

## *Aristolochia cochinchinensis* (Aristolochiaceae), a new species from southern Vietnam

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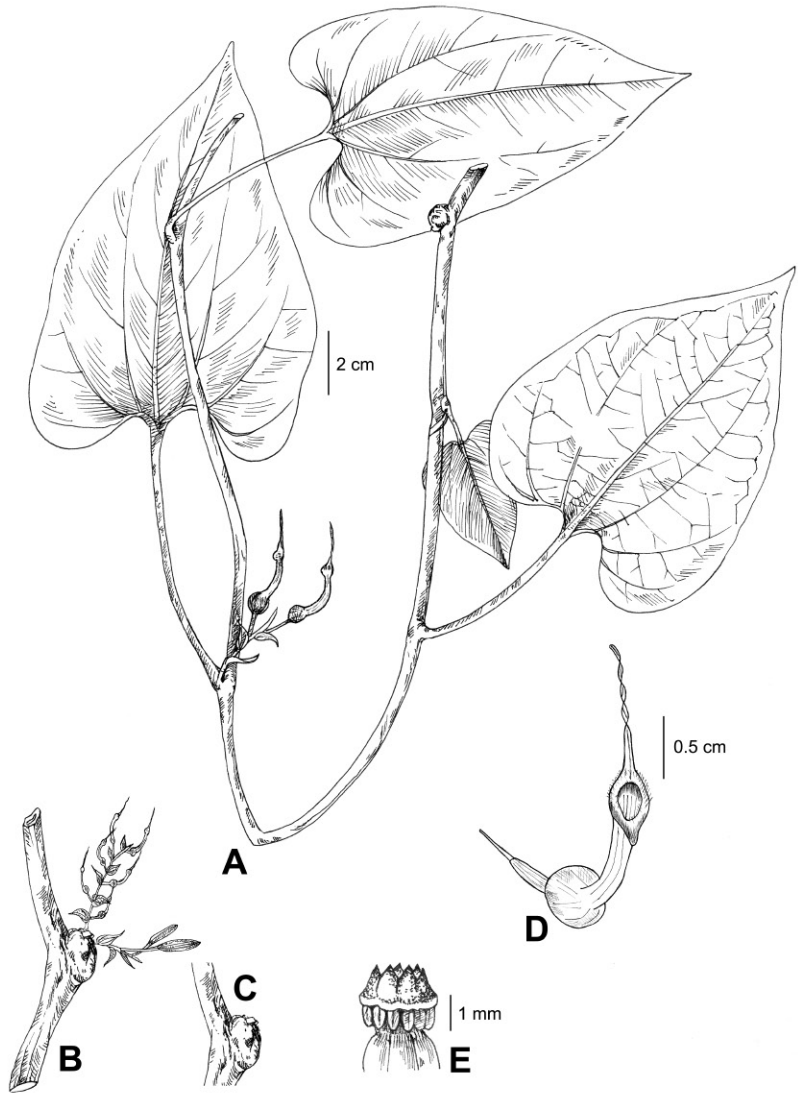
Do T.V., Nguyen D.Q., Nguyen T.Q.T., Wanke S. & Neinhuis C. 2015: *Aristolochia cochinchinensis* (Aristolochiaceae), a new species from southern Vietnam. — *Ann. Bot. Fennici* 52: 268–273.

*Aristolochia cochinchinensis* Do (Aristolochiaceae), a new species from southern Vietnam, is described and illustrated. It is characterized by a 6–8 cm long petiole with visible, cylindrical leaf scars, 5–9-flowered cymose inflorescences in clusters of two to four cymes, and a sessile utricle. Information about the distribution, habitat, and phenology as well as a comparison with four morphologically similar species (*A. longeracemosa*, *A. poomae*, *A. pothieri* and *A. yalaensis*) is provided. Synapomorphic characters such as an abaxially concave perianth and a completely monosymmetric floral limb with a complete fusion of the three sepals into one or two lobes places *A. cochinchinensis* in subgenus *Aristolochia*.

