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# Exploring Wonders of Northern Meliau Range in Central Sabah

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## Exploring wonders of northern Meliau Range in Central Sabah

**Contributed by Sabah Forestry Department**

**Introduction**

THE ultramafic land in Sabah covers approximately 4.6% of the landmass, highlighting its limited yet significant geographical extent. Although low in nutrient and high in minerals, this area holds considerable biodiversity importance, serving as a critical habitat for hyperendemic plants found exclusively in this region. One of the ultramafic localities in the Beluran district is the Meliau Range, which was formerly a Class II production forest reserve, has been re-gazetted as a Class I protection forest reserve in 2015 due to its significant importance in biodiversity and the provision of ecosystem services. This 22,932 ha-protected area, administered by the Beluran District Forestry Office, is partly bordered by oil palm plantations to the north and the production forest of Ulu Tungud Forest Reserve to the south. Little is known about the northern part of the Meliau Range Forest Reserve (FR) in central Sabah, unlike the southern part, which was explored 20 years ago. Hence, an expedition to study the flora and fauna, as well as the communities living near the northern part of the Meliau Range was organised by the Forest Research Centre (FRC) of the Sabah Forestry Department (SFD), in April, 2025. As emphasized by the Chief Conservator of Forests, Datuk Frederick Kugan, such documentation of biodiversity and communities would provide essential baseline information for the department's sustainable forest management, under the Heart of Borneo Initiative. The expedition was led by Mr John Sugau and Mr Razy Japir from FRC Sepilok, with assistance from Mr Abdul Jamal Ibrahim, Beluran District Forestry Officer, and his assistant, Mr Moses Matuin. SFD researchers conducted various research disciplines during the expedition. Researchers from the Forest Research Institute Malaysia (FRIM) and UiTM also participated on selective collaborative projects with SFD.

Soils and topography

The locality features rugged mountains and hills with steep slopes and sharp ridges, making landslides a common occurrence. The soils mainly originate from ultramafic rocks characterised by high magnesium and iron content but low silica content. These soils are typically thin and contain high concentrations of heavy metals, like nickel, chromium, and cobalt, which can be detrimental to many plant species. Essential nutrients, such as calcium, potassium, and phosphorus are often deficient in these soils. Despite these challenging conditions, certain plant species have adapted to thrive in ultramafic environments (known as serpentinophytes), leading to the development of unique plant communities with a high degree of endemism.

**Forest Ecosystems**

The Meliau Range FR comprises four main forest ecosystem types, namely Lowland Mixed Dipterocarp Forest, Lowland Ultramafic Forest, Upland Ultramafic Forest, and Lower Montane Ultramafic Forest. In the northern part of the reserve, the low-lying areas near the boundary have been significantly impacted by past logging activities. In contrast, the upland ultramafic forest shows minimal disturbance, with two distinct conditions observed between 400 and 700 metres above sea level: shallow, rocky soils support smaller tree structures, while areas with deeper soils support larger trees. Around 700 metres above sea level, a transition to lower montane forest is marked by the presence of mosses growing on dead logs and the base of trees. Overall, aside from the low-lying areas, the northern part of the Meliau Range retains an intact ultramafic ecosystem that is unique to Sabah and the island of Borneo.

**Plant Diversity**

A total of 168 herbarium specimens were collected during the expedition and are in the process of identification. Among these collections, there may be at least two potentially undescribed species from the Rubiaceae and Araceae families. A researcher from FRIM also discovered one interesting fern species, Sphaerostephanos sp. but yet to be identified. Other interesting botanical findings were the Sabah endemic pitcher plant (Nepenthes macrovulgaris), which is restricted to ultramafic areas and the Borneo endemic pitcher plant (Nepenthes veitchii), which is a robust plant with a unique tree climbing habit. The rare Chewlunia sabahensis (Rubiacae) is also found there. Interestingly, Seraya kuning keladi, Richetia laxa (Dipterocarpaceae), which is endemic to the northern parts of Borneo and a Vulnerable species, is very common around the area. In Sabah, this species is only known from the central part of Sabah in Beluran and Tongod districts. The team from UiTM recorded six nickel hyperaccumulator plant species. These include Phyllanthus balgooyi (Phyllanthaceae), which has the second highest concentration of Ni (with more than 16% with Ni) in any living material in the world, after Pycnandra acuminata (Sapotaceae) from New Caledonia, which contains 25% Ni in its latex. P. balgooyi thrives in semi-open areas on ridges within the Meliau Range. Besides plants, a fungal survey was conducted, recording diverse species. These findings mark new fungal distribution records for Meliau Range FR, highlighting the area's previously undocumented fungal biodiversity. Notably, a species of Amauroderma was recorded, adding significant value to Meliau's biodiversity as no previous records existed for this genus in the area. Other interesting findings include the delicate Mycena, leathery Microporus, colourful Russula, elegant cup fungus Cookeina, and the blackened wood-decomposer Xylaria.

