

**TAXONOMIC NOTES ON *ARISTOLOCHIA DILATATA* BROWN FROM INDIA:
LECTOTYPIFICATION AND A NEW SYNONYM**

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Abstract

Aristolochia gourigangaica Nair is proposed here as a synonym of *Aristolochia dilatata* Brown. Furthermore, the lectotype of *Aristolochia dilatata* is designated. Its relationship with *Aristolochia punjabensis* is also discussed.

Aristolochia L. comprises about 500 species representing the largest genus of Aristolochiaceae (Neinhuis *et al.* 2005). The genus is subdivided into three subgenera: *Aristolochia* (Schmidt) Ma, *Siphisia* (Rafinesque) Duchartre, and *Pararistolochia* (Hutchinson & Dalziel) Schmidt (González and Stevenson 2002, Neinhuis *et al.* 2005, Wanke *et al.* 2006). *Aristolochia* subgenus *Siphisia* comprises about 70 species, 50 of which occur in East and South Asia while the remaining 20 species are restricted to Central and North America (Wagner *et al.* 2012, Do *et al.* 2014, González *et al.* 2014). Among the Asian tropics, this subgenus mostly occurs throughout the Himalayan and Indo-Chinese region (including southern China).

In contrast to the well-known studies in respect of *Siphisia* taxonomy from Thailand (Phuphathanaphong 1987), China (Hwang *et al.* 2003), Vietnam (Do *et al.* 2014), nomenclature and relationship of *Siphisia* species from the Himalayan region is still problematic.

Brown (1911) originally described *Aristolochia dilatata* from India, a name, however, invalid under Art. 9 of the Melbourne Code (McNeill *et al.* 2012), because the holotype was not indicated. The author mentioned a syntype comprising of three gatherings: *R. Strachey & J.E. Winterbottom s.n.* (K-000820411), *J.E. Winterbottom s.n.* (K000820412), and *R. Strachey & J.E. Winterbottom 609* (K-000820410) instead. They were all collected at approximate 2300-2400 m from Kumaon, Uttar Pradesh, India. The first sheet shows both open flowers and mature fruits, the second sheet again flowers and fruits but the flower was not really open, and the third carries the perianth only, while ovary and pedicel are missing. Because diagnostic characters of *Aristolochia* flowers are more distinctive than those of fruits to differentiate species the specimen *R. Strachey & J. E. Winterbottom s.n.* (K000820411) is assigned as the lectotype of *Aristolochia dilatata* here (Fig. 1).

Furthermore, Nair (1969) described *Aristolochia gourigangaica* from India based on the specimen *N.C. Nair 35654* (K001050405) (Fig. 2). However, our thorough investigation of the type specimens revealed that the specimens *N.C. Nair 35654* is almost identical to *R. Strachey & J.E. Winterbottom s.n.* (K000820411) by a deltoid to deltoid-ovate lamina with a densely grey villous adaxial surface, perianth yellow on the outside with parallel veins, an equally inflated tube and a discoid-subrotundate limb, dark-purple with three indistinct lobes. *Aristolochia gourigangaica* is insufficiently distinct from *A. dilatata* to be maintained as separate taxon. Thus, *Aristolochia gourigangaica* is here considered as a synonym of *Aristolochia dilatata*.

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Aristolochia dilatata Brown, Bull. Misc. Inform. Kew 1911: 274 (1911).

Type: INDIA. Uttar Pradesh, Kumaon, elev. 2438 m, *R. Strachey & J.E. Winterbottom s.n.* (lecto. K000820411, designated here). - Syntype: INDIA. Uttar Pradesh, Kumaon, valley of Ramgunga, 15 May 1848, *J.E. Winterbottom s.n.* (K 000820412!); Madhari Pass, elev. 2440 m, *R. Strachey & J.E. Winterbottom 609* (K 000820410!).

Synonym: *Aristolochia gourigangaica* Nair, Bull. Bot. Sur. Ind. 10: 332 (1969).—Type: INDIA. Uttar Pradesh, Kumaon: Radgadi Pith-oragarh, Gouriganga valley, elev. 2800 m, 04 May 1965, *N.C. Nair 35654* (holo. K 001050405!). *syn. nov.*

Ma (1989) synonymized *A. dilatata* with *A. saccata* Wallich. Besides having a different leaf blade, *A. saccata* has the flowers arranged in cyme on old woody stems and three revolute lobes forming a trumpet-shaped limb. In contrast, the flower of *Aristolochia dilatata* is solitary or terminal on young branches, limb lobes greatly dilated.



Fig. 1. Lectotype of *Aristolochia dilatata* (*R. Strachey & J.E. Winterbottom s.n.* – K 000820407).

Aristolochia dilatata is most similar to *Aristolochia punjabensis* Lace in the leaf blade, abaxial leaf surface hairy as well as solitary flower on young branches. However, it is clearly distinguishable from the latter by the diagnostic characters of the perianth, which is glabrescent vs. villous, the upper tube is inflated vs. strongly constricted and the limb lobes are indistinctly 3-lobed vs. distinctly broadly ovate 3-lobed.

