THE GENUS TORENIA LINN. IN WESTERN PENINSULAR INDIA

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ABSTRACT

The paper presents a taxonomic study of the seven species of *Torenia* native to the wet, western part of peninsular India. *T. asiatica* L. has often been included among these. But it is actually a plant from S. E. Asia and not native to this region. The plant usually called *T. cordifolia* is different from *T. cordifolia* Roxb. and has been described as *T. indica* sp. nov. Another plant, often confused with *Lindenia crassipes* (L.) F. v. Muell., has been described as *T. lindemlioides* sp. nov. The paper also includes two new records for the region, *T. violacea* (Azaaol ex Blanco) Pennell and *T. thomassii* (Cham. & Schlechtend.) O. Kuntee.

Toreanias are well known garden annuals. The commonest garden representative of the genus in western India is *T. fournieri* Lind., an elegant introduction from S. E. Asia. Besides this plant, there are several species occurring spontaneously in the wet, western part of peninsular India. The identity of some of them is not easy to determine. A few others have been inadequately described. A taxonomic study of the genus in so far as it occurs spontaneously in this region might not, therefore, be out of place.

The genus *Torenia* was first described by Linnaeus in the dissertation Nova Plantarum Genera 45, no. 1108, 1751. It was soon validated in Sp. Pl. 619, 1753 and Gen. Pl. ed. 5, 270, 1754. The Linnaean generic type *T. asiatica* was based on a specimen (LINN 770.1) obtained from and named after Olof Torén who collected it around Canton in 1748-49. Linnaeus’ specific description included a reference to Van Rheede, Hort. Mal. 9: 103, t. 53, 1698. Van Rheede’s plant was collected around Cochin on the Malabar Coast and was illustrated and described under its Malayalam and Konkani names ‘Kaka-pu’ and ‘Gach-dolo’ (crow’s eye).

The Linnaean reference to Kaka-pu, the apparent similarity between the Cantonese and Cochin plants, as well as the indiscriminate use of the word ‘Indies’ to denote both China and India, caused many botanists to regard *T. asiatica* as native to western India. Gamble, however, raised a doubt. He did not list *T. asiatica* L. in his Flora of the Presidency of Madras. Further, he split up the plants described under *T. asiatica* in Hook. f. Fl. Brit. Ind. 4: 277, 1884, into distinct species. A study of the Linnaean type as well as of specimens from western India seems to justify Gamble’s view. Consequently, *T. asiatica* L., a plant originally from S. E. Asia, is excluded from this study.

This paper besides presenting two new records for the region, also proposes two new species. The reasons justifying the description of these as new species are put forward in the systematic treatment that follows:

KEY TO THE SPECIES

- A Calyx broadly winged:
  - B Calyx wings usually cordate at base, not decurrent on pedicel: 1. indica
  - BB Calyx wings attenuated at base, decurrent on pedicel: 2. violacea
- AA Calyx not broadly winged:
  - C Fruiting calyx ribbed:
    - D Flowers in axillary clusters; corolla less than 1 cm long; fructing calyx less than 0.8 cm long: 3. thomassii
    - DD Flowers solitary, axillary; corolla more than 2 cm long; fructing calyx more than 1.2 cm long: 4. biicolor
  - CC Fruiting calyx not ribbed:
    - E Corolla less than 1 cm long: 5. lindemlioides
    - EE Corolla more than 2.5 cm long: 6. torenia americana
    - FF Stem hisrate; corolla tube yellow or white: 7. hismata

1. *Torenia indica* sp. nov.

This plant has been taken for *T. cordifolia* Roxb. in most of our Herbaria and floristic works. A careful study of the pertinent literature and of numerous fresh as well as preserved specimens has led us to conclude that the present plant is not the one described by Roxburgh.

*T. cordifolia* Roxb. was clearly described by its author in Fl. Corom. 2: 32, 1802 and pictured on t. 161 of the same work. An earlier, independent and authentic painting of this plant exists in Calcutta in the Roxb. Ic. no. 315 (insk.).

Roxburgh describes the leaves of this plant as 'opposite, short pelted, hearted, saw'd, a little hairy, one inch long and three quarters broad'. The calyx is 'large, bellied, five-angled, two-lipp'd; upper lip slightly three-tooth'd; the under lip simply pointed, permanent'.

The two authentic illustrations of *T. cordifolia* although picturing different plants, agree perfectly among themselves as well as with the above
description in morphological characters. The leaves are short-petioled, clearly cordate or truncate at base. The calyces are not cordately winged in spite of the fact that several flowers have been pictured.

