

THE LOGANIACEAE OF AFRICA¹⁾

III. SPIGELIA L.

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RELATIONSHIP WITH OTHER GENERA

Spigelia L. is the type genus of the *Spigeliaceae* which are usually herbaceous plants with valvate aestivation, a capsule, and unwinged seeds. It differs mainly from its relatives by a cupula-like base of the capsule which remains after the valves have been shed, and a usually unbranched cincinnous inflorescence.

GEOGRAPHICAL DISTRIBUTION

This genus occurs mainly in the tropical parts of America and extends to the north to New Jersey in the United States with one species, *S. marilandica* (L.) L. The majority of species occur in Brazil, and the most widespread, *S. anthelmia* L. occurs in nearly the whole area of the genus, in Florida, Mexico, Central and northern South America, and the West Indies. It is naturalized in Africa and in Indonesia, in Java and the adjacent islands.

Spigelia L., Sp. Pl. 149. 1753; Progel in Martius, Fl. Bras. 6(1): 253. 1868; L. B. Smith, *Wrightia* 2: 90. 1960.

Annual or perennial herbs or undershrubs, glabrous or hairy with simple or stellate hairs. *Stems* usually terete. *Leaves* simple, opposite, often in whorls or pseudo-whorls at the apex of the stems, with connate sheaths and sometimes interpetiolar stipules. *Inflorescence* usually cincinnous, terminal or nearly so. Flowers opposite the bracts or nearly so. Sepals free or connate at the base, linear-lanceolate to ovate, equal or unequal. Corolla actinomorphic, infundibuliform, frail; lobes 5, erect, valvate in the bud, more or less triangular, acute, shorter than the tube. Stamens 5, included or exserted, equal, alternating with the corolla lobes; filaments free from each other, inserted on the corolla tube; anthers lanceolate or ovate; cells 2, parallel, discrete, dehiscent throughout by a longitudinal split. Ovary superior, 2-celled, with an axial placenta with several ovules in each cell; style 1, of which upper half deciduous and lower half persisting. Fruit a capsule, 2-lobed, loculicidal and septicidal, 4-valved; valves deciduous; a capular base remaining in the persistent calyx. Seeds polyhedrous, more or less obliquely ellipsoid or ovoid, tuberculate, verrucose, or

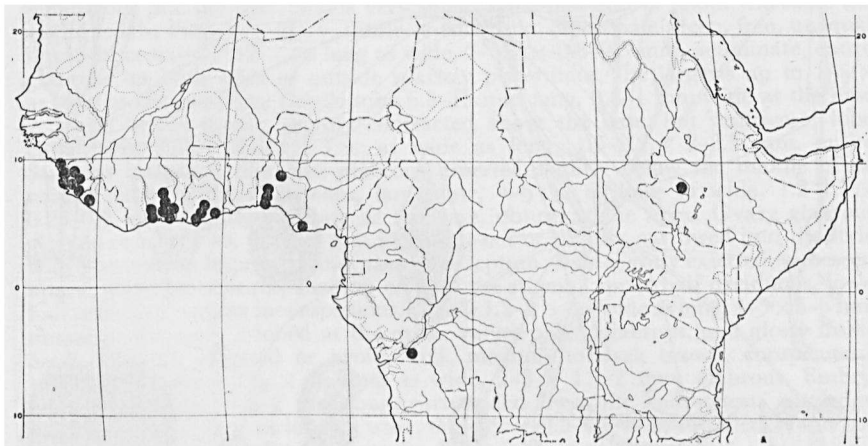
¹⁾ Continued from Act. Bot. Neerl. 10: 1-53. 1961 and Meded. Landbouwhoges. Wageningen 61(4): 1-31. 1961.

reticulate. Embryo straight, surrounded by much endosperm. Collectors in the axils of the leaves, bracts, and sepals (in *S. anthelmia* only?).

Type species: *S. anthelmia* L.

Distribution: About 50 species in tropical and extra-tropical America.

