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SYSTEMATICS

Studies on Schismatoglottideae (Araceae) of Borneo IX: A new genus, *Hestia,* and resurrection of *Apoballis*

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ABSTRACT. *Hestia* S.Y. Wong & P.C. Boyce is described as a new genus from Sarawak typified by *Hestia longifolia* (Ridl.) S.Y. Wong & P.C. Boyce (syn. *Schismatoglottis longifolia* Ridl.), and based on combined molecular and morphological analyses the genus *Apoballis* Schott is resurrected. A key to the Schismatoglottideae *sensu* Wong & Boyce is presented, and *Hestia* is illustrated.

Keyword: *Apoballis*; Araceae; Borneo; *Hestia longifolia*; Sarawak; Schismatoglottideae; *Schismatoglottis longifolia*.

INTRODUCTION

Tribe Schismatoglottideae is the most speciose and diverse aroid taxon in Borneo, comprising in excess of the 100 species of which over 95% are endemic. Besides the largest genus, *Schismatoglottis* Zoll. & Moritzi, the tribe includes, six small 'satellite' genera, *Aridarum* Ridl., *Bakoa* P.C. Boyce & S.Y. Wong *Bucephalandra* Schott, *Phymatarum* M. Hotta, *Piptospatha* N.E. Br., and *Schottarum* P.C. Boyce & S.Y. Wong, all of which are endemic to Borneo, except *Piptospatha*, which extends to the Malay Peninsula and Southern Peninsular Thailand (Bogner and Hay, 2000; Boyce and Wong, 2008). *Schismatoglottis* itself extends from Myanmar (Burma) to Vanuatu, and Southern China to New Guinea, but it is most abundant and diverse in Borneo. Wong et al. (in press) presents a molecular phylogeny of Tribe Schismatoglottideae, in which a Schismatoglottid Alliance comprising Schismatoglottideae, Cryptocoryneae and Philonotieae is proposed. The work is based on the chloroplast region: intergenic spacer *trnL-F*, coding region *matK*, the 3' portion of the *trnK* intron of 78 taxa in the tribe with post-cladistic mapping of morphologies to enable detection of homoplasy among traditionally utilized higher taxon morphological markers.

The present paper redefines generic boundaries of *Schismatoglottis* based on evidence from molecular analyses and post-cladistic morphological observations. The recognition of a new monospecific genus, *Hestia* S.Y. Wong & P.C. Boyce, is proposed together with the resurrection of the genus *Apoballis* Schott.

Key to genera of Schismatoglottideae and their principle subgeneric divisions in Sunda

1a. Wings of petiolar sheath fully or almost fully attached to the petiole; seeds never with a micropylar appendage 2

1b. Wings of petiolar sheath extended into a free ligular portion; seeds sometimes with micropylar appendage 3

2a. Inflorescences on very slender peduncles, nodding at anthesis, peduncle at spathe insertion flexing 180° from vertical axis. Infructescences narrowly campanulate, nodding. Plants of podsols .....*Hestia*

2b. Inflorescences erect to nodding at anthesis, if nodding, then either peduncle massive, or peduncle at spathe insertion at most 45˚ from vertical axis. Infructescences fusiform with a constricted orifice, or if campanulate, then thick-walled and erect, never nodding. Plants of various substrates but never on podsols 4

3a. Modules monoeuphyllous, congested in a distichous arrangement; ligular sheath persistent.....
.....*Schismatoglottis* insertae sedis

3b. Modules polyeuphyllous and leaves never distichous; ligular sheath when present marcescent 5

4a. Spathe limb persistent into fruiting. Petiolar sheath usually fully deciduous; spadix interstice always present, invariably at least partly naked.....*Apoballis*

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4b. Spathe limb deciduous during anthesis, or marcescent. Petiolar sheath persistent or marcescent; interstice where present always fully clothed with sterile flowers ..... (*Schismatoglottis*) 13

5a. Spathe not constricted 6

5b. Spathe constricted 12

6a. Thecae of anther never with horn- or needle-like projections 7

6b. Thecae of anther each with a horn- or needle-like projection, although these sometimes visible only after female anthesis 9