The plant described by Roxburgh does exist. Bonati in Lecomte, Fl. Gen. Indoch. 4:396, 1927 describes a plant with the typical leaves of $T. cordifolia$. Indeed, in his key to the genus $Torenia$ (ibid. 389) Bonati separates this species from the rest on the basis of leaf-shape, 'feuilles superieures sessiles, tronquees ou subcordiformes a la base- cordifolia'.

However, most Indian floristic works have applied the name $T. cordifolia$ to a plant with distinctly cuneate, decurrent leaf-bases and cordately winged calyx lobes.

The cause of this change may be the plate labeled $T. cordifolia$ by Hook. in Bot. Mag. t. 3715, 1839, based on a plant grown in Edinburgh in Oct. 1838 from seeds collected in Saharanpur. This plate represents our plant and not Roxburgh's. The discrepancy has been noted by Hook. f. in Bot. Mag. t. 3715, 1839, where he comments on the inappropriateness of using the epithet 'cordifolia' to describe a plant with non-cordate leaves.

It might be argued that the plant described here is only a variation of Roxburgh's plant. We have examined several specimens from various parts of India. They constitute a distinct taxon that is easily distinguishable from $T. cordifolia$ Roxb. as pictured and described in the original works.

**Description**: Annual herbs. Stem 4-sided, erect or sometimes rooting at the lower nodes, moderately ciliate on the angles. Leaves opposite, decussate, petiolate, ovate or ovate-lanceolate, penninerved, pubescent especially on the nerves, cuneate at the base, decurrent on the petiole; petioles hairy, up to 1.5 cm long; lamina up to 2 x 3.5 cm. Flowers crowded together in the axils of the upper leaves; flowering pedicels 1 cm long; fruiting 1.5 cm, 4-sided, ciliate. Calyx bilipped, c. 1 cm long; upper lip 3-toothed; lower lip 2-toothed; wings ciliate, cordate at base, non decurrent. Corolla white or light violet, bilipped, 1.5 cm long; tube equaling the calyx, distended at the base, interiorly hairy on lobed below. Stamens 4, didynamous; lower filaments longer, edentulate, curved towards each other; anthers perfect, divaricate. Ovary ovoid-conical, placed on a hypogynous disc; style filiform; stigma bilamellate. Capsule oblong-elliptic, included, septicidal; seeds numerous, pitted.

**Holotype**: Saldanha 6733 collected near Waghai on 26 Aug. 1961 and kept in the Blatter Herbarium, St. Xavier's College, Bombay.

**Isotypes**: Saldanha 6730, 6732, 6735.


The reduction of the plant, usually known either as T. peduncularis or as T. edentula, to Mimulus violaceus Azaolo ex Blanco has been made on the authority of Merrill and Pennell.

Merrill l. c. has the following comment on Mimulus violaceus, 'The description is short and imperfect, but there is every reason to believe that Fernández-Villar was correct in reducing it to the common and widely distributed Torenia peduncularis Benth. The species was described by Azaolo, not by Blanco.'

Pennell, in making the combination Torenia violacea, wrote 'Although not adopted by Merrill, his evidence makes it necessary to take this as the earliest described name ... Torenia peduncularis is the name under which our species has been universally known.'

Description: Annual erect herbs. Stem 4-angled, slightly winged, ciliate at angles; sometimes tinged with purple and rooting at lower nodes. Leaves opposite, decussate, ovate, serrate, petiolate, softly hairy especially on the upper surface; petioles c. 1 cm long; lamina up to 2 x 3 cm. Flowers solitary axillary or in terminal, unequally pedicelled, bracteate racemes. Pedicels prominent, 4-sided, hairy on the angles, up to 2 cm long. Calyx bilipped, broadly winged, elliptic in outline, 1 cm in flower, 1.5 cm in fruit; wings ciliate, narrowed at base, decurrent. Corolla bilipped, c. 2 cm long; tube bluish violet, emarginate; lower lip 3-lobed, deep purple except for a bright yellow patch in the throat. Stamens 4, didynamous; filaments arched, non-appendiculate; anthers perfect, deciduous, connivent with opposite pair. Ovary sub-conical, on a hypogynous disc; style slender, longer than the calyx; stigma bilamellate. Capsule narrow, acute at tip, slightly shorter than calyx; seeds numerous, minute, foveolate.

Type: Mimulus violaceus Azaolo ex Blanco from Calauang, Philippines. The specimen has not been located.

Occurrence: The only specimens from the area under study were collected in forest undergrowth on the top of Elimali Hill (c. 300 m) near Canna-nore—Saladanha 722946981! The plant which was locally abundant has not been previously reported from peninsular India.


