

AL FAATEH UNIVERSITY  
FACULTY OF SCIENCE  
DEPARTMENT OF BOTANY

# FLORA OF LIBYA

42

*10th November, 1977*

## **Editors :**

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AMARANTHACEAE

by ABDUL GHAFUOR

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## AMARANTHACEAE

ABDUL GHAFOOR

Dioecious or monoecious herbs or  $\pm$  shrubs, with petiolate, simple, opposite or alternate, exstipulate, almost entire leaves. Inflorescence terminal or axillary, spikes, racemes or panicles of cymes, sometimes thyrsoid or  $\pm$  globose. Flowers small, bisexual or unisexual, hypogynous, actinomorphic, sessile; lateral flowers of cymes sometimes modified into scales, hooks or spines; bract and 2-bracteoles persistent, scarious, hyaline to white or coloured. Sepals (perianth) 3-5, uniseriate, free or  $\pm$  connate at the base, imbricate, scarious and finally  $\pm$  indurated, mostly slightly pilose or woolly, green to white or variously coloured, enveloping the fruit. Petals absent. Stamens 3-5, antisepalous; filaments free or united at the base only or completely into a membranous cupule; staminodes often alternating with the 4- or 2-celled, longitudinally dehiscent anthers. Ovary 2-3-carpelled, syncarpous, unilocular with 1-many, basal, campylotropous ovules; style short or long, stigmas 2-3, capitate to filiform. Fruit membranous, rarely brittle, indehiscent or irregularly to circumscissily dehiscent utricle, rarely a circumscissile capsule or berry. Seeds lenticular-reniform with brittle, shining testa; embryo annular or curved, enclosing the endosperm.

A large family of 65 genera and more than 1000 species, distributed mainly in tropical and temperate countries. Represented in Libya by 4 genera and 11 species; those marked with an asterisk (\*) are known from cultivation only.

- |    |   |                      |
|----|---|----------------------|
| 1. | + Leaves opposite. Bracteoles with a vertical crest on dorsal side. Stamens united almost throughout their length; anthers monothealous | 1. <b>Gomphrena*</b> |
|    | — Leaves alternate. Bracteoles without a vertical crest on dorsal side. Stamens united at the base only; anthers dithealous             | 2                    |
| 2. | + Densely hoary or woolly herbs or subshrubs. Sepals lanate. Staminodes present   | 2. <b>Aerva</b>      |
|    | — Glabrous or pubescent herbs but not woolly or hoary. Sepals glabrous. Staminodes absent   | 3                    |

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3. + Spikes mostly green. Flowers unisexual. Sepals less than 5 mm long. Ovary with solitary ovules 3. **Amaranthus**  
— Spikes silvery to pinkish. Flowers bisexual. Sepals 6-10 mm long. Ovary with several ovules 4. **Celosia\***

### 1. **Gomphrena\***

L., Sp. Pl. 224. 1753; Gen. Pl. ed. 5. 105. 1754.

Herbs with opposite, sessile or shortly petioled, entire leaves. Inflorescence globose to ovoid-oblong or  $\pm$  cylindrical, spicate capitulum-like heads, subtended by leafy involucre. Flowers bisexual, single in the axil of each persistent bract; bracteoles 2, concave and keeled, winged or cristate outside along the midrib, persistent, falling with the fruit. Sepals 5, unequal or subequal, erect, nearly free,  $\pm$  indurated at the base in fruit. Stamens 5, united into a shortly 5-dentate staminal tube with emarginate to bifid teeth; anthers monothealous; staminodes absent. Ovary ovoid-oblong, 1-loculed with a single pendulous ovule; style short or long, stigmas 2, linear,  $\pm$  divergent or  $\pm$  erect. Fruit an ovoid or oblong, membranous, 1-seeded utricle. Seed lenticular-ovoid, compressed.

A genus of c. 90 neotropical and Australian species; some of which are introduced in many parts of the world as ornamentals; represented here by the following cultivated species.

\***Gomphrena globosa** L., Sp. Pl. 224. 1753; Bailey, Stand. Cycl. Hort. 2: 1355. 1950; Maire, Fl. Afr. Nord 8: 226. fig. 980. 1962.

Annual, erect to suberect, up to 1 m tall herb with  $\pm$  white appressed pubescence on young shoots. Leaves very shortly petiolate, broadly lanceolate to oblong or elliptic-oblong or oblanceolate, 2.5-12 x 2-5 cm, attenuate at the base, acute, hairy on both sides. Spikes subglobose to  $\pm$  cylindrical, c. 2 cm across, white pinkish to deep red; involucre bracts ovate, hairy. Flowers c. 6-6.5 mm long; bracts deltoid-ovate, 3-5 mm long, bracteoles laterally compressed, 8-12 mm long, carinate, mucronate, with a broad dentate crest from base to near the apex. Sepals narrowly lanceolate, unequal, c. 6-6.5 mm long, 3 outer lanate at the base, inner 2 slightly longer and densely lanate throughout. Staminal tube nearly as long as sepals, interstaminal lobes deeply 2-lobed; anthers linear, c. 1.25 mm long. Stigmas 2, divergent, as long as style. Utricle oblong-ovoid, c. 2.5 mm, compressed. Seeds

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brown, ovoid, c. 2 mm long, shining.

Type: Linnean Herb. 319/1 (LINN).

A-3 Tripoli, near Agriculture Faculty, Al-Faateh University, *Randa*, *M. Bughrara* 15 (ULT).