***S. anthelmia* L.**, Sp. Pl. 149. 1753; Aublet, Hist. Pl. Guian. Fr. 1: 126. 1775; Poirlet in Lamarck, Enc. 7: 344. 1806; Sims, Bot. Mag. 50: t. 2359. 1822; De Candolle, Prod. 9: 7. 1845; E. Bureau, Thèse Logan. 125. 1856; Bentham, Journ. Linn. Soc. 1: 62. 1857; Progel in Martius, Fl. Bras. 6(1): 262. 1868; Solereder in Engl. Prantl, Nat. Pflanzenf. 4(2): 35, f. 17. A. 1892; Backer, Trop. Natuur Ned. Ind. 1: 65. 1912; Heyne, Nutt. Pl. Ned. Ind. 4: 49. 1917; 2nd. ed. 2: 1267. 1927; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 25. 1931; v. Raalte in Pulle, Fl. Surinam 4(1): 104. 1932; Fr. Arnoldo, Zakflora Curaçao 98, 119, f. 45. 1954; Saunders, Handb. W. Afr. Flow. 56, f. 183. 1958; L. B. Smith, Wrightia 2: 98. 1960. **Fig. 1; Map 1**



Map. 1. *Spigelia anthelmia*.

Type: Hortus Uppsala, herb. Linnaeus 210.2 (LINN).

Heterotypic synonyms: *S. nervosa* Steud., Flora 26: 764. 1843; De Candolle, l.c. p. 560. Type: Suriname: Hostmann & Kappler 505 (isotypes: BM, 2 sheets, K, P, 3 sheets). Homotypic synonym: *S. anthelmia* L. var. *nervosa* (Steud.) Progel, l.c.

S. multispica Steud., l.c.; De Candolle, l.c. p. 560; Pulle, Enum. 373. 1906. Type: Suriname, Para District, Hostmann & Kappler 851a (isotypes: K, 2 sheets, P).

S. multispica Steud. var. *discolor* Progel, l.c. p. 263. Type: French Guiana: sin. loc., Poiteau July 1824 (K).

Annual herb, 2–60 (usually 20–50) cm high. Stems and each branch terminating with a whorl of 4 leaves and some inflorescences. Corolla lilac, pink, white, or tube white and lobes pale pink, with