7a. Spadix almost completely adnate to spathe; male flowers mostly sterile with a narrow zone of fertile flowers exposed by the spathe opening; peduncle declinate during fruit maturation but twisting to become semi-erect at fruit maturity; spathe persistent into fruiting, and then at fruit maturity swiftly drying, reflexing and opening basally by tearing at peduncle insertion to expose fruits but remaining distally convolute and while in this situation clasping the spadix. Seeds with blunt micropyle ..... *Bakoa*

7b. Spadix either entirely free or only part of the female flower zone which is adnate to spathe; male flowers all fertile; peduncle erect (and then spathe limb caducous) or declinate (and spathe persistent) throughout the fruit dispersal; spathe limb either caducous early in anthesis or persistent until fruit maturity and then falling, still fresh, to reveal entire spadix and ripe fruits. Seeds with a pronounced, hooked, micropylar appendage 8

8a. Spathe limb caducous early in anthesis (generally between female and male anthesis); peduncle erect at fruit dispersal; fruiting spathe a funnel-form splash-cup; spent parts of spadix falling post fertilization to leave only the female flower zone sitting in the base of the splash cup; pistils connate into a syncarpium, or free but coherentv .... *Piptospatha* sensu stricto (Elongata Group + type) excl. *Hottarum*

8b. Spathe limb persistent; peduncle declinate at fruit dispersal; fruiting spathe caducous prior to fruit dispersal, not forming a splash-cup; male and sterile flowers shedding post-anthesis to reveal an obscurely spirally-scarred spadix axis with the fertilized ovaries on a naked stipe revealed by the loss of subpistillar sterile flowers; pistils free ..... *Ooia*

9a. Thecae with needle-like projection extending only after female anthesis; projection tipped with a weakly peltate ovate-triangular flap. Appendix composed of pistillodes ..... *Schottariella*

9b. Thecae with a horn- or needle-like projection present prior to female anthesis; with the projection pointed and never associated with a terminal flap. Appendix, where present, composed of staminodes 10

10a. Sterile interstice of spadix with flattened scale-like staminodes; anthers not excavated ..... *Bucephalandra*

10b. Sterile interstice absent or with truncate staminodes; anthers nearly always with the top excavated (except *A. incavatum*) 11

11a. Thecae at each end of the anther (seen from above) ..... *Aridarum* Sect. *Aridarum*

11b. Thecae adjacent on one side of the anther (seen from above) ..... *Aridarum* Sect. *Caulescentia*

12a. Thecae of anther without horn- or needle-like projections; ovules on parietal placenta; seeds without a micropylar appendage ..... *Schismatoglottis* Multiflora Group

12b. Thecae of anther, each with horn- or needle-like projections; ovules on basal placanta; seeds with a long, hooked micropylar appendage ..... *Phymatarum*

13a. Stem pleionanthic 14

13b. Stem hapaxanthic ..... *Schismatoglottis* Calyptrata Group

14a. Petiole sheathing only at extreme base; each foliage leaf alternating with a cataphyll .... *Schismatoglottis* Tecturata Group

14b. Petiole usually sheathing for at least a third of its length (rarely less); foliage leaves not alternating with cataphylls..15

15a. Inflorescence erect; spathe limb irregularly crumbling and breaking away at or after male anthesis; small to medium plants ..... *Schismatoglottis* Asperata Group

15b. Inflorescence nodding; spathe limb clasping the spadix and more or less marcescent after anthesis, finally falling with spent parts of spadix; massive pachycauls ..... *Schismatoglottis* Corneri Group

Hestia S.Y. Wong & P.C. Boyce, gen. nov.—Typus: *Hestia longifolia* (Ridl.) S.Y. Wong & P.C. Boyce, comb. nov. Figure 1

Herbae terrestris. Rhizomae in solum podzolicus infossus penitus. Surculi hapaxanthicus ad basin valde facile disarticulates. Inflorescentiis numerosus, nutans ab pedunculis basin spathibus profunde flexis. Flores masculi 1-3-andricis; flores feminei ovarium ovoideum, 2-loculare, ovulum plura ad parietalum loculi insertum. Parte femina sparsiflora, parte mascula valde densiflora, staminodia ad

basim et paullo apicem habens, baccae carnosae densiter dispositae in spathae fructiferorum anguste-campanulatum persistens.

