

The genus *Thunbergia* in southern Africa*

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Keywords: Acanthaceae, revision, southern Africa, taxonomy, *Thunbergia*

ABSTRACT

The genus *Thunbergia* Retz. in southern Africa is revised and eleven species are recognized.

THUNBERGIA

Thunbergia Retz. in Phys. Saellsk. Handl. 1: 163 (1780, non '1776') nom. cons. non *Thunbergia* Montin in K. svenska Vetenskakad. Handl. 34: 288 (1773), nom. rejic.; L.f., Suppl. 292 (1781); Cothenius, Disp. 8: Mai-Jun. (1790) as '*Thunbergia*'; Poiteau in Revue hort., Paris 2,4: 409 (1845) as '*Thunbergia*'; Nees in DC., Prodr. 11: 54 (1847); Benth. & Hook. f., Gen. Pl. 2: 1072 (1886); Baill., Hist. Pl. 10: 423 (1891); Lindau in Natürl. PflFam. 4,36: 291 (1895); Burkill & Clarke in Fl. Trop. Afr. 5: 8 (1899); C.B. Cl. in Fl. Cap. 5,1: 3 (1912); Bailey, Cycl. Hort. 3337 (1929); Phill., Gen. 700 (1951); Chittenden in Dict. Gard. 2105 (1951); Heine in Fl. W. Trop. Afr. 2 (edn 2): 392 (1963); Melchior in Engl., Syll. PflFam. 2 (edn 12): 458 (1964); Heine in Flora Gabon 13: 58 (1966); Benoist in Fl. Madag. 182: 9 (1967); P.G. Meyer in Prodr. Fl. S.W. Afr. 129 (1968); Long in J. Arnold Arbor. 51: 273 (1970); Ross, Fl. Natal 321 (1972); R.A. Dyer, Gen. Sthn Afr. Pl. 1: 585 (1975); Compton, Fl. Swaz.: 546 (1976). Type species: *T. capensis* Retz.

Diplocalymma Spreng., Neue Entd. 3: 30 (1822).

Heksacentris Nees in Wall., Pl. Asiat. Rar. 3: 78 (1832).

Endomelas Rafin. in Fl. Tellur. 4: 67 (1836).

Pleuremidis Rafin. in Fl. Tellur. 4: 67 (1836).

Schmidia Wight. in Ic. Pl. Ind. Orient.: t.1848 (1852).

Herbs or herbaceous creepers; rootstock present or absent; epigealous organs sparsely to densely hairy. *Trichomes* unbranched, uni- or multi-cellular; glandular trichomes stipitate with heads panduriform or pinshaped. *Stems* laterally grooved, square, cylindrical or ribbed; unbranched or monopodially branched. *Leaves* simple, decussate, sessile or petiolate; petioles sometimes winged, basal part somewhat swollen; blade linear, lanceolate, ovate or elliptic, apex emarginate, rounded, obtuse or attenuate, base hastate, auriculate, cordate,

rounded or obtuse or acute, margin entire, lobed or toothed, veins looped or parallel to apex, main vein and some lateral veins ending in a mucro (Fig. 1). *Stipules* absent. *Flowers* axillary, zygomorphic, bisexual, pedunculate, subtended by 2 bracts. *Flower bracts* 2, sessile, opposite, caducous or persistent, enlarged sometimes to protect fruit, ovate, boat-shaped, keeled, base cordate. *Calyx* persistent, connate at the base, usually with 10-16 subuliform lobes, unequal in length. *Corolla* gamopetalous, tube cylindrical at base, infundibuliform in the upper part; 5-lobed, lobes obovate or sometimes nearly triangular, contorted; inner and outer surface of lobes and outer surface of tube white, shades of yellow, orange or purplish-blue; inner surface of tube shades of yellow, yellowish green or dark purplish black; one-celled trichomes sometimes present, as well as stipitate glands. *Stamens* 4; included, didynamous, inserted at the base of the infundibuliform part of the tube. *Filaments* broad at the base, linear dorsifixed, connective ending in an apiculum, multicellular hairs present at base. *Anthers* 2-theous; thecae of long stamens equal, spurred, with trichomes nearly along the whole length of the cleft and concentrated at the base; thecae of short stamens unequal, the longest one with trichomes along the whole length of the cleft, spurred, the other one with trichomes only at the base, spurs absent or rudimentary; spurs unbranched in exceptional cases, branched at apex (Fig. 2). *Gynoecium* superior, included, ovary 2-locular with two axile ovules per locule; style cylindrical; stigma funnel-shaped or 2-lobed, usually with one lobe above the other (Fig. 3). *Disc* present, annular, fleshy. *Fruit* a capsule, globose, beaked, loculicidal dehiscent, trichomes present or absent; fruit stalk, sometimes swollen (Fig. 4). *Seed* semi-globose with a cavity on the side of the hilum; testa brown to greyish black, pubescent, trichomes homogeneously distributed or adhering to form different patterns on the testa (Figs 5 & 6).

In 1773 Montin described the genus *Thunbergia* in Rubiaceae. In 1780 Raetzius, aware of *Thunbergia* Montin, used the same generic name for describing species of Acanthaceae collected by Thunberg at the Cape, hence *Thunbergia* Retz. was a later homonym and therefore illegitimate. Later authors such as the younger Linnaeus (1781) did not attribute *Thunbergia* to Retzius, and Lindau (1893) and C.B. Clarke (1912) actually attributed the name to Linnaeus *fil.* Fortunately the problem has been resolved by;

*Partly based on an M.Sc. thesis, University of Pretoria.

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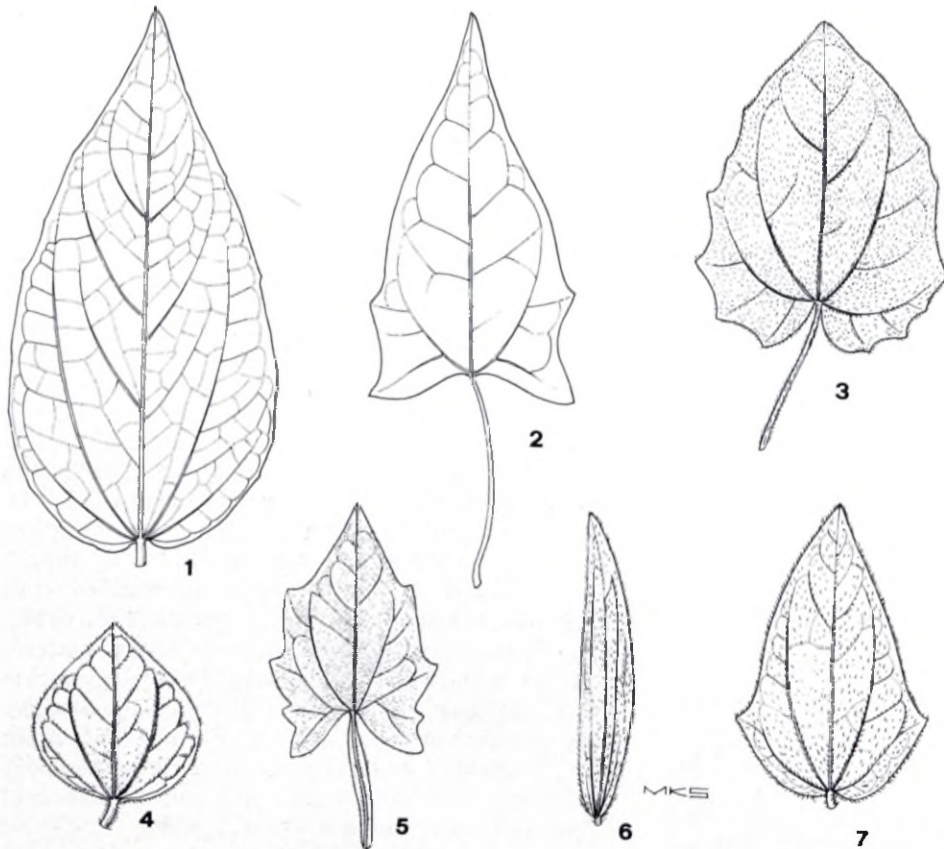


FIG. 1.—Variation of leaf base in *Thunbergia*, $\times 0,5$. 1, *T. natalensis* (Retief 220); 2, *T. purpurata* (Retief 213); 3, *T. amoena* (Retief 178); 4, *T. capensis* (Retief 254); 5, *T. aurea* (Van Greuning 246); 6, *T. venosa* (Stirton 347).

conservation of *Thunbergia* Retz. against *Thunbergia* Montin with *T. capensis* Retz. as the type species of the conserved name (ICBN, p. 396, 1978).

