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The Aroids of the
Matang Massif
Sarawak, Malaysian Borneo
I: Kubah National Park

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The Matang Massif comprises a sandstone block rising to more than 900 m (2980 ft) above sea level situated roughly 22 km (13.5 miles) NW of Kuching. Together with two isolated but geologically similar peaks – Gunung (Mount) Singgai and Gunung Berendang – the Matang Massif forms an area of outstanding biological importance not only because of the uninterrupted tropical forest encompassing a variety of ecologies but also because of the historical links to Odoardo Beccari (1843 – 1920), an Italian botanist and naturalist who can be rightly regarded as one of the founding figures of biological research in Sarawak.

Beccari was born in Florence, and after graduating spent a few months at Kew Gardens where he met Charles Darwin and William and Joseph Hooker, and also James Brooke, then Rajah of Sarawak. The latter was a useful connection, as Beccari had already decided to explore Sarawak, and sailed there from Southampton in April 1865, staying for three years. Initially Beccari was provided with a bungalow near the Brook Palace in Kuching but later had constructed a house he named Valle Ombroso (Shady Valley) situated on the flanks of the Matang Massif from where many of his botanical collections originate, including numerous species of aroids that were later worked up by the giant of 19th Century aroid taxonomy, Adolf Engler. Beccari's book based upon his time in Sarawak and Brunei ('Wanderings in the Great Forests of Borneo') is an outstanding example of early biological writing and opens a window on the world of tropical research at a time when Sarawak was truly an unspoiled tropical paradise.

The aroids of the Matang area are too rich and diverse to cover in a single article and we propose to cover the main trails of the Kubah National Park in this and the next part and then the minor trails and the rest of the Massif in a further two articles. Having said that, our knowledge of the aroid flora for much of the Massif is still patchy, especially so for Berendang and the Sungai (river) Adis (the river system separating Berendeng from the main part of the Matang Massif, and almost every fieldtrip reveals either a new record or a species to which we are unable to assign a name with confidence.

Protection

By various means the entire Matang Massif is protected. On the east flank protection is provided by water catchments that supply the Sungai Bungen and Sungai Cina watersheds, from which Kuching draws its domestic water supply, and by the Kubah National Park which includes the lowermost flanks and plateau but not the summit of the highest peak, Gunung Serapi. The summit of Serapi is protected by commercial and military telecommunications towers and their associated facilities. The western flanks of the Massif are protected by the presence of an important Hindu temple, Maha Mariamman Temple, while Gunung Senggai is an important Christian retreat and Gunung Berendang is protected in the main by its sheer inaccessibility, being situated on the far side of the flood plain of the Sungai Adis, an intricate series of intercrossing river channels separated by large areas of forested

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sandbanks and islands that are virtually impossible to access without boats.

Kubah National Park

Within Kubah N.P. are numerous marked trails lending access to most of the biomes that the park includes. For the first-time visitor to Kubah the Summit Trail, a sealed road leading from the Park H.Q. at 60 m asl (c. 200 ft) to the summit of the highest peak, Gunung Serapi at 911 m asl (c. 2990 ft), provides a gentle introduction to the park's three main ecologies as it passes through lowland mixed dipterocarp forest on deep soils, a zone of *kerangas* (tropical heath forest) and ends at the sub-summit plateau and summit comprised of upper hill forest interspersed with areas of nutrient deficient deep peat (podzols).

Around the Park H.Q. large clumps of *Alocasia scabriuscula* N.E. Br. (**Figures 1 & 2**) are noteworthy, and even though these have been planted, the species also occurs naturally in the park. The thickly textured leaves, mid-green in shade but almost pearl-grey in exposed positions, are held on often sandpapery maroon-speckled petioles while the clusters of waxy white, red-spattered inflorescences are most distinctive. *Alocasia scabriuscula* is a variable species and may consist of several cryptic taxa that differ not only in subtle morphologies but also ecologically. Typical *A. scabriscula* is a plant of inundated alluvium in full to partial sun; to date only the element always associated with shaded limestone cliffs has been recognized as distinct – *Alocasia ridleyi* A.Hay.

