

THE GENUS *EUPHORBIA* L. IN DACCA

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Abstract

The genus *Euphorbia* L. is represented in Dacca, East Pakistan by twelve species which, following the treatment of Pax and Hoffman, are arranged here under Sections *Anisophyllum*, *Poinsettia* and *Euphorbium*. Among the recorded species, two fall under the Section *Poinsettia* while the other two Sections include five species each. An artificial key to species and detailed descriptions of taxa are provided. Taxonomy and nomenclature of some critical species has been discussed.

Euphorbia L. is the largest and extremely diverse genus of the family **Euphorbiaceae**. Boissier (1862) recognized 27 Sections of **Euphorbia** while Pax and Hoffman (1931) arranged the species only in 9 Sections. In his revision of the genus from Bombay, India, Santapau (1955) straightened out the nomenclature of some species and provided a useful artificial key to the taxa. Datta and Mitra (1955) listed eight species of **Euphorbia** from Dacca giving only very brief descriptions.

The present enumeration includes twelve species which are placed, according to Pax and Hoffman's treatment in the Sections **Anisophyllum**, **Poinsettia**, and **Euphorbium**. The species under the Section **Anisophyllum** are characterised by stipulate, uniauriculate leaves, cyathial glands provided with petaloid limbs (appendages), and a much branched prostrate habit. These grow as ruderal or segetal weeds, most of which being introduced and naturalized here. Section **Poinsettia** includes plants with showy bract leaves due to which they are favourite in the gardens. The members of the Section **Euphorbium** have succulent, cactoid habit and are planted mostly for their medicinal importance and as fences or grown as ornamental pot plants.

Key to Species

1. Shrubs or small trees ; stem fleshy or woody
 2. Upper bract leaves wholly or partly red, lower leaves all green
 3. Bract leaves red near their bases, green at apices ; plants up to 1 m tall 6. *heterophylla*
 3. Bract leaves uniformly red ; plants 2 - 8 m tall 7. *pulcherrima*
 2. Upper leaves, if present, not different from lower leaves in colour
 4. Unarmed shrubs ; stem smooth, rod-like 12. *tirucalli*
 4. Trees or shrubs armed with stipular spines ; stems angled, ridged or with elevated tubercles
 5. Stems sprawling, not more than 2 cm across 9. *mili*
 5. Stem erect, more than 3 cm across
 6. Stem deeply 3-6 winged ; leaves less than 1 cm long 8. *antiquorum*
 6. Stem sub-cylindric or ridged ; leaves 10-30 cm long
 7. Stem ridged ; tubercles spirally arranged 10. *neriifolia*
 7. Stem subcylindric, not ridged, tubercles almost vertically arranged 11. *nivalia*
1. Annual herbs ; stem slender, erect or prostrate
 8. Glands of involucre with a conspicuous petaloid limb
 9. Cyathia many in close clusters ; seeds mucose, with shallow, transverse furrows or wrinkles 3. *parviflora*
 9. Cyathia solitary at the ends of the dichotomously branched peduncle ; seeds not mucose, rough, and without furrows or wrinkles 1. *emodi*

8. Glands of involucre without a petaloid limb or the limb not conspicuous
10. Erect or ascending herbs ; leaves 12 - 35 mm long 2. *hirta*
10. Prostrate herbs ; leaves less than 10 mm long
11. Capsule 1.0-1.3 mm \times 1.0-1.3 mm ; cocci obtusely keeled, pubescent all over 5. *thymifolia*
11. Capsule 1.5-2.0 mm \times 1.5-2.0 mm ; cocci acutely keeled, with stiff hair only at the angles of the cocci 4 *prostrata*

Section **Anisophyllum** (Haw.) Roep. in Duby, Bot. gall., 412 (1830).

1. *E. emodi* Hook.f., Fl. Brit. Ind. 5, 250 (1887).