The presence of conspicuously large bracts concealing the saucer-shaped calyx with its tooth-like lobes, panduriform glandular hairs, the structure of the corolla, the fruit being a globose capsule with a prominent, ensiform beak and the absence of retinacula are important features characterizing the genus *Thunbergia*.

The species of *Thunbergia*, indigenous in southern Africa, occur in grassveld, thornveld, bushveld, along the margins of forests or in false fynbos as creepers, shrublets or herbs. Although certain herbaceous creepers like *T. dregeana*, *T. amoena* and *T. purpurata* are usually part of the undergrowth of forests and wooded areas, the species are not

restricted to shady and moist places, but do occur in the open.

1. *Thunbergia natalensis* Hook. in Curtis's bot. Mag. 24: t.5082 (1858); Anderson in J. Linn. Soc., Bot. 7: 18 (1864); Wood in Trans. S. Afr. phil. Soc. 204 (1909); C.B. Cl. in Fl. Cap. 5,1: 4 (1912); Bews, Fl. Natal & Zululand 192 (1921); Phill. in Flower. Pl. Afr. 4: t.147 (1924); Bailey, Cycl. Hort.: 3339 (1929); Chittenden in Dict. Gard. 2106 (1951); Hulme, Wild Flow. Natal t.5, f. 10 (1954); Eliovson, S. Afr. Flow. for the Garden 274 (1955); Batten & Bokelmann, Wild Flow. E. Cape 135 (1966); Ross, Fl. Natal 323 (1972); Kruger, Bome, Struik & Rankplante 514 (1973); Agnew, Upland Kenya Wild Flow. 578 (1974); Gibson, Wild Flow. Natal t.97, f. 4 (1975); Jeppe, Natal Wild Flow. 93 (1975); Compton, Fl. Swaz. 547 (1976). Type: Natal, collector unknown (K, holo.!; PRE, photo!).

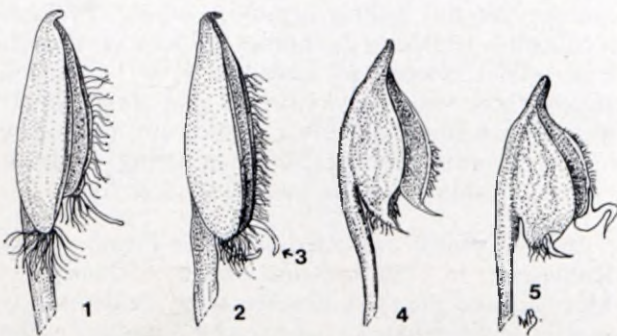


FIG. 2.—Different anther types in *Thunbergia*, $\times 6$. 1, part of a short stamen with anther locules different in length, *T. alata*; 2, part of a long stamen with anther locules more or less the same length, *T. alata*; 3, spur; 4, part of a long stamen with anther locules more or less the same length, *T. natalensis*; 5, part of a short stamen with anther locules different in length, *T. natalensis*.

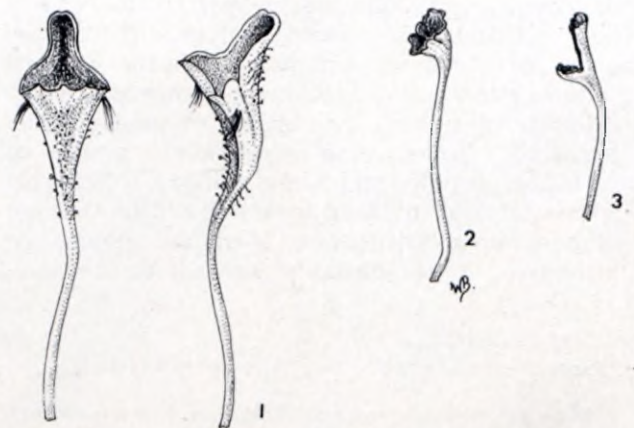


FIG. 3.—Stigmas and styles in *Thunbergia*, $\times 2,5$. 1, *T. natalensis*, stigma funnel-shaped; 2, *T. capensis*, stigma lobed; 3, *T. alata*, stigma lobed.

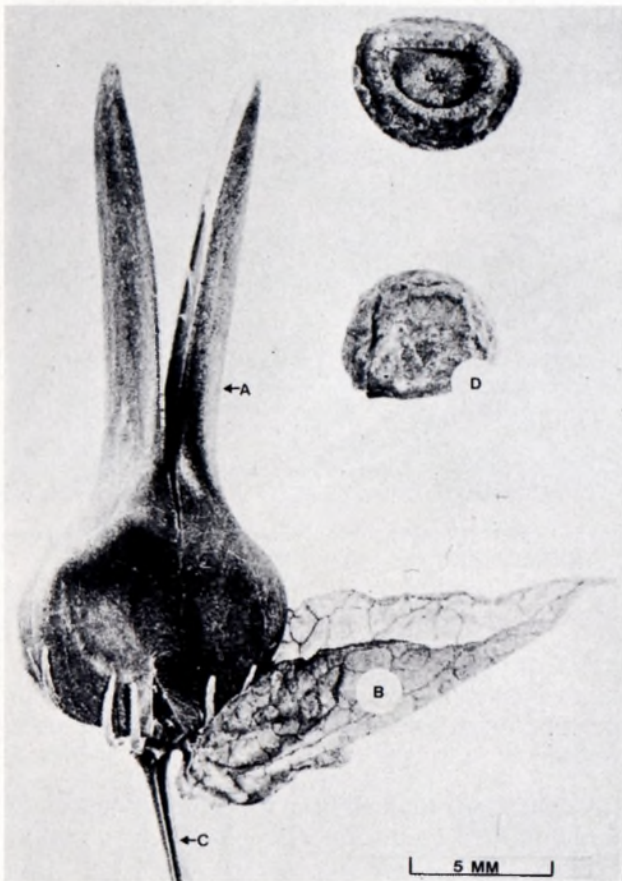


FIG. 4.—Flower parts of *Thunbergia purpurata*; A, carpel; B, bract; C, part of fruit stalk; D, seed.

Dwarf shrub, herbaceous, $\pm 0,75-1$ m high; stems puberulous. *Leaves* sessile or with petioles up to 28 mm long; blade elliptic to ovate, (21–) 55–110 (–159) \times (15–) 35–70 (–82) mm, apex acute, base cordate, margin entire, lobed or toothed. *Flower bracts* 17–27 \times (10–) 12–15 (–20) mm, light green

with conspicuous venation; with pin-like glands, ± 1 mm long, caducous. *Calyx* 1,5–6 mm long; connated at the base, unequally shortly lobed; unicellular trichomes present. *Corolla* with lobes 12–17 \times 13–20 mm, lobes light blue to purplish blue; tube 23–31 mm long and 2–18 mm in diameter, inside yellow to white with purplish blue to light blue stripes running from the lobes, outside light blue to purplish blue. *Filaments* 7–10 mm long, with stipitate glands, anther thecae 2,2–3,2 mm long, spurs conspicuously curved. *Style* 13–17 mm long with pin-like glands. *Stigma* funnel-shaped with pin-like glands and lateral clusters of multicellular trichomes. *Fruit* pubescent; 21–30 mm long, globose base 8–17 mm in diameter; stalk (26–) 35–76 (–89) mm long. *Seed* reddish-brown; surface ridged; 4,5–6,5 mm in diameter.

Found in shade along the margins of forests and woodland or pine plantations, rarely in direct sunlight. Recorded from the Transkei, Natal, Swaziland, Transvaal and northwards to Kenya (Fig. 7).

