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New records and a new species of *Strobilanthes* (Acanthaceae) from Arunachal Pradesh, East Himalayas

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ABSTRACT. Arunachal Pradesh in northeastern India hosts a diverse array of *Strobilanthes* Blume species. The occurrence of two previously unreported species, *Strobilanthes pubiflora* J.R.I.Wood and *S. paniculiformis* J.R.I.Wood, is documented. *Strobilanthes siangensis* J.R.I.Wood, Gammi & D.Borah is described as new and discussed in detail. A key to similar species is provided for identification purposes. The paper is illustrated with a map and photographs.

Keywords. India, Lamiales, new discoveries, taxonomy

Introduction

Arunachal Pradesh occupies the southern slopes of the Himalayas in northeastern India bordering on Tibet (Xizang) and Myanmar. Although the state is known to be very diverse in its flora, it is poorly explored botanically both for historical political reasons and because of its geographical inaccessibility. *Strobilanthes* Blume exemplifies the situation. It is the most species-diverse genus of Acanthaceae in Asia and is well-represented in all countries with a hilly topography and which experience a monsoon climate. Although 40 different species were recorded from Arunachal Pradesh by Roy et al. (2023), making it second in species number amongst eastern states of India only to the 44 species recorded from Meghalaya, our studies suggest that this is an underestimate and could increase with more focused expeditions.

Materials and methods

This paper is based on field collections and observations by all authors except JRIW. Collections have been made in most cases, but some records are based on photographic evidence. Identification has relied on the examination of herbarium specimens in ASSAM, CAL and K, and studies of the literature cited in the list of references.

Taxonomy

Strobilanthes inflata T.Anderson (Figs 1A, 2)

This was described by Anderson (1867) based on a collection by Hooker and Thomson from Sikkim. Although an old collection by Kingdon Ward was cited by Deng et al. (2006) from Arunachal Pradesh (*Kingdon-Ward 13930* (BM) from Bomte La), no specimen was cited by Roy et al. (2023).

Strobilanthes inflata is quite a variable plant (Deng et al., 2006), and these new collections do not conform well with the type, *S. inflata* var. *inflata*, described from Sikkim as it lacks the distinct white indumentum which gives the type variety its distinct grey colouring. Nonetheless the strongly ventricose, bent corolla and the recurved tips of the calyx lobes are very characteristic of *Strobilanthes inflata*. The following records from Arunachal Pradesh from temperate forest on hill slopes above a roadside confirm its continued presence.

Specimens examined. INDIA: **Arunachal Pradesh:** West Kameng District, Bomdila to Dirang, 27°16′49.0″N 92°25′32.5″E, c. 2000 m, 19 Jul. 2024, *L.T. Thungon 0169* (CAL); ibidem, 27°16′52.0″N 92°25′33.7″E, *L.T. Thungon 0170* (CAL).

Strobilanthes paniculiformis J.R.I.Wood (Figs 1B, 2)

This species was described from the "Naga Hills" and many collections are known from Nagaland and Manipur in northeastern India (Wood & Scotland, 2006), with more recent records confirmed from Sagaing and Kachin in Myanmar (Wood et al., 2022). The following record from Arunachal Pradesh is not, therefore, unexpected.

Strobilanthes paniculiformis resembles *S. pubiflora* and *S. oxycalycina* J.R.I.Wood in the pubescent corolla but is distinguished from both by the much-branched inflorescence and narrowly oblong-elliptic, very unequal leaves and from the latter by the obtuse calyx lobes, one of which is clearly longer than the other four.

Specimens examined. INDIA: **Arunachal Pradesh:** Upper Subansiri District, on the way to Daporijo, 1000 m, 28 Mar. 2020, *M. Taram 1223* (Photo).

Strobilanthes pubiflora J.R.I.Wood (Figs 1C, 1D, 2)

This was described from Bhutan and collections were cited from there and neighbouring parts of Darjeeling District in West Bengal. Specimens cited from Nagaland and Manipur by Wood (1994) were subsequently redetermined as the previous species, *Strobilanthus paniculiformis* (Wood & Scotland, 2006: 12). *Strobilanthes pubiflora* is a plant of open, well-drained forest and secondary woodland from 800 to 1700 m. The following record extends the range of this species to Arunachal Pradesh.