A prostrate annual. *Stem* 0.5-4.0 mm thick and 10-40 cm long, straggling from the root, often reddish, puberulous. *Leaves* glabrous on the upper surface, puberulous on the lower ; petiole 0.5-1.0 mm ; blade 0.8-2.0 cm \times 0.3-1.0 cm, obliquely oblong or linear-oblong, obtuse, base almost auricled on one side ; stipules linear, fimbriate. *Cyathia* axillary, solitary on dichotomously branched peduncle. *Involucre* c. 1.0 mm \times 0.7 mm, campanulate, glabrous, reddish, glands 4, each with a conspicuous, broad, white or rosy, sinuate appendage, lobes 5, fimbriate ; male flowers with hirsute bracteoles. *Capsule* 1.3-2.0 mm \times 2.0-2.5 mm, green or gray, glabrous or puberulous, cocci obtusely keeled. *Seeds* c. 1 mm \times 0.7 mm, tetragonal, rough, obtusely angled, blackish with grayish angles.

Representative specimens : Fatulla, 8.12.1965, M.N. Huda 128; *ibid.*, 6.1.1966, M.N. Huda 131 ; Tongi, 19.5.1966, M.N. Huda 162.

A common weed of cultivated land.

E. emodi resembles *E. parviflora* and *E. hirta* in the general facies and leaf shape, but can be easily distinguished by its rough black seeds with gray angles and without furrows or wrinkles.

Distribution : Hooker (1887) mentions the provenance of the species as Afghanistan and western Himalayas. It is probably recently introduced in East Pakistan.

2. *E. hirta* Linn., Sp. Pl., 454 (1753). Prain, Beng. Pl. 692 (1903) sub *E. pilulifera*.

Synonymy : *Euphorbia pilulifera* Linn. var. *hirta* (Linn.) Thellung in Ascher. & Graebn., Syn. 7, 425 (1916) ; *Euphorbia pilulifera* sensu Hook.f., Fl. Brit. Ind. 5, 250 (1887), non Linn. (1753).

An annual herb, 20-100 cm long, erect or prostrate. *Stem* 1-4 mm thick, usually branched, covered with conspicuous hispid yellowish hair. *Leaves* pubescent ; petiole 2-4 mm long ; blade 1.2-3.5 cm \times 0.5-2.0 cm, obliquely ovate or oblong, serrate, acute rarely sub-obtuse, base rounded at one side but truncate at the other, veins prominent. *Cyathia* axillary, many, pedunculate. *Involucre* 0.5-0.7 mm in length, staminate or hermaphrodite, flask-shaped, hispid, lobes fimbriate, each gland surrounded by a rounded, hyaline appendage. *Capsule* 0.7-1.0 mm \times 0.7-1.2 mm, pubescent, cocci obtusely keeled. *Seeds* 0.6-0.7 mm \times 0.2-0.3 mm, oblong, tetragonal, reddish, acute at one end, with shallow transverse furrows or wrinkles.

Representative specimens : Magbazar, 29.11.1965, M.N. Huda 127 ; Mirpur, 16.2.1966, M.N. Huda 139 ; Dhanmondi, 12.4.1966, M.N. Huda 153 ; Tongi, 19.5.1966, M.N. Huda 164.

A common weed on road side and on walls.

It can be separated by its nearly allied *E. parviflora* by its reddish seeds and smaller capsules (0.7-1.0 mm \times 0.7-1.2 mm, not 1.5-2.0 mm \times 1.5-2.0 mm).

Medicinal use : In Malaysia the latex is dropped into the eye for conjunctivitis, and used for poulticing sores and bruises on the legs (Burkill, 1935).

Distribution : Tropical and sub-tropical regions.

3. *E. parviflora* Linn., Syst. ed. 10. 2, 1047 (1759).

Synonymy : *E. hypericifolia* Linn., Sp. Pl., 454 (1753), pro parte tantum ; Hook.f., Fl. Brit. Ind. 5, 249, non 250 (1887), pro parte ; *E. hypericifolia* L. var. *parviflora*. (Linn) Prain, Beng. Pl., 692 (1903).

