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Euphorbia graminea Jacq. (Euphorbiaceae) - A new distributional record for the flora of Libya

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ABSTRACT

Euphorbia graminea Jacq was reported for the first time from Libya; specimens were collected from the Faculty of Agriculture research farm in the University of Tripoli, Libya. A taxonomic description with updated nomenclature and geographical distribution was provided. The voucher specimens were deposited in the Herbarium of the Botany Department (ULT), Faculty of Science, Tripoli University, Libya.

Keyword: *Euphorbia graminea*, Euphorbia, Euphorbiaceae, Spurge, Flora Libya, Grassleaf.

1. INTRODUCTION

The genus *Euphorbia* L. (Spurge) belongs to the family Euphorbiaceae. It is the third-largest genus of flowering plants and comprises about 2000 species distributed throughout the world, especially in the arid and semi-arid regions of the tropics and subtropics (Horn *et al.* 2014; Ernst *et al.*, 2015; Mabberley 2017). The majority of its species are herbaceous annuals and perennials, with some shrubs, trees, succulents, and xerophytic forms, rarely woody climbers (Olorode, 2012; Makhlouf, 2023). It is characterized by the presence of milky sap (Latex) which is often toxic or irritating, and a unique inflorescence called cyathium which is a highly specialized, pseudanthial inflorescence look like a single flower but is, in fact, a compact cluster of multiple reduced male and female flowers enclosed within a cup-like involucre, often with petal-like appendages called glands (Premer & Rudall, 2007; Scafidi *et al.*, 2016; Swamy & Prasad, 2022). The fruit is a schizocarpic capsule that splits at maturity into three individual carpels, each containing a single seed. (Judd *et al.*, 2016).

In this paper, *Euphorbia graminea* is recorded as an additional species to the genus Euphorbia in the Flora of Libya.

2. METHODOLOGY

Plant specimens of unusual *Euphorbia* species were reported growing in disturbed habitats in the Faculty of Agriculture research farm in Tripoli city (50°32'52.28" N, 13°13'23.20" E) (Fig. 1). The plants were photographed before collection (Fig. 2 & 3). Then, the plant specimens were collected and brought to the National Herbarium,

Faculty of sciences, University of Tripoli, where they were subjected to general herbarium procedures, examined and characterized with a detailed description, which were identified as *Euphorbia graminea*. Plant identification and authentication procedures were carried out and confirmed by the author at the National Herbarium of the Botany Department, Faculty of Science, University of Tripoli, using data from the following literature. (Yang *et al.*, 2005; Vincent, 2013; Scafidi *et al.*, 2016; Ravivarma *et al.*, 2022; Al-sheikh *et al.*, 2024).

Finally, the voucher specimens were given a voucher number (76.89.5.30), and then the voucher specimens were deposited in the same herbarium for future reference. (Fig. 4).

Figure 1. Left- Map of Libya showing Tripoli. Right- Place of collection.

3. RESULTS

Accepted name: *Euphorbia graminea* Jacq. In Select. Stirp. Amer. Hist.: 151 (1763).

Synonyms: *Adenopetalum gramineum* (Jacq.) Klotzsch & Garcke in Monatsber. Königl. Preuss. Akad. Wiss. Berlin 1859: 250 (1860). *Agaloma graminea* (Jacq.) D.B.Ward in Phytologia 89: 226 (2007)**.** *Eumecanthus gramineus* (Jacq.) Millsp. in Publ. Field Mus. Nat. Hist., Bot. Ser. 2: 413 (1916) (Source: https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:101568-2).

Description of species

Perennial herb, generally from 30-100 cm tall, branching from the base, dichotomously branched, ascending to scandent, glabrous, nodes thickened, lower nodes reddish. Leaves stipulate, petiolate; stipules > 0.5 mm long, minute, early deciduous, lower leaves ovate-deltoid, alternate, margin distantly toothed on the upper half, ornamented with whitish V-shaped patches, upper leaves linear-lanceolate, entire, the uppermost leaves smaller, linear-lanceolate. Cyathia asymmetrical, arising between braches on short to long-pedunculate dichasial cymes, bracts linear, opposite, 20-30 mm long, 4-7 mm wide, sparsely hairy, cup of cyathium campanulate or obconic, 1-2x0.8-1.6 mm, sparsely hairy; enclosing central female floret, surrounded by male florets, styles 3, each style 2-fid at apex, glands 2, ovate to elliptic or oblong, 0.1-0.3x0.2-0.4 mm, white above and green below with white margin, entire, alternate with bands of creamy white filiform appendages. Capsule tricarpellate, ovate – orbicular, exerted from cyathia, glabrous, about 2 x 3 mm, seeds ovoid, weakly angled, about 1.5 x 1.3 mm, dark gray, surface deeply punctate with pits in regular longitudinal rows (Fig. 2 & 3).

