



FLORA OF SOMALIA

VOLUME THREE

WITH CUMULATIVE INDEX TO
VOLUMES 1-4

EDITED BY MATS THULIN

subulate. Corolla white; tube 10–26 mm long; lobes 7–10, 7–18 mm long, linear to ovate-lanceolate, obtuse and apiculate to acute or acuminate at the apex. Stamens inserted near middle of corolla-tube; anthers c. 4–5 mm long. Fruit with lobes c. 6–8 mm long when dry, subglobose.

Acacia-Commiphora bushland, usually on sand; 40–300 m. C1, 2; S1–3; eastern Kenya. Thulin 6347; Kuchar 17031; Tardelli 64.

Kupicha in Fl. Zamb. 7(1): 316 (1983) included *J. punctulatum*, with a question-mark, in the widespread and variable *J. streptopus* E. Mey, but this has normally opposite leaves with acarodomatia and the stamens are inserted in the upper half of the corolla-tube. However, the relationship between *J. punctulatum* and *J. streptopus* is in need of further study.

120. SCROPHULARIACEAE

by P. Cuccuini & C. Nepi (*Alectra*, *Anticharis*, *Aptosimum*, *Scrophularia*), E. Fischer (*Bacopa*, *Craterostigma*, *Lindernia*, *Pseudosopubia*, *Rhabdotosperma*, *Stemodiopsis*, *Verbascum*), Ghebrehewet Medhanie (*Kickxia*, *Nanorrhinum*), M. Hjertson (*Campylanthus*, *Lindenbergia*), K.I. Mohamed & L.J. Musselman (*Striga*), M. Thulin (*Camptoloma*, *Chaenorhinum*, *Cycnium*, *Ghikaea*, *Misopates*, *Schweinfurthia*, *Vernonia*, *Xylocalyx*)

Cuf. Enum.: 884–912 (1963); Fl. Zamb. 8(2): 1–179 (1990); Fl. Afr. Centr.: 1–217 (1999).

Herbs or subshrubs, rarely climbers, shrubs or trees. Leaves opposite or alternate, entire, rarely divided, without stipules. Flowers bisexual, \pm zygomorphic, in racemes, spikes or panicles, or solitary in leaf axils. Calyx 4–5-lobed. Corolla sympetalous, rotate to narrowly tubular, often 2-lipped with 2-lobed upper lip and 3-lobed lower lip, throat of corolla often closed by a palate, base of tube sometimes spurred or gibbose. Stamens inserted in corolla-tube, (2–)4(–5), staminode(s) sometimes present; anthers with 2 well developed thecae, with 1 fertile theca and a reduced sterile theca, or with 1 theca only. Ovary superior, 2-celled, usually with many ovules on axile placentas; style terminal; stigma simple or 2-lobed. Fruit a capsule with septicidal, loculicidal or circumscissile dehiscence, rarely indehiscent. Seeds numerous to few, smooth or variously ornamented; endosperm present, embryo straight.

Cosmopolitan family with about 300 genera and 5500 species, mainly in temperate regions and on tropical mountains (see also Appendix).

The family *Scrophulariaceae* is here given a traditional circumscription, but molecular data (see, e.g., Oxelman, Backlund & Bremer in Syst. Bot. 24: 164–182, 1999, Olmstead & al. in Amer. J. Bot. 88: 348–361, 2001, and Albach, Meudt & Oxelman in Amer. J. Bot. 92: 297–315, 2005), indicate that, among the genera treated below, only n. 1–6 belong to *Scrophulariaceae* in a strict sense, whereas n. 7–14 belong to an expanded *Plantaginaceae*, and 18–24 to an expanded *Orobanchaceae*. The placing of genera n. 15–17, in tribe *Lindernieae*, is still uncertain.