A slender annual, ascending or decumbent. *Stem* 0.5-2.0 mm thick, puberulous, branched. *Leaves* glabrous on the upper surface, puberulous on the lower ; petiole 1-2 mm long ; blade 0.5-2.0 cm \times 0.3-0.7 cm, obliquely broadly or narrowly oblong, entire to serrulate, subobtuse to obtuse ; stipules setaceous, lacerate. *Cyathia* axillary, pedunculate with many subulate bracts, often subtended by two floral leaves. *Involucre* 1.5-2.0 mm \times 1.0 mm, turbinate, glabrous,

bracteolate, glands with white or pale pink appendages. *Capsule* 1.5-2.0 mm × 1.5-2.0 mm, sparsely pubescent. *Seeds* 1.0-1.3 mm × 0.5-0.7 mm, gray or light brown, with a thin mucous coat and broad shallow transverse furrows or wrinkles.

Representative specimens : Fatulla, 6.1.1966, M.N. Huda 132 ; Kurmitola, 23.2.1966, M.N. Huda 145.

A weed on waste land and on walls.

While commenting on the taxonomy of *E. hypericifolia* Linn. (sensu lato), Hooker (1887) expresses his doubt in treating Linnaeus's *E. parviflora* and *E. hypericifolia* as conspecific even after a very careful examination of numerous specimens. Our plant conforms to Boissier's diagnostic characters (capsule appressed hairy) of *E. parviflora* as cited in Hooker (op.cit.). Following Santapau (1955), we have maintained the specimens M.N. Huda 132 and 145 as belonging to *E. parviflora* L. on the basis of hairy capsule.

E. parviflora is similar to *E. hirta* and *E. emodi* in habit and leaf characters. The distinguishing features of these three species are summarized below :

<i>E. hirta</i>	<i>E. parviflora</i>	<i>E. emodi</i>
Capsule 0.7-1.0 mm x 0.7-1.2 mm	Capsule 1.5-2.0 mm x 1.5-2.0 mm	Capsule 1.3-2.0 mm x 2.0-2.5 mm
Seeds reddish with transverse furrows or wrinkles	Seeds grayish with a thin mucous coat and transverse furrows or wrinkles	Seeds rough, blackish with gray margins and no transverse furrows or wrinkles

Distribution : Ceylon, Indonesia, Burma : elsewhere it is an introduced weed.

4. *E. prostrata* Ait., Hort. Kew. 2, 139 (1789). Hook. f., Fl. Brit. Ind. 5, 266 (1887) ; Santapau in Bull. Bot. Soc. Beng. 8, 16 (1955).

A prostrate annual. *Stem* c. 0.6-1.2 mm thick, branched, young ones puberulous, older glabrous. *Leaves* with petiole c. 1 mm long ; blade 4-6 mm x 2-4 mm, oblong or slightly oblong-obovate, obtuse, suboblique at the base, serrulate, glabrous or sparsely puberulous, stipules pilose, apically toothed. *Cyathia* axillary, solitary or in a group, glands with narrow whitish appendages.

Capsule 1.5-2.0 mm x 1.5-2.0 mm, acutely keeled, with stiff hairs at the angles of the cocci only. *Seeds* reddish-brown to grayish-brown, c. 1.0 mm x 0.5 mm, subquadrate, with about 5-7 shallow, transverse wrinkles.

Representative specimens : Shahjahanpur, 15.11.1965, M.N. Huda 124 ; Mirpur, 16.2.1966, M.N. Huda 141 ; Kurmitola, 23.2.1966, M.N. Huda 142 ; Tongi, 19.5.1966, M.N. Huda 163.

Mainly ruderal but also occurs on lawns. Populations with light pink stems and dark green leaves are occasionally met with separated from those with green stems and light green leaves.

E. prostrata has often been confused with *E. thymifolia* with which it resembles very closely in habit and leaf shape. The distinguishing characters of these two closely related species are summarized in the following Table :

<i>E. prostrata</i>	<i>E. thymifolia</i>
Capsules 1.5-2.0 mm x 1.5-2.0 mm, cocci acutely keeled, with stiff hairs only at the angles of the cocci.	Capsules 1.0-1.3 mm x 1.0-1.3 mm, cocci obtusely keeled, pubescent all over.
Seeds c. 1.0 mm x 0.5 mm	Seeds c. 0.6 mm x 0.4 mm

Distribution : A native of tropical America but now spread in other parts of the earth.

