

# TWO OF HOTTA'S BORNEAN *SCHISMATOGLOTTIS* (ARACEAE: SCHISMATOGLOTTIDEAE) RECOLLECTED

by  
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## Abstract

Fieldwork in Sarawak and Brunei during 1963-64 by Mitsuru Hotta, as part of the Kyoto University Borneo Expedition, was the first Araceae-specific fieldwork for over 60 years and resulted in significant collections, including numerous novel taxa known from one or two collections. Until the turn of the millennium many of Hotta's taxa had not been recollected, and some remained incompletely known. Fieldwork since 2003 has resulted in the recollection of many of his species, including two of the most interesting *Schismatoglottis*, *S. erecta* and *S. gamoandra*. These are here presented with amended descriptions, and are illustrated.

Key words: Araceae, *Schismatoglottis*, Mitsuru Hotta

## INTRODUCTION

During the six-month of the 1963-1964 Kyoto University Borneo Expedition (Hotta, 1965a), Mitsuru Hotta took a special interest in the Araceae, and in so doing became the first person to renew study of the Araceae of Borneo for over 40 years, and the first to undertake specific aroid-related fieldwork since the early 1900's. The outcome of his field studies was a series of papers, published mainly in English, dealing principally with describing new and circumscribing existing genera, and publishing many novel species (Hotta, 1965a, d, 1966a, b, 1967, 1976, 1982). Hotta's work laid the foundations for the aroid research now active in the region, notably for the large and speciose genus *Schismatoglottis* Zoll. & Moritzzi, and its satellite genera (Bogner & Boyce, 2009; Boyce & Wong, 2006, 2007, 2008a, 2008b; Wong & Boyce, 2007a, 2007b, 2008), and for the diverse and megaspeciose genus *Homalomena* (Boyce & Wong, 2008a).

Despite the lasting impact of Hotta's collections and subsequent publications on the taxonomy of Bornean Araceae, many of his new species were long known from only the type collection. The dearth of additional collections was in part a result of the woody *foci* of fieldwork in Borneo over the past 40 years, and also in no small measure a reflection of the often restricted distribution of many of the mesophytic herbaceous plants in Borneo.

Since 2003 the author has been focussing fieldwork on the Araceae and as a result has located new populations of most of Hotta's aroid species. Two of the most interesting *Schismatoglottis* described by Hotta, *S. erecta* and *S. gamoandra*, are detailed here. Both were included in the most recent taxonomic revision of *Schismatoglottis* (Hay & Yuzammi, 2000), but at that time were known only from the type collections.

*Schismatoglottis erecta* M. Hotta, Mem. Coll. Sci. Univ. Kyoto, Ser. B, 32 (1966) 233, fig. 5, A–F; Hay & Yuzammi, *Telopea* 9(1): 87 – 88 (2000). Type: Malaysia, Bintulu ('4<sup>th</sup>') Division, Bintulu, Tatau, valley of Sungai Keyan, Ulu Sungai Kakus, 9 Nov 1963, M. Hirano & M. Hotta 479 (KYO, holo). Plate VII.

Erect to climbing herb to *ca.* 30 cm tall. *Stem* erect to decumbent, *ca.* 5 mm diam., often rooting at the nodes, with internodes to 1.5 cm long, epigeal, pleioanthic, glossy reddish brown, less often glossy medium green. *Leaves* many together, each module with *ca.* 6 leaves; *petiole* to 10–14 cm long, slender, sub-terete and very shallowly canaliculate, green to reddish-brown, sheathing only at the extreme base, the wings of the sheath extended into a persistent, linear-lanceolate ligular portion to 4 cm long; *lamina* erect, oblong-lanceolate to narrowly elliptic, margins somewhat crispulate, 10–15 cm long × 2–3.5 cm wide, rather thinly leathery, adaxially glossy bright medium green, abaxially paler green with mid-rib and all veins darker green, the base acute and somewhat decurrent, the apex acute and rather abruptly acuminate for *ca.* 2 cm; midrib abaxially prominent, adaxially grooved, with *ca.* 8 primary lateral veins on each side, alternating with lesser interprimaries and diverging at *ca.* 60°; secondary venation abaxially rather inconspicuous, adaxially more or less obscure, arising from the mid-rib; tertiary venation obscure. *Inflorescence* solitary; *peduncle* *ca.* 6 cm long, slender, glossy reddish brown, apically curved bringing the inflorescence subhorizontal to nodding. *Spathe* *ca.* 5 cm long; *lower spathe* subcylindric, *ca.* 2 cm long, glossy medium green to reddish brown, with conspicuous

