

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/270508045>

Arisaema bannaense and Arisaema lingyunense (Araceae), Two Additions to the Flora of India

Article in *Journal of Japanese Botany* · February 2014

CITATION

1

READS

491

3 authors, including:



Rajib Gogoi

Botanical Survey of India

130 PUBLICATIONS 789 CITATIONS

[SEE PROFILE](#)



A. A. Mao

Botanical Survey of India, Shillong

114 PUBLICATIONS 1,078 CITATIONS

[SEE PROFILE](#)

Arisaema bannaense and *Arisaema lingyunense* (Araceae), Two Additions to the Flora of India

Rajib GOGOI^{a,*}, Bladimir Bajur Theodore THAM^a and Ashiho Asosii MAO^b

^aBotanical Survey of India, Arunachal Pradesh Regional Centre
Senki View, Itanagar-791 111, INDIA;

^bBotanical Survey of India, Eastern Regional Centre
Laitumkhrah, Shillong, INDIA

*Corresponding author: rajibdzuko@gmail.com

(Accepted on July 13, 2013)

Arisaema bannaense H. Li and *A. lingyunense* H. Li are reported here as new additions to the Flora of India. Hitherto these two species were considered endemic to China.

Key words: *Araceae*, *Arisaema bannaense*, *Arisaema lingyunense*, flora, India, new record.

The genus *Arisaema* Martius (*Araceae*: *Arisaemateae*) contains about 180 species mainly distributed in N. E. Africa, Asia, East North America and Mexico and the highest concentration is found in China with 78 species (Mayo et al. 1997, Li et al. 2006, 2010). In India the genus is represented by 44 species and nine infra specific taxa (Karthikeyan et al. 1989). The enumeration of the genus in the Indian subcontinent was initiated by Hooker (Hooker 1893) and recorded 38 species of which 22 belonged to the Himalaya. The legacy was carried forward by Chatterjee (1954) who enumerated 44 species from India and Myanmar (Burma), of which 18 species were recognized as native to the Himalaya. Hara (1971) reported 17 species and Pradhan (1997) recorded 27 species from the Himalayan region. Chowdhery et al. (2009) reported 16 species from the state of Arunachal Pradesh, a trans Himalayan state of India, but the complexity and the actual diversity of the genus still remain unclear in the states of N. E. India as the majority of the natural habitat of the genus is under-explored or unexplored due to tough geographical terrain.

While on annual action plan of the exploration tours of Botanical Survey of India the first author collected one species of *Arisaema* with co-author (AAM) from Dzukou valley, at the border of Manipur and Nagaland in the year 2007. The plant was initially identified and even entered in the unpublished manuscript of “Flora of Dzukou Valley” as *A. galeatum* as it had a galeate spathe. A later perusal of literature and critical study of the specimens revealed that this species is *Arisaema lingyunense* H. Li, sect. *Arisaema* (Hara 1971, Gusman 2002, 2006, Li et al 1977, 2006, 2010).

Again very recently (November, 2012) the first author collected another *Arisaema* species with co-author (B.B.T.T.) from the place adjacent to Sessa Orchid Sanctuary, West Kameng Distric of Arunachal Pradesh. On critical study and perusal of literature it was determined as *Arisaema bannaense* H. Li (Li 1988) of sect. *Anomala* (Gusman and Gusman 2002, 2006, Li et al 2006, Murata 2011, Murata et al. 2013).

The present communication is the first addition of the two *Arisaema*, i.e., *Arisaema bannaense* H. Li and *A. lingyunense* H. Li to

the *Flora of India*. A detailed description with coloured illustrations are provided.

Arisaema bannaense H. Li in Bull. Bot. Res., Harbin **8**(3): 101 (1988); H. Li & al., Fl. China **23**: 47 (2006). TYPE: CHINA. Yunnan: Menla Xian, Lo Xiao-Zhong 1120 (KUN!).