5. *E. thymifolia* Linn., Sp. Pl., 454 (1753). Hook.f., Fl. Brit. Ind. 5, 252 (1887) ; Prain, Beng. Pl., 692 (1903).

An annual, prostrate herb. *Stem* 0.4-1.0 mm thick, villous. *Leaves* with petiole c. 1 mm long ; blade 2-5 mm x 2-3 mm, oblong, acute to subobtusely, suboblique at the base, serrulate, villous on the under surface, glabrescent on the upper ; stipules lanceolate, hairy-fimbriate. *Cyathia* axillary, solitary or sometimes grouped, glands greenish with narrow hyaline appendages. *Capsule* 1.0-1.3 mm x 1.0-1.3 mm, hairy all over, cocci obtusely keeled. *Seeds* reddish to brown, c. 0.6 mm x 0.4 mm, subquadrate with about 5 shallow transverse wrinkles.

Representative specimens : Tejgaon, 23.11.1965, M.N. Huda 125 ; Fatulla, 6.1.1966, M.N. Huda 133 ; Mirpur, 16.2.1966, M.N. Huda 140 ; Kurmitola, 23.2.1966, M.N. Huda 144 ; Kamalapur, 7.3.1966, M.N. Huda 150.

Mainly a ruderal weed preferring rough open ground, often also occurring on wayside walls.

Medicinal use : The dried leaves and seeds are used in India and Pakistan against diarrhoea and dysentery in children.

Distribution : All warm regions with the probable exception of Australia.

Section *Poinsettia* (Grah.) Boiss. in DC., Prodr. 15 (2), 52 (1862).

6. *E. heterophylla* Linn., Sp. Pl., 453(1753). Prain, Beng. Pl., 691(1903)

Annual or perennial, erect, up to 1 m tall. *Stem* 2-4 cm thick, branched, ridged, older woody. *Leaves* alternate ; petiole 1-4 cm long, slender ; blade 2-8 cm x 1-5 cm, glabrous, often puberulent on the under surface, ovate or oblong, dentate. *Leafy bracts* elliptic or panduriform, entire or dentate, red towards the base. *Cyathia* terminal, grouped. *Involucre* 3-5 mm long, campanulate or cup-shaped, glabrous, toothed, with a solitary conspicuous circular gland, exappendiculate ; male flowers with plumose bracteoles. *Capsule* 3-4 mm x 4-5 mm, glabrous, obtusely keeled, cocci plump. *Seeds* 2-3 mm x 1.5-2.0 mm, ovate, acute, blackish, densely covered by grayish tubercles.

Representative specimens : Ramna nursery, 2.6.1966, M.N. Huda 165 ; Dacca University Botanical garden, 26.10.1965, M.N. Huda 117.

Planted in gardens as an ornamental annual, often also occurring as an escape of cultivation.

E. heterophylla is nearly allied to *E. pulcherrima* but the former is shorter in stature and its leafy bracts are red only towards the base.

Distribution : Indigenous to North America.

7. *E. pulcherrima* Willd. ex Klotzsch in Otto & Dietr., Allg. Gartenz. 2, 27 (1834).

Synonymy : *Poinsettia pulcherrima* (Willd. ex Klotzsch) R. Grah. in Edinb. N. Phil. Journ. 20, (1836).

A shrub up to 8 m tall. *Stem* branched, cylindrical, glabrous. *Leaves* with petiole 2-8 cm long, slender, curved, reddish towards the top ; blade 5-18 cm x 2-11 cm, elliptic, acuminate, puberulous on the upper surface, pubescent on the lower, margin wavy with two or more prominent teeth ; stipules brown.

glandular. *Leafy bracts* with a petiole 1-3 cm long ; blade 4-10 cm x 1-3 cm, crimson, oblanceolate, puberulous when young, at length glabrous, acuminate, base attenuate, stipulate. *Cyathia* many on stout peduncles, staminate or hermaphrodite. *Involucre* 0.7-1.0 cm x 0.5-0.7 cm, obovate truncate, glabrous, obtusely 5-lobed, with a large, conical orange gland on one side ; male flowers with plumose bracteoles. *Capsule* with 3 bifid styles. *Seeds* not found.

