

**FLORA
OF
BANGLADESH**

NO. 3

**OCHNACEAE, TURNERACEAE,
FUMARIACEAE, TROPAEOLACEAE
AND FLAGELLARIACEAE**

EDITOR

M. SALAR KHAN
Department of Botany
University of Dacca

April 1975

By

Md. Salar Khan
Associate Professor of Botany
University of Dacca

And

Ahmed Mozaharul Huq
Senior Scientific Officer
Bangladesh National Herbarium

**BANGLADESH NATIONAL HERBARIUM
MINISTRY OF ENVIRONMENT AND FOREST
GOVT. OF THE PEOPLE'S REPUBLIC OF BANGLADESH**

FLORA OF BANGLADESH

NO. 3

OCHNACEAE, TURNERACEAE,
FUMARIACEAE, TROPAEOLACEAE AND
FLAGELLARIACEAE

EDITOR

M. SALAR KHAN

Department of Botany
University of Dacca.

April 1975
Reprinted : May 2007

By

Md. Salar Khan

Associate Professor of Botany
University of Dacca

And

Ahmed Mozaharul Huq

Senior Scientific Officer
Bangladesh National Herbarium

BANGLADESH NATIONAL HERBARIUM
MINISTRY OF ENVIRONMENT AND FOREST
GOVT. OF THE PEOPLE'S REPUBLIC OF BANGLADESH

**FLORA
OF
BANGLADESH**

NO - 3*

**(OCHNACEAE, TURNERACEAE, FUMARIACEAE
TROPAEOLACEAE AND FLAGELLARIACEAE)**

OCHNACEAE

Low trees or shrubs with watery juice, very rarely undershrubs or herbs. *Leaves* simple (rarely pinnate), mostly alternate, stipulate, generally coriaceous, smooth and shining. *Flowers* in axillary racemes or in panicles, sometimes in axillary dichasia, occasionally umbellate or in fascicles, very rarely axillary, solitary, regular, hermaphrodite, conspicuous; *sepals* 5 (sometimes 5 to 10), imbricate or contorted, distinct or basally connate; *petals* usually 5 (rarely 4 or 10), contorted or imbricate; disc present, often enlarged in the fruiting stage; *stamens* 4-10 or numerous, shorter than petals, free, inserted on the disc, occasionally some reduced to staminodes, filaments persistent, occasionally borne on elongated androphore, anthers basifixed, often deciduous, dehiscence longitudinal or by terminal pores; *carpels* 1-10, sometimes up to 15, ovary entire or deeply lobed, 1-10 locular, occasionally 15 locular, or carpels free below with a common style, stigmas 1-5, ovules 1-many on axile or parietal often intrusive placentae (a single ascending ovule in each locule or carpel in *Ochna* and *Ouratea*). *Fruit* drupaceous or baccate, usually borne on enlarged disc, carpels separating into 1-4 seeded fruitlets, or fruit 1-5 celled capsule with septicial dehiscence. *Seed* solitary to numerous in each fruit or fruitlet, with or without endosperm, embryo usually straight.

* The first two issues of this series were published during October, 1972, and April, 1973 respectively by the Ministry of Forests, Fisheries, and Livestock, Bangladesh. The first number included families, *Casuarinaceae*, *Phytolaccaceae*, *Hydrophyllaceae*, *Martyniaceae*, and *Caricaceae*. The families described in the second issue were *Moringaceae*, *Polemoniaceae*, *Pedaliaceae*, *Basellaceae*, and *Butomaceae*.

28 genera and 400 species (Melchior, 1964) widely distributed in the tropics of both hemispheres but chiefly centred in Brazil. The largest genus *Ochna* occurs mostly in tropical Africa and Asia.

OCHNA Linn., Sp. Pl., 732 (1753).

Small subdeciduous trees or shrubs bearing annulate branchlets with scars of bud scales. *Leaves* serrate. *Flowers* conspicuous, yellow; *stamens* numerous with more or less persistent filaments; *carpels* 3-15, free, uniting above in a central common style, stigma more or less capitellate, ovule solitary in each carpel; disc more or less elongated or conical becoming thick and fleshy in fruit bearing the fruitlets.

A genus of about 95 species distributed in the tropics of the Old World of which only two are found in Bangladesh.

Key to Species

1. Anthers about twice longer than the filaments; sepals generally erect at the fruiting stage *squarrosa*
- Anthers shorter than or only slightly longer than the filaments; sepals generally reflexed at the fruiting stage *wallichii*

Ochna squarrosa Linn., Sp. Pl., 732 (1753). Hook. f., Fl. Brit. Ind. 1, 523 (1875); Prain, Beng. Pl., 214 (1903)-reprint (1963); Kanjilal *et al.*, Fl. Assam 1, 219 (1936); Benthall, Trees of Calcutta, 97 (1946). Pl. I.

Glabrous tree, 5-7 m tall. *Leaves* 15-20 × 2.5-5.0 cm, lanceolate or oblanceolate or elliptic, acute, acuminate or mucronate, finely serrate to serrulate, narrowed into a short petiole up to 3 cm long, base often unequal, stipules very minute, subulate. *Flowers* in axillary panicles, sometimes in racemes, rarely solitary, fragrant, orange-yellow, pedicel up to 3.5 cm long or more; *sepals* 5, up to 2.5 × 0.7 cm, lanceolate, imbricate or contorted, persistent, coriaceous, free or slightly united at the base, brown or deep purple; *petals* usually 5, the number varying up to 12, c. 2.6 × 1.0 cm, usually clawed, imbricate or contorted, membranous, deciduous; *stamens* numerous, free, filaments inserted on the prominent disc, persistent, anthers oblong, about twice longer than the filaments, basifixed, dehiscence longitudinal or by terminal pores; *carpels* 3-10, free, uniting above in a common style c. 1.8 cm long, and placed on a more or less elongated conical disc, ovule solitary in each carpel, ascending, stigma capitellate. *Fruit* of 5-10 drupes, c. 1 cm long, free, oblong to sub-spherical, brownish, seated on the succulent enlarged disc and surrounded by the persistent erect coriaceous sepals. *Seed* 1, c. 5.5 × 3.0 mm, more or less oblong, slightly reticulated. *Flowering period*: February to May.