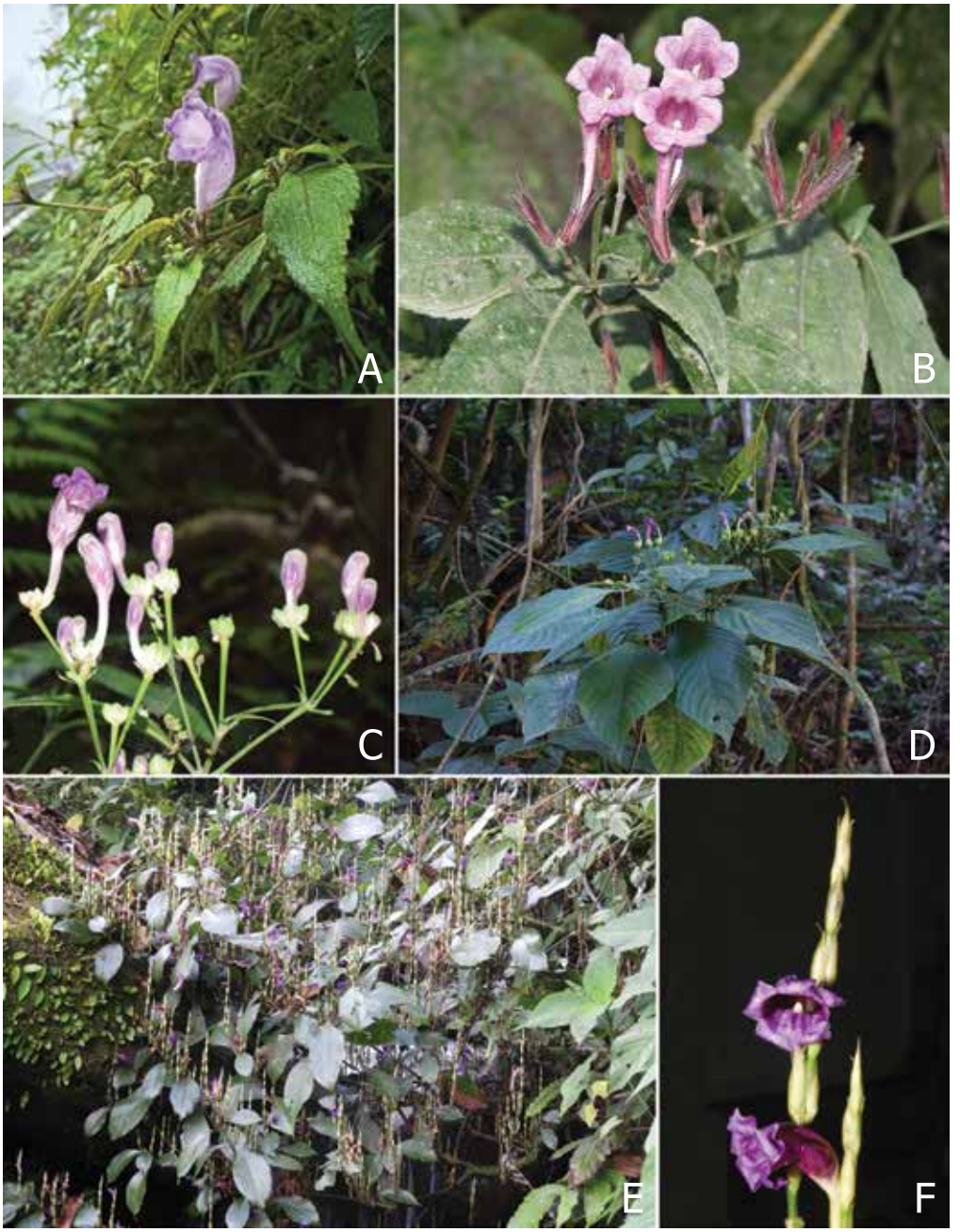

Fig. 1. *Strobilanthes* species from Arunachal Pradesh. **A.** *Strobilanthes inflata* T.Anderson. **B.** *Strobilanthes paniculiformis* J.R.I.Wood. **C.** *Strobilanthes pubiflora* J.R.I.Wood, habit. **D.** *Strobilanthes pubiflora*, inflorescence. **E.** *Strobilanthes elongata* Clarke, habit. **F.** *Strobilanthes elongata*, flowering spike. (Photos: A, L.T. Thungon; B, E, F, M. Taram; C, D, D. Borah)