1. Corolla-tube spurred or gibbose at base..... 2
- Corolla-tube not spurred or gibbous 6
2. Corolla-tube gibbous at base 3
- Corolla distinctly spurred at base 4
3. Corolla whitish with yellow palate; pedicels 3–17 mm long; seeds \pm radially symmetrical with 4–6 longitudinal wing-like ridges..... 8. *Schweinfurthia*
- Corolla pink; pedicels up to 2.5(–4) mm long; seeds with dorsal face \pm smooth and ventral face with a marginal ridge or wing 9. *Misopates*
4. Corolla purplish blue and white; anthers marginally coherent in 2 pairs 7. *Chaenorhinum*
- Corolla yellow; all 4 anthers marginally coherent to form a ring-like structure..... 5
5. Anthers ciliate; capsule dehiscence operculate, with a detachable lid produced by a circumscissile split 10. *Kickxia*
- Anthers glabrous; capsule dehiscence valvate..... 11. *Nanorrhinum*
6. Leaves all alternate or rarely opposite in seedlings..... 7
- Leaves opposite, at least the lower ones 12
7. Stamens 2..... 8
- Stamens 4 or 5, sometimes 2 of them sterile..... 9
8. Annual herbs; corolla-tube funnel-shaped to campanulate, not geniculate..... 4. *Anticharis*
- Shrubs, subshrubs or woody-based perennial herbs; corolla-tube narrowly cylindrical, with 2 geniculations (sometimes hidden by calyx) 14. *Campylanthus*

120. Scrophulariaceae

9. Corolla yellow, subrotate, 20 mm or more in diam. 10
- Corolla not yellow, with a funnel-shaped or cylindrical tube, less than 10 mm in diam. 11
10. Flowers in 2–7-flowered clusters arranged in branched inflorescence; seeds pitted 1. *Verbascum*
- Flowers in lax racemes; seeds with longitudinal furrows 2. *Rhabdotosperma*
11. Plant pubescent with short eglandular hairs; flowers sessile 5. *Aptosimum*
- Plant covered by 1–4 mm long glandular hairs; flowers with distinct pedicels 6. *Camptoloma*
12. Flowers in axillary cymes arranged in branched inflorescence; corolla urn-shaped, dark red or brownish purple, c. 5 mm long 3. *Scrophularia*
- Flowers in racemes, spikes or solitary in leaf-axils; corolla not as above 13
13. Fertile stamens 2, 2 staminodes sometimes present 14
- Fertile stamens 4 15
14. Corolla rotate with short inconspicuous tube; stamens exerted 13. *Veronica*
- Corolla 2-lipped with distinct tube; stamens included 16. *Lindernia*
15. Leaves in a basal rosette 17. *Craterostigma*
- Leaves not in basal rosette 16
16. Anthers with 2 equal thecae 17
- Anthers with 2 unequal thecae or with 1 theca only 20
17. Anthers with stipitate thecae 18. *Lindenbergia*
- Anthers with sessile thecae 18
18. Pedicels curved and reflexed in fruit 15. *Stemodiopsis*
- Pedicels not as above 19
19. Stems creeping, glabrous; corolla white to blue-violet 12. *Bacopa*
- Stems erect, pubescent; corolla yellow to orange with purple markings 19. *Alectra*
20. All anthers with 2 unequal thecae; calyx becoming woody in fruit and remaining on plant for a long time 24. *Xylocalyx*
- Anthers, at least in 1 pair of stamens, with 1 theca only 21
21. Corolla-tube narrow at base and distinctly widened towards throat; anthers of 1 pair of stamens with 1 theca, the other pair 2-theous with a reduced sterile theca; subshrubby herbs or shrubs 22
- Corolla-tube ± cylindrical; anthers all with 1 theca only; herbs 23
22. 2-theous anthers with stipitate thecae, the sterile theca rounded; calyx up to 10 mm long; plant pilose to glabrous 20. *Pseudosopubia*
- 2-theous anthers with sessile thecae, the sterile theca filiform; calyx 11–13 mm long; plant scabrid 21. *Ghikaea*
23. Corolla with an acute bend below throat 22. *Striga*
- Corolla straight or curved but not with acute bend 23. *Cynium*

1. VERBASCUM L. (1753)

Celsia L. (1753).

