***Aglaonema tassai* (Araceae; Tribe: Areae) – *sp. nov.* from Arunachal Pradesh, Northeast India**

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Abstract

Aglaonema tassai H.Tag & A.Nangkar, a new species of *Aglaonema* Schott (Araceae) recognized from Rottung, East Siang District of Arunachal Pradesh in Northeast India, has been described and illustrated with labelled diagram and color photographs including that of Holotype. This new species resembles *Aglaonema hookerianum* Schott, *A. modestum* Schott ex Engl. and *A. simplex* (Blume) Blume but significantly differ in stem, leaves, inflorescence, cataphylls, spathe, spadix and fruit characters. Main distinguishing morphological characters and key to the locally available species are provided for its easy identification.

Key words: *Aglaonema tassai*, New species, Endemic, Arunachal Pradesh, India

INTRODUCTION

The genus *Aglaonema* (Araceae; Tribe: Areae) was established by Schott in 1829 and has 32 accepted species with 99 synonyms as recorded in version 1.3 of www.theplantlist.org. This genus inhabits humid and heavily shaded forests of southeastern Asia, northeastern India, southern China, Indonesia, Malaysia and New Guinea (Li & Boyce 2010; Hay 1998). Nicolson (1969) from Smithsonian Institute was the first to revise the genus *Aglaonema* Schott of Southeast Asia, and has reported the existence of 76 binomials of which 21 are accepted. These plants are primarily native to Southeast Asian countries. Karthikeyan *et al.* (1989) have mentioned five species of *Aglaonema* from India whereas J.D. Hooker (1893) reported the existence of *Aglaonema hookerianum* Schott (from Khasia Hills, Cachar and Chittagong) and *Aglaonema clarkei* Hook.f. (from Chittagong). However, *A. clarkei* is now treated as a synonym of *A. hookerianum*.

The Indian state of Arunachal Pradesh is situated on a part of the Eastern Himalayan chain of mountains endowed with rich tropical to temperate broadleaved and moist forest types those favoured the luxuriant growth of several *Aglaonema* species. However, majority of Arunachal Himalayan regions are still remains unexplored due to remoteness and inaccessible mountain terrains. While exploring the aroid flora of the state, the authors collected one species of *Aglaonema* Schott from Rottung (altitude 400 – 700 m) in East Siang District of Arunachal Pradesh in the year 2014. During further intensive botanical field survey such a plant was not observed outside of the East Siang range. The perusal of literature and critical study of the specimen revealed that it is a new species of the genus *Aglaonema* that is closely related to *A. hookerianum* Schott, *A. modestum* Schott ex Engl. and *A. simplex* (Blume) Blume. This population is now named as *Aglaonema tassai*, *sp. nov.*, and is presented here along with suitable description, illustrations and coloured photographs.

Taxonomic treatment:***Aglaonema tassai* H.Tag & A.Nangkar, sp. nov. [PLATE - I]**

Perennial herbs, evergreen with dark green stem; basal stem, terete, decumbent; branches sub-erect, terete, 21 – 40 cm high, 1.5 – 2.6 cm in diameter; internodes 1 – 2 cm long, rooting from places just below the nodes. **Cataphylls** 3 – 5, early caducous, slightly yellow, white to green, oblong to lanceolate, obtuse to $\pm$ acute, 3 – 4 cm long, 1 – 1.5 cm wide. **Leaves** 1 – 4 (usually 2), not crowded at stem apex; **petioles** 13 – 18 cm long, 1 – 2 cm wide, dark green, base sheathing. **Lamina** elliptic to ovate-oblong, 22 – 31 cm x 13 – 15 cm, entire, caudate-acuminate, base tunicate-rounded, green, non-variegated, lateral veins 7 – 20, running parallel to each other. **Inflorescence** generally 1, rarely 2 at the same time from leaf axils. **Peduncle** short, major part (80 – 90%) remain covered with cataphylls (sometime almost up to spathe base), 5 cm long, 0.5 cm wide, green, erect, much shorter than petiole. **Spathe** canoe-shaped, light yellow or white to green, 4 – 5 cm long, 2.5 cm wide, obovate, entire, acute – acuminate and curved to 80 – 90, 1 – 2 cm part of spathe in lower and upper extremes never open. **Spadix** sessile, 3.1 cm long, shorter than spathe, about 1.2 cm short of spathe apex; **Female** part free, not adnate to spathe, 1 cm long, 0.8 cm wide; ovary green, slightly globose - oval, 1-loculed, 1-ovuled; stigma sessile, white, circular, concave; **Male** part 2.1 cm long, 0.6 cm wide, whitish, terete tip rounded, deciduous; stamens 2, united; anthers with porous dehiscence. **Berries** not much crowded, ovoid, 0.4 – 0.6 cm long and 0.3 cm thick, green, red when ripe, 1-seeded.

