



The first record of *Euphorbia hirta* L. (Euphorbiaceae) in the flora of Libya

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Abstract

Euphorbia hirta L. belong to the family Euphorbiaceae is a crispy hairy cauterized by its large laceolate – elliptic serrate leaves with cyathia grouped in axillary capitate cymes. This species is recorded here for the first time in the flora of Libya, the specimens were collected from Gabes about 100 km east of Tobruk city in North East part of Libya. The morphological description is provided to facilitate further identification of this species and to warrant its future detection as well, the plant specimens are given voucher number (7689528), and then the Voucher specimens were deposited at the National Herbarium of Botany Department, Faculty of Science, University of Tripoli (ULT).

Key words. *Euphorbia hirta*, Euphorbiaceae, Flora, New record, Toruk

Introduction

The genus *Euphorbia* L. is the third largest genus of flowering plants, with almost 2000 species distributed throughout the world with highest diversity found in arid and semi-arid regions of the tropics and subtropics (Horn *et al.*, 2014; Mabberley, 2017) (Ernst *et al.* 2015), with large diversity of life forms including geophytes, herbs, shrubs, trees, succulent, and xerophytic form and is characterized by distinctive morphological synapomorphy, the cyathium inflorescence and milky latex (Horn *et al.*, 2012). (Prenner & Rudall 2007). (Swamy and Prasad, 2022) (Scafidi *et al.*, 2016)

Euphorbia hirta is an annual herb 15-50 cm high, belongs to section Anisophyllum Roep. subsect. Hypericifoliae Boiss.

E. hirta has many Local names in different countries. In China, it is called Feiyangcao, Dafeiyang, Jiejiehua, and Daruzhicao. Malaysia: Ambin jantan, kelusan; English: Asthma herb, hairy spurge; Indonesia: Daun biji kacang (Malay. Moluccas), nanangkaan (Sundanese); Papua New Guinea: Sip (Kurtatchi.Bougainville), kiki kana kuku (Gunantuna, New Britain); Philippines: Botobotonis (Tagalog), gatas-gatas (Bisaya,Tagalog); Laos: Mouk may, ungl yang; Thailand: Nam nomraatchasee (central), yaa nam muek; Vietnam: C[or]s[uwx]ra, C[or]s [uwx]al[ows]n[as]; French: Euphorbea fleusentete, euphorbepilulifere; India: Dudhi, reddinanabrolu; Bangladesh: Bara Keru, Ghaopata; Norway: Demba sindji; Australia: Asthma plant; and Liberia: tuagbono (Huang. 2012).

It is native to a new world, and is now a common weed of warm temperate, tropical and subtropical countries and widespread in warm temperate and tropical regions (Abu Bin Nyeem *et al*, 2017; <https://powo.science.kew>) (Fig. 6). It is a pantropical weed in disturbed areas, waste spaces and grasslands, roadsides, irrigated grounds near cultivation, sandy soils, hillside, sea shore with altitude from 0-1700 m and pathways in many parts of the world. (Pahlevani, 2017). *E. hirta* is a very popular herb amongst practitioners of traditional herbal medicine for its antidiarrhoeal, wound healing, antipyretic, anti-inflammatory, hypoglycemic and sedative activities. Moreover it is also used in different systems of medicine in the treatment of bronchitis, skin diseases, analgesics, gastrointestinal disorders, vomiting, respiratory diseases and pulmonary disorders (Abu Bin Nyeem *et al*, 2017).

Materials and methods

The plants of *Euphorbia hirta* were reported, photographed and collected from Gabes region belonging to Tobruk city in northeast part of Libya (Fig. 1 & 2). The specimens were brought to the National herbarium, Faculty of sciences, Tripoli University, where subjected to the general herbarium techniques, and then examined carefully and characterized with detailed description. Plant identification and authentication procedure were carried out by the author at the National herbarium of Botany Department, Faculty of Science, University of Tripoli using the data from the flora Palaestina (Zohary, 1972), Nouvelle Flore Du Liban Et De La Syrie (Mutterde, 1970), Flora of west Tropical Africa (Hutchinson *et al*, 2014), floras of Egypt (Boulos, 2000) and Mauritania (Barry & Celles 1991) (Khamar *et al*, 2021). Finally, the plant specimens are given voucher number (7689528), and then the Voucher specimens were deposited in the same herbarium (Fig, 5).