Another common aroid near the H.Q., this time not planted, is the liane *Rhaphidophora elliptica* Ridl. (**Figure 3**) with oblong green leaves on petioles carried in neat ranks along a curiously angled stem up into the canopy. The plants in exposed positions around the H.Q. are rather small; in deep forest this climber reaches into the tops of the tallest trees and produces single chrome yellow inflorescences from the tips of the free shoots . Less common on the trees is *Scindapsus longistipitatus* Merr. (**Figure 4**) with glossy deep green leaves and rolling pin-sized inflorescences arising only from clinging shoots that readily differentiates *S. longistiptatus* from another common Kubah species, *S. hederaceus* Miq. in which the leaves are pale, dull green and the single, cigar-sized spadix is carried on the tips of long, free lateral shoots.

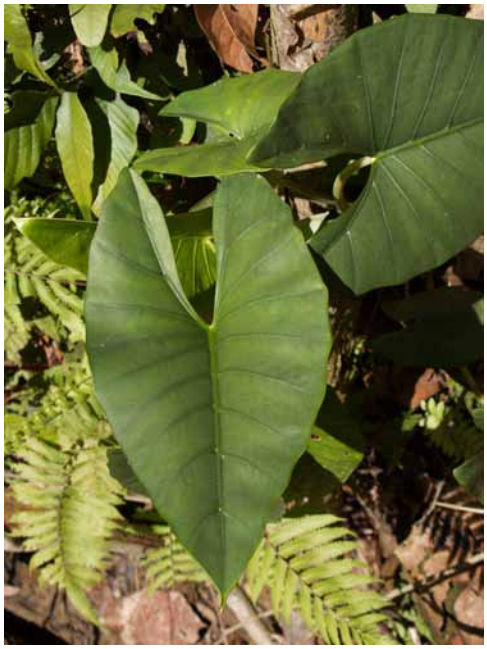

Figure 1: *Alocasia scabriuscula* N.E.Br. with distinctive thick-textured leaves turning grey in exposed situations.

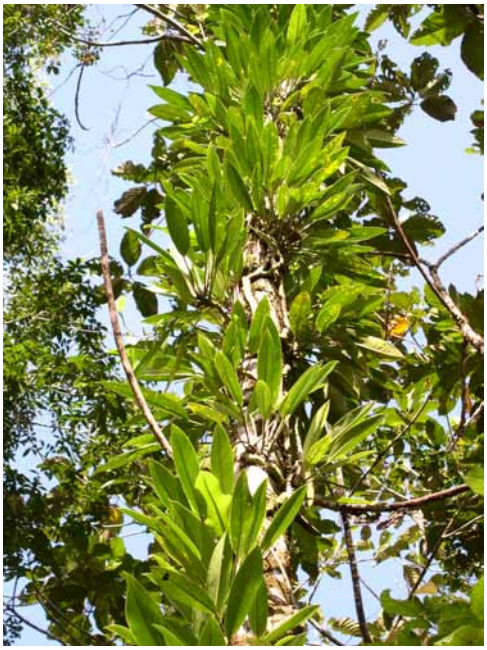

Figure 3: *Rhaphidophora elliptica* Ridl.

Figure 2: *Alocasia scabriuscula* N.E.Br. with clusters of waxy white inflorescences.

Figure 4: *Scindapsus longistipitatus* Merr. Note the distinctive long, winged and channeled petioles.

Summit Trail

Almost immediately after leaving the H.Q. on the Summit Trail, aroids become obvious in the trailside lowland dipterocarp forest. Large clumps of *Schismatoglottis asperata* Engl. (**Figure 5**) with curiously soft rubbery-textured leaves carried on sandpapery-warty petioles (**Figure 6**) occur in shady seepage areas along the forest margins. The leaves of this species are remarkably variable, with plants in a single population displaying a wide range of markings ranging from plain unmarked deep olive-green via silver and paler green banding through to heavily marbled and spotted in three shades of green and silver. Matang is the type locality of *S. asperata* with the specimen used to describe it originating from Beccari's work

