

Limestone Plants of Gua Labua

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The Gua Labua limestone hills are located within the Ulu Muda Forest Reserve, Kedah. The discovery of limestone in the area is significant because it is possibly the only limestone area between Baling (to the south of Ulu Muda) and Yala Province in Thailand. This outcrop is not recorded on any geological map perhaps because its summit is below the tree canopy and is not visible from the air.

Following reports from local people that there were caves in the area, in 2006 Hymeir Kamarudin and Rohani Rahmani from the Malaysian Nature Society (MNS) investigated and confirmed that they were limestone hills, and that the larger contained two moderately large caves.

The northern element of the Peninsular Malaysian flora

The northern phytogeographic element (from Alor Star in Kedah to Perlis) shares many similarities with the monsoon forest flora of southern Thailand. One such northern species is *Tetrameles nudiflora* (Datisceae). This large tree thrives on limestone rocks and is the dominant tree around the base and lower levels of the outcrop. In common with monsoon species, it is deciduous and flowers on bare twigs. Although common, it has rarely been collected in flower.



▲ Flowers on bare twigs.

▼ The huge, steep buttresses of *Tetrameles nudiflora*.

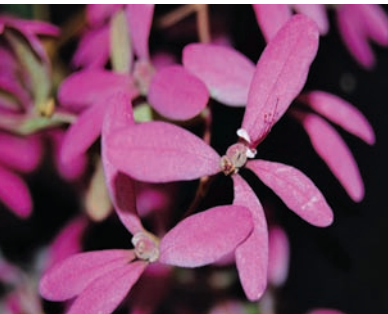


▲ Gua Labua in the Ulu Muda Forest Reserve.

The survey of the flora and caves of the newly-discovered Gua Labua, sometimes called Gua Labu, was carried out jointly by FRIM, WWF-Malaysia and participants from Malaysian Karst Society and Malaysian Nature Society Kedah Branch in early March 2008. Access is from the Sungai Labua that drains into the Tasik Muda reservoir. Plants were collected from Kuala Labua to Gua Labua (Gua I and II).



▲ *Nervilia calcicola* is a new orchid record for Kedah.



▲ *Congea griffithiana* var. *griffithiana* with small white flowers surrounded by large pink bracts.

Nervilia calcicola (Orchidaceae) produces flowers after its single heart-shaped leaf has died down. It is common in wet, low-lying areas in the lowland forest and contrary to what its name suggests, it is not usually found on limestone rocks. This rare species is endemic in Peninsular Malaysia and peninsular Thailand and presently is known from Langkawi, mainland Kedah and Perlis.

The large vine, *Congea griffithiana* var. *griffithiana* (Labiatae), is a very beautiful high climber with bright pink bracts.

It is distributed from Gurun (Kedah), north through peninsular Thailand to Myanmar (Tenasserim).

A notable difference in the understory herbaceous flora compared with elsewhere in Peninsular Malaysia was the prevalence of Acanthaceae species (at least 4 genera and 6 species) and, conversely, the absence of genera that are usually common further south, such as *Argostemma* (Rubiaceae), *Cyrtandra* and *Henckelia* (Gesneriaceae), and *Sonerila* (Melastomataceae). Species of the small tree *Oreophora* (Annonaceae) were well represented with 3 of the 8 Peninsular Malaysian species. While the northern element was well represented in the area, the limestone hills supported few species (*Chirita involucrata* and *Epithema saxatile*, Gesneriaceae) that are restricted to limestone, probably due to the small size of the hills and the fact that their summits do not rise above the tree canopy, so that characteristic sun-loving species, such as *Paraboea* species (Gesneriaceae), were not found. Nevertheless, it is a significant area for conservation because of the number of rare species found on and around the limestone hills.



▲ *Paranephelium macrophylla* (Sapindaceae), one of the commonest trees growing on the limestone outcrop.

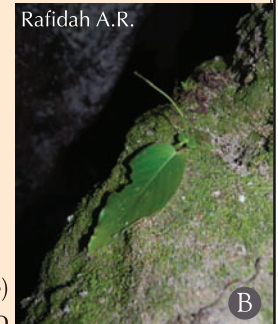
Rare limestone species



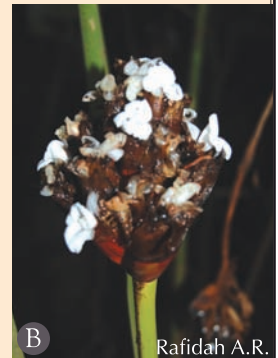
◀ Shrubby *Capparis acutiflora* (Capparaceae) grows on limestone boulders. This species is a new record for Peninsular Malaysia and the southernmost locality of this Indian species. Its flower has spreading stamens.



