

Lindernia



Ambika Prasad Research Foundation | Odisha

Lindernia

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LINDERNIA

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Lindernia crustacea

Front Cover:

Lindernia pusila

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MESSAGE

Nature has many unknown and unexplored species which are useful for mankind in various aspects. These species are prone to extinction due to high anthropogenic activities and frequent climatic changes. Among them, small unexplored herbs growing in moist areas, marshy areas, and near water bodies are more susceptible and need to address them at an alarming rate. The species belonging to the family Linderniaceae, are such herbs having less knowledge about their identification, distribution and uses. Happy to know that the participants of the training program on Medicinal plants conducted by Ambika Prasad Research Foundation are publishing a book entitled “Linderniaceae”. I congratulate the authors of this work and hope, it will be beneficial for the researchers, academicians, scholars and intellectuals.

Again, I appreciate the hard work of the participants in publishing such a valuable book.

Sanjeet Kumar

Dr. Sanjeet Kumar

CEO, Ambika Prasad Research Foundation, Odisha

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INTRODUCTION

Genus *Lindernia* All., a group of flowering plants from the family Linderniaceae, traditionally belonged to the family Scrophulariaceae. Based on molecular studies *Lindernia* is segregated along with 12 other genera from the rest of Scrophulariaceae to a new family Linderniaceae in its direction of evolution. Globally, the genus *Lindernia* comprises about 160 species. It is distributed almost throughout the Tropical and Temperate regions of the world. They fall into 3 main geographical groups. The largest in Asia followed by Africa and America. The distribution and taxonomy of *Lindernia* have been studied by various taxonomists in certain widespread areas, namely Southeastern North America, Himalayas, India, Burma, China, Malesia, and Nepal. A preliminary study on the genus *Lindernia* shows that there are about 31 taxa reported from India. *Lindernia* currently contains 12 or more different genera, of which 3 other genera: *Vandellia* L., *Bonnaya* Link & Otto, and *Ilysanthes* Rafin are most commonly used. These 4 genera were distinguished by the androecium, capsule, leaf, and calyx.

Lindernia is an annual herb, seen in moist and shady habitats. They are erect or prostrate herbs with serrate margins. The general characteristics of *Lindernia* are, opposite leaves; petiolate or sessile; leaf blade margin often toothed or rarely entire; veins pinnate or palmate. Inflorescences terminal or axillary, racemose, sometimes pseudo-umbellate, rarely in large panicles, or flowers solitary. Flowers opposite or alternate, often pedicellate. Bracteoles absent. Calyx lobes 5, equal or subequal, parted or split on 1 side. Corolla lower lip is larger than the upper, extended; the upper lip is erect. Stamens 4, all fertile or 2 anterior reduced and filaments appendaged; anthers coherent or apex of locules of anterior ones pointed or spurred. The style is mostly 2-lamellate, apex often enlarged. Seeds are small and numerous.



Lindernia anagallis



***Lindernia anagallis* (Burm.f.) Pennell**

Name changed: *Torenia anagallis* (Burm.f.)
Wannan, W.R.Barker & Y.S.Liang

Family: Linderniaceae

Common name: Gadag vel

Habit: Herb

Habitat: Grow in moist areas.

Food values: Leaves are cooked as leafy vegetables.

Medicinal values: NIL

Flowering & Fruiting: April to September

Distribution: Bhutan, Cambodia, India, Japan, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam, Australia and India.





Description

It is an annual diffuse herb, rooting at lower nodes, and growing 10-40 cm tall. It is a creeper with many branches. Leaves 0.8-2 x 0.5-1 cm, ovate to elliptic, base truncate, margin crenate-serrate, apex subacute, glabrous, sessile. Flowers are white to pink in colour with a yellow spot on lower lip, axillary, solitary or rarely 2-per node, upper lip entire, lower lip 3-lobed, Calyx deeply 5-lobed almost to the base, 3-6 mm long, lobes linear-lanceolate. Corolla tube 6-8 mm long; limb 2-lipped. staminodes 2-lobed, Stamens 4, fertile; anterior filaments with a linear appendage near base; anthers of basal pair spurred. Capsule to 1.3 mm long, linear, glabrous, much exceeding the calyx. Seeds 0.5 mm long, ellipsoid.