Distribution: A native of tropical America, introduced and commonly cultivated in Gardens in all warmer regions of old world and naturalized in many countries.

*Fl.* October-November.

### 2. AERVA

Forsk., *Fl. Aegypt. - Arab.* 170. 1775 (nom. cons.)

*Ouret* Adans., *Fam. Pl.* 2: 268, 586. 1763.

Prostrate to erect or scandent, whitish-woolly, dioecious-polygamous perennial herbs or subshrubs. Leaves alternate or rarely  $\pm$  opposite, simple, shortly petioled, entire. Inflorescence axillary or terminal, short to long peduncled spikes or panicle of leafless spikes. Flowers bisexual, occasionally unisexual, solitary in the axil of each persistent bract, bracteoles 2, persistent. Sepals 5, oval or lanceolate-oblong, green in the middle, scarious margined, fleecy, persistent. Stamens 5, filaments dilated and united at the base into a cupule; staminodes 5, mostly subulate-triangular, alternating with dithecous anthers, truncate or emarginate. Ovary ovoid or subglobose, unilocular with solitary pendulous ovule; style short to long, simple, stigmas 2, subulate, papillate on inner side or rarely capitate; pistillode with very short style and rudimentary stigmas present. Fruit an ovoid or subglobose, 1-seeded, membranous, irregularly dehiscent utricle, enveloped by and not exceeding sepals. Seeds ovoid-reniform, compressed, black.

A genus of c. 10 species, distributed in tropical and subtropical countries of Africa and Asia and in the adjoining Islands; represented in Libya by only one species.

*Aerva javanica* (Burm. f.) Juss ex J.A.Schultes, *Syst. Veg.* ed. 15,5: 565. 1819; Durand & Barratte, *Fl. Lib. Prodr.* 200. 1910; Keith, *Prelim. Check List Lib. Fl.* 1: 200. 1965.

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*Iresine javanica* Burm. f., Fl. Ind. 212. 1768; *Iresine persica* Burm. f., Fl. Ind. 212. 1768; *Illecebrum javanicum* (Burm. f.) Murr., Syst. Veg. ed. 13.206. 1774; *A. tomentosa* Forsk., Fl. Aeg. - Arab. CXXII, 170. 1775; *Achyranthes javanica* (Burm. f.) Pers., Syn. 1: 259. 1805; *Aerva persica* (Burm. f.) Merrill in Phil. Journ. Sc. 19: 348. 1921; Pamp., Prodr. Fl. Ciren. 185. 1931; Maire, Fl. Afr. Nord. 8: 215. 1962.

Perennial, up to 1.5 (-2) m tall, basally woody and much branched dioecious herb or shrublet, with terete, striate stems densely beset with yellowish-white tomentum to  $\pm$  woolly. Leaves alternate, sessile to very shortly petiolate, this in robust plants up to c. 2 cm long; lamina narrowly linear-oblong or oblanceolate-obovate to suborbicular, 2.5-10 x up to 2 cm, densely whitish or yellowish tomentose on both sides, margins plane or  $\pm$  involute, apex obtuse. Inflorescence a simple, sessile, cylindrical, densely-flowered leafless spike or lax due to interruption by lateral globose flower clusters or spikes in terminal panicle; male spikes comparatively slender than female. Flowers unisexual, male flowers smaller than female, covered with dense soft yellowish-white woolly pubescence; bracts and bracteoles similar, scarious, semi-transparent, broadly deltoid-ovate, up to 2.5 mm long, persistent. Sepals subequal, usually densely woolly, 2 outer ones larger than 3 inner, oblong-obovate to obovate-spathulate in female and ovate in male flowers, inner sepals elliptic-oblong. Stamens with c. 1.5-2.5 mm long anthers. Utricle compressed, rotundate, c. 1-1.5 mm long and broad. Seeds brown or black, c. 1 mm long.

Two varieties are recognized here.

- + Leaves usually broader, variable, usually more than 6 mm broad, straight, flat. Spikes 8-10 mm broad in female plants. (Outer sepals in female flowers c. 3 mm long) a) var. **javanica**
- Leaves usually linear to narrowly linear-oblong up to c. 6 mm broad, subfalcate. Spike 4-5 mm broad in female plants. (outer sepals in female flowers c. 2 mm long) b) var. **bovei**

a) var. **javanica** (Fig. 1, A-D).

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Fig. 1.

*Aerva javanica* var. *javanica*: A, flowering shoot x 0.5; B, male flower x 6; C, female flower x 6; D, immature seed x 20; *A. javanica* var. *bovei*: E, flowering branch x 0.5.

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Leaves narrowly oblong or elliptic-ovate to obovate-suborbicular, more than 6 mm broad. Spikes usually paniculate, terminal, dense, stout, usually (6-) 8-10 mm broad in female plants. Outer sepals c. 3 mm long.

Holotype: Herb. Burmann (G)

E-1 Wadi Aghage, c. 70 km from Ghat towards Algerian border, 19.2.1977, M. A. Siddiqi 94 (ULT).

Distribution: Drier parts of tropics and subtropics of Asia, Africa, Canaries, Cape Verde Isles, and Cameroun.

Confined to Southern parts of Libya (Tibesti, Ghat, Uweinat etc.).

