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Orchids of Perlis: Limestone Endemics

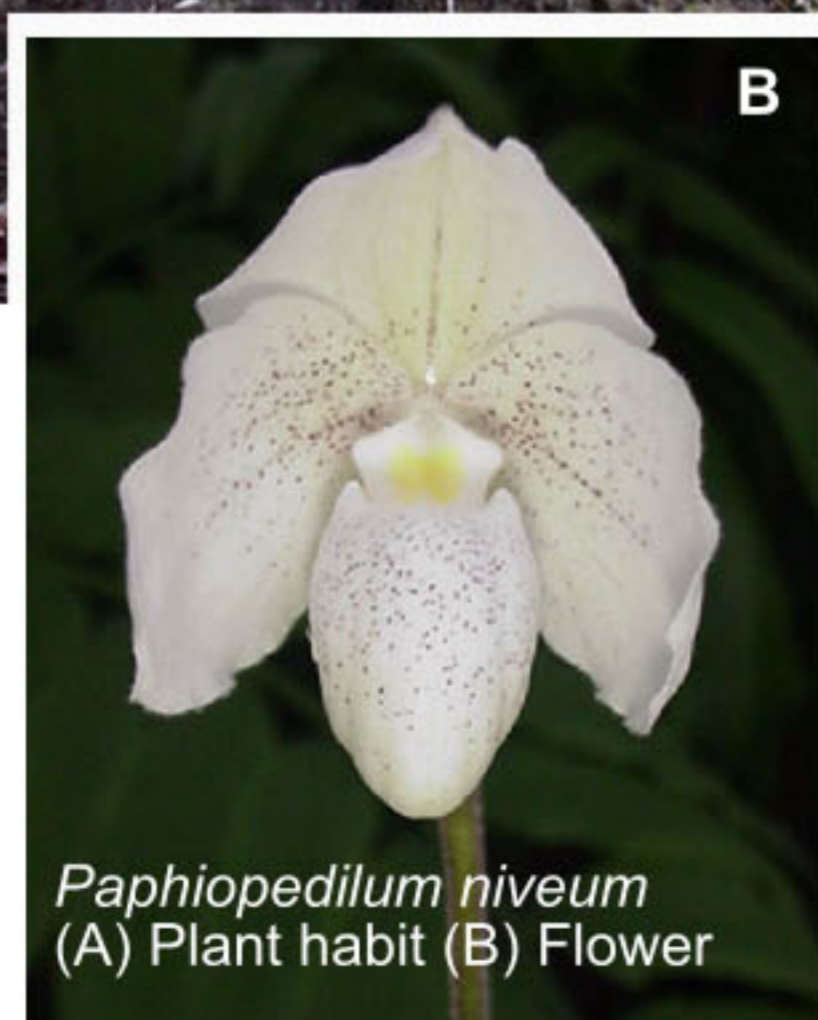
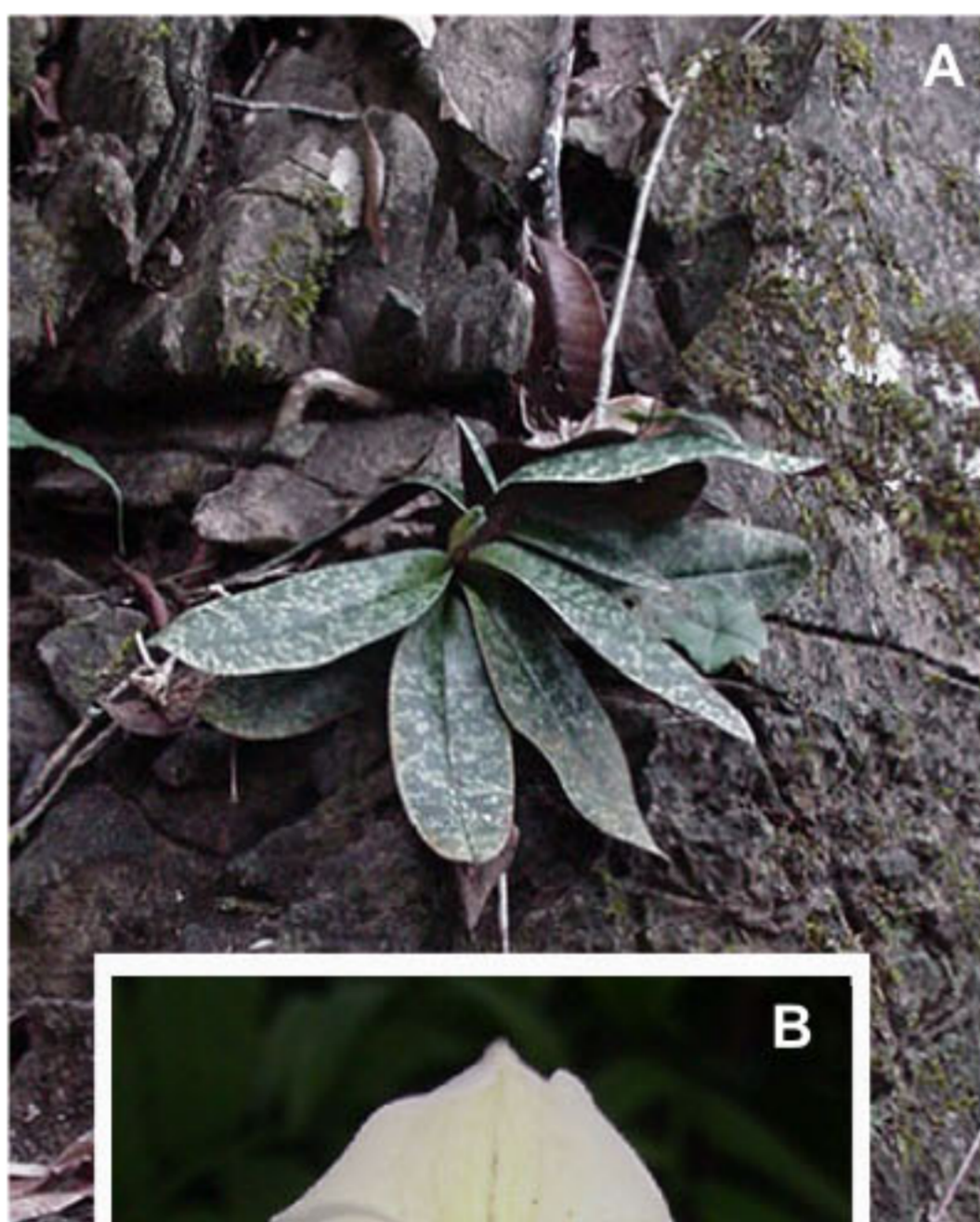


