Taiwania 62(1): 29–32, 2017
DOI: 10.6165/tai.2017.62.29

Pyrenaria khasiana R.N. Paul var. *lakhimpurense* (Theaceae), a new variety from Assam, India

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(Manuscript received 3 September 2016; accepted 16 December 2016; online published 25 January 2017)

ABSTRACT: A new variety of *Pyrenaria khasiana* R.N. Paul from Northeast India, *Pyrenaria khasiana* var. *lakhimpurense* N. Odyuo & D.K. Roy, is described and illustrated. It can be distinguished by silky villous pedicel, non-foliaceous bracteoles and sepals, shape and size of sepals and petals from the typical *P. khasiana*. Key to the Indian *Pyrenaria* is given.

KEY WORDS: Assam, India, New variety, *Pyrenaria khasiana*, Theaceae.

INTRODUCTION

The flowering plant family Theaceae is one of the most important economic and medicinal plant families comprises 9 genera and up to 460 species that are most diverse in the forests of subtropics and tropics, especially in Southeast Asia (Prince, 2007). The genus *Pyrenaria* Blume comprises 31 species, 1 subspecies and four varieties, is distributed in tropical South-East Asia from north-eastern India and northern Myanmar through south-western China and Indo-China Peninsula to the Malaysian region (Yang *et al.*, 2000; Li *et al.*, 2011; WCSP 2016; Tropicos 2016). It is characterized by axillary, one to few, pedunculate flowers, numerous stamens in 3-6 series and are fused at the base and adnate to the corolla, dry to succulent pericarp and 2-5 laterally compressed seeds per locule (Prince, 2007). In India, so far the genus is represented by 3 species namely *P. barringtoniifolia* Seem., *P. diospyricarpa* Kurz and *P. khasiana* R.N. Paul (Chauhan and Paul, 1993).

Pyrenaria khasiana was described by R.N. Paul (1979) based on the collections made by S. Kurz from Khasi Hills, Meghalaya (alt. 675-1000 m), India between 1867 – 1871. Paul (1979) gave only collection number (Holotype, S. Kurz 161A; Isotype 161B, 161C (CAL) but did not mention the date of collection. Whereas the type specimens examined at CAL mentioned only Khasi Hills and Brahmaputra plains without any specific locality. *P. tibetana* Hung T. Chang was described from Tibet in 1983 and it was reduced to synonym of *P. khasiana* R.N. Paul by Yang (2005).

During the botanical exploration (2011 – 2015) in the forests of southern foothills of Himalayan in the district of North Lakhimpur, Assam bordering Arunachal Pradesh, the authors encountered one interesting Theaceous plant growing in the semi-evergreen broad-leaf forest. In-depth examination of the specimens and perusal of literature (Dyer, 1874; Paul, 1979; Chauhan and Paul, 1993; Chang, 1983; Yang, 2005; Prince, 2007; Ming and Bartholomew, 2007) revealed that the plant belongs to the genus *Pyrenaria* and is closely related to *P. khasiana* R.N. Paul but differs from it by pedicel silky villous (vs glabrous), bracteoles non-foliaceous (vs foliaceous), sepals ovate, orbicular to obovate, to 15 mm long, non-foliaceous (vs suborbicular, to 9 mm long, foliaceous) and petals oblanceolate-obovate**,** to 20 mm long (vs obovate to suborbicular, to 12 mm long) (Table 1). Based on the differences, the taxon is described here as a new variety of *P. khasiana*.

TAXONOMIC TREATMENTS

Key to the Indian species of *Pyrenaria*

1a. Fruits with 5 stigmatic protuberances at apex and persistent calyx at base ……..…….…..... 2
1b. Fruits without 5 stigmatic protuberances at apex and persistent calyx at base ……...…….……... ***P. barringtoniifolia***
2a. Branchlets sparsely pubescent to glabrous; bracteoles smaller than sepals ……..……. 3
2b. Branchlets densely pubescent; bracteoles larger than sepals ...…….…… ***P. diospyricarpa***
3a. Bracteoles and sepals foliaceous; pedicel glabrous ……...…… ……...……..……..…… ***P. khasiana*** var. ***khasiana***
3b. Bracteoles and sepals non-foliaceous; pedicel silky villous ……..… ……..……... ***P. khasiana*** var. ***lakhimpurense***