Nortenia thouarsii Cham. & Schlechtend. in Linnaea 3: 18, 1828.


Description: Erect or procumbent annual herbs. Stem 4-angled, slightly winged at angles, rooting at lower nodes, with spreading branches. Leaves opposite, decussate, petiolate; petiole up to 0.5 cm long; lamina ovate, serrate, pinnerved, softly hairy, up to 1 x 1.5 cm. Flowers axillary, usually fasciculated. Pedicels 0.5-1 cm long. Calyx obliquely bilipped, divided to about 1/4 its length, c. 0.5 cm long; upper lip 2-lobed, slightly curved;
lower lip 3-lobed; dorsal ridge of each sepal narrowly winged and ciliate in flower, ribbed in fruit. Corolla bilipped, 1 cm long, pink except for white spot on centre of lower lip; upper lip triangular, entire; lower lip 3-lobed. Stamens 4, didynamous; upper filaments shorter, inserted at top of tube; lower filaments longer, appendiculate, arched, inserted in throat; anther-cells divaricate, connivent with opposite pair. Ovary elongated, included, septicidal; stigma bilamellate. Capsule narrow, elongated, included, septicalical; seeds numerous, minute, sub-spherical, foveolate.

**Type:** Nortenia thouarsii Cham. & Schlechtend. Specimen not located. The most complete set of Chamisso's collection is said to be in Leningrad. Prof. Vassilczenko of the Komarov Botanical Institute informs us that they do not possess the type.

**Occurrence:** North Kanara: Honavar, Saldanha 851-61; Belve, Saldanha 5865-69; Parappa, Fischer 45201.

A rare plant not previously reported from western peninsular India.


**Description:** Annual, decumbent herbs. Stem diffuse, 4angled, ciliate on ridges, especially near the nodes. Leaves opposite, petiolate; mature petals c. 1 cm long, pubescent; lamina triangular-ovate, serrate, acute at apex, subcordate at base, pubescent, with 4-5 pairs of veins. Flowers axillary, solitary; pedicels well developed, c. 2 cm in flower, up to 3 cm in fruit. Corolla zygomorphic, c. 3 cm long; tube slightly curved, deep purple; upper lip erect, slightly emarginate, deep purple; lower lip 3-lobed; lobes rounded, whitish. Stamens 4, didynamous; lower filaments arched, with filiform appendages; anther-cells divaricate, connivent with opposite pair. Ovary narrow, elongated; style slightly curved, filiform; stigma bilamellate. Capsule narrow, elongated, included, septicalical; seeds numerous, minute, sub-spherical, foveolate.

**Type:** Torenia bicolor Dalz. ex Herb. Dalz. (K!)


An elegant little plant in moist, shaded soil at the end of the monsoon. It does not seem to occur to the north of Ratnagiri.

5. **Torenia lindernioi3es** sp. nov.

This is an enigmatic little plant that has often been included under Lindernia crustacea (L.) F. v. Muell. But it differs from the latter in the structure of the calyx and of the capsule.

**Torenia lindernioi3es** has a distinctly winged calyx which completely encloses the mature capsule. The capsule is elongated, elliptic in outline and narrowed at the top. *Lindernia crustacea*, however, has sepals that are, at most, slightly thickened in the middle and never invest the capsule completely. Its mature capsule is obovate with a broad, rounded apex that projects beyond the cup-shaped calyx. The corollae are very similar in structure but can be differentiated by the colour of the upper petal, which is a light pink in the case of *Torenia lindernioi3es* and a diffuse violet-purple in *L. crustacea*.

The inclusion of this plant in the genus *Torenia* might, at first sight, appear doubtful. The limits of the genera *Torenia* and *Lindernia* are not easy to define. *Lindernia crustacea* itself has been considered a *Torenia* by not a few authors. We have, for the present, followed Pennell in Journ. Arn. Arb. 24: 254, 1943, where he transfers *Lindernia renata* Pennell to the genus *Torenia* with the following
remark. In our first species, *Torenia crenata*,
the small flowers, unwinged calyx and foliaceous
bracts all led me to consider it a *Lindernia*; but I
now incline to place generic value on another
feature of the calyx. In *Lindernia* the sepals
whether distinct or joined, do not invest the cap-

sule, but have their tips somewhat spreading,
whereas in *Torenia* the sepals do invest the capsule,
being curved up it with their connivent tips pro-
jecting above it.

*T. linderniodides* has a calyx with lobes united
almost to the top and completely enclosing the
mature capsule. Further, the calyx is clearly
winged as in the majority of *Torenia* and
*Lindernia*, being very close to the Sect. *Torenioi-
des* of the latter genus.

