



WWF®

REPORT

GREATER  
MEKONG

2014



WWF-Greater Mekong

**MYSTERIOUS MEKONG**  
NEW SPECIES DISCOVERIES 2012-2013



WWF is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by: conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

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**Front cover**

The Cambodian Tailorbird (*Orthotomus chaktomuk*), a new bird species discovered in 2013 © James Eaton / Birdtour Asia.





A tributary of the Mekong River flows through unbroken and highly biodiverse rainforests of the Greater Mekong region, Cambodia.

## At a glance, by country...

|                             |     |
|-----------------------------|-----|
| Cambodia                    | 13  |
| China<br>(Guangxi / Yunnan) | 116 |
| Laos                        | 32  |
| Myanmar                     | 26  |
| Thailand                    | 117 |
| Vietnam                     | 99  |

Note: The sum of the above figures does not equal the total number of new species discovered in 2012 and 2013, as some species have a distribution spanning more than one country.



Blind huntsman spider, *Sinopoda scurion*, in its original cave habitat in Laos.

# EXECUTIVE SUMMARY

An extraordinary 367 new species were discovered in the Greater Mekong in 2012 and 2013. Among the species newly described by scientists are 290 plants, 24 fish, 21 amphibians, 28 reptiles, 1 bird and 3 mammals [see Appendix].

The Greater Mekong region of Southeast Asia, through which the Mekong River flows, consists of Cambodia, Laos, Myanmar, Thailand, Vietnam and Yunnan province and Guangxi Zhuang Autonomous Region in southern China. The region is home to some of the planet's most

charismatic and endangered wild species, including the tiger, Asian elephant, Irrawaddy dolphin, saola, and Mekong giant catfish—and between 1997 and 2011 an incredible 1,710 new organisms were described<sup>1</sup> by science in these landscapes.<sup>1,2,3,4,5</sup>

Adding to the fantastic bestiary of creatures living in the Greater Mekong are new characters such as the Cambodian Tailorbird, Laotian giant flying squirrel, 'hunch-bat of Vietnam', an iridescent-coloured rainbow lizard, a fish who is ahead of the reproduction game, the 'Zorro'-masked water snake, a salmon-coloured orchid and a primitive white-headed viper. A skydiving gecko, giant flying frog, "fishzilla" (walking snakehead fish), brightly-coloured bronzeback snake, pufferfish and blind huntsman spider further add to the newly discovered assemblage.

These discoveries, painstakingly identified and recorded by the world's scientists and compiled here by WWF-Greater Mekong, demonstrate that the region is the frontline for scientific exploration. But they also remind us of what we stand to lose if regional development is not sustainable. The recent extinction of the rhino in the region<sup>6</sup> and the ongoing plight of the tiger, whose numbers in the region may be as low as 250 individuals<sup>7</sup>, are poignant reminders of this. In addition, the devastating illicit trade in wildlife is now worth at least 16 billion US dollars annually.<sup>8</sup>

WWF seeks a world that values, accounts for, and safeguards natural capital as vital to human well-being and economic prosperity. Our focus is on the world's richest and most diverse natural capital including tropical forests and river basins. They underpin well-being and prosperity across entire regions, and yet, global markets value them more dead than alive. Today the region's forests are being cleared on an industrial scale, mainly for land to produce commodities we all use. According to a recent WWF report, *Ecosystems in the Greater Mekong: past trends, current status, possible futures*, between 1973-2009 the Greater Mekong countries lost 42.4 million hectares of forest, 30 per cent of forest cover.<sup>9</sup>

Our dynamic and innovative solutions-oriented approach to conservation sees us working with global networks of scientists, policymakers, businesses, financial institutions, and communities to help turn this around. Dwindling forests generate short-term profits, but economists estimate that their true value to the global economy – if managed sustainably – could be in the order of trillions of dollars each year.

Today the Greater Mekong region forms part of one of the five most threatened biodiversity hotspots in the world.<sup>10</sup> Rapid unsustainable development, including poorly planned infrastructure, uncontrolled and non-transparent extractive activities, and agricultural expansion, as well as the rampant wildlife trade, are profoundly degrading the health of the region's ecosystems—and consequently, the well-being of the millions of people who directly depend on natural resources. Warmer temperatures, and more extreme floods, droughts, and storms as a result of climate change, only exacerbate these pressures.

Thorough and consistent management of ecosystems across the Greater Mekong region will help nations adequately address complex, challenging, and regional-scale issues like habitat loss and fragmentation, unsustainable natural resource use, poaching, and climate change.



**367 SPECIES**  
DISCOVERED IN  
2012 AND 2013 IN  
THE GREATER MEKONG



*Bulbophyllum salmoneum*,  
a new orchid species

© Orchids Online

<sup>1</sup> Refers to the official process by which a species is described in the peer-reviewed scientific literature once discovered and therefore formally determined as 'new'.

# Colourful characters: New discoveries in focus

## The tailor of Phnom Penh: A new city- dwelling bird

*Orthotomus chaktomuk*  
(Cambodia)



*Orthotomus chaktomuk*

© James Eaton / Birdtour Asia

In 2013, a new bird species was described by scientists hiding in plain sight in Cambodia's capital Phnom Penh.<sup>11</sup>

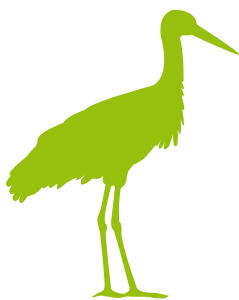
The Cambodian Tailorbird (*Orthotomus chaktomuk*), as the new species is called, is a small, light and dark grey bird, with an orange-red tuft on its head, about the size of a Eurasian Wren (*Troglodytes troglodytes*). The species is likely confined to dense shrub habitat in the floodplain of the Mekong river on the edge of the city. The dense shrub habitat allowed it to remain undetected for so long despite living on the outskirts of a major city. It is one of two bird species endemic to Cambodia, the other being the Cambodian Laughingthrush (*Garrulax ferrarius*).