T. natalensis is characterized by its growth form, purplish blue corolla, the curved spurs of the anthers and a funnel-shaped stigma. The species flowers from October to March.

The 'Natal Blue Bell' is found growing in gardens. Bor & Raizada (1941) mention that *T. natalensis* occurs in gardens throughout India. According to J. Erens (pers. comm., 1976) the species can easily be propagated by means of cuttings.

2. *Thunbergia venosa* C. B. Cl. in Fl. Cap. 5,1: 6 (1912); Bews, Fl. Natal & Zululand 192 (1921); Hulme, Wild Flow. Natal t.12, f.11 (1954); Ross, Fl. Natal 323 (1972). Types: Natal, Itafamasi, Wood 643 (K, lecto.!; BOL!; NH!; PRE, photo!; SAM).

KEY TO SPECIES

Herbaceous shrublets or single-stemmed herbs:

Shrublet, 0,75–1 m; corolla purplish blue; stigma funnel-shaped 1. *T. natalensis*

Shrublet, 0,25–0,4 m or a single-stemmed herb, 0,09–0,3 m; stigma 2-lobed, one lobe below the other:

A single-stemmed herb; leaf blade narrowly ovate 2. *T. venosa*

A herbaceous shrublet; leaf blade ovate to broadly ovate 3. *T. atriplicifolia*

Herbaceous climbers (sometimes rather a scrambler):

Leaves with petioles not winged; fruit glabrous or sparsely pubescent:

Leaves sessile or with petioles less than 8 mm; anther thecae not spurred 4. *T. capensis*

Leaves with petioles usually longer than 8 mm; anther thecae spurred (if not, then leaf base hastate):

Leaf base hastate:

Leaf with veins on abaxial side dark purple 5. *T. purpurata*

Leaves not as above 6. *T. pondoensis*

Leaf base cordate:

Flowers white 7. *T. neglecta*

Flowers dull orange or lemon-yellow:

Leaves densely pubescent, flowers lemon-yellow (Transvaal) 8. *T. amoena*

Leaves sparsely pubescent, flowers dull orange (Natal, Cape Province) 9. *T. dregeana*

Leaves with petioles winged; fruit densely pubescent:

Inner surface of corolla tube dark purplish black, corolla orange; seeds with trichomes adhering in wing-like protuberances 10. *T. alata*

Inner surface of corolla tube dull white, corolla dull orange; seeds with trichomes adhering in papillae-like protuberances 11. *T. aurea*

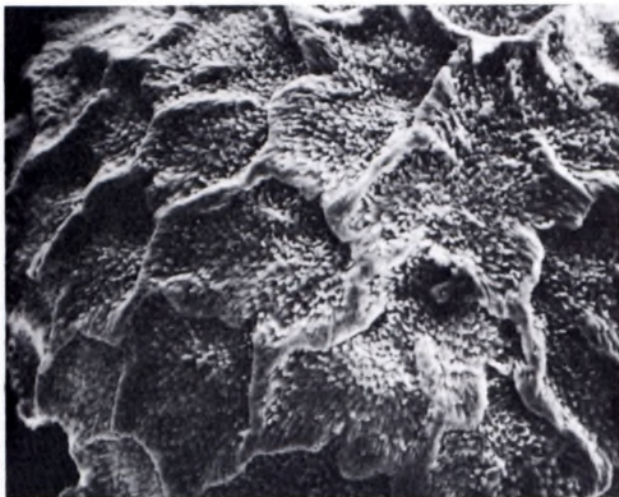


FIG. 5.—Part of the seed surface of *Thunbergia pondoensis* where the trichomes adhere to form ridges, $\times 42$.

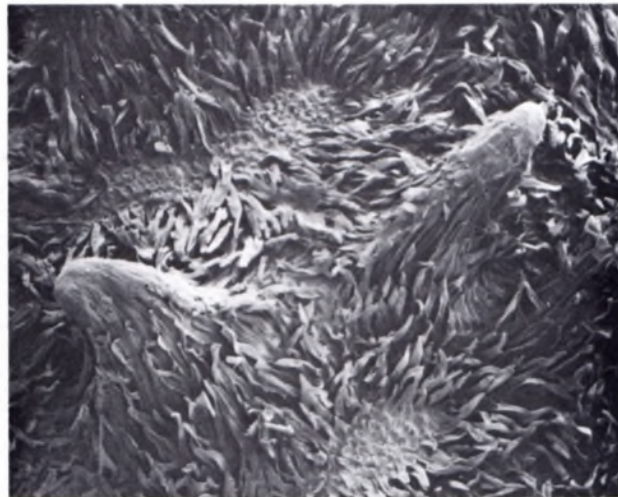


FIG. 6.—Part of the seed surface of *Thunbergia aurea* with patches where no trichomes occur, $\times 56$.

Herb, sparsely to densely pubescent; trichomes on stem, yellowish brown. *Leaves* sessile; blade linear to lanceolate, (14–) 30–77 \times (4–) 7–30 mm, apex acute, base cordate, margin entire or with a few teeth, main vein and lateral veins raised on under surface. *Flower bracts* (18–) 20–25 \times (8–) 16–20 mm, longer than mature fruit. *Calyx* covered with stipitate glands having one stalk cell and multicellular trichomes; lobes 2.5–4.8 mm long. *Corolla* with inner and outer surface of lobes and outer surface of tube yellow, inside of tube dull yellow; lobes 9.5–14 \times 11–20 mm, tube 23–21 mm long and 2.4–11 mm in diameter. *Filaments* 3–4.6 mm long; anther thecae 3–4.2 mm long. *Style* 11–13 mm long; unicellular trichomes present on upper part. *Fruit* glabrous; 15–25 mm long; globose base 6–10 mm in diameter; stalk 45–60 mm long. *Seed* reddish brown; surface with prominent ridges; 2.6–4.6 mm in diameter.

T. venosa is found in grassland where it occurs in open sunlight. The species is endemic in Natal (Fig. 8).

It is distinguished from related taxa by its single stem with slender, sessile leaves, densely crowded in the upper part. The species flowers from September to April.

A decoction obtained from the minced roots of *T. venosa* is used by the Zulu people as a love-potion (Hulme, 1954).

3. *Thunbergia atriplicifolia* E. Mey. ex Nees in DC., Prodr. 11: 56 (1847); Anderson in J. Linn. Soc., Bot. 7: 20 (1864); Sim, Fl. Kaffraria 61 (1894); Wood in Trans. S. Afr. phil. Soc. 203 (1909); Wood, Natal Plants t.594 (1912); C.B. Cl. in Fl. Cap. 5,1: 7 (1912); Bews, Fl. Natal & Zululand 192 (1921). Hulme, Wild Flow. Natal t.12, f. 11 (1954); Letty, Wild Flow. Trans. 313 (1962); Batten & Bokelmann, Wild Flow. E. Cape 140 (1966); Van der Schijff, Checklist Kruger Nat. Park: 86 (1969); Gledhill, E. Cape Veld Flow. 214: t.57, f. 7 (1971?); Ross, Fl. Natal 323 (1972); Gibson, Wild Flow. Natal t.97, f. 2 (1975); Jeppe, Natal Wild Flow. 92 (1975);

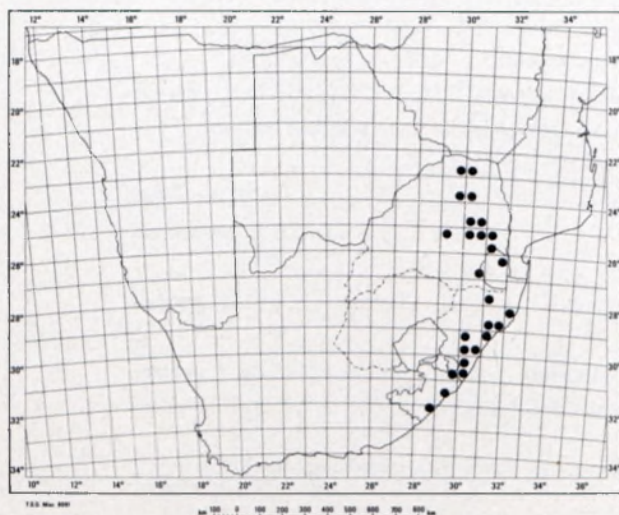


FIG. 7.—●, *Thunbergia natalensis*.

