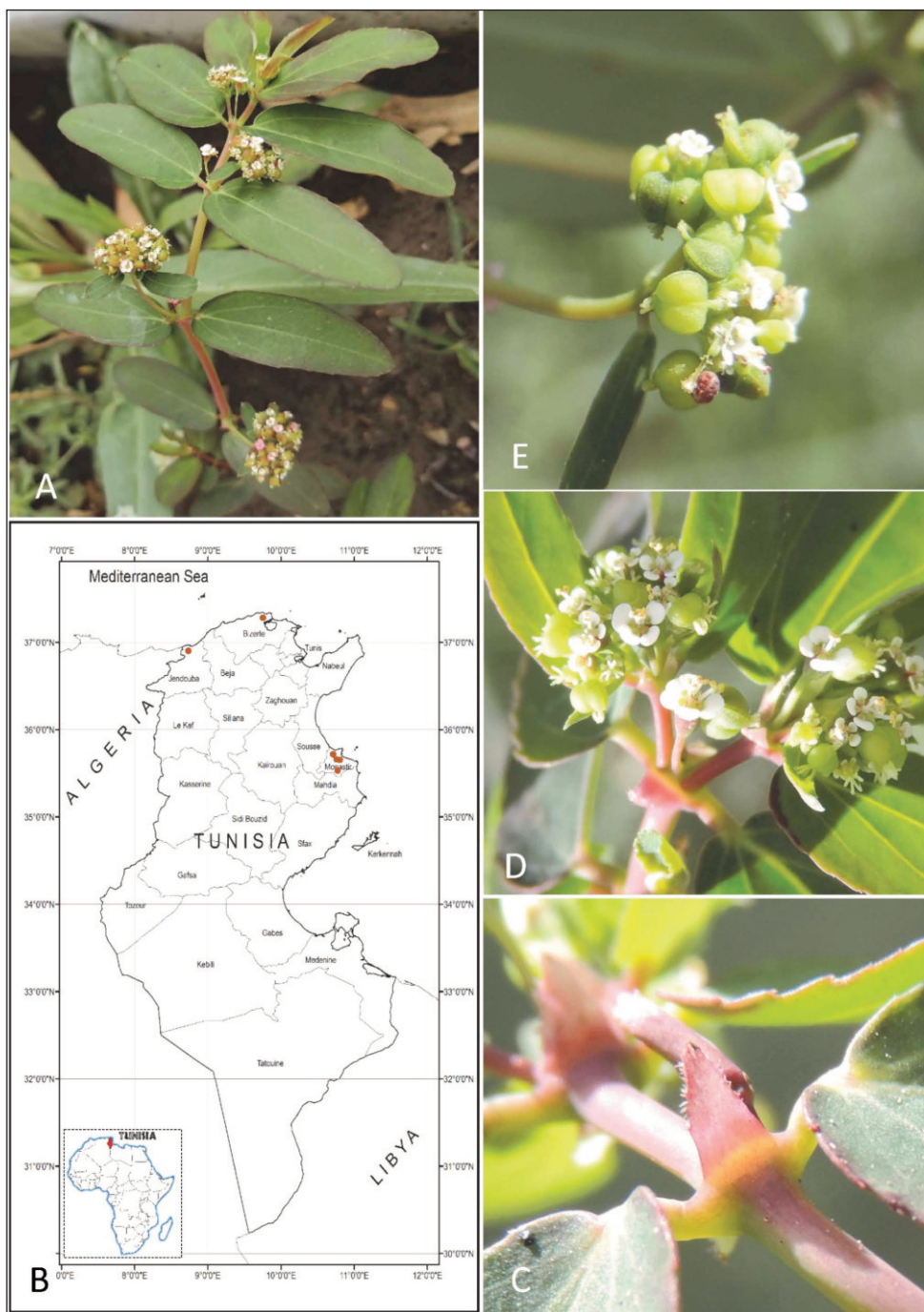


Fig. 1. *Euphorbia hypericifolia* in Tunisia. A. Habit, B. Map distribution in Tunisia, C. Stipule shape, D. Inflorescence and cyathia, E. Capsules. (Photographs by R. El Mokni).

Taxonomic annotations – *Euphorbia hypericifolia* can be confused with other species previously included in the ‘*E. hypericifolia* aggregate’. In fact, *E. hypericifolia* shows affinities with *E. hyssopifolia* (a taxon reported present as introduced within some countries of the African continent, Benin, Burkina, Burundi, Cameroon, Chad, Gabon, Ghana, Greece, Guinea, Guinea-Bissau, Liberia, Mali, Nigeria, Togo), especially for similar habit and leaf morphology (Mugnai & al. 2018, 2021). In *E. hypericifolia* cyathia are subtended by reduced, bract-like leaves and grouped in capitate glomerules (see Fig. 1A), while *E. hyssopifolia* is characterized by solitary cyathia or in small cymose clusters at distal nodes or on congested, axillary branches (Steinmann & al. 2016). *E. hypericifolia* also differentiates from *E. hyssopifolia* for its complete glabrescence, larger purplish red coloration fresh stipules and smaller seeds (Chen & Wu 2004). Moreover, the species has been also confused with *E. nutans* Lag. (a taxon reported introduced in African continent only from Morocco). In its general habit and size, *E. nutans* shows a clear resemblance to both *E. hypericifolia* and *E. hyssopifolia*. However, *E. nutans* differs by having stem hairs arranged in lines. Compared to *E. nutans*, *E. hypericifolia* is completely glabrous (see Figs. 1A, C-E) (vs. hairy at least on the internodes, and hairs could also be present on leaves, especially towards the base) with conspicuous, outspreading and as much as 2 mm long stipules joined into a clearly visible membranous sheath (see Fig. 1C) (vs. inconspicuous), fruits (see Fig. 1E) are not longer than 1.4 mm (vs. 1.5–2.0 mm long), and seeds are ca. 0.8 mm long with often poorly defined transverse ribs (vs. seeds are 1.0–1.3 mm long with usually prominent transverse ribs) (see more in Pahlevani & Riina 2011). *Euphorbia hypericifolia* shows also affinities with *E. indica* Lam., another member of the aggregate group (reported in the Africa continent as a weed in Angola, Botswana, Ethiopia, Malawi, Mozambique, Sudan-South Sudan, Zambia and Zimbabwe). The two species are very closely related, but easily distinguished by the larger, sparsely pilose, rarely almost glabrous, often purplish tinged capsule of *E. indica* and its stipules which remain separated (see more in Pahlevani & Riina 2011).

Specimina visa: TUNISIA: Bizerta, Bizerta-city, El-Bhira, 03/06/2021, *R. El Mokni s.n.* (Herb. R. El Mokni); Monastir, Ksar Hellal, 11/09/2023, *R. El Mokni s.n.* (Herb. R. El Mokni), *ibidem*, 30/06/2025, *R. El Mokni s.n.* (Herb. R. El Mokni), *ibidem*, 18/08/2025 *R. El Mokni s.n.* (Herb. R. El Mokni), Monastir-city, 29/06/2025, *R. El Mokni s.n.* (Herb. R. El Mokni), *ibidem*, 29/07/2025, *R. El Mokni s.n.* (Herb. R. El Mokni), Touza, 18/08/2025 *R. El Mokni s.n.* (Herb. R. El Mokni); Jendouba, Tabarka, 12/12/2024, *R. El Mokni s.n.* (Herb. R. El Mokni).

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