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# Borneo's New World

Newly Discovered Species in the Heart of Borneo





*Dendrelaphis haasi*, a new snake species discovered in 2008



© Gernot Vogel

## Heart of Borneo Vision

**The equatorial rainforests of the Heart of Borneo are conserved and effectively managed through a network of protected areas, productive forests and other sustainable land-uses, through cooperation with governments, the private sector and civil society.**

With this report, WWF's Initiative in support of the Heart of Borneo recognises the work of scientists and researchers who have dedicated countless hours to the discovery of new species in the Heart of Borneo, for the world to appreciate and in its wisdom preserve.



Cover photos: Main / View of Gunung Kinabalu, Sabah © Eric in S F (sic); Inset photos from left to right / *Rhacophorus belalongensis* © Max Dehling; *Dendrobium lohokii* © Amos Tan; *Dendrelaphis kopsteini* © Gernot Vogel.

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# A declaration of support for biodiversity

**In February 2007, an historic Declaration to conserve the Heart of Borneo, an area covering 220,000km<sup>2</sup> of irreplaceable rainforest on the world's third largest island, was officially signed between its three governments – Brunei Darussalam, Indonesia and Malaysia.**

That single ground breaking decision taken by the three governments to safeguard one of the most biologically rich and diverse habitats on earth, was a massive visionary step. Its importance is underlined by the number and diversity of species discovered in the Heart of Borneo since the Declaration was made.

Scientists have discovered more than 123 new species in the Heart of Borneo area during the past 3 years – an average of more than 3 new species per month. These fascinating finds include the world's longest known stick insect, a flame-coloured snake and a colour-changing frog. In total, 67 plants, 29 invertebrates, 17 fish, five frogs, three snakes and two lizards and a brand new species of bird have been discovered (see Appendix).

## **Heart of Borneo – heart of biodiversity**

The Heart of Borneo is a global treasure teeming with unique and extraordinary life. Once described by Charles Darwin as “one great luxuriant hothouse made by nature for herself”, this island within an island is home to 10 primate species, more than 350 bird species, and 150 reptiles and amphibian species. In addition, a staggering 10,000 plant species are sheltered by the region's rainforests.

Numbering among Borneo's more than 200 species of mammal are elephants, orang-utans, clouded leopard and rhinoceros, co-existing here in one of the last strongholds remaining for these charismatic species.

Although the habitats inside the Heart of Borneo are certainly exceptional they are also some of the least explored. As the last 3 years of independent scientific discovery has proven, new forms of life continue to be unearthed and the future promise of more discoveries is a tantalising one for the next generation of researchers to contemplate. The challenge is to ensure that these precious landscapes are still intact for future generations.

The Heart of Borneo Declaration is proving to be a major driver of conservation and sustainable development in the region and sets forth a framework of action for Borneo's threatened species and equatorial rainforest through a network of protected areas and responsibly managed forests.

## **WWF's Heart of Borneo Initiative**

To support the efforts of the three governments, WWF launched a large scale conservation initiative, one that spans the local-to-global spectrum.

At the local and national level, the three governments have mapped out a course of conservation and management of the Heart of Borneo around five pillars of protected area, trans-boundary and sustainable natural resource management, eco-tourism and capacity building.

WWF is supporting these efforts in all three countries, working very closely with government agencies to turn the paper declaration into tangible on-ground action, district by district, region by region, to fulfil the conservation promise of the Heart of Borneo Declaration.

Internationally, WWF is using its global network to focus efforts to support the Declaration through its Heart of Borneo (HoB) Initiative. Amongst its many other activities, WWF is working with key regional forums such as the Association of Southeast Asian Nations (ASEAN) and regional institutions such as the Asian Development Bank (ADB) to leverage support for delivering on the HoB commitments.

Other HoB Initiative activities include the establishment of a 'Green Business Network' to raise awareness in the private sector of the vital role it can play in delivering conservation and sustainable development to the HoB. With an estimated 50% of land within current HoB boundaries in private hands, the private sector is crucial to ensuring sustainable land use.