Euphorbia graminea belongs to the subgenus. *Chamaesyce,* section *Alectoroctonum* (Schltdl.) Baill (Yang *et al.*, 2012). It is a native weed from Central Mexico, Mexico Gulf, Mexico, Northwest Argentina, Aruba, Belize, Bolivia, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, French Guiana, Guatemala, Honduras, Netherlands Antilles, Nicaragua, Panamá, Peru, Suriname, Venezuela and Windward Islands. (Webster & Bruch, 1967; Ravivarma *et al.*, 2022).

It was introduced in many Caroline Islands. (Fosberg & Canfield 1980), Arkansas, South Brazil, California, Caroline Islands, Cyprus, Florida, India, Louisiana, Palestine, Sweden, Texas (Al-Skeikh *et al.*, 2024) Fiji Islands (Smith, 1991), Hawaii (Wagner *et al.*, 1999), Taiwan (Yang *et al.*, 2005), Galapagos Islands (Guézou *et al.*, 2010), Nigeria (Aigbokhan & Ekutu, 2012). Israel (Scafidi *et al.*, 2016; Danin *et al.*, 2005); (Fig 5).

Figure 2. Plant habit of *Euphorbia graminea*.

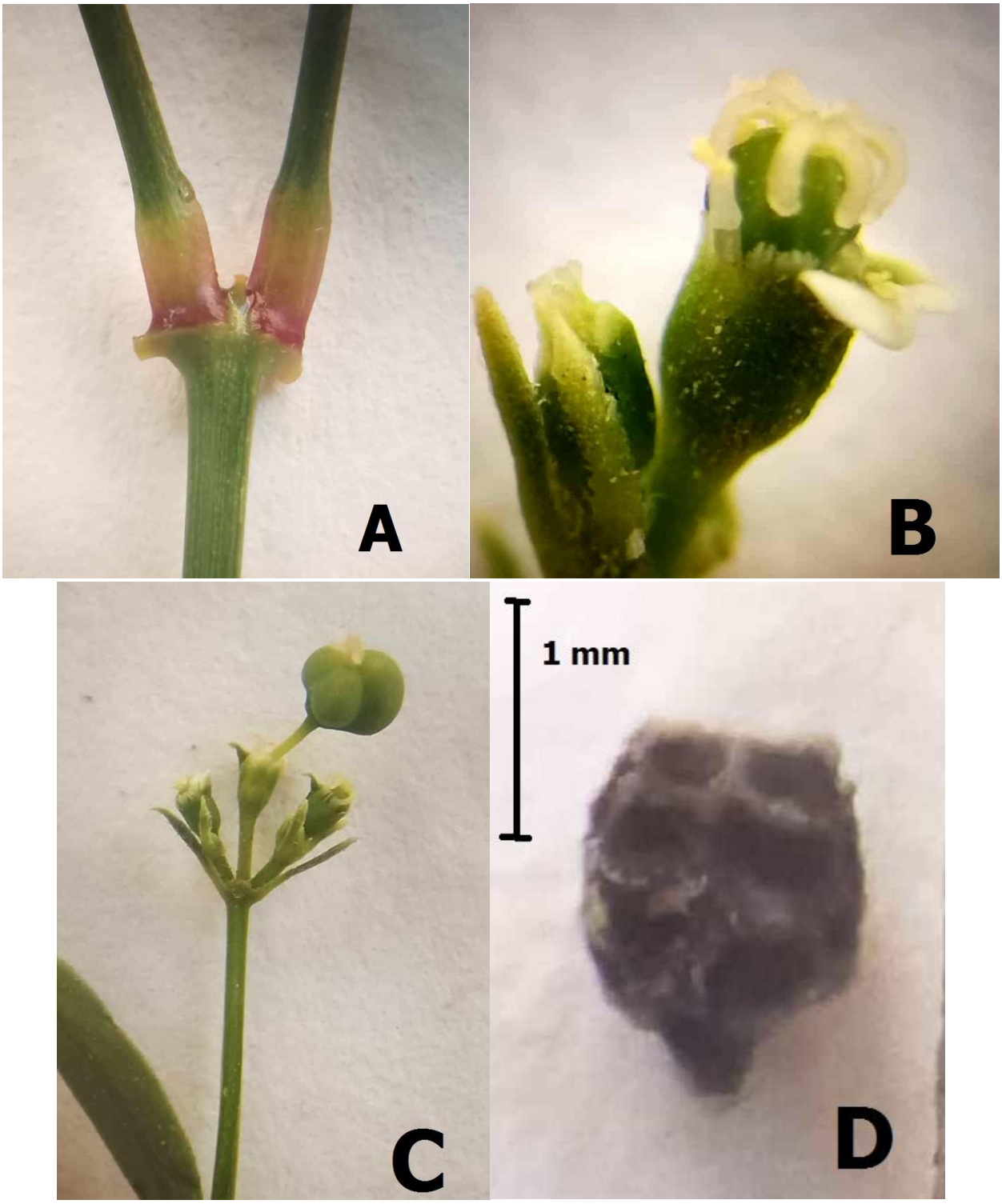

Figure 3. *E. graminea,* A- Thickened nodes, B- Cyanthium, C- Dichasial inflorescence, D-Seed.

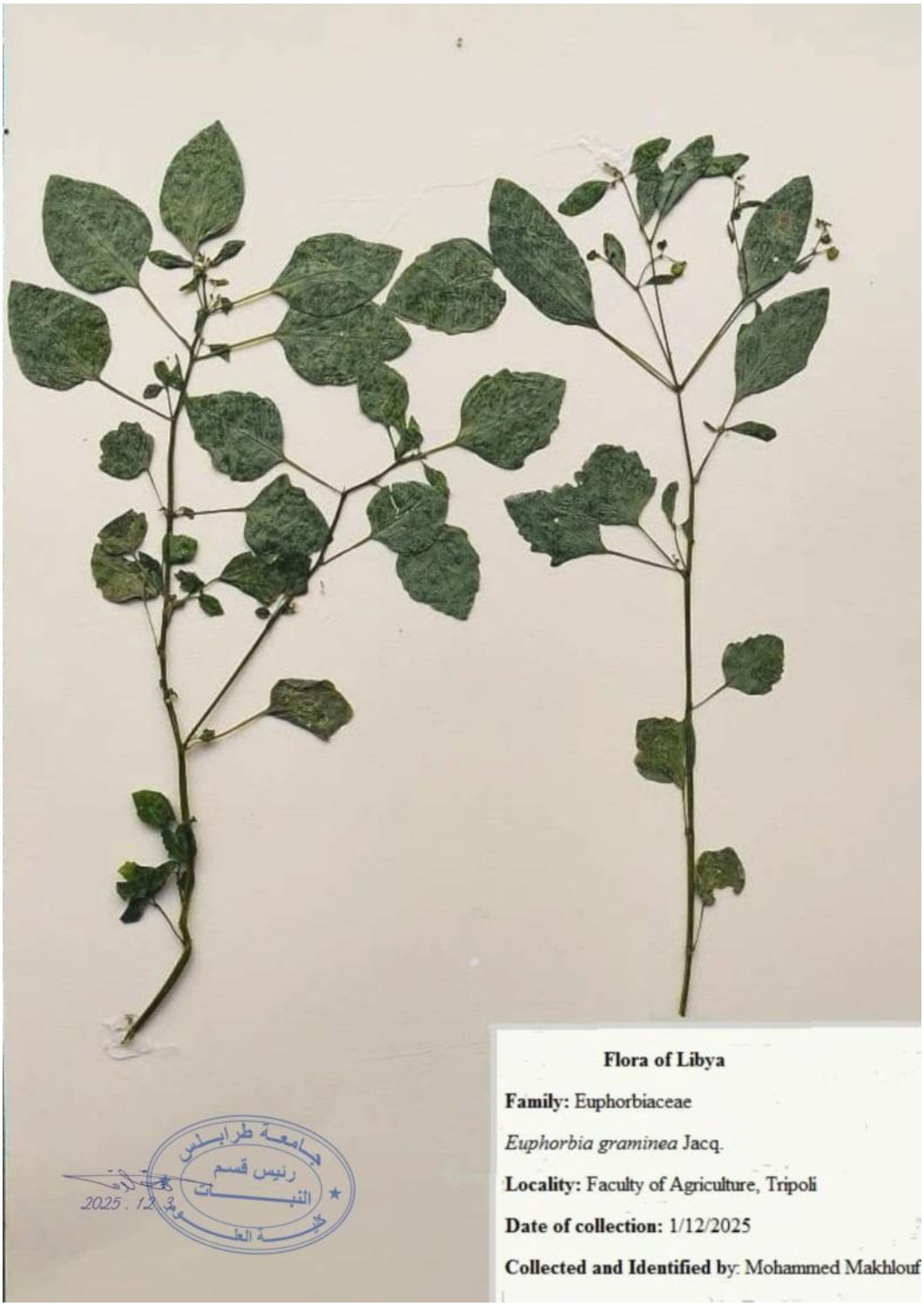

Figure 4. Voucher specimen of *E. graminea*.