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Perlis, being the northernmost state in Peninsular Malaysia, experiences a monsoonal climate with a dry season between January and April. The state has about 12,048 ha of forested land scattered into seven permanent reserved forests. Most of its forested areas lie in a continuous belt on the Setul Limestone formation along the western border. The four of the largest reserves, namely Wang Mu Forest Reserve, Bukit Bintang Forest Reserve, Mata Ayer Forest Reserve and Kurong Batang Forest Reserve are located on Nakawan Range, which is part of the Setul Formation that lies between the Perlis-Thailand border. Nakawan Range is aged from Ordovician to Devonian (450-350 million years ago) and is the oldest and longest continuous limestone range in the peninsula. It extends to the eastern part of Langkawi Islands and extends north into Thailand where it is known as Tung Song Formation. Perlis has semi-deciduous forest known as White Meranti-Gerutu (semi-deciduous forest with Indo-Malayan affinities), and the most dominant Meranti are *Shorea hypochra* and *S. roxburghii* on limestone. As for Gerutu, the most gregarious in Perlis State Park is *Parashorea stellata* (Rahimatsah and Osman 2002).

Perlis has a great diversity of orchids with about 117 species in 35 genera recorded so far (Ridley 1911, Chin 1977, Sharma 1992, Kiew 1993, Rusea *et al.* 2001, Shakirah 2003, Jutta and Faridah 2005, and Yong 2006). Of these, six are recognised as limestone endemic, namely, *Cleisostoma discolor*, *Eulophia andamanensis*, *Habenaria carnea*, *Malaxis prasina*, *Paphiopedilum niveum* and *Pomatocalpa andamanica*.

Paphiopedilum niveum is a beautiful white snowy slipper orchid known from Langkawi Island, Perlis and Kelantan. This species, once found abundantly on the limestones in Langkawi Island, Kedah is now seriously threatened by over-collection for horticultural trade. The populations in Perlis are more vulnerable as the limestone hills are much more accessible than the isolated islands in the Langkawi Islands. In Perlis, *P. niveum* is found on Bukit Rongkit, Bukit Merah and Bukit Bintang (Yong 2006). Now the population is almost totally wiped out on the southern part of Bukit Rongkit due to the over-collection. In view of this serious threat, the populations on Bukit Merah, Bukit Bintang and the northern part of Bukit Rongkit should be totally protected and monitored closely.



Paphiopedilum niveum
(A) Plant habit (B) Flower



Habenaria carnea
(A) habit (B) inflorescence

Habenaria carnea is another interesting limestone orchid. Its leaves appear in two colour forms. The juvenile plants have brown leaves with white dots; when they reach reproductive maturity, the colour gradually changes from brown to olive green. In full bloom, the leaves are entirely green, speckled with white dots (Yong 2006). This species has beautiful pink flowers arranged in a terminal inflorescence. Its median sepal is fused with petals thus forming a hood.

Malaxis prasina
(A) growing among the ferns
(B) flowers



Malaxis prasina is found in Thailand and Laos. In Peninsular Malaysia, this species is only recorded from the Perlis limestone. It grows well on the forest floor in shaded habitats. This species is recognised by its thin, green and dark purple flushed leaves. The flowers are small, green and crowded on the rachis.

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Eulophia andamanensis is a tuberous terrestrial orchid well adapted to rest in the drought season. Their above-ground vegetative parts die after flowering, leaving the underground tuber in a dormant state. Its fleshy rhizome produces a flowering shoot and a leafy shoot from two separated buds when wet season (April to September) arrives. The inflorescence is up to 55 cm long, with many well-spaced flowers. The petals and sepals are green with purple flushes

while the lip is white with brown veins and green on the lateral lobes and edges of the epichilium.

Pomatocalpa andamanica is a tough lithophytic orchid (sometimes epiphytic) commonly found on exposed and dry limestone rocks. This species has an elongated erect stem, coriaceous strapped leaves and a branched inflorescence. The flowers are non resupinate, small, clustered at the end of each branch and yellow with dark red markings.



Cleisostoma discolor is an epiphytic orchid on tree trunks. It has a short stem and fleshy leaves. The inflorescence arises from the base of stem, is branched and has many small flowers crowded at the end branch. Sepals and petals are green with dark purple-red median band.



There is a high similarity between the orchids in Perlis and orchids in Thailand due to the geologic, geographic, climatic and floristic proximity. The Indo-Malayan element is strongly expressed in the Perlis orchids. Yong (2006)

recorded 21 species, all of which are restricted to the northern part of Peninsular Malaysia and Thailand. Of these, six are new records to Malaysia. These findings further support the theory that the Perlis flora belongs to the Indo-Malayan floristic region instead of Malayan floristic region, as expressed by Ridley (1911), Symington (1943), Steenis (1950) and Woodruff (2003).

Perlis has indeed a rich array of orchid flora but much more survey is needed, particularly in areas yet to be explored. Orchid diversity and its distribution in Perlis are still poorly understood and more information is urgently needed. The lack of information on current distribution and biology, coupled with rapid habitat changes, make it impossible to assess accurately the conservation status for each species.

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Mesmerized by the Vulnerable Masked Finfoot (*Helopais personata*)



Many bird watchers were elated with the news that a lone masked finfoot, a rare migrant, vulnerable to extinction and uncommon in the urban forest, was spotted in FRIM between December 2004 and May 2005.