Dacca District: Dacca University botanic garden, 15.4.1946, S. K. Sen, 25.4.1968, Paritosh 77, 7.2.1953, Mohammad Shahjahan, 27.3.1973, A. M. Huq 893; Savar 12.5.1968, Md. Akram Hossain 122.

The leaves generally fall in the cold weather and are replaced in February and March by the reddish-brown new foliage which makes a beautiful contrast with the orange-yellow flowers that are delicately scented.

The bark is used as a digestive tonic, and the leaves in dressing the wounds. The wood is made into walking sticks.

O. squarrosa is a native of peninsular India, Assam, Burma, and Ceylon. In Bangladesh, it is occasionally planted in gardens.

Ochna wallichii Planch, in Hook., Lond. Journ. Bot. 5, 650 (1846). Hook. f., Fl. Brit. Ind. 1, 525 (1875); Kanjilal *et al.*, Fl. Assam 1, 219 (1936). Pl. II.

Small deciduous trees or shrubs, glabrous with dark brown bark marked by annulate leaf scars. *Leaves* 10-25 cm long, lanceolate to oblong, acute to shortly acuminate, often cuspidate, serrate or serrulate, coriaceous, lateral nerves 15-19 or more on either half, nervules indistinct, stipules minute, subulate, subequal. *Flowers* in loose axillary panicles or in few flowered corymbs mostly at the ends of the short lateral branches, pedicel 1.5-3.0 cm long or more, jointed near the base; *sepals* 5, up to 2 cm long or more, persistent, deep brown, ovate to lanceolate or oblong, obtuse, imbricate; *petals* 5, 2.3-2.5 cm long or little more, obovate, usually clawed, imbricate, generally deciduous; *stamens* numerous, inserted on the persistent enlarged disc, filaments persistent, anthers bilobed, basifixed, oblong, equaling or only a little longer than the filaments; *carpels* 3-10, free below, united above into a common style greatly exceeding the stamens, stigma capitellate. *Fruit* of 3-6 drupes, c. 1 cm long, surrounded by the persistent, oblong to suborbicular sepals which remain reflexed at maturity. *Seed* 1, c. 7.5 × 6 mm, subspherical, reticulated.

Dacca district: Dacca, Ramna, 20.3.1964, Din Mohammad 250, Minto road, A. F. Mohammad 114.

Chittagong district: Cox's Bazar, Ramu, 26.3.1973, M. S. Khan 2928.

Sylhet district: Sylhet, near T. B. Hospital, 21.5.1968, Sudhangsu 27, Amalendu 158, Gulnehar Hamid 127.

TURNERACEAE

Herbs, shrubs or rarely trees. *Leaves* simple, alternate, entire or lobed, usually exstipulate or minutely stipulate, serrate or pinnately lobed, leaf base 2-glandular. *Flowers* usually 2-bracteolate, solitary, axillary, or rarely few, fasciculate, bisexual, peduncle often articulate, sometimes adnate to the petiole; *sepals* 5-fid, arising on the rim of the hypanthium, imbricate, deciduous; *petals* 5, inserted at the throat of the hypanthium, distinct, clawed, contorted in bud, membranous, sometimes with fimbriate scale; *stamens* 5, usually adnate to the hypanthium opposite the sepals, perigynous or rarely hypogynous, filaments free, anthers 2-celled, oblong with longitudinal dehiscence; *carpels* 3, ovary 1-locular with 3-numerous ovules on 3 parietal placentae; styles 3, terminal, filiform, stigmas simple or 3-many fid, fringed or flabellate. *Fruit* a loculicidal capsule with many seeds, rarely 3-seeded, opening by 3 valves. *Seed* arillate, pitted, oblong, cylindrical, slightly curved, endosperm fleshy or bony, embryo large, straight.

8 genera and about 120 species chiefly in tropical Africa and America with a few of pantropic distribution. The family is represented in Bangladesh by a solitary genus, *Turnera*.

TURNERA Linn., Sp. Pl., 271 (1753).

The largest genus of the family having about 100 species mostly in America and one in Africa and Asia. The only species, *T. ulmifolia* of tropical south America, is naturalized in Bangladesh.

Turnera ulmifolia Linn., Sp. Pl., 271 (1753). Prain, Beng. Pl., 371 (1903) - reprint (1963). Pl. III.

English: West Indian Holly, Sage rose.

An undershrub or shrub, branching mostly upwards, often hairy. *Leaves* up to 8 cm long, simple, exstipulate, alternate, lanceolate, young leaves tomentose, older glabrescent, short petioled, lamina serrate, usually 2-glandular at the two sides of the leaf base, glands sessile, circular, yellowish-brown, darker in the centre. *Flower* up to 4 cm long, complete, bisexual, solitary, axillary, peduncle often adnate to the petiole; *sepals* 5, up to 2.5 mm long, densely pubescent, linear or oblong, deciduous; *petals* 5, up to 3.5 cm long, yellow; *stamens* 5, c. 18 mm long from the point of attachment, filaments slender, equal in length, anther c. 4 mm long, 2-celled, dorsifixed, oblong with slightly attenuate tip, curved; *carpels* 3, connate in a 1-celled ovary with numerous ovules on 3 parietal placentae, style 3, c. 16 mm long, terminal, quite free, filiform, stigma fringed or flabellately 3-5 or more fid. *Fruit* c. 8 mm long, hirsute, ovoid or oblong, many seeded capsule, opening by 3 valves. *Seeds* c. 2.5 mm long, numerous, oblong or cylindrical,

slightly curved, greyish with fine pits in longitudinal rows, aril membranous, endosperm fleshy with straight embryo. *Flowering period*: During cold weather.

Kushtia district: Kushtia, near Government college, 5.2.1973, Moula Baksha & S. Alam 14.

Rajshahi district: Puthia near Rajbari, 8.2.1973, A. M. Huq 853.

Khulna district: Bagerhat, 12.6.1974, Khan & Huq (K. 3955).