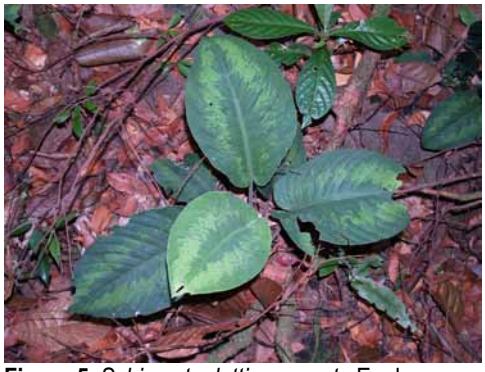

Figure 5: *Schismatoglottis asperata* Engl., one example of the leaf variation present in Kubah.

Figure 6: *Schismatoglottis asperata* Engl. displaying the distinctive rough petioles**.**

Another common aroid of the lower part of the trail is *Schismatoglottis tecturata* (Schott) Engl. (**Figure 7**), a diminutive species with pendent leaves in deep matte green, with or without a central silvery band, occurring on vertical earth banks in medium shade. *Schismatoglottis tecturata* is unusual among the genus in having a spathe in which only the margin of the spathe is shed during anthesis; in most other spaces the entire spathe limb above the constriction is lost at some point between female and male anthesis. *Schismatoglotti tecturata* was originally described from cultivated plants in the collection of Heinrich Schott, in Vienna and stated as simply originating from 'Borneo'; later it was redescribed under the name *S. beccariana* Engl. together with the variety *albolineata* Engl., both names are based on Beccari specimens originating from Matang.

Figure 7: *Schismatoglottis tecturata* (Schott) Engl. with the distinctive marcescent spathe limb margin.

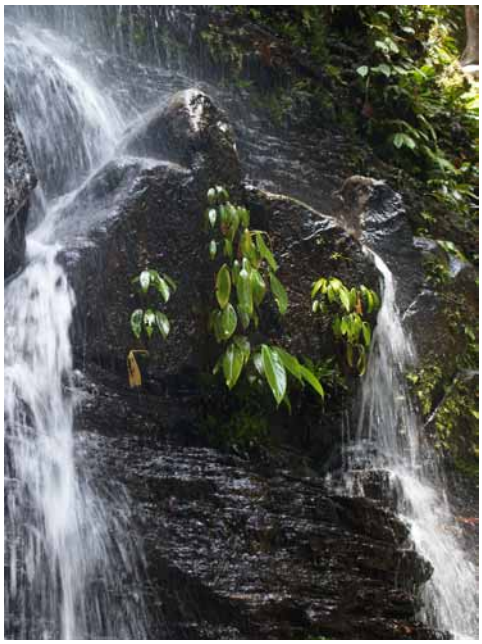

Figure 8: *Aridarum borneense* (M.Hotta) Bogner & A.Hay in habitat in the flow of a waterfall.

Aside from two named trails, the Rayu Trail that leaves the Summit Trail at about 275 m (c. 900 ft), and the Waterfall Trail that splits from the Summit Trail at c. 300 m (1000 ft)), there are several smaller unnamed trails leading from either side of Summit Trail which provide access to wetter, shadier habitats. About 10 minutes walk from the H.Q. a large culvert passes under the road to allow a small stream (the Sungai Bungen) to enter a narrow valley via a large waterfall and then eventually join a larger river (the Sungai Cina) that can be heard flowing in the deep valley below. Following the Sungai Bungen from the trail and along the edge of the sandstone bluff leads to a small manmade dam. This is the type locality of *Aridarum borneense* (M.Hotta) Bogner & A.Hay (**Figure 8**), a remarkable rheophytic aroid with neat fans of pale green stiffly leathery leaves held out almost vertical from the exposed sandstones and shales (the latter revealed by water action) on the deep shady cliffs and rocks along the river course. The *Aridarum* habitat is shared with other rheophytes including *Schismatoglottis multiflora* Ridl. (**Figures 9 & 10**), *Piptospatha grabowskii* (Engl.) Engl. (**Figure 11**) with its distinctive nodding pink spathes, and slender-leaved *Homalomena paucinervia* Ridl. (**Figures 12 & 13**), while saturated ledges on the sandstone cliff provide a habitat for *Homalomena lancea* Ridl. with its tidy rosettes of thick, deep green leaves. Remarkably all of these species with the exception of the *Piptospatha* were first described from Matang. Further up the cliffs and away from the constant flow of water can be found curtains of pendent leaves of *Schismatoglottis mayoana* Bogner & M.Hotta (**Figures 14 & 15**), yet another species based on a type specimen originating from this remarkable mountain system.