Chirita involucrata (Gesneriaceae) is a delicate species restricted to the limestone hills of Kedah and Kelantan. At Gua Labua, it was found only around one shaded cave mouth-red circle (A). The plant begins to flower when it has only one or two leaves (B).



Phrynium obscurum (Marantaceae), a new record for Peninsular Malaysia for this Thai species, is robust with delicate white flowers and red fruits. Habit (A) Inflorescence (B).



The Cicada Tree

The ground below several *Paranephelium macrophylla* trees was wet from a steady dripping of liquid from the tree canopy. Around one of these trees was a large number of moulted cicada exoskeletons and several were seen close by on another tree indicating that the rain was caused by cicadas feeding on trees and expelling excess honeydew. At Gua Labua, only one tree species, *P. macrophylla*, and apparently the same cicada, the Green Cicada, *Dundubia vaginata* (identified by S. Azman from Universiti Kebangsaan Malaysia) were involved. This phenomenon has also been reported from several *Shorea* (Dipterocarpaceae) species.

Acknowledgements

Special thanks to Ms. Avelinah Julius for identifying *Capparis acutiflora*, Mr. P. Suksathan for *Phrynium obscurum* and Mr. S. Azman for *Dundubia vaginata*.

Alien Vine Running Wild in Cameron Highlands

By Yao, T.L. (yaotzeleong@frim.gov.my)

In May 2007 while walking along the winding streamside trail in the Parit Falls Forest Reserve, Cameron Highlands, a bunch of showy mauve flowers caught my eye. Intrigued by the size of the bell-shaped flowers, which were almost up to 6 cm across, I stopped to scrutinize the plant more closely.



The rampant vine growing along the forest edge.

It was a herbaceous climber scrambling over exposed roadside scrub. With its branched tendrils each ending in a pair of claw-like hooks, it was poised to smother other herbs beneath. The stem was tinged purple and the showy mauve corolla sat on a five-lobed light green calyx with whitish veins. The colour of the corolla appeared to fade with age.

This Cup-and-Saucer Vine, aptly named for its large cup-shaped corolla sitting on a saucer-shaped calyx, is known as *Cobaea scandens* (Polemoniaceae). The family originates from Central America and is not native to Malaysia.

It was first recorded growing wild in Cameron Highlands in May 2007. It was collected again, in February 2008 at the same locality, from a rampant plant covering a tree about 20 m tall. The species is undoubtedly naturalised and apparently well-adapted to local conditions. Cameron Highlands is a horticultural hotspot prone to alien species invasion.

Would the niche competition between native climbers and this newly introduced *Cobaea scandens* have a negative impact on the survival of native herbaceous climbers in Cameron

Highlands? Present observations suggest that it is unable to penetrate the forest. However, through competition it may eventually displace native forest margin species, as shown by other alien species occupying forest margins in Peninsular Malaysia.

Acknowledgement

I am grateful to Dr Francis Ng for identifying the specimen.



The showy flowers of the Cup-and-Saucer Vine *Cobaea scandens*.

Macrofungi from the Morib, Kuala

Intertidal mangrove forests support diverse and characteristic communities of flora, fauna and microorganisms. In such forests, fungi are among the best decomposers and therefore play an important role in the shoreline ecosystem. Some macrofungi occur in marine habitats where high salinity conditions prevail, examples are *Nia vibrissa*, *N. epidermoidea* and *N. globospora* found on fully submerged substrates such as driftwood and sunken ships. Others such as *Halocyphina villosa* and *Calathella mangrovei* are usually found on mangrove substrates.

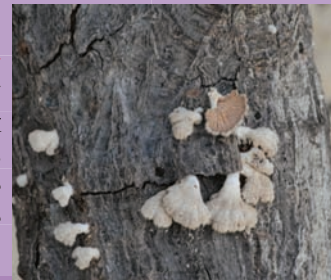
Macrofungi were collected from decaying trunks, branches, twigs and roots of trees that occur on or above the tide line at Kuala Selangor and Morib in Selangor and Port Dickson in Negeri Sembilan. Macrofungi collected from the mangrove areas were attached to mangrove wood substrates. No macrofungi were found growing on the soil probably due to the instability of the soil and changing tides. At all sites, *Rhizophora apiculata* was the dominant tree on which the fungi were found although at Port Dickson, macrofungi were also found attached to *Sonneratia alba*.

