

New Records for the Flora of Libya

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Abstract

Five genera and eleven species are added to the flora of Libya. They are collected and/or photographed in several trips throughout Libya from 1998 to 2014. These are: *Glinus* (Molluginaceae), *Allenia* (Chenopodiaceae), *Flaveria* (Asteraceae), *Sesbania* (Fabaceae), *Citarexylem* (Verbenaceae). The species also include, *Populus euphratica* (Salicaceae), *Chloris gayana* (Poaceae), *Picris echeoides* (Asteraceae), *Ferula verticillata* (Apiaceae), *Antirrhinum ramosissimum* (Scrophulariaceae) and *Physallis philadelphicus* (Solanaceae).

المستخلص

تم في هذه الدراسة جمع و/أو تصوير خمس أجناس وأحدى عشرة نوع جديد لتضاف إلى موسوعة النباتات الليبية وذلك من خلال عدة رحلات من 1998 إلى 2014م. وهذه الأجناس هي: *Glinus* (Molluginaceae), *Allenia* (Chenopodiaceae), *Flaveria* (Asteraceae), *Sesbania* (Fabaceae), *Citarexylem* (Verbenaceae).

وتتضمن الأنواع أيضا:

Populus euphratica (Salicaceae), *Chloris gayana* (Poaceae), *Picris echeoides* (Asteraceae), *Ferula verticillata* (Apiaceae), *Antirrhinum ramosissimum* (Scrophulariaceae), and *Physallis philadelphicus* (Solanaceae).

Keywords: Flora of Libya; Molluginaceae; Chenopodiaceae; Fabaceae; Verbenaceae; Salicaceae; Apiaceae.

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Introduction

Since 1986 when the flora of Libya project was completed and published in the series of the "Flora of Libya", edited by Ali et al. (1976-1987), about twenty species were added (Siddiqi et al, 1986; El-Gadi et al, 1987).

Many others were encountered and not published officially in prominent scientific journals. Some are mentioned in this paper. More, probably, unknown species need to be collected and recorded.

Libya occupies a vast area of North Africa (more than 1.67 km²). It is characterized by variable habitats ranging from plains and mountains in the north to desert valleys and oasis in the south. Because of this wide area, remote habitats and the long period (quarter of a century) since the publication of the series of the Flora of Libya, there are still remote localities that need to be visited and, hence, many taxa need to be recorded. In this paper five genera: *Glinus* (*G. lotoides* L.) in the Molluginaceae, *Allenia* (*A. autrani* (Post) Zoh.) in the Chenopodiaceae, *Flaveria* (*F. bidentis* (L.) Kuntze in the Asteraceae, *Sesbania* (*S. sesban* L.) Merr (Fabaceae) and *Citharexylum* (Verbenaceae) are recorded for the first time from Libya. The presence of these genera in Libya, is confirmed by specimens and drawings. In addition, the following species are also newly recorded: *Populus euphratica* Oliv. (Salicaceae), *Picris echioides* L. (Asteraceae), *Chloris gayana* Kunth (Poaceae), *Physallis philadelphicus* (Solanaceae), *Ferula biverticillata* Thieb (Apiaceae), and *Antirrhinum ramosissimum* (Scrophlariaceae). These plant taxa are not mentioned in the Flora of Libya series (Ghafoor, 1977; Jafri and Rateeb, 1978; Siddiqi, 1978; Jafri, 1980; Siddiqi, 1980; Qaiser, 1982; Alavi, 1983; Jafri, 1985; Sherif and Siddiqi, 1985, and Siddiqi, 1987). Brief description and scientific drawings or photos are provided for all taxa included in this study. The voucher specimens are deposited in the Herbarium of the Botany Department, Faculty of Science, University of Tripoli (ULT).

Materials and Method

Several field trips were conducted to different parts of Libya, either with flora students or along with other groups of reseachers. Sometimes, specimens were collected, in other cases photographs were taken by camera. The locations of the specimens collected or photographed are shown on Fig. 1.

