

## NEW RECORDS OF THREE AROIDS FROM BANGLADESH

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### Abstract

Three species, namely *Colocasia lihengiae* C. L. Long *et* K. M. Liu, *Typhonium blumei* Nicolson and Sivadasan and *T. cochleare* A. Hay belonging to Araceae are recorded for the first time for Bangladesh. An updated nomenclature with important synonyms, illustrated descriptions, flowering and fruiting times, ecology, geographical distribution and occurrence within Bangladesh for each species are also provided.

### Introduction

About 110 genera and about 2500 species (Croat 1979) have, so far, been reported in the family Araceae. The tropics and the subtropics of both the hemispheres are the homes of Aroids

The first two authors collected specimens of the family Araceae from different parts of Bangladesh and found that three species, namely *Colocasia lihengiae* C. L. Long *et* K. M. Liu, *Typhonium blumei* Nicolson and Sivadasan and *T. cochleare* A. Hay among the collected specimens, are new records for Bangladesh. There is no previous report on the existence of these three taxa within the territory of Bangladesh.

The illustrated taxonomic descriptions of the three species, updated nomenclature, important synonyms, notes on ecology, geographical distribution on global context and within Bangladesh are presented. All the specimens examined including the types have been cited.

### Materials and Methods

Many plants, including Aroids, have been collected from different forest areas of Bandarban and Sherpur districts during 2004. The specimens, after study, have been preserved in the Bangladesh National Herbarium (DACB). The published articles of Nicolson and Sivadasan (1981), Hay (1993), Sriboonma *et al.* (1994) and Long and Liu (2001) on the family Araceae helped the authors to identify the three new recorded species.

#### 1. *Colocasia lihengiae* C. L. Long *et* K. M. Liu, 2001 Bot. Bull. Acad. Sin. 42: 313-317. (Fig. 1)

Type: **China**. Yunnan Prov.: Mengla, Mengxing. River watershed, in a valley with dense rainforest, 20.06.1998, Long Chun-lin & Li Meilan 9806 (holotype: KUN); Paratype: 18.07.1998, Long Chun-lin & Li Meilan 9824 (KUN), cultivated in Kunming Botanical Garden.

Terrestrial perennial herb with stolons and an erect rhizome. Rhizome 4 - 8 cm long, 2 - 3 cm in diam.; stolons 6 - 12, trailing horizontally, non-branching, thin, pale green or pale purple, 70 - 80 cm long, 0.5 cm in diam., with dark green cataphylls. Leaves 4 - 6; petiole cylindrical, light green, reddish-purple, 80 - 120 cm long; blade peltate, sagittate - cordate, membranous, 30 - 40 cm long, 18 - 25 cm wide, upper surface glossy green, lower surface pale green; primary lateral veins 6 pairs, pale green; marginal veins inconspicuous. Inflorescence 4 - 6; peduncle cylindrical, pale green, 40 - 50 cm long, much shorter than petiole. Spathe constricted in the middle, lower convolute part (tube) yellowish green, 4 - 5 cm long, 2 cm in diam., nearly cylindrical; lamina

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oblong-lanceolate, golden yellow, 11 - 13 cm long, 4 cm wide, reflexed. Spadix fragrant, female zone golden yellow, cylindrical, 2 - 2.5 cm long, 0.7 cm in diam.; male zone cylindrical yellow, 3.5 cm long, 0.6 - 0.8 cm in diam.; neutral flower zone between female and male zones, cylindrical, 1 cm long, 0.4 - 0.5 cm in diam.; appendix absent; female flowers obovoid; carpels 3 or 4, ovary unilocular, placentae 2, parietal, ovules spindle shaped, nearly erect, numerous, stigma sessile, discoid; synandria 8 - 10 androus, ca. 0.1 cm long, yellow. Flowering and fruiting time: May-July.