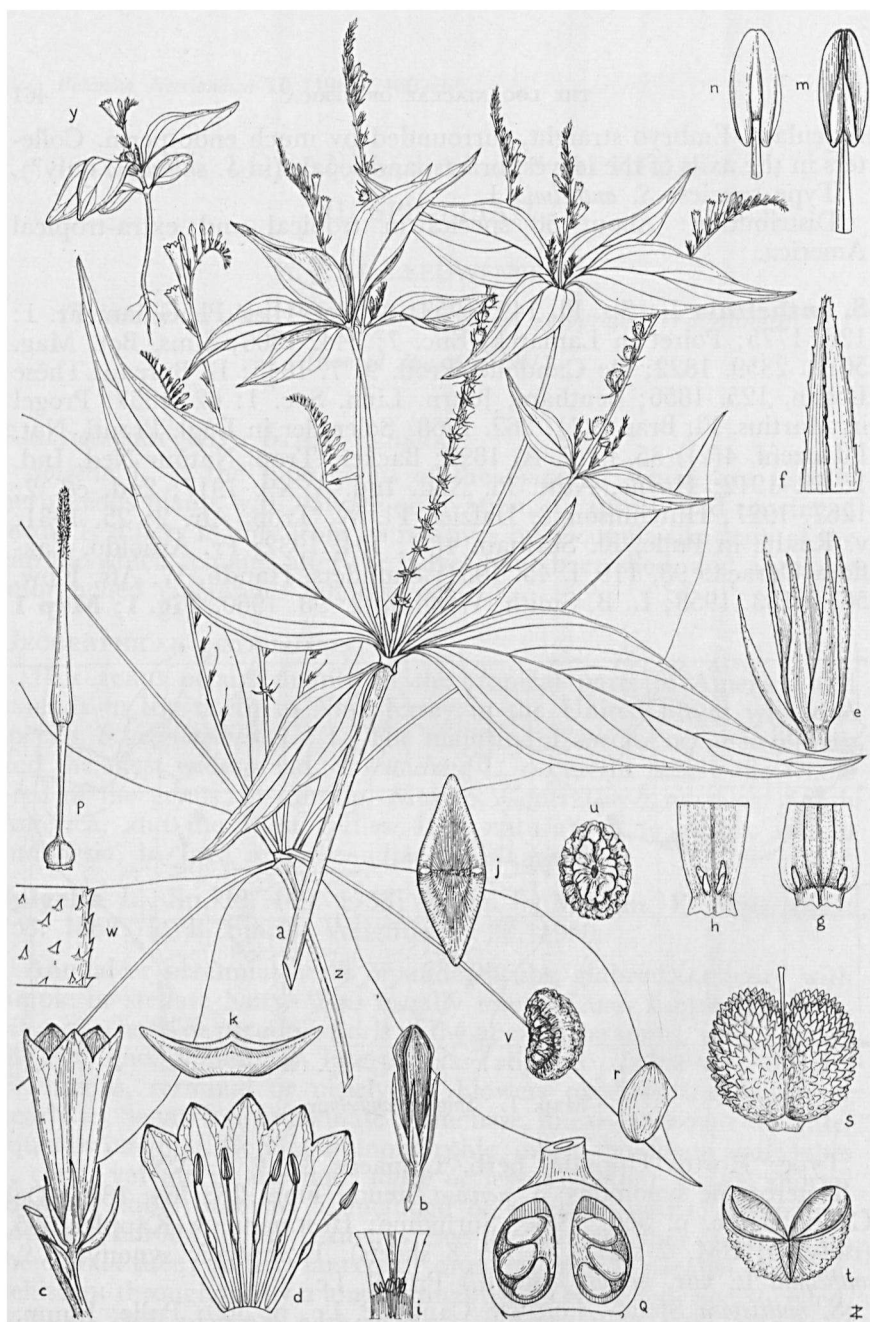


Fig. 1. *Spigelia anthelmia*: a. Plant apex, $\frac{1}{2} \times$; b. Flower bud, $3 \times$; c. Flower, $3 \times$; d. Opened flower, $3 \times$; e. Calyx with bracteole, $6 \times$; f. Apex of sepal outside, $24 \times$; g. Base of sepal inside, with colleters, $12 \times$; h. Base of bract inside, with colleters, $12 \times$; i. Base of leaf above, with colleters, $3 \times$; j. Cupular base of capsule above, $6 \times$; k. Idem laterally, $6 \times$; m. and n. Anthers both sides, $12 \times$; o. Pistil, $6 \times$; p. Longitudinal section of ovary, $30 \times$; q. Ovule, $60 \times$; r. Seed ventrally, $6 \times$; s. Seed laterally, $6 \times$; t. Valve, $3 \times$; u. Portion of leaf margin above, $12 \times$; v. Small plant, $\frac{1}{2} \times$; w. Plant apex, $\frac{1}{2} \times$. (a-w. Leeuwenberg 3210; y. Aruba, Stoffers 1836 (U); z. Suriname, Rombouts 624 (U)).

or without 5 pairs of longitudinal lines inside below the lobes, $2\frac{1}{2}$ – $5\frac{1}{2}$ × as long as the calyx, 8–17 mm long, glabrous on both sides. Capsule green, composed of 2 ellipsoid parts, with an impressed line in the middle, conspicuously tuberculate, scabrous; the remaining base boat-shaped or nearly fusiform.