Molluginaceae

Glinus L. Sp. Pl. 463 (175); Gen. Pl., ed. 5. 208. 1754.

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Annual herbs, tomentose, rarely glabrous, with alternate, exstipulate leaves. Flowers are bisexual, clustered at the axils of leaves, almost sessile. Sepals 5, imbricate, equal. Petals absent or indefinite. Stamens are 8-20, distinct or in groups. Ovary superior, 3-5 loculed, each locule with many ovules. Styles 3-5. Fruit is a capsule, 3-5 celled, opening by 5 valves. Seeds reniform with large strophules.

Glinus lotoides L., Sp. Pl. 463 (1753); Zohzry, Fl. Palest. 1.: 73. 1966.

Annual stellate-tomentose, branched at the base, up to 36 cm tall, decumbent to ascending. Leaves semiwhorled, obovate-spathulate, variable in size (6-18 x 7-13 mm), petioles 4 mm or less. Flowers hermaphrodite, calyx 6mm long, and petals absent. Fruit is a capsule, 5 mm long and 3-5 mm wide, pentagonal, and many seeded. Seeds are 0.5 mm, almost kidney shaped, finely tuberculate, and brown coloured with large appendages (strophile).

Specimens studied: A-3 Wadi Ka`am dam, Al Khums, flooded banks of the dam, common 29. 12. 1994. This plant species is also observed in Wadi Imrawin, Messak, south of Ubari (E-2) 2001, and Wadi Ashomer, southeast of Taknis, Jabal al Akhdar (A-7) 2012 and Wadi al Mgenin (Fig. 2).

Chenopodiaceae

AelleniaUlbrich

Glabrous bluish green herb or shrub with long and loose branches. Lower leaves 1-3(4) x 1.5-3 cm., linear. Bracteoles with a broad base, semicircular above, as long as the perianth. Bracteoles triangular and shorter than the perianth. Perianth segments 5, oval below, acuminate above, first membranous, later hardening, each with a large wing (flowers 2 cm in diameter); the base pentagonal, with a swollen margin and with 5 radial ribs above with sinuses between them. Stamens 5. Style ovate semicircular, stigma 2, truncate above. Seed horizontal.

Aellenia autrani (Post.) Zohary, Fl. Palest. Vol. 1. 1966; *Salsola autrani* Post., Fl. Syr. Pal. Sin. 690 (1883 – 1896).

Annual herb, somewhat succulent when young, branching from base; branches effuse or pyramidal – paniculate. Leaves remaining during inflorescence, sessile, somewhat expanded at base, linear, 1 to 5 cm long, obtuse, the floral oblong to ovate. Flowers small, solitary, in somewhat dense or loose spikes. Bracteoles orbicular, puberulent, green, about as long as floral leaves, lobes of fruiting perianth wings ovate, obtuse.

Invasive weed recently appeared in the southern area of Gharian making the fields blue colored.

A-2 Ghout Erreh and Tamasyrt, south of Gharian, very common. Also observed in Ain Tobi and Abu Ghaylan (Fig. 3).

Distribution: Syria, Lebanon and Palestine.