The species was first spotted in 2009 during routine bird surveys for avian flu and has since been spotted in other

locations around the city, including a construction site. The discovery of an un-described bird species in a busy capital city is obviously exceptionally uncommon!

Its specific name comes from a Khmer word that means four-faces, which describes where the bird is found: in the floodplain where the Bassac, Mekong, and Tonlé Sap rivers meet.

Tailorbirds are named for the meticulous way in which they construct their nests by weaving leaves together. Unfortunately, due to the small (and shrinking) size of the birds' habitat, the species is listed as "Near Threatened" on the International Union for Conservation of Nature's Red List.



+ 1

ONE NEW BIRD  
HAS BEEN DISCOVERED  
IN THE GREATER MEKONG

## White-head Burmese viper

*Azemiops kharini*  
(Yunnan, Guangxi  
and Vietnam)

Scientists recently discovered a new primitive viper species, from Tam Dao Mountain, Tam Dao Village, Vinh Phuc Province, Vietnam.<sup>12</sup>

The venomous species is thought to be a primitive viper species because it has an elliptically shaped, flattened head; enlarged head plates; smooth dorsal scales; folding front fangs; the absence of heat-sensing pits; and a coiled venom gland duct in adults.

The species can be found in dense bamboo and tree-fern groves interspersed with open, sun-lit zones, and usually inhabits deep leaf litter that accumulates near fallen trees. Its diet consists mostly of rodents that are associated with quick-flowing mountain streams. The genus is known to inhabit cooler mountainous areas at altitudes of up to 1000 m, as well as disturbed areas, including agricultural lands and secondary forests.

The White-head Burmese viper is dispersed across a broader range than the Black-head Fea's Viper (*Azemiops fea*), with a distribution stretching from eastern China to northern Indochina.<sup>13</sup> The two species of *Azemiops* are found a short distance from each other, and are apparently separated by the Red River Valley. *Azemiops fea* can be seen west of the Red River, and *Azemiops kharini* can be seen to the east of the Red River.



+ 28

TWENTY-EIGHT NEW REPTILES  
HAVE BEEN DISCOVERED IN  
THE GREATER MEKONG



*Azemiops kharini*

© Nguyen Thien Tao / Vietnam National Museum of Nature

## A new pufferfish

*Tetraodon palustris*  
(Thailand)

A new freshwater pufferfish was encountered in 2013 by scientists in the Mekong Basin of Thailand.<sup>14</sup>

The yellow species with grey-green blotches was discovered as a result of a survey conducted by a determined group of scientists aiming to further knowledge of pufferfish.

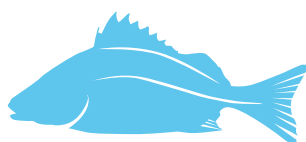
An ichthyological survey was conducted from January 2011 to December 2012 in the Mekong basin in the northeastern region of Thailand as an attempt to supplement the small number of published scientific studies on freshwater pufferfishes in the genus *Tetraodon* from the Mekong Basin of Thailand. It was during this survey that the authors collected an unknown freshwater pufferfish of the genus *Tetraodon* from marshes and swamps. The shape and colour pattern of this new species differs from those of previously described *Tetraodon* from the Mekong basin.

The freshwater rivers of northeastern Thailand, from which this species was discovered, form part of one of the priority conservation landscapes of

WWF-Greater Mekong. WWF projects in Thailand and adjacent Laos work with local communities to develop fish conservation zones. We hope these help protect the amazing fish diversity of the Mekong including giants such as Mekong Giant Catfish (*Pangasianodon gigas*) as well as undiscovered species.

Pufferfish are among the more charismatic species of fish found in Earth's waters, with a defence mechanism that sees the fish inflate to ward off predators. Pufferfish are also believed to be the second-most poisonous vertebrates in the world, after the golden poison frog (*Phyllobates terribilis*), with certain internal organs highly toxic to most animals when eaten.

The new species joins 25 other known species of pufferfish from Southeast Asia and more than 850 known fish species from Greater Mekong.



+ 24

TWENTY-FOUR NEW FISH  
HAVE BEEN DISCOVERED IN  
THE GREATER MEKONG



© Chavaltit Vidthayanon / Mekong River Commission

*Tetraodon palustris*



# Laotian giant flying squirrel

*Biswamoyopterus laoensis*

(Laos)

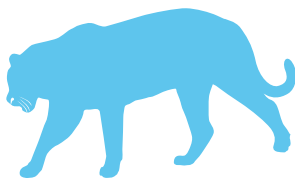
As new mammal discoveries become increasingly rare in the animal kingdom, it is extraordinary that a new species of flying squirrel from the genus *Biswamoyopterus* was described in 2013 from Laos.<sup>15</sup>

The discovery is based on a single individual collected from a local bush meat market in Ban Thongnami, Pak Kading District, Bolikhamxai Province. Wildlife trade, driven by both local consumption and the global market for luxury wildlife products, is one of the biggest threats to biodiversity across the Mekong region. WWF is thus working, in all our priority landscapes and protected areas, to ensure government enforcement agencies have the motivation and capacity to effectively crack down on illegal wildlife trade.