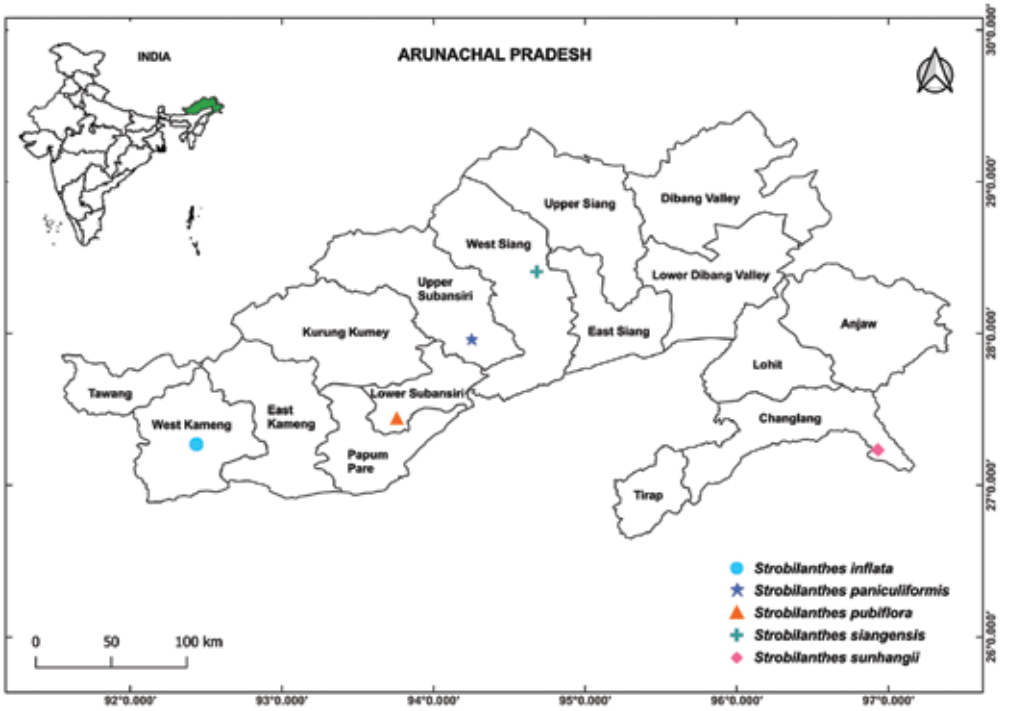

Fig. 2. Map of Arunachal Pradesh showing distribution of species cited in this paper.

Two or three plants were seen on a roadside in tropical forest. Further records might be expected. The pubescent corolla, rounded bracts, subglobose heads and broadly oblong-elliptic leaves are characteristic.

Specimens examined. INDIA: **Arunachal Pradesh:** Lower Subansiri District, Potin, 1000 m, 28 Oct. 2017, *D. Borah 0378* (Photo).

Strobilanthes sunhangii T.Deng, J.T.Chen & Y.F.Deng (Fig. 2)

This was described from Medog in Tibet in 2020 (Chen et al., 2020) and reported from Arunachal Pradesh (Chowlu et al., 2023), where it was found in tropical semi-evergreen forest at an elevation of 1300–1600 m. Three collections were cited, two from Pakke Kessang District (*K. Chowlu 41103* (ARUN000028868) and *K. Chowlu 41528* (ARUN)), and one from Upper Subansiri District (*Kumar Ambrish 17238* (ARUN)). We have an additional record from Changlang District.

Specimen examined. INDIA: **Arunachal Pradesh:** Changlang District, on the way to Vijoynagar, 800 m, 14 Oct. 2023, *D. Borah 4889* (ASSAM).

Strobilanthes siangensis J.R.I.Wood, Gammi & D.Borah, **sp. nov.**
This species belongs to the group placed by Bremekamp (1944) in his segregate genus *Semnostachya* Bremek., which is characterised by the spicate inflorescences in which the bracts, bracteoles and calyx lobes are all similarly linear-oblong, the bracts persistent, the stamens included and the corolla usually glabrous on the exterior. In India this group is poorly represented with only five recognised species all occurring in the northeast region (see key below). The new species is possibly most similar to *Strobilanthes elongata* Clarke in facies (Figs 1E, 1F) but can be immediately distinguished from this and other species in the group by its white corolla which is pubescent on the exterior. – TYPE: India, Arunachal Pradesh, Kaying, Siang District, 28°24′54″N 94°41′18″E, 472 m, 22 April 2021, *L. Gammi 0219* (holotype CAL; isotype ASSAM). (Figs 2–4)