Lindernia antipoda



***Lindernia antipoda* (L.) Alston**

Name changed: *Bonnaya antipoda* (L.) Druce

Family: Linderniaceae

Common name: Sparrow Lindernia

Habit: Herb

Habitat: Wetland and moist areas.

Food values: Leaves are cooked as leafy vegetables.

Medicinal values: Root decoction is used to cure diarrhoea.

Flowering & Fruiting: August to October

Distribution: China, Myanmar, Thailand, Cambodia, Laos, Vietnam, Malaysia, Indonesia, Philippines, Australia, Pacific Islands and India.

Description

It is an annual prostrate herb, growing up to 40 cm long from a fibrous rootstock. Leaves are opposite and oblong to lanceolate, about 1-4 cm,



branching at the base, ascending, spreading base cuneate, margin subentire to serrate, apex obtuse, sessile. Flowers pink to purple in colour, white marks on the lower lip with two yellow stamens, solitary, axillary or in terminal racemes; bracts leafy; pedicel 1 cm long. Calyx divided to the base; lobes 4 mm long, lanceolate, margin scarios. Corolla bluish with yellow coloured mouth, 6- 8 mm long, internally short pilose between the

staminodes. 2 fertile stamens, staminodes 2. Capsule 1-1.4 cm long, linear-lanceolate. Seeds yellow and ridged.

Lindernia ciliata

***Lindernia ciliata* (Colsm.) Pennell**

Name changed: *Bonnaya ciliata* (Colsm.) Spreng.

Family: Linderniaceae

Common name: Fringed Lindernia

Habit: Herb

Habitat: Found in moist areas.

Food values: NIL

Medicinal values: *Lindernia ciliata* is traditionally used in the treatment of jaundice.

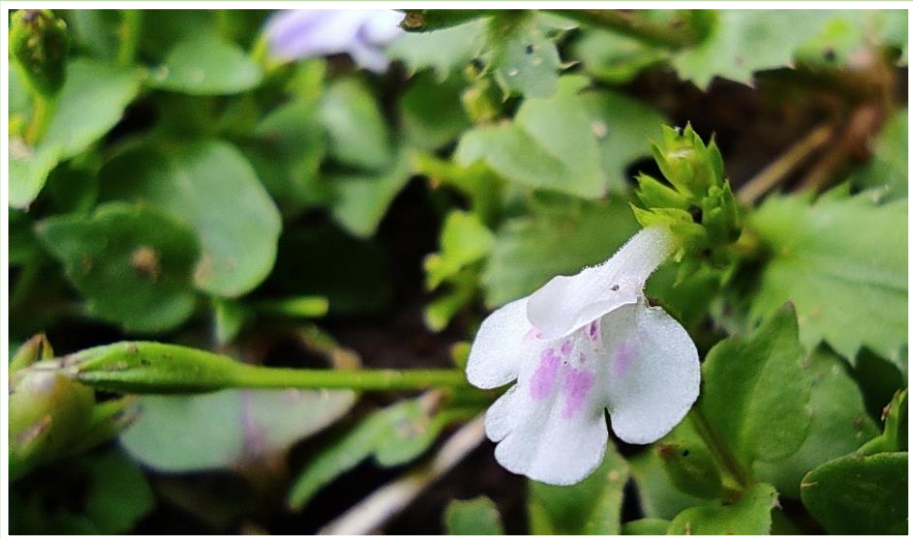
Flowering & Fruiting: Throughout the year

Distribution: China, Myanmar, Cambodia, Laos, Vietnam, Malaysia, Philippines, Northern Australia, The Pacific and India.



Description

Lindernia ciliata is an erect, small annual herb growing up to 20 cm. The stem is erect to decumbent, sometimes rooting at proximal nodes or at their last nodes, 3-20 cm. leaves cauline, thin, ecliptic-oblong, base rounded, margin aristate-dentate, apex obtuse to acute, 4.4.5 x 0.7-12 mm. Petiole absent. Flowers in terminal racemes, sepals 4-6 mm, corolla white, pink or lavender, abaxial lobes sometimes with darker pink or purple markings, tube curved, 5-7 mm, stamens 2, anthers unequal, staminodes without appendage and distal segment. Ovary 2 -3 mm long, elongate. Capsule 1-1.5 cm long, linear, septum winged, exceeding the fruiting calyx. Seeds are ovoid to ellipsoid or oblong, irregularly angled not ribbed, black in colour.