Description: Herba annua; caulibus 4-gonis, prius
erectis, tum ramis diffusis prostratis praeediti; folia
opposita, decussata, perianthi, ovaria crenato-ser-
ata, glabra, petioliis c. 0.5 cm, laminis penninervis.
c. 1 x 1 cm. Flores zygomorphi, axillares, solitarii;
calyces regulariter 5-dentati, distincte alati, alis
cliliatis; corollae bilabiatae, tubo dorsiventraliter
compresso, roseo, labio superiore breviori, bifido,
inferiori vero 3-lobato, albo sed macula media pur-
purea ornato; stamina 4, didynamis; filamenta in-
feriora superioribus longiora, appendiculata, cur-
vata, super tubum pilis glandulosis prolongata;
antherae perfectae, divaricatae, cum oppositis con-
niventes. Ovarium ovoidum disco hypogyno in-
sidenso, stylis filiformibus, stigmatibus bilamellatis.
Capsulae ellipticae, apice angustae, inclusae, semi-
niibus pluribus, minutis, rotundatis, toveolatis.

Holotypus: Sedgwick 2511 lectus ad Dandelli.
N. Kanara, mense maii 1919 et in Blatter Herbario
(BlAT), Collerii Sti Francisci Xaverii, Bombay, po-

ditum.

Paratypus: Salrenha 7509-10 & 7432, Sarnapau
10828, Sedgwick 2433.

Descriptio: Annuus herba. Stau erecto at first
with diffuse, prostrate branches later on. Leaves
opposite, decussate, petiolate, obovate, crenate-serrate,
glabrous; petioli c. 0.5 cm long; laminae pennis-
ervi, c. 1 x 1 cm. Flowers zygomorphic, axillary,
solitary. Calyx equally 5-toothed, clearly winged;
winged calyx, c. 0.4 cm. Corolla bilabiata; tube dor-
siventrally compressed, pink, 0.8 cm long; upper lip
shorter, bifid; lower lip 3-lobed, white except for a
purple spot in the middle. Stamens 4, didynamous;
lower filament longer, appendiculate, curved, pro-
longed as a line of glandular hairs on the tube;
amphora perfect, divaricate, connivent with opposite
pair. Ovary ovoid, situated on a hypogynous disc:

style filiform; stigma bilamellate. Capsule elliptic,
narrowed at top, included; seeds numerous, rounded,
foveolate.

Holotype: Sedgwick 2511 collected at Dandelli,
N. Kanara in May, 1919 and deposited in the Blatter Herbarium, St. Xavier’s College, Bombay.

Paratypus: Salrenha 7509-10 & 7432 Sarnapau
10828, Sedgwick 2433.

Occurrence: Kozhikode: Chundale, Salrenha
74321; Kamblakad, Salrenha 7509-10
North Kanara: Dandelli, Sedgwick 2511; Ekambi,
Puri 117221; Londa, Sarnapau 10828; Supa, Richie
11361 Shankara: Agungi, Raghunath 80823!

The plant is fairly widespread although poorly
represented in our Herbaria. It is interesting to
note that *Sarnapau* 10828 (BlAT) and Fischer 899
(CAL) have been identified as *Torenia* because of
their winged calyces.

Hill in Bot. Mag. t. 9615, 1942; Stearn in Chitt-
tenden, Dict. Gard. 2127, 1951.

*Torenia asiatica* Hook. f. in Fl. Brit. Ind. 4:277;
1884, pro parte.

*Torenia leucostophon* Alston in Trimen, Handb.
Fl. Ceyl. 5: 212, 1951.

We have followed Stearn in considering *T. leu-
costophon* Alston as a synonym of *T. iranecorica*
Gamble. The only difference between them seems
to be the white corolla-tube in the former and the
yellow tube in the latter.

Description: Annual, prostrate herba. Stem
4-angled, glabrous, slender, diffuse; internodes up
to 10 cm. Leaves opposite, decussate, ovate-lanceolate, serrate, often acuminate; petiole c. 1 cm; lamina penninerved, glabrous or pubescent, up to 1.5 x 5 cm. Flowers solitary, axillary; pedicels up to 4 cm; calyx narrow, bilipped, divided to 1/4 its length, c. 1.5 cm long; lobes acuminate, slightly keeled, decurrent, moderately pubescent. Corolla zygomorphic, up to 3 cm long; tube bright yellow, rarely white (Gamble, Alston); limb purple with broad upper lip and 3-lobed lower lip. Stamens 4, didynamous; lower filaments arched, with subulate or rod-like appendages; anthers divaricate, connivent. Ovary elongated, on a hypogynous disc; styles slightly hairy and geniculate at base, broader at tip, c. 3 cm long; stigma bilamellate, with acute tip. Capsule narrow, included; seeds numerous, minute, pitted.