4. DISCUSSION

The genus *Euphorbia* was represented in Libya by 29 species (Makhlouf, 2023), so this addition raises their number to 30. Among the 29 earlier known species, none of them are closely related to *Euphorbia graminea*, so that it can be readily distinguished from other species of the genus *Euphorbia* by its linear, opposite leaf-bracts, alternate, ovate-rounded leaves ornamented by a V-shaped white patch on the upper surface; 2 white ovate to elliptic or oblong glands alternate with bands of creamy white filiform appendages, and a seed surface

deeply punctate with pits in regular longitudinal rows (Fig. 2 & 3). Therefore, it can be easily included in the already constructed diagnostic key in the Flora of Libya encyclopedia.

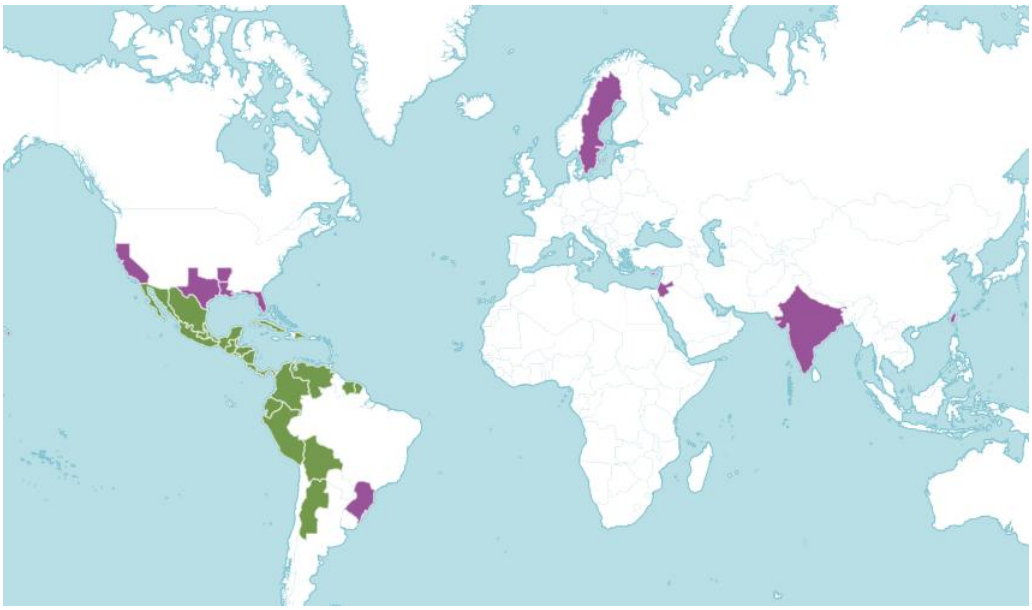

Figure 5. Global distribution of *Euphorbia graminea* before this addition. (**Source:** https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:101568-2)

With this study, our record of *E. graminea* as a naturalized alien species highlights how important field investigations are; it also shows that many Phytogeographical sectors of Libya remain under-prospected. Its introduction is most probably accidental, may be linked to the horticultural trade, or may be as a seed contaminant in the soil or with other plants. The suitable Mediterranean climate provides favorable conditions for its establishment in our area.

5. CONCLUSION

This finding contributes to the understanding of floristic dynamics and biological invasions in our ecosystems. *E. graminea* was reported in a relatively small area with small populations, and its distribution in Libya is now very restricted. It is rated as a very rare genus and species. However, due to its potential invasiveness, the status of *E. graminea* in Libya should be monitored, considering its potential spread from the site where it has been recorded.

Acknowledgement
The author has no acknowledgments to disclose.

Informed consent
Not applicable.

Conflicts of interests
The author declare that they have no conflicts of interest, competing financial interests or personal relationships that could have influenced the work reported in this paper.

Ethical approval & declaration
In this article, as per the plant regulations followed in the Department of Botany, Faculty of Sciences, University of Tripoli. Libya; the author observed a new distributional record for the flora of Libya - *Euphorbia graminea* Jacq. (Euphorbiaceae). The ethical guidelines for plants & plant materials are followed in the study for species observation, identification & experimentation.

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Data and materials availability

All data associated with this study are present in the paper.

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