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Gleadovia konyakianorum (Orobanchaceae), a new species from Nagaland, India

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Abstract

A new species of the genus *Gleadovia* from Nagaland, Northeastern India, *Gleadovia konyakianorum* is here described and illustrated. The new species differs from its presently known congeners, such as *G. banerjiana*, *G. mupinense* and *G. ruborum* in having strictly 1-flowered inflorescence borne at stem apex, urceolate calyx unequally 5-lobed at apical part, white corolla, narrowly ovoid to fusiform, ca. 1 cm long anther, moderately shorter style, 0.5–0.6 cm long and in narrowly subulate, comparatively longer stigma, to 2.5 cm long. Identification key to the species of *Gleadovia* is given.

Keywords: Root parasite, *Gleadovia*, new species, Eastern Nagaland, Konyak tribe

Introduction

The genus *Gleadovia* was described by J.S Gamble and D. Prain (1900: 488) including a single species, *G. ruborum* Gamble & Prain (1900: 489) on plants collected in 1898 from Bodyar, Jauansar in N.W. Himalaya. It differs from the allied genus *Christisonia* Gardner (1847: 153) by 2 fertile cells in each anther, distinctly 2-lipped corolla and by large subequal stigma lobes. *Gleadovia* is represented by three known species distributed in India and China (Roy 2017). These species are: *G. ruborum* Gamble & Prain (India and China), *G. mupinense* Hu (1939: 2) (China) and *G. banerjiana* Deb (1956: 799) (India). One more species, which undoubtedly belongs to the genus *Gleadovia*, was found during botanical exploration in Pessao Village area near Tobu town in Mon district of Eastern Nagaland, India. Few flowering samples were found growing as a parasite on the stilt and subterranean roots of *Strobilanthes* sp. After critical examination of collected specimens and literature studies (Gamble & Prain 1900, Hu 1939, Deb 1956, 1961, Issar 1966, Roy 2017), the authors realized that it is morphologically distinct from all known species of the genus *Gleadovia.* Therefore, it is described here as a new species.

Taxonomic treatment

Gleadovia konyakianorum N.Odyuo, D.K.Roy & Aver., ***sp. nov.*** (Figs. 1, 2)

The new species differs from its presently known congeners in having strictly 1-flowered inflorescence borne at stem apex, urceolate calyx unequally 5-lobed at apical part, white corolla, narrowly ovoid to fusiform, ca. 1 cm long anther, moderately shorter style, 0.5–0.6 cm long and in narrowly subulate, comparatively longer stigma, to 2.5 cm long (Table 1).

Type:—INDIA, Nagaland, Mon district, Tobu town subdivision, Pessao village, 1500–1600 m, 26°12´45.7´´N 94°55´29.9´´E, *N. Odyuo & D.K. Roy 139053*, 20 April 2017 (holotype, ASSAM!, Isotype: CAL!).

Fleshy achlorophyllous herb, up to 10 cm high, bearing many yellowish scale leaves; parasitic on stilt and subterranean roots of *Strobilanthes* sp. Stem fleshy, 2–3 cm long, 0.4–0.6 cm in diam. Scale leaves spirally arranged, lanceolate, oblanceolate to ovate, smooth, glabrous, varying in size, 0.3–3 × 0.3–2 cm, shortly apiculate to obtuse or emarginate at apex. Inflorescence 1-flowered. Flower large, subsessile, ebracteate, fleshy, hermaphrodite, hypogynous, ebracteolate. Calyx urceolate, glabrous, split in nearly 1/3 of its length, more shorter than corolla tube, 4.0–5.5 × 1–1.5 cm, irregularly 5-lobed at apical part; lobes elliptic-lanceolate, 0.5–0.8 × 0.3–0.5 cm; veins parallel. Corolla white, tubular, thick,