In order to achieve the far-reaching commitments envisaged in the HoB Declaration, the HoB Initiative also recognises that long-term financing schemes, equitably shared amongst stakeholders, need to be developed. Several financing mechanisms are being explored, including Payments for Ecosystem Services (PES) and Reducing Emissions from Deforestation and Degradation (REDD) to provide incentives to practice sustainable land use and encourage the implementation of conservation measures.



# a closer look at the new discoveries...

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## The world's longest insect (*Phobaeticus chani*)

This enormous stick insect, found near Gunung Kinabalu Park, Sabah, in the Heart of Borneo measures 56.7cm or over half a metre in length. Despite its size, very little is known about its biology and ecology, although it was described in 2008<sup>1</sup>. It is believed to inhabit the high rainforest canopy making it especially elusive and difficult to study. Also known as 'Chan's megastick' after the scientist that donated this particular specimen to the Natural History Museum in London, this species is the current title holder for a number of world records. In addition to being the world's longest insect, the species also wins the insect world record for the longest body, measuring an impressive 35.7cm.

Only three specimens of this extraordinary creature have ever been found, all of them from the Heart of Borneo. Borneo has long been known as an exciting hub for monster insects, not least the giant cockroaches that measure 10cm in length and were only discovered in the Heart of Borneo in 2004.

*Phobaeticus chani* was selected as one of "The Top 10 New Species" described in 2008 by The International Institute for Species Exploration at Arizona State University and an international committee of taxonomists<sup>2</sup>.

## A flame-coloured snake (*Dendrelaphis kopsteini*)

*Dendrelaphis kopsteini* or Kopstein's Bronzeback snake is a beautiful-looking species that can grow to an impressive 1.5 metres in-length. Discovered in 2007<sup>3</sup> in lowland to upland rainforest, this uncommon new species differs from all other *Dendrelaphis* species by a bright orange, almost flame-like, neck colouration that gradually fuses into an extraordinary iridescent and vivid blue, green and brown pattern, that extends the entire length of the snake. The top of the head is deep bronze, a characteristic of all bronzeback snakes, and a dark stripe extends from the snout, across the eye, to the start of the neck.

When threatened, the Kopstein's bronzeback has the ability to flare its nape, revealing bright orange colours. Like most *Dendrelaphis* species, the Kopstein's bronzeback has an aggressive disposition with a painful bite. In the wild, many inhabit trees and they hunt frogs and lizards.

The scientists who discovered this snake, Gernot Vogel and Johan van Rooijen, named the snake in honour of Felix Kopstein, an Austrian physician and herpetologist. Some weeks after the publication of this species, Gernot received a telephone call from the Netherlands. The person introduced himself as Peter Kopstein, the son of Felix Kopstein. He was 82 and wanted to express his thanks for the late honour of his father, who died when Peter was young. Gernot and Felix subsequently exchanged several letters<sup>4</sup>.

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### A beautiful wild orchid (*Thrixspermum erythrolomum*)

Experts say that nowhere else nurtures such an extensive and diverse collection of orchids as Borneo. Approximately 3,000 magnificent species of orchid can be found here, more than anywhere else on Earth. What's more, the past three years have been very fruitful when it comes to new orchid discoveries. No less than 37 new orchids were discovered in the Heart of Borneo, accounting for the lion's shares of the 51 new orchids discovered or described on the entire island since the beginning of 2007. One such orchid, *Thrixspermum erythrolomum*, was described from Gunung Trus Madi<sup>5</sup>, Malaysia's second highest mountain at 2,642m, close to Gunung Kinabalu. This mountain is well known to support a diverse range of unique flora and fauna. The discovery adds further to Borneo's reputation as a mysterious secret garden.



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### A colour-changing flying frog (*Rhacophorus penanorum*)

This unique frog was found 1,650m above sea level in Gunung Mulu National Park, Sarawak, in the Heart of Borneo<sup>6</sup>. The species is known only from the Tapin Valley near a small stream in the area, making it highly endemic. Tiny, with males growing to just 3.5cm, the Mulu Flying Frog as it is commonly known has a small pointed snout and is unusual in that the species has bright green skin at night but changes colour to display a brown hue during the day. As the photographs show, the eyes of this minute species also change colour.