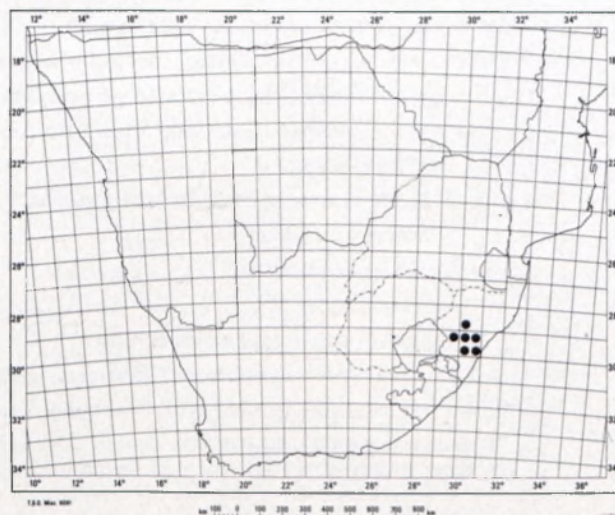


FIG. 8.—●, *Thunbergia venosa*.

Compton, Fl. Swaz. 546 (1976). Type: Cape Province, Kei River near Komga, *Drege* s.n. (K., lecto.!: PRE, photo!).

T. aspera Nees in DC., Prodr. 11: 56 (1847); Sim, Fl. Kaffraria 61 (1894); Wood in Trans. S. Afr. phil. Soc. 18: 203 (1909); C.B. Cl. in Fl. Cap. 5,1: 8 (1912); Bews, Fl. Natal & Zululand 192 (1921); Ross, Fl. Natal 323 (1972). Type: Cape Province, Transkei, *Gill* s.n. (K, holo.!: PRE, photo!).

T. aspera Nees var. *parvifolia* Sond. in Linnaea 23: 90 (1850); C.B. Cl. in Fl. Cap. 5,1: 8 (1912). Type: Transvaal, Magaliesberg, *Zeyher* 1418 (K, lecto.!: PRE, photo!).

T. bachmannii Lindau in Bot. Jb. 17: 94 (1893); Lindau, l.c. (Beibl. 41): 38,41 (1893); C.B. Cl. in Fl. Cap. 5,1: 8 (1912); Compton, Fl. Swaz. 546 (1976). Type: Transkei, sin. loc., *Bachmann* 1267 (K, lecto.!: PRE, photo!).

T. baurii Lindau in Bot. Jb. 24: 312 (1898). Type: 'Cape Province', Baziya, *Baur* 169 (K, holo.!: PRE, photo!).

T. flavohirta Lindau in Bot. Jb. 24: 311 (1898). Type: 'Cape Province' Baziya, *Baur* 58 (K, holo.!: PRE, photo!).

T. galpinii Lindau in Bot. Jb. 24: 310 (1898); C.B. Cl. in Fl. Cap. 5,1: 6 (1912). Type: Transvaal, Saddleback Mountain, *Galpin* 1277 (K, holo.!: PRE!).

T. xanthotricha Lindau in Bot. Jb. 24: 311 (1898); C.B. Cl. in Fl. Cap. 5,1: 8 (1912); Bews, Fl. Natal & Zululand: 192 (1921); Van der Schijff, Checklist Kruger Nat. Park 86 (1969). Type: Transvaal, Barberton, *Galpin* 496 (K, holo.!: BOL!; PRE!; SAM!).

T. atriplicifolia Nees var. *kraussii* C.B. Cl. in Fl. Cap. 5,1: 7 (1912). Type: Natal, sin. loc., *Krauss* 405 (K, holo.!: PRE, photo!).

T. bachmannii Lindau var. *minor* C.B. Cl. in Fl. Cap. 5,1: 8 (1912). Type: sin. loc., *Cooper* 893 (K, holo.!: BOL!; PRE, photo!).

T. cordibracteolata C.B. Cl. in Fl. Cap. 5,1: 7 (1912). Type: sin. loc., *Cooper* 895 (BOL, iso.!: PRE, photo!).

T. hirtistyla C.B. Cl. in Fl. Cap. 5,1: 7 (1912); Bews, Fl. Natal & Zululand 192 (1921); Ross, Fl. Natal 323 (1972). Type: Natal, sin. loc., *Gerrard* 1274 (K, holo.!: NH!; PRE, photo!).

Shrublet, 0,25–0,4 mm high, sparsely to densely pubescent. *Stems* with a tendency to twine. *Leaves* sessile or with petioles up to 4 mm long; blade ovate, elliptic to lanceolate, (10–) 23–62 (–80) × (6–) 12–35 (–55) mm, apex acute, obtuse or emarginate, base cordate, truncate or cuneate, margin entire or toothed, usually only with two teeth at the base. *Flower bracts* persistent, (13–) 17–27 mm long. *Calyx* 3–5 mm long and (8–) 10–17 mm broad. *Corolla* with inner and outer surface of lobes and outer surface of tube dull white, inner surface of tube dull yellow; lobes (10–) 13–17 (–20) × (11–) 15–29 mm, tube 20–27 (–32) mm long and (1,7–) 2–10 mm in diameter with unicellular trichomes and stipitate glands. *Filaments* 4–6,5 mm long; anther thecae 3–4 mm long. *Style* 11–16 mm long, upper part pubescent or glabrous. *Fruit* (13–) 15–19 mm long with globose base (6–) 7–10 mm in diameter; stalk (26–) 32–78 (–104) mm long. *Seed* reddish or greyish brown with trichomes usually evenly arranged; 3,8–6 mm in diameter.

T. atriplicifolia is found as a subordinate species in grassland where it flourishes in both loam and sandy soil. The species has a wide distribution, occurring in the Transvaal, Swaziland, Natal, Transkei and the Cape Province (Fig. 9).

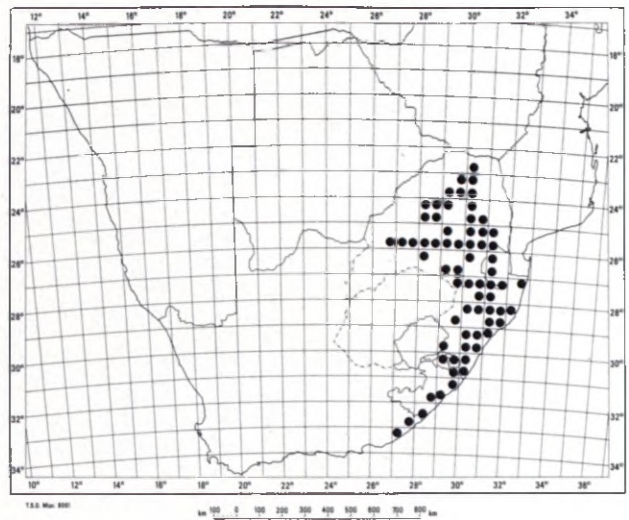


FIG. 9.—●, *Thunbergia atriplicifolia*.

The species is very variable and occurs in different habitats: it is not only found inland, but also in grassveld close to the sea.

Lindau (1898) who described *T. bachmannii*, *T. xanthotricha* and *T. flavohirta* mentions that these three species might be varieties of one species, namely *T. atriplicifolia* and that they needed further investigation. Clarke (1912) in his revision of the genus also indicates that it is an open question whether it is not better to regard the species *T. bachmannii*, *T. xanthotricha* and *T. aspera* as conspecific. In 1864 Anderson cited *T. aspera* as a synonym of *T. atriplicifolia*. Clarke (1912) used leaf shape, pubescence of the style and the form of the flower bracts, to distinguish *T. atriplicifolia*, *T. aspera*, *T. cordibracteolata*, *T. bachmannii*, *T. hirtistyla* and *T. xanthotricha*. The range of variation within this species complex is very marked. However, as extreme forms are linked by numerous intermediates no formal subdivisions are upheld here. Variation of the leaf blade within the species is shown on Fig. 10.