Fl. January-April Vern.: Elgaab, Ghell, Eigaab gebeli

- b) var. *bovei* Webb. in Hook., Niger Flora (Spic. Gorg.) 173. 1849; Boiss., Fl. Or. 4: 993. 1879 (Fig. 1, E).

*A. bovei* (Webb) Edgew. in Journ. Linn. Soc. 6: 206. 1862; *A. persica* var. *bovei* (Webb.) Chiov., Fl. Somala 286. 1929; Corti, Fl. Veg. Fezzan 97. 1942; *A. pseudo-tomentosa* Blatter & Hallberg in Journ. Bomb. Nat. Hist. Soc. 26: 817. 1919.

Leaves linear to narrowly linear oblong or widely oblanceolate, up to c. 6 mm broad,  $\pm$  falcate-recurved, with involute or plane margins. Spikes simple or paniculate, terminal, often lax due to interruption by lateral globose or oblong-globose flowers clusters, usually 4-5 (-6) mm broad in female plants. Outer sepals c. 2 mm long.

Lectotype: Arabia, *Bove*

E-1 10 km before Ghat, sandy ground, not common, 24.2.1976, S. M. H. Jafri 6350 (ULT); G-8 Kurkur Ibrahim, up stream part, Gebel Uweinat, 7.11.1968, L. Boulos 3352, 3354, 3386, 3403, 3283, 3243; 3377, 3338, 3274 and 3265 (ULT).

Distribution: India, Pakistan, Afghanistan westwards to African Sahara, Somalia, Sudan, Chad, Niger and west tropical Africa.

A common plant in southern parts of Libya (Gebel Uweinat westwards to

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Algerian border).

*Fl.* November-March

### 3. AMARANTHUS

L., *Sp. Pl.* 989. 1753; *Gen. Pl.* ed. 5. 427. 1754

Annual rarely perennial, glabrous, hairy or glandular, monoecious or dioecious herbs. Leaves alternate, petiolate, simple, entire or sinuate. Inflorescence lax or dense, axillary, bracteate cymose clusters arranged in spikes or panicles. Flowers unisexual, 2-bracteolate, bracteoles green, scarious, persistent. Sepals (2-) 3-5, free or united at the base, linear or lanceolate-spathulate, scarious, persistent, accrescent to fruit in female flowers. Stamens (2-) 3-5, free, anthers ditheous; staminodes absent. Ovary membranous, laterally compressed, unilocular with solitary, erect, basal ovule; style 0; stigmas 2-3, elongated. Fruit an ovoid or globular, 1-seeded, circumscissile or irregularly dehiscent or indehiscent utricle, shorter to mostly exceeding the sepals. Seeds lenticular or orbicular, usually black and glittering, endospermous.

About 50 species, mostly weedy and distributed in warmer parts of the world, introduced and naturalized in temperate regions; represented in Libya by 8 species.

- |    |  |                           |
|----|--|---------------------------|
| 1. | + Sepals (4-) 5  | 2                         |
|    | — Sepals (2-) 3 (-4)   | 4                         |
| 2. | + Bracteoles in female flowers as long to twice as long as lanceolate-oblong, or narrowly ovate or elliptic-oblong clawless sepals. Utricle circumscissile | 3                         |
|    | — Bracteoles in female flowers c. half as long as broadly spathulate, distinctly clawed sepals with patent limb. Utricle indehiscent                       | 3. <b>A. standleyanus</b> |
| 3. | + Sepals enlarged above, narrowly oblong-spathulate to spathulate, obtuse or truncate, emarginate at the apex, longer than fruit                           | 1. <b>A. retroflexus</b>  |
|    | — Sepals lanceolate to ovate or elliptic-oblong,   |                           |



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- acute at the apex, as long as or slightly longer than the fruit
2. **A. hybridus**
4. + Inflorescence mostly consisting of axillary cymose clusters 5  
 — Inflorescence mostly consisting of terminal leafless spike or a panicle with apical spicate part 7
5. + Utricle usually slightly exceeding or equal to the sepals, wrinkled 4. **A. graecizans**  
 — Utricle shorter than the sepals, membranous and inconspicuously wrinkled 6
6. + Leaves green, shortly petioled, oblong-obovate to spatulate. Bracteoles spinescent, twice the size of sepals 6. **A. albus**  
 — Leaves purplish-red, long petioled, broadly rhombic-ovate or broadly elliptic to oblong-lanceolate. Bracteoles shorter than the sepals 5. **A. tricolor\***
7. + Sepals longer than fruit, more than 3 mm long, awned at the tip. Fruit circumscissile, obscurely wrinkled, membranous 5. **A. tricolor\***  
 — Sepals shorter than or  $\pm$  equal to fruit, up to 2 mm long, acute or sub-obtuse and awnless. Fruit indehiscent or irregularly breaking, wrinkled, not membranous 8
8. + Fruit  $\pm$  globose, not or hardly exceeding the sepals. Seeds rounded, reticulate with areoliform scurfy verrucae 7. **A. viridis**  
 — Fruit ellipsoid, clearly exceeding the sepals. Seeds ellipsoid, not reticulate 8. **A. deflexus**
1. **Amaranthus retroflexus** L., Sp. Pl. 991. 1753; Durand & Barratte, Fl. Lib.

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Fig. 2,  
*Amaranthus retroflexus*: A, entire plant x 0.5; B, fruit x 12; C, seed x  
20.