dark green longitudinal veins, differentiated from the limb by the abrupt inflation of the latter during female anthesis; *limb* ca. 3 cm long, ellipsoid in the lower 2/5 (corresponding to male zone of spadix), then abruptly and narrowly acuminate in the remainder, rather fleshy, caducous at onset of male anthesis, externally glossy pale olive-green with darker longitudinal venation, internally pale green to dirty cream, somewhat 'greasy' in appearance. *Spadix* much shorter than spathe, ca. 3 cm long, more or less hourglass-shaped; *female flower zone* conoid, adnate to the spathe in the lower half, 1.5 cm long; *pistils* crowded, obovoid, ca. 1 mm diam. (fresh), 0.5 mm diam. Dry, bright green; *stigma* button-like, sessile, about 1/2 the diameter of the fresh ovary; interstillar staminodes confined to a row along the spathe/spadix adnation, about the height of the pistils, stipitate, flat-topped, ca. 1 mm diam., dark cream; *sterile interstice* obconoid, ca. 5 mm long, composed of crowded, columnar staminodes ca. 0.6 mm diam., dull cream aging to dark brown; *male flower zone* obovoid, ca. 1.7 cm long, distally 1 cm diam., apically rounded; *stamens* crowded, truncate with the connective thick and slightly raised above the thecae and deeply channelled across the top between the pores, ca. 0.75 mm across, very bluntly rhomboid, dull cream; *pores* paired at each end of the anther, bordered by raised rims; *pollen* released in strings; *appendix* absent. *Infructescence* urceolate, dark reddish green, ca. 2.5 cm long, declinate.

**Distribution:** Endemic to Sarawak, distributed from the Ai watershed through the Kanowit and Song valleys into the Rejang basin, thence to Belaga.

**Habitat:** Terrestrial or lithophytic, sometimes on steep river banks, always in perhumid dense forest, 50-250 m alt.

**Notes:** The erect and ultimately climbing stems *Schismatoglottis erecta* are immediately distinctive. By its ligular sheath, in lacking an appendix, and by having paired pores on each end of the anther, it might appear most closely allied to *S. schottii* Bogner & Nicolson (Kalimantan Tengah), sharing the somewhat elongate stem, inflated and abruptly acuminate spathe and clavate male zone. *Schismatoglottis schottii* differs from *S. erecta* in the smaller inflorescence, rather larger pistils, less conspicuous sterile interstice, the connective not raised and conspicuously grooved from theca to theca, and in lacking raised rims around the pores.

Other specimens seen: Sarawak, Sri Aman Division: Lubok Antu, Batang Ai, Nanga Sumpa, 01° 12' 07.6"; 112° 02' 51.2", 27 July 2004, *P.C. Boyce, Jeland ak Kisai & N. Lembang AR-551* (SAR+spirit); Lubok Antu, Batang Ai, Nanga Sumpa, Wong Enseluai, 01° 11' 00.9"; 112° 04' 20.8", 6 April 2005, *P.C. Boyce et al. AR-1143* (SAR+spirit); Lubok Antu, Batang Ai, Nanga Sumpa, Sungai Pedali, 01° 11' 58.9"; 112° 03' 27.0", 25 May 2008, *P.C. Boyce, Wong Sin Yeng & Jipom ak Tisai AR-2396* (SAR+spirit); Sarikei Division: Meradong, Sungai Matob, 01° 52' 06.1"; 111° 55' 30.7", 8 Dec. 2005, *P.C. Boyce et al. AR-1610* (SAR+spirit) Kapit Division: Belaga, km 10 Bakun - Bintulu-Miri road junction, 02° 50' 51.7"; 114° 01' 57.6", 11 Oct 2005, *P.C. Boyce, Jeland ak Kisai & Jipom ak Tisai AR-1430* (SAR+spirit); *AR-2046* (SAR+spirit); Belaga, Belaga road, 02° 43' 45.8"; 113° 45' 37.1", 12 Oct. 2005, *P.C. Boyce, Jeland ak Kisai & Jipom ak Tisai AR-1452* (SAR+spirit).