Staurophragma Fisch. & Mey. (1843).

Herbs or rarely small shrubs, glandular-pubescent to densely villous, usually with branched hairs, rarely glabrous. Leaves alternate along stem and in a basal rosette, entire or pinnatifid to pinnatisect, pinnately veined. Inflorescence terminal, lax, cymose, with axillary cymes and usually accessory flowers or racemose, bracteoles usually present; flowers shortly to distinctly pedicellate. Calyx deeply 5-lobed, lobes equal. Corolla yellow, rarely violet or purple, subrotate, ± actinomorphic or somewhat zygomorphic, the 2 upper lobes slightly shorter than the 3 lower ones. Stamens 4–5, equal, exerted, the median one sometimes reduced to a staminode; filaments usually villous; anthers with confluent thecae (syntheticous) rounded at base. Ovary ovoid to globose, usually densely pubescent, with straight filiform style; stigma capitate; mucronate base of style persistent in fruit. Capsule with septicidal dehiscence. Seeds numerous, pitted.

About 360 species in Europe, Asia (diversity centre in Turkey and Iran), and in north-east Africa southwards to Kenya.

V. sinaiticum Benth. (1846). Fig. 176.

V. somaliense Baker (1895); type: N1, "Golisi" range, Cole s.n. (K lecto.).

Plant biennial, 60–200 cm tall; stem erect, richly branched, densely greyish-tomentose without glandular hairs. Leaves entire, densely greyish-tomentose; basal leaves with oblong or ovate-oblong blade, 60–300 × 40–140 mm, dentate, with 20–90 mm long petiole; stem leaves with shorter petiole or sessile, rounded-truncate at the base. Inflorescence with numerous long branches; flowers in 2–7-flowered clusters (partial inflorescences); lower bracts subcordate-triangular, shortly cuspidate, scarcely longer than partial inflorescences, upper bracts shorter than partial inflorescences; pedicel of primary flower of a cluster 4–10 mm long. Calyx-lobes densely tomentose, 4–7 mm long, oblong, entire, acute. Corolla yellow, 20–28 mm in diam., densely pilose with branched hairs outside, glabrous inside.

G. speciosa (Rendle) Diels (1908); *Graderia speciosa* Rendle (1896). Fig. 195.

Ghikaea spectabilis Schweinf. & Volkens (1897).

Plant 1–3 m tall, scabrid. Leaf-blades ovate, up to 40 × 16 mm, obtuse to acuminate, with entire margin. Flowers on pedicels up to 8 mm long. Calyx 11–13 mm long, divided about halfway into triangular lobes with revolute margins. Corolla rose to pink or purple, 25–40 mm long; tube 15–20 mm long, much widened towards the mouth. Capsule 8–10 × 7–8 mm, emarginate.

Acacia-Commiphora bushland, often in rocky places; 150–1500 m. N1; C1, 2; S1; E Ethiopia, N Kenya. Bally 9964; Gillett & Hemming 24244; Thulin & Abdi Dahir 6623.

22. STRIGA Lour. (1790)

Mohamed, Musselman & Riches in Ann. Missouri Bot. Gard. 88: 60–103 (2001).

Annual or perennial hemiparasitic herbs, hirsute, pilose or scabrid; stems simple or branched mainly from above middle, stiffly erect, square or terete. Leaves opposite or subopposite, reduced to small scales at the base. Inflorescence a dense or lax terminal spike or raceme. Calyx tubular, (4–)5(–8)-lobed; lobes equal or subequal. Corolla-tube cylindrical with an acute bend; limb 2-lipped, upper lip 2-fid or emarginate, lower lip 3-lobed. Stamens 4, 2 long and 2 short, included; anthers with 1 theca only. Style persistent; stigma clavate. Capsule oblong or subovoid, with loculicidal dehiscence. Seeds dust-like, minute, with prominent ornamented ridges.