Moderate clump-forming herb. *Stem* hypogeal, hapaxanthic, usually very deeply buried in the peat layer, shoots disarticulating readily from stem. *Leaves* few per module but modules usually superposed to form dense clumps; *petiole* D-shaped, with the abaxial angles rounded to acute, sheathing in the lower part; wings of the sheath tapering, fully attached except for distal briefly ligulate portion; *lamina*

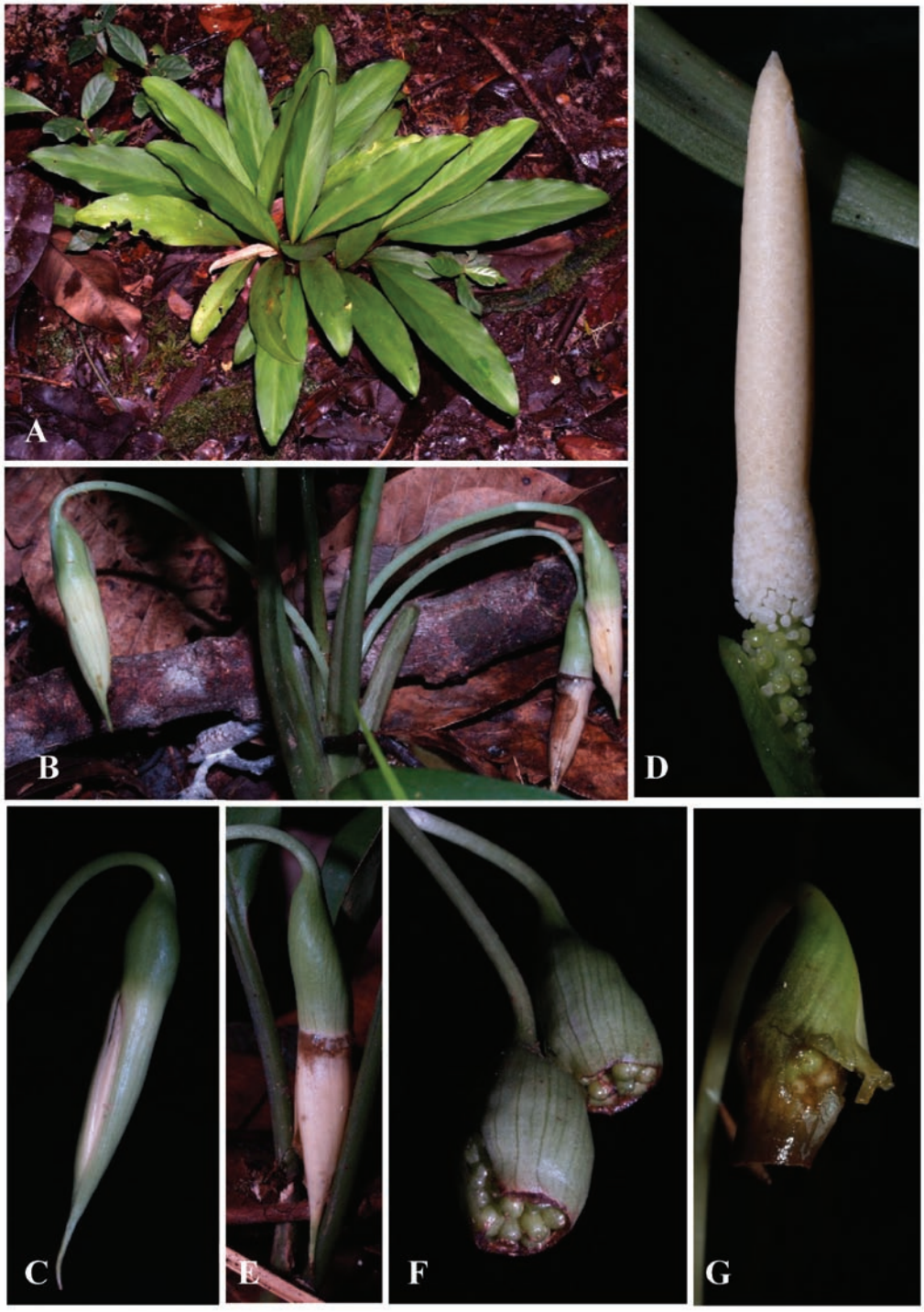

Figure 1. *Hestia longifolia* (Ridl.) S.Y. Wong & P.C. Boyce. A, Plant in habitat on podsol; B, Nodding inflorescences, the inflorescence to the left at female anthesis; upper right at male anthesis, lower right post-anthesis with spathe beginning to degrade prior to being shed; C, Spathe slightly gaping at female anthesis; D, Spadix with the spathe removed artificially to reveal the female and male flower zones; E, Inflorescence post-anthesis with spathe limb rotting at junction of lower spathe, later to be shed together with spent part of spadix; F, Infructescences with the distinctive narrowly campanulate lower spathe; G, Fruits.