Slightly further along a side trail departs from the Summit Trail into a shallow valley that cuts through the sandstone to produce a pebble-based stream with earth banks. Large fans of *Homalomena crassinervia* Ridl. (**Figure 16**), another Matang speciality, are common here. *Homalomena crassinervia* is superficially similar to *H. geniculata* (a species from east of the Batang (big river) Lupar) but has the leaves broader and rather thicker textured and somewhat elliptico-oblong and markedly glaucous beneath. Also here is to be found a complex assemblage of *Homalomena* including *H. borneensis* Ridl. (**Figure 17**) (this may or may not be synonymous with *H. hostiifolia* Engl.) and several cordate-leaved species that as yet have defied attempts at identification. From this point the Summit Trail begins to climb quite steeply while the forest on either side begins to take on a *kerangas* aspect, with the tree canopy lower and less dense and the soils consisting of deep sandy peat. Such habitats are much less rich in aroids, although the occasional patch of damper *kerangas* (*kerapas*) forest will support *Alocasia beccarii* Engl. (**Figure 18**) with its stiff

deep green boat-shaped leaves and a low climbing *Scindapsus* with exceptionally stiff leaves and either single or few-grouped clusters of thick, white spathes. This group is currently referred to as the *coriaceous* group and in all probability comprises many species that are superficially similar. The name *Scindapsus rupestris* Ridl. has been published for the Bau area (the adjacent area to Matang) and this name seems to apply to the element with a single inflorescence that is strongly clove perfumed at anthesis that is present on Matang (**Figures 19 & 20**).

At c. 700 m the Summit Trail enters a deep cutting with steep shady sides topped with upper hill forest. The flushes on this cutting and the forest above house further colonies of *Schismatoglottis asperata* along with stands of

Figure 9: *Schismatoglottis* multiflora Ridl. in habitat. Note that the inflorescence in anthesis has already shed the spathe limb.

Figure 10: *Schismatoglottis multiflora* Ridl. Close up of the inflorescence at the onset of male anthesis with the spathe limb beginning to shed.

Figure 11: *Piptospatha grabowskii* (Engl.) Engl. with its distinctive nodding pink spathes.

Figure 12: *Homalomena paucinervia* Ridl., a rheophytic species with typically narrow, tough leaves.

Figure 13: *Homalomena paucinervia* Ridl., the entire spathe is less then 1 cm long.

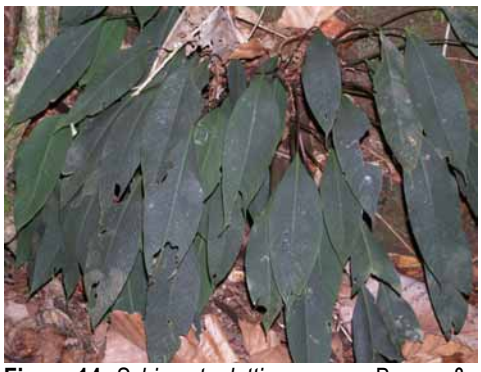

Figure 14: *Schismatoglottis mayoana* Bogner & M.Hotta with pendent, matte olive-green leaves.

Figure 15: *Schismatoglottis mayoana* Bogner & M.Hotta in late bud.

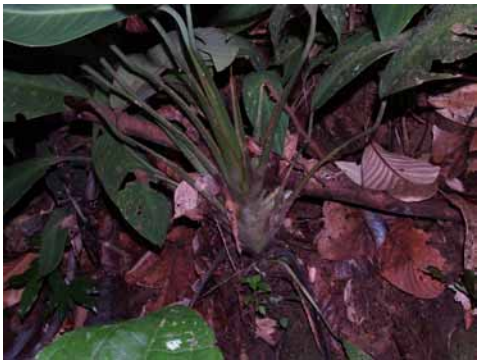

Figure 16: *Homalomena crassinervia* Ridl. displaying the distinctive tight fans of leaves.