Flying frogs are frogs with the ability to glide as a result of large and fully webbed feet, and aerodynamic flaps of skin on the arms and legs. Their evolution is seen as an adaptation to their life in trees, high above the ground. Such frogs are capable of making long, gliding leaps, sometimes 15 metres or more, to a neighbouring tree branch or even all the way to the ground. They also have oversized toe pads to help them land softly and stick to tree trunks. Borneo has at least three other species of flying frogs.

Gunung Mulu, a UNESCO World Heritage site, is a large mountainous national park and as such, the terrain can be remote, making this isolated landscape an ideal haven for undiscovered pockets of biodiversity. More than 70 species of amphibians are now known from here.





## A zebra-striped fish (*Eirmotus insignis*)

A remarkably striking zebra-striped fish was officially described in 2008<sup>7</sup>. The eight-banded barb, as it is commonly-called, has been mostly recorded from the middle Kapuas between the towns of Sanggau and Putussibau, Kalimantan, in the Heart of Borneo.

One of 17 fish discovered in the Heart of Borneo in recent years, the eight-banded barb measures around 3.6cm, and typically inhabits slow-moving, shallow, shady rainforest streams and swamps. The water in this habitat type is often murky, with substrate composed of mud or fallen leaves, twigs and branches. Such environments are also often dimly-lit due to the rainforest canopy above.

The fish were found sheltering among overhanging tree roots and aquatic vegetation. It is noted as something of a shy, reluctant feeder.



## An elusive new bird species

A new bird species, the 'Spectacled Flowerpecker', was recently discovered in the Danum Valley Conservation Area, Sabah, in the Heart of Borneo<sup>8</sup>.

Scientists observed the bird while walking along a 250m canopy-walkway and very quickly realised they were on the verge of discovering something very significant.

The bird is an attractive grey colour with bright white arcs above and below the eye, a white throat extending as a broad white stripe down the centre of the belly, and white tufts at the breast sides. The name given to the species refers to the bird's prominent eye-rings.

The finding is all the more surprising given its location in Danum Valley, where a scientific research station has been in operation since 1986. Scientists believe the species is a canopy specialist, inhabiting and feeding off fruits in the high trees. The species very rarely ventures below the canopy, explaining why the bird has only just been found.

Scientists revisited the area several times, but there was no further sign of the bird.

The species emphasises the importance of the commitment already made by Brunei Darussalam, Indonesia and Malaysia to protect the Heart of Borneo, and to ensure the many new species discovered in this unique area survive.



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### **The Belalong tree frog (*Rhacophorus belalongensis*)**

As a result of the Heart of Borneo declaration, 58 per cent of Brunei Darussalam's national territory will fall under some level of environmental protection, good news for new species such as the Belalong tree frog, *Rhacophorus belalongensis*, discovered in 2008<sup>9</sup>. This species was discovered in the Sungai Belalong basin in the Temburong district, hence its name, and it is miniature: males barely measure more than 3cm and females usually less than 3.8cm species. The species was encountered in the rainforests of Brunei, where it was found on vegetation next to small, fast-flowing creeks at heights between one and three metres above the ground. Scientists also heard the frog calling from the very tops of trees up to 10m high.



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### **A long-tailed slug (*Ibycus rachelae*)**

Perhaps the rarest of the extensive invertebrate species group are slugs which, according to scientists, are infrequently encountered. At great altitudes on Borneo, several rare and highly endemic species appear to exist, including one new colourful green and yellow species, *Ibycus rachelae*, described from Sabah, Malaysia, in the Heart of Borneo<sup>10</sup>. Discovered on leaves in primary montane forest at altitudes up to 1,900m on Gunung Kinabalu, the species has a particularly long tail, three times the length of its head, with a body length of 4cm. According to scientists, the slug has the habit of wrapping the long tail around its body when resting.