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Prodr. 200. 1910; Pamp., Pl. Trip. 71. 1914; Prodr. Fl. Ciren. 184. 1931; Maire, Fl. Afr. Nord. 8: 201. fig. 980. 1962; Quezel & Santa, Nouv. Fl. Alger. l.c.; Keith, l.c. 219. (Fig. 2).

Annual, up to c. 1 m tall, erect, pale green herb, unbranched or with ascending,  $\pm$  terete to angular, multicellular hairy shoots. Leaves with up to 6 cm long petiole; lamina rhombic-ovate or ovate-oblong, 2-11 x 2-6 cm, subundulate on margins, cuneate or attenuate at the base, obtuse to  $\pm$ acute and mucronate at the apex. Inflorescence stout, terminal and axillary spikes with short lateral branches, the terminal usually forming an erect leafless panicle up to 10 x 3 cm. Flowers pale green, sometimes pink tinged, male and female together, the latter much more numerous particularly towards apices; bracteoles linear-lanceolate, longer than or equal to sepals, pale membranous with green mid vein extending into stiff sharp pointed acumen or arista. Sepals 5, lanceolate-oblong, up to 2.25 mm long, usually obtuse in male flowers; oblong-spathulate to spathulate, 2-3 mm long, obtuse or emarginate and mucronulate at the tip in female. Stamens 5. Stigmas 2-3, patent-flexuose or erect. Utricle subglobose, usually slightly shorter than the sepals, circumscissile,  $\pm$  wrinkled below the lid. Seed black, shining, c. 1 mm across.

Type: Described from material cultivated at Uppsala Botanic Garden, Herb. Linn 1117.22 (LINN).

A-3 Tripoli, Faculty of Agriculture Farms, Al-Faateh University, erect up to 70 cm tall, weed in fields, 25.5.1977, *A. Ghafoor* 314 and 317 (ULT); G-8 Gebel Uweinat, 7.11.1968, *L. Boulos* 3207 (ULT).

Distribution: A native of tropical America, introduced and naturalized as weed of cultivated fields in Europe, North Africa, Asia and Australia.

A common weed in cultivated fields.

Fl. May-August      Vern. bu zinzir

2. ***Amaranthus hybridus*** L., Sp. Pl. 990. 1753 (Fig. 3).

*A. hypochondriacus* L., Sp. Pl. 991. 1753; *A. paniculatus* L., Sp. Pl. ed. 2. 1406. 1763; *A. cruentus* L., Sp. Pl. ed. 2. 1406. 1763; *A. chlorostachys* Willd., Hist. Amaranth. 34, t. 10. f. 19. 1790.

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Fig. 3, *Amaranthus hybridus*: A, habit x 0.5; B, fruit x 12; C, seed x 20.

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Fig. 4, *Amaranthus standleyanus*: A, flowering plant x 0.5; B, fruit x 10; C, a sepal x 15; D, seed x 15.

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Annual, usually erect, up to 2 m or sometimes more tall herb with angular, glabrous or hairy above, erect or less commonly ascending shoots. Leaves with up to 15 cm long petiole; lamina broadly lanceolate to rhomboid or ovate, up to c. 20 x 8 cm, glabrous or sparsely pilose on veins, attenuate or  $\pm$  cuneate at the base, obtuse-subacute, mucronulate at the apex. Inflorescence of axillary and terminal, green or reddish panicle of simple spikes, composed of upwardly approximate cymose clusters. Flowers green or reddish, male and female intermixed; bracteoles deltoid-ovate to deltoid-lanceolate, equal to c. twice as long as sepals, pale membranous, acuminate-aristate. Sepals (3-) 5, lanceolate or elliptic-oblong, 1.5-3 mm long, membranous, midrib greenish, acute-acuminate or sometimes inner ones obtusish. Stigmas mostly 3, erect, flexuose or  $\pm$  recurved. Utricle subglobose to ovoid, 2-3 mm long, with short neck, circumscissile, not wrinkled, rarely longitudinally sulcate or rugulose below the neck. Seeds shining black, rounded, 1-1.25 mm in diameter, smooth in middle, obscurely reticulate around the margins.

Type: Herb. Linn. 1117/19 (LINN).

A-3 8 km from Tripoli University, from orange crop, 4.1.1976, *Fathi B. Ratip* 84 (ULT); Al-Faateh University Campus, Tripoli, 20.5.1977, *A. Ghafoor* 314 AG (ULT); Ministry of Agriculture, Sidi El-Misri, Tripoli, 22.4.1967, *L. Boulos* 1731 (ULT).

Distribution: Throughout the warmer regions of the world, mainly Asia and tropical Africa and America.

Townsend (in Nasir & Ali, Fl. W. Pak. 71: 11.1974) recognizes two subspecies, subsp. **hybridus** and subsp. **cruentus** (L.) Thell. Our material agrees with subsp. **cruentus** which differs from the type subsp. in having longest bracteoles of female flowers, 1-2 times as long as the sepals; stigma bases and upper part of fruit hardly swollen and absence of a distinct neck.

The plant is used as pot herb in tropical Africa.

*Fl.* March-May

3 ***Amaranthus standleyanus*** Parodi ex Covas in Darwiniana 5: 339. 1941 (Fig. 4).