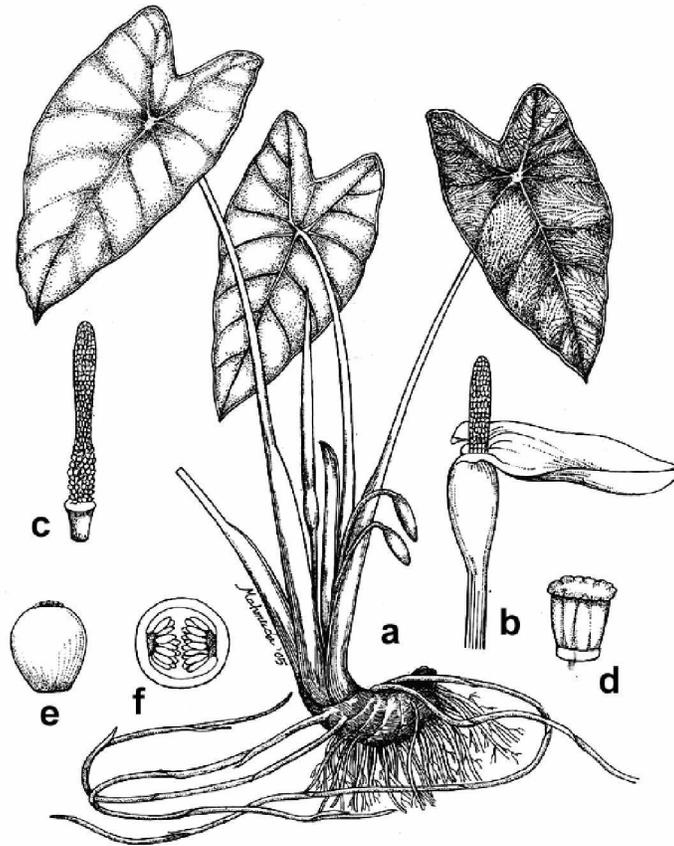


Fig.1. *Colocasia lihengiae* C. L. Long *et* K. M. Liu. (a) habit sketch of a flowering plant ( $\times 0.07$ ); (b) inflorescence ( $\times 0.27$ ); (c) spadix ( $\times 0.33$ ); (d) synandrium ( $\times 8$ ); (e) pistil ( $\times 11.33$ ); (f) transverse section of ovary ( $\times 12$ ).

*Specimens examined:* **Bandarban** District: Thunchi forest area, 24.09.2004, Hosne Ara HA 1357 (DACB); Pavel Partha 748 (JUH); Bangladesh National Herbarium (Cultivated), 05.05.2005, Hosne Ara HA 1465 (DACB).

*Ecology:* Grows in deep rain forest in lime stone areas, shady places of hill slope and at the foot hill.

*Geographical distribution* : China, Yunnan Province, Bangladesh.

**Note:** So far, five species of *Colocasia*, namely *C. affinis*, *C. esculenta*, *C. fallax*, *C. heterochroma* and *C. oresbia* have been reported within the Bangladesh territory by Ara 2000, 2001 and Ara *et al.* 2003, 2005. *C. lihengiae* is the newly reported one within the country and differs from the above mentioned five species because of its attractive evergreen perennial habit, stolons non-branching, 70 - 80 cm long, leaf blade sagittate - cordate, upper surface glossy green and absence of an appendix in spadix.

2. *Typhonium blumei* Nicolson and Sivadasan, *Blumea* **27**: 494 (1981), f. 4. A. Hay, *Blumea* **37**: 373-375 (1993); Sriboonma *et al.*, *J. Fac. Sci. Univ. Tokyo* **3** (15): 305 (1994); *Arum divaricatum* auct. non L.: Roxb., *Hort. Bengal.* 65 (1814), *Fl. Ind.* **3**: 503 (1832); Wight, *Icon.* **3**: 6 (1844), t. 790; *Typhonium divaricatum* auct. non Bl., nom. illegit.: Bl., *Rumphia* **1** (1837) t. 36A Schott, *Aroid.* **12** (1855), t. 18; Hook. f., *Fl. Brit. Ind.* **6**: 510 (1893); Engler, *Pflanzenr.* **73** (IV. 23F): 115 (1920); Rao and Verma, *Bull. Bot. Surv. Ind.* **18**(1-4): 19-20 (1976); Liu, *Fl. Taiwan* **5**: 815 (1978), t. 1530; Li in Wu & Li, *Fl. Reipubl. Pop. Sinic.* **13**(2): III (1979). (Fig. 2)

Type : Probably (vide Nicolson and Sivadasan, l. c.) Japan, Kyushu, Nagasaki, c. 1826, Burger and von Siebold s.n. (L, holo & iso, n.v.).