*Aristolochia* is the largest genus in Aristolochiaceae, comprising about 500 species. It is widely distributed throughout the tropics, subtropics and extending to temperate regions as well (González & Stevenson 2002, Hwang *et al.* 2003, Neinhuis *et al.* 2005, Wanke *et al.* 2006, Wagner *et al.* 2012). The genus is currently subdivided into three monophyletic subgenera: *Siphisia*, *Pararistolochia* and *Aristolochia*. The Old World species of *Aristolochia* subgenus *Aristolochia* have been shown to form a monophyletic section *Diplolobus* (González & Stevenson 2002, Neinhuis *et al.* 2005, Wanke *et al.* 2006, Ohi *et al.* 2006) and may be further subdivided in two subsections based on morphological characters.

While unilabiate flowers with a stipe between utricle and ovary characterize subsection *Podanthemum*, unilabiate or bilabiate flowers without a stipe between utricle and ovary are characteristic of subsection *Aristolochia* (González & Stevenson 2002).

Currently fourteen *Aristolochia* species, belonging to the subgenera *Siphisia* (eight spp.) and *Aristolochia* (six spp.) are known from Vietnam (Pham 2000, Nguyen 2003, Do *et al.* 2014). During recent field studies in southern Vietnam aiming at re-investigation of the *Aristolochia* diversity in connection with preparation of a taxonomic revision of Vietnamese taxa, we collected unusual specimens of *Aristolochia*, which when



**Fig. 1.** *Aristolochia cochinchinensis*. — **A:** Habit. — **B:** Inflorescence. — **C:** Leaf scar. — **D:** Front view of flower. — **E:** Detailed view of gynostemium. Drawings by Nguyen Huu Quyet from the holotype.

compared with species from SE Asia (Lecomte 1910, Hou 1984, Ma 1989, Hansen & Phuphathanaphong 1999, Pham 2000, Hwang *et al.* 2003, Phuphathanaphong 1987, 2006), did not match any known taxon. The species described here is placed in subgenus *Aristolochia* section *Diplolobus* subsection *Aristolochia*.