From the Ariophantidae family, this unusual species makes use of so-called 'love darts' in courtship. Made of calcium carbonate, the love dart is harpoon-like which pierces and injects a hormone into a mate, and may play a role in increasing the chances of reproduction. Many more new species of slug and land snail have been collected in the Heart of Borneo recently but await official scientific description<sup>11</sup>.



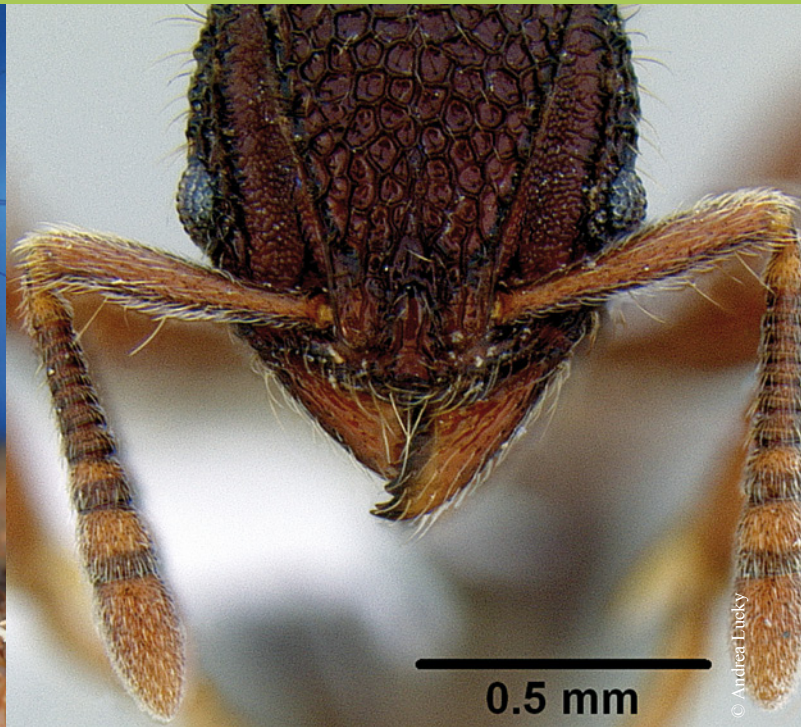


## A new freshwater prawn (*Macrobrachium kelianense*)

This new freshwater prawn species, *Macrobrachium kelianense*, was discovered in 2007<sup>13</sup>. The species was one of two newly identified by scientists in the Kelian River, located in the interior of East Kalimantan, in the Heart of Borneo. This river flows through pristine tropical rainforest and into the 980km-long Mahakam River, the largest river in East Kalimantan that extends from the Borneo highlands to the Makassar Strait. The river is particularly rich in wildlife, with nearly 150 endemic fish species, 300 bird species and the critically endangered Irawaddy Dolphin.

The new prawn is tiny, measuring barely more than one centimetre in length and it differs from similar species by having a greater number of teeth.

Several other new species of freshwater prawn from Borneo are currently awaiting official scientific description<sup>14</sup>.



## All creatures great and small...

A sizeable number of other new invertebrate species have also been discovered since the signing of the Heart of Borneo Declaration. These include net-winged beetles, a benthic water bug, a wasp, ants and flies. In total, 29 new invertebrates have been identified.

A new reddish-brown ant, *Lordomyrma reticulate*, was described in 2008<sup>15</sup>. In total seven specimens of the ant were obtained from leaf litter in lowland dipterocarp rain forest in Sabah, Borneo, in a selectively logged tract 3km northeast of the Danum Valley Conservation Area.

The discovery of this species is highly significant as it has expanded the known range of the genus to include Southeast Asia. Prior to this publication, no *Lordomyrma* had been described from the area bounded by New Guinea to the south and Japan to the north.

Although often perceived as insignificant, invertebrates play very important roles in ecology.





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### **An unexpected skink discovery (*Lipinia inexpectata*)**

In 2007 scientists described a new species of skink from several isolated localities in Sabah, Sarawak, and Kalimantan<sup>16</sup>. The new skink from the Heart of Borneo is small compared with other *Lipinia* species, measuring just under 8cm in length. The species is dark brown with dark grey and brown horizontal stripes down the body and a series of dark spots next to the stripes.