Where the distribution areas of *Thunbergia atriplicifolia* and *T. capensis* overlap, plants occur pointing to hybridization of gene-flow between the two species. Such specimens were in the past identified either as *T. atriplicifolia* or *T. capensis*. The leaves of the plants look like those of *T. capensis* only larger, whereas the flowers resemble those of *T. atriplicifolia*. The following specimens are examples of such intermediate plants:

TRANSKEI.—3228 (Butterworth): Mazeppa Bay (–BC), *Story* 4463 (PRE); Kei Mouth (–CB), *Flanagan* 552 (GRA, PRE, SAM); Bulura River Mouth (–CC), *Acocks* 15799 (PRE).

According to Batten & Bokelmann (1966), the Xhosa people prepare a love-potion from the roots and leaves of the plants and Watt & Breyer-Brandwijk (1962) mention that the leaves of *T. atriplicifolia* are used to make a hairwash. The species is known as 'Natal Primrose' or 'Cape Primrose'.

4. *Thunbergia capensis* Retz. in Phys. Saellsk. Handl. 1, 3: 164 (1776); L.f., Suppl. 292 (1781);

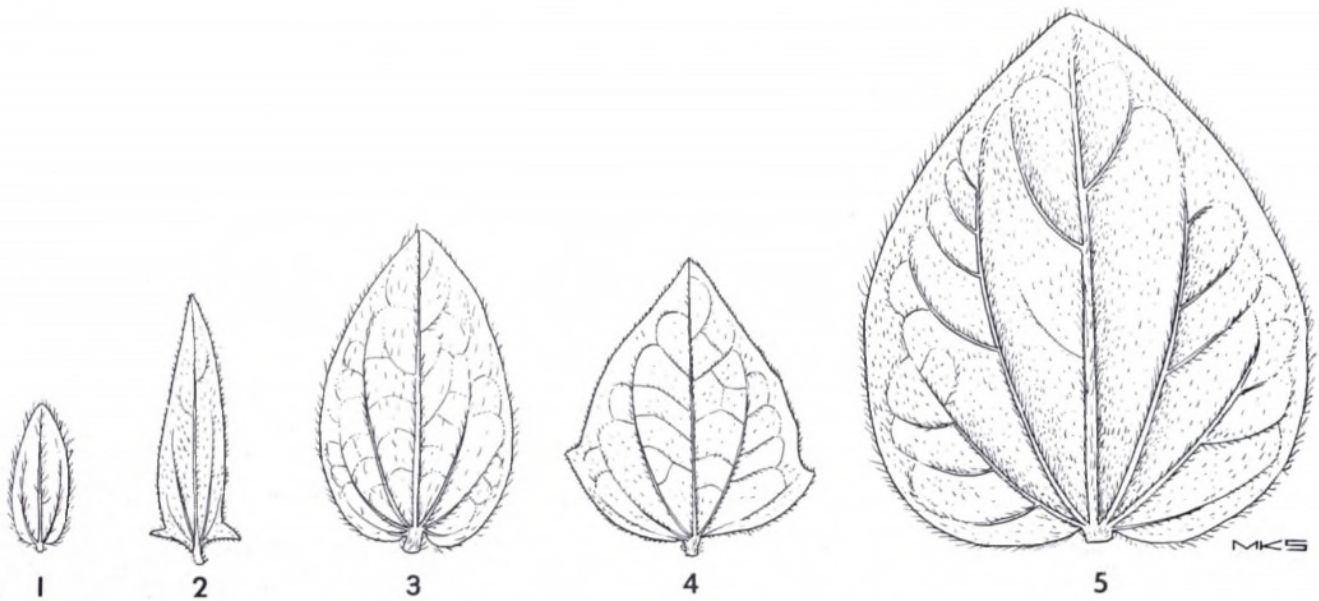


FIG. 10.—Variation of leaf shape in *Thunbergia atriplicifolia*, $\times 0,75$. 1, De Sousa 431; 2, Retief 192; 3, Retief 120; 4, Retief 222; 5, Pott 5656.

Thunb., Nov. Gen. Pl. 1: 21 (1781); Thunb., Prodr. 106 (1800); Lam., Encycl. 7: 637 (1806); Lam., Tabl. Encycl. 3: 97, t.549 (1819); Thunb. Fl. Cap. (edn 2): 488 (1823); Lodd., Bot. Cab. t.1529 (1829); Nees in Linnaea 15: 351 (1841); Drège, Zwei Pfl. Doc. 137, 226 (1843); Krauss, Flora: 136 (1846); Nees in DC., Prodr. 11: 55 (1847); Anderson in J. Linn. Soc., Bot. 7: 20 (1864); Lindau in Bot. Jb.: 17 (beibl. 41): 36, 39 (1893); Sim, Fl. Kaffraria 61 (1894); C.B. Cl. in Fl. Cap. 5,1: 5 (1912); Marloth, Fl. S. Afr. 3: 170 (1932); Fourcade, Check list Flow. Pl. George, Knysna, Humansdorp & Uniondale 6 (1941); Chittenden in Dict. Gard. 2105 (1951); Martin & Noel, Fl. Albany & Bathurst 100 (1960); Batten & Bokelmann, Wild Flow. E. Cape 135 (1966). Type: Cape Province, *Thunberg in Herb. Thunb.* 14601 (UPS, lecto.; PRE, microfiche!; LUND!).

Scrambler, greyish green, pubescent. *Stems* prostrate, twining or erect. *Leaves* sessile or shortly petiolated; petioles up to 7,5 mm long; blade ovate to reniform, 15–33 (–50) \times 14–38 (–47) mm, apex acute, obtuse or emarginate, base cordate, cuneate or truncate, margin lobed or emarginate, trichomes on upper surface orientated in the same direction. *Flower bract* 10–16 \times 8–13 mm. *Calyx* covered with short stipitate glands and unicellular trichomes; lobes 2,5–4,4 mm long. *Corolla* with the inner and outer surface of the lobes and the outer surface of the tube as well as part of the inner surface of the tube yellowish green, bottom part of tube on inner surface dull yellowish green; lobes 7–9 (–18) \times 3–6 (–15) mm, tube 12,3–13,5 (–20) mm long and 2–7 (–10) mm wide. *Filaments* 3–5,5 (–15) mm long; anther thecae without spurs or only one locule of long stamens spurred, thecae 1,5–2 (–4) mm long. *Style* 7,5–8 (–12) mm long. *Fruit* 11,3–24 mm long with bulbous base 6–11 mm in diameter; stalk (18–) 25–62 (–98) mm long. *Seed* brown; some trichomes adhere to form comb-like protuberances; 3,2–5 mm in diameter.

T. capensis flourishes not only on sandy soil in grassland along the coast, but occurs also in stony soil of false fynbos as found in the Ecça Pass area. *T. capensis* is endemic to the Cape Province and the Transkei (Fig. 11).

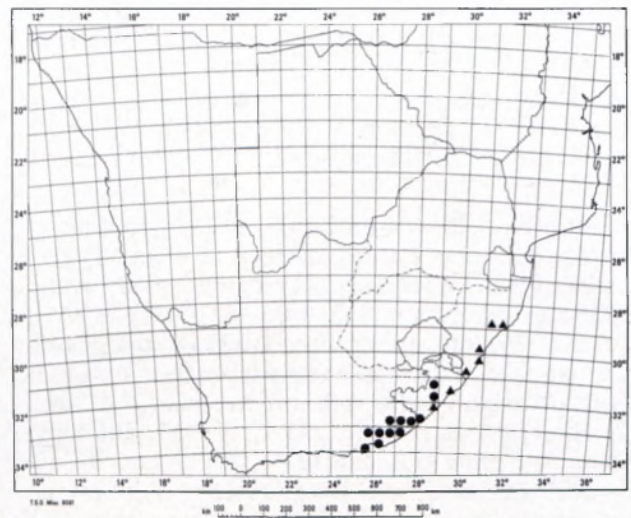


FIG. 11.—●, *Thunbergia capensis*; ▲, *T. purpurata*.