Lindernia crustacea



***Lindernia crustacea* (L.) F. Muell.**

Name changed: *Torenia crustacea* (L.) Cham. & Schltldl.

Family: Linderniaceae

Common name: Malaysian Lindernia

Habit: Herb

Habitat: Found in open moist grasslands, river beds and moist areas.

Food values: NIL

Medicinal values: It is traditionally used to treat ear ache, injury and fever.

Flowering & Fruiting: July to September

Distribution: Widely distributed through Tropical and Subtropical regions of the Globe, from Africa through Asia to Australia and The Pacific.



Description

Lindernia crustacea is a prostrate perennial, diffusely branched herb, growing up to 10-20 cm tall. The stem is much branched, usually rooting



at the lower nodes; stem 4-angled, slightly winged on angles. Leaves are ovate to ovate-heart shaped, base truncate, margin serrate, apex subacute, penni nerved, 0.5-1.5 cm long, 0.4- 1.2 cm wide. Petiole 1-6mm long. Flowers arise singly in the leaf axils, on stalks 0.5-2.5 cm long. Corolla rose to purple in colour with a yellow mark on lower lip, 5 -8 mm long. Upper lip is 2-lobed, lower one 3-lobed, middle lobe

slightly larger than lateral ones. Stamens 4, didynamous; lower pair of stamens with a subulate appendage at the middle of the filament. Ovary globose. Capsules are oblong-ovoid, 3.5-5 mm long. Seeds minute and numerous.

Lindernia dubia

***Lindernia dubia* (L.) Pennell**



Family: Linderniaceae

Local name: NIL

Habit: Herb

Habitat: Found in wetlands and river beds.

Food values: NIL

Medicinal values: NIL

Flowering & Fruiting: July to January

Distribution: The species is widely distributed in Argentina, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Cuba, Dominican Republic, Ecuador, Guatemala,

Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Venezuela and India.



Description

Herb, annual, erect or sometimes ascending, rooting at the lower nodes, stem herbaceous, quadrangular. Much branched near the base. Leaves sessile, basal ones larger, smaller towards the apex, 0.5–2.5 × 0.2–1.5 cm, ovate or ovate-elliptic. Upper lanceolate, 3-5 veins from the base, veins distinct on lower larger leaves, base cuneate-attenuate or rounded, apex acute to acuminate, occasionally obtuse, margin entire or shallowly 2–3 toothed, largest leaves near the base. Flowers solitary, axillary, pedicel cylindrical, glandular hairy, equalling or longer than the leaves, 5-10 mm long. Calyx deeply 5-lobed, 3-4 mm long, linear or lanceolate, apex acute, sparsely glandular, sepals basally connate. Corolla 6-10 mm long, white, tube 4.5-5 mm, the upper lip slightly emarginate at the apex, lower lip 3-lobed, lobes rounded. Perfect stamens 2, filaments 1 mm long, glabrous; anthers 2-lobed, coherent below the upper lip. Staminodes 2, 1 mm long, linear, densely covered with yellowish stalked glands throughout and corolla tube below, distinctly spurred just below the apex. Ovary 1.1-1.4 mm long, ellipsoid, style 2.5-3 mm long, stigma, 2- lamellate. Capsule 2-5 mm, ellipsoid or obliquely ellipsoid, obtuse to acute at apex, glabrous, mature capsules yellow, persistent calyx present. Seed numerous.



Lindernia nummulariifolia

Lindernia nummulariifolia (D.Don) Wettst.

Name changed: *Craterostigma nummulariifolium* (D.Don) Eb.Fisch., Schäferh. & Kai Müll.

Family: Linderniaceae

Common name: NIL

Habit: Herb

Habitat: Found in marshy areas & along the streams.

Food values: NIL

Medicinal values: NIL

Flowering & Fruiting: July to November

Distribution: The species is widely distributed in Angola, Cameroon, Central African Republic, Ethiopia, Gabon, Kenya, Liberia, Madagascar, Malawi, Mozambique, Nigeria, Sudan, Tanzania, Uganda, Zambia, Zimbabwe and India.