The particular Latin name given to the species refers to the unexpected nature of the discovery. This skink had been mistakenly referred to as *Lipinia quadrivittata* for 90 years. This species is known from the southern Philippines and Sulawesi in eastern Indonesia. It was only when a team of scientists examined the Borneo skink carefully that they realised the species had different DNA, colouration and an independent evolutionary history from *Lipinia quadrivittata*.

The new species finds itself in good company: Nanga Tekalit in Sarawak is rich in herpetofauna, including as many as 40 species of lizards.

### **A lungless frog (*Barbourula kalimantanensis*)**

Although not a new species discovery, scientists did discover something amazing about the Bornean Flat-headed Frog in 2008. The 7cm-long species is the world's first lungless frog<sup>17</sup>. Instead of lungs, this unique species breathes entirely through its skin. Other organs can be found in the place lungs would normally be, which makes the overall appearance of the frog flatter. As well as a larger surface area with which to absorb more oxygen, scientists believe this flatter and more aerodynamic shape allow the frogs to manoeuvre more capably in the fast flowing streams the species inhabits in the Kalimantan rainforest, in the Heart of Borneo.

The species was first discovered in 1978 and is currently listed as Endangered on the IUCN Red List of Threatened Species. It is known only from two locations in the middle of the Kapuas River Basin, where the species is threatened by pollution from mining activities.



# Appendix

(NB. This list may not be a completely exhaustive record of new species discovered in the Heart of Borneo)