oblonceolate, the base attenuate to narrowly rounded, the apex shortly acuminate and mucronate, the mucro solid; *primary veins* c. 6-8 per side, flush adaxially, barely prominent abaxially, *interprimary veins* irregularly present, *secondary* and *tertiary venation* inconspicuous and flush with the lamina. *Inflorescences* sequentially maturing synflorescence; *peduncle* very slender, wiry, suberect and elongating in fruit), *inflorescence* nodding from the apex of the peduncle; *spathe* narrowly cylindrical, long mucronate apically; lower spathe, narrowly ovoid, differentiated from spathe limb by a weak constriction; *limb* narrowly lanceolate, clasping and very slightly inflating and gaping at anthesis, thence deliquescent-deciduous; *spadix* equalling limb portion of spathe in length; *female flower zone*, adnate to the spathe; *interpistillar staminodes* few amongst the ovaries, mainly concentrated into a somewhat interrupted single row along the spathe/spadix adnation and another basally at the insertion of the spadix on the spathe/peduncle; *pistils* globose, rather distant; *stigma* button-like, sessile; *ovules* few on a basal placenta; *interstice staminodes*, slender-stalked, apically narrowly clavate, a little higher than the pistils; *male flower zone* cylindric; *stamens* close-packed, some with filaments partially united forming dimerous to trimerous male flowers, others solitary; *anthers* ±dumbbell-shaped from above with the connective forming a slight dome between the thecae; thecae opening through apical slit-like pores; pollen dusty; *appendix* tapering-cylindric to very narrowly ovoid, composed of very close-packed columnar flat-topped staminodes. *Fruiting* spathe narrowly campanulate, nodding, long-persistent, at fruit maturity deliquescing starting from the margin backwards towards the peduncle, and splitting longitudinally, fruits falling whole. *Fruit* ovoid-globose to somewhat compressed, ripening green, stigmatic remains dark brown. *Seeds* ellipsoid, strongly longitudinally ribbed, medium brown.

Distribution. MALESIA: disjunct between the Malay Peninsula, where it is known to only from Perak, and Borneo, where it is known from numerous but widely scattered localities in Sarawak and Brunei.

Habitat. In kerangas formations in lowland rain forest and lowland hill forest, and regrowth, always occurring on raised podsols in swampy areas, sometimes near streams to c. 250 m alt.

Notes. This is a very distinctive genus easily recognised by the rather numerous nodding inflorescences on relatively very long slender wiry peduncles. There is only a weak constriction present between the lower spathe and upper spathe and the orifice of the lower spathe is open during fruiting. The entire non-female portion of the spadix often dries and adheres to the spathe limb with the whole combined unit shedding.

Hestia longifolia has vegetative modules that readily disarticulate from the deep-seated rhizome. The function of the disarticulation in this podsol-obligated species is not clear, but it is speculated that it may be an adaption to fire resistance in a highly fire-prone habitat. Perhaps enabling the shoot unit to be destroyed in some way prevents damage to the main perennating system.

Etymology. *Hestia* is named for the daughter of Cronus and Rhea, she was one of the twelve Olympians until replaced by Dionysus. Hestia was the Roman Goddess of the hearth and its fire, and was accorded special honour at feasts and sacrifices. She was also the Goddess of Chastity. The name is chosen in allusion to the fire-prone habitat of the single species, and the barely opening spathe.

Hestia longifolia (Ridl.) S.Y. Wong & P.C. Boyce, comb. nov.

Basionym: *Schismatoglottis longifolia* Ridl. J. Bot. 40: 37 (1902) Type: Malaysia, Perak, Bukit Larut, *King's Collector* 1967 (Lecto: K!, selected by Hay, in Sandakania 7 (1996) 26).

