

Morphological variability, typification and a new synonym of *Striga angustifolia* (Orobanchaceae)

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Article Details: Received: 2024-09-30 | Accepted: 2024-12-12 | Available online: 2024-12-16



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Abstract: Morphological variability in *Striga angustifolia* (D. Don) Saldanha over a range of habitats in many Indian states is discussed, illustrated and an amended morphological circumscription of the taxon is provided here. Recently described *S. todgarhica* C.S. Purohit is synonymized under *S. angustifolia*. Lectotype is designated here for the name *S. glabrata* Benth. and neotype is designated for the name *Buchnera angustifolia* D. Don.

Keywords: Ecophene, Ecological variations, Indumentum, Lectotype, Neotype, New species, Synonym

Introduction

The hemi-parasitic genus *Striga* consists of about 54 species, distributed in tropical and subtropical Old World to Australia (POWO, 2024). So far, 11 have been documented for the Indian flora, namely *S. angustifolia* (D. Don) C.J. Saldanha, *S. densiflora* (Benth.) Benth., *S. gesnerioides* (Willd.) Vatke, *S. indica* K.M.P. Kumar, P. Jayanthi, A. Rajendran & M. Sabu, *S. kamalii* Omalsree, K.M.P. Kumar, M. Sabu & Sunojk., *S. khordhae* Sanjeet Kumar & Devi, *S. lutea* Lour., *S. masuria* (Buch.-Ham. ex Benth.) Benth., *S. musselmanii* Omalsree & V.K. Sreenivas, *S. sulphurea* Dalzell and *S. todgarhica* C.S. Purohit (Devi & Kumar, 2024). Morphological variations are based on changes in growth rates, carbon allocation patterns, host specificity (Arigela et al., 2021a), nutrient cycling, competitive interactions (Ryan, 1991; Grime et al., 2008), soil moisture and atmospheric temperature (Arigela et al., 2021b). Variations in the density of the indumentum on plant parts of species of *Striga* depends on the altitude (Matthew, 1999) and climate of their habitats. Recently described species *S. todgarhica* is based on quantitative

characters and it is an ecophene of *S. angustifolia*. According to Venu & Sanjappa (2021), characterization and novelty described merely based on quantitative characters should be reduced to synonym of appropriate species. During the floristic explorations under the various projects, authors studied *S. angustifolia* from the states of Andhra Pradesh, Bihar, Chhattisgarh, Goa, Jharkhand, Karnataka, Kerala, Maharashtra, Odisha, Rajasthan, Tamil Nadu, and Telangana. We observed morphological variations within and between different populations of *S. angustifolia* in the above states of India. Our studies explicates that the variations in the morphological characteristics such as size of plant, indumentum on leaves and other parts, size of bracts and bracteoles, size of calyx and number or ribs, size of corolla tube, shape and size of corolla lips, and size of capsule (Figure 1–4) are driven by ecological factors in different habitats. Plants are glabrous or less hairy in rainy season and at end of monsoon they become more hairy. Based on our field observations of live plants at Aravalli Hills, Sambhar Lake and Ramgarh Vishdhari Wildlife Sanctuary of Rajasthan, study of protologues, type specimens and, we found that all the taxonomic characters of *S. todgarhica* (Purohit, 2021) are very similar and fall within the circumscription of *S. angustifolia* and treated as synonym of it.

Taxonomic treatment

Striga angustifolia (D.Don) Saldanha, Bull. Bot. Surv. India 5: 70. 1963.

≡ *Buchnera angustifolia* D.Don, Prodr. Fl. Nepal. 91. 1825.

Neotype (designated here): India, Madras, 29 February 1928, *F.C. Børgesen s.n.* (BR0000036145867!, Figure 5A); isoneotype BR0000036145850! (Figure 5B).

= *Striga euphrasioides* Benth., Companion Bot. Mag. 1: 364. 1836, non *Buchnera euphrasioides* Vahl, Symb. Bot. 3: 81. 1794, *nom. rej.*

= *Striga glabrata* Benth., Companion Bot. Mag. 1: 364. 1836.

Lectotype (designated here): Nepal, August 1821, [Wallich cat. n. 3868B] *N. Wallich s.n.* (K001117478!, Figure 5C).

Remaining syntypes: India, Bihar, Araria district, Nathpur, 28 July 1810, [Wallich cat. n. 3868A] *F. Buchanan-Hamilton 1418* (E01298948!, K001117477!); Myanmar, Prome (Pyay), 9 October 1826, [Wallich cat. n. 3868C] *N. Wallich s.n.* (K001117479!); Myanmar, Taong Dong, [Wallich cat. n. 3868D] *N. Wallich s.n.* (K001117480!, Figure 5D).