Description

Small annual herb, prostrate or semi-erect, 1-15 cm tall, simple or with few branches. Stem erect, sub quadrangular, sparsely spreading, hairy on angles. The leaves are simple and opposite. Leaf blade broadly ovate to orbicular-ovate, 5–10 × 4–15 mm, abaxially glabrous or sparsely hairy only on midrib, base broadly cuneate to cordate. Margin slightly notched in corrugated or has sharp teeth. Glabrous on the upper surface or sparse hairs on the mid rib, veins parallel from base. The leaves are often tinged with purple on their lower face. Inflorescence terminal or axillary sub umbels, few flowered. Central flowers sessile or short pedicelled, cleistogamous; other flowers on pedicels 2 cm, sometimes sterile. The



calyx measures 2 to 3 mm long. It ends with lobes lanceolate to linear subulate, varying in length of half the length of the tube to its full length. Corolla violet, rarely blue or white, 6 to 8 mm; lower lip spreading flat, 3-lobed; upper lip ovate. Filaments of anterior stamens basally small appendaged. Stamens 4. The fruit is a capsule narrowly ellipsoid tapering. It measures 8 to 12 mm long. It contains many seeds.

Seeds are brown in colour.

Lindernia oppositifolia

Lindernia oppositifolia (L.) Mukerjee

Name changed: *Bonnaya oppositifolia* (Retz.) Spreng.



Family: Linderniaceae

Common name: NIL

Habit: Herb

Habitat: Found in marshy areas, forest edges, along the streams.

Food values: NIL

Medicinal values: NIL

Flowering & Fruiting: July to October

Distribution: The species is widely distributed in Cambodia, Indonesia, Laos, Malaysia, Myanmar, Pakistan, Vietnam and India.



Description

Lindernia oppositifolia is a very short, erect, procumbent herb with a diffusely branched stem. Stem glabrous. Leaves linear- oblong, acute, distantly serrate, sessile 4 x 0.5 cm. Racemes 13 cm long, terminal; pedicels opposite, 2 cm long, slender, perpendicular to the axis. Flowers paired; sepals 7 mm long, linear lanceolate, free to the base; corolla 12 mm long; upper lip entire or emarginate, lower lip equally 3-lobed; anthers divaricate; staminodes linear, bulged at apex. Capsule 17 x 1.5 mm, terete; seeds 0.3 mm long, obovoid, minutely muricate.



Lindernia procumbens

***Lindernia procumbens* (Krock.) Philcox**

Family: Linderniaceae

Common name: False pimpinell

Habit: Herb

Habitat: Found along river banks and moist areas.

Food values: NIL

Medicinal values: The paste of the aerial parts of the plant is used to cure boils, sores and itches.

Flowering & Fruiting: January to April

Distribution: The species is widely distributed in Afghanistan, Altay, Amur, Austria, Bangladesh, Belarus, Bulgaria, China, Czechoslovakia, East European Russia, East Himalayas, France, Germany, Greece, Hungary, India, Iran, Italy, Japan, Jawa, Kazakhstan, Korea, Laos, Malaya, Manchuria, Marianas, Myanmar, Nepal, New South Wales, Pakistan, Poland, Portugal, Romania, South European Russia, Switzerland, Tadzhikistan, Taiwan, Thailand, Turkey, Ukraine, Vietnam and India.



Description

It is an erect herb, 5-20 cm in height, basally much-branched and glabrous. Roots slender. Leaves sessile, elliptic to ovate-elliptic, margins entire or sub-crenate, somewhat rhomboid, veins 3-5, parallel from base, 1-2.5 X 0.6-1.2 cm. Flower axillary and solitary. Pedicel slender, 1.5 cm long, longer than subtending leaf and glabrous. Calyx deeply 5-lobed almost to the base, lobes linear-lanceolate, 4 mm long. outside sparsely pubescent, apex obtuse. Corolla 3-6 mm long, pink to purple in colour,



tube 3.5 mm, lower lip 3 mm, 3-lobed, middle lobe rounded and larger than other lobes, lateral lobes elliptic, upper lip 1 mm, 2-lobed. Stamens 4, fertile, anterior filaments with a small globular or slender spur at the base. anterior filaments with a small globular or slender spur at the base. Stigma 2-lobed. Capsule globose to ovoid-globose, as long as or slightly longer than persistent calyx. Seeds yellow and oblong.

Lindernia pusilla

Lindernia pusilla (Merr.)

Name changed: *Yamazakia pusilla* (Willd.) W.R.Barker, Y.S.Liang & Wannan

Family: Linderniaceae

Common name: NIL

Habit: Herb

Habitat: Found in grassy bunds of paddy fields and along grassy borders of ponds or tanks in the wet and dry low lands.