At all sites, we found...



Fomitopsis ostreiformis (family Fomitopsidaceae) is widespread in the mangrove areas. The fruiting body may be formed in a single layer or in several imbricate layers. This species is found attached to decaying branches and trunks of *Rhizophora apiculata* at almost every 50m in the Morib mangrove.

Schizophyllum commune (Schizophyllaceae) known locally as 'kulat sisir', is an edible fungus. It is one of the most widespread fungi in the world. In the mangrove area it grows on the bark of *R. apiculata*. The gills on the underside of the fruit body split when it dries out thus giving rise to the name of the genus which means "split gill".



▲ *Hexagonia* cf. *tenuis* (Polyporaceae) is a bracket fungus also common in inland forest.



▲ *Phellinus* sp. A (Hymenochaetaceae), growing on *Sonneratia alba*, is hoof-shaped and has several concentric coloured rings on its upper surface.

▲ Monkey's ear (*Auricularia auricula*, Auriculariaceae, 'telinga kera') is edible and sold in dry form in local markets. It is especially popular among the Chinese who consume it for good health.



▲ Attached to *Sonneratia alba*, this perennial bracket fungus, *Inonotus* sp. A (Hymenochaetaceae), has coarse hairs on the cap surface. Sometimes the pileus is sessile or effused-reflexed.



mangrove forests in a Selangor and Port Dickson

By Nazura, Z. (nazura@frim.gov.my), Lee, S.S. & Siti Aisyah, A.

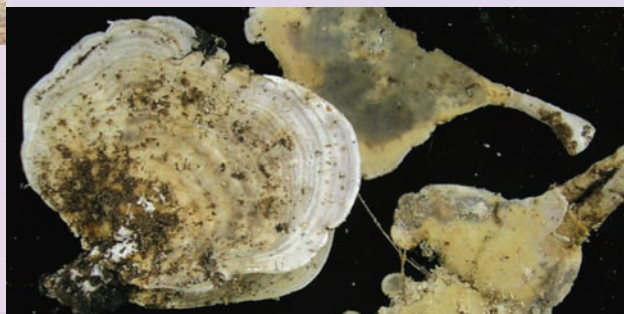
Being found at all sites, *Fomitopsis ostreiformis* and *Schizophyllum commune* were the most widely distributed macrofungi in mangrove areas. They were found growing on the living branches and trunks of *Rhizophora apiculata*. With the exception of these two species, species which were found at any one site were not found at the other sites. A few species such as *F. ostreiformis*, *Phellinus* sp. A and *Phellinus* sp. B, *Hymenochaete* sp., *Innonotus* sp. A and *Innonotus* sp. B were found on every collecting trip whereas other species were only found occasionally.



▲ Tips of the erect fruiting bodies of *Xylaria* sp. (Xylariaceae) are covered with a greyish white powder formed by asexual spores or conidia. It grows gregariously on decaying trunks of *R. apiculata*.

More from Kuala Selangor...

The decaying fruiting body of *Rigidoporus defibulatus* (Meripilaceae) was collected near the tide line. It has an eccentric stipe and flexible fruiting body. ▼



Growing on decaying trunks of *R. apiculata* is an agaric mushroom, *Mycena* sp. (Mycenaceae). ▼



Others from Morib...



a) *Innonotus* sp. B (Hymenochaetaceae) has a bumpy surface with coarse brown hairs. Fruiting bodies were found throughout the year attached to decaying trunks of *R. apiculata*.

b) The saprophytic *Dacryopinax spathularia* (Dacrymycetaceae) is also common on dead logs in inland forests.



c) *Pycnoporus sanguineus* (Polyporaceae), common on dead wood, has a flexible, bright orange fruiting body with a thin context.

d) *Stemonitis axifera* (Stemonitidaceae) is most distinctive, producing tiny feather-like slender brown sporangia on black stalks up to 2.0 cm in height.



e) The fruiting body of *Corioloopsis* sp. (Polyporaceae) has several layers and a brown context.



f) *Hymenochaete* sp. (Hymenochaetaceae) has a spongy fruiting body covered with short erect hairs on the underside. It was found throughout the year growing on trunks and roots of *R. apiculata*.

g) A pathogenic *Phellinus* sp. B attached to a living branch of *R. apiculata*.

Ex situ conservation of the endemic and critically endangered

Begonia herveyana

By Tan, J.P.C. (joannetan@frim.gov.my)
& Chan, Y.M.



Leaves are broad, ovate and rather symmetric with prominent red veins below, most having a red undersurface.