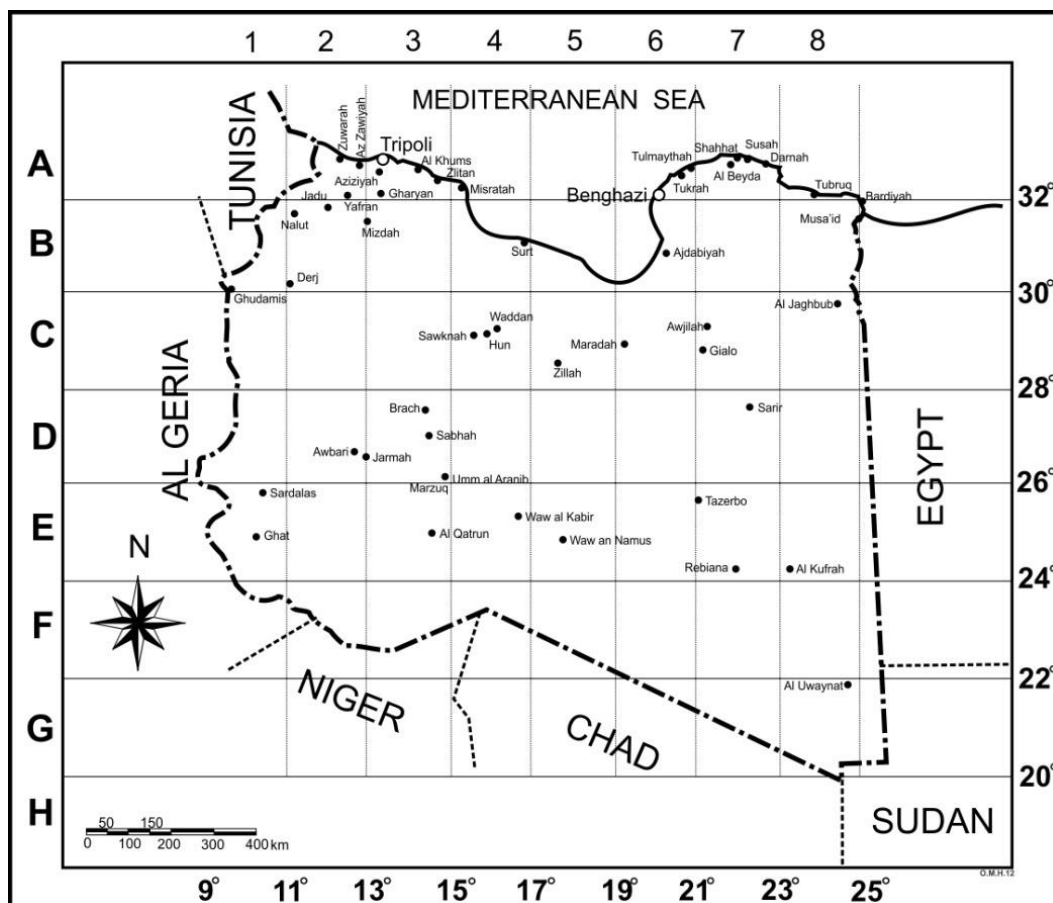


Fig. 1. Location map of specimens. Modified from Ali et al. (1976-1986).

Verbenaceae

***Citharexylum* L**

Sp. Pl. 625. 1753: Gen. Pl. ed. 5: 273. 1754.

Shrubs or trees with opposite-decussate, tenate or verticillate leaves, usually with a pair of glands at the base of lamina. Spicate raceme terminal or axillary. Flowers small, white or yellow. Calyx tubular or cyathiform, 5-toothed or lobed to truncate. Corolla tube infundibuliform or cylindrical with 5, patent lobes. Stamens 5, lower 2 forming staminodes, included. Ovary 2 carpellary, perfectly or imperfectly 4-loculed, with 1 ovule in each locule. Style terminal with bifid stigma. Fruit a fleshy drupe, partly enclosed by enlarged, persistent calyx (Jafri and Ghafoor, 1974).

About 115 species, mainly distributed from southern United States to Argentina and Uruguay. Represented in Libya by a single cultivated species.

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Citharexylum cinerem Linn., Ind. Occ. Brasil. S. 6.; Bailey, St. Cyc. Hort. 1: A-Z. 1963.

Trees up to 6 m high with branches 4-angled first and becoming cylindrical. Leaves elliptic-oblong or lanceolate, opposite, usually obtuse, glabrous or nearly so beneath. Flowers are white, in long lax and nodding spike-racemes, faintly scented. Calyx unequally lobed. Corolla tube twice as long as calyx. Fruit nearly globular, red becoming black.

E-3 Tripoli, University of Tripoli campus, cultivated in front of buildings and in many places as ornamental tree (Fig. 4).

Asteraceae

Flaveria A. Juss.,

Flaveria bidentis (L.) Kuntze, Bolous, Fl. Egypt. 3: 238. (2002); *Flaveria contrayebra* (Cav.) Pers., Stud. Fl. Egypt, Tachh. 572. 1974; *F. bonariensis* DC., Prodr. 5: 635 (1836).