Stems erect, terete, unbranched or once or twice branched, glabrous, pale green, with one or two (sometimes more) pairs of leaves between the base and the apex; branches 1–2 together in the axils of the cauline and sometimes in the axils of the apical leaves. *Leaves* of apical whorl which consists of 2 decussate pairs close together, usually much larger than the cauline ones. Leaves of these pairs equal, but the pairs usually unequal; all sessile or sometimes petiolate; petiole up to 10 mm long; blade pale to medium green above, paler (slightly greyish-green) beneath, herbaceous, drying papyraceous, ovate-oblong, ovate-lanceolate, or oblong-lanceolate, $2\text{--}4 \times$ as long as wide, $4\text{--}18 \times 1.2\text{--}6$ cm (cauline ones up to 10×3.5 cm), acuminate at the apex, more or less suddenly narrowed to the base or decurrent into the petiole, entire, sparingly puberulous to glabrous above, more puberulous to glabrous beneath. Stipules united, membranaceous, broadly triangular, about $\frac{1}{2}$ –1 × as long as wide, obtuse, entire, glabrous. *Inflorescences* terminal and in the axils of the whorled leaves, cincinnous, 1—several together, shorter or longer than the leaves. Peduncle very short, glabrous or sparsely puberulous like the axis. Bracts very small, sepal-like and of about the same size as the sepals. Flowers solitary, sessile or subsessile. *Sepals* pale green, free, unequal, linear-lanceolate, $7\text{--}12 \times$ as long as wide, $2\text{--}5.5 \times 0.3\text{--}0.5$ mm, acuminate, entire, glabrous on both sides or outside sparsely puberulous, the largest up to $1\frac{1}{2} \times$ as long as the smallest. *Corolla* tube $6.5\text{--}15$ mm long, $0.8\text{--}1$ mm wide at the base, $2\text{--}3$ mm at the throat, slightly contracted above the base, not ventricose; lobes equal, triangular, about $1.3 \times$ as wide as long, $1.5\text{--}2.2 \times 2\text{--}2.5$ mm, entire. Stamens included; filaments glabrous, inserted slightly below the middle of the corolla tube; anthers glabrous, lanceolate, $4\text{--}6 \times$ as long as wide, $1.2\text{--}1.7 \times 0.25\text{--}0.3$ mm, slightly sagittate at the base, obtuse at the apex. Ovary glabrous, globose or nearly so, $0.5\text{--}0.8$ mm in diam., not or slightly narrowed into the style, with 2 somewhat impressed lines above the septum; style slightly exserted, pubescent above, glabrous beneath, shading off into the stigma, upper half deciduous, lower half persisting; stigma inconspicuous. *Capsule* $1.2\text{--}2 \times$ as wide as long, $4\text{--}5 \times 5\text{--}6$ mm, obtuse at the base, 2-lobed at the apex; valves paler, glabrous, and glossy inside. *Seeds* obliquely ellipsoid or ovoid, dull, medium to dark brown, conspicuously tuberculate, about $1\frac{1}{2} \times$ as long as wide, $2\text{--}3 \times 1.5\text{--}2$ mm, glabrous. Embryo white, spatulate, $1.8\text{--}2$ mm long, surrounded by white endosperm; cotyledons elliptic, about $1\frac{1}{2} \times$ as long as wide, $0.8\text{--}0.9 \times 0.5\text{--}0.6$ mm, rounded at the base and at the apex; rootlet 0.3 mm in diam., obtuse at the base.

Distribution: Indigenous in tropical America, from Mexico and Florida to Peru and Brazil. Naturalized in tropical Africa, especially in West Africa, and in Indonesia in Java and some neighbouring islands.

Ecology (in Africa): Waste places at low elevations.

GUINEA: Conakry, de Wit 6068 (WAG); *ibid.*, Monod, rec. 15 Dec. 1946 (IFAN); *ibid.*, Chillou 1453 (BR, COI, IFAN, K); Salesses, Chillou 1616 (BR, PRE).

SIERRA LEONE: Rokupr, Jordan 258 (K); Binkolo, Northern Province, Deighton 1284 (BM, K); Makump, Dawe 505 (K); *ibid.*, Deighton 1408 (BM, K); Freetown, Deighton 2061 (K); Kortright, Freetown, Gledhill 26 (K); Kasawe Forest Reserve, King 268 (K); Njala, Pyne 5 (K); Bo District, Bo, Gardner 47 (BM), 76 (BM).

LIBERIA: Monrovia, Dinklage 2763 (B, P); *ibid.*, Linder 1540 (GH, K); *ibid.*, Voorhoeve 126 (WAG); Kakata, N.E. of Monrovia, Bequaert 189 (K).

IVORY COAST: Bouaké, Chevalier 34138 (P); Dimbokro, Chevalier 34103 (P); 64 km N. of Sassandra, 3 km N. of Niapidou, Leeuwenberg 3210 (GC, WAG); Sassandra, Dautiat (?), rec. 10 July 1948 (IFAN); Yapo, 50 km N. of Abidjan,

Roberty 15358 (G); near Divo, de Wit 6067 (WAG); Adiopodoumé, 17 km W. of Abidjan, Giovanetti (?) 177 (IFAN); *ibid.*, Herb. I.D.E.R.T. 1553 (ABI); *ibid.*, Leeuwenberg 1925 (BR, GC, K, LISC, MO, P, WAG, Z); *ibid.*, Roberty 15750 (G).