= *Striga todgarhica* C.S.Purohit, J. New Biol. Rep. 10(2): 90. 2021. *syn. nov.*

Holotype: India, Rajasthan, Todgarh-Raoli Wildlife Sanctuary, Jojawar Range, Uperli Babhan, 460 m, 25°46.306' N 73°56.897' E, 12 November 2017, *C.S.Purohit 33306* (BSJO000050878!, Figure 6A); isotypes BSJO000050876! (Figure 6B), BSJO000050877! (Figure 6C).

Annual herbs, erect, 10–50 cm high. Stem unbranched or branched, subquadrangular, pubescent or hispid or hispidulous. Leaves 10–42 × 1–4 mm, linear or narrow lanceolate, sessile, scabrous hairy or strigose, midrib prominent, apex subacute-acute or acuminate, margins entire, veins obscure, lower ones opposite to subopposite, upper ones subopposite to alternate. Flower sub-sessile or upper ones sessile, alternate or sub-opposite, axillary or in lax terminal spike or raceme; bracts foliaceous, usually longer than calyx, sometimes upper bracts equal or little shorter than calyx; bracteoles shorter than

calyx, up to 3 mm long, linear, scabrous hairy or strigose; pedicels up to 2 mm long, scabrous hairy or strigose. Calyx 6–12 mm long, 12–15 ribbed, prominent when mature, pilose or hispidulous or strigose;



Figure 1: A–D. Habit variations in *Striga angustifolia*





Figure 3: A–D. Corolla variations in *Striga angustifolia*



Figure 4: A–D. Corolla variations in *Striga angustifolia*



Figure 5: A. Neotype of *Buchnera angustifolia* D.Don (BR0000036145867, © Herbarium of Meise Botanic Garden, Meise), B. Isonotype of *B. angustifolia* D.Don (BR0000036145850, © Herbarium of Meise Botanic Garden, Meise), C. Lectotype of *Striga glabrata* Benth. (K001117478, © The Trustees of the Royal Botanic Gardens, Kew), D. Remaining syntype of *S. glabrata* Benth. (K001117480, © The Trustees of the Royal Botanic Gardens, Kew)