Specimens examined. **MALAYSIA.** PERAK: Tanjong Pondok, *Burkill & Hanif 13246* (K, SING); Maxwell's Hill, *Curtis 2082* (SINGT); Bukit Larut, *Hay et al. 9063* (UPM); Taiping Hill, *Henderson 10253* (SING); Taiping, along rd to Maxwell's Hill, *Nicolson 1069* (SING); Kuala Temangoh, *Ridley 14307* (SING); Gunung Hijau, *Ridley s.n.* (SING); 'Perak Hills', *Ridley s.n.* (K); Maxwell's Hill, *Ridley s.n.* (SING); Relau Tujor, *Wray 1784* (CAL), *2193* (CAL, SING). SARAWAK: Kuching Division: just outside Kubah NP, above intake dam on Sg. Bungen, *Boyce 770* (K); Bau, Kampung Grogo, 1 Mar 2004, *P.C. Boyce & Jeland ak Kisai AR-233* (SAR); Bau, Kampung Grogo, 3 Jun 2004, *P.C. Boyce & Jeland ak Kisai AR-433* (SAR); Bau, Gunung Towai, 16 Oct 2004, *P.C. Boyce & Jipom ak Tisai AR-730* (SAR); Bau. Kampung Bogag, Gunung Tibugai, 01°21'31.1"; 110°03'48.7", 6 Jan 2005, *P.C. Boyce & Jeland ak Kisai AR- 948* (SAR); Bau, Kampung Bogag, Gunung Tibugai, 01°21'31.1"; 110°03'48.7", 12 Jan 2005, *P.C. Boyce, R. Kneer & Jeland ak Kisai AR-960* (SAR); Bau, Kampung Grogog, 18 Jun 2005, *P.C. Boyce & Jeland ak Kisai AR-1239* (SAR); Bau, Krokong, Kampung Tringgus, Sungai Bong, 01°15'32.2"; 110°05, 27 Jun 2006, *P.C. Boyce, Jeland ak Kisai & Wong Sin Yeng AR-1847* (SAR); Matang, Kubah National Park, Sg. Senduk trail, 01°37' 24.1"; 110°10'04.5", 4 Aug 2007, *P.C. Boyce, Wong Sin Yeng & Simon Maclean AR-2133* (SAR); Bau, Bongo Range, trail to Tegora Mine, 01°19'41.5"; 110 °09'19.0", 8 Sep 2007, *P.C. Boyce, Wong Sin Yeng & Alexander Kocyan AR-2192* (SAR); Serian, *Brooke 9605* (L). Sarikei Division: Sarikei, Ulu Sarikei, Rumah Nyuka, 23 Oct 2006, *P.C. Boyce & Wong Sin Yeng AR-2042* (SAR). 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-1417* (SAR). Limbang Division: Limbang, Nanga Medamit, Mulu N.P., trail from Camp 5 to Kuala Terikan, 04°12'58.0"; 114° 53' 20.1", 29 Sep 2007, *P.C. Boyce et al. AR-2227* (SAR); Limbang, Nanga Medamit, Mulu N.P., Sungai Abun Kiri, tributary from Sungai Terikan, from the back of Mentawai Research Station, 04°14'07.4"; 114°52'27.6", 2 Oct 2007, *P.C. Boyce et al. AR-2286* (SAR); Limbang, Nanga Medamit, Mulu N.P., trail from Kuala Terikan to Camp,

04°12'58.0"; 114°53'20.1", 3 Oct 2007, *P.C. Boyce et al. AR-2322* (SAR). BRUNEI: Luang Kolom, *Bernstein JHB228* (K); Brunei Muara District: Lumapas, Bukit Lumapas, *Bygrave et al. 46* (K); Belait District: Labi, Sg. Rampayoh, *Coode et al. 7297* (K); Labi, Sg. Rampayoh, *Dransfield et al. 1283* (K). Tutong District: Ukong, Andulau FR, Bukit Besong, *Dransfield et al. 1146* (K).

Resurrection of *Apoballis*

Apoballis Schott, Oesterr. Bot. Zeit. 8: 318. 1858.—Type: *Apoballis neglecta* Schott ≡ *Schismatoglottis rupestris* Zoll. & Moritzi ex Zoll.