Genus of some 40 species in the Old World tropics, well represented in Africa. In addition to the species treated here the following species known from adjacent countries may well turn up in Somalia: *S. yemenica* Musselman & Hepper, *S. hermonthica* (Del.) Benth., *S. aspera* (Willd.) Benth., and *S. pubiflora* Klotzsch.

Species of *Striga* (witchweeds) are among the most specialized of all root-parasites and some of them cause severe damage to cultivated crops especially in semi-arid regions of Africa.

1. Calyx 4- to 5-ribbed; plant succulent..... 4. *S. gesnerioides*
- Calyx 10- or more-ribbed; plant not succulent... 2
2. Leaves up to 3 mm wide, with obscure veins and entire margin; calyx 10-ribbed; corolla red and/or yellow 1. *S. asiatica*
- Leaves 4–12 mm wide, with 2 to 5 prominent veins and toothed margin; calyx 10–15 or more-ribbed; corolla salmon pink..... 3
3. Hairs on stem stiff; lower bracts distinctly 3-veined, toothed; corolla-lobes of lower lip 6–9 mm long..... 2. *S. forbesii*

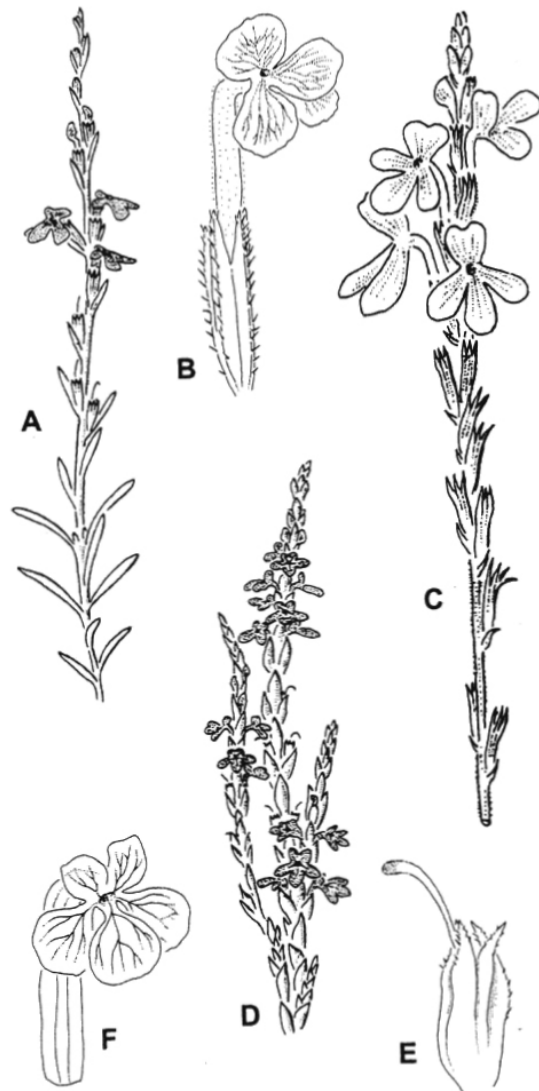


Fig. 196. A, B: *Striga asiatica*. A: flowering branch, × 2/3. B: flower, × 3.5. – C: *S. latericea*, inflorescence, × 2/3. – D–F: *S. gesnerioides*. D: habit, × 2/3. E: calyx and style, × 3.5. F: corolla, × 3.5. – A, B from Fischer s.n., C from Parker 4034, D–F from Miller 546. Drawn by E. Fischer.

- Hairs on stem soft; lower bract obscurely veined, entire; corolla-lobes of lower lip 10–15 mm long 3. *S. latericea*

1. *S. asiatica* (L.) Kuntze (1891); *Buchnera asiatica* L. (1753). Fig. 196A, B.