Food values: NIL

Medicinal values: The paste of whole plant is mixed with coconut oil and applied externally on affected areas of the body to treat skin diseases.

Flowering & Fruiting: July to December

Distribution: The species grows in the Indian continent, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam, East Asia and Malaysia.



Description

It is a suberect, annual plant, growing 6-30 cm tall. Stem prostrate, branches often widely spreading from the root-stock, or prostrate at the base, with long internodes.

Leaves ovate to orbicular-ovate, 0.5-2.0 x 0.5– 1.5 cm, truncate at base, obtuse at apex, crenate-serrate, with prominent nerves beneath; petioles 1-3 mm long.

Flowers 1-4 in axils of leaves.

Pedicels 3-20 mm long, slender, glandular-pubescent, longer

Calyx, tube 1 mm long, smooth, lobes lanceolate, glandular without pilose. Corolla white to

purple in colour; upper lip erect, 3 mm long, 2-lobed at apex, dirty pale brown or mauvish- brown with purplish lines or pale mauve or pale blue; tube 4 mm long; lower lip 4-6 mm across, mid lobe broadly ovate, slightly larger than lateral ones, with a yellow blotch at the base. Posterior filament 2 mm long, anterior ones longer, all glabrous, Hypogynous disc white, style glabrous; lamellae of stigma ciliolate at margins. Capsule globose, 3-4 mm in diameter, glabrous; seeds oblong- cuniform, 0.5 mm long, truncate at both ends, longitudinally alveolate and tawny.



Lindernia rotundifolia

Lindernia rotundifolia (L.) Alston

Family: Linderniaceae

Common name: Round leaf Lindernia

Habit: Herb

Habitat: Found in marshy areas & along the streams.

Food values: NIL

Medicinal values: A paste made with leaves of the plant is applied to the boils once a day for seven days to treat boils. Leaf paste is also used to treat headaches by applying it twice a day.

Flowering & Fruiting:
August to January

Distribution: The species is widely distributed in Bangladesh, Bolivia, Brazil North, Brazil Northeast, Brazil South, Brazil Southeast, Brazil West-Central, Colombia, Comoros, Costa Rica, Guatemala, Honduras, India, Madagascar, Mauritius, Peru, Sri Lanka, Venezuela and India.



Description

Annual erect or diffuse herb, rooting at lower nodes. Stem green, branching from base of the stem. Leaves palmately 3-5-nerved, sessile, minutely glandular-punctate on both surfaces; lamina elliptic, ovate, obovate, or orbicular, 2-16 mm long, 1-12 mm wide; base cuneate to rounded; margin 2 or 3(4) pairs serrate or remotely toothed, occasionally entire; apex acute or obtuse. Flowers solitary in axils; pedicels alternate or occasionally opposite, 2-18 mm long. About 1/2 length of subtending leaf, stipitate-glandular, especially near the base of pedicel; erect to spreading, often reflexed in fruit. Calyx is deeply 5-lobed, zygomorphic or irregular, 1.4-2.5 mm long, lanceolate, acuminate and glandular. Corolla white or light-blue with purple blotches on throat and purple spots on lower lobes, tufts of trichomes at base of anterior lobes; tube 9-12.2 mm long. Androecium of 2 fertile stamens and 2 staminodes; free part of staminoidal filament 2-3.2 mm long, staminodes slightly exserted from corolla tube, incurvate, with yellow glands; fertile anthers coherent, filaments 1.4-1.7 mm long, glabrous. Ovary ellipsoid, 2 mm long; disk small, at ovary bottom, yellow; style 3-5.5 mm long, often persisting until capsule dehisces; stigma 2-parted. Capsule 1.5-3 mm long, approximately equalling and infrequently exceeding the length of calyx, ovate to ellipsoid, apex acute, glabrous. Seeds pale brown, falcate-oblong, rugate, 0.5 mm long.



Lindernia veronicifolia

Lindernia veronicifolia (Retz.) F. Muell.

Name changed: *Bonnaya veronicifolia* (Retz.) Spreng.

Family: Linderniaceae

Habit: Herb

Habitat: It is mostly found in wetlands of the Tropical deciduous forest and near paddy fields.

Food values: NIL

Medicinal values: NIL

Flowering & Fruiting: June to November

Distribution: The species is distributed in Sri Lanka and India.