Annual, up to 40 (-50) cm tall, pale green, much branched herb with

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procumbent or ascending, densely puberulent to glabrous (in our material) shoots. Leaves with up to 2 cm long petiole; lamina ovate-rhombic or lanceolate-rhombic, 0.5-2 x 0.3-1.2 cm,  $\pm$  undulate-crenate on margins, cuneate or attenuate at the base, obtuse-emarginate, with inconspicuous mucro at the apex. Inflorescence of axillary, ovoid to spherical cymose clusters, occasionally forming a short terminal spike. Flowers pinkish-green, male and female together, the latter more numerous, bracteoles ovate, shorter than the sepals, acute. Sepals 5, broadly obovate to spatulate with a distinct claw, c. 2 x 1 mm, obtuse, membranous, mucronate. Stamens 5, anthers oblong, yellow. Stigmas 3, erect-flexuose. Utricle subglobose, c. 1.5 mm long, wrinkled, indehiscent. Seeds brownish-black,  $\pm$  ovoid, shining, c. 1.25 mm long.

Type: Described from Argentina.

A-3 10-20 km E. Tripoli, along the coastal road to Khoms, in sand, 22.11.1966, L. Boulos 1018 (ULT).

Distribution: A native of South America (Argentina), naturalized in South and Central Europe and North Africa (Libya).

This species has been recorded for the first time from Libya.

Fl. October-November

4. *Amaranthus graecizans* L., Sp. Pl. 993.1753; Keith, Prelim. Check List. Lib. Fl. 1: 218. 1965.

Annual, prostrate to erect, mostly up to 50 cm tall herb, branching from the base, branches angular, beset with short to long usually crispy multicellular hairs or glabrescent. Leaves with 3-50 (-55) mm long petiole; lamina broadly ovate or rhomboid-ovate to narrowly oblong-obovate to lanceolate or linear-lanceolate, 4-50 (-55) x 2-30 mm, attenuate to petiole, margins  $\pm$  undulate, acute to obtusish, slightly retuse and mucronulate. Inflorescence all axillary, small sessile cymose  $\pm$  oblongish clusters. Flowers green, male and female together in the same cluster; bracteoles oval to lanceolate-oblong, slightly shorter than sepals or almost equalling, whitish-membranous with a narrow green midrib extending into a small acumen. Sepals 3, all 1.5-2 mm long, ovate-lanceolate or  $\pm$  oblanceolate-spatulate, acute-mucronate in female flowers; lanceolate-oblong to linear-oblong in male

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flowers. Stamens 3, with yellow exerted anthers. Stigmas 3, flexuose, 0.5 mm long. Utricle subglobose, compressed, exceeding the sepals, 2-2.25 x c. 1.5 mm, wrinkled with a smooth neck, dehiscence clearly circumscissile. Seed lenticular, shining black, 1-1.5 mm in diameter, inconspicuously reticulate.

Two subspecies are recognized here.

- + Leaves narrowly oblong-obovate to lanceolate or linear-lanceolate, (2.5-) 3-6 times as long as broad 4.a) ssp. **graecizans**
- Leaves broadly ovate or rhomboid-ovate, usually less than twice as long as broad 4.b) ssp. **silvestris**

### 4.a) ssp. **graecizans** (Fig. 5,A)

*A. angustifolius* Lam., Encycl. Meth. Bot. 1: 115. 1783 (*nom. illegit.*); Maire, Fl. Afr. Nord 8: 206. Fig. 983. 1962; *A. blitum* Linn. var. *graecizans* (Linn.) Moq. in DC., Prodr. 13 (2): 263. 1849; *A. silvestris* Vill. var. *graecizans* (Linn.) Boiss., Fl. Or. 4: 990.1879.

Leaf blade narrowly oblong-obovate to lanceolate or linear-lanceolate, (2.5-) 3-6 times as long as broad. Bracteoles acute-acuminate, shorter than sepals. Sepals abruptly narrowed above with short mucro.

Type: Described from Virginia, Herb. Linn. 1117/3 (LINN).

**A-3** 10-20 km E. Tripoli, along the coastal road to Khoms, in sand, 22.11.1966, *L. Boulos* 1012 (ULT); **A-7** Dariana, c. 40 km from Benghazi, c. 100 from road and 200-300 km from the sea, 16.6.1972, *S.I.Ali & S. A. Faruqi* 453 (ULT); **D-3** Grega (c. 150 km from Sebha towards Garma), prostrate, near water course, 20.3.1973, *S. I. Ali & S. A. Faruqi* 1352 (ULT); **G-8** Gebel Uweinat, 7.11.1968, *L. Boulos* 3172; 3189; 3210; 3234 (ULT).

Distribution: South West Asia, subtropical and North Africa.

*Fl.* March-July

### 4b) ssp. **silvestris** (Vill.) Brenan, Watsonia 4: 273. 1961. (Fig. 5,B-D)

*A. silvestris* Desf., Tabl. Hort. Paris 44. 1804 - (*nom. nudum.*); Vill., Cat. Pl.