This arboreal species with red and white fur is the second member of the genus *Biswamoyopterus* to be discovered by scientists (the other

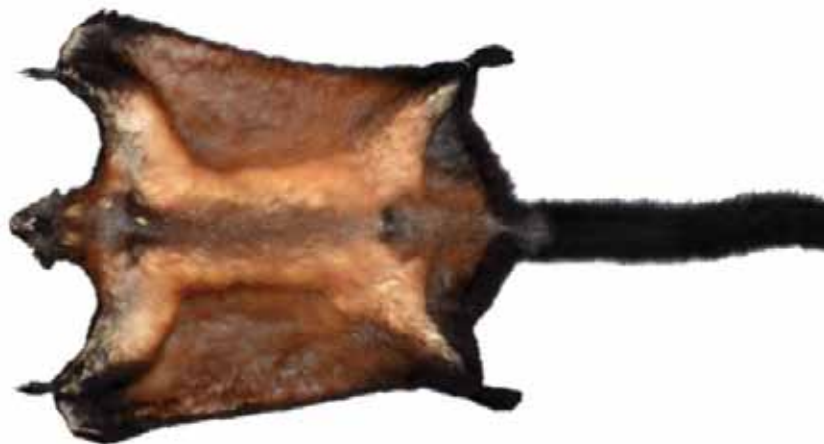
being *Biswamoyopterus biswasi* from Arunachal Pradesh, northeast India). Over 1,000km separate the two very similar species, with the new species residing in an area of central Laos characterised by extensive limestone karst formations. This habitat is also home to other unique and rare endemic rodents, including the Laotian rock rat, known locally as Kha-nyou (*Laonastes aenigmamus*), and the Lao limestone rat (*Saxatilomys paulinae*).<sup>16</sup>

The species is among three new mammals discovered in 2012 and 2013 in the Greater Mekong.



+ 3

THREE NEW MAMMALS  
HAVE BEEN DISCOVERED  
IN THE GREATER MEKONG



*Biswamoyopterus laoensis*

© Daosavanh Sanamxay

## The 'hunch-bat of Vietnam'

*Hipposideros griffini*  
(Vietnam)



© Vu Dinh Thong / Institute of Ecology and Biological Resources, Hanoi

*Hipposideros griffini*

*Hipposideros griffini*, discovered in 2012, is unlikely to win a beauty contest anytime soon. With an appearance to rival the lead character of Victor Hugo's 1831 literary classic *The Hunchback of Notre-Dame* (a.k.a. *Notre-Dame de Paris*), mother nature certainly did not grant this species with a very charming appearance.<sup>17</sup> However, what it lacks in beauty, it makes up for in function: its very peculiar nose may assist in echolocation, the sonar-like ability used by bats to help them navigate.

This new member of the bat community joins more than 70 other species within the genus *Hipposideros* in the world today. It was found at 248m above sea level in Cat Ba National Park on Cat Ba Island in Ha Long Bay in northern Vietnam, as well as in Chu Mom Ray National Park, situated on the mainland more than 1,000km (600 miles) to the south. It was located in disturbed and primary forests.

Cat Ba Island has been the site of other extraordinary new species discoveries in recent years, including a rare leopard gecko (*Goniurosaurus catbaensis*) in

2008.<sup>18</sup> This gecko, which has large, cat-like eyes and distinctive stripes along the length of its body, is found only in the moist tropical forests of northern Vietnam's Cat Ba National Park.

Griffin's leaf-nosed bat, as this species is more commonly known, was first seen in 2008, but it was not until later, after catching some of the bats, that a team of researchers led by Dr Vu Dinh Thong from the Institute of Ecology and Biological Resources, Hanoi, found out it was actually a new species that had never before been documented.

The new bat species was named in honour of the late Donald Redfield Griffin (1915–2003) of Rockefeller University (New York). He was a pioneer in the field of bat echolocation research.

Another new bat species, *Murina balaensis*, was discovered in 2013 in Thailand.<sup>19</sup>

## A rainbow lizard

*Lygosoma veunsaiensis*  
(Cambodia)

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This species was discovered in the remote rainforest of Veun Sai-Siem Pang Conservation Area in Ratanakiri Province, Cambodia, by a Fauna and Flora International herpetologist, Neang Thy. *Lygosoma veunsaiensis* is a new type of skink with several distinct characteristics including its iridescent skin, which is a result of the way its scales refract sunlight to create a rainbow-like shimmer.<sup>20</sup> It is also unusually long, a trait that is amplified by its proportionally lengthy tail and short legs (less than half a centimetre long).<sup>21</sup>

It was a very fortunate discovery, as Neang Thy explained: “These creatures are difficult to find because they spend so much of their life hidden underground. Some similar species are known from only a few individuals. We were very lucky to find this one.”<sup>22</sup>

This species was named for the region in which it was found, the Veun Sai-Siem Pang Conservation Area

(VSSPCA), as a tribute and to underscore the area’s importance for the conservation of Cambodia’s threatened biodiversity.<sup>23</sup>

Indeed, the need to respond to such threats to biodiversity are becoming all the more urgent as Cambodia is proving to be a hotbed for new species discoveries. Lack of research in recent decades could explain this sudden rush of new findings, according to Peter Geissler from Zoologisches Forschungsmuseum Alexander Koenig in Germany, one of the authors who described the skink. “Three decades of conflict effectively prevented herpetological investigations until the late 1990s,” he said, “and now we have a chance to uncover many of the things that have previously been missed, especially new reptiles.”<sup>24</sup>



*Lygosoma veunsaiensis*

© Gabor Csorba / Hungarian Natural History Museum

# Giant, bright green, flying frog

*Rhacophorus helenae*  
(Vietnam)

Helen's Flying Frog, *Rhacophorus helenae*, a huge, green, "flying" frog was discovered less than 100km from Ho Chi Minh City, an urban centre with over 9 million people.<sup>25,26</sup>

Helen's Flying Frog can grow to almost 10cm in length and belongs to the group of frogs that have the greatest ability to glide. With large feet that are fully webbed and flaps of webbing on the outside of their arms, they can glide sometimes 50 feet (15 metres) gracefully down from trees to breed in forest pools, and even from tree to tree.<sup>27</sup>

They likely spend most of their time out of human sight in the forest canopy, which would explain why this new species with such a fantastic appearance has been completely unknown to science until now.