T. ulmifolia is planted near the Hindu temples, and also occurs as a garden escape.

FUMARIACEAE

Annual or perennial herbs often with watery juice. *Stem* branched, glabrous, brittle, often scandent by the help of petioles and divided leaves. *Leaves* alternate or subopposite, sometimes radical, exstipulate, usually much divided into narrow segments. *Flowers* small, borne in terminal or leaf-opposed racemes, transversely zygomorphic, hermaphrodite; *sepals* 2, scale-like, caducous; *petals* 4 in 2 whorls, the outer of 2 larger with one or both gibbous or spurred more or less completely enclosing the rest of the flower, while the 2 inner smaller, erect, always similar, narrower, coherent at the tips; *stamens* usually 6, diadelphous, usually opposite to the outer petals, the central anthers of each bundle 2-celled and the remaining anthers 1-celled, dehiscence longitudinal or lateral; *carpels* 2, ovary superior, 1-locular with 2 to many ovules on 2 parietal placentae of which one may be sterile bearing solitary ovule (*Fumaria*), style long or short, stigma entire or bifid, stigmatic surfaces 2, 4 or 8. *Fruit* indehiscent, 1-seeded nut (*Fumaria*) or a transversely septate capsule dehiscing by valves. *Seed* small, sometimes strophiolate, albuminous with minute embryo.

19 genera and about 425 species distributed mostly in temperate Eurasia but also in south Africa, north America, and the Mediterranean region. Only one genus, *Fumaria* occurs in Bangladesh.

FUMARIA Tourn. *ex* Linn., Sp., Pl., 699 (1753),
Gen. Pl. ed. 5, 314 (1755).

The genus can be readily distinguished from the rest of the family by the following characters: a) the outer petals forming a tube and one of them gibbous at base, b) the gibbous petal developed into a sac like spur at its base, and c) fruit an indehiscent 1-seeded nut.

About 50 species usually agrarian weeds of the temperate regions of the Old World. Only one species, *F. parviflora* is an introduced weed in Bangladesh.

Most European authors including Rendle (1930), and Engler and Diels (1956) regarded *Fumariaceae* as a subfamily of *Papaveraceae*. Rendle separated the Fumaroideae from the Papaveroideae and the Hypecoideae by the marked dissimilarity between the two whorls of petals, the saccate or spur-like development at the base of one or occasionally both of the outer petals, the presence of two tripartite stamens in the transverse plane, and by the presence of oil sacs instead of latex. Hutchinson (1959) maintained *Fumariaceae* as a separate family but included with it the Hypecoideae. The present treatment follows Lawrence (1951) who excludes the Hypecoideae from the *Fumariaceae* which are distinguished by zygomorphic corolla with partially connate petals and distinctive androecium of six stamens.

Fumaria parviflora Lamk., Encyc. 2, 567. Hook. f., Fl. Brit. Ind. 1, 120 (1872); Prain, Beng. Pl. 1, 142 (1903)-reprint (1963); Kanjilal *et al.*, Fl. Assam 1 (1), 66 (1934). Pl. IV.

Glabrous annuals up to 50 cm tall with watery juice, branches angled or sulcate. *Leaves* much divided or dissected, segments very narrow, 2.5-5.0 cm long. *Flowers* 4.5-6.0 mm long, transversely zygomorphic, white or rose with purplish tips, bracts c. 2 mm long, subulate, persistent; *sepals* 2, scarious, lanceolate, caducous; *petals* 4, 2-seriate, imbricate, erect, outer 2 dissimilar, one flat or concave, the other gibbous and spurred at the base, the two inner similar, keeled, cohering at tips over the anthers; *stamens* 6, 3.0-3.5 mm long, diadelphous, each bundle opposite the outer petal, tripartite at the apex, filaments in each bundle wider at bases, the central anther 2-celled and the two laterals 1-celled, dehiscence longitudinal or lateral; *carpels* 2, connate in a 1-celled superior ovary with usually one fertile placenta bearing 1 or 2 ovules attached to the base of the placenta, style filiform, more or less equal to the length of stamens, stigma usually bifid. *Fruit* 2.5-3.0 × 3.0-3.2 mm, a globose nut with slightly flattened top, stalked, rugulose when dry. *Seed* 1, c. 2.0 × 1.5 mm. *Flowering period*: November-June. *Chromosome number*: 2n = 28 (Darlington & Wylie, 1955).

Dacca district: Dacca, Tejgaon, 12.1.1954 and 20.1.1954, Sukhdeo, Paltan, March 1939, Chatterjee and Sen.

Barisal district: Basudebpur, 9.1.1963, S. K. Dutta.

Chittagong Hill Tracts: Kaptai, near barrage, 28.5.1972, Abdul Aziz 108.

Rajshahi district: near Taherpur, 8.2.1973, A. M. Huq 835; Naogaon, Patnitola, 10.2.1973, A. M. Huq 861; Rajshahi-Natore, Beharipara, 5.2.1973, A. M. Huq 756; Meherhandi, 17.4.1970, Salma Hossain 72; Rajshahi University campus, 8.11.1968, E. Begum 30; Chagati, 4.2.1961, P. Sarma; Narayankandi, 4.3.1967, M.S. Khan 1473.

Fumaria parviflora is a weed of cultivated land in Bangladesh almost always associated with the mustard crops. According to Mason as reported by Ridley (1930) crows eat the fruits of this species and help in its dispersal.

TROPAEOLACEAE*

Succulent herbs with watery sap, annuals or sometimes perennials by the presence of tubers, mostly prostrate, twining, frequently climbing with the sensitive petioles. *Leaves* simple, sometimes pinnately compound, alternate, or lower opposite, exstipulate, commonly peltate, sometimes lobed to divided or dissected, petioles very long, slender, often sensitive to contact twisting round objects and thus enabling the plant to climb. *Flowers* solitary, axillary, often in umbels, long pedicelled, zygomorphic, showy, spurred, usually orange or yellow, rarely purple or blue (but the garden forms showing a great range of colour); *sepals* 5, connate at the bases, imbricate or valvate, petaloid, bilabiate, the dorsal one produced into a spur; *petals* 5, rarely fewer by abortion, imbricate, usually clawed, the posterior 2 exterior and somewhat different from the anterior 3 petals which have the margins of claws ciliate, slightly perigynous, entire or undulate; *stamens* 8, in two whorls of four each, one row on each side of the ovary (the median one from each whorl being suppressed), unequal, free, anthers bilobed, declinate, dehiscence longitudinal; *carpels* 3, ovary 3-lobed, 3-loculed, each locule with a single pendulous ovule from axile placentation, style 1, simple, stigmas 3, linear. *Fruit* a 3-seeded schizocarp (3-winged in *Magallana*) which divides into 3, 1-seeded, rugose fruitlets which separate from the short axis and remain indehiscent. *Seeds* non-endospermic with straight embryo and fleshy cotyledons.

