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Sterculia megistophylla at Sepilok, Sabah

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In May 2008, while doing botanical collection in the Rainforest Discovery Centre (RDC), Sepilok, Sabah, bunches of showy humongous red fruits on a tree trunk caught our eyes. It looked like a *kelumpang* (*Sterculia*) but the fruits were enormous, measuring over 40 cm across. I (the first author) was very much attracted to the splendid display. The tree turned out to be *Sterculia megistophylla*, known as *melebu* or *biris merah*. This is a rare species, not often seen in the forest but has a rather large range being recorded from Sumatra, Peninsular Malaysia and Borneo. In Borneo, it is known only in Sarawak and it inhabits the lowland mixed dipterocarp forest and occasionally in the *kerangas* forest, below 1,000 m altitude.

Upon further inquiries of the planting at RDC, we were informed that the seeds of this magnificent tree were collected by Mr. Leopold Madani from Lanjak-Entimau Wild Sanctuary, Sarawak in 1993. The collection was made during the Tree Flora of Sabah and Sarawak project expedition. Credit to Leopold, he planted the seedlings along the RDC Lake a year later. These trees have started fruiting. The strikingly large and bright reddish-orange fruits cauliflorous on tree trunks have become a huge attraction to visitors. Back at the Forest Research Institute Malaysia, L.G. Saw, who made the collection (FRI 39846), mentioned that even when first seen in the forest, it was a spectacular sight with bright red follicles appearing on the tree trunk.

The tree we saw is about 8 m tall and 12 cm in diameter. It has a smooth, orange-brown bark and the leaves are spirally arranged, papery to somewhat leathery, oblong-ovate in shape, with a rounded base and acuminate apex. The most attractive part of the tree is the bunches of reddish fruits in clusters of five, beset with dense stellate hairs and its inner surface is glabrous on the inner surface. There are about 10–12 seeds in each follicle; these seeds are ellipsoid, white when young and black when ripened.

An unfortunate name...

The generic name *Sterculia* means faeces (*stercus*) in Latin. It refers to the unpleasant faecal odour of the flowers. The epithet *megistophylla* is taken from *megistos* meaning very large and *phylon* meaning leaf; referring to the very large leaves in Greek. Fortunately, the species bears spectacular fruits which impresses people with its beauty rather than its name.

Acknowledgements

Thanks to Mr. Leopold Madani, Mr. Joseph Tangah and Mr. John B. Sugau from Forest Research Centre, Sandakan for providing historical information and Dr. L.G. Saw for providing the photographs.

Suggested reading:

Ashton, P.S. (1988). Sterculiaceae. Manual of the Non-Dipterocarp Trees of Sarawak 2: 415.
Tantra, I.G.M. (1976). A revision of the genus *Sterculia* L. in Malesia (Revisi marga *Sterculia* L. di Malesia) (Sterculiaceae). Pengumuman Lembaga Penelitian Hutan, Bogor 102: 93–94.
Wilkie, P. & Berhaman, A. (in press). Sterculiaceae. Tree Flora of Sabah and Sarawak. Volume 7.



▲ One can't miss this – the fruits are simply too startling!



Dehiscid follicles exposing black ripened seeds.



In search of the rare fern *Hypodematium glabrium* (Hypodematiaceae) from Gua Teja, Kelantan

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Gua Teja was first botanised by M.R. Henderson in 1935 as part of his survey of the limestone flora of Peninsular Malaysia. It was here that he collected the very rare fern, *Hypodematium glabrium* (Copel.) Holttum (Hypodematiaceae). In April 2009, we went in search of Henderson's Gua Teja and *H. glabrium*.

Where is Gua Teja? To answer this, we had to piece several clues together. The cave is not named on the topographic map nor was it listed by Davison and Kiew (1990) or Price (2001). There is a River (Sg.) Teja flowing into Sg. Betis from the north and it was along Sg. Betis that Henderson collected in 1935. There are five limestone hills along Sg. Betis near Fort Lambok. Could one of these be Gua Teja? By studying a photograph taken by Henderson in 1939, we were able to pin-point which of these hills is Gua Teja (Fig. 1). We now know it is located along Sg. Betis, west of Gua Musang in the state of Kelantan with coordinates 4° 54'N, 101° 46'E. From Gua Musang to Kuala Betis it is a 45-minute drive through *Ladang Melayu Orang Asli* village, crossing over Sg. Betis and on through oil palm plantations. To get to the base of the hill, a short walk through scrub is necessary.