To date, Helen's Flying Frog is still only known from two patches of lowland forest surrounded by agricultural land in Binh Thuan and Dong Nai provinces in southern Vietnam. Lowland forests are among the most threatened habitats in the world, largely because they are so accessible (i.e. no mountains for people to scale in order to get there).

Despite its recent scientific discovery, Helen's Flying Frog is unfortunately already under great threat from ongoing habitat loss and degradation.<sup>28</sup> Scientists are warning that the frog could merit listing as a threatened species under IUCN Red List criteria.

Dr Jodi Rowley had the honour of naming the new species *Rhacophorus helenae* after her mother.<sup>29</sup>

+ 21

TWENTY-ONE  
NEW AMPHIBIANS  
HAVE BEEN DISCOVERED IN  
THE GREATER MEKONG



*Rhacophorus helenae*



*Rhacophorus helenae*

© Jodi J L Rowley / Australian Museum

© Jodi J L Rowley / Australian Museum

# A fish who's ahead in the reproduction game

*Phallostethus cuulong*  
(Vietnam)

This new 'penis head' fish (*Phallostethus cuulong*), is certainly among the more bizarre discoveries to surface in the Mekong Delta region of Vietnam.<sup>30,31</sup>

The fish is a newcomer to the Phallostethidae family of fish, whose thin, nearly transparent bodies are characterized by the unusual placement of their sex organs.<sup>32</sup>

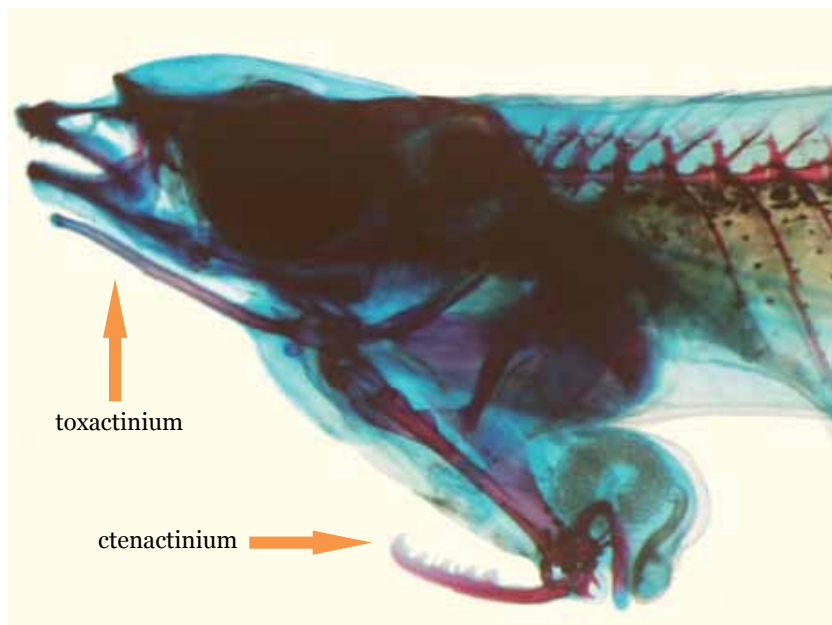
The male fish's priapium (the technical name for its sex organ) is a complex, muscular organ located underneath the fish's chin. In addition to including the urogenital opening and the anus, the priapium is also equipped with a bony rod (toxactinium) and a saw-like hook (ctenactinium), which is used to clutch on to the female during mating. The female fish's genitals are also located at her throat, and unlike most fish, fertilization for the *Phallostethus cuulong* takes place

inside the female's body. The hook probably increases the success of fertilization, researchers say.<sup>33</sup>

Researchers from Can Tho University in Vietnam and zoologist Koichi Shibukawa of the Nagao Natural Environment Foundation in Tokyo, Japan collected and studied nine specimens of this new fish species, including six males and three females.<sup>34</sup> They were found in the slow-flowing shallow waters around banks of canals and rivers in Soc Trang and Tra Vinh Provinces, Vietnam.<sup>35</sup>



*Phallostethus cuulong*  
(male, top; female, bottom)



*Phallostethus cuulong*

# 'Zorro'-masked water snake

*Homalopsis mereljcoxi*  
(Cambodia, Thailand and  
Vietnam)

A new species of masked water snake was discovered in Ban Badan Reservoir, Nakhon Ratchasima Province, Thailand.<sup>36</sup>

Sporting a Zorro-like mask across their wide heads, water snakes of the genus *Homalopsis* exceed 1.3m and are marked by a pattern of alternating brown and cream bands along the length of their bodies. These snakes are nocturnal ambush predators whose diet consists mostly of small fish. Members of the *Homalopsis* genus are viviparous<sup>11</sup> and females give birth to relatively large young.