Species	Scientist(s)	Year	Location
<b>Amphibians</b>			
<i>Pelophryne linanitensis</i>	Das	2008	Gunung Murud, Sarawak
<i>Pelophryne murudensis</i>	Das	2008	Gunung Murud, Sarawak
<i>Pelophryne saravacensis</i>	Inger & Stuebing	2009	Sunghai Segaham, Belaga District, Kapit Division, Sarawak
<i>Rhacophorus belalongensis</i>	Dehling & Grafe	2008	Brunei lowland rainforests
<i>Rhacophorus penanorum</i>	Dehling	2008	Gunung Mulu, Sarawak
		<b>Subtotal</b>	<b>5</b>
<b>Reptiles</b>			
<i>Anomochilus monticola</i>	Das, Lakim, Lim & Hui	2008	Gunung Kinabalu Park, Ranau District, Sabah, Malaysia
<i>Dendelaphis kopsteini</i>	Vogel & van Rooijen	2007	Borneo-wide
<i>Dendelaphis haasi</i>	Vogel & van Rooijen	2008	Borneo-wide
<i>Lipinia inexpectata</i>	Das & Austin	2007	Kapit Division, Sarawak
<i>Luperosaurus sorok</i>	Das, Lakim & Kandaung	2008	Crocker Range Park, Sabah
		<b>Subtotal</b>	<b>5</b>
<b>Birds</b>			
'Spectacled Flowerpecker' (awaiting formal scientific naming)	Edwards, Webster & Rowlett	2009	Danum Valley, Sabah
		<b>Subtotal</b>	<b>1</b>
<b>Fish</b>			
<i>Pangio lidi</i>	Hadiaty & Kottelat	2009	Belayan River in the Mahakam drainage
<i>Eirmotus insignis</i>	Tan & Kottelat	2008	Kapuas drainage in Kalimantan Barat
<i>Eirmotus isthmus</i>	Tan & Kottelat	2008	Mentaya drainage, Central Kalimantan
<i>Homaloptera batek</i>	Tan	2009	Upper Mahakam basin in East Kalimantan
<i>Kottelatimia hipporhynchos</i>	Kottelat & Tan	2008	Kahayan, Sampit and Kapuas basins
<i>Lobocheilos erinaceus</i>	Kottelat & Tan	2008	Danum Valley, Sabah
<i>Lobocheilos ixocheilos</i>	Kottelat & Tan	2008	Kapuas drainage in Kalimantan, Borneo
<i>Lobocheilos ovalis</i>	Kottelat & Tan	2008	Sarawak, Brunei, Sabah
<i>Lobocheilos tenura</i>	Kottelat & Tan	2008	Kapuas drainage in Kalimantan
<i>Lobocheilos terminalis</i>	Kottelat & Tan	2008	Kinabatangan and Segama drainages in Sabah, Borneo
<i>Lobocheilos unicornis</i>	Kottelat & Tan	2008	Segama drainage in Danum Valley, Sabah
<i>Nanobagrus immaculatus</i>	Ng	2008	Kahayan River drainage
<i>Ompok supernus</i>	Ng	2008	Rungan River drainage in Kalimantan
<i>Osteochilus bleekeri</i>	Kottelat	2008	Kapuas drainage, Kalimantan
<i>Paedocypris carbunculus</i>	Britz & Kottelat	2008	Pangkalan, Sabah
<i>Rasbora lacrimula</i>	Hadiaty & Kottelat	2009	Mahakam drainage in Kalimantan
<i>Rasbora patrickyapi</i>	Tan	2009	Rungan-Kahayan basin, Central Kalimantan
		<b>Subtotal</b>	<b>17</b>
<b>Invertebrates</b>			
<i>Aphelocheirus bruneiensis</i>	Zettel, Lane & Moore	2008	Brunei
<i>Chinemesa uniannulata</i>	Redei	2007	Danum Valley, Sabah
<i>Enigmocephala deinorhyncha</i>	Redei	2007	Kapit Division, Sarawak
<i>Eriococcus szentivanyi</i>	Kozár & Williams	2009	Gunung Kinabalu, Sabah
<i>Eulichas villosa</i>	Hájek	2009	Gunung Emas and Gunung Kinabalu
<i>Foenobethylus bidentatus</i>	Várkonyi & Polaszek	2007	Brunei
<i>Hoyicoccus hendersonae</i>	Kozár & Williams	2009	Gunung Kinabalu, Sabah
<i>Ibycus rachelae</i>	Schilthuizen & Liew	2008	Gunung Kinabalu, Sabah
<i>Lordomyrma reticulata</i>	Lucky & Sarnat	2008	Near Danum Valley
<i>Macrobrachium kelianense</i>	Wowor & Short	2007	Kelian River, East Kalimantan
<i>Macrobrachium urayang</i>	Wowor & Short	2007	Kelian River, East Kalimantan
<i>Paratelius emasensis</i>	Malohlava & Bocak	2009	Crocker Range