Pyrenaria khasiana R.N. Paul, Bull. Bot. Soc. Beng. 33: 115. 1979; Chauhan & Paul in Sharma & Sanjappa, Fl. India 3: 166. 1993; Tianlu Min & Bruce Bartholomew in Fl. China 12: 414. 2007. *P. tibetana* Hung T. Chang in Acta Sci. Nat. Univ. Sunyatseni 22(2): 64.1983. ***Type***: India: Khasi hills & Brahmaputra plains, *S. Kurz* 161A (Holo. CAL 0000005946).

Pyrenaria khasiana R.N. Paul var. ***lakhimpurense*** N. Odyuo & D.K. Roy, ***var. nov. Type***: INDIA. Assam: North Lakhimpur, Dullung Reserve Forest, (Behind Beat office towards North), alt. 171 m, N27°24´36´´, E94°11´42´´, 9 Feb 2011, *N.Odyuo & D.K.Roy 121172* (Holotype: ASSAM!; Isotype: CAL!). **Figs. 1 & 2**

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Fig. 1: ***Pyrenaria khasiana*** R.N. Paul var. ***lakhimpurense*** N. Odyuo & D.K. Roy: **A.** Habit. **B.** Foliage. **C.** A twig with floral buds. **D.** Flower. **E.** Fruiting twig. **F.** Immature fruit. **G.** Matured fruits. **H.** Seeds.

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Table 1: Morphological comparison between ***P. khasiana*** var. ***khasiana*** **and** ***P. khasiana*** var. ***lakhimpurense*** *var. nov.*

Characters	***P. khasiana*** var. ***khasiana***	***P. khasiana*** var. ***lakhimpurense***
Leaf blade	broadly oblanceolate to oblong-lanceolate, 7–20 × 3–8 cm	oblanceolate to spathulate, 22–25 × 8.5–10.5 cm
Secondary veins	12–17 on each side of midvein	17–22 on each side of the midvein
Pedicel	glabrous, 4–6 mm long	silky villous, ca. 3 mm long
Bracteoles	ovate to lanceolate, to 10 mm long, foliaceous	ovate, to 2.5 mm long, non-foliaceous
Sepals	suborbicular, 8–9 mm, foliaceous	ovate, orbicular to obovate, 5-15 mm, non-foliaceous
Petals	obovate to suborbicular, to 12 mm long	oblanceolate-obovate, to 20 mm long