Begonia herveyana is endemic to Peninsular Malaysia and is confined to Malacca and Johor. Close monitoring of the population in Malacca indicated a size of merely 150 adult plants.

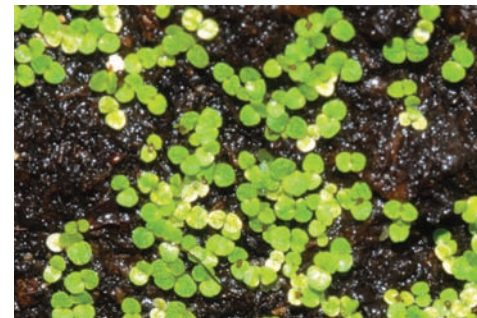
Like most foliage begonias, *B. herveyana* can be reproduced asexually by leaf propagation and sexually by seeds. We collected both seed capsules and leaves from wild plants. The leaves were cut into smaller pieces, parallel to the main veins. The cuttings were planted slanting about 0.5 to 1.0 cm into a soil medium and kept in a misting chamber with high humidity and low light intensity. We recorded 100% success using leaf propagation. However, after potting, the growth of these plantlets slowed down during the first six months. Application of fertilizer did not appear to help.

Within a month, sprouts emerged from the cuttings. Two months later, individual plantlets were ready to be potted.



The dust-like seeds were propagated conventionally and *in vitro*. In the conventional method, the seeds were carefully sprinkled evenly over the surface of a tray of peat moss and kept in a misting chamber. Germination occurred after 2 weeks and the seedlings were placed in the green house for more sunlight. After 2–3 months, the seedlings were transplanted into new community trays for further growth.

In vitro germination is a common method employed in plant conservation, which enables large numbers of seedlings to be raised in a relatively short time. Although seeds enclosed in a seed capsule are naturally uncontaminated, it is crucial for the surface of the capsule to be uncontaminated as well. The capsule was gently washed with soap water followed by several immersions in Chlorox, sterile water and alcohol, in a laminar flow chamber. Seeds from an opened capsule were placed on a folded, sterile filter-paper in a funnel, and washed with the sterilizing solutions. Direct exposure to sterilizing solutions apparently did not damage the seeds as they germinated at about the same time as those from intact capsules, i.e., at 21 to 28 days. The germination success was estimated to be more than 80%.



They may be tiny but they are certainly robust!



(a) Germination after one month. (b) After 2-3 months, the seedlings were ready to be transplanted. Note that these seedlings were of the same age and sown from the same seed capsule as above.

From our experience, it is relatively easy to get uniform seedlings from seed germination, but it is tedious to grow seedlings via this method compared to leaf propagation. The growth of *in vitro* seedlings was faster compared to those grown by the conventional method.

Begonia herveyana grows well using all the above methods. For conservation purposes, conventional and *in vitro* seed germination are more appropriate compared to leaf propagation as these approaches conserve greater amounts of genetic diversity. Leaf propagation is, however, very useful when there is no seed available and when domestication and propagation are the primary aims. *In vitro* propagation is suitable for rapid mass production for domestication purposes. The choice of an appropriate propagation method therefore depends on the objectives of the propagation and the availability of mother plants and resources.

Suggested reading

Chua, L.S.L., Kiew, R. & Chan, Y.M. 2007. Assessing conservation status of Peninsular Malaysian begonias. Paper presented at the 7th Flora Malesiana Symposium, 17–22 June, Leiden, the Netherlands.

Kiew, R. 2005. Begonias of Peninsular Malaysia. Natural History Publications (Borneo) Sdn. Bhd. & Singapore Botanic Gardens.

McHoy, P. 2005. How To Keep Houseplants Alive and Happy. Anness Publishing Ltd.

Aeginetia acaulis The Ephemeral (Orobanchaceae)

By Chan, Y.M. (yokemui@frim.gov.my)

***Aeginetia acaulis* (Roxburgh) Walpers**
(Syn *Orobanche acaulis* Roxburgh, *Aeginetia pedunculata* (Roxburgh) Wallroth, *Orobanche pedunculata* Roxburgh)

In July 2008, Mr. Abdullah Piee and I were on a mission to find two species of critically endangered begonias (*Begonia abdullahpieei* and *B. rhyacophila*) in Kelian Gunung, Perak. When tramping up the Sungai Lata Puteh waterfall (150 m altitude), we were greeted by a charming cluster of crimson-coloured flowers that stood out against the green backdrop of a fern carpet, on a moist earth bank. The plant has a short stem and reduced leaves. Buds were found on bare rootlets of a nearby tree and we spied another population on a hill slope of the adjacent Sungai Tebing Tinggi at an altitude of 240 m asl.

