

Spigelia L. (Spigeliaceae/Strychnaceae): Addition of a Genus to the Flora of Karnataka

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Abstract

While working for the Flora of Kumta taluk in Uttara Kannada district of Karnataka, an interesting herb, *Spigelia anthelmia* L. was collected. Review of literature revealed that the Genus has not been included so far by any other workers and hence is the new introduction to Flora of Karnataka. Present paper deals with its description, a note on its taxonomic status, distributional tracks in India, its ecology and the hitherto recorded ethno medicinal uses of the plant.

Keywords: *Spigelia*, New report, Karnataka, Flora, Uttara Kannada, Kumta

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INTRODUCTION

While surveying the plant populations in Uttara Kannada, a northern coastal district of Karnataka, an interesting patch of a herb was observed. The herb, on later observation found to be *Spigelia anthelmia* L. A comparative study of the literatures confirmed that this species and its genus is not reported from

Karnataka state and therefore has been described here.

Spigelia anthelmia L. Sp. Pl.149. 1753; D C., Prod. 9: 7. 1845; Leenh. in Fl. Malesiana 6: 376–378, fig. 38.1962; Philcox in Dassanayake and Clayton (ed.) Rev. Handb. Fl. of Ceylon 10: 266. 1996. (*Spigeliaceae* C. Martius=*Strychnaceae*). Figure 1 (A–H).



Fig 1: *Spigelia anthelmia* L. (A–H). A. Habit; B. Open Flower; C. Inflorescence; D. Petals split open stamens, E. Calyx; F. Gynoecium; G. Fruit (Notice the copular base of the dehisced fruit in persistent calyx); H. Seed.

Annual herb, 50–70 cm high, unbranched or with few pairs of branches arising near the base: stem erect, terete, cylindrical, green, glabrous, with a few remote pairs of small leaves and an apical pseudo whorl of four larger leaves. Leaves with interpetiolar, broadly triangular, blunt, glabrous stipules: petioles 0–0.5 cm; lamina ovate-oblong to ovate lanceolate, 3–10 by 1–3 cm, herbaceous, scabrous above, glabrous beneath, cuneate and often decurrent at the base, attenuate at the apex; nerves 4–6 pairs, strongly ascending. Inflorescence a second spike, in the axils of the whorled upper leaves, up to 15 cm long; peduncle very short, glabrous; bracts lanceolate, 4–2 mm long. Flowers spaced, subsessile. Sepals 5, free, slightly unequal in length, ovate-linear-lanceolate, 2–3 mm, acute, glabrous to sparsely puberulous outside, pale green. Corolla salver-shaped, 5-lobed, glabrous, white to red or purplish; tube 6–10 mm, lobes triangular. Stamens 5, inserted slightly below the middle of the tube; filaments filiform, 1 mm; anthers attached slightly above the base, lanceolate, 1–1.5 mm. obtuse. Ovary glabrous, subglobose, 0.5–0.75 mm; style cylindrical, 0.75 mm; stigma ovate-lanceolate, 1.5–2 mm, pubescent near the tip, caducous. Capsule 4–5 by 5–6 mm, squamulate-tuberculate, 2-lobed, 4-valved, valves deciduous leaving cupular base in persistent calyx. Seeds obliquely ellipsoid or ovoid, 1.5–2 mm, dull-brown, tuberculate.

Chromosome numbers: $2n = 48$ [1].

Flowering & Fruiting: July– September.

Specimen examined: INDIA, Karnataka, Uttara Kannada District, Bargi ($14^{\circ} 31' 38.4''$ N, $74^{\circ} 24' 20.7''$ E) \pm 55 m, 16 August 2010, Gurumurthi R. Hegde & G. R. Hegde (KUDB) 544.

Note: Genus *Spigelia* is one among the 8 genera placed under *Strychnaceae* sect of the older *Loganiaceae* [2]. Seventy-six species are listed for *Spigelia* in Index Kewensis and all are widely distributed through the southeastern U. S., Mexico, Central America, and S. America to Brazil and the West Indies. All are annual or perennial herbs. There has been less controversy about the systematic position of this genus; nevertheless Jussieu [3] placed *Spigelia*, with *Ophiorrhiza* L. in his *Ordo*

Gentianae. Endlicher [4] and all subsequent authors referred *Spigelia* to the *Loganiaceae*, associated usually with *Mitreola* and *Mitrasacme*. In general *Spigelia* may be regarded as one of the true members of the *Loganiaceae*. Within the *Gentianales* there is a successive development from syncarpy to secondary apocarpy [5]. The most common feature is syncarpy, but the *Apocynaceae* and *Asclepiadaceae* are characterized by secondary apocarpy with fused stigmas. In the tribe *Spigeliaceae* (*Loganiaceae*) there is an intermediate state with partly apocarpous gynoeceum which will result in a bilobed capsule [6]. The recent literature on the phylogenetic relationships within the *Gentianales* by Backlund *et. al* [7] assigns *Spigelia* under Family *Loganiaceae*. In view of this, we also consider the Genus *Spigelia* under Family *Loganiaceae*.

Distribution: Native of South America. Naturalized in tropical West Africa and in Malaysia. For the Indian Flora the genus is a recent introduction with one rare collection of the plant from Jabalpur [8]. Subsequently, Umamaheshwari *et al.* [9] reported the plant from Tuticorin harbour of southern end of East coast and Gulf of Munnar of Peninsular India, and opined its recent introduction through the Wood logs imported from South east Asia. Recently, the plant also has been recorded from open sunny sites along the Railway tracks at Mumbai of Maharashtra [10]. For the state of Karnataka, as there is no record of the plant in any regional flora [11,12] the genus is a new introduction. Only one spot, i.e. Bargi of Kumta taluk was found to be inhabited by this weed.

Ecology: A rare weed of roadsides, waste places in open area in sandy soils during rainy season. Found in association with *Cassia tora* L., *Leucas indica* (L.) R. Br. ex Vatke, *Desmodium triflorum* (L.) DC., *Lindernia ciliata* (Colsm.) Penn., *L. crustacea* (L.) F. V. Muell. *Eriocaulon xeranthemum* Mart. and *Evolvulus nummularius* (L.) L. Clifford [13] reported this plant from Nigeria and specially mentions one among major plants dispersed by vehicles. Interestingly, in our area of collection, populations were sighted only at Bargi along the National Highway 17. Flowers open only for a very short period in the afternoon from 12:30 pm till 05:00 pm. No

pollinator could be recorded and the plant is self-pollinated. By next day early morning petals of pollinated flowers fall off with the stigma. Meanwhile, dehiscence of the fruit starts in the afternoon by 02:30 pm and continues up to 04:00 pm. No threat by any predators has been observed, however, some of the individuals showed black spot on the leaves. According to Amadi [14] the *Spigelia* leaf spot disease in Nigeria is caused by a fungus *Curvularia lunatus* and severe infections result in the total killing of the plant.

Ethnobotany: A poisonous plant. The decoction of the roots is said to be used as an effective vermifuge locally in Jabalpur areas [8]. In addition, the plant is also said to be a criminal poison [2] and is used for the same purpose by the Cuna Indians of Panama and Colombia as *Ina Nusu* (translates rat medicine) [15]. The plant contains the alkaloid Spigeline that acts upon the heart, especially the endocardium. Amadi [14] mentioned about Spiganthine, a cardioactive principle obtained from this plant. However, no usage is found by the local people from the area of present collection.

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