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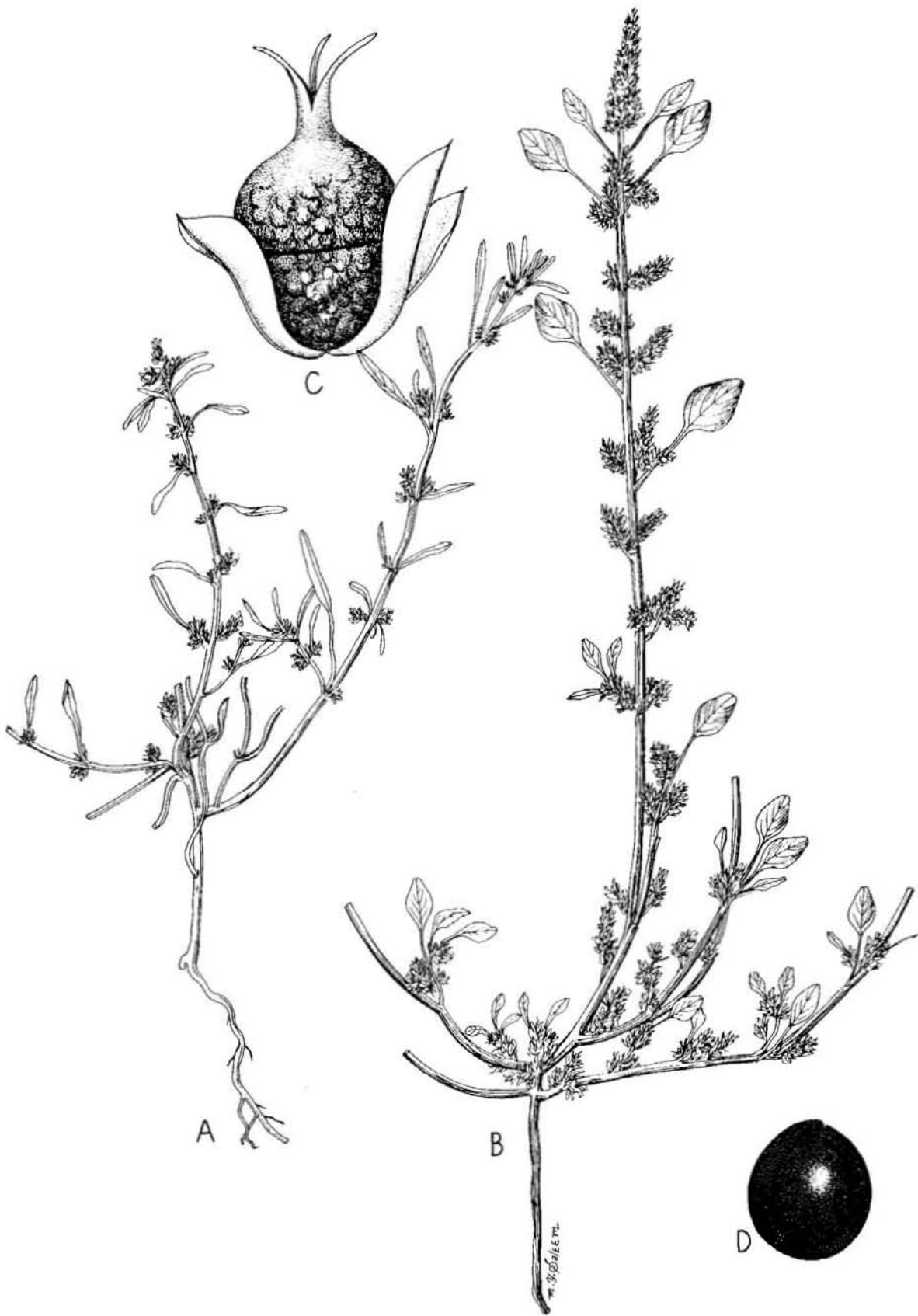


Fig. 5, *Amaranthus graecizans* ssp. *graecizans*: A, flowering plant x 0.5. A. *graecizans* ssp. *silvestris*: B, flowering shoots x 0.5; C, fruit x 23; D, seed x 13.

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Jard. Strasb. 111. 1807; Durand & Barratte, Fl. Lib. Prodr. 200. 1910; Pamp., Pl. Trip. 71. 1914; Prodr. Fl. Ciren. 185. 1931; *A. blitum* L. var. *silvestris* (Vill.) Moq. in DC., Prodr. 13 (2): 263. 1849; *A. graecizans* L. var. *silvestris* (Vill.) Aschers. in Schweinf., Beitr. Fl. Aethiop. 176. 1867.

Leaf blade broadly ovate or rhomboid-ovate, usually less than twice as long as broad. Bracteoles ovate-lanceolate or acute-acuminate, nearly as long as sepals. Sepals oblanceolate-subspathulate.

Type: *Tournefort*, 1849 (P).

**A-2** c. 10 km from Zuara on way to Ferua, sandy roadside, 25.11.1976, *A. Ghafoor* & *S. A. Alavi* 83 AG (ULT); **A-3** University of Tripoli, Faculty of Agriculture Farm, 9.12.1975, *Fathi B. Ratip* 51 (ULT).

Distribution: Warmer parts of Europe, North Africa, East Tropical Africa, West and S. W. Asia to N. W. Pakistan and India.

*Fl.* October-December

5. \**Amaranthus tricolor* L., Sp. Pl. 989. 1753.

*A. tristis* L., Sp. Pl. 989. 1753; *A. melancholicus* L., Sp. Pl. 989. 1753; *A. gangeticus* L., Syst. Veg. ed. 10. 1268. 1759; *A. mangostanus* L., Cent. Pl. 1: 32. 1755; *A. polygamus* L., Cent. Pl. 1: 32. 1755.