The family contains 2 genera, *Tropaeolum* and *Magallana*, the latter having only one species, *M. porifolia* native to Patagonia (south Argentina). In Bangladesh, the family is represented by *Tropaeolum* only.

TROPAEOLUM Linn., Sp. Pl., 345 (1753).

About 80 species chiefly distributed on the mountains of Mexico and Andes as far south as Chile, and also in south Brazil. *T. majus* Linn. is the only species that is commonly grown as an ornamental plant in Bangladesh.

Tropaeolum majus Linn., Sp. Pl., 345 (1753). Pl. V.

English: Common nasturtium of the gardens, Indian cress.

Stems branched from the base, frequently climbing with the sensitive leaf stalks. *Leaves* with petiole up to 20 cm long or more, peltate, orbicular, petiole base wide at the union with the succulent stem, lamina 6-7 cm across or more. *Flowers* with pedicels 20 cm or more showing various shades of orange, yellow or purple; *sepals* 5, 9-13 mm long, connate at the bases, usually petaloid, posterior sepal produced below into a long pointed

* The family *Tropaeolaceae* previously included in *Geraniaceae* is now accepted by most authors as a distinct family from the latter on the characters of free stamens and the absence of beak at the top of the mature fruit.

spur c. 2.5 cm long; *petals* 5, c. 2.5 cm long, oblanceolate to suborbicular, entire or undulate, the anterior 3 smaller and usually clawed with ciliate margins at the bases of the claws, while the 2 posterior being perigynous and larger, situated and attached to the base of the spur; *stamens* 8 in two rows of four, situated on each side of the ovary, free, unequal in length but usually from 8-12 mm, anther 2-celled, c. 3 mm long, oblong, basifixed, opening lengthwise; *ovary* 3-lobed, 3 loculed, each locule containing 1 pendulous ovule on axile placentation, style apical, simple, with 3 unequal linear stigmas. *Fruit* a 3-seeded schizocarp with no beak, each of which separating from the short axis and remaining indehiscent, mericarps rugose, grey. *Seed* c. 10 × 5 mm, nonendospermic with straight embryo. *Flowering period*: January to May. *Chromosome number*: $2n = 28$ (Darlington & Wylie, 1955).

Dacca district: Dacca University botanic garden, 24.2.1973, A. M. Huq 885, 23.1.1947, S. K. Sen, 15.1.1952, Sukhdeo; Dacca, Curzon hall area, 19.5.1970, M. A. Rahman 128.

The species is a native of Peru and is one of the most popular hardy annuals cultivated as a decorative plant in window-boxes, pots and on borders. It has been in cultivation in Europe since 1684 (Bailey, 1950). There is a great range of horticultural colour and habit forms, probably the result of hybridization between the various species. The leaves and flowers have been used in salads, and the young green fruits pickled (Bailey, 1950; Syngé, 1956). The use of the peppery tasting leaves in salads like the leaves of cress has given rise to the name 'Indian cress'.

FLAGELLARIACEAE

Erect or scandent shrubs, sometimes climbing by means of leaf-tip tendrils. *Leaves* often long, many nerved, plicate, leaf base sheathing, closed, leaf apex sometimes ending in a tendril. *Flowers* small, in terminal panicles, regular, bisexual or unisexual (by non development of anthers), plants being monoecious or dioecious. *Perianth* 6 in 2 whorls, dull grey, segments free, imbricate, more or less persistent; *stamens* usually 6, sometimes less or absent, filaments free, fertile or sterile, anthers 2-locular, introrse, dehiscence longitudinal; *carpels* 3, connate in a 3-celled superior ovary, ovule solitary in each cell, spreading or pendulous from the central axis, style very short, divided near to the base into 3 or more linear and papillose stigmatic arms. *Fruit* indehiscent, berry or drupe with 1-3 pyrenes. *Seeds* with copious endosperm and small embryo.

3 genera and about 10 species of tropics and subtropics of the Old World. In Bangladesh, the family is represented by only one genus, *Flagellaria*.

FLAGELLARIA Linn., Sp. Pl., 333 (1753).

3 species distributed from tropical Africa and Asia, extending eastwards through Formosa, tropical Australia up to Fiji and Samoa islands. Only one species occurs in Bangladesh.

Flagellaria indica Linn., Sp. Pl., 533 (1753). Hook. f., Fl. Birt. Ind. 6, 390 (1892); Prain, Beng. Pl. 818 (1903) - reprint (1963). Pl. VI.

A glabrous climbing shrub with long slender stems. *Leaves* up to 30 cm long, lanceolate with many parallel nerves and cirrhose tips, leaf sheath c. 4 cm long, closed, and tightly adpressed to the stem. *Flowers* with scarious bracts, brownish at apices, sessile, 5-many in terminal panicles, bisexual or unisexual (by non development of anthers); *perianth* 6 in two whorls, c. 3 mm long, dull grey, imbricate, subcoriaceous, lanceolate to oblong; *stamens* normally 6, hypogynous, c. 3 mm in bisexual flowers, all fertile, anthers subsessile, oblong, bilobed, dehiscence longitudinal, occasionally 4-6 stamens sterile (rarely sterile stamens 9), sterile stamens (antherless) c. 5 mm long, linear, equal or unequal in length; *carpels* 3, connate in a 3-celled superior ovary, ovule solitary on axile placenta, style divided near to the base, stigmatic arms c. 2 mm long, 3-5, rarely 7 (when sterile stamens 9), papillose. *Fruit* a small globose or ovoid drupe, 1-2 seeded. *Seeds* globose or ovoid, testa membranous, endosperm thick, embryo small. *Flowering period*: At the end of cold season.

Chittagong district: Teknaf, 26.10.1965, M.S. Khan 619 (sterile).

Noakhali district: Sonapur, 28.3.1951, Belayet Hossain Chowdhury.