Species	Scientist(s)	Year	Location
<i>Paratelius nigricornis</i>	Malohlava & Bocak	2009	Crocker Range
<i>Paratelius snizeki</i>	Malohlava & Bocak	2009	Crocker Range
<i>Phaenicocleus minor</i>	Štys & Baňar	2009	Crocker Range
<i>Phaenicocleus sabahensis</i>	Štys & Baňar	2009	Crocker Range
<i>Phaenicocleus schwendingeri</i>	Štys & Baňar	2009	Mount Kinabalu
<i>Phobaeticus chani</i>	Hennemann & Conle	2008	Kinabalu Park, Sabah
<i>Phortica alba</i>	Chen & Toda	2007	Gunung Kinabalu and Crocker Range, Sabah
<i>Phortica epsilon</i>	Chen & Toda	2007	Gunung Kinabalu
<i>Phortica expansa</i>	Chen & Toda	2007	Gunung Kinabalu
<i>Phortica jamilli</i>	Chen & Toda	2007	Gunung Kinabalu
<i>Phortica kinabalensis</i>	Chen & Toda	2007	Gunung Kinabalu and Crocker Range, Sabah
<i>Phortica lanuginosa</i>	Chen & Toda	2007	Gunung Kinabalu
<i>Phortica liewi</i>	Chen & Toda	2007	Gunung Kinabalu and Crocker Range, Sabah
<i>Phortica membranifera</i>	Chen & Toda	2007	Crocker Range
<i>Phortica ni</i>	Chen & Toda	2007	Gunung Kinabalu, Sabah
<i>Phortica palmata</i>	Chen & Toda	2007	Crocker Range
<i>Phortica zeta</i>	Chen & Toda	2007	Crocker Range
		<b>Subtotal</b>	<b>29</b>
<b>Plants</b>			
<i>Alocasia infernalis</i>	Boyce	2007	Kapit Division, Sarawak
<i>Alphonsea borneensis</i>	Turner	2009	Sintang, Central Kalimantan
<i>Appendicula clemensiorum</i>	Wood	2008	Mount Kinabalu National Park
<i>Appendicula tembuykenensis</i>	Wood	2008	Mount Kinabalu National Park, Kota Belud District
<i>Ascidieria maculiflora</i>	Wood	2008	Ulu Padas, Sipitang District
<i>Boesenbergia imbakensis</i>	Sakai & Nagam.	2009	Imbak Canyon, Kinabatangan, Sabah
<i>Boesenbergia laevivaginata</i>	Sakai & Nagam.	2009	Bario, Marudi District
<i>Boesenbergia subulata</i>	Sakai & Nagam.	2009	Belait, Labi
<i>Bulbophyllum aschemon</i>	Verm. & Lamb	2008	Kelabit Highlands
<i>Bulbophyllum belliae</i>	Verm. & Lamb	2008	Mount Kinabalu National Park
<i>Bulbophyllum belonaeglossum</i>	Verm. & Lamb	2008	Sabah
<i>Bulbophyllum cyrtognomom</i>	Verm. & Lamb	2008	Crocker Range
<i>Bulbophyllum haematostictum</i>	Verm. & Lamb	2008	Batu Punggul near Sepulot, Sabah
<i>Bulbophyllum leptoglossum</i>	Verm. & Lamb	2008	Gunung Mulu National Park
<i>Bulbophyllum retrorsum</i>	Verm. & Lamb	2008	Kinabalu National Park
<i>Bulbophyllum rutilan</i>	Verm. & Lamb	2008	Long Pa Sia area, Sipitang District, Sabah
<i>Bulbophyllum simii</i>	Verm. & Lamb	2008	Lanjak Entimau Protected Forest, Sarawak
<i>Callicarpa argentii</i>	Bramley	2009	Gunung Meranti, Central Kalimantan
<i>Chelonistele senagangensis</i>	Wood	2008	Ulu Senagang, Tenom District, Sabah
<i>Cleisocentron gokusingii</i>	Wood & Lamb	2008	Mount Rimau near Long Pa Sia, Sipitang District, Sabah
<i>Dendrobium cymbicallum</i>	P.O'Byrne & J.J.Wood	2007	Sipitang District
<i>Dendrobium deflexilobum</i>	Wood & Lamb	2008	Crocker Range, Tambunan District
<i>Dendrobium devogelii</i>	Wood	2008	Apo Kayan, between Long Ampung and Long Nawan, Kalimantan
<i>Dendrobium jamirusii</i>	Wood & Lamb	2008	Kalabakan area, Pensiangan District, Tawau Division
<i>Dendrobium jiewhoei</i>	Wood & Chan	2008	Crocker Range, Tambunan District
<i>Dendrobium lohokii</i>	Wood & Lamb	2008	Pensiangan District, Sabah
<i>Dendrobium lumakuense</i>	Wood	2008	Mount Lumaku, Sipitang District, Sabah
<i>Dendrobium montis-hosei</i>	Wood	2008	Hose Mountains, Kapit District, Sarawak
<i>Dendrobium muluense</i>	Wood	2008	Gunung Mulu National Park, Sarawak
<i>Dendrobium punbatuense</i>	Wood	2008	Pun Batu, Pensiangan District, Sabah