Annual, up to 40 cm tall, usually branched from middle, hispid; stem obtusely square. Leaves 10–50



Fig. 197. *Striga forbesii*, habit, $\times 2/3$. — From Kew Bull. 41: 213 (1986). Drawn by F.N. Hepper.

$\times 0.5$ – 3 mm, opposite, linear or narrowly-elliptic, margin entire, veins obscure. Lower bracts 6 – 35 (– 50) $\times 1$ – 3 mm, leaf-like, upper bracts lanceolate, shorter or longer than calyx. Flowers alternate in lax racemes, raceme longer than vegetative stem. Calyx 10-ribbed, 4 – 9 mm long; tube 2 – 7 mm long; lobes 5, equal, or 6 – 8 , unequal, narrowly lanceolate. Corolla red with yellow throat, occasionally yellow; tube 8 – 14 mm long, bent and expanded distally above calyx, sparsely to densely pubescent; lobes of lower lip 2 – 5×1 – 3 mm, obovate, spread-

ing; upper lip 1 – 3×2 – 4 (– 7) mm, emarginate.

Grassland and bushland on sandy soil; 30 – 50 m. S3; widespread in tropical and southern Africa and Madagascar, and in Asia, introduced elsewhere. Gillett & al. 25045; Senni 309; Moggi, Tardelli & Bavazzano 413.

S. asiatica is known to attack crops such as sorghum and maize, especially in Madagascar and southern Africa. Plants recognized as *S. hirsuta* Benth. in Mohamed & al. (2001) are provisionally included here as *S. hirsuta* is an illegitimate name and the taxonomy is in need of further study.

2. *S. forbesii* Benth. (1836). Fig. 197.

Annual, up to 70 cm tall, unbranched or with 2 – 4 branches below the middle, scabrous to hispid; stem square, furrowed. Leaves 15 – 40 (– 90) $\times 4$ – 12 mm, opposite, lanceolate, coarsely toothed, 3 – 5 -veined, usually shorter than internodes. Lower bracts 20 – 50 (– 90) $\times 3$ – 12 mm, leaf-like, longer than calyx, upper bracts shorter than calyx. Flowers opposite in open racemes, raceme shorter than vegetative stem. Calyx 10 – 15 -ribbed, 9 – 14 (– 20) mm long; tube 4 – 6 mm long; lobes 5, equal, broadly lanceolate, 5 – 9 (– 14) mm long, longer than tube. Corolla salmon-pink; tube 20 – 25 mm long, bent and expanded distally above calyx, densely glandular-pubescent; lobes of lower lip 6 – 9×3 – 6 mm, obovate, spreading; upper lip 3 – 6×6 – 9 mm, emarginate.

Weed in cultivations; 30 – 120 m. C2; S2, 3; widespread in tropical Africa. Musselman 7086 (ODU); Kuchar 17495.

3. *S. latericea* Vatke (1882). Fig. 196C.

S. somaliensis Skan (1906); type: N1, "Onunuff", James & Thrupp s.n. (K holo.).

Perennial, up to 60 cm tall, unbranched or with 2 – 3 branches from base, pubescent; stem square, furrowed. Leaves 20 – 35×4 – 6 mm, opposite, linear to lanceolate, slightly toothed, 3-veined, shorter than internodes. Lower bracts 20 – 33×2 – 6 mm, linear, often shorter than calyx, upper bracts lanceolate, shorter than calyx. Flowers opposite in racemes, raceme lax at base, dense above middle, shorter than vegetative stem. Calyx at least 15-ribbed, 10 – 24 mm long; tube 10 – 15 mm long; lobes 5, unequal, broadly lanceolate, 5 – 15 mm long, longer than tube. Corolla salmon-pink; tube 22 – 30 mm long, bent and expanded distally above calyx, densely glandular-pubescent; lobes of lower lip 10 – 15 (– 20) $\times 7$ – 9 mm, obovate; upper lip 7 – 13×13 – 14 mm, emarginate.