The plant is characterized by broadly ovate leaves with apices acute, obtuse or emarginate, the greenish yellow colour of the corolla and the anther thecae not being spurred. The flowering period of *T. capensis* is from October to April.

The species is suspected of hybridizing with *T. atriplicifolia* where their areas overlap (see *T. atriplicifolia*). Specimens of *T. capensis* with erect stems and flowers nearly double the normal size were collected near Hayes railway halt between Grahamstown and Port Alfred. On investigation they were found to have a triploid chromosome number.

Leaves of this species mixed and crushed with those of a species of *Clematis* and *Ziziphus mucronata* Willd. subsp. *mucronata* are applied to glandular swellings (Batten & Bokelmann, 1966).

5. *Thunbergia purpurata* Harv. ex C.B. Cl. in Fl. Cap. 5,1: 5 (1912); Bews, Fl. Natal & Zululand 192 (1921); Ross, Fl. Natal 323 (1972). Type: Natal sin. loc., Sanderson 442 (Herb. Hook. K, lecto!; PRE, photo!).

A dark green, herbaceous creeper, sparsely pubescent. Stems purplish green where internodes thicken; nodes hairy, a few trichomes present on nodes. Leaves with veins on abaxial side dark purple; petiolate, petioles (11-) 18-47 mm long; blade lanceolate (21-) 46-78 (-90) × (11-) 18-37 (-47) mm, apex usually acuminate, sometimes obtuse or emarginate; base hastate, margin entire. Flower bracts 13-23 × 8-20 mm. Calyx with unicellular trichomes and stipitate glands; lobes 1,3-4,7 mm long. Corolla with inner and outer surface of lobes and outer surface of tube white, tube dull yellow on inner surface; lobes 9-13 × 10,5-13 mm, tube 20-25 mm long, 2,5-8 mm in diameter. Filaments 4-6,5 mm long; anther thecae 3,5-3,7 mm long, spurs not strongly developed. Style 11-14 mm long. Fruit 22-25 mm long, globose base 8-10 mm in diameter; stalk 30-52 mm long. Seed reddish brown; some trichomes adhere to form comb-like protuberances; 4,5-7 mm in diameter.

T. purpurata is usually found along the margins of forests or in open parts in the tropical coastal forests. The species occurs only along the coast of Natal and the Transkei as far south as the Kei River (Fig. 11).

It is distinguished from related species by its dark green leaves with conspicuously dark purplish veins on the under surface. The species flowers from November to March.

In 1827 Hooker published a drawing and a description of *T. angulata* Hils. & Boj. ex Hook., endemic in Madagascar, with a separate drawing of an anther that was from a *Thunbergia* species of the Cape (Clarke, 1912). *T. angulata* is not found along the coast of southern Africa as maintained by Hooker and also Anderson (1864) and Lindau (1893). The anther could, according to Clarke (1912), belong to *T. purpurata* described later on. The two species can easily be distinguished by the anther thecae which, in *T. purpurata*, are not spurred or weakly so, the leaf base of *T. purpurata* is hastate and not cordate, whereas the corolla of the species is white and not purple.

6. *Thunbergia pondoensis* Lindau in Bot. Jb. 17: 93 (1893); Lindau l.c. (beibl. 41): 41 (1893); Wood, Natal Plants 4: t.340 (1906); Wood in Trans. S. Afr. phil. Soc. 18: 204 (1909); Bews, Fl. Natal & Zululand 192 (1921); Ross, Fl. Natal 323 (1972). Type: Natal, Backbeach, Durban, Bachmann 1265 (Bt); Inyesane, Wood 4015 (NH, lecto!; PRE, photo!).

Herbaceous creeper, pubescent. Leaves petiolate, petioles 10-52 mm long; blade ovate, 25-90 × 14-70 mm, apex acute, sometimes obtuse, base

hastate, margin entire, lobed or toothed. Flower bracts persistent; 14-24 × 9-20 mm. Calyx with lobes 2-7 mm long, lobes subuliform. Corolla with inner and outer surface of lobes and outer surface of tube white, inner surface of tube orange yellow; lobes 10-15 × 14-23 mm, tube 18-20 mm long, 4-7 mm in diameter. Filaments 4-7 mm long, anther thecae 3-5 mm long. Style 8-12 mm long, unicellular trichomes present on upper part. Fruit 15-20 mm long, globose base 7-10 mm in diameter. Seed dark brown; trichomes adhere to form ridges on testa; 2,5-4,5 mm in diameter.

T. pondoensis is found as a twiner in the undergrowth under trees in woodland. The species occurs in the Transvaal and Natal (Fig. 12).

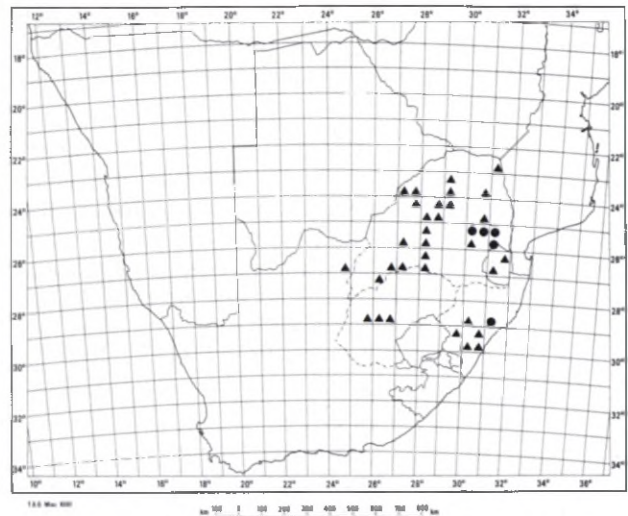


FIG. 12.—●, *Thunbergia pondoensis*; ▲, *T. neglecta*.

Characterized by its hastate leaf base, the species flowers from December to March.

The specific epithet *pondoensis* refers to the area, Pondoland (eastern part of the Transkei), but the species is not known from this area. The locality given by Clarke (1912) and Wood (1909) for Wood 4015, the lectotype, is Entumeni in Natal and not Inyesane as stated on the label of the specimen in NH.

7. *Thunbergia neglecta* Sond. in Linnaea 23: 89 (1850); Anderson in J. Linn. Soc., Bot. 7: 20 (1864); C.B. Cl. in Fl. Cap. 5,1: 9 (1912); Van der Schijff, Checklist Kruger Nat. Park 86 (1969); Ross, Fl. Natal 323 (1972); Compton, Fl. Swaz. 547 (1976). Type: Transvaal, Magaliesberg, Zeyher 1420 (Herb. Benth. K, lecto!).

T. hirta Sond. in Linnaea 23: (1850); Lindau in Bot. Jb. 17 (Beibl. 41): 36, 38 (1893). Type: Orange Free State, Groot Vet Rivier, Zeyher 1419 (Herb. Benth. K, iso.; PRE, photo!).

T. dregeana sensu Van der Schijff, Checklist Kruger Nat. Park 86 (1969); sensu Compton, Fl. Swaz.: 546 (1976).

Scrambler, pubescent. Leaves petiolate, petioles 9-30 mm long; blade ovate, (12-) 29-47 (-57) × (13-) 20-47 (-55) mm, apex acute, obtuse or emarginate, base cordate, margin entire, lobed or toothed. Flower bracts persistent; 11-20 × (5-)

8–14 mm. *Calyx* with lobes 2–6 mm long; lobes subuliform, sometimes toothed, stipitate glands and a few unicellular trichomes present. *Corolla* with inner surface and outer surface of lobes and outer surface of tube dull white, inner surface of tube dull yellow; lobes 9,5–14,5 × 13–23 mm; tube 17–27 mm long, 2–3 mm in diameter. *Filaments* 4–6 mm long; anther thecae 2,4–3 mm long. *Style* 7–12 mm long, unicellular trichomes present on upper part. *Fruit* 13–20 mm long, globose base 6–10 mm in diameter. *Seed* reddish brown; trichomes adhere together to form comb-like protuberances on testa; 3,5–5,0 mm in diameter.