Snakes from this genus are relatively abundant in the low elevation wetlands of Southeast Asia. At Tonle Sap in Cambodia, they are harvested in large numbers for their skin and as a source of protein. Despite its newness to science, *Homalopsis mereljcoxi* is the most exploited species of those within the genus in the Greater Mekong region. Given their larger size and distinct

markings, they are seen as more desirable, particularly by the novelty leather industry.<sup>37</sup>

Only one species of the *Homalopsis* genus was recognised for the majority of the last 250 years (Linnaeus' original description of *Coluber buccatus* in 1758) until 2006 when another species was identified. Despite the distribution, abundance, and excessive exploitation of these snakes, the genus and species have remained poorly studied.

The new species was identified by scientist John C. Murphy and colleagues during their examination of 163 specimens of the genus *Homalopsis*. It is named in honour of Merel "Jack" Cox, for his years of dedication to the study of the snakes of Thailand.



*Homalopsis mereljcoxi*

<sup>11</sup> Giving birth to live young.



© John C. Murphy

The new snake species *Homalopsis merejcoxi* is ironically already the most exploited *Homalopsis* species and is exploited in the snake harvest at Tonle Sap, in Cambodia.

## Salmon orchid

*Bulbophyllum salmoneum*  
(Laos and Vietnam)



*Bulbophyllum salmoneum*



+ 290

TWO HUNDRED AND NINETY  
NEW PLANTS HAVE BEEN DISCOVERED  
IN THE GREATER MEKONG

Such is the influence of the Mekong River basin in the makeup of the region that even the plants are beginning to resemble fish! This new salmon orchid species was found in the environs of Mo village in Quang Binh province, Minh Hoa district, Thuong Hoa municipality, Vietnam.<sup>38</sup>

The salmon orchid, with 3cm-long green sepals, was described by Leonid V. Averyanov and J.J. Vermeulen. It is found 400-800 metres above sea level in the Annamite Mountains.

This isolated mountain range that links Laos and Vietnam is the location of the largest and most ambitious project in the history of WWF's involvement in the Greater Mekong region. The Carbon & Biodiversity Project (CarBi)<sup>iii</sup> aims to halt deforestation, through forest protection and sustainable use of forest resources, and preserve the Annamite landscape's unique species diversity.

CarBi covers an expanse of more than 200,000 ha of forest, including one of the largest continuous natural forest areas in continental Asia. This area of remarkably high biodiversity and unique endemism – including the enigmatic saola *Pseudoryx nghetinhensis* – is also unfortunately one where deforestation and illegal logging are rife.

The partnerships through which this project is facilitated will also help to reduce the many threats the region is facing, including illegal or unsustainable logging, unsustainable agriculture, and the illegal timber trade, by training local administration and forestry officials and promoting sustainable forest management. While it is important for species and forest conservation, the project will also enhance the income of the area's culturally diverse people who depend on forests for their livelihoods.

**Find out more:**  
[panda.org/greatermekong/carbi](http://panda.org/greatermekong/carbi)

<sup>iii</sup> The full title of the project is: Avoidance of deforestation and forest degradation in the border area of southern Laos and central Vietnam for the long-term preservation of carbon sinks and biodiversity (CarBi).



# A zebra-striped lizard

*Cyrtodactylus  
phuketensis*  
(Thailand)



© Montri Srimontha

*Cyrtodactylus phuketensis*

This zebra-striped species is roughly 11.5cm long and looks ‘other worldly’. The decorative gecko is currently known only from Khao Phra Thaeo Non-hunting Area, Phuket Island, southwestern Thailand.<sup>39</sup>

Phuket Island is one of Thailand’s most popular tourist destinations. Although most of the forested areas of the island have suffered much from human disturbance and have been replaced by settlements, tourism infrastructure, and agricultural plantations, some patches of primary and mature secondary forest remain, especially in the centre of the island, where two recently described, endemic reptile species were found.

The snake fauna of the island benefitted from some dedicated surveys in the 1970s, but overall the lizard fauna has received little attention thus far.

In the Khao Phra Thaeo Non-hunting Area and its direct surroundings, a team of scientists collected a series of *Cyrtodactylus* species which showed obvious similarities to *C. macrotuberculatus*. However, after being thoroughly investigated, differences began to surface and although related, the new eye-catching finds were determined to be an entirely new species.

# Blind huntsman spider

*Sinopoda scurion*  
(Laos)



© Peter Jäger / Senckenberg Research Institute, Frankfurt

Look, no eyes! Blind huntsman spider, *Sinopoda scurion*

Arachnologist Dr Peter Jäger of the Senckenberg Research Institute in Frankfurt, Germany, has discovered the first eyeless huntsman spider in the world.<sup>40,41</sup>

With a leg span of only six centimetres and a body size of around twelve millimetres, the spider *Sinopoda scurion* does not number amongst the larger of the huntsman spiders, which include more than 1,100 species. However, it is the first of its kind in the world without any eyes.<sup>42</sup>

“I found the spider in a cave in Laos, around 100 kilometres away from the famous Xe Bang Fai cave,” reports Peter Jäger, head of the Senckenberg Research Institute’s arachnology section. “We already knew of spiders of this genus from other caves, but they always had eyes and complete pigmentation. *Sinopoda scurion* is the first huntsman spider without eyes.” The lack of eyes is attributable to living permanently without daylight.<sup>43</sup>

The spiders are in good company: fish, scorpions and crabs adapted to caves have already been found in the caves of Laos. Because of the small-scale area in which the spider species can be found it is possible to

study their adjustment to the cave as a dwelling - the number of eyes present and the visual faculty may possibly shed light on the time of settlement.<sup>44</sup> Jäger also pointed out that “the spiders can be used as indicators for the threat to their habitats. These are often endangered by tourism or the exploitation of the limestone rocks to make cement.”