Representative specimens : Dacca University genetical garden, 7.11.1965, M.N. Huda 119 ; Balda garden, 10.11.1965, M.N. Huda 122 ; Ramna nursery, 10.5.1966, M.N. Huda 161.

Commonly planted as an ornamental shrub.

E. pulcherrima resembles *E. heterophylla* in general appearance ; but the former is much taller and its leafy bracts are crimson throughout.

Distribution : A native of central America.

Section **Euphorbium** Benth. in Benth. & Hook.f., Gen. 3, 260 (1880).

8. *E. antiquorum* Linn., Sp. Pl., 450 (1753). Hook.f., Fl. Brit. Ind. 5, 255 (1887) ; Prain, Beng. Pl., 691 (1903).

An erect glabrous shrub up to 3 m. tall. *Stem* woody, branches thick, fleshy, armed with stipular spines, spines 3-8 mm long ; branchlets broad, 3-6 winged. *Leaves* few, small, 3-5 mm long, deciduous, almost nerveless, shortly petiolate. *Cyathia* not seen.

Representative specimens : Ramna Park, 12.2.1966, M.N. Huda 136 ; Dacca University Botanical garden, 10.5.1966, M.N. Huda 158.

Commonly planted in gardens as an ornamental shrub, and sometimes as a hedge. A many angled dwarf form with cock's comb like branches is also occasionally grown.

Medicinal use : According to Heyne as reported by Burkill (1935), the latex of the plant is used in West Borneo as a fish poison.

Distribution : Throughout Pakistan, India and Ceylon.

9. *E. milii* Des Moul. in Bull. Bot. Hist. Nat. Soc. Linn. Bordeaux 1, 27 (1826).

Synonymy : *Euphorbia splendens* Boj. in Hook., Bot. Mag., t. 2902 (1829).

A low sprawling shrub. *Stem* branched, spiny, fleshy, up to 2 cm across ; spines up to 25 mm long, paired. *Leaves* 2.0-6.5 cm x 1.0-2.0 cm, arising between each pair of spines, obovate to oblanceolate, glabrous, entire, apiculate, attenuate at the base. *Cyathia* grouped on the ultimate branches of the dichotomous peduncle in the axils of the uppermost leaves, each cyathium being supported by two petaloid, orbicular, apiculate bracts c. 1.0 cm x 1.5 cm, glabrous, crimson on the upper surface, pale on the lower. *Involucre* c. 3 mm x 2 mm, flask-shaped, glabrous, lobes fimbriate, orange ; male flowers with pilose bracteoles. *Capsule* 1.5-3.0 mm x 1.0-2.0 mm, glabrous, concealed within the involucre, styles connate but divided at the apex. *Seeds* 2.2-2.5 mm x 1.5-2.0 mm, grayish.

Representative specimens : Dacca University Botanical garden, 26.10.1965, M.N. Huda 116; Balda garden, 10.11.1965, M.N. Huda 120 ; Ramna nursery, 12.2.1966, M.N. Huda 135.

A common ornamental pot plant.

E. milii Des Moul. is supposed to differ from *E. bojeri* Hook. in the length of leaves and structure of spines. According to Boissier (1862) *E. splendens* Boj. (*E. milii* Des Moul.) has leaves often 50 mm long where as those of *E. bojeri* are only 14-20 mm long ; and (fide Pax and Hoffman, 1931) the spines in the former species arise from expanded bases while those of the latter species lack such structures. The available material at Dacca shows that the leaf size varies from 20-65 mm even on the same plant and the older spines of almost all plants examined have expanded bases irrespective of leaf size. The status of these two taxa needs further investigation.