Grassland, weed in sugar cane cultivation; 20 – 1500 m. N1, 2; S1, 3; Ethiopia, Kenya, Tanzania. Bally 10025; Glover & Gilliland 1231; Terry 3384.

S. latericea is a perennial that produces aerial shoots from adventitious buds developing from the

roots, unique in the genus. The aerial parts also have a perennial habit with new shoots arising from the lower nodes after much of the stem matures and dies.

4. *S. gesnerioides* (Willd.) Vatke (1875); *Buchnera gesnerioides* Willd. (1801). Fig. 196D–F. Warick (Som.).

Annual or occasionally perennial, 12–30 cm tall, unbranched or branched from the base, usually succulent, drying black or brown, sparsely to densely hispid or pilose; stem terete or obtusely square. Leaves 4–10 × 1–3 mm, opposite or subopposite, lanceolate, scale-like, appressed, entire, usually shorter than internodes, with obscure veins. All bracts similar, 2.5–6 × 2–3 mm, lanceolate, longer or shorter than calyx. Flowers opposite or subopposite in simple spikes, spike shorter or longer than vegetative stem. Calyx 5-ribbed, 4–9 mm long; tube 3–6 mm long; lobes 5, unequal or subequal, linear, deltate or lanceolate, 1–3 mm long, shorter than tube. Corolla creamy-white, blue, pink or purple; tube 8–14 mm long, bent and expanded distally above calyx, pubescent with very few sometimes glandular hairs; lobes of lower lip 2–6 × 1.3–3 mm, obovate, spreading; upper lip 1–2 × 2–2.5 mm, indistinctly 2-lobed or emarginate.

Grassland, rocky outcrops; 20–1860 m. N1–3; S1–3; Socotra, Eritrea, Ethiopia, widespread in tropical Africa and Asia. Collenette 277; Gillett 4938; Thulin & Bashir Mohamed 7088.

S. gesnerioides is unique in the genus in that it parasitizes only dicotyledons. It has evolved many host-specific strains that differ in succulence, number of branches, pubescence and colour of stem, bract length relative to calyx, length of calyx-lobes relative to tube, and corolla colour and size.

23. *CYCNIMUM* E. Mey. ex Benth. (1836)
Hansen in Dansk Bot. Arkiv 32: 1–72 (1978).

Herbs or small shrubs with tuberous or elongated rhizome. Leaves opposite, occasionally alternate or in whorls of 3. Flowers in terminal racemes or solitary. Calyx 4–5-lobed, lobes equal or unequal. Corolla salver-shaped; tube curved or straight, hairy at throat; limb 2-lipped, upper lip shallowly 2-lobed, lower lip 3-lobed. Stamens 4, included, filaments bearded on one side, anthers with 1 theca only. Style filiform; stigma capitate. Fruit a loculicidal capsule or a berry. Seeds numerous.

15 species in tropical and southern Africa.

C. tubulosum (L. f.) Engl. (1895); *Gerardia tubulosa* L. f. (1782); *Rhamphicarpa tubulosa* (L. f.) Benth. (1835). Fig. 198.

Mostly a perennial erect or ascending herb, up to 40 cm or more high. Leaves linear to ovate, up



Fig. 198. *Cynium tubulosum*. A: habit, × 0.5. B: calyx and capsule, × 2.2. — Modified from Dansk Bot. Arkiv 32: 32 (1978). Drawn by B. Johnsen.

to 70(–100) mm long, acute or obtuse, with entire to irregularly toothed or lobed margins. Flowers in racemes or solitary; pedicels 2–50(–90) mm long. Calyx-lobes (4–)5, ovate to linear, 2–12(–18) mm long. Corolla white or pink; tube curved or straight, 14–55 mm long; limb 15–70 mm in diam. Capsule 4–8 mm long, obliquely beaked.

Edge of swamps, seasonally flooded grassland or bushland; 5–30 m. S2, 3; widespread in tropical and southern Africa. Kilian 1790/Lobin 6644; Gil-