



NOTE

Taxonomic notes on some *Aristolochia* species in Vietnam

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ABSTRACT: This study revised taxonomically some previously misidentified *Aristolochia* species in Vietnam. As a conclusion, these specimens were previously misidentified as *A. heterophylla*, *A. indica*, *A. westlandii* and *A. zollingeriana*, are here corrected to *A. longgangensis*, *A. cambodiana*, *A. fangchi* and *A. acuminata*, respectively. Furthermore, *A. westlandii*, *A. zollingeriana* are excluded from Vietnam and *A. indica* is a non-indigenous species of Vietnam.

KEY WORDS: Aristolochiaceae, Nomenclature, Taxonomy, Vietnam.

INTRODUCTION

Aristolochia L. (Aristolochiaceae) comprises approximately 500 species, worldwide distributed with centers of diversity in the tropical and subtropical regions (Wagner *et al.*, 2012). In contrast with well-known of *Aristolochia* species from neighbouring countries and regions as China (Hwang *et al.*, 2003), Taiwan (Hou 1996), Japan (Murata 2006, Watanabe *et al.*, 2006), Thailand (Phuphathanaphong 1987), and Malaysia (Hou 1984), the comprehensively taxonomic and systematic studies of this genus in Vietnam has been still poorly known. Nguyen (2003) represented a checklist of 13 *Aristolochia* species and one variety for the flora of Vietnam. More recently new discoveries raised an amount of *Aristolochia* species occurring in Vietnam to 22 (Do *et al.*, 2014, Huong *et al.*, 2014, Do *et al.*, 2015a, 2015b, 2015c).

While conducting the taxonomic revision of *Aristolochia* for the flora of Vietnam, we found out some misidentified *Aristolochia* species in the country, e.g. the specimens belonging to *A. longgangensis* C.F. Liang was misidentified under *A. heterophylla* Hemsley, *A. cambodiana* Pierrei ex Lecomte was misidentified under *A. indica* L.. These confusions were due to incomplete specimens, likely lacking of flowers and fruits. Actually they have been still using in mostly local publications, e.g. Pham (2000), Vo & Tran (2001), Vietnam Red Data Book (2007), and Vo (2011) presented a brief description and a line drawing of *A. indica* from Vietnam, but these did not resemble the diagnostic characters of *A. indica* (Lecomte, 1909). Therefore, this study aims to resolve those misidentifications. The present study not only shows the taxonomic issues of the genus *Aristolochia* but also implies that the taxonomic revision of other plant groups in Vietnam is needed, especially on the previous

publications are non-taxonomic treatments.

MATERIAL AND METHODS

Survey of Herbarium Specimens and Related Literature—Approximately 400 herbarium specimens from related herbaria: CPNP, HN, HNU, IBK, IBSC, K, KUN, L, MO, NIMM, NY, P, PE, U, and VNMN were examined as well as reviewed the literature regarding *Aristolochia* descriptions from Vietnam and adjacent areas such as the flora of China, the flora of Thailand, and the flora Malesianae.

Field Collections—Field works were conducted to observe and record the morphological characters of vegetative and productive organizations (e.g. the morphology and the coloration of leaves, perianth, utricle, tube, limb and capsule), which were probably not indicated in dried specimens.

RESULTS AND DISCUSSION

The specimens belonging to *A. longgangensis* C.F. Liang was misidentified under *A. heterophylla* Hemsley

Vo & Tran (2001) firstly reported *A. heterophylla* (now synonym of *A. kaempferi* Will.) for Vietnam based on the specimen *Nguyen Nghia Thin s.n.* (HNU!) collected from Luoi Hai Mountain, Phu Tho, Vietnam, with only two sheets. These specimens possess diagnostic characters of *Aristolochia* subgen. *Aristolochia* rather than that of *Aristolochia* subgen. *Siphisia* by having stems slender, leaf blade chartaceous and capsules dehiscent from the base upward. This problem was brought to my attention that the name *A. heterophylla* may be misapplied to that specimen and other name, therefore, needs to be correctly applied. Otherwise, that specimen is very



identical in morphological comparison with the protologue and type specimen of *A. longgangensis* (Type: Zhao Rui–Feng 201 (IBK!)). Furthermore, one additional specimen of *A. longgangensis* was also previously collected from the bordered locality, in Vinh Phuc province, (ZhongYuedui 2201 (IBK!, IBSC!)). The specimen Nguyen Nghia Thin s.n., therefore must be correctly determined as *A. longgangensis*, and *A. heterophylla* is here excluded from Vietnam.

The specimens belonging to *A. cambodiana* Pierrei ex Lecomte was misidentified under *A. indica* L.