The eyeless huntsman spider was named after the Swiss company Scurion that makes headlamps for caves.<sup>45</sup> The headlamps by Scurion help scientists to illuminate the darkest corners of caves, and thus recognise hazards such as poisonous snakes and scorpions, but also discover very small organisms.<sup>46</sup>

The eyeless huntsman is not the first significant “creepy crawly” to be found in Laotian caves. Other unusual arthropods include the Laotian huntsman spider *Heteropoda maxima* with a leg span of up to 11 inches (30cm), the whip scorpion *Typopeltis magnificus* with a span of 10 inches (26cm) and the predatory centipede *Thereuopoda longicornis* with a total span of almost one foot, three inches (about 40cm).



*Ptychozoon kaengkrachanense*

## Skydiving gecko

*Ptychozoon  
kaengkrachanense*  
(Thailand)

A new species of Parachute Gecko, *Ptychozoon kaengkrachanense* was discovered in the montane evergreen forest in Kaeng Krachan National Park, Phetchaburi Province, western Thailand.<sup>47</sup> By extending flaps of skin on its flanks and between its toes, the Kaeng Krachan Parachute Gecko is able to glide between the trees in its rainforest habitat.<sup>48</sup>

Three dark markings in the shape of chevrons on its back and other features such as a unique tail distinguish the new species from all known *Ptychozoon* species.<sup>49</sup> *Ptychozoon kaengkrachanense* is the fifth species of *Ptychozoon* recorded from Thailand, along with *P. horsfieldii*, *P. kuhli*, *P. lionotum* and *P. trinotaterra*, but it is the only species of *Ptychozoon* endemic to the country.

Its rainforest home is also special. The species is the 68th reptile species recorded from Kaeng Krachan National Park, which was already known to house the richest herpetofauna of all protected areas of Thailand and it thus reinforces the exceptional value of the park in terms of biodiversity and its conservation.<sup>50</sup>

On a larger scale, the environment in which the species was discovered falls within the Dawna-Tenasserim Landscape. This area spans more than 58,000km<sup>2</sup>, and is one of the highest priority conservation areas for tigers globally, on a par with sites in India, and one of the most significant biodiversity areas in Southeast Asia.

This vast wilderness comprises a continuous block of forest straddling western Thailand and eastern Myanmar. The region is also globally important for Asian elephant (*Elephas maximus*) conservation, and shelters one of the few remaining breeding populations of the endangered Siamese crocodile (*Crocodylus siamensis*). Among the many other notable species occurring here are: Asian tapir (*Tapirus indicus*), Asiatic black bear (*Ursus thibetanus*), sun bear (*Helarctos malayanus*), gaur (*Bos gaurus*), Rufous-necked hornbill (*Aceros nipalensis*) and wild water buffalo (*Bubalus arnee*).

# “Fishzilla” Walking snakehead fish

*Channa longistomata*  
(Vietnam)



*Channa longistomata*

© Museum of Research Institute for Aquaculture, Vietnam

A new snakehead fish was discovered in Vietnam, Ha Nam province, Kim Bang district, Tam Chuc lake, Ba Sao town.<sup>51</sup>

*Channa longistomata* was named according to its specific characteristics, including a long mouth, distinct from that of the other 25 similar species. The outer edges of its fins are tinged red-pink or yellow, and its pectoral fins display 3-5 black bars.

Called a snakehead, as its head looks like that of a snake, the new species is predatory, subsisting on a diet of smaller fish and invertebrates. Certain other attributes of this species also seem more snake-like than fish-like: incredibly, this snakehead fish is able to breath atmospheric air and can even survive on land for up to four days, as long as it stays wet. Its movements on land may appear more cumbersome than a smoothly slithering snake, but this species can writhe and wriggle its way up to ¼

mile on wet land between bodies of water.<sup>52</sup> *National Geographic* has dubbed snakehead fish as “Fishzilla”.<sup>53</sup>

Each spawning-age female can release up to 15,000 eggs at once. Snakeheads can mate as often as five times a year. This means in just two years, a single female can release up to 150,000 eggs<sup>54</sup>. The genus can grow to 1.2m maximum length and are important in aquaculture and commonly used in rice-fish farming. Snakeheads of various varieties are valued as food. In Vietnam, they are called ca loc, ca qua, or ca chui, and enjoyed in clay pot dishes and pickled preparations.<sup>55</sup>

The new species can be found in provinces of the Da river basin (Dien Bien, Lai Chau, Son La and Hoa Binh) and in lakes near the regions of lime mountains of Ha Nam and Ninh Binh.

# Brightly-coloured bronzeback

*Dendrelaphis nigroserratus*  
(Myanmar and Thailand)

This new snake species was found at Kaeng Krachan National Park in southern Thailand, incredibly while it was in the middle of consuming a Wallace's Flying Frog (*Rhacophorus nigropalmatus*).<sup>56</sup>

This relatively large species of *Dendrelaphis* measures up to 156 cm and is distinguished by a thick black stripe behind the eye, which extends onto the neck in a sawtooth pattern of black, oblique bars.<sup>57</sup>

Also known as the Sawtooth-necked Bronzeback, this snake can be found in hilly evergreen forest between 900 and 1,350 metres above sea level (i.e. lower montane forest). It has been recorded near forest streams and stands of bamboo, but is absent from deforested areas.<sup>58</sup> According to scientists, the new discovery underscores the notion that further exploration is needed in the hilly western parts of Thailand, one of the areas in which this species occurs, along with parts of southern Thailand and southern parts of neighbouring Myanmar.<sup>59</sup>

Thailand has been accessible to foreign visitors for a long time. Consequently, many herpetologists have visited the country to explore and document its herpetofaunal richness. Nevertheless, new species are still being described, especially snakes. In general, snakes are notoriously hard to find due to their low densities and elusive habits, such that more undescribed species are expected to inhabit the country.