*Schismatoglottis gamoandra* M. Hotta, Mem. Coll. Sci. Univ. Kyoto, ser. B, 32 (1966) 237, fig. 7, A-G; Hay & Yuzammi, *Telopea* 9(1): 123-124 (2000) – Type: Malaysia, Sarawak, Bintulu ('4<sup>th</sup>') Division, Bintulu, Tatau, along Sungai Latai, small branch of Ulu Sungai Kakus, 7 Nov 1963, M. Hirano & M. Hotta 817 (KYO, holo). Plate VIII.

Small herb to *ca.* 15 cm tall. *Stem* ± hypogeal, creeping, condensed near soil level, more elongate below, pleionanthic, cut tissues plum-purple. *Leaves ca.* 5 together in a rosette, tightly appressed to the ground; *petiole* to *ca.* 6 cm long, D-shaped in cross-section, sheathing in the lower 1/4, sheath open, narrowly alate above the sheath, the wing mostly crisped or not; wing of sheath fully attached, broad, apically truncate; *lamina* narrowly ovato-sagittate, 8-15 cm long × 3.5-6.5 cm wide, stiffly chartaceous, somewhat brittle, metallic medium to dark green, pewter-grey adaxially, sometimes with a conspicuous paler grey or green median band, much paler abaxially, apex acute, base narrowly and rather shallowly cordate with posterior lobes 1-1.5 cm long; in nature often with adventitious plantlets arising from damaged edges; *midrib* adaxially somewhat prominent (fresh & dry) less so abaxially, with 5- 8 primary lateral veins on each side, these alternating with lesser interprimaries and diverging at *ca.* 60°; *secondary venation* rather sparse, arising mostly from the midrib; *tertiary venation* forming a very conspicuous tessellate reticulum abaxially and adaxially (fresh & dry). *Inflorescences* 1-3 together subtended by short, broad cataphylls, erect or more often usually somewhat recumbent by reflexing of the peduncle; *peduncle* to *ca.* 4 cm long, medium green. *Spathe ca.* 5 cm long; *lower spathe*

ca. 2 cm long, green, narrowly ovoid, ca. 1 cm diam., differentiated from the limb by an abrupt constriction; *spathe limb* ovate, inflated over the male zone and appendix of spadix during female anthesis, white, ca. 3 cm long, caducous by deliquescing at the spathe limb/lower spathe junction during male anthesis. *Spadix* 3-3.6 cm long, narrowly hourglass-shaped; *female flower zone* ca. 1.5-1.7 cm long, adnate to the spathe in the lower ca. 2/3, narrowly spindle-shaped; pistils slightly lax, medium green, slightly upwards-directed; *ovary* subglobose, ca. 1 mm diam.; *stigma* sessile, button-like, papillate, ca. 0.3 mm diam.; *interpistillar staminodes* absent from among the pistils, confined to a row along the spathe-spadix adnation, and concentrated in the sterile interstice, subsessile, truncate, waxy-white, drying scale-like, ca. 1.3 mm across; *sterile interstice* ca. 5 mm long covered with staminodes, these strongly compressed and dense in fresh material but drying somewhat lax and scale-like, distally attenuate to ca. 2 mm diam.; *male flower zone* obconic, distally ca. 4 mm diam.; *stamens* large, ca. 1.3 mm across, truncate, connate, with the dome-like apices of the thecae elevated above the connective and opening through very conspicuous, large apical pores ca. 0.6 mm diam.; *appendix* more or less hemispheric, pale to medium yellow; *appendix staminodes* irregularly polygonal with sharp angles and flat tops, ca. 0.8 mm diam. *Fruiting spathe* narrowly urceolate, ca. 3 cm long, erect to weakly reflexed.

Distribution: Endemic to Sarawak, distributed across the Bintulu-Kapit Division border in an area defined by the Sungai Kakus (N), Jeram Pelagus (SW) and Belaga (NE).

Habitat: Gallery to riverine mixed dipterocarp forest on clay-derived soils overlying shales; 40-110 m asl.