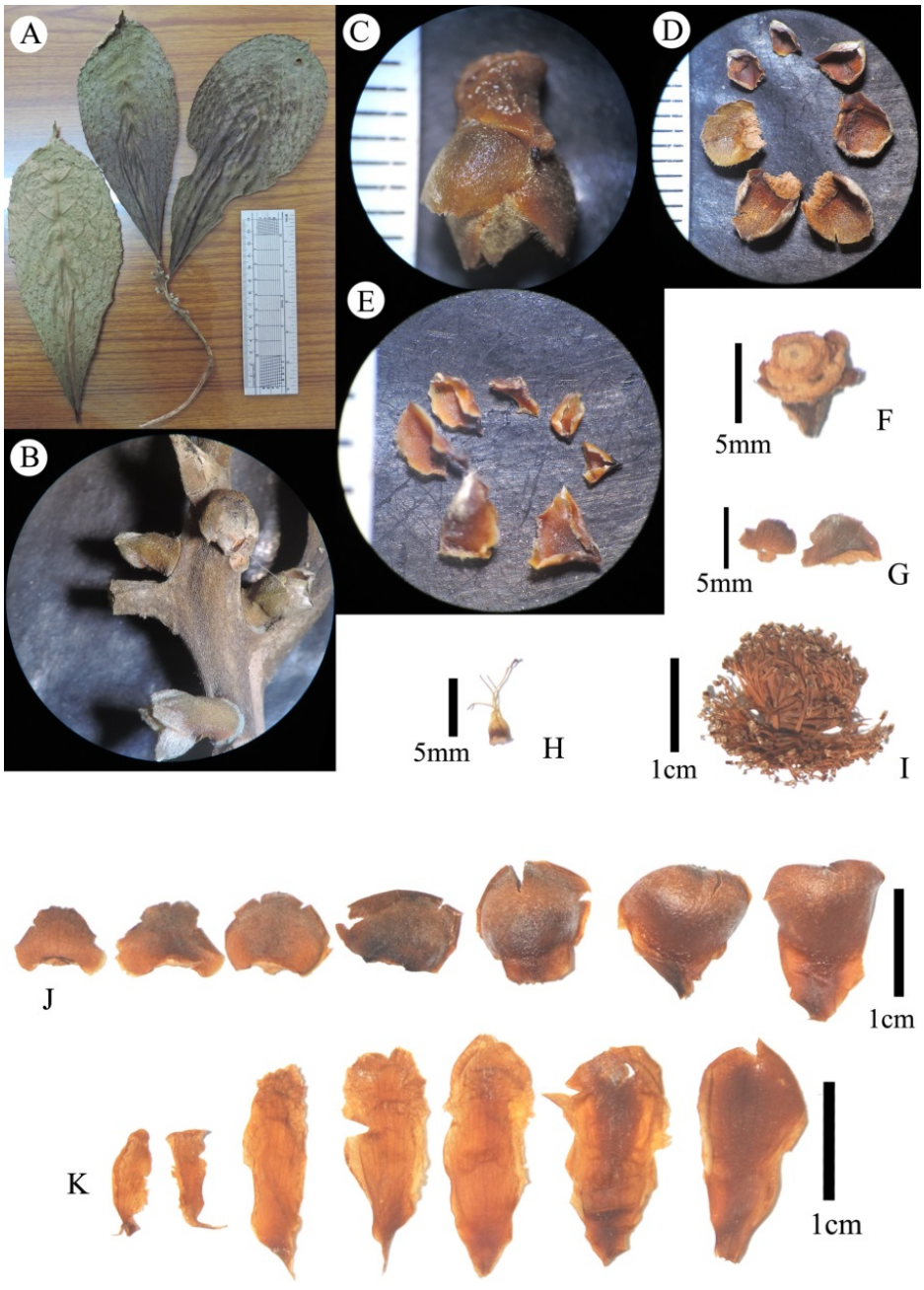


Fig. 2: ***Pyrenaria khasiana*** R.N. Paul var. ***lakhimpurense*** N. Odyuo & D.K. Roy. **A.** Leaves. **B.** Portion of branchlet showing hairs. **C.** Floral bud. **D.** Sepals (ventral view, from bud). **E.** Petals (from bud). **F.** Pedicel. **G.** Bracteoles. **H.** Gynoecium. **I.** Stamens. **J.** Sepals (from bloomed). **K.** Petals (from bloomed).

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Small tree, to 5 m high. Young branchlets sparsely pubescent. Leaves oblanceolate to spathulate, 22–25 × 8.5–10.5 cm, leathery, serrate, glabrous above, sparsely pubescent below, midrib raised below, depressed above, secondary veins 17–22, depressed above and raised below, base attenuate to cuneate, apex long acuminate; petioles sparsely pubescent in young, later glabrascent, to 0.7 cm long. Flower axillary, solitary, ca. 4.5 cm across; pedicel silky villous, 3 × 2 mm; bracteoles 2, ovate, 2.0–2.5 × 2.5–3.0 mm, non-foliaceous, leathery, silky villous outside, glabrous inside, apex obtuse; sepals persistent, 7, ovate, orbicular to obovate, 0.5–1.5 × 0.7–1.2 cm, non-foliaceous, silky villous outside, glabrous inside; petals 7, white, unequal, oblanceolate-obovate, 1.0–2.0 × 0.5–1.5 cm, silky villous outside, glabrous inside, apex rounded; stamens numerous, basally connate; filaments glabrous, to 1 cm long, outer whorl slightly adnate to petals; anther dorsifixed, bilobed; ovary 5-loculed, 3–4 mm long; styles 5, free, ca. 7 mm long. Fruit subglobose, 2.5–3.5 × 2.3–3.2 cm, glabrous, apex crowned with 5 stigmatic protuberances, with persistent calyx at base; pericarp fleshy, yellowish when ripe, spongy when dry. Seeds 5–7, 8–10 mm, hemispheric, occasionally 2 per locule; testa bony. Flowering in February to May, fruiting in June to August.