Perennial subshrub, up to 1.2 m high, stems at first decumbent and rooting at nodes, eventually ascending, internodes 1–20 cm. ***Leaves*** petiolate, slightly unequal in each pair, decussate, 6–22 × 2.5–7.5 cm, elliptic to oblong-elliptic, apex acuminate and weakly falcate, base attenuate, margin serrate, both surfaces glabrous, abaxially paler, lateral veins 10–13 pairs; petiole 0.7–3.5 cm. ***Inflorescence*** of simple or bifurcating spikes up to 20 cm long; peduncle 2–8 cm, rachis 3–13 cm long; flowers in opposite pairs c. 10 mm apart; bract 1, narrowly lanceolate, acuminate, glabrous, 6–12 × 1–2 mm, bracteoles 2, similar but only 3–10 × c. 1 mm; calyx subequally 5-lobed to base, lobes 7–9 × c. 1 mm, linear-lanceolate, acuminate to a fine point, margin scarious, glabrous. ***Corolla*** 3.5–4.5 cm long, white (cream in bud), funnel-shaped, the tube pubescent, basal cylindrical part 3.0–4.0 × c. 0.1 mm, then slightly bent and abruptly ventricose, reaching 7–9 mm wide at mouth, lobes broadly ovate, emarginate, 5–6 × 6–7 mm; stamens didynamous, included, 2 long, 2 short, longer pair 1.1–3.7 cm long, shorter pair 0.7–3 cm long, filaments pubescent, anthers 1.8–2 × c. 1 mm, muticous; style slender, 3–3.5 cm long; ovary c. 0.3 × 0.1 cm, glabrous.

Distribution. Only known from the type collection.

Habitat and ecology. The plants were found growing in two populations in a moist shaded area along a perennial stream. The first population consisted of around 700 plants, and the second population of around 1100 to 1200 plants. Both populations are separated by an aerial distance of 150 meters. The associated plants included *Sellaginella* sp., *Psychotria* sp., *Elatostemma* sp., *Cinnamomum bejolgota* (Buch.-Ham.) Sweet, *Gonostegia hirta* (Blume) Miq., *Carex baccans* Nees, *Acanthus leucostachyus* Wall. ex Nees, *Acmella paniculata* (Wall. ex DC.) R.K.Jansen, *Urena lobata* L., *Hedyotis scandens* Roxb., *Pandanus* sp., *Lasia spinosa* (L.) Thwaites and *Begonia* sp., etc.

Fig. 3. *Strobilanthes siangensis* J.R.I.Wood, Gammi & D.Borah. **A.** Habit. **B.** Corolla, front view. **C.** Corolla, side view. (Photos: L. Gammi)

Phenology. March to June (flowering). Plants were flowering prolifically in 2019 but only a single flower was seen by L. Gammi in June 2024. The site was not visited in the intervening years. However, this does suggest that *Strobilanthes siangensis* is plietesial in flowering, though further long-term observation is needed to confirm this.

Provisional IUCN conservation assessment. Data Deficient (DD). Too little is known about the size and extent of the populations of this species and of threats to their existence to make any meaningful assessment.