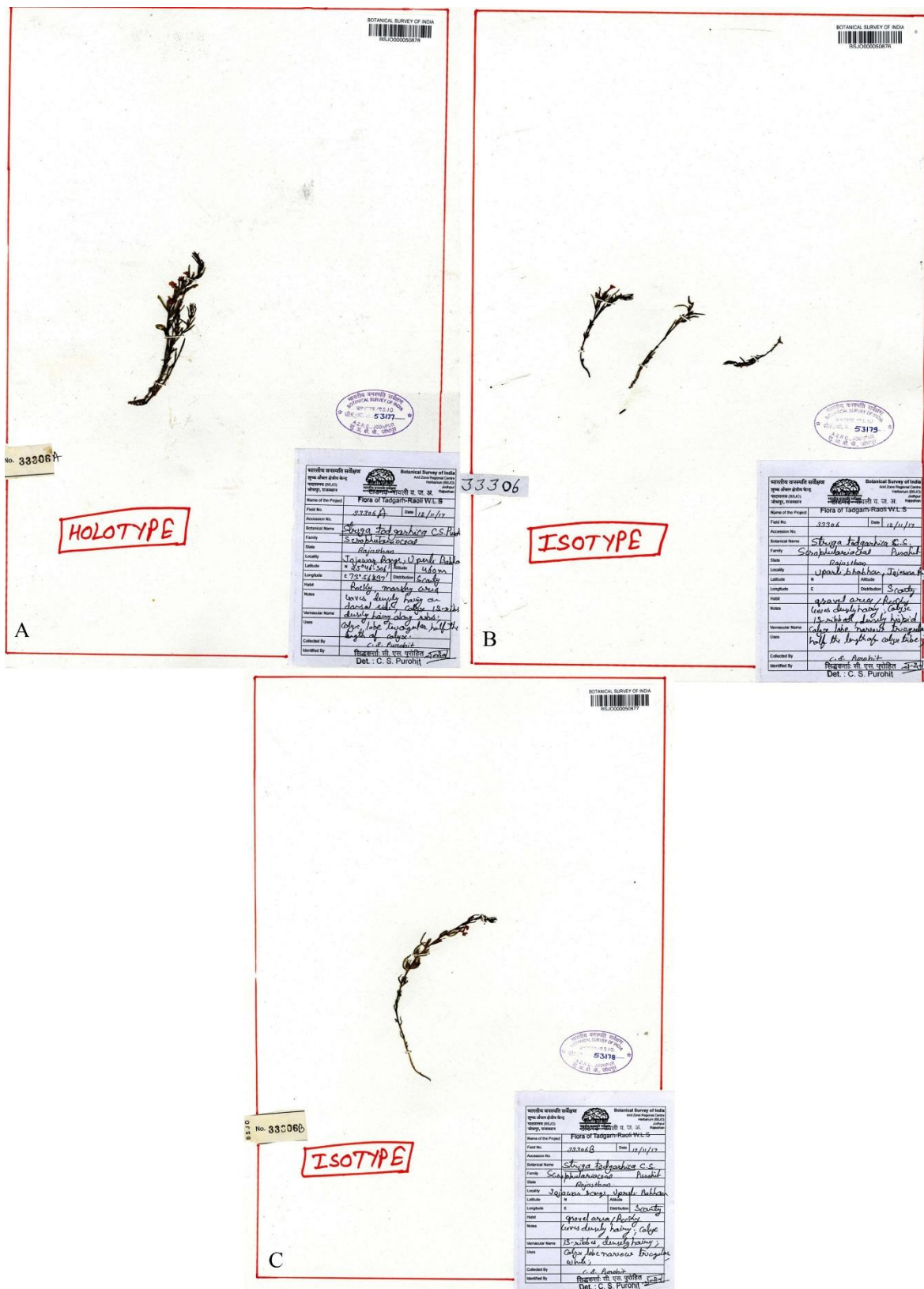


Figure 6: A. Holotype of *Striga todgarhica* C.S.Purohit (BSJO000050878, © Botanical Survey of India, AZRC, Jodhpur), B. Isotype of *S. todgarhica* C.S.Purohit (BSJO000050876, © Botanical Survey of India, AZRC, Jodhpur), C. Isotype of *S. todgarhica* C.S.Purohit (BSJO000050877, © Botanical Survey of India, AZRC, Jodhpur)

tube 3–6 mm long; lobes narrow triangular, unequal to subequal, usually as long as tube. Corolla 19–28 mm long; tube 9–20 mm long, pale whitish green, pubescent; upper lip white, 2–4 × 3–6 mm, broad obovate, usually apex emarginated in middle, sometimes truncate; lower lip white, 4–8 × 2.5–4.5 mm, 3-lobed. Stamens 4, didynamous, epipetalous, attached at the base of throat, glabrous; anthers light yellow. Ovary 1.5–2.5 mm long, cylindrical, light green, glabrous; ovules many; style 4–5 mm long, glabrous, light green. Capsule 5–10 mm long, obovoid-oblong, 2-valved, loculicidal, enveloped by calyx. Seeds many, 0.2–0.3 mm long, narrow ovoid-conical, brownish-black.

Flowering and fruiting: August to December.

Distribution: Australia (Cocos Islands), Bangladesh, Bhutan, China (Hainan), India (throughout the country), Malawi, Mozambique, Myanmar, Nepal, Oman, Pakistan, Sri Lanka, Tanzania, Vietnam, Yemen, Zambia and Zimbabwe.

Notes: The above neotype is required since all original material seems lost. Don (1825) described *Buchnera angustifolia* based on the specimens collected by N. Wallich from Nepal. The types of the *Prodromus Florae Nepalensis* are at BM and duplicates at LINN at Smith herbarium (Stafleu & Cowan, 1976). Presently, no original material is extant for the name *Buchnera angustifolia* D. Don at BM and LINN. Therefore, the specimen collected by F.C. Børgesen from Madras, India at BR (K000821380) is chosen here as neotype. The specimen is well preserved, has mature stem and leaves, well developed inflorescence and capsules, and also depicts the taxon as recognized today. While describing *Striga glabrata*, Bentham (1836) cited the type information as “*Buchnera asiatica*, *Benth. Scroph. Ind. 40. Linn. Spec. 879 ex parte*. HAB. East India, Nepal, and Mountains of Ava, *Wallich*, also in the Peninsula ? (v. s.)”. Pertaining to this specification, five original specimens were traced, one at E (E01298948) and four at K (K001117477, K001117478, K001117479 and K001117480). The best one, K001117478, is designated here as the lectotype.

Acknowledgements

Authors are thankful to the Director, Botanical Survey of India, Kolkata and Head of Office, Botanical Survey of India, Arid Zone Regional Centre, Jodhpur for facilities.

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