Studies on Homalomeneae (Araceae) of Borneo IX: A New Species of *Homalomena* Supergroup Chamaecladon from Kalimantan Timur, Indonesian Borneo

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ABSTRACT

Homalomena agens is described and illustrated as a new species of the Chamaecladon Supergroup from Kalimantan Timur, Indonesian Borneo. A brief overview of the recent publication history of *Homalomena* in the humid Asian tropics, together with a review of the taxonomy of the Chamaecladon Supergroup in Borneo, and a key to described species in Borneo, is provided.

KEY WORDS

Araceae, Kalimantan, Indonesia, Borneo, *Homalomena*, Chamaecladon Supergroup.

INTRODUCTION

The last compete revision of *Homalomena* is that of Engler (1912). Shortly before this work, and since, only partial regional accounts of varying quality have been attempted (i.e. Alderwerelt van Rosenburgh, 1922a, 1922b; Ridley, 1902, 1905, 1907, 1913, 1925). However, after a long period of what amounts to botanical neglect *Homalomena* has in recent years become the focus of intensive study, initiated by Mitsuru Hotta (KYO), Alistair Hay (formerly NSW) and Clare Herscovitch (NSW), and most recently accelerated by a consortium based in Malaysia. Outputs to date include historical taxonomic accounts (Ng, Boyce & Sofiman, in press.; Ng *et al*., in press), clarification of typifications (Boyce & Wong, 2009), regional taxonomic accounts, including numerous taxonomic novelties, for Peninsular Malaysia (Baharuddin & Boyce, 2010a, in press; Zulhazman, Boyce & Mashhor, in press a, in press b), Jawa, (Backer & Bakhuizen van den Brink, 1968), Sumatera (Hotta, 1985, 1986, 1993; Hay & Herscovitch, 2002); Borneo (Hotta, 1967; Hay & Herscovitch, 2002; Boyce & Wong, 2008; Boyce, Wong & Fasihuddin, 2010; Hoe *et al*., 2011), and New Guinea (Hay, 1999; Hay & Herscovitch, 2003), analyses of particular ecological niches, e.g. helophytism (Wong, Boyce & Fasihuddin, in press), and pollination studies (Tung, Boyce & Wong, 2010; Hoe *et al*., 2011).

Chamaecladon Supergroup

Boyce & Wong (2008) defined the informal Chamaecladon Supergroup by a combination of morphologies including small to minute often creeping, less often erect, plants with odorless, or very rarely aromatic, tissues, spathes less than 1 cm, very exceptionally up to 2 cm long and

lacking a constriction between the upper and lower spathe, and spathe movement during anthesis comprising simple gaping and closing of the spathe limb. Defining floral morphologies include interpistillar staminodes much shorter than the associated pistil, a two- to three-locular ovary, staminate flowers with two to three anthers, and stamens lacking an expanded connective. Chamaecladon species, notably those in Borneo, are often associated with a rheophytic habitat, or commonly with steep forested banks. Many taxa have leaf blades and petioles that are distinctly velvety or scintillating owing to the presence of sub-microscopic indumentum. See **Plate 1**.

A significant proportion of described Asian species of *Homalomena* belong to the Chamaecladon Supergroup. By a combination of the invariably poor state of preservation of the Type material and the small size of the inflorescences the chamaecladons pose considerable taxonomic problems. One result has been that taxa have been assigned tortuous and considerable synonymies, not least *H. humilis* (Jack) Hook. *f.* with over 40 synonyms, of which only three are homotypic.

Recent attempts to better understand species from this supergroup has revealed that many taxa appear to be obligated to specific geologies and localities (e.g. *H. atrox* P.C.Boyce, S.Y.Wong & Fasih.), while at the same time a shift away from reliance on inadequate herbarium material, and improved observation of the tiny spadices aided by recent advents in digital photography, has begun to reveal a wealth of useful characters, not least in the pistillate flowers and their associated staminodes, that suggest that there are a great many novel taxa awaiting recognition.

As has been stated in previous papers in this series, *Homalomena* is a large and ill-understood genus. Much remains to be done, particularly with regard to assigning Types of pre-existing names to living plants. There is also a pressing need to supply names to species that clearly have no assignable name since without a convenient taxonomic 'handle' data communicability is much hindered. To this end in instances where there is no doubt as to their novelty we are naming novel species. One such is proposed here.