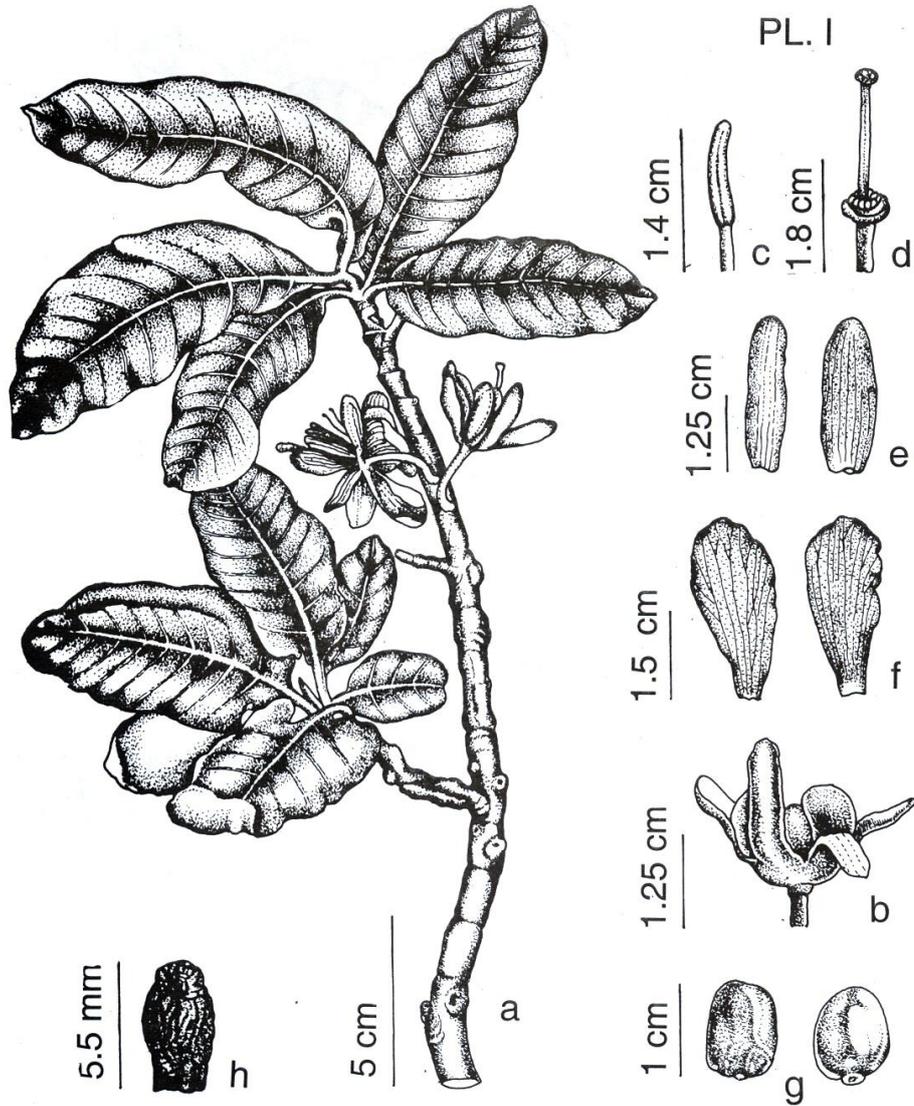
Patuakhali district: Bauphal thana, Indrakul, 12.3.1973, Khan & Huq (K. 2117), 16.3.1973, Khan & Huq (K. 2864).

Acknowledgements

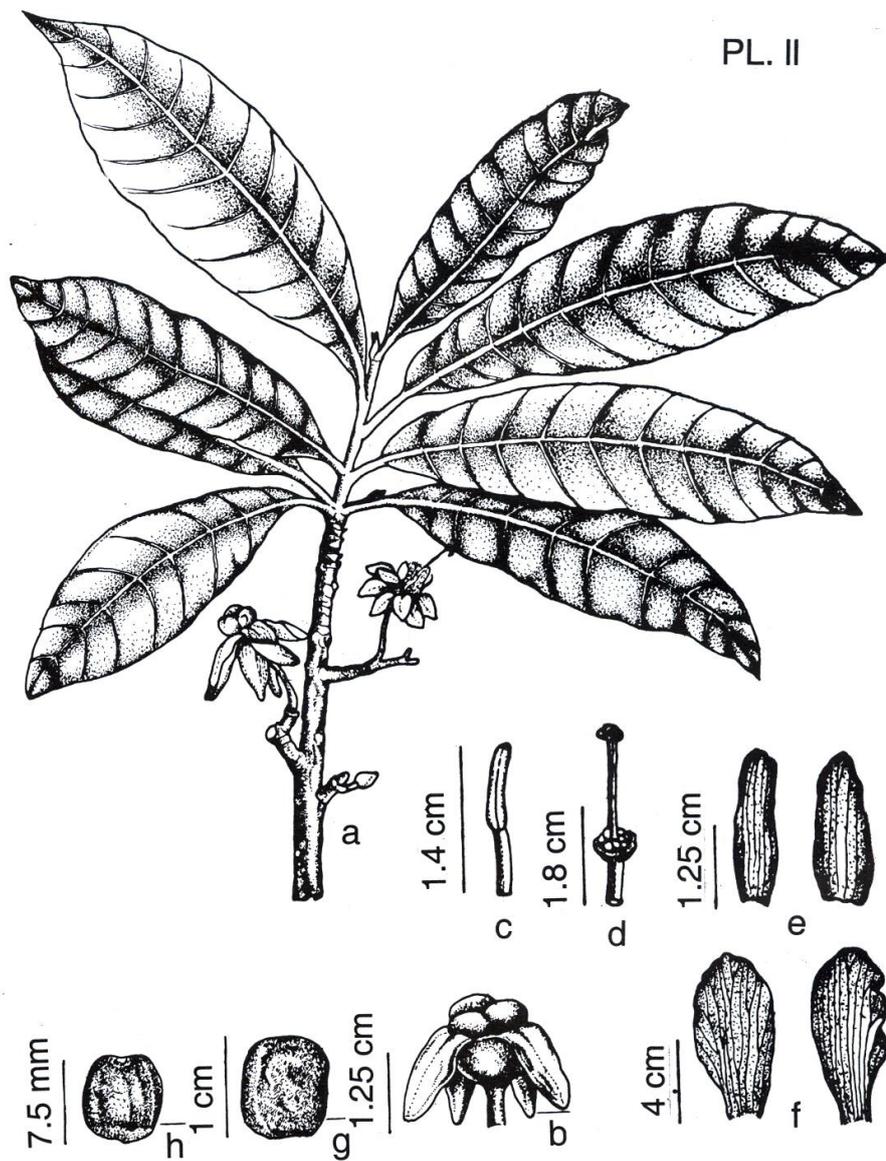
The authors would like to express their thanks to the Bangladesh Agricultural Research Council for their generous grant without which the publication of the present series could not have been resumed. We are also indebted to Mr. B. L. Burtt of the Royal Botanic Garden, Edinburgh for criticism on the style and contents of this series.