The basic taxonomic characters of new species *Aglaonema tassai* closely resembles with *A. hookerianum* Schott, *A. modestum* Schott ex Engl. and *A. simplex* (Blume) Blume in having terete stem, visible nodes and internode, terete spadix, and absence of staminodes and sterile zone, but significantly differ from them by having only 1 – 4 leaves which are not crowded at the tip, and absence of a stipe. *Aglaonema tassai* differ with *Aglaonema simplex* by having erect but much shorter and decumbent stem, leaves 2 – 4, not crowded at stem apex, lateral veins 6 – 20 each side, spathe canoe-shaped, short peduncle, male zone, terete with rounded apex, ovary oval, seed oval; and differ with *Aglaonema modestum* by having less or none crowded leaf at stem apex, more lateral veins per side in leaf, shape of spathe canoe, sessile spadix, and cathaphylls 3 – 5.

The new species is also very closely related to *Aglaonema hookerianum* by having spadix sessile, terete and shorter than spathe, non-variegated ovate to elliptic lamina. But, differs by having erect but much shorter decumbent stem, 1 – 2 inflorescences (usually single) at a time, curved spathe apex, female part not adnate to spathe, less leaf number (1 – 4 max.), not crowded at stem apex, and shorter peduncle (max. 5 cm long), thick terete spadix, ovate ovary. The major differences between these four species are provided in Table 1.

Table 1. Comparison of diagnostic morphological characters of *Aglaonema tassai* sp. nov. with its three related species

Characters	<i>A. hookerianum</i> Schott	<i>A. simplex</i> (Blume) Blume	<i>A. modestum</i> Schott. ex Engl.	<i>A. tassai</i> sp. nov.
Stem	Erect, 40 – 50 cm tall, 1.5 – 2.0 cm diameter; internodes 1.5 – 3 cm long; rooting at nodes	Erect, cylindric, 40 – 80 cm tall, 1 – 2 cm diameter; rooting at nodes; internodes 2 – 3 cm long	Erect, stem green, 40 – 70 cm tall, 1.5–2 cm in diameter; internodes 0.4 – 3 cm long; rooting at nodes	Erect but lower part decumbent, 21 – 40 cm tall, 1.5 – 2.6 cm diameter, terete, internodes 1 – 2.0 cm long, rooting from upper part of internodes and at nodes