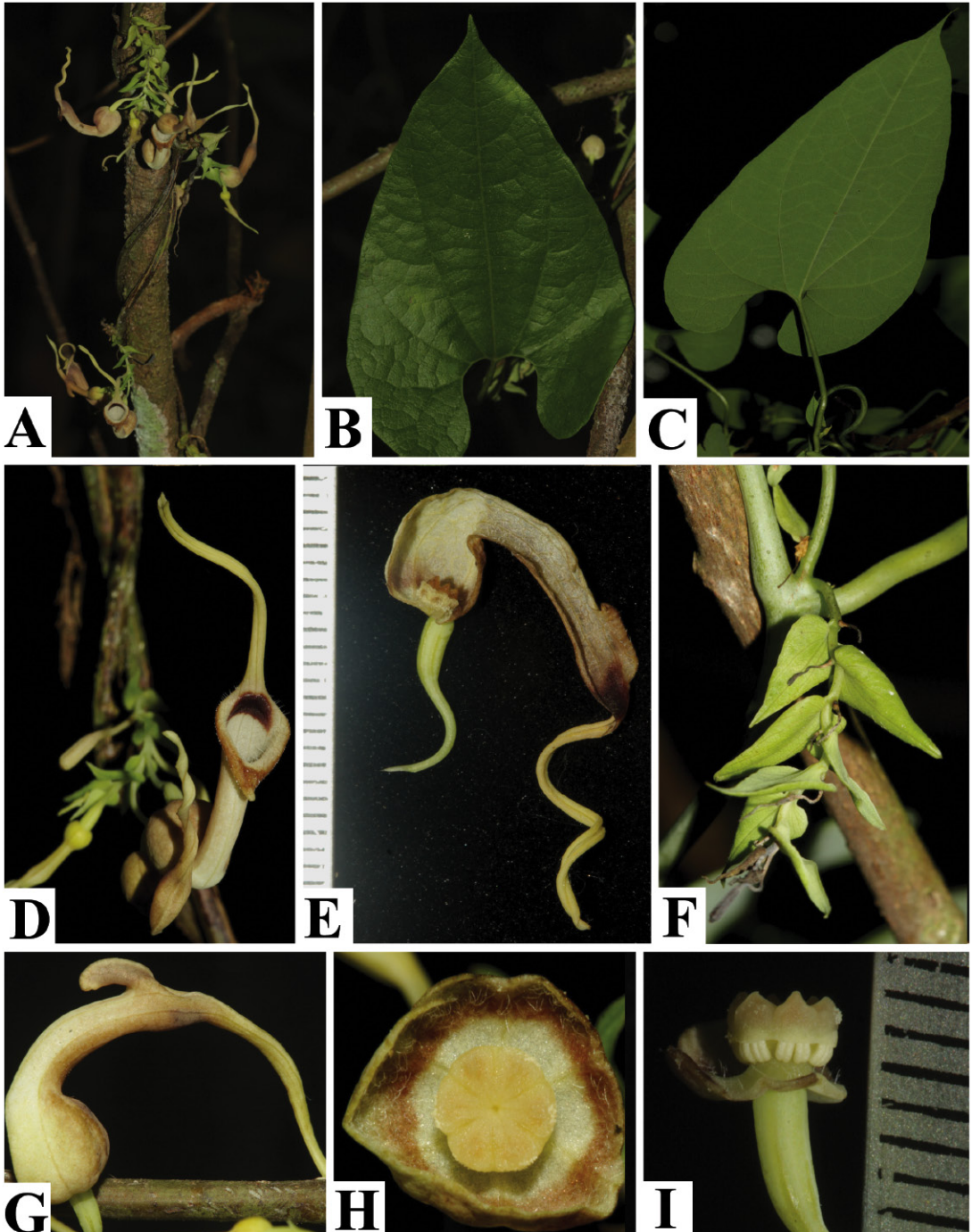
***Aristolochia cochinchinensis* Do, sp. nova**  
(Figs. 1 and 2)

TYPE: Vietnam. Binh Phuoc, Bu Gia Map National Park, 12°16'23.69"N, 107°11'18.78"E, 320 m a.s.l., 8 August

2011 *T.H. Luu 539* (holotype VNMN!; isotype SGN!). — Paratype: Vietnam. Dac Nong, Ta Dung Nature Reserve, on well drained basalt soils along trails in submontane evergreen tropical forest dominated by the Fagaceae, Lauraceae and Myrtaceae, 11°82'107"N, 108°05'449"E, 460 m a.s.l., 26 June 2010 *T.H. Luu 511* (SGN, VNMN).

ETYMOLOGY: The specific epithet refers to the former name of southern Vietnam where the species was discovered.

Slender climber with numerous fasciculate and cylindrical roots. Stems terete, twisted, slightly furrowed, glabrescent when young, becoming glabrous. Petioles 6–8 cm long, slender, straight, glabrous, leaf scar clearly visible, convex, cylindrical, 1.5–2 × 2–3 mm, remaining



**Fig. 2.** *Aristolochia cochinchinensis*. — **A:** Habit. — **B:** Adaxial leaf surface. — **C:** Abaxial leaf surface. — **D:** Front view of open flower. — **E:** Longitudinal section of open flower. — **F:** Inflorescence. — **G:** Lateral view of open flower. — **H:** Cross section of gynostemium and inner surface of utricle. — **I:** Detailed view of gynostemium. Photographs by Luu Hong Truong from the type material.

on twigs after leaf abscission, leaf blade triangular-ovate to broadly-ovate or ovate-cordate, 8–15