Notes: *Schismatoglottis gamoandra* is immediately recognisable by the stiffly chartaceous leaves in a rosette closely appressed to the ground, and tessellate tertiary venation. In addition it has highly distinctive large stamens with very robust, apically dome-like thecae opening through very large confluent pores. The stamens are connate, with faint suture lines marking their union, and the two pollen sacs on either side of the connective are confluent with each other.

Hay and Yuzammi placed *S. gamoandra*, somewhat tentatively, in their *S. calyptрата* Group, but as this group is defined by, hapaxanthic shoots *S. gamoandra* is there clearly misplaced. Indeed, currently it is not at all

clear to what *S. gamoandra* is most closely related. The stiffly chartaceous leaf laminae with the petiolar sheath fully attached is reminiscent of these states in species of the *Schismatoglottis nervosa* complex, although *S. gamoandra* lacks the aromatic vegetative tissues that define *S. nervosa* and its kin. *Schismatoglottis gamoandra* also approaches the *S. nervosa* complex in the interstitial staminodes being markedly compressed and in these drying somewhat scale-like.

Other specimens seen: Sarawak: Kapit Division, Pelagus, Jeram Pelagus, 02° 11' 59"; 113° 04' 01", Woodpecker Trail, 1 Dec. 2004, P.C. Boyce & Jeland ak Kisai AR-802 (SAR+spirit); Jeram Pelagus, Rapids Trail to waterfall, 02° 11' 35.7"; 113° 03' 30.08", 15 March 2005, P.C. Boyce, Jeland ak Kisai & J. Tisai AR-1062 (SAR+spirit); Belaga, Belaga road, Sungai Unan, 02° 55' 40.0"; 113° 44' 15.4", 12 Oct 2005, P.C. Boyce, Jeland ak Kisai & Jipom ak Tisai AR-1427 (SAR+spirit); Bintulu, Bukit Merairi, 02° 46' 26.9"; 113° 39' 19.8", P. Leong PL-40(sub AR-1287) (SAR, SING) & P. Leong PL-251(sub AR-1274).

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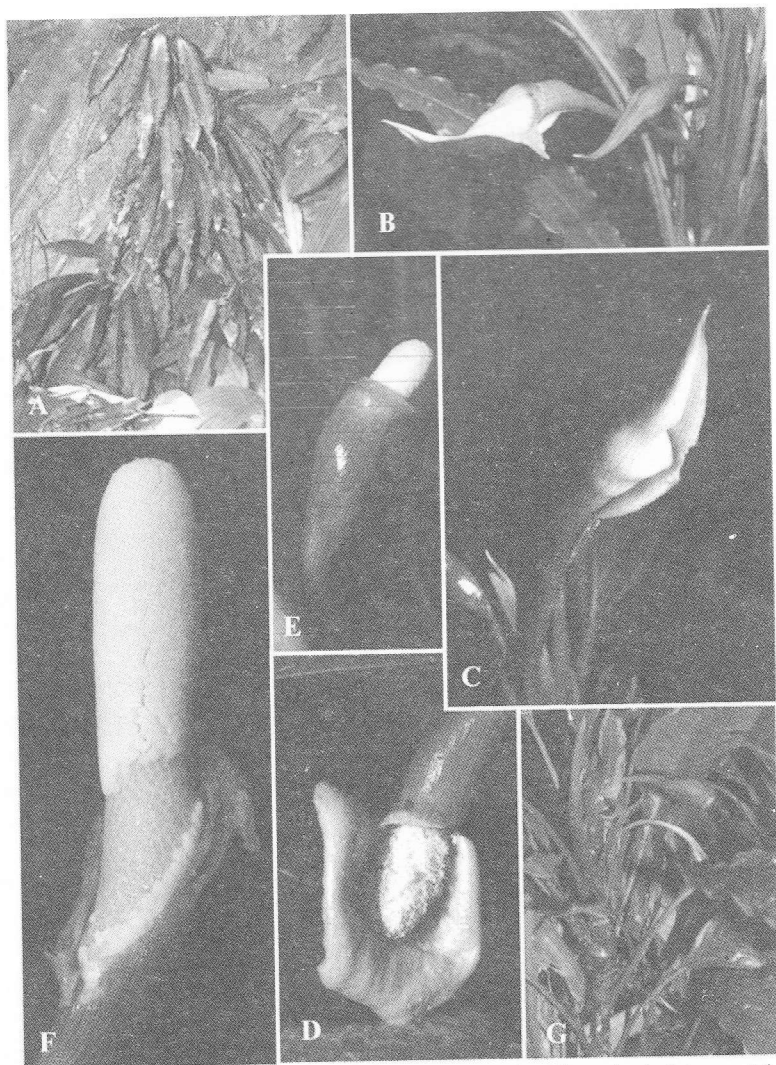