Henderson's notes were too brief to give clues as to where it grew, whether at the base, on cliffs or at the summit. We skirted around the base of the hill which was almost impenetrable with thickets of prickly *Streblus ilicifolius* (Moraceae) until we reached the river



▲ Dr Hans Nooteboom with *Hypodematium glabrium* at Gua Renayang. ►

and it was here that we spotted the plant. Like other limestone species, it is restricted to lightly-shaded ledges and crevices that have a shallow layer of soil.

At Fort Lambok, we explored Gua Renayang (4° 53'18" N, 101° 45' 45" E) and Gua Senarip (4° 53'11" N, 101° 46' 05" E) (Fig. 1). Gua Renayang is home to the hyper-endemic *Paraboea lambokensis* (Gesneriaceae) and other species such as *Microchirita involucreta* and *Monophyllaea hirticalyx*.

Although *Hypodematium glabrium* is found on all three hills, each population has, strangely, less than five plants. The hills are readily accessible and farming activities around Fort Lambok have already led to weed invasion and canopy opening thus exposing the



Fig. 1. Gua Teja in the cluster of hills.

fern to full sunlight. This rare fern is under threat and we would classify it as critically endangered. Conservation of this species and *Paraboea lambokensis* through habitat protection are highly recommended.



Gua Teja from the road in an oil palm estate.



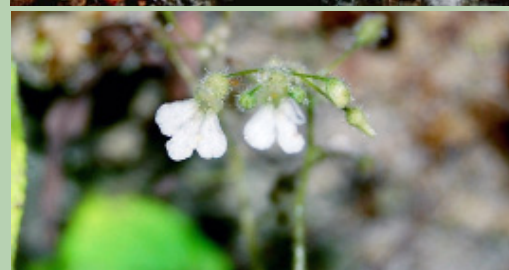
Gua Teja: a view from Gua Senarip.



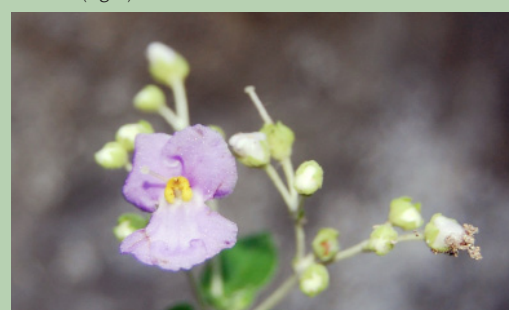
Microchirita involucreta (Gesneriaceae) is restricted to limestone.



Male flower (top), habit and female flowers (bottom) of *Begonia foxworthyi* (Begoniaceae).



Monophyllaea hirticalyx (Gesneriaceae). Habit (left), flowers (right).



Paraboea lambokensis (Gesneriaceae). Habit (left) and flowers (right).

In taxonomy, *Hypodematium glabrium* was originally placed in Davalliaceae but is now separated into Hypodematiaceae. *Hypodematium* has only one species in Malaysia and it is known from only two locations, i.e., Gua Teja and the Bidi limestones in Kuching (Sarawak).

Acknowledgements

Thank you to Pauzi Husin and Adam Rohemy Mohd. Raid for guiding us and to P.K.F. Leong (Singapore Herbarium) for providing specimen images of *H. glabrium*.

Suggested reading:

- Davison, G.W.H. & Kiew, R. 1990. Survey of Flora and Fauna of Limestone Hills in Kelantan with Recommendations for Conservation. Malaysian Nature Society. 98 pp.
- Henderson, M.R. 1939. The flora of the limestone hills of the Malay Peninsula. Journal Straits Branch Royal Asiatic Society 17: 13–87.
- Holttum, R.E. 1985. Two new species of *Tectaria* from limestone in Peninsular Malaysia, with comments on some other species. Gardens Bulletin Singapore 38: 145–148.
- Price, L. 2001. Caves and Karst of Peninsular Malaysia. Gua Publications (Kuala Lumpur). 98 pp.