Plants evergreen, rhizome cylindric, inside purple, outer layer light yellow, robust, ca. 3–7 × 0.8–2.5 cm, rooting on whole surface but more on the upper part of the rhizome. Leaves 1–2 together, separately arranged on rhizome back perhaps from different seasons, petiole green or light purplish, cylindric, ca. 26–78 × 0.8–1.5 cm, with cataphylls; leaf blade adaxial side green, abaxial side light green 3 foliolate, leaflets entire, base acute apex acuminate to caudate, acumen ca. 1–1.5 cm long; central leaflet with petiolule ca. 2.5–6 cm, blade green, elliptic to oblong, ca. 17–29 × 5–7 cm, base cuneate; lateral leaflets with petiolule ca. 0.9–2 cm, blade lanceolate ca. 17–27 × 3.5–7.5 cm, base obliquely rounded, cataphylls 1 or 2, brown, encircling the petiole, ca. 9–15 cm. Peduncle 17–26 cm, encircled in cataphylls, brown in colour. Spathe green; tube outside whitish green, inside white or whitish green, ca. 6 × 1.2 cm, throat margins spreading, auriculate, limb arching, obovate, green, ca. 6 cm long, 5 cm wide, apex acuminate or acute. Spadix bisexual and unisexual (male). Bisexual spadix: female zone ca. 2.2 × 1 cm, ovary green, ca. 1.5 mm wide, ovoid, style short, stigma white, disciform; male zone ca. 2 cm long, sparsely covered by male flowers; appendix erect, light green, ca. 4 cm long, cylindric, ca. 4 × 0.3 cm, apex obtuse. Male spadix: male zone ca. 2 cm long, base ca. 4 mm in diameter; male flowers lax, of 2–4 stamens, subsessile, anthers creamy colour and purple at tip, (ovoid or sub globose), dehiscing by an apical united slit; appendix cylindric ca. 3.5 cm long, light green, apex sub clavate ca. 1 × 0.2 cm. Berry orange-red, obovoid.

Flowering : November – December.

Distribution: India and China.

Habitat: In India this species is common in the forest floor of primary evergreen broadleaved subtropical moist forests near streams at an altitude of 1200 m.s.l. It was growing abundantly in and around Sessa of West Kameng district of Arunachal Pradesh.

Specimens examined: **INDIA**. Arunachal Pradesh, West Kameng Distr., Sessa, behind Military Base, 1200 m, 24 Nov. 2012, 25°31'41.6"N 091°33'46.9"E, R. Gogoi & B. T. Tham 35416 (ARUN; Fig. 1).

Note: This species is close to *A. garrettii* Gagnepain from Thailand, but can easily be separated from it due to the presence of a sub-clavate spadix appendix, which is exerted from the spathe tube so that it is clearly seen from outside (Li et al. 2006).

Arisaema lingyunense H. Li in Acta Phytotax. Sin. **15**(2): 107 (1977); H. Li & al., Fl. China **23**: 51 (2010). TYPE: CHINA. Guangxi, Lingyun, Lingyun Exped. 32777 (HT!).

Plants dioecious, tubers globose to sub globose, ca. 3 cm in diameter, with few tubercles. Leaves two, petiole ca. 30 cm, basal part forming pseudostem; Leaf blade 3-foliolate; leaflets with petiolules, 1.5–2 cm; central leaflet rhombic, ca. 10 × 10 cm; lateral leaflets oblique, lateral ones 13–14 × 10–11 cm, base cuneate in the inner side, rounded at outer side; peduncle shorter than petioles, ca. 6 × 0.4 cm, spathe purple with white lines; tube funnel form, ca. 4 × 1.5 cm, limb incurved, galeate, lateral margins elongated into broad wings, with whitish reticulate networks on both sides, ca. 10 × 8 cm, base constricted, apex rounded with a acumen, ca. 2 cm long. Spadix unisexual; female zone conic, ca. 3 × 2 cm; ovary cylindric, ca. 5 mm long; style short; stigma disciform; male zone cylindric, ca. 3 × 0.9 cm; stamens 2–3, anthers stipitate, dehiscing by horseshoe-shaped slit; appendix purple, flagellate, proximal ca. 13–14 cm long, ca. 1.5 cm in diam., subcylindric, base attenuate, not truncate, stipe ca. 1.5 × 0.8 cm (in female), ca. 4 × 3 mm (in male), distal filliform part ca. 30 cm long (in female). Fruits not seen.