Plate VII: *Schismatoglottis erecta* M. Hotta. A. Plant in habitat with elongated stems rooting at the nodes. B. Flowering shoot with open inflorescence at onset of male anthesis; note the persistent ligular petiolar sheaths. C. Inflorescence at female anthesis; note the spathe limb slightly inflated and gapping. D. Inflorescence at male anthesis with the spathe limb beginning to be shed; note pollen released in strings. E. Inflorescence post male anthesis with spathe limb shed. F. Spadix at female anthesis, with spathe artificially removed. G. Shoot with developing infructescences. A-B: AR-1452; C, E: AR-551; D, F: AR-1610; G: AR-2046.

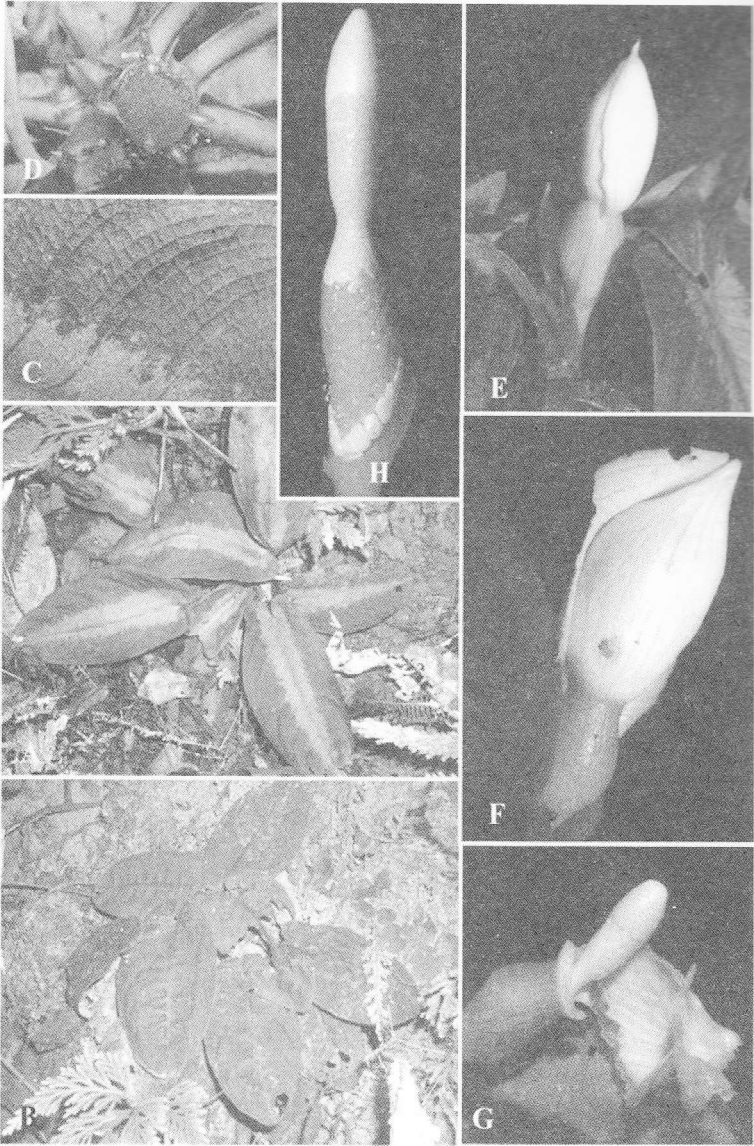


Plate VIII: *Schismatoglottis gamoandra* M. Hotta. A, B. Plants in habitat to show leaf variation. C. Detail of tessellate tertiary venation. D. Cut stem to show red internal tissue. E. Inflorescence at female anthesis. F. Inflorescence near end of female anthesis. G. Inflorescence at male anthesis; note the spathe limb deliquescing at the limb/lower spathe junction. H. Spadix at female anthesis, with spathe artificially removed. A, B: AR-1062; C-H: AR-802.