Description of species

Accepted name: *Euphorbia hirta* L. Sp. Pl. 454 1753

Synonyms:

Chamaesyce hirta (L.) Millsp.

Desmonema hirta (L.) Raf.

Ditrita hirta (L.) Raf.

Euphorbia hirta var. *typica* L.C.Wheeler

Euphorbia pilulifera var. *hirta* (L.) Thell.

Chamaesyce gemella (Lag.) Small.

Chamaesyce hirta f. *glaberrima* (Koidz.) Hurus.

Chamaesyce hirta var. *glaberrima* (Koidz.) H.Hara.

Chamaesyce hirta var. *laeticincta* Croizat.

Chamaesyce hirta f. *litoralis* Hurus.

Chamaesyce karwinskyi (Boiss.) Millsp.

Chamaesyce pekinensis var. *glaberrima* (Koidz.) Makino & Nemoto.

Chamaesyce pilulifera var. *glaberrima* (Koidz.) H.Hara.

Chamaesyce rosei Millsp.

Euphorbia bancana Miq.

Euphorbia capitata Lam.

Euphorbia chrysochaeta W.Fitzg.

Euphorbia gemella Lag.

Euphorbia globulifera Kunth.

Euphorbia hirta var. *destituta* L.C.Wheeler.

Euphorbia hirta var. *glaberrima* Koidz.

Euphorbia karwinskyi Boiss.

Euphorbia nodiflora Steud.

Euphorbia oblitterata Jacq.

Euphorbia pilulifera var. *arechavaletae* Herter.

Euphorbia pilulifera var. *discolor* Engelm.

(<https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:101651-2>)

Decryption of the species

Annual herb 15-50 cm high, hispid with long often yellowish crisped hairs. Stems many, usually terete, procumbent or ascending; Leaves simple, opposite, 2 – 4 x 1 – 1.4 cm, elliptic, lanceolate or obovate-lanceolate, acute or subacute, serrate or dentate, dark green above, pale beneath, base usually unequal obliquely rounded, stipules 1 – 2 mm, membranous, lanceolate – subulate, ciliate. Flowers unisexual, small, numerous and crowded together in dense terminal and axillary capitate cymes about 1 cm in diameter, involucre campanulate, ca. 1 × 1 mm, pilose, marginal lobes 5, triangular-ovate; glands 4, red, circular, oblong, or reniform, appendages white to reddish, narrowly elliptic to obdeltoid, to 0.3 × 0.2 mm, margin entire to slightly undulate. Male flowers 4 - 5; anthers red. Female flower: pedicel short, exerted from involucre; ovary 3-angular, sparsely pilose; styles 2, free; stigma slightly 2-lobed. Capsule 3-angular, 1-1.5 × 1-1.5 mm, smooth, shortly pilose; fruiting peduncle to 1.5 mm. Seeds narrowly ovoid, tetragonal, 0.7-0.9 × 0.4-0.5 mm, pink-red, sides transversely furrowed; caruncle absent. Fl: July-November. (Zohary, 1972). (Fig. 3, 4, 5).

$2n = 18$ (Santana *et al*, 2016).