KEY TO SPECIES OF THE CHAMAECLADON SUPERGROUP IN BORNEO

1a. Leaves (blade and petiole) erect to spreading. **2**
1b. Leaf blades pendent. Granite, Bukit Kelam, Kalimantan . . . ***H. ovalifolia***
2a. Leaf blades stenophyllous; facultative rheophytes **3**
2b. Leaf blades not stenophyllous; mesophytes, or lithophyes not associated with riverine habitats **4**
3a. Leaf blades thinly but stiffly coriaceous, glaucous abaxially with conspicuous striate pellucid secretory canals running parallel to the primary lateral veins; Matang, Sarawak . . . . . ***H. paucinervia***
3b. Leaf blades softly coriaceous, abaxially not glaucous, and lacking pellucid canals; Batang Ai, Sarawak . . . . . ***H. atrox***
4a. Entire plant, especially the leaf blades, conspicuously velvety **8**
4b. Plants not so **5**
5a. Leaf blade coriaceous **6**
5b. Leaf blade membranous **7**
6a. Leaves spreading. Leaf base ranging from cuneate to truncate, exceptionally weakly wide-cordiform; spathe ca. 8 mm wide (at base); staminate flowers very congested . . . . . .***H. griffithii* sens lat.** (incl. in Borneo *Homalomena hayupensis* Engl., *H. grabowskii* Engl. & *H. sulcata* Engl.)
6b. Leaves stiffly erect. Leaf base rounded; spathe ca. 4 mm wide at base; staminate flowers not congested . . . . . ***H. agens***
7a. Leaf blade about twice as long as the petiole; primary lateral veins many, dense, arranged evenly along the length of the midrib . . .***H. saxorum***
7b. Leaf blade about half the length of the petiole; primary lateral veins few,