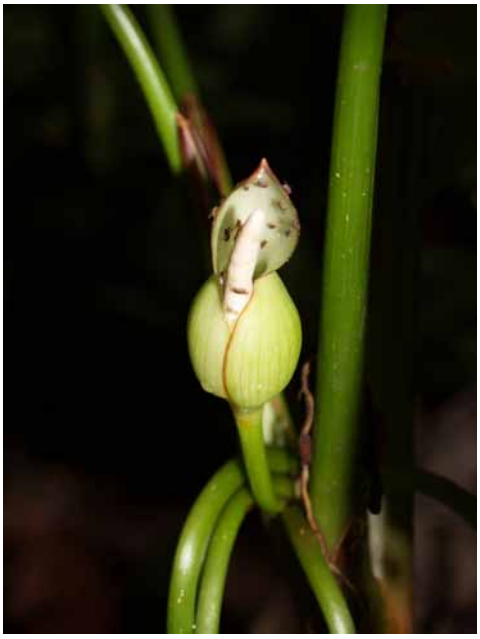

Figure 17: *Homalomena borneensis* Ridl. at female anthesis with numerous Diptera visitors.

Figure 21: *Homalomena insignis* Ridl. with clusters of relatively large, anise-perfumed inflorescences.

Figure 18: *Alocasia beccarii* Engl. in habitat. Note the white sand soils typical of the kerangas habitat favoured by this species.

Figure 19: *Scindapsus* rupestris Ridl. is one of a group of several very similar species. Note the smooth, stiff green leaves.

Figure 20: *Scindapsus rupestris* Ridl. is readily separated by the solitary, thick-spathed inflorescence strongly fragrant of cloves.

Figure 22 *Rhaphidophora latevaginata* M.Hotta with the shingle-leaves closely pressed to the climbing surface.

Figure 24 *Rhaphidophora korthalsii* Schott with its distinct wide leave divisions.

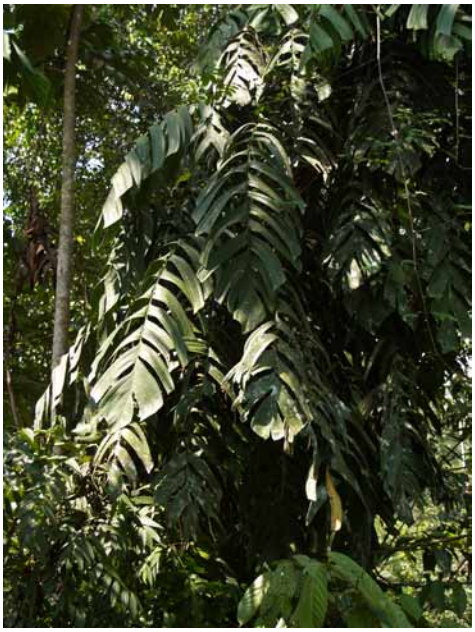

Figure 23: *Rhaphidophora korthalsii* Schott with its distinct wide leave divisions.

Homalomena insignis Ridl. The latter is a very handsome plant with the leaves iridescent emerald green above and, in many forms, plum-red below on deep red petioles. The inflorescences are large for the size of the plant and pure white with a strong aniseed smell at anthesis (**Figure 21**). The trees above are clothed with large plants of *Rhaphidophora latevaginata* M.Hotta (**Figure 22**), a species with bluish green leaves that overlap in the manner of roof tiles; the stems spiralling up the trunks and the leaves gradually increasing in size but, unlike the closely related *R. korthalsii* Schott (**Figure 23**) (which is abundant in the riverine forest that can be found along the Rayu and Waterfall Trails) and *R. tenuis* (**Figure 24**) (found occasionally in the ridge top *kerangas* on the Rayu and Main Trails), the leaves of *R. latevaginata* never morph into the deeply divided adult leaves but rather remain in the juvenile state even on flowering plants.

... to be continued in the next issue