× 5–10 cm, papery, leaf base cordate to auriculate, sinus 1.5–2 × 1.2–1.5 cm, leaf apex acumi-

nate, mucronate, up to 1 cm long, adaxial surface glabrous, abaxial surface pubescent, basal veins palmate, three pairs, venation reticulate, prominent on abaxial surface, flattened and slightly sunken on adaxial surface, margin entire, glabrous. Inflorescences cymose, 5–9-flowered, in clusters of two to four cymes on young branches and older stems. Inflorescence axis 2–5 cm long, ascending, glabrous; bracteoles clasping around axis, conspicuous, triangular-ovate, longitudinally veined, 6–8 × 3–4 mm, cordate at base, acuminate at apex, sessile, both surfaces pubescent, persistent. Pedicels 4–5 mm long, slender, pendulous, glabrous. Ovary oblong, 2–3 × 1–1.2 mm, glabrous. Perianth 2.2–2.5 cm long, outside brownish or creamy-whitish, glabrescent to glabrous, with obscure striation, inside creamy-whitish; utricle conspicuous, distinctly delimited from the tube, spherical, 3–4 mm diam., without a stipe between ovary and utricle, inside densely glandular; tube slightly bent upwards at basal part, cylindrical, 0.6–0.7 × 0.2–0.3 cm, outside glabrescent, inside sparsely covered with glandular hairs; limb 1-lobed, laterally linear-lanceolate, tapering, 1.2–1.5 × ca. 0.2 cm, and apically slightly twisted, basal part rim-like surrounding mouth; mouth elliptic, 0.3–0.4 cm in diam., with a small purplish-brown patch on throat, inner surface of limb and mouth pubescent. Gynostemium 6-lobed, 1.5–2.0 × 2.2–2.5 mm, with conical apices, stamens six in one series of single anther, anthers oblong, 0.6–0.8 mm long, white. Young fruits ovate-oblong with 6 longitudinal lobes.

**DISTRIBUTION AND HABITAT:** *Aristolochia cochinchinensis* was found at semi-open trails on basalt soils in deciduous forest dominated by *Lagerstroemia calyculata* among the buffer zone of the Bu Gia Map National Park (Binh Phuoc province) and the Ta Dung Nature Reserve (Dac Nong province) in southern Vietnam. Very few saplings were recorded. Local farmers impose strong pressure on the remaining primary forest patches (buffer zone) converting them mostly into soybean, corn, pepper and coffee fields. As a consequence, the species may be harmed by human activities within a very short time. *Aristolochia cochinchinensis* flowers from the end of the local rainy season through July to September, while fruits are expected to ripen from October to December.

*Aristolochia cochinchinensis* can be distinguished from the two other species of subsection *Aristolochia* occurring in Vietnam (*A. contorta* and *A. dongnaiensis*) by the shape and size of leaves, petioles, inflorescences and limb. It is morphologically similar also to the Thai endemics (Phuphathanaphong 1987, 2006) *A. longercacemosa*, *A. pommae* and *A. yalaensis*, as well as to *A. pothieri*, which occurs in Thailand and Cambodia. There are however clear differences (see Appendix).

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Appendix. Morphological comparison *Aristolochia cochinchinensis* with *A. longeracemosa*, *A. poomae*, *A. pothieri* and *A. yalaensis*.