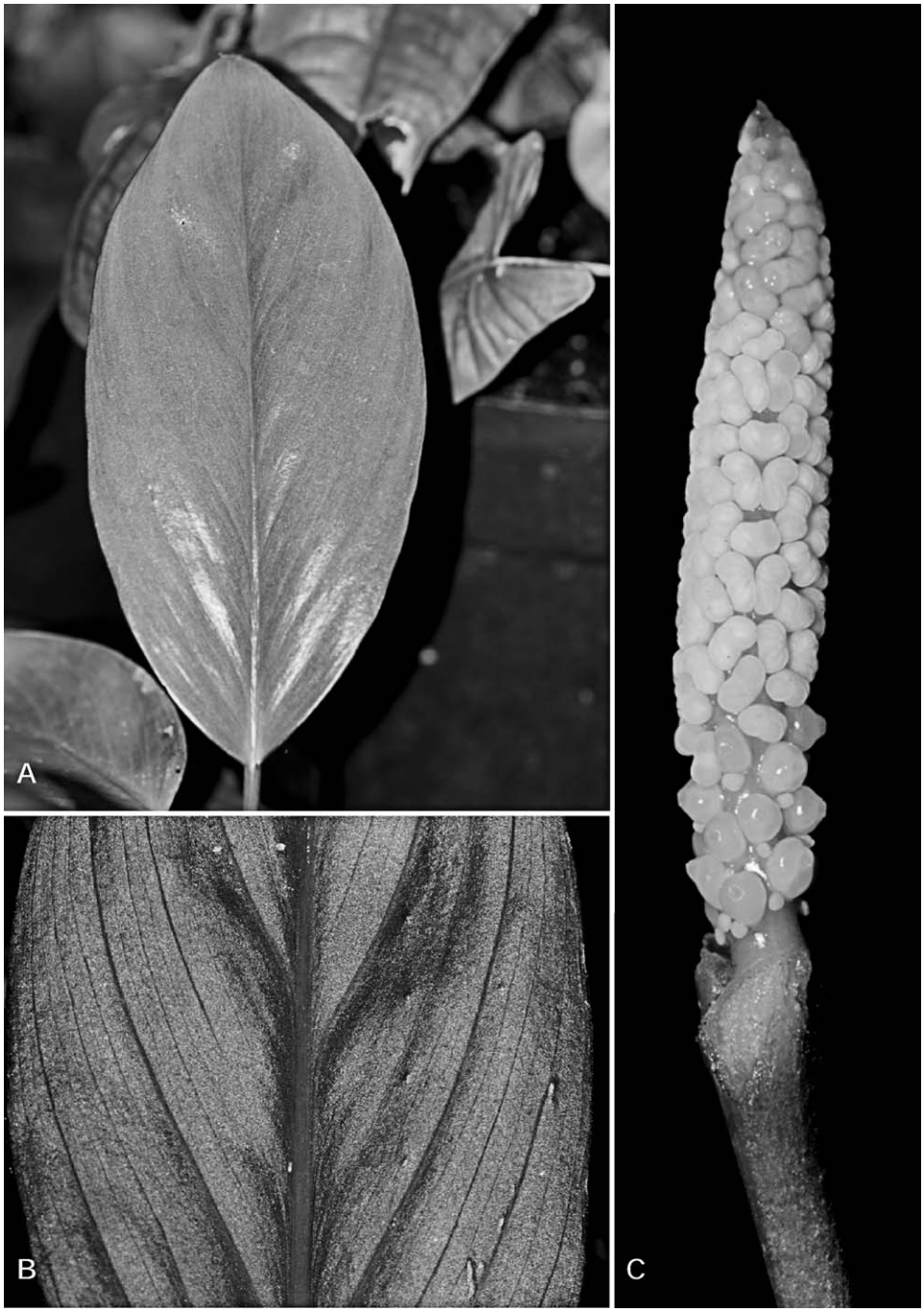

Plate 1. ***Homalomena agens*** Kurniawan & P.C.Boyce. **A.** Leaf blade adaxial view. **B.** Leaf blade abaxial view. Note the sparse primary venation. **C.** Spadix at pistillate anthesis, spathe artificially removed. All from the type plant. Images © Peter C. Boyce and Agung Kurniawang.

arising from the basal third of the midrib . . . . . ***H. obscurifolia***

8a. Leaf blade base wide-cordiform. S Kalimantan. . . . . ***H. korthalsii***

8b. Leaf blade base cuneate to minutely cordiform. Widespread in Sunda . . . . . ***H.* Humilis Complex**

Homalomena agens Kurniawan & P.C.Boyce, **sp. nov.** Morphologice *Homalomenae saxorum* similis, sed foliis rigide erectis (non arcuatis) subsucculentibus nitidis (non submembranaceis impolitis), venis primariis lateralibus paucis distantibus facile distinguenda. In foliis rigidis *H. griffithii* accedens, sed floribus masculis laxis, spathis fere vix tertia parte latis prompte dissimilis. Type. INDONESIA, Kalimantan Timur, Kabupaten Malinau, Kecamatan Malinau Selatan (Loreh), Mt. Sidi, Western hill, 150 m asl, 30 Nov. 2005, cultivated in Bali Botanic Garden, Indonesian Institute of Sciences-LIPI (Kebun Raya Eka Karya Bali), accession E200512189, *I Gede Tirta GT2281* (holotypes THBB [dried specimens and inflorescences in alcohol]; isotypes BO). **Plate 1.**

Small evergreen mesophytic herbs to ca. 20 cm tall with aromatic (terpenoids) vegetative tissues. **Stem** pleionanthic, subterranean, erect ca. 20 mm thick, deep red, internodes to ca. 2 mm long. **Leaves** few together, stiffly erect; petiole mainly terete, distal-most portion shallowly, rounded abaxially, ca. 10 cm long, semi-glossy, adaxially deep reddish brown, abaxially reddish; petiolar sheath 4–5 cm long, almost $^1/_2$ length of petiole, sheath margins in-rolled and closed, persistent, margins red, terminal part tapering; lamina elliptic, 14–19 cm long × 4.5–6.5 cm wide, sub-succulent to coriaceous, glossy medium to dark green adaxially, abaxially reddish-purple to reddish-brown, margins smooth, adaxially minutely stained red, especially towards the tip, base ovate, weakly oblique, tip acute, apiculate for ca. 1 mm; midrib somewhat rounded-raised abaxially, adaxially somewhat impressed, ca. 2.5 mm wide, with ca. 7 primary lateral veins on each side, these diverging at 30° from the midrib, abaxially almost flush, and notably darker than the blade, adaxially almost flush or very slightly impressed; interprimary veins ca. ½ width of the primary lateral veins, regularly interspersed; secondary venation very inconspicuous; tertiary venation invisible, all veins running into a weakly defined thickened intermarginal vein. **Inflorescences** up to 3 together, erect at anthesis, later declinate; peduncle to ca. 3 cm long × ca. 1.5 mm diam., medium green, somewhat brownish stained. **Spathe** 1.8–2.8 cm long, ca. 4 mm wide, not constricted, semi-glossy reddish green externally, somewhat shiny pale green internally, with a terminal short mucro to 2–3 mm long, spathe opening at anthesis by inflation and thence by a broad slit, later closing by which time spadix has extended to project beyond the tip of the closed spathe. **Spadix** 1.4–2.2 cm long × 3 mm diam., sterile at the tip by the non-development of the staminate flowers, stipitate, stipe ca. 1 mm, green; **pistillate flower zone** 3–4 mm long; pistils few, scattered, usually only 2–3 spirals, obliquely globose, ca. 1 mm tall × .8–.9 mm diam. greenish white, stigma sessile, somewhat punctate, .2–.3 mm diam.; most pistils with a single staminode situated on ventral side of the flower relative to the base of the spadix, occasionally (basal-most flowers) with 2–3 staminodes; interpistillar staminodes globose, almost sessile, ca. .2 mm long, white; suprapistillar interstice absent; **staminate flower zone** 1–1.6 cm long, apex acute; **staminate flowers** somewhat laxly arranged, especially towards the lower part of the spadix, broadly dumbbell shaped, consisting of two stamens, stamens rounded, ca. .5 mm tall, .5 mm long × ca. 1 mm wide, white to very pale green, anther thecae opening by a broad terminal slit. **Infructescence** declinate by flexing of the basal portion of the peduncle, red. **Fruits** and **seeds** not observed.