**Type:** *Torenia trucancorica* Gamble probably at Kew. There are numerous sheets identified by Gamble himself at Coimbatore (MH) and at Calcutta (CAL). All of them have a distinctly yellow tube.

**Occurrence:** Kottayam: Changanacherry, Saldanha 7845-551: Kanjirapally, Meebold 1561, Saldanha 7874-751: Peermade, Saldanha 7017-18; Thekkadi, Jacob 177801, Trivandrum: Pollimudi, Barnes sr. no. 872841.

Fairly common in central Kerala during the postmonsoon period from September onwards. Easily recognised by the bright yellow corolla-tube.


*Torenia asiatica* L. var. *hisruta* (Willd.) Hook. f. in Fl. Brit. Ind. 4: 277, 1884.

*Torenia asiatica* auct. pl. *pro parte*.

**Description:** Annual, creeping herbs. Stem 4-angled, hisrute, rooting at nodes, with internodes up to 4 cm long. Leaves opposite, decussate; petiole c. 1 cm long, hairy; lamina ovate-deltoid, serrate, truncate or sub-cordiform at base, acute at apex, densely hairy, penninerved, up to 2 x 3 cm, usually smaller. Flowers solitary, axillary; pedicels hisrute, up to 5 cm long. Calyx bilipped, divided to 1/4 its length, tabular, hairy, neither keeled nor ribbed; upper lip 3-toothed; lower lip 2-toothed. Corolla zygomorphic, over 3 cm long; tube deep purple, 1/4 length of calyx; upper lip erect, broad, rounded, pale blue to lilac; lower lip 3-lobed; lateral lobes deep purple; lower central lobe purple towards margin, white towards throat. Stamens 4, didynamous; lower filaments longer, appendiculate, arched; anthers perfect, divaricate, connivent. Ovary on a hypogynous disc; stigma bilamellate. Capsule included in the reticulate, scarious, persistent calyx; seeds minute, numerous, pitted.

**Type:** *Torenia hisruta* Willd. There is no specimen in the Wildenow collection at Berlin-Dahlem. Wildenow seems to have based his species on Lam. Illus. Gen. t. 523, fig. 1(2), 1794. This figure shows the terminal portion of the plant. It has no adventitious roots at the nodes. The illustration could explain the characters 'caulis erectus' and 'fores minores' mentioned by Wildenow in his type description. Our plant, on the contrary, has a creeping stem and comparatively large flowers. It agrees perfectly with *T. hisruta* Benth. as regards habit and locality. The question whether *T. hisruta* Willd. and *T. hisruta* Benth. denote one and the same plant is bound to arise. A satisfactory answer can be given only when the actual specimen on which Lamarck's drawing was based has been located. We have secured a photograph of a specimen in the Lamarrck collection (P), labeled *T. hisruta*, through the kindness of Prof. Aubreville. But this specimen does not seem to be a *Torenia* at all. The problem, therefore, has not been solved. If Wildenow and Bentham are referring to different plants, then, Bentham's plant has to be renamed. We have provisionally assumed the conspecificity of *T. hisruta* Willd. and *T. hisruta* Benth.

**Occurrence:** Kozhikode: Meppadi, Saldanha 7540-52! Nilgiris: Gudalur, Narayana & Rau 18487; Ochterloney Valley, King s. n.; Pandurall, Barber 55831; Sispara Ghat, Gamble 134341.

A pretty plant occurring in the Kerala, Nilgiri and Coimbatore hills between 700-2000 m from August to January. It does not occur in the northern districts of our region.

*T. courtallensis* Gamble and *T. vagans* Roxb. have not been found in the area under study though they are fairly common on the drier, leeward side of the S. Indian mountains.

**ACKNOWLEDGEMENTS**

The author wishes to express his sincere thanks to Rev. Fr. H. Santapau, S.J., Director, Botanical Survey of India and to Dr. C. C. G. J. van Steenis, Director, Rijksherbarium, Leyden, for their valuable suggestions. He also thanks Dr. W. T. Stern, British Museum, London, Dr. I. T. Vassilczenko, Komarov Botanical Institute, Leningrad, Dr. G. Wagenitz, Botanischer Garten und Museum, Berlin-Dahlem and Prof. Aubreville, Laboratoire de Phanérogamie, Paris, for their help in the study of the types.
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