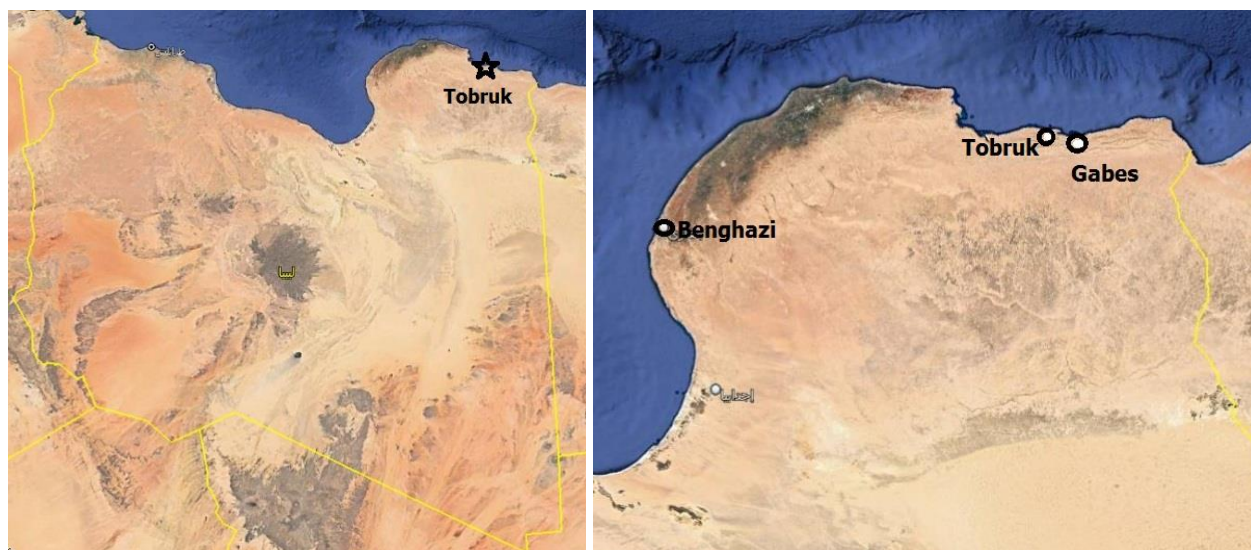


Figure1. Map of Libya showing location of Tobruk city **Figure 2:** Northeast Libya showing locality



Figure 3 and 4. Habit of *Euphorbia hirta*.