fleshy, 5.5–7.5 × 1.0–1.2 cm, abaxially glabrous, adaxially densely hairy in distal part, strongly bilabiate; upper lip 2-lobed, lobes lanceolate, 1.5–1.7 × 0.4–0.5 cm, acute at apex; lower lip 3-lobed, lobes lanceolate, 1.0–1.5 × 0.4–0.5 cm, acute at apex; veins parallel. Stamens 4, epipetalous, equal in length; filaments stout, 2.3–2.5 cm long, ca. 2 mm wide, glabrous throughout; anthers narrowly ovoid to fusiform, glabrous, somewhat truncate at the base, ca. 1 × 0.3 cm, with 2 fertile cells. Pistil syncarpous; style stout, 0.5–0.6 × ca. 2 cm, glabrous; stigma narrowly subulate, 2.3–2.5 cm long, incurved, 2-lobed, lobes parallel, glabrous. Ovary superior, 0.8–1.0 × 1.0–1.2 cm, glabrous, 1-celled with 4 dichotomously branched parietal placentas, ovuliferous throughout; ovules numerous, white. Fleshy nectariferous (?) annular disc at the base of ovary, bright orange, ca. 3 mm high. Fruit not seen.

Etymology:—The new species is named in honor of the Konyak tribe of Nagas predominantly inhabiting in the Eastern Nagaland, Northeastern India.

FIGURE 1. *Gleadovia konyakianorum* in nature. [Photo by D.K. Roy].