Annual, up to 1.5 m tall, erect or suberect herb with angular, glabrous or sparsely  $\pm$  crisped hairy shoots and inflorescence. Leaves with up to 8-10 cm long petiole; lamina broadly rhombic-ovate or broadly elliptic to oblong-lanceolate, 3-10 x 2-8 cm, cuneate to attenuate at the base, emarginate to obtuse or acute at the apex. Inflorescence of axillary, subglobose clusters, each c. 5-25 mm in diameter, the basal distant, the uppermost without subtending leaves and closely arranged to form terminal spike, male and female flowers in the same cluster. Flowers green to purplish-red, c. 2 mm across; bracteoles mostly broadly ovate, shorter than the sepals, papery, awned. Sepals 3, lanceolate-elliptic or oblong-elliptic, 3-5 mm long, acuminate-acute with  $\pm$  flexuose tip, subaccrescent in fruit. Stigmas 3, c. 2 mm long. Utricle ovoid, c. 2.5 x 1.5 mm, with a small neck, below the styles, inconspicuously wrinkled, enclosed by sepals. Seeds black or brownish-black,

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Fig. 6, *Amaranthus albus*: A, flowering branch x 1.5; B, fruit x 20; C, seed x 20.

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lenticular, 1-1.5 mm in diameter, obscurely reticulate.

Type: Herb. Linn. 1117/7 (LINN).

A-3 Tripoli, Al-Faateh University Campus, Faculty of Science gardens, cultivated, 20.9.1977, A. *Ghafoor* 316 AG (ULT).

Distribution: Japan westwards to Pakistan, South East Asia, Europe and Africa, West Indies, Fiji Islands etc.

An introduced and common summer ornamental in Tripoli and elsewhere.

*Fl.* May-October

6. ***Amaranthus albus*** L., Syst. Nat. ed. 10. 2: 1268. 1759; Maire, Fl. Afr. Nord 8: 203. Fig. 981. 1962 (Fig. 6).

Annual, prostrate-procumbent to erect, up to 50 cm tall, almost glabrous herb. Leaves very short petioled, lamina oblong-obovate to spatulate, (1.5-) 2-5 (-6) x (0.8) 1-2 cm,  $\pm$  undulate, attenuate-cuneate at the base, weakly obtuse, emarginate and with c. 1 mm long mucro at the apex. Inflorescence of axillary, few-flowered, c. 5 mm long pseudospicate clusters. Flowers green; bracteoles lanceolate-subulate, twice as long as sepals, long spinescent at the tip, with broad membranous margins. Sepals 3, linear-elliptic, c. 1.5 mm long,  $\pm$  obtuse to short acuminate. Stamens 3, anthers yellow, subexserted. Utricle ovoid-subglobose,  $\pm$  1.5 mm, usually slightly longer than perianth,  $\pm$  wrinkled, circumscissile. Seeds black, c. 1 mm in diameter, shining.

Type: Described from North America.

A-3 Tripoli, Faculty of Agriculture fields, University of Al-Faateh, prostrate-procumbent herb with green flowers, 1.4.1977, A. *Ghafoor* 284 AG (ULT); Ministry of Agriculture, Sidi-el-Masri, Tripoli, 22.4.1967, L. *Boulos* 1733 (ULT).

Distribution: A native of Southern North America, naturalized and widespread in North Africa, E. Mediterranean region, Europe and Australia.

*Fl.* March-May.

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Fig. 7. *Amaranthus viridis*: A, entire plant x 0.5; B, fruit x 22; C, seed x 20.

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7. **Amaranthus viridis** L., Sp. Pl. ed. 2: 2: 1405. 1763; Andrews, Fl. Pl. Anglo-Egypt. Sudan 1: 117. 1950; Aellen in Rech. f., Fl. Iran. 91: 8. 1972; Townsend in Nasir & Ali, Fl. W. Pak. 71: 14. Fig. 2, A-B. 1974 (Fig. 7).

*A. gracilis* Desf., Tabl. Ecol. Bot. 43. 1804; Pamp., Pl. Trip. 71. 1914; Maire, Fl. Afr. Nord. 8: 210. f. 985. 1962; Keith, Prelim. Check List Lib. Fl. 1: 218. 1965; *Chenopodium caudatum* Jacq., Collect. Bot. 2: 325. 1788; *Albersia caudata* (Jacq.) Boiss., Fl. Orient. 4: 992. 1879.

Annual, up to 80 (-100) cm tall, erect or suberect to spreading herb with glabrous to floccose hairy, angular shoots. Leaves with up to 10 cm long petiole; lamina ovate to  $\pm$  rhombic-ovate, (2-) 3-8 x 1.5-5.5 cm, cuneate to subtruncate at the base, obtuse, and indistinctly to distinctly emarginate and mucronate at the apex. Inflorescence of axillary and terminal clusters or paniculate spikes up to 12 cm long, c. 3-6 (-8) mm broad, male and female flowers intermixed, the latter more numerous. Flowers green, c. 2.0 mm across; bracteoles lanceolate-ovate, shorter than sepals, green with membranous margins. Sepals 3 (-4), narrowly oblong to subspathulate, c. 1.25-1.5 mm long, acute, not or minutely mucronate,  $\pm$  thickened and carinate towards apex in female flowers; lanceolate to oblong-ovate, c. 1.5 mm, acute, concave in male flowers. Stamens 3. Stigmas 2-3, erect to suberect. Utricle subglobose to somewhat pyriform,  $\pm$  compressed, c. 1.25-1.5 x 1.5 mm, not or slightly longer than sepals, rugose-wrinkled all over, indehiscent or irregularly dehiscent. Seed dark brown to black, round, 1-1.5 mm in diam., faintly reticulate, minutely punctate, shining.