Flowering: June – July. Fruiting: July –

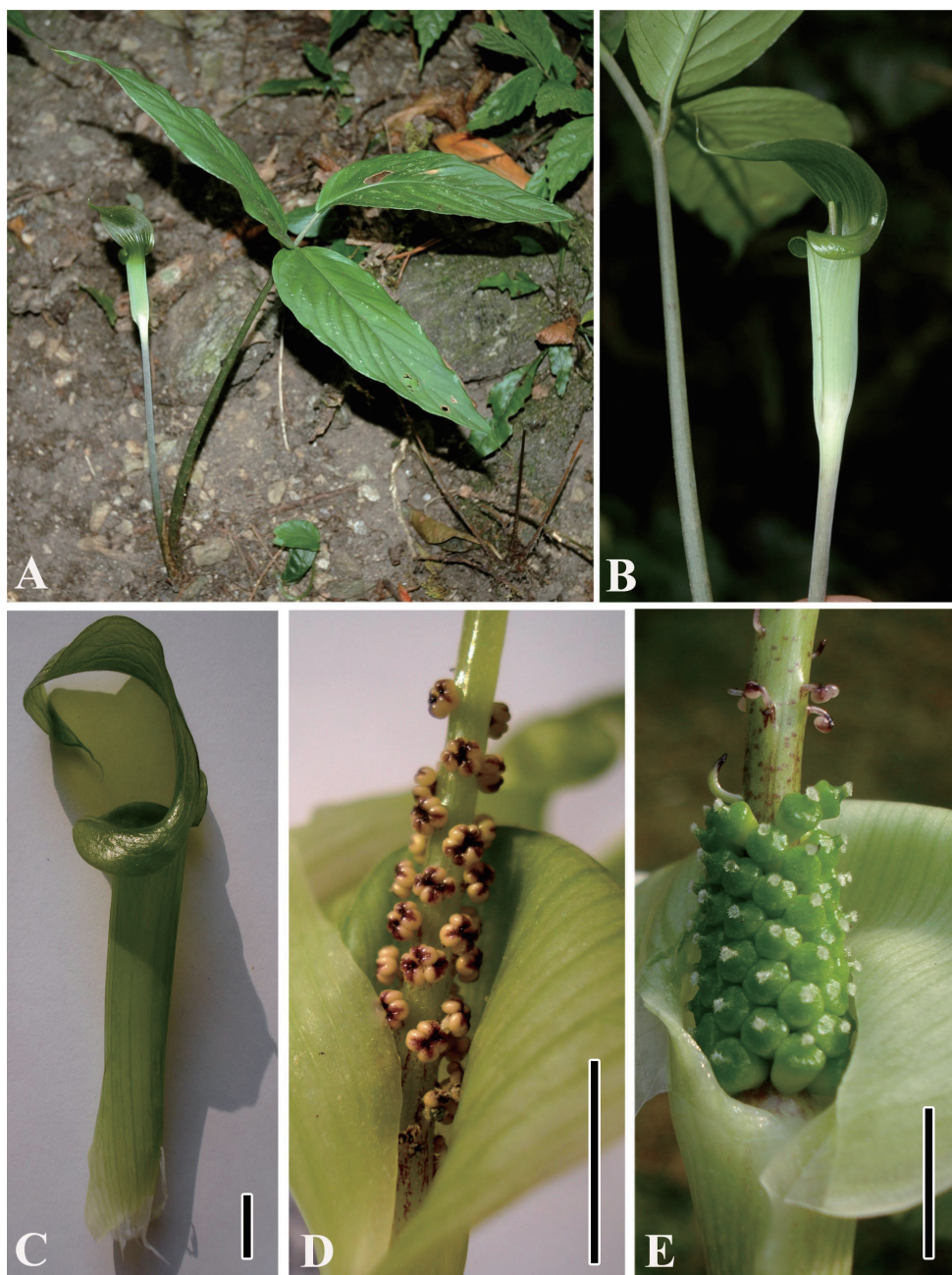


Fig. 1. *Arisaema bannaense* H. Li. A. Plant in natural habitat. B. Close view of spathe. C. Detached spathe. D. Male zone of the spadix in male plant. E. Close view of female zone in the female plant. Photographed by Rajib Gogoi. Scale: 1 cm.

October.

Distribution: India, China and W. Myanmar.

Habitat: In India the species is quite rare in its habitat. A small colony was recorded near

swamps of reeds and shrubby bamboos in high humus, rich shady locations of Dzukou Valley at an altitude of 2450 m.