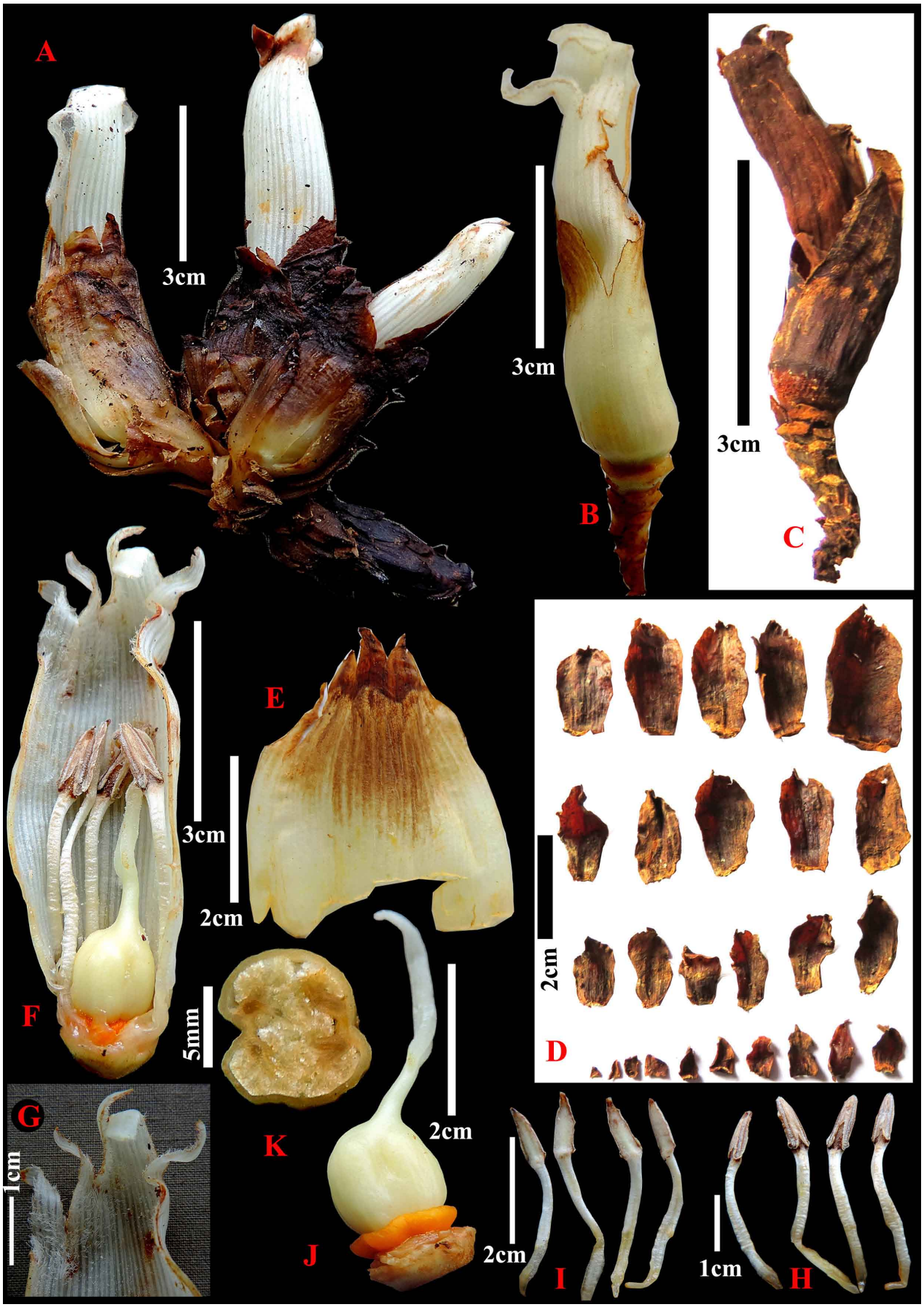

FIGURE 2. *Gleadovia konyakianorum*. **A.** Habit. **B.** Fresh flower. **C.** Dry flower. **D.** Scale leaves. **E.** Calyx. **F.** Tangential section of corolla (showing stamens & pistil). **G.** Corolla lobes (showing hair inside). **H.** Stamens (anthers in ventral view). **I.** Stamens (anthers in dorsal view). **J.** Pistil, **K.** Cross section of ovary. All photos were made from type specimen. [Image by D.K. Roy].

Ecology and phenology:—The species was found growing as a parasite on the stilt and subterranean roots of *Strobilanthes* sp. on the bank of streams. The habitat of the species is represented by mountain terrain (alt. 1500–1600 m.) with the semi-evergreen forest coverage. Flowering in the month of April.

Distribution:—India. Nagaland, Mon District (only known from type locality Pessao village under Tobu Subdivision). Endemic.

Conservation status:—The new species is currently known only from the type locality. About 15–20 individuals were found growing on a same host plant. Nearby areas of about 10 km^2 were thoroughly surveyed, but no additional plants were located. According to the IUCN Red List Categories and Criteria version 3.1 the species has been provisionally considered as Data Deficient or DD (IUCN 2016). Habitat destruction caused by illegal falling of trees is the major threat to this species.

TABLE 1. Morphological differences between *G. konyakianorum, G. banerjiana, G. mupinense* and *G. ruborum.*

Characters	*G. konyakianorum*	*G. banerjiana*	*G. mupinense*	*G. ruborum*
Stem	2–3 cm long	2–3 cm long	5–20 cm long	4–10 cm long
Leaves	Lanceolate, oblanceolate to ovate	Lanceolate or ovate-lanceolate, spatulate	Oblong-lanceolate or lanceolate	Ovate or oblong
Inflorescence	Strictly 1-flowered borne at stem apex	1–3-flowered cymose borne at stem apex	3- to several flowered subcapitate or subcorymbose borne on upper part of stem	3- to several flowered, subcapitate or subcorymbose clustered at stem apex
Bract	0	0	1, oblong-lanceolate	1, obovate
Bracteoles	0	0	2, linear-lanceolate	2, spatulate-oblanceolate
Flower	Subsessile	Subsessile	Pedicellate, pedicel 2–9 cm long	Pedicellate, 1–2.5 cm long
Calyx	Urceolate, 1–1.5 cm in diam., much shorter than the corolla	Spathaceous, 3–4.5 cm in diam., more or less equal to the corolla	Tubular, slightly enlarged upward, 1–1.2 cm in diam., much shorter than the corolla	Tubular-campanulate, funnelform upward, 1.5–1.8 cm in diam., much shorter than the corolla
Corolla	5.5–7.5 cm long, white; lobes densely hairy adaxially	3.5–5.5 cm long, white or rose tinged or light yellow; lobes densely hairy adaxially	4–7.5 cm long, usually pale purple, pale purple-red, or rarely white; lobes densely villous on both surfaces	5–7 cm long, corolla usually red, rose-red, or rarely white; lobes glabrous abaxially, villous adaxially
Stamens	More or less equal	Didynamous	More or less equal	More or less equal
Filaments	Glabrous throughout	Glabrous throughout	Densely villous at base	Densely villous at base
Anther	Narrowly ovoid to fusiform, ca. 10 mm long	Attenuated, ca. 4 mm long	Ovoid, 3–3.5 mm long	Ovoid, 3–4 mm long
Style	0.5–0.6 cm long	0.8–0.9 cm long	4–5.5 cm long	3–5 cm long
Stigma	Narrowly subulate, 2.3–2.5 cm long, 2-lobed	Capitate, ca 0.3 cm long	Discoid or obscurely 2-lobed	Discoid or obscurely 2-lobed
Disc	Bright orange, ca. 3 mm high	Dull white, ca. 1.5 mm high	?	?