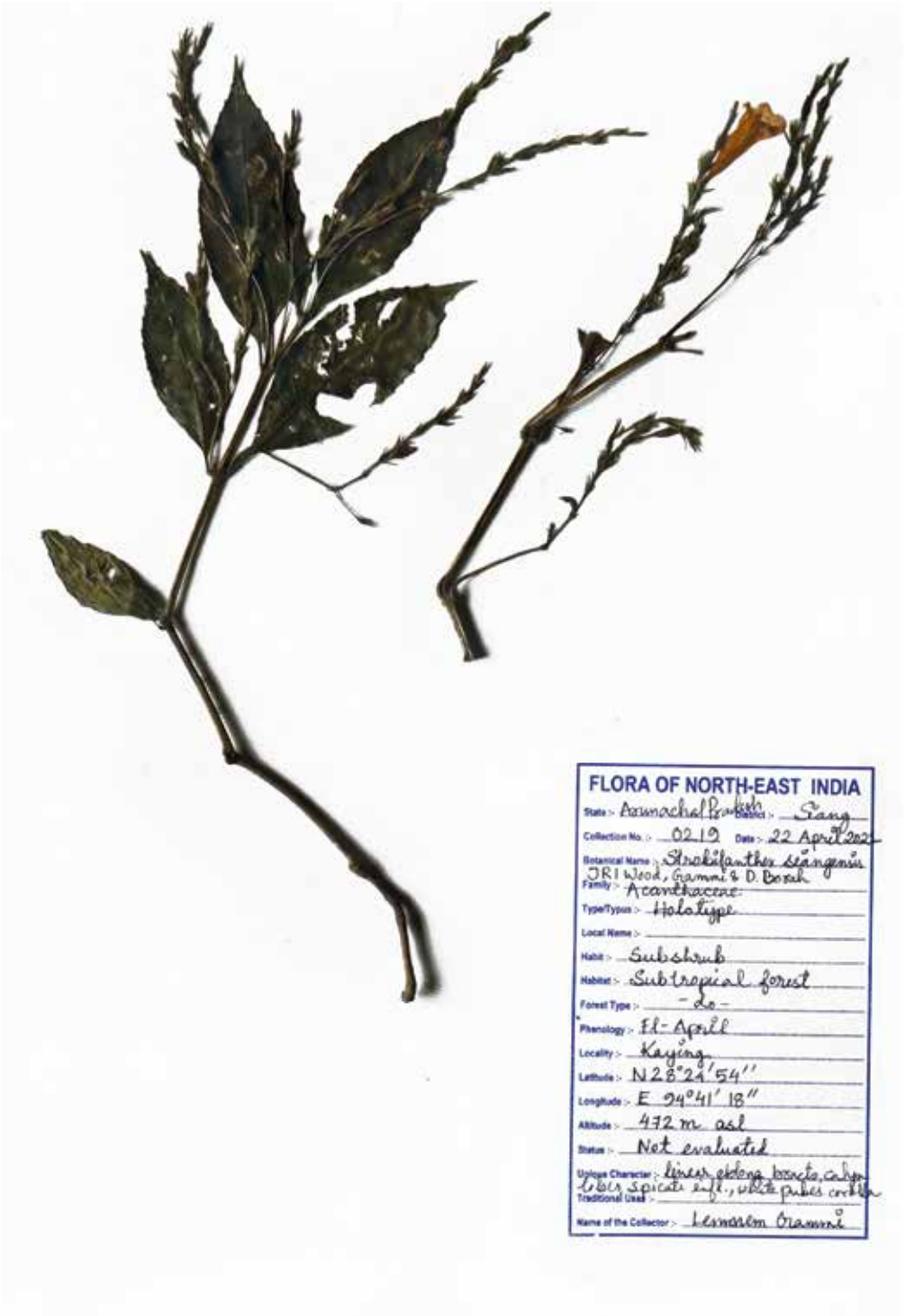

Fig. 4. Holotype of *Strobilanthes siangensis* J.R.I.Wood, Gammi & D.Borah. (Photo: D. Borah)

Notes. Attempts to divide *Strobilanthes* into genera (Bremekamp, 1944) have proved problematic because of overlapping characters and the homoplastic nature of some of the superficially distinctive characters. Nonetheless certain groups can be easily discerned and one such is the cluster of species placed by Bremekamp in the genus *Semnostachya* Bremek. (Albertson & Wood, 2012: 50). This group consists of about 25 species (unpublished data) and is characterised by having persistent bracts and bracteoles, which resemble each other in form and texture. The calyx is subequally 5-partite. The corolla is typically glabrous and curved, and the pollen is always of the ellipsoid, scalariform type (see, for example Fig. 3B in Wood & Scotland, 2009). This group is absent from Peninsular India and from the Himalayas west of Arunachal Pradesh. The new species is one of the few Indian representatives of this group and is unusual in having a pubescent corolla. There are only six species of the *Semnostachya* group found in India: *S. nobilis* Clarke, *S. fimbriata* Nees, (including *S. macrostegia* (Nees) Clarke), *S. elongata* Clarke (including *S. furcata* Biswas), *S. abbreviata* Y.F.Deng & J.R.I.Wood, *S. polythrix* T. Anderson and the new species. In contrast, the group is diverse in South China with at least 12 species, and much of Southeast Asia including Indonesia and the Philippines.

Key to *Strobilanthes* species of the *Semnostachya* group in India

1a. Stems, peduncle and inflorescence all covered in bristly reddish hairs .... *S. polythrix*
1b. Stems, peduncle and inflorescence glabrous to pubescent but never covered in long reddish bristly hairs 2

2a. Corolla white, pubescent ..... *S. siangensis*
2b. Corolla blue, glabrous 3

3a. Cystoliths prominent; plant drying light green in appearance; inflorescence glabrous 4
3b. Cystoliths obscure; plant drying dark blackish green; inflorescence sparsely hairy 5

4a. Bracts obtuse, shorter than the calyx ..... *S. abbreviata*
4b. Bracts finely acuminate, equalling sepals ..... *S. elongata*

5a. Inflorescence, terminal, a branched panicle of spikes, spikes 17–25 cm long; upper leaves sessile; bracts acuminate ..... *S. nobilis*
5b. Inflorescence axillary, the spikes 2–6 cm long; upper leaves distinctly petiolate; bracts truncate, often fimbriate ..... *S. fimbriata*

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