Characters	<i>A. hookerianum</i> Schott	<i>A. simplex</i> (Blume)	<i>A. modestum</i> Schott. ex Engl.	<i>A. tassai</i> sp. nov.
Lamina	Leaves 2, ovate to elliptic or lanceolate to narrowly elliptic, apiculate - acuminate to long acuminate, 7 – 13 primary lateral veins; petiole 14 – 24 cm long, 0.7 – 0.9 cm in diameter, sheathing at base	Leaves 5 or 6, densely crowded at stem apex, ovate-oblong, caudate-acuminate or long acuminate, primary lateral veins 6 – 8 per side; petioles green, 6 – 15 cm, proximally sheathing	Leaves 6, mostly crowded at stem apex, ovate to ovate-lanceolate, long acuminate, primary lateral veins 4 or 5 per side; petioles green, 5 – 20 cm, sheathing for more than ½ of length	Leaves 2 – 4, not crowded at stem-apex, elliptic to ovate-oblong, caudate-acuminate, primary lateral veins 6 – 20 each side; petioles 13 – 18 cm long, 1.0 – 2.0 cm in diameter, sheathing at base
Peduncle	1 – 3 together, 10 – 21 cm long. 0.4 cm in diameter	2 – 4, 2 – 6 cm long	3 together, 10 – 12.5 cm long	1 – 2 together, 5 – 5.8 cm long, 0.5 cm in diameter
Cataphyll	Absent	Early caducous, broadly linear, 4 – 7 cm, abruptly acute	Absent	Oblong, lanceolate, 3 – 4 cm long, covering over half the length of peduncle, obtuse to acute
Spathe	3.7 – 6 cm long, decurrent for (0.6) 1 – 1.5 (2) cm, stipe none; whitish green	Cymbiform, ovoid, 3 – 4.5 cm long, 1.3 cm in diameter; light green	Green, oblong-lanceolate, 5.5 – 7 cm long, 1.5 – 2 cm in diameter, long acuminate	Spathe light green both side, narrowly canoe-shaped, 4.5 cm long, 2.5 cm in diameter, shortly acuminate, curved, middle part open, semi-persistent, macrescent, till fruits ripe
Spadix	Sessile, thin, cylindric, 2.5 – 4 cm long, 0.8 cm short of spathe apex	2.5 – 4.5 cm long, slightly longer than or equal to spathe, stipitate	Thin cylindric, 2.8 cm long, stipitate, shorter than spathe apex	3.1 cm long, sessile, terete, somewhat conic, shorter than spathe, 1.2 cm short of spathe apex
Pistillate zone	0.3 – 0.6 cm long, major part of pistillate portion adnate to spathe; ovary ovoid	0.5 cm long, ovary globose	0.5 – 0.8 cm long, ovary subglobose, adnate to spathe	Green, narrowly cylindric, 0.7 cm – 1 cm long, 0.8 cm in diam., ovary ovate, pistillate part free, not adnate to spathe
Staminate zone	2 – 3.7 cm long, 0.3 – 0.6 cm thick, terrete, slightly conic	2 – 3 cm long, 0.5 cm thick, conic	2 – 3 cm long, elongate, 0.3 – 0.4 cm in diameter	2.1 cm long, 0.6 cm in diameter, terete, tip rounded
Fruits and Seeds	Ripe berry red, 2 – 3 cm long, 0.9 – 1.4 cm in diameter; seed size not known	Ripe berry oblong, red, 1.2 – 1.8 cm long, 0.7 – 1.0 cm in diameter; ovary globose; seeds oblong, 1.1–1.5 cm	Ripe berry oblong, orange, 2 – 3 cm long, 1.0 – 1.3 cm in diameter; ovary subglobose; seeds oblong	Ripe berry ovoid, red, 0.4 – 0.6 cm long and 0.3 cm in diameter; ovary unilocular; seed 1, subglobose

Phenology: *Flowering:* April to June; *Fruit ripening:* November – December. *Time of appearance:* Seed germination observed during 1st week of April to 3rd week of May in tropical region.

Key to species:

- 1a. Stipe in spathe present 2
- 1b. Stipe in spathe absent 3
- 2a. 2.5cm long spadix, slightly longer than or equal to spathe *A. simplex*
- 2b. 2.8cm long spadix, shorter than spathe apex *A. modestum*
- 3a. Cylindric, 2.5 – 4 cm long spadix, 0.8 cm short of spathe apex..... *A. hookerianum*
- 3b. Terete, 3.1 cm long, 1.2 cm short of spathe apex *A. tassai*

TYPES: India: Arunachal Pradesh, East Siang District, Rottung Forest, latitude: 28° 08' 51.7" N; longitude: 95° 14' 32.9"E; altitude: 656 m AMSL; *Hui Tag & Atek Nangkar 99*,

Figure 1. Labelled diagram of *Aglaonema tassai* Hui Tag & Atek Nangkar: **A.** Whole plant; **B.** Spadix showing male and female zones; **C.** Female flowers; **D.** Cluster of fruits; **E.** Fruits

dated 26.04.2014 (HOLOTYPUS: ASSAM)]; Hui Tag & Atek Nangkar 100; dated 26.04.2014 (PARATYPUS: HAU)].

Habitat: Grows in dense moist evergreen forest floor, on shaded hills slope with altitudes of 400 – 700 m AMSL.

Conservation status: Known only from East Siang district of Arunachal Pradesh. Following IUCN (2001), criteria this taxon should therefore be treated as Data Deficient. The recorded natural habitat is not part of any type of Protected Area for biodiversity.

Etymology: The specific epithet '*tassai*' is established in memory of the father of the first author (HT), Late Hui Tassa, from the domicile village New Gaa in the Kamle district of Arunachal Pradesh, India.

Distribution: So far, known only from one locality in the East Siang District of Arunachal Pradesh and is treated here as an endemic species.

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