Herbaceous. *Stem* pleionanthic, epigeal, erect to decumbent. *Leaves* few to many, often clustering terminally; *petiole* usually glabrous, sometimes minutely puberulent, leaf sheath fully attached, tapering, persistent to slowly degrading in the marginal distal part; *lamina* oblonceolate to ovato-sagittate, sometimes variegated, glabrous adaxially and abaxially, basal cuneate to saggitate, apex acute to long acuminate; primary and secondary venation bipinnate, tertiary venation obscure. *Inflorescence* solitary or synflorescence, up to 5 together; *spathe* long, up to 20 cm; *lower spathe*, ovoid, differentiated from the spathe limb with gradual or abrupt constriction; spathe limb oblong-lanceolate, *upper spathe* persistent until well after anthesis, then delisquescing, opening only slightly, the distal portion remaining convolute, with only the ventral part of the male zone exposed; *spadix* equaling or less than spathe; *female flower zone*, more or less cylindric, obliquely inserted to adnate for up to $^1/_3$ of its length; pistils globose, sessile; interpistillar staminodes present or absent; *interstice* prominent, mostly naked with a few groups of small more or less sessile staminodes; *male flower zone* cylindrical to slightly tapering, the lower part corresponding with the spathe constriction; stamens crowded, dumbbell to irregular shaped; *appendix* present. *Fruiting spathe* urceolate, declinate; *Fruits* and *seeds* not seen.

Distribution. 12 species; Thailand, Malay Peninsula, Sumatera, Java, Nusa Tenggara. *Apoballis neglecta* Schott, *Apoballis acuminatissima* (Schott) S.Y. Wong & P.C. Boyce comb. nov., *Apoballis belophylla* (Alderw.) S.Y. Wong & P.C. Boyce, comb. nov., *Apoballis brevipes* (Hook. f) S.Y. Wong & P.C. Boyce, comb. nov., *Apoballis grandiflora* (Alderw.) S.Y. Wong & P.C. Boyce, comb. nov., *Apoballis hastifolia* (Hallier f. ex Engl.) S.Y. Wong & P.C. Boyce, comb. nov., *Apoballis javanica* (Engl.) S.Y. Wong & P.C. Boyce, comb. nov., *Apoballis longicaulis* (Ridl.) S.Y. Wong & P.C. Boyce, comb. nov., *Apoballis mutata* (Hook. f.) S.Y. Wong & P.C. Boyce, comb. nov., *Apoballis okadae* (M. Hotta) S.Y. Wong & P.C. Boyce, comb. nov., *Apoballis ovata* (Schott) S.Y. Wong & P.C. Boyce, comb. nov. and *Apoballis sagittifolia* (Alderw.) S.Y. Wong & P.C. Boyce, comb. nov.

Habitat. Terrestrial in primary lowland to hill forest, sometimes rheophytes. 50-1,500 m alt.

Notes. *Apoballis* comprises the *Schismatoglottis* Rupestris Group previously recognized by Hay & Yuzammi (2000). Molecular analysis undertaken in the previous study (Wong et al., in press) has shown that for all taxa sampled (*Apoballis acuminatissima* and *A. mutata*), *Apoballis* is the basal to Schismatoglottideae *sensu* Wong & Boyce.

Apoballis is defined by the decidous leaf sheath and prominent naked interstice interspersed sparsely with staminodes. The spathe usually hardly opens, and is semi-persistent into fruiting.

Apoballis acuminatissima (Schott) S.Y. Wong & P.C. Boyce, comb. nov.: *Schismatoglottis acuminatissima* Schott in Ann. Mus. Lugd.-Bat. 1. 1864. ≡ *Schismatoglottis concinna* Schott ≡ *Schismatoglottis lavallei* L ≡ *Schismatoglottis lavallei* var. *purpurea* N.E. Br. ≡ *Schismatoglottis lavallei* var. *immaculata* N.E. Br. ≡ *Schismatoglottis lavallei* var. *lansbergiana* L.Linden ex N.E. Br. ≡ *Schismatoglottis rubrocincta* Engl. ≡ *Schismatoglottis kurimana* Alderw.

Apoballis belophylla (Alderw.) S.Y. Wong & P.C. Boyce, comb. nov.