By Dr Pan Khang Aun (pankhangaun@frim.gov.my)



Photo credit: Bamard Lau



Photo credit: Anthony Lau

There was no report of such sightings in this part of the country except in Taman Negara and Royal Belum State Park, both of which have pristine forest areas. Terry Ong's book on "Birds of FRIM" documented 181 species in 45 families, which is approximately a third of the country's bird diversity. It was published in 2003, before the eventful sightings. There has not been any sighting of this shy and elusive bird ever since.

What is so special about this bird, which is popularly known as the prima donna of FRIM in the bird watchers' circle? Firstly, she has strange morphological features - the upper part of her body is duck-like with a yellow bill, olive-brown upper part and a narrow white line running down to the sides of the neck. The legs and feet are green and lobed, which are rather peculiar in more than one aspect. The bird swims with its neck partially submerged and bobs its neck back and forth rather ungainly. Because her visits are so rare, she was indeed an excellent crowd puller drawing car loads of visitors to FRIM at that time. We are extremely delighted that she had chosen to fly past and rest in FRIM!

Throughout the world, the family Heliornithidae has only three species. This particular species hails from north-east India through South East Asia including Malay Peninsula to Sumatra and Java. These birds are usually found in dense jungle swamps, ponds and mangroves. In FRIM, this bird was sighted only at the pond adjacent to the nursery and school.

A Rare Cucurbit from the Perlis Limestone



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A rare climber from the cucumber family was collected from Gua Cenderawasih, Perlis, during one of our field collection trips early this year. Known as *Neosalsmitra clavigera* (Wall.) Hutch, it has not been collected for more than 70 years since the 1930s!

It was found near the peak of the limestone hill, in a dry and disturbed habitat. Imin, our field assistant, saw lots of little fruits hanging on the rocks and from the canopy of trees. They resembled little lanterns, dangling beautifully in the sunlight. The fruit is unlike any cucurbit or gourd we had seen before; it is narrowly cylindrical and has a triangular opening at the top.

This interesting plant belongs to the Cucurbitaceae because it has coiled tendrils and male flowers typical of the family. Dr. Brigitta Duyfjes, an expert on Malesian Cucurbitaceae from the National Herbarium of The Netherlands, identified it as *Neosalsmitra clavigera*. *Neosalsmitra* is coined from the Greek word *Neo* meaning new and the genus *Alsomitra*, a climbing gourd native to Sunda Islands. John Hutchinson, a British botanist, found that several *Alsomitra* species were distinct in their leaf type, fruit and seed shape. They have compound 3-5 foliolate leaves instead of simple ones, with fruits that are narrowly cylindrical and seeds that are uniquely star-shaped, toothed and winged. He therefore decided to give a new identity to this group and named them *Neosalsmitra*.

Neosalsmitra clavigera is the only species of its genus found in Peninsular Malaysia and locally, was previously known only from Pulau Langkawi and mainland Kedah. This is a new record for Perlis. Although



Flowers of *Neosalsmitra clavigera*

rare in Peninsular Malaysia, *Neosalsmitra clavigera* is widely distributed from southeast Continental Asia including south China through east Malesia to Australia and the Pacific in seasonally dry forests. The species is absent from tropical everwet rain forests.



Fruits of *Neosalsmitra clavigera*

Starry, starry seeds...

Note: *N. clavigera* is also recorded as *Alsomitra clavigera* (Ridley, 1992, in *The Flora of the Malay Peninsula*) and *Neosalsmitra integrifoliola* (Turner, 1995, in *Gardens Bulletin of Singapore* 47 (1995) 182).



Photo credit Ooi Beng Yean



Photo credit Tee Lian Huat

Have you seen this bird in FRIM lately? If you have, please notify us at the Zoology Unit, Tropical Forest Biodiversity Center (TFBC) telephone 03-62797268/7701 or fax us the information at 03-62731041 or even e-mail us. Do let us know how you can assist us in the conservation of this species in FRIM and in other parts of Malaysia.