The species turned out to be the rarely sighted *Aeginetia acaulis*. It is a parasitic herb without chlorophyll that parasitizes the roots of non-gramineous plants such as *Cyrtandra*, *Ficus*, *Piper*, *Saurauia*, *Schismatoglottis* and *Staurogyne*. Malaysia has only two species, the other being *A. indica*. *Aeginetia indica* is also rarely seen and was recently

recorded from Gunung Perlis on the border between Malaysia and Thailand.

Last collected in 1954, *Aeginetia acaulis* is only known from the Batang Padang valley in Perak (610 m altitude) and Hulu Langat in Selangor (365 m altitude). Little is known about its lifecycle or reproductive behaviour, only that it flowers from June to December. The plant grows on roots in moist or muddy soils and apparently blooms during the rainy season.

The conservation status of *Aeginetia acaulis* is unknown – we do not know whether it is really rare or simply rarely seen because it flowers for only a very short time. It may however, be noted as vulnerable in Peninsular Malaysia because of its restricted distribution.

The existing population in Sungai Lata Puteh is within a watershed area, and is thus protected, while the population in Sungai Tebing Tinggi is in a secondary forest with dense shrubs and open canopy.

Specimens of *Aeginetia* must be quickly preserved in spirit because the soft tissue decays very fast. The delicate and brittle flowers render making pressed specimens almost impossible.



1. The bright flowers of *Aeginetia acaulis* spotted among ferns and shrubs on a moist earth bank next to a waterfall. The plant is parasitic on tree roots.
2. A cluster of buds emerging from the root of its tree host.
3. A dissected flower reveals four white stamens adhering to the style.
4. The inflorescence flaunting its crimson colour with a spathe-like calyx and tubular corolla and a striking yellow stigma.
5. *Aeginetia indica* in Sarawak.



Giant Voodoo Lily

By Tan, H.S. (tanhuisin@frim.gov.my)

It was in May 2007 at Gunung Gading National Park in Sarawak that we had our very first encounter with the Giant Voodoo Lily (*Amorphophallus hewittii*, Araceae). The putrid smell of rotting flesh emanating from its flower was a dead giveaway, we had no difficulty in finding the plant.

Typically in a flowering *Amorphophallus*, there are no leafy parts. The inflorescence measured up to 1.5 m tall and had a creamy spadix borne on a 85 cm stout peduncle. The spadix was partially protected by a colourful spathe, producing a strong odor of decaying flesh to lure flies and beetles. The entire contraption is an insect-trap and has a specific function in pollination. Attracted by the smell of food, these insects enter the spathe, browse and forage, and in the process, deposit pollen grains collected from the male flowers onto female flowers.

Apparently this species flowers very rarely (P.C. Boyce, pers. comm.) despite being common and widespread. Specimens with flowers are rarely available so we were really lucky that day.

Amorphophallus is a Greek name meaning *amorphous* (deformed) and *phallus* (penis) (Mayo *et al.* 1997). The genus comprises about 100 tuberous species occurring in tropical Asia and Africa. The one that we found in Gunung Gading is the largest species of the genus in Borneo. Partly due to its impressive dimension, it is often mistaken for *A. titanum*, which is restricted to Sumatra. This species is closely related to *A. borneensis* from southeast Kalimantan and *A. lambii* from Sabah.

Amorphophallus hewittii is endemic to Sarawak and grows on rich forest soils amongst limestone and granite formations. This is the only species that grows on a variety of soils, ranging from granitic (e.g., at G. Gading) to shales (e.g., at G. Mulu) and sandstone (at G. Matang). It is possible that this species actually comprises several very closely related cryptic taxa. Molecular research and detailed studies on pollination biology are required to confirm this.



▲ *Amorphophallus hewittii* at G. Gading.



▲ Thankfully I am taller than the Giant Voodoo Lily!

Suggested reading

Ridley, H.N. 1925. The Flora of the Malay Peninsula Vol. 5. L. Reeves & Co., London. Pp. 92–95.

Mayo, S.J., Bogner J. & Boyce, P.C. 1997. The Genera of Araceae. Royal Botanical Gardens, Kew. 370 pp.

<http://www.aroid.org/genera/amorphallus/> (Accessed 17 Aug. 2007)

<http://www.malesiana.com/plant/10Expand.asp?ProductCode=AM-9> (Accessed 9 Aug. 2007)