The long hard road: Like most wildlife in the Greater Mekong, *Dendrelaphis nigroserratus*, from Thailand and Myanmar, is under threat from increasing habitat destruction.

## OPPORTUNITIES: WWF IN MYANMAR

With three of the most pristine large rivers and some of the most extensive intact forest in the region, Myanmar is one of the most biologically diverse and ecologically productive nations on Earth.

Living resources vital to human well-being – forests, fisheries, freshwater ecosystems, fertile soils, coastal and marine ecosystems – the country's natural capital, are the foundation of Myanmar's long-term sustainable economic development. Myanmar has witnessed its neighbours over-exploit their natural capital, creating precariously fragmented ecosystems unable to support sustainable economic growth over the medium and long term.

But as Myanmar opens up politically and economically, it is experiencing many of the same pressures faced by the rest of the Greater Mekong, from deforestation to illegal wildlife trade, sand mining to hydropower.

The government and civil society organizations of Myanmar are now seeking partnerships and state-of-the-art guidance on how to best manage their natural capital, preserving the country's globally important biodiversity for the near and long-term health and prosperity of the people of this vast and diverse nation.

In 2014, WWF established an office in the country, with the aim of supporting Myanmar's development ambitions with a focus on spatial planning and biodiversity conservation in parallel with ecosystem services protection and sustainable livelihoods.

**Learn more:** [panda.org/greatermekong/myanmar](http://panda.org/greatermekong/myanmar)





View of the Dawna-Tenasserim Landscape on the Myanmar-Thailand border.

# Giving green a chance: Conclusions & recommendations

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Fostering sustainable green economies across the Greater Mekong could provide the solution to the region's development dilemma: how can sustainable economic growth and prosperity be achieved while ensuring environmental protection and human well-being?

Green economy approaches aim to understand and emphasise the interdependencies of human systems and natural systems. These approaches ask that we 'join the dots' between ecosystem integrity and resilience of human systems to understand the interrelationships of ecosystem quality, economic systems and conditions determining human well-being. Environmental capacity, from local systems to the biosphere, cannot be reduced to a productive capacity alone. Ecosystem integrity also determines the capacity of a place to provide for the people

that live there, enable livelihoods or support achievement of equitable development goals – and to adapt to increased human pressures while continuing to supply ecosystem services to social and economic systems.

As one of the most biologically diverse places on the planet, the Greater Mekong is home to numerous endangered and endemic species. The Mekong River Basin alone is the richest river basin in the world in terms of fish stocks, and livelihoods of people in the region are directly linked to the basin's productivity. The economic and social development of the Greater Mekong Subregion (GMS) depends on the continued productivity of its interconnected ecological systems. This ecological productivity, and hence the prosperity of the GMS, depend upon intact, healthy and diverse natural ecosystems, which provide resilience to the increasingly evident impacts of climate change, while ensuring continued access to water, energy, food, export commodities, and livelihoods for over 70 million people. The challenge for the GMS is how to maintain or assure environmental capacity in the face of the rapid economic and social change being observed across the six countries in the region.

Each country in the GMS – and their respective economic structures – is different and so require solutions tailored to their national needs. Regionally however, it has been declared that well-maintained biodiversity and ecosystem services are essential to achieving regional and national development and social goals. GMS countries are undertaking a range of activities to improve natural resource management, biodiversity conservation and climate resilience. Cambodia, China (Yunnan and Guangxi), Laos, Myanmar and Thailand agreed to enter into a regional collaboration on the environment and established the Core Environment Program–Biodiversity Conservation Corridors Initiative (CEP-BCI) in 2008. Numerous other programs are also being implemented with support from various partners, contributing to a comprehensive approach to sustaining natural capital in the region.

Furthermore, in July 2011, the GMS Environment Ministers Meeting announced that their regional vision of a “poverty free and ecologically rich GMS” will be achieved through the development of “a green, inclusive and balanced economy, and as a first step in this transition we aim to maintain and enhance ecosystems and the services they provide.” In the same year, at the 2011 GMS Summit, countries endorsed a new ten-year strategic framework that contains many core elements of a transition to a green economy; but there is still a need to create and enhance incentives for reducing footprint pressures on natural capital in the Greater Mekong through changing the top-down framework or enabling policy conditions for achieving conservation goals in each country.



According to the 2011 UNEP report “Towards a Green Economy”, several enabling conditions can help facilitate the transition to a green economy. Key steps that need to be taken to create these enabling conditions include:

- Prioritizing government investment and spending in areas that stimulate the greening of economic sectors as opposed to depleting our natural capital
- Identifying and addressing environmental and social costs in addition to financial costs
- Investing in capacity building and training
- Establishing and/or strengthening sound policy and regulatory frameworks
- Strengthening international or transboundary environmental governance

Sound regulatory frameworks implemented via harmonized policies and legislation across the GMS are critical to GMS countries adequately addressing complex, challenging, regional-scale issues like habitat loss and fragmentation, unsustainable natural resource use, and climate change. All of these factors combined inevitably result in the extinctions of the region’s unique biodiversity, including many species yet to be discovered. Addressing all of these challenges requires stronger transboundary and regional collaboration because countries cannot solve these problems individually. Regional collaboration needs high levels of political support. It also needs to be formalised into a regional agreement, which is supported through an effective institutional framework and mechanism.