Glabrescent annual 20-60 (80) cm, with much branched stems. Leaves lanceolate-elliptic, 3.5 to 10 cm Long and 0.6-1.8 wide, sparsely serrate to dentate to subentire, petiolae or almost sessile. Capitula are small in congested scorpioid terminal glomerules, and irregularly rayed. Involucre about 0.5 long and 1 mm wide, almost cylindrical; phyllaries 2-serrate, obtuse. Ray florets are 2-3 with pale yellow corolla. Disc florets 3-8 mm long and 3-3.5 mm wide. Achenes of ray florets 2.5 mm, cylindrical, black. Achenes of disc florets 2 mm long and 0.5 mm wide, ellipsoid, black.

Specimen studied: E-3, Murzuq farms, Murzuq, 20.01.2011 O. S. Sharashy (Fig. 5).

Sesbania Scop.

Introd. Hist. Nat. 308. 1777, nomen conserv.

Annual herbs or shrubs or small trees, short-lived, soft woody. Leaves paripinnate, leaflets many pinnate, stipules minute or non. Racemes axillary, lax, many flowered. Flowers are yellow or red purple, variegated. Calyx broad with truncate tube, toothed or subequally lobed. Corolla glabrous, yellow, standard orbicular or ovate. Stamens 9+1 and free from the standard. Pod long, dehiscent, beaked, 8-50 seeded.

About 50 species widely distributed in warm and wet regions of the world (Boulos, 1999).

Sesbania sesban (L.) Merr., Philipp. J. Sci. (Bot.) 7: 235. 1912; Boulos, F. Egypt., 1: 318. 1999.

Rapid growing and reaching a height of 2.4 m.

Specimen studied: E-3 near Murzuq Agriculture Project, 20. 01. 2011. O. S. Sharashy.

Reported by Keith (1965) as exotic, seeds introduced under the name *Sesbania macrocarpa* in June 1961 and sent to Ag. Exper. Station at Sebha for use as a windbreaker. Not mentioned in series of "Flora of Libya", Fabaceae no. 86 by Jafri (1980), (Fig. 5).

Asteraceae

Picris echioides L., Sp. Pl. 792 (1753); Tutin et al., Fl Eu. 3: 316 (1972). *Helminthia lustranica* Wilk, Ill. Fl. Hisp. 2: 145 (1893); Zoha., Fl. Pal. 3. (1962).

Annual or biennial herbs. Stems 30 – 90 cm, with rigid often tubercle – based hairs, often with some slender spines. Leaves with numerous unequal rigid hairs, the larger thickened at the base or tubercle based, and often with scattered spines; basal 3.5 – 25 x 1.5 – 10 cm, elliptical to lanceolate or oblong – oblanceolate, obtuse to acute, sinuate to dentate, narrowed at base into a winged petiole; lower cauline similar to basal but with semi-amplexicaule petioles, the upper lanceolate to ovate, sessile, amplexicaule. Capitula numerous. Involucre 1.2 – 2.0 x 1.0 – 1.5 cm. Bracts with pectinate ciliate margins, the outer ovate - cordate, acuminate, the inner lanceolate, slightly longer than the outer. Cypselas 5-7 mm, transversely muricate, with long beak about as long as the body, the inner reddish-brown, more or less straight, the outer whitish, curved.

A-7. Ain Mara, Jabal al Akhdar, 25.08. 1999, F. B. Erteeb. (Fig. 7)

Distribution: South Europe, naturalized in central Europe and further north, central and western Asia, western Africa, north Atlantic islands, and North America.

Solanaceae

Physalis philadelphicus Lam., Encycl. Met. Bot. 2. 101 (1786); Tutin et al., Fl. Eu. 3: 196 (1972).