Characters	<i>A. cochinchinensis</i>	<i>A. longeracemosa</i> <sup>1</sup>	<i>A. poomae</i> <sup>2</sup>	<i>A. pothieri</i> <sup>3</sup>	<i>A. yalaensis</i> <sup>4</sup>
Petioles	6–8 cm long, with a visible leaf scar	6–11 cm long, without a leaf scar	2–3 cm long, without a leaf scar	3–5 cm long, without a leaf scar	4–6 cm long, without a leaf scar
Leaf blade	entire, triangular-ovate to broadly ovate, 8–15 × 5–10 cm	entire, ovate-cordate, 11–14 × 10.5–13 cm	entire, ovate to lanceolate-ovate, 5.5–9 × 2.5–3.8 cm	three-lobed or rarely entire, broadly ovate, 8–15 × 5–10 cm	entire, ovate-cordate, 7–12 × 5–8 cm
Leaf base	deeply cordate, sinus 1.5–2 × 1.2–1.5 cm	deeply cordate, sinus 1.5–2.5 × 1.5–3.0 cm	deeply cordate, sinus 0.8–1.5 × 0.5–0.7 cm	deeply cordate, sinus 2–3 × 2.2–2.8 cm	deeply cordate, sinus 1–2 × 1.3–3 cm
Veins	palmately 7-nerved	palmately 7–9-nerved	palmately 5–7-nerved	palmately 3-nerved	palmately 5–7-nerved
Inflorescences	5–9-flowered, in clusters of 2–4 cymes, on young branches and older stem	6–7-flowered, 1–2 cymes, on young branches	1–4-flowered solitary cyme, on young branches	densely-flowered panicle-cyme, on young branches	3–5-flowered, in clusters of 1–4 cymes, on young branches and older stem 2.5–3.5 cm long
Inflorescence axis	2–5 cm long	2.0–3.5 cm long	2.0–5.0 cm long	6 cm long	
Bracteoles	triangular-ovate, 6–8 × 3–4 mm, sessile, conspicuous	ovate, 6 × 4 mm, sessile, conspicuous	ovate-lanceolate, 5–8 × 2–3 mm, sessile, conspicuous	lanceolate, 1.0 × 0.5 mm, stipe, deciduous	lanceolate, 3.5–5 × 1.5–2 mm, sessile, conspicuous
Pedicels	ca. 0.4–0.5 cm long	ca. 0.3 cm long	ca. 0.5 cm long	0.6–0.7 cm long	ca. 0.5 cm long
Perianth	curved, creamy-whitish	slightly curved, dark purple	curved, creamy-purplish	straight, purplish-reddish	curved, pale green
Stipe	absent	absent	absent	present spherical or ovoid, 3.5–7.5 × 3.3–4 mm in diam.	absent
Utricle	spherical, 3 × 4 mm diam.	globose to ovoid, 6 × 6 mm in diam.	oblong-ovate, 5–6 × 3–4 mm in diam.	oblong-ovate, 5–6 × 3.3–4 mm in diam.	ovoid or globose, 3 × 3 mm in diam.
Tube	cylindrical, 0.6–0.7 × 0.2–0.3 cm	cylindrical, ca. 0.6 × ca. 0.15 cm	cylindrical, 0.4–0.8 × ca. 0.1 cm	cylindrical, 0.8–1.6 × 0.1–0.2 cm	cylindrical, ca. 0.4 × ca. 0.2 cm
Limb	linear-lanceolate, 1.2–1.5 × 0.2 cm, twisted at apex	scagittate, 1.0–1.2 × 0.4–1.2 cm, retuse at apex	linear-lanceolate, 1.2–1.6 × 0.2–0.3 cm, straight	spathulate, 1.3–1.8 × 0.5–0.7 cm, straight	oblong, ca. 1.0 × 0.3 cm, straight
Gynostemium	6-lobed, conical apices	6-lobed, obtuse apices	6-lobed, truncate apices	6-lobed, conical apices	6-lobed, triangular apices
Fruits	ovate-oblong in young state	oblong-ovate in young state	ovate-oblong in young state	ovoid with pedicel 6 cm	unknown

<sup>1)</sup> Based on the original species description, type specimen (*Bänziger 667, C*) and the line drawing in Hansen and Phuphatanaphong (1999). <sup>2)</sup> Based on the original species description, type specimen (*Pooma 268, BKF*), line drawing (fig. 4) and field photo (fig. 7C) in Phuphatanaphong (2006). <sup>3)</sup> Based on the original description (Lecomte 1910), type specimen (*Harmand 3166, P*) as well as the recent species description and line drawing (fig. 11) in Phuphatanaphong (1987). <sup>4)</sup> Based on the original species description, the type specimen (*Pooma et al. 4321, BKF, K, L*), line drawing (fig. 5) and field photo (fig. 7A and B) in Phuphatanaphong (2006).