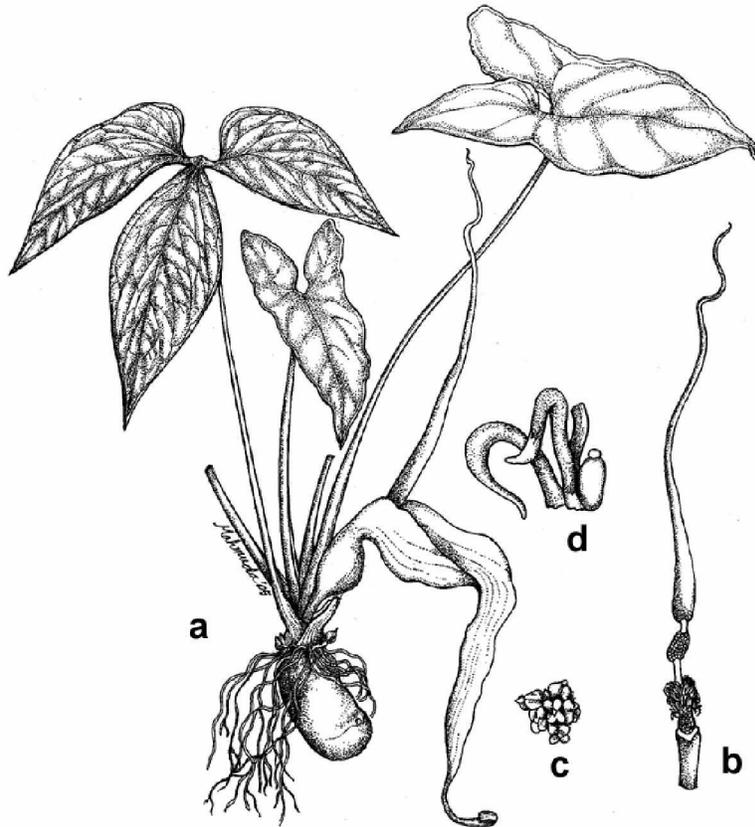


Fig. 2. *Typhonium blumei* Nicolson and Sivadasan. (a) habit sketch of a flowering plant ( $\times 0.21$ ); (b) spadix ( $\times 0.17$ ); (c) male flowers ( $\times 2.67$ ); (d) pistil and sterile flowers ( $\times 2.67$ ).

Tuber subcylindrical, up to 3 cm long, 2 cm wide. Leaves 2 - 8; petiole green, 20 - 35 cm long, 0.4 - 0.5 cm diam., basal 4 cm sheathing; leaf blade membranous, green above, pale green below, usually ovate-sagittate, occasionally hastate to trilobed, 5 - 15 cm long, 3.5 - 10 cm wide, the posterior lobes abruptly narrowing on the inside toward the sinus. Peduncle short, 3-5 cm long, 0.3 - 0.4 cm wide, pale green. Spathe 15 - 38 cm long, lower portion convolute, ellipsoid ovoid, greenish outside and purplish inside, 1.5 - 3.5 cm long; blade 13 - 35 cm long, 4.5 cm broad at base, spreading and withering, dark purple, abruptly tapering from below the middle, apex usually twisted. Spadix subequaling spathe; female zone conic, 0.5 - 0.8 cm long, 0.8 cm broad at base, sterile portion 1 cm long and covered with densely congested, orange, filiform, erect and slightly curved, finely papillose; naked interstice to 1.5 - 3 cm long; male zone to 1 - 2.8 cm long, 0.4 - 0.6 cm in diam., orange; appendix to 9.5 - 29 cm long, dark purple, subsessile but often unequally somewhat swollen at base. Infructescence surrounded by persistent spatheaceous tube: berry pale green, with several seeds. Flowering and fruiting time: May-July.

*Specimens examined* : **Sherpur** District: Zhinaigati Thana, Rangtia forest, 22.06.2004, Hosne Ara HA 1026 (DACB); Pavel Partha 718 (JUH); Bangladesh National Herbarium (Cultivated), 01.05.2005, Hosne Ara HA 1463 (DACB).

*Ecology* : Grows on shady hill slope beside *chhara* in deep rain forest.

*Geographical distribution*: East and S. E. Asia.

**Note** : Five species of *Typhonium*, previously reported from Bangladesh (Ara 2001), are *T. flagelliforme*, *T. gracile*, *T. listeri*, *T. roxburghii* and *T. trilobatum*. *T. blumei* is different from the above mentioned five species and it can easily be identified by its subcylindrical tuber, spadix about equalling the spathe and sterile flowers distinctly papillose, curved upward.

**3. *Typhonium cochleare*** A. Hay, *Blumea* **37**: 365-366 (1993). Sriboonma *et al.*, *J. Fac. Sci. Univ. Tokyo* **3** (15): 310 (1994). **(Fig. 3)**

Type : Australia, Northern territory, Kapalga, 12.12.1984, D. L. Jones 1732 (DNA holotype).