Aristolochia indica L. is natively distributed in India, Sri Lanka, Myanmar and Australia (Samanta *et al.*, 1999). In first publication of *Aristolochia* for the flora of Vietnam, Lecomte (1909) listed *A. indica* in Vietnam based on two specimens, i.e. *L. Pierre 5681* (P 01964042!, P 01964066!) and *Ch.d' Alleizettes.n* (P 01738451!), collected from the cultivated plants at Sai Gon Botanic Garden, Vietnam. However the latter is a certain error by showing the label and specimen do not belong together.

Nearly one century later, *A. indica* has been widely accepted as an indigenous species of Vietnam by mostly local publications. Pham (2000) presented a brief description and a line drawing of *A. indica* from Vietnam that probably followed Lecomte's description (Lecomte, 1909). However, the line drawing (Fig. 1218) illustrated the strange plant with the lanceolate lamina, very few flower in axillary, no stipe between the utricle and the ovary which did not resemble the diagnostic characters of *A. indica* (eg. leaf lamina oblong to obovate, inflorescences panicle, a present stipe between utricle and ovary) (Lecomte, 1909). It is probable that the author did not consult the protologue as well as Pierre's previously *Aristolochia* collection. Recently, while compiling Vietnam Red Data Book (2007), the authors listed this species at the vulnerable category (VU A1c) along with a line drawing, a brief description, as well as distribution was provided. This line drawing, however, is completely different from Pham's line drawing (Pham 2000) and Pierre's collection (P) in the shape of leaves, inflorescences and bracteoles. Five years later, Vo (2011) reported *A. indica* as a medicinal plant in Vietnam, brief information about taxonomy along with the line drawing as Vietnam Red Data Book (2007) was also given. It is reasonable to think that *A. indica* not only introduced in Vietnam as Lecomte's previous report (Lecomte, 1909), but the name *A. indica* may also be misapplied to other morphologically related *Aristolochia* species.

Actually, the line drawing of *A. indica* was shown in the abovementioned publications drawn from the specimen Nguyen Tay Dinh 3157 (NIMM!), which showed the otherwise characters with *A. indica* from

India such as a triangular-ovate or delta leaf blade with cordate at base, the inflorescences fascicled-cymes in the leaf axils, the utricle sessile and the bracteoles lanceolate, conspicuous, but mostly resemble with the diagnostic characters of *A. cambodiana* (Do *et al.*, 2014). These evidences led to conclude that all specimens were previously erroneously determined as *A. indica* by Vietnam Red Data Book (2007) and Vo (2011), are here corrected to *A. cambodiana*. In addition, *A. indica* is a non-indigenous species of Vietnam.

The specimens belonging to *A. fangchi* Wu ex Chow & Hwang was misidentified under *A. westlandii* Hemsley

Vo (2011) mentioned *A. westlandii* Hemsley occurring in Vietnam along with brief description such as a cylindrical rootstock, an oblong to ovate-oblong lamina with rounded or truncated at leaf base, smaller perianth. However these characters do not match with the diagnostic characters of *A. westlandii* described from China (Type: *Westland s.n.* (K!)) such as a globose rootstock, an oblong-linear lamina with deeply cordate or auriculate at base, larger perianth. Otherwise, *A. westlandii* sensu Vo (2011) is completely associated with my recent field observation and data derived from *A. fangchi* Wu ex Chow & Hwang (Type: *K. L. Shi 2* (IBSC!)) that was newly recorded for Vietnam (Do *et al.*, 2015c). Additionally, no other sheet from visited herbaria confirmed the new occurrence of *A. westlandii* in Vietnam. Therefore, *A. westlandii* sensu Vo (2011) must here be corrected to *A. fangchi*, and the former has been still not yet recorded from Vietnam.

The specimens belonging to *A. acuminata* Lam. was misidentified under *A. zollingeriana* Miq.

Nguyen (2003) firstly recorded *A. zollingeriana* for Vietnam based on two specimens: *T. Nguyen et al. 49* (NIMM 4481!) and *T. Nguyen et al. 28* (NIMM 4508!) which is characterized by having an ovate-cordate or oblong-ovate leaf blade with both leaf surfaces glabrous, a brownish purple perianth and an obovoid-globose to ovoid-cylindric capsule. However these morphological characters differ from the type specimen of *A. zollingeriana* (Type: *Zollinger s.n.* (U 0112696!)) which has a triangular-ovate to rhombic-cordate leaf blade, abaxially densely puberulous, a pale yellowish or greenish perianth, and a cylindric capsule, but most identical to *A. acuminata* Lam. (Type: *Commerson s.n.* (P!)). Therefore, *A. zollingeriana* must be excluded from the country.

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