GHANA: between Asokua and Kumasi, Darko 708 (BR, K); Kumasi, Roberty 12775 (G, Z); Dunkwa, Whiting 21 (K); Benso, Tarkwa District, Andoh F.H. 5516 (BR, K); Achimota, Ankras Agric. 216 (K); *ibid.*, Irvine 1446 (K); *ibid.*, Morton G.C. 25317 (K); Labadi, Accra Plains, Anteson s.n. (GC); Legon Hill, Quarry Road, Adams 3500 (GC).

NIGERIA: Jebba, near Niger R., Hagerup 718 (K); Oyo Province, Ibadan District, Jones 753 (K); Ibadan, Coombe 122 (BR, K); *ibid.*, Humbler 323 (K); *ibid.*, Roberty 1631 (G); Lagos, Bels 57 (U); *ibid.*, Chevalier 14065 (P); *ibid.*, Dalziel 1042 (E, K); *ibid.*, Dawoder (?) 31 (E); *ibid.*, Dodd 432 (P); *ibid.*, Stubbings 72 (K); Port Harcourt, Niger Delta, Maitland A (K).

CONGO: LEOPOLDVILLE: Kisantu, Callens 3654 (BR).

ETHIOPIA: S.W. of Jimma, Jimma Agr. Tech. School D 7 (K).

MADAGASCAR: *sin. loc.*, Perrottet s.n. (G) (finding loc. doubtful).

The description is based upon the specimens cited above and the extra-African material of the following herbaria: K, L, P, U, WAG.

English name: Wormgrass.

French name: Brinwillière.

LINNAEUS gives the following citations with *Spigelia anthelmia*:

Arapabaca quadrifolia, fructu testiculato. Plum. gen. 11. (= Plumier, Nov. Pl. Amer. Gen. 11, t. 31. 1703); Barr. equin. 15. (= Barrère, Essai Hist. Nat. France Equinoxiale 1st. ed. 15. 1741; 2nd. ed. 15. 1749 (same text)).

Arapabaca brasiliensibus dicta planta. Marcgr. bras. 46. (= Piso & Marcgrav, Hist. Rer. Nat. Brasiliae 35. 1648, with figure of flowering and fruiting plant).

PLUMIER describes and figures the flower and the fruit of *Spigelia anthelmia*. PISO & MARCGRAV describe and figure an unbranched plant with a single inflorescence bearing flowers and fruits. BARRÈRE cites the phrase of PLUMIER with that of PISO & MARCGRAV as synonym. LINNAEUS gives after his citations a description in italics of a once branched specimen with two branches and solitary inflorescences at the apices of the stem and the branches. Therefore it is evident that he did not base his description on those of the cited authors, but that he saw living plants or herbarium material of this species.

In the Linnean Herbarium of the Linnean Society of London two specimens of *Spigelia anthelmia* are preserved. One much branched collected by Rolander in Suriname after the publication of the Species Plantarum in 1755. The other specimen is provided with the abbreviation H.U. which means Hortus Upsaliensis. This specimen agrees, though not completely, with his description. It bears two not entirely developed branches. The third specimen seen by LINNAEUS examined by the present author is preserved in the Stockholm Herbarium. This is unbranched. Of the three specimens discussed above the second one agrees the best with LINNAEUS's description and therefore here is considered the type.

Although it was not easy to find out what specimen might be the type, there is no doubt about the identity of the species. All cited authors mean the same species to which belong undoubtedly all specimens discussed.

Remark: The other varieties cited by PROGEL which may be specifically different from *S. anthelmia* are not studied here.

Uses: Plant was used as anthelmintic, but dangerous by poisonous alkaloids. As it was introduced in Africa shortly ago nothing is known of use by Africans.

ACKNOWLEDGEMENTS

The author expresses his gratitude to the directors and curators of the herbaria cited in the two preceding papers on African *Loganiaceae* and of the Ghana Herbarium (GC), the Oxford Forest Herbarium (FHO), and the National Herbarium of Pretoria (PRE) for putting material at his disposal.