References

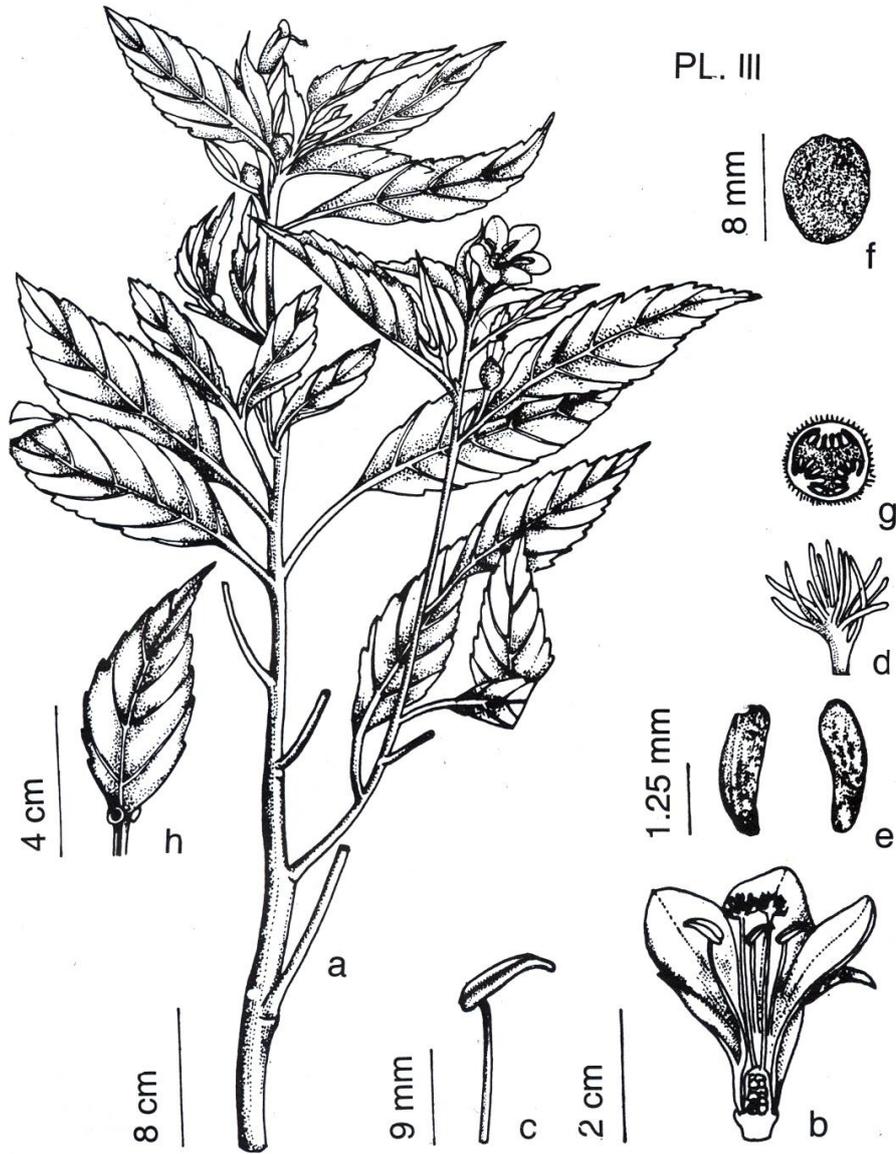
- Bailey, L. H. (1950). *The standard cyclopedia of horticulture*. Vols. 1-3 (U.S.A.) - enlarged edition.
- Darlington, C. D. & A. P. Wylie (1955). *Chromosome atlas of flowering plants*. 2nd ed. (London).
- Engler, A. & L. Diels (1936). *Syllabus Der Pflanzenfamilien*. 11th ed. (Berlin).
- Hutchinson, J. (1939). *The families of flowering plants*. Vols. 1 & 2 (Oxford).
- Lawrence, G.H.M. (1955). *Taxonomy of flowering plants*. (New York).
- Melchior, In: Engler, A. (1964). *Syllabus Der Pflanzenfamilien Band II*, 161-162, 181, 328 (Berlin-Dahlem).
- Rendle, A. B. (1930). *The classification of flowering plants*. Vol. 1. ed. 2 (reprint-1953). (Cambridge).
- Ridley, H. N. (1930). *The dispersal of plants throughout the world*. (Ashford, Kent).
- Synge, P. M. (1956). *The Royal Horticultural Society Dictionary of Gardening*. ed. 2 Vol. III. (Oxford).