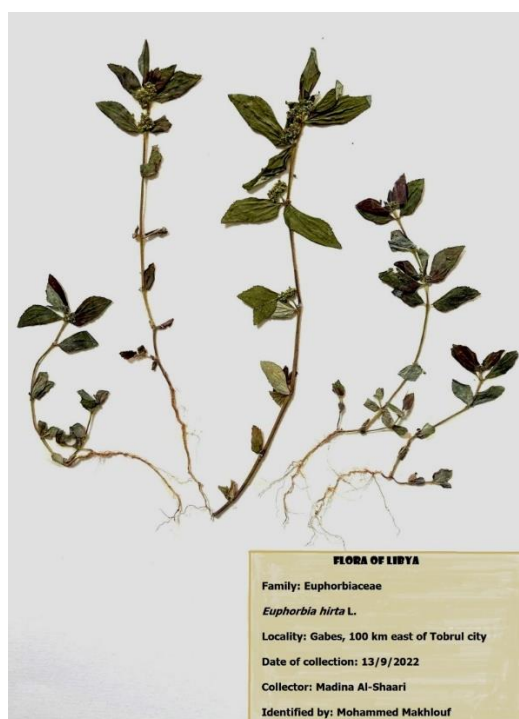


Figure 5. Herbarium specimen of *Euphorbia hirta*

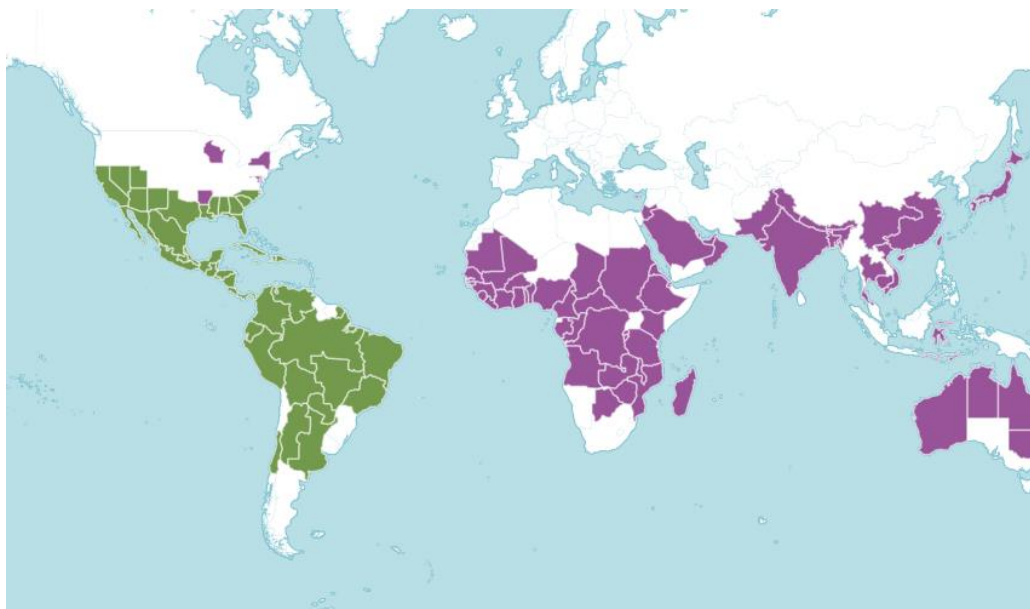


Figure 6. Distribution of *E. hirta*, green Native, Purple Introduced (From <https://powo.science.kew.org>).

Results and discussion

Euphorbia hirta is recorded for the first time in the flora of Libya; the specimens were collected from Gabes about 100 km east of Tobruk city in the east part of Libya. The plant is easily identified by its opposite elliptic, lanceolate or obovate-lanceolate, leaves, serrulate or dentate, dark green above, pale beneath, their bases usually unequal obliquely rounded, and dense terminal and axillary cymes about 1 cm in diameter, also the presence of crisp hairs especially on younger branches. The genus *Euphorbia* is represented in Libya by 28 species, with 27 species in the Flora of Libya encyclopedia (Jafri & EL-Gadi, 1982) in addition to the recently recorded species *E. hypericifolia* (Mahklouf, 2023); so this addition raises the number of species to 29 species. It is distributed throughout the temperate or tropical parts of India, Asia, Australia, and Africa, often found in lowland, paddy fields, gardens, waste places, and on the roadsides. It prefers dry and humid conditions, from sea level up to 2200 m altitude. It is native to Central and South America and introduced in many other countries, especially Asia and Africa countries. (Abdul *et al*, 2007; Manorma & Preety, 2011; Huang *et al*, 2012; Asha *et al*, 2014; Ghosh *at al*, 2019; www.powo.science.kew.org). In the Mediterranean region, it is found in Egypt (Moawed *et al*, 2015), Palestine and Jordan (Zohary, 1972), Syria and Lebanon (Mutterde, 1970), and Cyprus (www.powo.science.kew.org).

It is found in highly diverse environments like the rims of conurbations, roadsides and trail sides, uncultivated lands, or wastelands (Li *et al.* 2008; Halford & Harris 2012; Silva *et al.* 2014). It is tolerant to high temperatures and drought within its distribution area (Santana *et al.* 2015; CABI 2021). According to Waterhouse (1993), each single plant of *E. hirta* plant can produce up to 3,000 seeds. Seeds are dispersed by an explosive mechanism of the capsule, as described by Bolaji *et al.* (2020) (Khamar *et al.*, 2021). However, this dispersal mechanism only sends seeds a few meters away around the mother plant (Hufhuis & Hay 2017).

The way of its introduction to Libya remains unknown, while in other countries there are reports regarding the introduction of seeds with wool or as contaminants in pasture hay or cereal grain (EPPO, 2008; Mahklouf & Abuhadra, 2020). The proximity of the main routes would be one of the incidental introductions of this species, this mode of dispersal has been greatly implied in the introduction and the naturalization of species belonging to the same genus in certain European countries (i.e., *E. davidii* in Switzerland (Hoffer-Massard 2011) and Bulgaria (Vladimirov & Petrova 2009); *E. serpens* in Bulgaria (Petrova, 2018), *E. glyptosperma* and *E. serpens* in Romania (Șîrbu & Sușnia, 2018), *E. prostrata* in Hungary (Bátori *et al.*, 2012) and *E. hypericifolia* in Malta (Mifsud 2018).

Conclusion

Euphorbia hirta was collected from Tobruk city for the first time; this discovery further enriches the vascular flora of Libya and brings the number of taxa of the genus *Euphorbia* up to 28 species. With this study, our record of *E. hirta* as a naturalized alien highlights how important field investigations are; it also shows that many Phytogeographic sectors of Libya remain under-prospected.

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