Some Boletes in Peta, Taman Negara Endau-Rompin

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Peta is the eastern gateway to the Endau-Rompin National Park, Johor. This is the second largest national park in Peninsular Malaysia. It has one of the world's oldest rainforests and has volcanic rocks dating 240 million years. The park encompasses some 49,000 ha of primary lowland tropical rainforest and has some unique flora and fauna, including the endangered Sumatran Rhinoceros. An abundance of macrofungi can be found in the park, particularly during rainy seasons.

Boletes belong to the family Boletaceae, order Boletales, phylum Basidiomycota, kingdom Fungi. Their fruiting bodies look typically like mushrooms; the only difference is that the lamellae or gills in the mushroom are replaced by tubes, and on the underside of the cap, one sees the 'pores' which are the openings of the tubes. It is because of this that the boletes are often called fleshy pore fungi. In tropical forests they form ectomycorrhizas with trees in the families Dipterocarpaceae and Fagaceae. This is a crucial symbiotic association between the vegetative mycelium of the fungus and the young roots of trees; the roles of ectomycorrhizas are well described in numerous publications. The humid microclimate coupled with a rich diversity of host trees in our Malaysian forests support a wide diversity of boletes. This diversity is, however, difficult to enumerate because of fruiting seasonality and production of short-lived and often solitary fruiting bodies. The eminent mycologist E.J.H. Corner mentioned that 300 species of boletes in Malaysia would not be an exaggeration.

In September 2009, there was a run of boletes in Peta and many species, including new ones, were documented. Some interesting ones are shown here.



The fruiting bodies of *Boletus corrugatus* are about 20–53 mm in width. They are dry, olivaceous and woolly when young. The tomentum melts into viscid drops as the fruiting body ages.

◀ *Boletellus emodensis*. This common bolete of Malaysia and South East Asia fruits around the base of living tree trunks and on roadside slopes. Its wine red, scaly pileus and stipe, and large, bright yellow pores which stain blue when handled, are distinctive.





◀ The brown pileus and pale brown, lacerate to lacunose-reticulate stipe with white base is characteristic of *Boletus peltatus*. It generally fruits gregariously.



▶ *Tylopilus pernanus* is tiny, measuring only about 10–30 mm in height. It has pale pink pores and a pinkish tinge on the pileus and stipe. Often growing gregariously, it is common in lowland and hill forests.



◀ *Heimioporus japonicus* has a bright red fruiting body. It was very common and widespread during our visit. The pileus is dry and subvelutinous and the tubes are yellow, not staining blue. The stipe is ridged to sublacerate and overlain with a red pruina. This is the first report for the taxon in Malaysia.



▶ *Boletus longicollis*. This type-species of *Boletellus* sect. *Ixocephali* has a long viscid stem and pileus. Thought to be widespread but infrequent in lowland and mountain forests, we found it several times in Endau-Rompin.



◀ *Tylopilus plumbeoviolaceus* is commonly known as the violet-grey bolete. The purplish brown to dark reddish brown cap and the purplish stem are distinctive. Like most *Tylopilus*, the mushroom is inedible due to its bitter taste. It is suspected to be a new record for Malaysia.



▶ *Pulveroboletus ravenelii*, the type species of the genus, has a bright yellow pileus. A pulverulent veil, and tubes and inner flesh that change to blue upon injury are distinctive. It appeared to be very common during our visit.

Pulveroboletus viridisquamosus has distinct olive green scales on the pileus and stipe. This species is endemic to Malaysia.



Strobilomyces annulatus has the characteristic shaggy to scaly, blackish or grayish caps with partial veils and woolly stems of the genus. The flesh stains pink or orangish-red when sliced, slowly turning black. This species has an ample ring on the stem and large echinulate-subreticulate spores.



Austroboletus longipes is easily recognised from the nearly uniform brown colour of the pileus and stipe, yellowish underside and red reaction with alkali. It was found growing gregariously in Endau-Rompin during our visit.

We suspect the following are new to science.



Austroboletus sp.



Phylloporus sp.