Woodland, thornveld and grassland are natural habitats of *T. neglecta*. The plants usually occur in loam soil under trees and shrubs, but they do grow in direct sunlight between the trees and shrubs. *T. neglecta* is the only species of the genus *Thunbergia* occurring in the Orange Free State. It is also found in Botswana, Transvaal, Swaziland, Natal and the Cape Province (Fig. 12).

In 1850 Sonder described two new species, namely, *T. hirta* and *T. neglecta*. Anderson (1864) regarded them as conspecific and chose the epithet *neglecta* for the species, therefore, according to Article 57.2 of the *International Code of Botanical Nomenclature* (1978), his choice must be followed.

8. *Thunbergia amoena* C.B. Cl. in Fl. Cap. 5,1: 9 (1912). Type: Transvaal, Houtbosch Mountain, Nelson 498 (K, lecto.!; PRE!).

Creepers with a densely pubescent, velvet appearance. *Leaves* petiolate, petioles (8–) 12–48 (–65) mm long; blade ovate, (31–) 40–64 (–79) × (28–) 36–62 (–76) mm, apex acute to obtuse, base cordate, margin entire or toothed. *Flower bracts* persistent; 14–20 × 10–20 mm. *Calyx* covered with short stipitate and pinlike glands; lobes 3–6 mm long. *Corolla* with inner and outer surface of lobes and outer surface of tube lemon yellow, inner surface of tube dull yellow; lobes 10–16 × 14–17 mm, tube 19–29 mm long and 2–10 mm in diameter. *Filaments* 5–6 mm long, anther thecae 2,5–3,2 mm long. *Style* 11,4–13 mm long;

unicellular trichomes present on upper part. *Fruit* 16–18 mm long, globose base 6–7 mm in diameter; stalk 16–24 mm long. *Seed* brown; trichomes adhere to form ridges on surface; 3–5 mm in diameter.

T. amoena occurs mainly along the margins of inland forests, but is also found along the margins of pine plantations and against rocky slopes where the forest changes to mountain grassland. It forms dense mats on the pine needles and rocks. *T. amoena* is endemic to the Transvaal (Fig. 13).

Characteristics of *T. amoena* are the dense pubescence of the plant and the lemon-yellow colour of the corolla. The species flowers from November to February.

9. *Thunbergia dregeana* Nees in Linnæa 15: 352 (1841); Presl, Bot. Bemerk. 94 (1844); Nees in DC., Prodr. 11: 58 (1847); Drège in Linnæa 20: 200 (1847); Anderson in J. Linn. Soc., Bot. 7: 20 (1864); Sim, Fl. Kaffraria 60 (1894); Wood, Natal Plants 3: t.280 (1902); Wood in Trans. S. Afr. phil. Soc. 18: 203 (1909); C.B. Cl. in Fl. Cap. 5,1: 10 (1912); Bews, Fl. Natal & Zululand 192 (1921); Fourc., Check List Flow. Pl. George, Knysna, Humansdorp & Uniondale 6 (1941); Chittenden in Dict. Gard. 2106 (1951); Batten & Bokelmann, Wild Flow. E. Cape 141 (1966); Ross, Fl. Natal 323 (1972); Gibson, Wild Flow. Natal t.97, f. 33 (1975); Jeppe, Natal Wild Flow. 92 (1975). Type: Cape Province, Fort Beaufort, Drège s.n. (K, lecto.!; PRE, photo!).

T. fragrans sensu E. Mey. in Drège, Zwei Pfl. Doc. 141, 226 (1843); Nees in DC., Prodr. 11: 58 (1847). Type: Cape Province, sin. loc., Eckl. 38b (B).

Herbaceous, pubescent, creeper. *Leaves* petiolate, petioles (2–) 15–60 mm long, blade ovate, 13–53 (–70) × 14–50 (–70) mm, apex acute; base cordate, margin toothed. *Flower bracts* caducous; 13–19 × 8–20 mm. *Calyx* covered with short stipitate glands; lobes 3,5–6 mm long, sometimes branched at the apex. *Corolla* with inner and outer surface of lobes and outer surface of tube dull orange yellow, inner surface of tube dull yellow, lobes 13–25 × 13–27 mm, tube 16–26 mm long and 2,6–6 mm in diameter. *Filaments* 4–5,7 mm long; anther thecae 3,6–4,6 mm long. *Style* 10–13 mm long. *Fruit* 15–24 mm long, base 7–10 mm in diameter; stalk (19–) 39–70 (–100) mm long. *Seed* greyish brown; trichomes adhere to form ridges on surface; 4–6 mm in diameter.

T. dregeana is found along streams and the margins of forests. The species occurs along the eastern coast of Natal and in the Cape Province as far south as the Gamtoos River (Fig. 13).

This species is characterized by a dull orange-yellow corolla with large lobes. It flowers from November to February. A strong decoction of *T. dregeana* is used by the Zulu people as a remedy for venereal diseases (Watt & Breyer-Brandwijk, 1962). Medley Wood (1902) mentions that local Asian women, like the Zulus, prepare a hairwash from the green fruits of *T. dregeana*.

10. *Thunbergia alata* Sims in Bot. Mag. t.2591 (1825); Lodd., Bot. Cab. t.1045 (1825); Hook.,

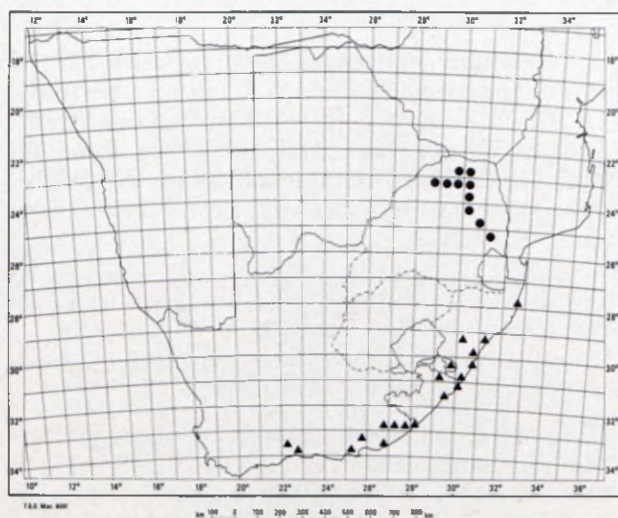


FIG. 13.—●, *Thunbergia amoena*; ▲, *T. dregeana*.

Exot. Fl. t.177 (1827); Nees in DC., Prodr. 11: 58 (1847); Klotzsch in Peters' Reise Mossamb. 196 (1862–1864); Anderson in J. Linn. Soc., Bot. 7: 19 (1864); Lindau in Bot. Jb. 17 (beibl. 41): 40 (1893); Lindau in Engl., Pfl. Ost. Afr. C. 366 (1895); Burkill in Fl. Trop. Afr. 5: 16 (1899); Wood, Natal Plants 3: 6, 300 (1902); C.B. Cl. in Fl. Cap. 5,1: 10 (1912); Bews, Fl. Natal & Zululand 192 (1921); Bailey, Cycl. Hort. 3338 (1929); Chittenden in Dict. Gard. 2105 (1951); Eliovson, The Complete Gardening Book for S. Afr. 36, 131 (1960); Benoit in Fl. Madag. 182: 10 (1967); Ross, Fl. Natal 323 (1972); Kruger, Bome, Struik en Rankplante 514 (1973); Jeppe, Natal Wild Flow. 92 (1975); Plowes & Drummond, Flow. of Rhodesia 129, t.170 (1976). Type: Zanzibar, *Bojer* s.n. (K, holo.!, PRE, photo!).

Herbaceous creeper; pubescent. *Leaves* petiolate, petioles (10–) 22–50 mm long, winged; blade ovate (16–) 21–43 (–63) × (10–) 17–32 (–48) mm, apex acuminate, acute or obtuse, base cordate or hastate, margin entire or toothed. *Flower bracts* 13–19 × 10–16 mm. *Calyx* with sessile and stipitate glands. *Corolla* with inner and outer surface of lobes and outer surface of tube orange, inner surface of tube dark purplish black with white stripes at base; lobes 7,5–13,5 × 11–20 mm. *Filaments* 4–5,7 mm long; anther thecae 3,6–4,6 mm long. *Style* 8,5–11 mm long; stipitate glands present. *Fruits* 15–18 mm long, globose base 7,5–9 mm in diameter; stalk (13–) 35–64 mm long. *Seed* brown; some trichomes adhere to form wing-like protuberances; 2,4–4 mm in diameter.