Species	Scientist(s)	Year	Location
<i>Dendrobium roseocalca</i>	Wood	2008	Crocker Range
<i>Dendrobium sabahense</i>	Wood	2008	Batu Urun, Kinabatangan District, Sabah
<i>Dendrobium serena-alexianum</i>	Wood & Lamb	2008	Foothills of Gunung Kinabalu
<i>Dendrobium stronglyloflorum</i>	Wood	2008	Kelabit Highland
<i>Dendrobium tetrabrachium</i>	Wood	2008	Julau District, Sarawak
<i>Dendrobium toppiorum</i>	Lamb & Wood	2008	Sipitang District, Sabah
<i>Fissistigma brevistipitatum</i>	Turner	2009	Sungai Millian, Nabawan District, Interior Division, Sabah
<i>Fissistigma bygravei</i>	Turner	2009	Babagon to Ulu Terian, Penampang District, West Coast Division
<i>Fissistigma carrii</i>	Turner	2009	Gunung Kinabalu
<i>Fissistigma montanum</i>	Turner	2009	Pagon Ridge, Brunei
<i>Friesodielsia formosa</i>	Turner	2009	Kalimantan, Central Kalimantan, headwaters of S. Kahayan
<i>Gardenia chani</i>	Low	2007	Badas Forest Reserve, Belait District
<i>Goniothalamus kamarudini</i>	Turner & Saunders	2009	Gunung Kinabalu
<i>Goniothalamus megalocalyx</i>	Turner & Saunders	2009	Extreme headwaters of Balleh River, western slope of Bukit Tibang, Kapit District
<i>Goniothalamus phaeotrichus</i>	Turner & Saunders	2009	Sungai Iban, Belaga District, Kapit Division
<i>Homalomena ardua</i>	Boyce & Wong	2008	Mulu National Park, Sarawak
<i>Homalomena striatieopetiolata</i>	Boyce & Wong	2008	Mulu National Park, Sarawak
<i>Jejewoodia crockerensis</i>	Wood & Lamb	2008	Crocker Range
<i>Liparis trifoliata</i>	Wood & Ormerod	2008	Gunung Kinabalu
<i>Malleola honhoffii</i>	Schuit. & Vogel	2007	Kelabit Highlands
<i>Mallotus connatus</i>	Aparicio	2007	Sintang, Kalimantan
<i>Mycaranthes depauperata</i>	Wood	2008	Sipitang District, Sabah
<i>Plagiostachys brevicecarata</i>	Julius & Takano	2007	Ulu Kimanis, Crocker Range Park, Papar District
<i>Plagiostachys longicaudata</i>	Julius & Takano	2007	Lahad Datu District, Danum Valley Conservation Area
<i>Plagiostachys megacarpa</i>	Julius & Takano	2007	Ulu Kimanis, Crocker Range Park, Papar District
<i>Plagiostachys roseiflora</i>	Julius & Takano	2007	Danum Valley Conservation Area, Lahad Datu District
<i>Plagiostachys viridisepala</i>	Julius & Takano	2007	Kinabalu Park-Sayap, Kota Belud District
<i>Polyalthia beamaniorum</i>	Turner	2008	Crocker Range, Keningau District
<i>Polyalthia charitopoda</i>	Turner	2008	Bukit Telingan, Labi
<i>Polyalthia miliusoides</i>	Turner	2008	Keningau District
<i>Sarcogyphis masiusii</i>	Miadin, A.L.Lamb & Emoi	2008	Tawau District, Sabah
<i>Syzygium flagrimonte</i>	Ashton	2009	Gunung Api, Mulu National Park
<i>Syzygium praestantilimum</i>	Ashton	2009	Labi, Brunei
<i>Syzygium tubiflorum</i>	Ashton	2009	Maliau Basin, Sabah
<i>Thrixspermum erythrolomum</i>	O'Byrne & Verm.	2008	Tambunan District, Gunung Trus Madi, Sabah
<i>Trichoglottis sithasmahae</i>	Wood & Lamb	2008	Gunung Kinabalu, Sabah
<i>Wendlandia tombuyukonensis</i>	Suzana, Pereira & Sugau	2008	Gunung Kinabalu Park, Ranau District, Sabah, Malaysia
		<b>Subtotal</b>	<b>67</b>
		<b>Total</b>	<b>123</b>



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