Syntypes: Described from Europe & Brazil, Herb. Linn. 1117/15 & 1117/16 (LINN).

**A-3** Tripoli, Weed in pots, University Campus, erect herb, *A. Ghafoor* 311 AG (ULT); University Campus, plot of Botany Department, *Fathi B. Ratib* 7 (ULT); **A-7** c. 5 km from Baida towards Shahat, 20.6.1976 *S. I. Ali & S. A. Faruqi* 793 (ULT).

Distribution: Tropical, subtropical and naturalized in temperate regions.

A most common species in Libya, found as weed in waste and cultivated fields; used as vegetable in tropical areas of both hemispheres.

Fl. February - November. Vern. bu Zinzir

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8. **Amaranthus deflexus** L., Mantissa alt. 2: 295. 1771; Maire, Fl. Afr. Nord. 8: 211. fig. 986. 1962; Quezel & Santa, Nouv. Fl. Alger. 1: 305. 1962; Keith, l.c. 218.

*Albersia deflexa* (Linn.) Fourr. in Ann. Soc. Linn. Lyon NS 17: 142. 1869.

Perennial, prostrate to  $\pm$  ascending, usually up to 60 cm tall herb with stout,  $\pm$  angled, green or reddish stems, beset with flexuose or crispy long hairs on younger parts. Leaves with up to 2.5 (-3) cm long petiole; lamina mostly rhombic-ovate or broadly ovate-lanceolate, up to 5 x 2.5 cm, somewhat truncate to shortly cuneate, moderately to densely hairy on margins, subretuse and mucronulate at the  $\pm$  acute to obtuse apex. Inflorescence dense terminal and axillary spikes, up to 10 cm long and c. 5-12 mm across, basal spikes with c. 1 cm across dense subglobose clusters. Flowers green, male and female intermixed, the latter more numerous; Bracteoles ovate-lanceolate or deltoid-ovate, c. 0.5 as long as sepals, pale membranous with green median part. Sepals 2-3, similar in male and female flowers, linear-oblong to  $\pm$  spatulate 1.5-2 mm long, obtuse to somewhat acute, minutely mucronulate. Stamens 2-3. Stigmas 2-3, flexuose. Utricle ellipsoid, 1.75-3 mm long, occasionally constricted at tip, without wrinkles, not or irregularly dehiscent. Seeds compressed-ellipsoid, black, shining.

Type: Described from plants cultivated at Uppsala Botanic Gardens, Herb. Linn 1117/18 (LINN) as "*A. scandens*".

Reported by Keith (l.c.) without any locality. Also reported by Maire (l.c.) from Tunis, Algeria and Morocco and there is a possibility of its occurrence here.

Distribution: A native of South America, introduced and naturalized in S. Europe, North and tropical Africa, Eastern Mediterranean to Central Asia and Japan.

Fl. May-October

### 4. CELOSIA\*

L., Sp. Pl. 205. 1753; Gen Pl. ed. 5. 96. 1754.

Annual or perennial herbs with simple, alternate, entire or sublobed leaves.

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Inflorescence dense to lax, axillary and terminal, silvery to pinkish spikes or thyrses. Flowers small, bisexual, 2-bracteolate. Sepals 5, free, equal, erect in fruit. Stamens 5, united at the base; staminodes absent. Ovary compressed, 1-loculed, 2-many ovuled; style 0 or short, stigmas 2-3. Fruit a circumscissile, 2-many-seeded capsule. Seeds black, shining, lenticular, strongly compressed, weakly to strongly reticulate.

A genus of c. 50 species, distributed mainly in tropics and warmer regions, especially Africa; represented by 1 cultivated species in Libya.

*Celosia\* argentea* Linn., Sp. Pl. 205. 1753; Maire, Fl. Afr. Nord 8: 192. fig. 978. 1962.

Annual, up to 2 m tall herb with almost glabrous, strong ridged and usually sulcate branches. Leaves shortly petioled, lanceolate-oblong to narrowly linear, 2-15 x 0.5-3.5 cm, mostly acute. Inflorescence a dense, up to 20 cm long, silvery to pink, many-flowered, conical to cylindrical, crested or plumose spike. Bracts and bracteoles lanceolate. Sepals narrowly elliptic-oblong, 6-10 mm long, with wide, membranous margins. Ovary 4-8-ovuled. Style 5-7 mm long, with 2-3 stigmas. Capsule ovoid to globular, 3-4 mm in diameter. Seeds lenticular, 1.25-1.5 mm long and broad, finely reticulate.

Holotype: Herb. Linn. 288.1 (LINN)

Distribution: Throughout the tropical world as weed of cultivated fields.

Cultivated as an ornamental in gardens during summer in Tripoli and other places.

forma *cristata* (Linn.) Schinz in Pflanzenfam. ed. 2. 16c: 29. 1934.

*Celosia cristata* Linn., Sp. Pl. 205. 1753; *C. argentea* L. var. *cristata* (L.) O. Kuntze, Rev. Gen. Pl. 1: 541. 1891.

The whole inflorescence bears long, plumose and squat branches giving the appearance of "Cock's comb" which is also its English vernacular name.

Type: Herb. Linn. 288.4 (LINN)



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Distribution: Cultivated in tropical and subtropical regions.

*Fl.* June-August

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