Basionym: *Schismatoglottis belophylla* Alderw., Bull. Jard. Bot. Buitenzorg III, 4 (1922) 203.—Type: Indonesia, Sumatera, North Sumatera, Sibolangit, 2 Dec 1917, *J.A. Lörzing 5450* (holotype: BO; isotype: L).

Apoballis brevipes (Hook. *f.*) S.Y. Wong & P.C. Boyce, comb. nov.: *Schismatoglottis brevipes* Hook. *f.* ≡ *Schismatoglottis minor* Hook. *f.*

Basionym: *Schismatoglottis brevipes* Hook. f., Fl. Brit. Ind. (1894) 538; Engl. & Krause, Pflanzenr. 55 (IV.23Da) (1912) 102, fig. 56; Hay, Sandakania 7 (1996) 17, fig. 2, ca. —Type: Malaysia, Perak, *Scortechini* 623b (holotype: K).

Apoballis grandiflora (Alderw.) S.Y. Wong & P.C. Boyce, comb. nov.

Basionym: *Schismatoglottis grandiflora* Alderw., Bull. Jard. Bot. Buitenzorg III, 4 (1922) 201.—Type: Indonesia, Sumatera, West Sumatera, Mt Talamau, 1 May 1917, *H.A.B. Bünnenmeijer 536* (holotype: BO + BO spirit).

Apoballis hastifolia (Hallier *f.* ex Engl.) S.Y. Wong & P.C. Boyce, comb. nov.

Basionym: *Schismatoglottis hastifolia* Hallier f. ex Engl., Pflanzenr.55 (IV.23Da) (1912) 116.—Type: Cult. Hort. Bogor, Bed XI.B.X.56, Jan/Feb 1906, *A. Engler 4052* (holotype: B).—Epitype: Indonesia, Sumatera, North Sumatera Province, general region of Marban, Bilah, nr Bilah Pertama (Parbasiran), Feb-Mar 1928, *Rahmat Si Toroes 119* (NY).

Apoballis javanica (Engl.) S.Y. Wong & P.C. Boyce, comb. nov.

Basionym: *Schismatoglottis javanica* Engl, in Engl. & Krause, Pflanzenr. 55 (IV.23Da) (1912) 108 (excl. fig 67); Alderw, Bull. Jard. Bot. 3 (4), (1922) 208.—Type: Java, Cult. Hort. Bogor., *A. Engler 4053* (holotype: B)

Apoballis longicaulis (Ridl.) S.Y. Wong & P.C. Boyce, comb. nov.: *Schismatoglottis longicaulis* Ridl. ≡ *Schismatoglottis forbesii* Engl.

Basionym: *Schismatoglottis longicaulis* Ridl., J. Bot. 40 (1902) 37; Engl., Pflanzenr. 55 (IV.23Fda) (1912) 103; Rendle, J. Bot. 63 (1925) 125.—Type: Indonesia, Sumatera, Lampung, G. Trang, Jul 1880, *H.O. Forbes 1491* (holotype: BM, delet.; isotype: CAL).

Apoballis mutata (Hook. f.) S.Y. Wong & P.C. Boyce, comb. nov.: *Schismatoglottis mutata* Hook.*f*. ≡ *Schismatoglottis linguiformis* Engl. ≡ *Schismatoglottis batoensis* Engl. ≡ *Schismatoglottis ridleyana* Engl. ≡ *Schismatoglottis rotundifolia* Engl. ≡ *Schismatoglottis monticola* Alderw. ≡ *Schismatoglottis leptophylla* Alderw., Bull. ≡ *Schismatoglottis brooksii* Alderw.

Basionym: *Schismatoglottis mutata* Hook. f., Fl. Brit. Ind. 6 (1894) 538; Ridl., Materials Fl. Mal. Pen. 3 (1907) 32 & Fl. Mal. Pen. 5 (1925) 111; Engl., Pflanzenr. 55 (IV.23Da) (1912) 110. Henderson, J. Malayan Br. Roy. Asiat. Soc. 5 (1927) 275 & J. Malayan Br. Roy. Asiat. Soc. 17 (1939) 84; Chin, Gard. Bull. Sing. 35 (1982) 182; Hay, Sandakania 7 (1996) 19, fig. 2, D.—Type: Malaysia, Perak, Bukit Larut, *King's Collector* 4443 (K lecto, CAL isolecto; selected by Hay, 1996).