Annual herb, subglabrous with a few short hairs on young shoots, leaves and calyces. Stem erect, 45 to 60 cm. Leaves ovate to ovate – lanceolate, 2 – 10 x 1 – 4 cm, acuminate, cuneate at base, entire or sinuate to somewhat dentate towards the base. Petiole 2 – 5 cm. Pedicels 5 – 10 mm. Calyx 4 – 10 mm, ovate, fruiting calyx 30 – 50 mm, green, often purple veined. Corolla 5 – 30 mm in diam., yellow with brownish purple markings at the throat. Anthers 1.25 – 4 mm, purple, curved at anthesis. Filaments purple. Berry 13 – 40 mm, green to purple, filling and sometimes splitting the calyx.

A-2 Al Harsha, Zawia, grows as a weed in a cultivated field, 10.04.2001, F. B. Erteeb. 2554 – F. (Fig. 8).

Distribution: North and South America, Europe, naturalized in Ukraine for its edible fruit, and could be found as a weed elsewhere.

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Salicaceae

Populus euphratica Oliv., Voy. Emp. Othman, ed. Min. 6: 319 (1807); Boulos, Fl. Egy. 1: 14 (1999).

Tree up to 15 m high, with spreading branches, twigs puberulent. Leaves variable in shape ranges from linear – lanceolate on juvenile branches to broadly ovate or triangular on mature ones, 2-12 x 2-8 cm; flowers remote, long pedicelled, in loose catkins. Fruit large ovoid capsules. Seeds numerous with a tuft of long silky hairs.

C–8. About 25 km to the west of Al Jaghub oasis, 25. 08. 2002, F. B. Erteeb.

Around 25 trees some of them are coming from old laying trunks, in sand dunes in only one locality (Fig. 9).

Distribution: North Africa, southwest and central Asia.

Apiaceae

Ferula biverticillata Thieb, Bull. Soc. Bot. Fr. 82: 190 (1935).

Perennial herb with fusiform root stock, ranges from 20-40 cm high stem anfibrous at the base, erect, striate divaricately branched from the middle into several branches with 2-4 whorls of inflorescence. Leaves up 35 cm, falling before anthesis, mainly basal leaves or confined to the lower part of the stem, ovate in outline, 3-4 pinnatifid, densely or sparingly scabrous bristly, segments ovate or oblong in outline, 2-3 pinnatepartite, ultimate lobes short, oblong or linear, mucronate; upper leaves reduced to short acuminate sheaths, not inflated, appressed to the stem. Inflorescence verticillately or corymbose branched; fertile umbells 4-14 rayed. Involucre 0 or a few bracts. Petals yellow. Stylopodium depressed–conical, much shorter than the deflexed styles. Fruit 1-1.2 cm long to 0.3-0.5 wide, as long as or somewhat longer than the pedicel, linear-elliptic. Specimen studied: A-7, farm southeast of Al Marj, Jabal al Akhdar, 23. 7. 2007 (Fig. 10).

Poaceae

Chloris gayana Kunth, Revis. Gram. 89 (1829); Hitchcock, Man. Grass. U.S. 2nd. Ed. 1: 220 (1971); Zohary, Fl. Pal. 4: 222 (1986).

Perennial with long, stout, leafy stolons. Culms 1 to 1.5 m tall, nodes brown. Blades flat, 3 – 5 mm wide, tapering to a fine point; spikes several to numerous, erect or ascending, 5 to 10 cm long. Spikelets crowded, pale – tawing. Lemma 3 mm. long, hispid, on the margins near the summit. The awn 1 to 5 mm long, commonly 2 rudiment florets present.

A specimen brought to the Herbarium for identification is identified and illustrated (Fig. 11). It is cultivated in Brak agricultural project southwestern Libya. Originally from Tropical Africa and commonly known as Rhodes Grass. It is valued as very important forage grass.



Fig. 2. *Glinus lotoides*: A, portion of the plant. B, flower; C, seeds. Fig. 2D. Branch of the plant (photograph).