Identification key to the species of *Gleadovia*

1a. Flower subsessile, ebracteate, ebracteolate; filaments glabrous throughout; style less than 1 cm long **2**
1b. Flower long pedicellate; filaments hairy to the base; style more than 3 cm long **3**
2a. Calyx spathaceous, 3–4.5 cm in diam., more or less equal to corolla; corolla 3.5–5.5 cm long; stamens didynamous; anther attenuated, ca. 4 mm long; stigma capitate; annular disc dull white..... ***G. banerjiana***

2b. Calyx urceolate, 1–1.5 cm in diam., much shorter than corolla; corolla 5.5–7.5 cm long; stamens more or less equal; anther narrowly ovoid to fusiform, ca. 10 mm long; stigma narrowly subulate, to 2.5 cm long; annular disc bright orange ..... ***G. konyakianorum***

3a. Flowers densely clustered at the stem apex; bracteoles spatulate-oblanceolate; pedicel 1–2.5 cm long; calyx tubular-campanulate, funnelform upward; corolla lobes glabrous abaxially, hairy adaxially ..... ***G. ruborum***

3b. Flowers more or less spaced on the upper part of stem; bracteoles linear-lanceolate; pedicel 2–9 cm long; calyx tubular, slightly enlarged upward; corolla lobes densely villous on both surfaces ..... ***G. mupinense***

Other specimens studied

Gleadovia banerjiana Deb, J. Bombay Nat. Hist. Soc. 54: 749. 1957 & in Bull. Bot. Surv. India 3: 342.1961.
INDIA: Manipur. Imphal, Koupru hills, 2000 m a.s.l., 11 April 1954, *D.B. Deb* 2247A-CAL329964!.

Gleadovia ruborum Gamble & Prain, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 69(2): 489. 1900. INDIA. Uttar Pradesh: North-West Himalayas, Jaunusar, Bodyar (on the northern slopes in very shady woods of Fir and Deodar), 8–9,000 ft. a.s.l., June 1898, *J.S. Gamble* 26949 -K000999865!, K000999866!; CAL. 329959!

Gleadovia mupinense Hu, Sunyatsenia 4: 2. 1939.
CHINA: Sichuan. Roadsides, forests, humid places; 3000–3500 m a.s.l., 6 July 1933, *T.T. Yu* 2189 -PE1643589! -PE00032337!.

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References

Deb, D.B. (1956) A new species of *Gleadovia* Gamble *et* Prain from Manipur. *Journal of Bombay natural History Society* 54 (3): 799–801.

Deb, D.B. (1961) Dicotyledonous plants of Manipur territory. *Bulletin Botanical Survey of India* 3 (3–4): 253–350.

Gamble, J.S. & Prain, D. (1900) Description of a new Himalayan genus of Orobanchaceae. *Journal of the Asiatic Society of Bengal* 69 (2): 488–489.

Gardner, G. (1847) Contributions towards a flora of Ceylon. *Calcutta Journal of Natural History and Miscellany of the Arts and Sciences in India* 8: 156–161.

Hu, H.H. (1939) On the genus *Gleadovia* in China. *Sunyatsenia* 4 (1–2): 1–9.

Issar, R.K. (1966) A note on the occurrence of *Gleadovia ruborum* a rare Himalayan genus. *The Indian Forester* 92 (2): 131–132.

IUCN (2016) *Guidelines for using the IUCN Red List Categories and Criteria. Version 12.* Prepared by the Standards and Petitions Subcommittee. Available from http://www.iucnredlist.org/documents/RedListGuidelines.pdf (accessed 1 October 2017)

Roy, D.K. (2017) Lectotypification of the name *Gleadovia ruborum* Gamble & Prain (Orobanchaceae). *Phytotaxa* 323 (2): 197–198. https://doi.org/10.11646/phytotaxa.323.2.9

Ventenant, E.P. (1799) Orobancaceae. *In: Tableau du rigne vegetale selon la methode de Jussieu 2.* J. Drissonier, Paris, pp. 292–295.