Cormous herb; corm subglobose, up to 2 cm wide. Leaves 5 - 8 together; petiole 18 - 30 cm long, 0.3 - 0.5 cm wide at base, elliptic with an obtuse base (c.  $7 \times 5$  cm) to hastate to very deeply and narrowly trilobed with the anterior lobe c.  $10 - 16 \times 5 - 7$  cm and the posterior lobes c.  $9.5 - 14 \times 3.5 - 5.5$  cm, 5 primary lateral veins. Peduncle 3 - 7 cm long, 0.5 cm in diam.. Spathe 15 - 28.5 cm long, lower portion ovoid, rather thick-walled, 2 - 2.5 cm long, blade long-acuminate, spreading below, twisted above, 13 - 26 cm long, 2 - 3 cm wide at base, brownish purple outside and dark purple inside. Spadix exceeding the spathe, 7 - 30.5 cm long; basal female zone conic, 0.5 cm long, 0.6 cm in diam. at base, then a 0.5 cm long, 1 cm diam zone of very fine and crowded filiform yellow sterile organs, then a 1.7 cm long and 0.2 cm in diam longitudinally ridged, naked interstice; male zone 0.8 - 1 cm long, 0.4 cm in diam., coral pink; appendix very slender and attenuate, short stipe, 26 cm long, dark purple; spathe base persistent in fruit. Flowering and fruiting time: May - July.

*Specimens examined*: **Sherpur** District: Zhinaigati Thana, Rangtia forest, 22.06.2004, Hosne Ara HA 1030 (DACB); Pavel Partha 719 (JUH); Bangladesh National Herbarium (Cultivated), 05.05.2005, Hosne Ara HA 1464 (DACB).

*Ecology* : Grows on shady and stony hill slope, adjacent to *chhara* in deep rain forest.

*Geographical distribution* : Australia (Northern territory).

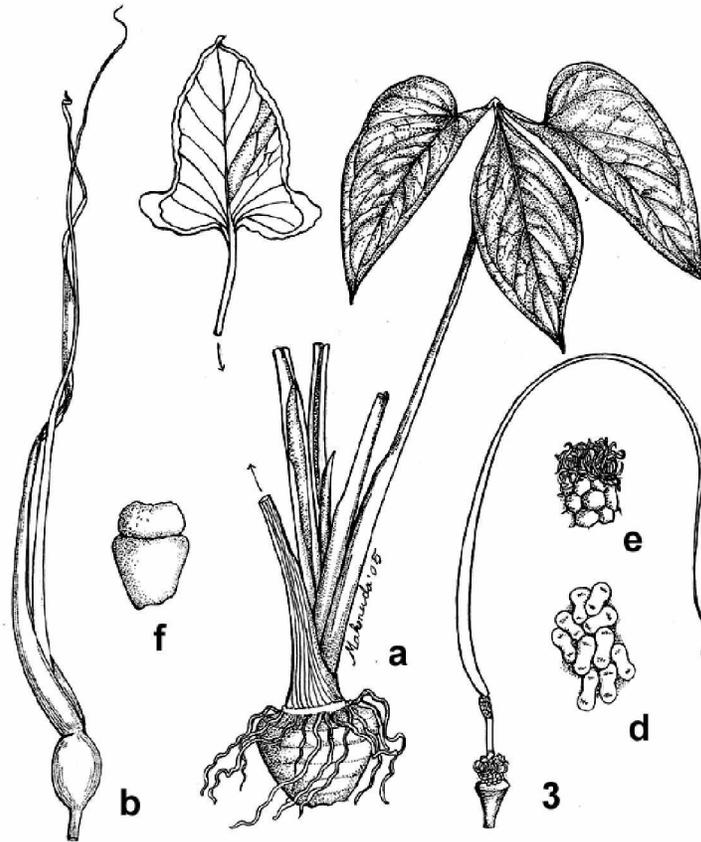


Fig. 3. *Typhonium cochleare* A. Hay. (a) tuber, plant and leaves ( $\times 0.28$ ); (b) inflorescence ( $\times 0.34$ ); (c) spadix ( $\times 0.36$ ); (d) male flowers ( $\times 5.6$ ); (e) part of female zone and sterile flowers ( $\times 2.4$ ); (f) pistil ( $\times 8$ ).

**Note:** *T. cochleare* can easily be separated from all other *Typhonium* species so far reported in Bangladesh because of its (*T. cochleare*) characteristic sub-globose tuber, spadix somewhat exceeding the spathe and more than 7 mm, curled sterile flowers.

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