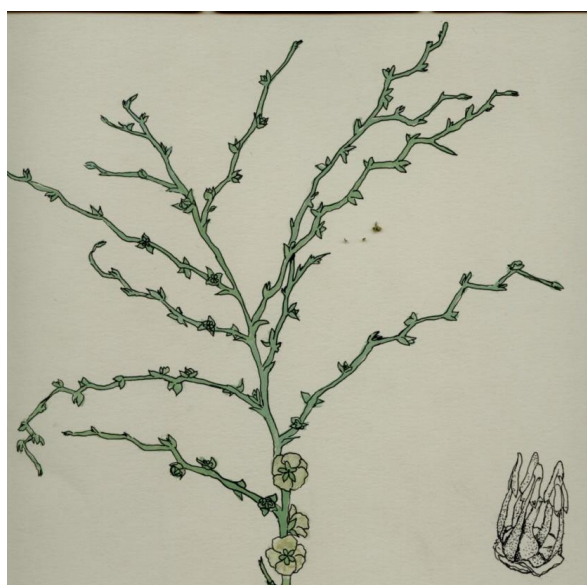


Fig. 3. *Allenia austrani*, portion of plant and flower.

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Scropholariacea

Antirrhinum ramosissimum Coss. et Dur., Coss., III. Fl. Atlant., ii. 153 (1897); Quezel, P. et S. Santa., Nouv. Fl. Alger. Tome II . 847. Fig. 2517. 1963.. Edit. Nat. Rech. Scien.; Ozenda, P., Fl. Sah. 383. Fig. 138. 1977.

A dwarf shrub with numerous intricate branches, stiff, and the old branches become spiny. Leaves entire, narrow, and deciduous. Pedicel slender and longer than the bract and calyx. Calyx lobed into 5 oval-lanceolate sepals. Corolla 5 to 7 mm pale violet-whitish. Fruit small subglobose capsule.

Specimen studied: B-2, Al Hamada, Derj area, common. Near the Algerian border, 2. 8. 2010 (Fig. 12).



Fig. 4. *Citharexylum cinerem*: on the left leaves from older branches, right leaves from young branches of the same tree.



Fig. 5. *Flaveria bidentis*.



Fig.6. *Sesbania sesbana*. Part of the plant (right) and Seeds (left).

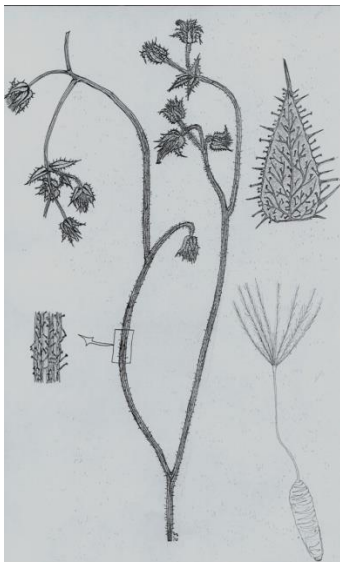


Fig . 7. *Picris echioides*.

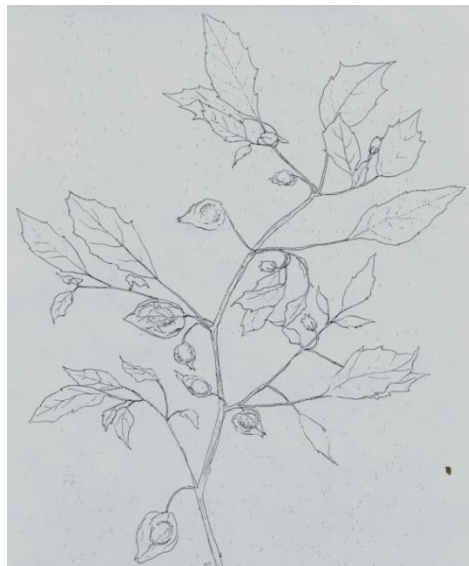


Fig. 8. *Physalis philadelphicus*.

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Fig. 9. *Populus euphratica*.



Fig. 10. *Ferula biverticillata*. Habit (left), with the dug root stock and fruits (right).

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Fig. 11. *Chloris gayana*.



Fig. 12. *Antirrhinum ramosissimum*.

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