Boletus sp.1



Gyroporus sp.



Boletus sp.2

Suggested reading:

Corner E.J.H. (1972). *Boletus in Malaysia*. Government Printer, Singapore. 263 p.

Corner E.J.H. (1974). *Boletus and Phylloporus in Malaysia: further notes and descriptions*. Gardens' Bulletin, Singapore 27: 1-16.

A new *Dipterocarpus* record for Johor

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Dipterocarpus tempehes, a species previously known only in Borneo (*keruing asam*), has been found in the district of Segamat in Johor. Inhabiting the banks of Sg. Kudung (adjacent to Endau-Rompin National Park), Sg.

rare, at least in these sites. The species is easily distinguished by its fruits which do not have the characteristic enlarged calyx lobes (Fig. 4) of most *Dipterocarpus* spp.

FRIM, working in collaboration with the state Forest Department, has mapped the spatial distribution of *D. tempehes* trees at Sg. Bantang and Ayer Panas. More than 180 trees have been recorded to date with an unknown number occurring at Sg. Kudung. Maps of tree position, overlaid onto topography and forest reserve maps (courtesy of Jabatan Ukur dan Pemetaan Malaysia and Forest Department, respectively) are now with the District Forest Office at Segamat. Such maps are crucial for decision making, implementation of conservation measures and monitoring work. Saplings are growing well in the Kepong Botanic



Fig. 5. The trunk (a), leafy twig (b) and flower (c) of this Critically Endangered species. In Borneo, *keruing asam* timber has high economic value.



Fig. 4. Although it is a member of the Dipterocarpaceae, it does not have the typical winged fruit.

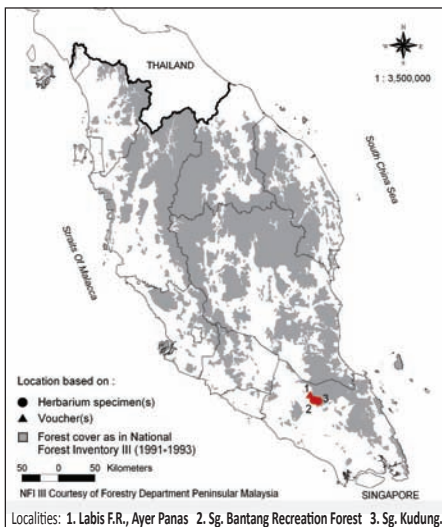


Fig. 1. The sites in Johor.

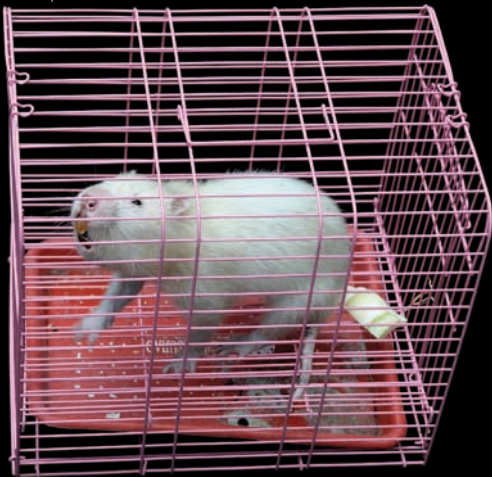
Bantang and Ayer Panas in Labis Forest Reserve (Fig. 1), it favours alluvial soil at altitudes below 300 m, being locally abundant in freshwater swamps and near stream banks (Figs. 2 & 3). Trees of *Dipterocarpus tempehes* are large, frequently reaching heights of 50 m and trees up to 90 cm diameter are not



Fig. 2. Sg. Bantang Recreation Forest.



Fig. 3. This species is locally abundant near the stream banks.



The Large Bamboo Rat

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There are two species of bamboo rats in Peninsular Malaysia – the large bamboo rat *Rhizomys sumatrensis* and the hoary bamboo rat *R. pruinosus*. The large bamboo rat, as its name implies, is a large rotund rodent with big clawed feet, small ears and a short tail sparsely covered with coarse hairs. In the Indomalayan region, certain species of bamboo rats are pale brownish grey having a darker hue on top of the head and sparse coarse hair. The young has contrasting reddish-brown cheeks. Colour variation may occur, for example, in 2009, a female large bamboo rat weighing 2 kg, captured in Pekan, Pahang, was frosty white, had sparse coarse hair and a pinkish, hairless tail. The hoary bamboo rat is, by contrast, much smaller in size and has a different hair color.