Distribution : A native of Madagascar.

10. *E. neriifolia* Linn., Sp. Pl. 451 (1753). Hook f., Fl. Brit. Ind. 5, 255 (1887) ; Prain, Beng. Pl., 691 (1903) ; Benth., Trees of Calcutta, 369 (1946).

A small, fleshy, glabrous tree up to 10 m tall. *Stem* 10-25 cm in diameter ; branches ridged, tubercles of spines spirally arranged, a pair of spines arising from each tubercle. *Leaves* 10-26 cm long, fleshy, obovate to oblanceolate, entire, glabrous, apex rounded, often apiculate, deciduous ; stipular spines 0.5-1.2 cm long. *Cyathia* in groups of threes from the sinuses of tubercles, yellowish, peduncled. *Involucre* c. 1 cm across, flask-shaped, staminate or hermaphrodite, glabrous ; glands greenish, without appendages ; male flowers with plumose bracteoles. *Capsule* enclosed in the involucre, stigma capitate. *Seeds* not found.

Representative specimens : C. & B. nursery, 12.2.1966, M.N. Huda 138 ; Balda Garden, 29.2.1966, M.N. Huda 147 ; Dacca University Botanical garden, 10.3.1966, M.N. Huda 160.

Occasionally planted in the gardens.

E. neritifolia is often mistaken for its nearly related *E. nivulia* from which, however, it differs by its ridged stem, spirally arranged tubercles, and spines usually borne on elevated tubercles.

Medicinal use : The juice of the heated or pounded leaves is poured into the ear as a remedy for ear ache.

Distribution : Indigenous to India and Pakistan.

11. *E. nivulia* Buch.-Ham. in Trans. Linn. Soc. 14, 286 (1825). Hook.f., Fl. Brit. Ind. 5, 255 (1887) ; Prain, Beng. Pl., 691 (1903) ; Benthall, Trees of Calcutta, 368 (1946).

A fleshy glabrous tree up to 20 m high. *Stem* subcylindrical or cylindrical, without ribs or angles, tubercles more or less vertical, each bearing a pair of sharp stipular spines. *Leaves* 10-30 cm x 4-10 cm, fleshy, oblanceolate, entire, glabrous, obtuse, deciduous ; stipular spines 0.5-1.0 cm long, borne on tubercles. *Cyathia* not seen.

Representative specimen : Balda garden, 29.2.1966, M.N. Huda 146. Occasionally planted.

This species can be easily separated from its nearest ally *E. neritifolia* by its almost cylindrical, ribless stem (not ridged) and by almost vertically arranged tubercles (not spiral).

Distribution : Indigenous to India and Pakistan.

12. *E. tirucalli* Linn., Sp. Pl., 452 (1753). Hook.f., Fl. Brit. Ind. 5, 254 (1887) ; Prain, Beng. Pl., 691 (1903) ; Santapau in Bull. Bot. Soc. Beng. 8, 5 (1955).

A large shrub or small tree up to 10 m high. *Stem* green, cylindrical, unarmed, densely branched above. *Leaves* none or few, small, 0.5-1.5 cm long, linear-oblong, obtuse, flaccid, glabrous, deciduous. *Cyathia* not found.

Representative specimens : Ramna Park, 12.2.1966, M.N. Huda 137 ; Balda garden, 29.2.1966, M.N. Huda 148 ; Dhanmondi, 12.4.1966, M.N. Huda 152 ; F.H.M. Hall garden, 10.5.1966, M.N. Huda 159.

Often planted as a hedge or a wind-break. The latex is capable of producing rubber, but contains too much resin to be of any real value (White, Dyer & Sloane, 1941).

Distribution : A native of tropical Africa and South Africa. According to White *et al.* (loc. cit.) this species was first mentioned and figured by Hendrik Adriaan van Rheede in his *Hortus Malabaricus* (1679) from which it appears that it was probably introduced into India by Portugese travellers and might have been already in general use as a hedge plant in Malabar in the latter half of the seventeenth century.

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