Note: Superficially *P. khasiana* R.N. Paul var. *lakhimpurense* N. Odyuo & D.K. Roy is close to *P. menglaensis* G.D. Tao, but it differs in having sparsely pubescent young branchlets and petioles (vs densely villous), oblanceolate to spathulate leaves with attenuate to cuneate base and long acuminate apex and with secondary veins depressed above and raised beneath (vs ovate to oblong-ovate with rounded base and bluntly acute apex and with secondary veins raised on both surfaces), 2.0–2.5 mm long bracteoles, silky villous outside (vs 5–10 mm long, yellow sericeous outside), 7, ovate or orbicular to obovate, 0.5–1.5 cm long sepals, silky villous outside (vs 5 or 6, broadly ovate to suborbicular, 1–2 cm long, yellow sericeous outside), 7, oblanceolate-obovate, 1.0–2.0 cm long petals (vs 5–7(–9), broadly ovate to suborbicular, 2.5–3.5 cm long), subglobose fruits, 2.3–3.2 cm in diam. (vs globose, 5–8 cm in diam.).

Distribution and habitat: The new variety is an under-story tree in semi-evergreen broad- leaf forest of Kakoi and Dullung Reserve Forests, North Lakhimpur district of Assam. The common associated species are *Saurauia armata* Kurz, *Glochidion ellipticum* Wight, *Balakata baccata* (Roxb.) Esser, *Bischofia javanica* Blume, *Mesua assamica* (King & Prain) Kosterm., *Sterculia hamiltonii* (Kuntze) Adelb., *Garcinia* x *mangostana* L, *Artocarpus lacucha* Buch. –Ham., *Carallia brachiata* (Lour.) Merr., *Aristolochia griffithii* Hook.f. & Thomson ex Duch., *Hodgsonia macrocarpa* (Blume) Cogn., *Goniothalamus sesquipedalis* (Wall.) Hook.f. & Thomson.

Etymology: The new variety is named after the place of occurrence, North Lakhimpur district, Assam, India.

Additional specimens examined: **INDIA**. Assam: North Lakhimpur district, Kakoi Reserve forest, Digha, 9. Feb 2011, *N. Odyuo & D. K. Roy* 121131 (ASSAM!); Dullong Reserve forest, 11 May 2012, *N. Odyuo & R. Daimary* 126502 (ASSAM!).

Specimens of other Indian species examined:

Pyrenaria barringtoniifolia Seem.: INDIA. Assam: Darrang, Charduar, March 1877, *G. Mann* 722 (ASSAM!); Lakhimpur, Joypore reserve, 4 Apr 1936, *G.K. Deka* 13348 (ASSAM!); Lakhimpur, Jaikai reserve, 6 Feb 1939, *G.K. Deka* 18030 (ASSAM!). Meghalaya: Khasi & Jaintia Hills, Umsaw reserve, 10 Jun 1935, *S.R. Sarma* 11057 (ASSAM!).

Pyrenaria diospyricarpa Kurz: INDIA. Assam: Sibsagar, Jamuguri Road, 14 Nov 1912, *U. Kanjilal* 1907 (ASSAM!); Lakhimpur, Dighal Tarang, 22 Jan 1931, *U. Kanjilal* 8951 (ASSAM!).

Pyrenaria khasiana R.N. Paul: INDIA:. Khasi Hills & Brahmaputra plains, *S. Kurz* 161A (CAL!).

ACKNOWLEDGEMENTS

Authors are grateful to Dr. P. Singh, Director, Botanical Survey of India, Kolkata and Dr. A.A. Mao, HoO, BSI, Eastern Regional Centre, Shillong for encouragement and facilities. They are also thankful to Shi-Xiong Yang, Department of Phytotaxonomy and Plant Geography, Kunming Institute of Botany, The Chinese Academy of Sciences, Heilongtan, Kunming, Yunnan for his expertise comments on the identity of this *Pyrenaria* taxon.

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