Apoballis okadae (M. Hotta) S.Y. Wong & P.C. Boyce, comb. nov.

Basionym: *Schismatoglottis okadae* M. Hotta, Contr. Biol. Lab. Kyoto Univ. 27 (1987) 151, fig. 1; van Steenis, Allertonia 4 (1987) 293.—Type: Indonesia, Sumatera, Sumatera Barat, Karang Puteh, 16 Feb 1981, *M. Hotta & H. Okada 276* (holotype: KYO; isotype: BO).

Apoballis ovata (Schott) S.Y. Wong & P.C. Boyce, comb. nov.: *Schismatoglottis ovata* Schott ≡ *Schismatoglottis sylvestris* Alderw. ≡ *Schismatoglottis sylvestris* var. *subcordata* Alderw.

Basionym: *Schismatoglottis ovata* Schott, Ann. Mus. Lugd.- Bat. 1 (1863) 125. – Type: Indonesia, 'Borneo' [almost certainly Sumatera], *Korthals s.n.* (holotype: L, 2 sheets).

Apoballis rupestris (Zoll. & Moritzi ex Zoll.) S.Y. Wong & P.C. Boyce, comb. nov.: *Schismatoglottis rupestris* Zoll. ≡ *Schismatoglottis latifolia* Miq. ≡ *Apoballis neglecta* Schott ≡ *Schismatoglottis latifolia* Miq. var. *rubescens* Engl. ≡ *Schismatoglottis treubii* Engl. ≡ *Schismatoglottis wigmannii* Engl. ≡ *Schismatoglottis treubii* forma *viridipes* Alderw.

Basionym: *Schismatoglottis rupestris* Zoll., Syst. Verz. 1 (1854) 77; Miq., Fl. Ind. Bat. 3 (1856) 214; Schott, Syn. Aroid. (1856) 120; Engl., in A. & C. DC., Monogr. phan. 2 (1879) 350; Engler, Bot. Jahrb. Syst. 25 (1898) 19; Koord., Exkurs.-Fl. Java 1 (1911) 259; Backer, Beknopte Fl. Java 17 (1957) 33; Bakh.f. & Koster, in Blumea 12 (1963) 67; Backer & Bakh.f., Fl. Java 3 (1968) 116.—Type: Java, Bogor, *Zollinger 84* (holotype: L; isotype: P).

Apoballis sagittifolia (Alderw.) S.Y. Wong & P.C. Boyce, comb. nov.: *Schismatoglottis sagittifolia* Alderw.

Basionym: *Schismatoglottis sagittifolia* Alderw., Bull. Jard. Bot. Buitenzorg III, 4 (1922) 204.—Type: Indonesia, Sumatera, West Sumatera, Ophir Distr., West of Taloe, 8 Apr 1917, *H.A.B. Bünnenmeijer 64* (holotype: BO + BO spirit).

Schismatoglottis sensu Wong & Boyce

The resurrection of *Philonotion* Schott (Wong et al., in press) and the genera dealt with above leaves a core *Schismatoglottis* that is so far monophyletically supported. *Schismatoglottis* now comprises the Calyptrata Group, Multiflora Group, Tecturata Group, Asperata Group and Corneri Group *sensu* Hay & Yuzammi (2000). The taxonomy and systematics of the Multiflora and Asperata Groups is currently under review by the authors.

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婆羅洲砂勞越的天南星科落檐族研究 (IX)：新屬 *Hestia* 發表及 *Apoballis* 屬的重新承認

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本文發表產於婆羅洲砂勞越的天南星科一新屬 *Hestia* S.Y. Wong & P.C. Boyce 模式種為 *Hestia longifolia* (Ridl.) S.Y. Wong & P.C. Boyce (*Schismatoglottis longifolia* Ridl. 為其同物異名)。此外，結合分子與形態分析的資料，我們恢復了 *Apoballis* Schott 屬的地位，而將 12 種原棲屬於 *Schismatoglottis* 的植物學名做了新組合處理。本文並提供落檐族 (Schismatoglottideae *sensu* Wong & Boyce) 的檢索表與 *Hestia longifolia* 的彩色圖版以資辨識。

關鍵詞：*Apoballis*；天南星科；婆羅洲；*Hestia longifolia*；砂勞越；落檐族；*Schismatoglottis longifolia*。