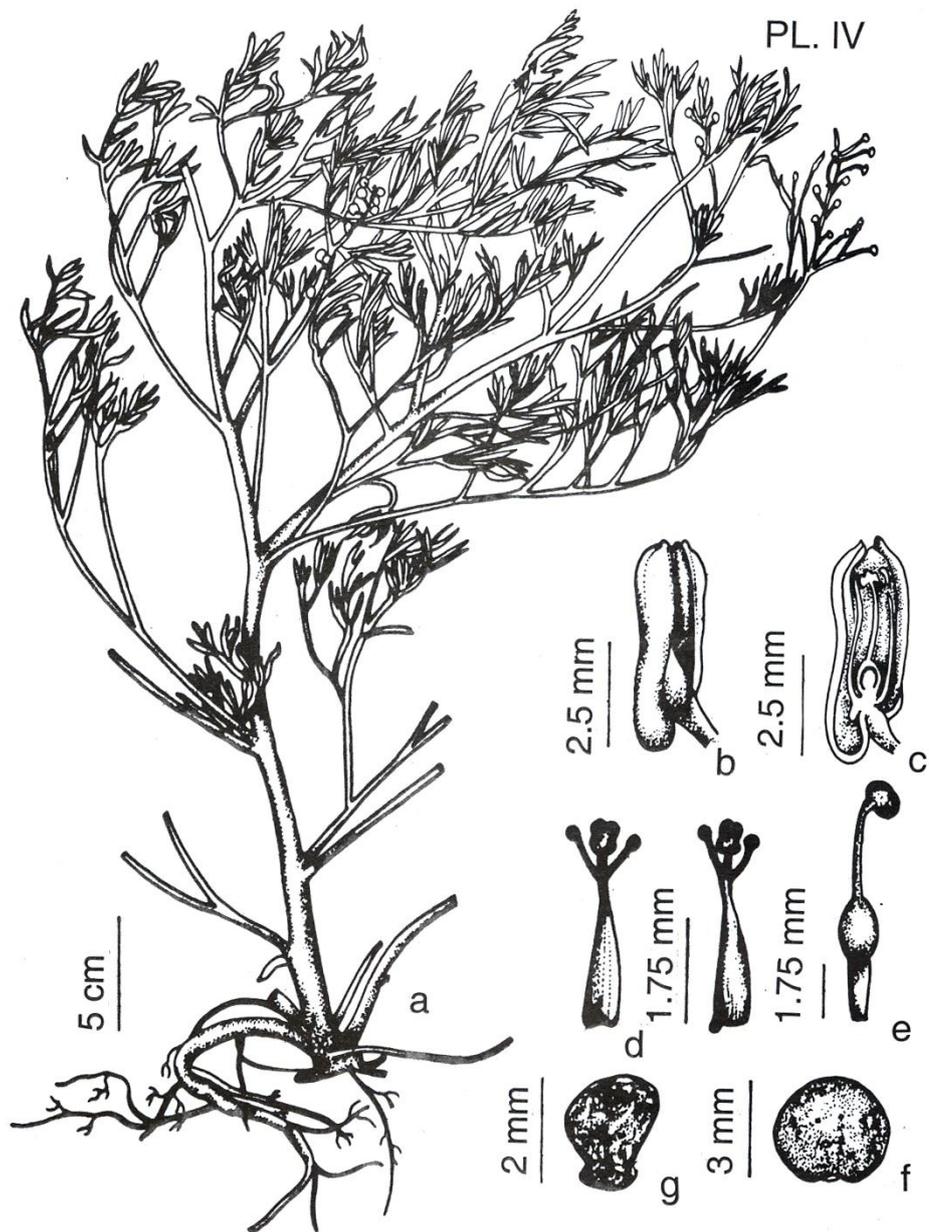
Pl. I. *Ochna squarrosa* Linn. a) A twig; b) a fruit with persistent sepals; c) a stamen; d) gynoecium; e) two sepals; f) two petals; g) two drupes; h) a seed.



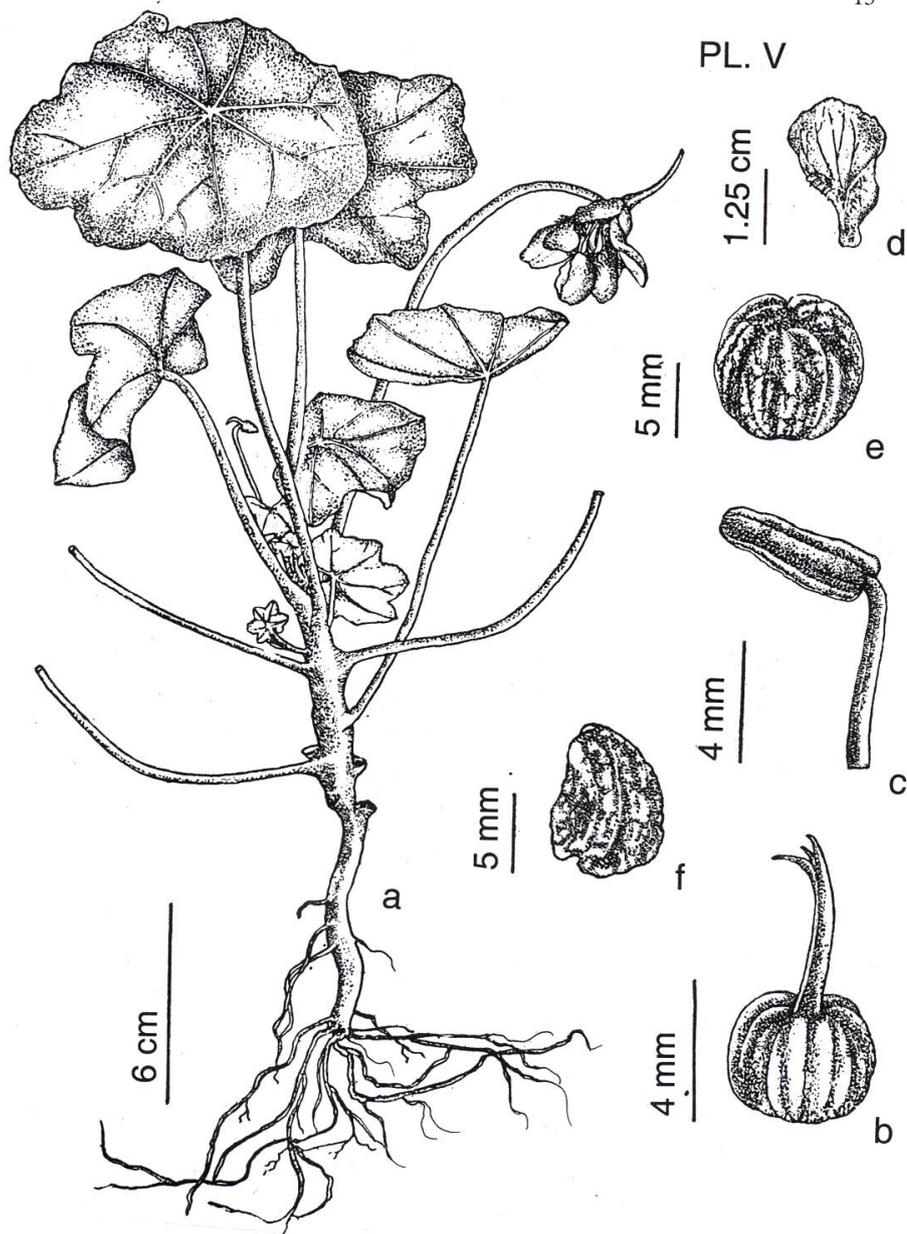
Pl. II. *Ochna wallichii* Planch. a) A twig; b) a fruit with persistent sepals; c) a stamen; d) gynoecium; e) two sepals; f) two petals; g) a drupe; h) a seed.