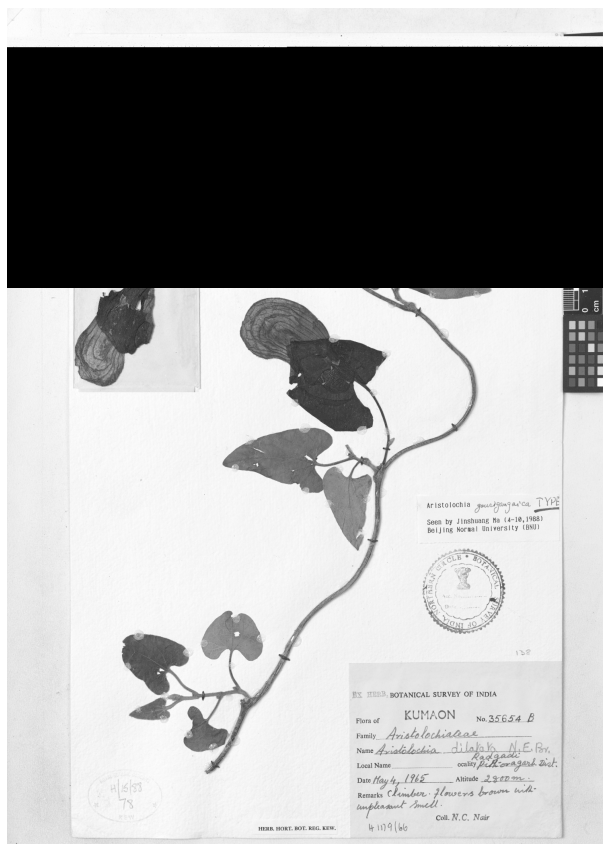


Fig. 2. The type of *Aristolochia gourigangaica* (N.C. Nair 35654 - K 001050405)

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References

- Do TV, Nghiem TD, Wanke S and Neinhuis C 2014. *Aristolochia quangbinhensis* (Aristolochiaceae), a new species from Central Vietnam. *Phytokeys* **33**: 51-59.
- González F and Stevenson DW 2002. A phylogenetic analysis of the subfamily Aristolochioideae (Aristolochiaceae). *Rev. Acad. Colomb. Cienc.* **26**: 25-60.
- González F, Wagner ST, Salomo K, Samain MS, Isnard S, Rowe NK, Neinhuis C and Wanke S 2014. Present trans-Pacific disjunct distribution of *Aristolochia* subgenus *Isotrema* (Aristolochiaceae) was shaped by dispersal, vicariance and extinction. *J. Biogeogr.* **41**: 380-391.
- Hwang SM, Kelly LM and Gilbert MG 2003. Aristolochiaceae. In: *Flora of China*. Vol. **5**, Z.Y. Wu and H.R. Peter (eds.). pp. 246-269. Beijing: Science Press and St. Louis: Missouri Botanical Garden Press.
- Ma JS 1989. A revision of *Aristolochia* Linn. from E. and S. Asia. *Acta Phytotax. Sin.* **27**(5): 321-364.

- McNeill J, Barrie FR, Buck WR, Demoulin V, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Marhold K, Prado J, Prud'Homme Van Reine WF, Smith GF and Wiersema JH 2012. International code of nomenclature for algae, fungi, and plants (Melbourne Code), adopted by the eighteenth international Botanical Congress Melbourne, Australia, July 2011 (Regnum Vegetabile, 154). A.R.G. Gantner Verlag, Ruggell, 208 pp.
- Nair NC 1969. *Aristolochia gourigangaica*. Bull. Bot. Surv. India **10**: 332.
- Neinhuis C, Wanke S, Hilu KW, Muller K and Borsch T 2005. Phylogeny of Aristolochiaceae based on parsimony, likelihood, and Bayesian analyses of *trnL-trnF* sequences. Plant Syst. Evol. **250**: 7-26.
- Ohi-Toma T, Sugawara T, Murata H, Wanke S, Neinhuis C and Murata J 2006. Molecular phylogeny of *Aristolochia* sensu lato (Aristolochiaceae) based on sequences of *rbcL*, *matK*, and *phyA* genes, with special reference to differentiation of chromosome numbers. Syst. Bot. **31**: 481-492.
- Phupathanaphong L 1987. Aristolochiaceae. Flora of Thailand **5**: 1-31.
- Royal Botanic Gardens, Kew 1911. Plantarum novarum in herbario horti regii conservatarum. Kew Bull. **1911**: 273-274. London.
- Wagner ST, Isnard S, Rowe NP, Samain MS, C Neinhuis and Wanke S 2012. Escaping the lianoid habit: evolution of shrub-like growth forms in *Aristolochia* subgenus *Isotrema* (Aristolochiaceae). Am. J. Bot. **99**(10): 1609-1629.
- Wanke S, González F and Neinhuis C 2006. Systematics of pipevines-combining morphological and fast-evolving molecular characters to investigate the relationships within subfamily Aristolochioideae (Aristolochiaceae). Int. J. Plant Sci. **167**(6): 1215-1227.

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