**Wildlife Diversity**

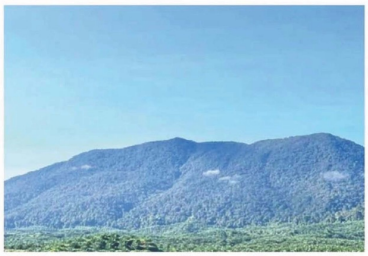
The expedition documented 18 mammal species from 11 distinct families. Among these, the Red-leaf Monkey and the Thick-spined Porcupine are exclusive to Borneo. Six recorded species are deemed threatened according to the IUCN Red List, including the Vulnerable Red-leaf Monkey, which is endemic to Borneo. Poaching presents a continuing threat, as signs of wildlife traps were found near the reserve's border. Furthermore, illegal littering, particularly plastic waste, has been observed within the reserve. During the bird survey, a total of 90 bird species were documented, including 1 Critically Endangered, 4 Vulnerable, and 16 Near Threatened species according to the IUCN Red List. Among the most significant records were two Vulnerable hornbills—the Rhinoceros (Buceros rhinoceros) and the Black Hornbill (Anthracoceros malayanus)—which rely on large, mature trees for nesting and foraging. Their presence indicates that elements of primary forest structure continue to exist in the landscape. Near Threatened-listed species, such as the Red-naped and Diard's Trogons, Great Argus, and Bornean Black Magpie further suggest that the forest maintains sufficient canopy continuity and vertical complexity to support birds associated with intact lowland forest. Particularly noteworthy was the detection of the Critically Endangered Malaysian Blue-banded Kingfisher (Alcedo peninsulae), a species closely linked to undisturbed, shaded streams. Its presence emphasises the hydrological integrity of the site and enhances the conservation significance of Meliau Range. The species richness and diversity of freshwater fish and anurans were studied specifically along the tributaries of the Tungud River. The assessment documented a total of 33 freshwater fish and frog species, consisting of 15 fish and 18 anurans. Notably, the findings highlight the ecological significance of the area as a refuge for several Bornean endemic species. Among the fish recorded, nine species are endemic to Borneo, with Lobochellos erinaceus and Gastromyzon borneensis currently listed as Near Threatened according to the IUCN Red List, emphasising the need for ongoing monitoring and habitat protection in the region. A total of 12 Bornean endemic species of anurans were recorded. Of particular conservation interest is Meristogenys jerboa, which is currently listed as Vulnerable by the IUCN. Its presence in Meliau Range calls for proactive measures to safeguard the area's ecological integrity. The diversity and presence of both endemic and threatened species suggest that the riparian ecosystems within the Tungud River remain relatively intact and healthy. For the insect survey, one notable insect thu has been recorded is the Bornea endemic damselfly, Libellag phaeton. This species belong to the family Chlorocyphida and is currently listed as Nea Threatened on the IUCN Red Lis Other Bornean endemic insect are a moth from the famil Erebidae, Micromorphe oculat and a flower chafer, Ixorid regia bicolor. The 'exploding ant' Colobopsis saundersii, was alsc recorded here. It is a unique ant that is willing to sacrifice itsell when it is threatened. Its defence mechanism involves secreting a sticky, toxic fluid from the body It is so called because it appears to explode when releasing the yellow secretion from its body.

**Socio-economic aspects**

The findings revealed that the stakeholders operating near the Meliau Range FR including plantation companies demonstrate a significant reliance on the natural wate resources flowing from the forest reserve. Rivers originating from the Meliau Range serve as critical water sources not only for estate operations — such as daily use, agricultural activities and domestic supply — but also for surrounding communities These include various villages that depend on clean river wate for their daily needs. Across the board, plantation representatives acknowledged the importance of these rivers in sustaining both livelihoods and ecosystem balance. Their awareness of the forest's ecological role extends beyond water, as they recognise the Meliau Range as a critical habitat for wildlife, a source of clean air, and a potential ecotourism asset. Despite some operational challenges, such as human-wildlife conflict and unclear boundaries, stakeholders collectively voiced support for preserving the forest reserve.

**Conclusion**

This scientific expedition is essential for gathering first-hand information for forest conservation. The reserve boasts exceptional biodiversity and is home to numerous endemic and threatened species. Datuk Kugan elaborated that the discoveries and findings will further bolster Sabah's reputation as a global biodiversity hotspot and highlight the importance of protecting the lesser-known life forms in Borneo's rainforests. The reclassification of Meliau Range Forest Reserve as a Class I forest reserve is a prudent decision by the Sabah Forestry Department to preserve and conserve these high-conservation-value forests.



Bukit Masasau is one of the highest hills in the northern part of the Meliau Range, with an elevation of over 800 metres.

**Read more:**

https://www.theborneopost.com/2025/06/19/exploring-wonders-of-northern-meliau-range-in-central-sabah/?fbclid=IwY2xjawLS5exleHRuA2FlbQIxMABicmlkETFHRVlXOUs0RTMyWUwyZHhWAR5EwMdis3dApybCJCoj3dgAb_Cwn1ROUM1k_NAdko6a_-ukWWgGT7xxPTM3vQ_aem_ezp4MEtDBBn0v17-IKCWbg

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