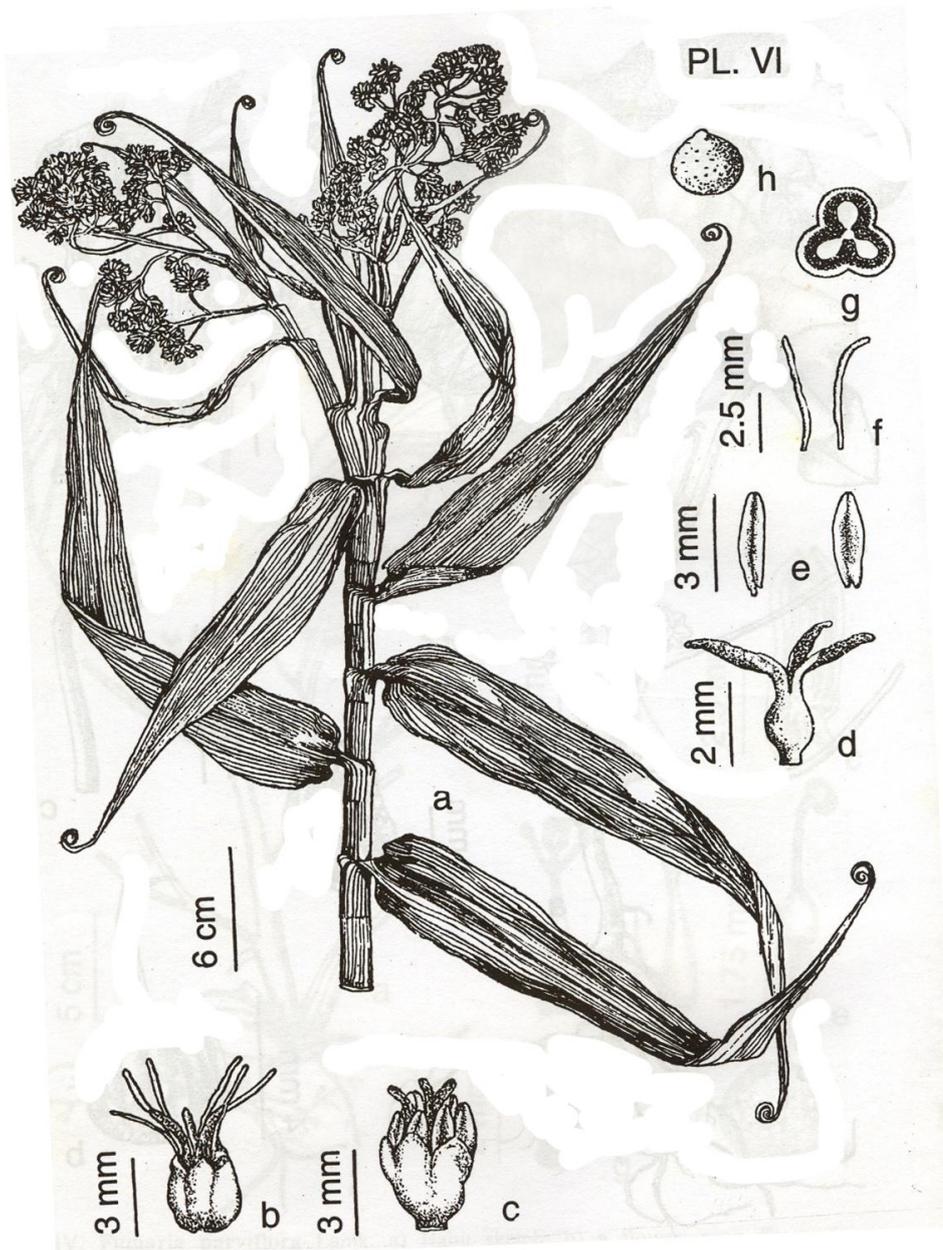
Pl. III. *Turnera ulmifolia* Linn. a) A flowering branch; b) a flower in longitudinal section; c) a stamen; d) stigma; e) two seeds; f) a fruit; g) ovary in cross section; h) a leaf showing 2 glands at leaf base.



Pl. IV. *Fumaria parviflora* Lamk. a) Habit sketch; b) a flower; c) a flower in longitudinal section; d) androecium showing two tripartite bundles; e) gynoecium; f) a fruit; g) a seed.



Pl. V. *Tropaeolum majus* Linn. a) Habit sketch; b) gynoecium; c) a stamen; d) one of the three anterior petals; e) a fruit; f) a seed.



Pl. VI. **Flagellaria indica** Linn. a) A flowering branch; b) a unisexual flower; c) a bisexual flower; d) gynoecium; e) two fertile stamens; f) two sterile (anther-less) stamens; g) ovary in cross section; h) a fruit.

LIST OF FAMILIES PUBLISHED

	Flora No.
Basellaceae	2
Butomaceae	2
Caricaceae	1
Casuarinaceae	1
Flagellariaceae	3
Fumariaceae	3
Hydrophyllaceae	1
Martyniaceae	1
Moringaceae	2
Ochnaceae	3
Pedaliaceae	2
Phytolaccaceae	1
Polemoniaceae	2
Tropaeolaceae	3
Turneraceae	3

Published by: **Bangladesh National Herbarium**
Ministry of Environment and Forest
Chiriakhana Road, Mirpur-1
Dhaka-1216, Bangladesh.

Price : Taka 50.00
 \$ 10.00
 £ 5.00

Printed at : Bangla Academy Press,
Bangla Academy, Dhaka 1000,
Bangladesh.