Specimens examined: **INDIA**: Dzukou Valley, at the



Fig. 2. *Arisaema lingyunense* H. Li. A. Plants in natural habitat with trifoliate leaf and emerging spathe. B. Close view of spathe. C. Lateral view of spathe with flagellate appendix apex. D. Front view of spathe. Photographed by A. A. Mao. Scale: 5 cm.

border of Manipur and Nagaland, 2450 m m.s.l., 10 July 2007, A. A. Mao & R. Gogoi 115037 (ASSAM; Fig. 2).

Note: *Arisaema lingyunense* is close to *A. dahaiense* H. Li, but the former is easily

distinguishable with its underground subglobose tuberous stem from the latter with cylindric rhizomatous stem (Li et al 2006).

The authors are grateful to Director, Botanical Survey of India for his encouragement. The authors are highly thankful to Dr. Guy Gusman of Universite Libre de Bruxelles, Belgium for confirming the identity of both the species reported herein and also to Dr. Peter C. Boyce, Malaysia for going through the manuscript.

References

- Chatterjee D. 1955. Indian and Burmese species of *Arisaema*. Bull. Bot. Soc. Beng. **8**: 118–139.
- Chowdhery H. J., Giri G. S. and Pramanik A. 2009. Materials for the Flora of Arunachal Pradesh **3**: 230–234. Botanical Survey of India, Kolkata.
- Gusman G. and Gusman L. 2002. The Genus of *Arisaema* – A Monograph for Botanists and Nature Lovers. A. R. GantnerVerlag, Ruggell.
- Gusman G. and Gusman L. 2006. The Genus *Arisaema*, second revised and updated edition. A. R. G. Gantner Verlag, Ruggell.
- Hara H. 1971. A revision of the Eastern Himalayan Species of the genus *Arisaema* (Araceae). In: Hara H. (ed.), The Flora of Eastern Himalaya **2**: 321–354. University of Tokyo Press, Tokyo.
- Hooker J. D. 1893. Flora of British India **6**: 497–508.
- Karthikeyan S., Jain S. K., Nayar M. P. and Sanjappa M. 1989. Flora Indicae Enumeratio: Monocotyledonae. pp. 7–9. Botanical Survey of India, Calcutta.
- Li H. 1988. Notes on the genus *Arisaema* from Yunnan. Bull. Bot. Res., Harbin **8**: 99–101.
- Li H., Shiao Y., and Tseng S.-L. 1977. Claves diagnosticae et taxa nova Aracearum Sinicum. Acta Phytotax. Sin. **15**(2): 107.
- Li H., Zhu G. H. and Murata J. 2010. *Arisaema*. In: Wu Z. Y., Raven P. H. and Hong D. Y. (eds.), Flora of China **23**: 43–69. Science Press, Beijing and Missouri Botanical Garden Press, St. Louis.
- Martius K. F. P. von 1831. Ueber die Art der Befruchtung bei einigen Aroideen und über die Charakteristik mehrere Gattung dieser Familie. Flora **14**: 458–459.
- Mayo S., Bogner J. and Boyce P. C. 1997. The genera of Araceae. 270 pp. Royal Botanic Gardens, Kew.
- Murata J. 1984. An attempt at an infrageneric classification of the genus *Arisaema* (Araceae). J. Fac. Sci. Univ. Tokyo, sect. 3, Bot. **13**: 431–482.
- Murata J. 2011. *Arisaema* in Japan. Hokuryukan, Tokyo (in Japanese).
- Murata J., Nagamasu H. and Ohashi H. 2013. A nomenclatural review on the infrageneric classifications of *Arisaema* (Araceae). J. Jpn. Bot. **88**(1): 3–45.
- Pradhan U. C. 1997. Himalayan Cobra-Lilies (*Arisaema*). Their Botany and Culture. 2nd ed. Primulaceae Books, West Bengal.
- R. Gogoi^a, B. B. T. Tham^a, A. A. Mao^b: インド新産のテンナンショウ属 2 種, *Arisaema bannaense* と *Arisaema lingyunense* (サトイモ科)
- これまで中国固有、及び中国とミャンマーに固有とみなされてきた、テンナンショウ属 (サトイモ科) の 2 種をインドから初めて報告した。 *Arisaema bannaense* H. Li は雲南省から記載された種で、アルナチャル・プラデシュの Sessa で得られた。 *Arisaema lingyunense* H. Li は広西チワン族自治区から記載された種で、マニプールとナガランドの境界域に位置する Dzukou Valley で得られた。
- ^a インド・植物調査所アルナチャル・プラデシュ地域センター、
^b インド・植物調査所東部地域センター)