Description

It is an annual creeping herb. Leaf oblong to oblanceolate, wide cunate base, slightly amplexicaul, leaf margin sharply sub-aristate serrate, Glabrous or occasionally with scattered hispid hairs on the lower surface, 0.9–2.7 x 0.6-1.0

cm. Inflorescence terminal raceme.

Corolla Violet-purple with purple spots on the lower lips.

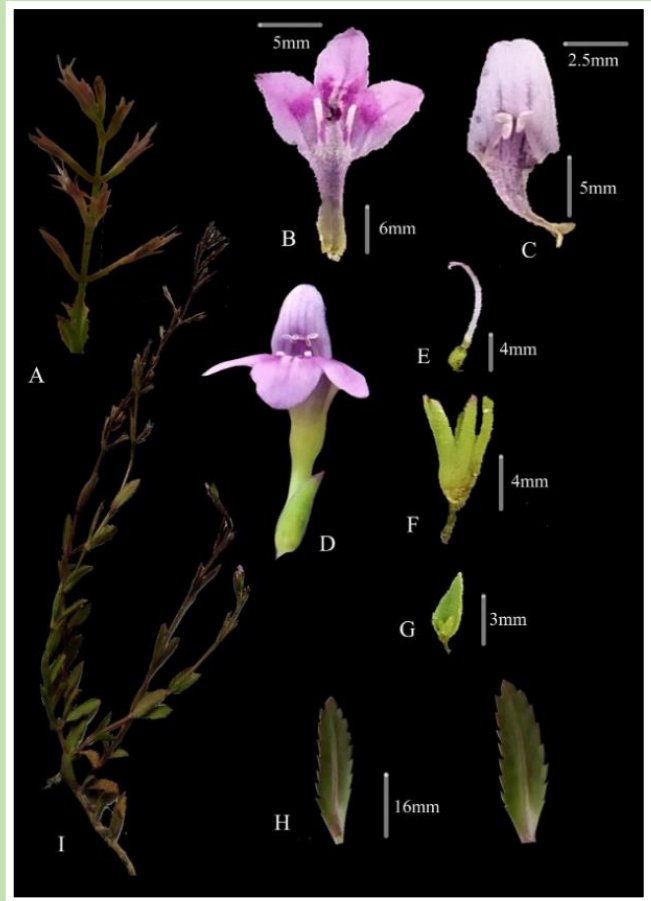
Ventral lip 3 rounded lobes 5.5-6.0 mm long,

Central lobe larger than the laterals. Dorsal lip emarginate, 4-5.5 mm long,

obtuse to truncate at apex.

Staminodes 2,

white with pink spots at the base. Capsule 12-15 mm.



Lindernia viscosa

Lindernia viscosa (Hornem.) Merr.

Name changed: *Yamazakia viscosa* (Hornem.) W.R.Barker,
Y.S.Liang & Wannan

Family: Linderniaceae

Common name: Sticky Lindernia

Habit: Herb

Habitat: It is mostly found in waysides, edges of forests, paddy fields, swamps and moist shady places.

Food values: NIL

Medicinal values: NIL

Flowering & Fruiting: June to November

Distribution: The species is widely distributed in Bangladesh, Cambodia, Indonesia, Laos, Malaysia, Myanmar, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam and India.



Description

It is an annual herb, 8-12 cm high, with stems erect or sparsely spreading, with coarse spreading long hairs. Leaves opposite, elliptic or ovate, $1.5-3.5 \times 1-2$ cm, attenuate or broad at base,



subentire or crenate or serrate-dentate and shortly ciliate along margins, obtuse at apex, membranous, sparsely hirsute on both surfaces, pinnately veined; lateral veins 3 or 4 pairs; upper leaves sessile and smaller than lower leaves; lower leaves with petiole; petioles 5 mm long. Flowers are borne in leaf axils, 6-10 flowered racemes. Flowers pale blue or violet, 4×2 mm. Calyx deeply 5-lobed; lobes linear-lanceolate, 2.5-3.1 mm.



Corolla tube; upper lip erect, notched or bifid; lower 3-lobed, spreading. Stamens 4, fertile, the 2 upper stamens on the corolla throat, usually included, the lower 2 with arched filaments having a rounded appendage towards the base, about 2.2 mm

long; anthers cohering in pairs, stigma 2-lamellate. capsule is spherical, almost as long as the persistent sepals. many-seeded; seeds rectangular, 0.1–0.2 mm long, rugose and straw-coloured.

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