The Tropical Forest Biodiversity Center (TFBC) Programme has the overall goal to inventorise and document the forest biodiversity in Malaysia for the purpose of conservation and sustainable utilisation of resources. Outputs aimed for under the Ninth Malaysia Plan are an authoritative checklist of birds, checklist of mammals and checklist of fishes. TFBC's Zoology Unit shall also be formulating management plans for selected protected areas, establishing criteria for the identification of important animal areas, and drawing guidelines for the establishment of conservation areas for threatened flora and fauna. In the immediate team, TFBC is also pursuing the development of a framework master plan for the establishment of a National History Museum for Malaysia under the auspices of the Ministry of Natural Resources and Environment.

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A ray of hope for *Dipterocarpus semivestitus* once thought extinct



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Fresh water swamp forest. The forest floor is water-logged and dense with tree saplings

Dipterocarpus semivestitus (Dipterocarpaceae) is an extremely rare species known from only a few localities in its range of Peninsular Malaysia and Kalimantan. In Peninsular Malaysia, it is confined to the freshwater swamp forests in Parit Forest Reserve, Sungai Tinggi, Sungai Rotan and Bukit Kecil in Perak. The last specimen collected was in 1957, from Bukit Kecil in Manjung. The past five decades had seen large tracts of forest converted for agriculture and development - in Parit, several thousand hectares were cleared for development of Bandar Seri Iskandar, with a percentage given to Universiti Teknologi Mara (UiTM), Universiti Teknologi Petronas (UTP) and others. This is why we needed to find out whether the population still exists. Our searches in the surrounding forest fragments is guided by the knowledge that the species favours freshwater swamp forest. Forested grounds of Parit Forest Reserve and UTP yielded no results.

We were not ready to give up hope. In early 2007, we surveyed a narrow belt of UiTM's forested area and lo and behold, we stumbled upon a mature tree. From then on, it was a feverish search and comb operation. To date we managed to enumerate 53 individuals and they are found within the 55 ha area. The elation of having found such a rare species was clouded by the knowledge that the population is seriously threatened with extinction as the area is in the process of infrastructure development. Species such as *Shorea macrantha*, *S. hemsleyana*, *Vatica flavida* and numerous other plant species are confined to the freshwater swamp forest.

The forest here is exceedingly rich and inventory efforts conducted by the Flora of Peninsular Malaysia team

(FRIM) managed to garner 38 species. Some of the common tree species found here are *Trigonostemon verticillatus* (Euphorbiaceae), *Shorea singkawang*, *S. platycarpa*, *S. parvifolia*, *S. leprosula*, *S. bracteolata* and *Vatica pauciflora* (Dipterocarpaceae), *Sterculia rubiginosa* (Sterculiaceae), *Sarcotheca glomerula* (Oxalidaceae), *Lepisanthes tetraphylla* (Sapindaceae) and *Pholidocarpus kingianus* (Arecaceae), which is a tree palm restricted to swamp forests. Shrubs and herbaceous plants include *Crytosperma lasioides* (Araceae), *Hyptis suaveolans* (Labiatae), *Clerodendrum deflexum* (Verbenaceae) and *Etlingera metriocheilos* (Zingiberaceae).

The impending earthwork for infrastructure development rang the alarm bell and highlighted the urgent need to rescue the species. The mapping team moved in quickly to map all the 53 trees of *D. semivestitus*. A detailed report and an appeal was sent to the Vice Chancellor of the University and the Perak Government in the hope of saving the population. FRIM is extremely pleased that the University is sensitive to the matter and is taking steps to prevent

the conversion of the swamp forest.

This example is one of the most recent on how research helps in refining development policies that have impact on biodiversity and the environment. It demonstrates that there is a workable balance between development and conservation. *Dipterocarpus semivestitus* is an excellent example because conservation of the population is complicated by the fact that the land no longer belongs to the State Government and that there are pressures within the University to develop the area. The road to effective conservation is long and arduous, in this case requiring much negotiation between stakeholders. Contributions from all stakeholders are crucial to the effective conservation of species and populations.

Earthwork at forest fringes in UiTM



D. semivestitus



Scaly, lenticellate bole



Young leaves



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