T. alata is found along margins of forests where it is humid and the soil is humic, but also in open sunlight and more sandy soil. The species is indigenous to east Africa and occurs southwards to the eastern Transvaal and Natal (Fig. 14).

The species is characterized by the colour of the corolla, winged petioles and the trichomes of the seed surface forming wing-like protuberances. *T. alata* flowers nearly the whole year round.

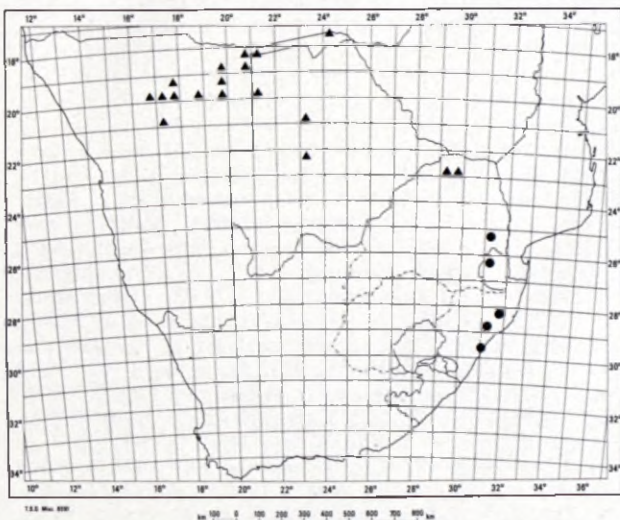


FIG. 14.—●, *Thunbergia alata*; ▲, *T. aurea*.

T. alata is known as the Black-eyed Susan, because the inner surface of the corolla tube which is usually a purplish black colour, surrounded by the bright orange corolla lobes, reminds one of an eye.

It is cultivated in many tropical and subtropical parts of the world where the species often becomes naturalized. Different colour variations occur. In 1839 Paxton described a species known as *T. aurantiaca*, darker in colour and with larger flowers than *T. alata*. The author mentions that the seed of this species cultivated in England was from the Cape of Good Hope. As far as known, only the form with flowers having an orange corolla with the inner surface of the corolla tube purplish black, is indigenous in southern Africa. Invisible ultra violet patterns on the fresh corolla of *T. alata* but visible as fluorescent patterns in pressed herbarium specimens, were observed by Eisner (1973).

11. *Thunbergia aurea* N.E. Br. in Kew Bull. 1909: 127 (1909); P.G. Meyer in Prodr. Fl. S.W. Afr. 129 (1968). Type: Botswana, Kwebe-Hills, *Lugard* 114 (K, lecto.!, PRE, photo!).

Perennial herb with erect or trailing stems, pubescent. *Leaves* petiolate, petioles (7–) 24–43 mm long, winged; blade lanceolate, (29–) 38–97 (–114); × (15–) 37–52 (–75) mm, apex acute or acuminate, base hastate or truncate, margin entire. *Flower bracts* 15–21 × 8–17 mm, papery thin with a conspicuous venation and longer than the mature fruit. *Calyx* 1,4–4,2 mm long; sessile and stipitate glands as well as uni- and multicellular trichomes present. *Corolla* with inner and outer surface of lobes and outer surface of tube dull orange-yellow, inner surface of tube dull white; lobes 1,9–4,5 mm × 3–5,3 mm, tube 9–17 mm long and 1,4–5 mm in diameter. *Filaments* 3,4–5 mm long, anther thecae 1,4–2 mm long. *Style* 5,5–6,5 mm long. *Fruit* 14–20 mm long, globose base 6–9 mm in diameter; stalks (13–) 22–58 mm long; densely pubescent. *Seed* brown; testa distinctly visible in spaces between trichomes, trichomes adhere to form papillae-like protuberances; 2,4–4 mm in diameter.

T. aurea occurs in three of the veld types distinguished by Giess (1971) in South West Africa/Namibia, namely: (i) mountain savanna and karst veld, (ii) thorn savanna; and (iii) tree savanna and dry forest. It is found in sandy soil under trees and shrubs or against the slopes of dolomite hills. The species is also known from Botswana and the Transvaal (Fig. 14).

The species is characterized by its small size and the dull orange-yellow colour of the corolla, a winged petiole like *T. alata* and the trichomes of the seed surface adhering to form papillae-like protuberances. *T. aurea* flowers from January to March.

According to De Winter (specimen no. 4159) the leaves of *T. aurea* are used as spinach, and Rodin (specimen no. 9105) mentions that the leaves are dried and then boiled. The decoction obtained, is used as a remedy against coughing.

IMPERFECTLY KNOWN TAXA

T. humilis Eckl. & Zeyh., Cat. Sem. Pl. Cap.: no type.

T. capensis Retz. var. *grandiflora* Nees in DC., Prodr. 11: 55 (1847): the type has not been found.

T. stenophylla C.B. Cl. in Fl. Cap. 5, 1: 6 (1912): the type specimen in the British Museum (Natural History) is very poor and throws no light on the identity of the taxon.

UITTREKSEL

'n Hersiening van die genus *Thunbergia* in suidelike Afrika is onderneem. Elf spesies word erken.

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Thunb. 14601; *Tyson* 1206(3), 2559(9). *Vahrmeijer* 607(9), 1577(7); *Vahrmeijer & du Preez* 2495(11); *Vahrmeijer & Tölkén* 277(3); *Van der Schijff* 8(1), 1222(7), 3255(7), 5895(1), 5916(1); *Van der Walt* 321(3); *Van Greuning* 263(11); *Van Hoepen* 1738(3); *Van Jaarsveld* 1079(8), 1098(6); *Van Vuuren* 1332(3), 1835(3); *Van Wyk* 1402(7), 5094(1); *Verdoorn* 140(3). *Walters* sub PRE 10759(7); *Ward* 571(9), 942(9), 3517(7); *Watmough* 402(9); *Wells* 2018(3), 3124(4); *Werdermann & Oberdieck* 1738(7), 2013(7), 2124(1); *Wild & Drummond* 6971(11); *Williams* sub TRV 7677(7); *Wood* 1(3), 284(1), 543(9), 643(2), 696(2), 1218(5), 4015(6), 6376(9), sub SAM 18933; *Wylie* sub NH 28009(2), sub Wood 8478. *Young* 303(3), 372(1), 489(3), A 545, A 655. *Zeyher* 1418(3), 1419(7), 1420(7); *Zwanziger* 686(11).

APPENDIX: SPECIMENS EXAMINED

The specimens are listed alphabetically according to the name of the collector. The figures in brackets refer to the number of the taxon in the text.

- Acocks* 9898(2), 10799(7), 10966(5), 11756(3), 12554(4), 13049(3), 13298(3), 13317(9), 13584(4), 17883(4), 21962(3); *Archibald* 5572(4), 6083(4). *Bachmann* 1267(3); *Bandert* 41(3); *Barker* 1504(4), 2732(4), 2876(3), 6136(3), 7909(9); *Barrett* 154(3); *Baur* 58(3), 169(3); *Bayliss* 1706(3), 2518(1); *Blenkiron* sub J16128(3); *Bokelmann* 1(1); *Bos* 1263(8); *Botha & Van Wyk* 1063(3); *Bourquin & Fakude* 17(3); *Bredenkamp* 368(7), 526(7), 1282(7), 1308(7), 1324(7); *Bremekamp & Schweickerdt* 155(7); *Breyer* sub TRV 17895(6); *Brown & Shapiro* 450(7); *Buitendag* 731(3), 1026(3), 1027(6); *Burt Davy* sub PRE 10637(3). *Codd* 1804(3), 4166(11), 4784(7), 6059(6), 7954(8); *Codd & De Winter* 3081(1), 4950(3); *Codd & Dyer* 9188(8); *Coetzee* 1523(3); *Comins*