Rhizomys sumatrensis lives in extensive burrows under clumps of large forest bamboos. It is nocturnal and remains underground during the daytime appearing at night to forage and roam. The adults often wander widely across forested areas and they use road crossings.

This medium-sized mammal scrambles with ease up bamboo stems. Gripping the stem with its legs, the regular sections of the stem wall are ripped off to enable it to get to the roots. These roots are then dragged back to the burrows. Bamboo roots are the main diet, occasionally, tapioca and sugar cane



This *Rhizomys sumatrensis* is white in color and can easily be regarded as a guinea pig.

roots are raided and consumed. According to literature, this rodent can be easily kept in captivity. When young, it can be tamed. A mixed diet of starchy roots, e.g., sweet potatoes, tapioca, carrots and nuts can be fed to captive animals. When threatened, it produces a harsh cough or bark-like grunt and may grind its teeth noisily.

A female large bamboo rat has a gestation period of not less than 22 days. Their young are born hairless with eyes closed up to 24 days. After 10–13 days, the hair and incisor teeth begin to appear. Their first attempt at solid food takes place on the 29th day but they will continue to suckle up to 3 months. The longest known life span (in captivity) is 3 years and 7 months. This species is slow in breeding and is hunted heavily for food by the aborigines.

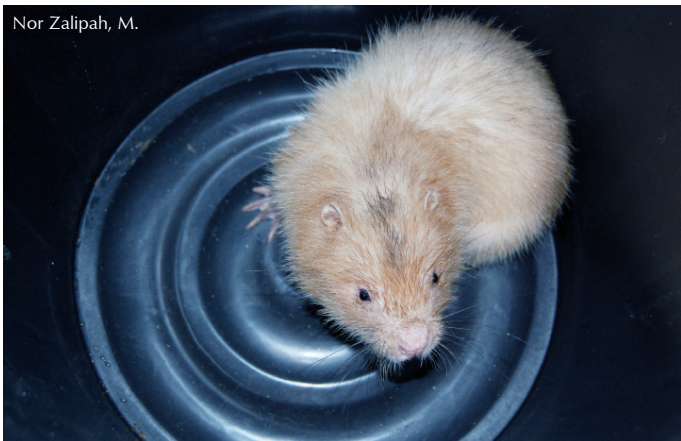
R. sumatrensis is well-distributed in Yunnan (China) and Southeast Asia namely in Myanmar, Thailand, Laos, Vietnam, Cambodia, Peninsular Malaysia and Sumatra (Indonesia). This species is related to the Chinese bamboo rat, *R. sinensis*, which is known to carry the deadly *Penicillium marneffe* fungus.

Suggested reading:

Corbet, G.B. & Hill, J.E. 1992. *The Mammals of the Indomalayan Region*. Natural History Museum Publications. Oxford University Press, New York.

Francis, M.C. 2008. *A Field Guide to the Mammals of South-East Asia*. New Holland Publishers (U.K.) Ltd, London. 392 pp.

Nor Zalipah, M.



A large bamboo rat (*Rhizomys sumatrensis*) captured in Belum Forest Reserve and subsequently released to nature.



The Editor: Conservation Malaysia Bulletin, Forest Research Institute Malaysia, 52109 Kepong, Selangor D.E. (attn: Dr. Lillian Chua lillian@frim.gov.my or Dr. Saw Leng Guan sawlg@frim.gov.my). Conservation Malaysia is distributed free of charge upon request. We welcome any contribution or feedback. Send contributions or address comments and queries to the editor. Past issues are available at <http://www.tfbc.frim.gov.my>. Funded by the Ministry of Plantation Industries and Commodities. Design by: Aslina Baharum (FRIM). Editorial team: Dr. Lee Su See, Dr. Laurence Kirton, Dr. Saw Leng Guan and Dr. Lillian Chua.