Distribution

Known from only the type locality.

Ecology

Lowland humid forest, shaded areas, on rocky clay soil, ca. 150 m alt.

Etymology

From Latin *agens* – of striking appearance – in allusion to the highly distinctive appearance and posture of the foliage.

Notes

Homalomena agens is a very distinct species, notably by the stiffly erect almost sub-succulent glossy leaves with rather few primary lateral veins. In overall appearance it is most similar to *H. saxorum* (Schott) Engl., but is readily distinguished by the stiffly erect (not arching) sub-succulent or coriaceous (not membranous) leaves, proportionately shorter, wider leaf blades with somewhat sparse (not dense) venation and an acute (not shortly acuminate) leaf tip. *Homalomena saxorum* was described from the south of Borneo (*fide* Schott, 1864). The Types (L, BO) are functionally sterile, the specimens having been collected post anthesis and thus all floral morphologies degraded beyond taxonomic usefulness. No spadix details are provided by Schott while those given by Engler (1912) are from a Sumateran collection by Beccari that is not conspecific with Bornean (i.e. Typical) material.

Homalomena saxorum is one of six Bornean chamaecladon treated by Ridley (1905). Of the others, *H. ovalifolia* (Schott) Ridl. is a highly distinct lithophytic species with pendent velvety leaf blades that is endemic to the massive granite outcrop of Bukit Kelam, Sintang, Kalimantan Barat.

Homalomena paucinervia Ridl. is a stenophyllus facultative rheophyte restricted to riverine sandstones on the Matang massif, Kuching, Sarawak. It is one of a number of species with conspicuous striate pellucid secretory canals running parallel to the primary lateral veins on the abaxial surface of the blade.

Homalomena griffithii (Schott) Hook. *f.* is unique in the Chamaecladon Supergroup by the large size of the spathe, and the very dense arrangement of the staminate flowers. The species is highly variable in leaf shape but very consistent in inflorescence size and morphology. In the stiff leaves *H. griffithii* is reminiscent of *H. agens* but readily distinguished as shown in the above key.

Homalomena humilis (Jack) Hook. *f* and *H. pumila* Hook. *f.* are members of a complex of closely similar species distinguished by the distinct velvety nature of the upper surface of the leaf blades. Together they constitute one of the taxonomically most difficult species' groups in the genus and have amassed an impressive and dense synonymy. Pending a thorough revision of the complex, including recollection at the type localities of the numerous species that have been recognized there is little that can be done other than to treat the complex as a morphotaxon, for which the earliest species name in *Homalomena* is *H. humilis*.

Engler (1912) treats five Bornean species additional to those in Ridley's account: *Homalomena metallica*. (N.E.Br.) Engl. was described from material introduced into cultivation to Belgium from Borneo. By the richly colored velvety leaves it is clearly a member of the *H. humilis* complex, but will likely never be assigned to a living species as the Type material is too fragmentary and the original locality states simply 'Borneo'.

Homalomena subcordata (Schott) Engl. (1912), a *nomen illeg*. as the combination is preoccupied by *H. subcordata* Engl. (Engler, 1881), was provided a new name – *H. korthalsii* – by Furtado (1939).

Homalomena hayupensis Engl and *H. grabowskii* Engl., *H. sulcata* Engl. are all now considered junior synonyms of *H. griffithii*.

Alderwerelt (1922) added one further species, *Homalomena obscurifolia* Alderw., which is readily distinguished by the leaf blade only about half the length of the petiole and the few primary lateral few arising from the basal third of the midrib.

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