In addition, underpinning these regional efforts to encourage and maintain healthy ecosystems and sustainable populations of species, like those featured in this report, WWF aims to work closely with governments and key partners to:

- RESTORE focal species populations to ecosystems where they were once abundant
- RECOVER focal species populations where populations still exist
- RECONNECT habitat to ensure focal species populations increase

Recognising that investing in conservation of natural capital is unlikely to succeed without concurrent supporting realization of green economies in practice, WWF also supports governments and conservation partners by:

- Developing community-based natural resource management and livelihoods
- Encouraging adoption of sustainable production, consumption and ecosystem stewardship standards in the private sector
- Empowering civil society in their role as educators and ‘watchdogs’ on social and environmental safeguards and environmental justice

Only by fostering increased sustainable forestry, alternative land uses and sustainable livelihoods at all levels (regional, national, provincial, and local) will further pressure on remaining populations of the region’s unique species be reduced.

# APPENDIX

## Greater Mekong new species 2012 and 2013.

### Plants

| SPECIES                                | SCIENTIST(S)                          | YEAR | COUNTRY                                 |
|--|---------------------------------------|------|---|
| <i>Acronema crassifolium</i>           | Huan C.Wang, X.M.Zhou & Y.H.Wang      | 2013 | China (Yunnan)                          |
| <i>Aeginetia flava</i>                 | J.Parn.                               | 2012 | Thailand                                |
| <i>Amischotolype barbarossa</i>        | Duist.                                | 2012 | Thailand                                |
| <i>Amischotolype divaricata</i>        | Duist.                                | 2012 | Cambodia / Myanmar / Thailand / Vietnam |
| <i>Amischotolype wetzeniana</i>        | Duist.                                | 2012 | Myanmar / Thailand                      |
| <i>Anomum calcaratum</i>               | Lamxay & M.F.Newman                   | 2012 | Laos                                    |
| <i>Anomum calcicola</i>                | Lamxay & M.F.Newman                   | 2012 | Laos                                    |
| <i>Anomum celsum</i>                   | Lamxay & M.F.Newman                   | 2012 | Laos / Vietnam                          |
| <i>Anomum chryseum</i>                 | Lamxay & M.F.Newman                   | 2012 | Laos                                    |
| <i>Anomum glabrifolium</i>             | Lamxay & M.F.Newman                   | 2012 | Laos                                    |
| <i>Anomum plicatum</i>                 | Lamxay & M.F.Newman                   | 2012 | Laos                                    |
| <i>Anomum prionocarpum</i>             | Lamxay & M.F.Newman                   | 2012 | Laos                                    |
| <i>Anomum rubidum</i>                  | Lamxay & N.S.Lý                       | 2012 | Vietnam                                 |
| <i>Anomum stephanocoleum</i>           | Lamxay & M.F.Newman                   | 2012 | Laos                                    |
| <i>Anomum tenellum</i>                 | Lamxay & M.F.Newman                   | 2012 | Laos / Vietnam                          |
| <i>Amorphophallus arcuspadix</i>       | A.Galloway, Ongsakul & Petra Schmidt  | 2012 | Laos                                    |
| <i>Amorphophallus bolikhamxayensis</i> | A.Galloway, Ongsakul & Petra Schmidt  | 2012 | Laos                                    |
| <i>Amorphophallus brevipetiolatus</i>  | A.Galloway, Ongsakul & Petra Schmidt  | 2012 | Laos                                    |
| <i>Amorphophallus crispifolius</i>     | A.Galloway, Ongsakul & Petra Schmidt  | 2012 | Laos                                    |
| <i>Amorphophallus ferruginosus</i>     | A.Galloway                            | 2012 | Laos                                    |
| <i>Amorphophallus terrestris</i>       | Hett. & Claudel                       | 2012 | Cambodia / Thailand                     |
| <i>Ancylostemon dimorphosepalus</i>    | W.H.Chen & Y.M.Shui                   | 2012 | China (Yunnan)                          |
| <i>Annamocalamus kontumensis</i>       | H.N.Nguyen, N.H.Xia & V.T.Tran        | 2013 | Vietnam                                 |
| <i>Ardisia rubricaulis</i>             | S.Z.Mao & C.M.Hu                      | 2013 | China (Guangxi)                         |
| <i>Argostemma glabra</i>               | Joongku Lee, T.B.Tran & R.K.Choudhary | 2013 | Vietnam                                 |
| <i>Argostemma phyllocharis</i>         | Sridith                               | 2012 | Thailand                                |
| <i>Arisaema claviforme</i>             | Brugg., J.Ponert, Rybková & Vuong     | 2013 | Vietnam                                 |
| <i>Arisaema honbaense</i>              | Luu, Tich, G.Tran & V.D.Nguyen        | 2013 | Vietnam                                 |
| <i>Arisaema lushuiense</i>             | G.W.Hu & H.Li                         | 2012 | China (Yunnan)                          |
| <i>Aristolochia multinensis</i>        | Y.S.Huang & Yan Liu                   | 2013 | China (Guangxi)                         |
| <i>Aspidistra coccigera</i>            | Aver. & Tillich                       | 2012 | Vietnam                                 |
| <i>Aspidistra jiewhoei</i>             | Tillich & Škorničk.                   | 2013 | Vietnam                                 |
| <i>Aspidistra jingxiensis</i>          | Yan Liu & C.R.Lin                     | 2012 | China (Guangxi)                         |
| <i>Aspidistra phanluongii</i>          | Vislobokov                            | 2012 | Vietnam                                 |
| <i>Aspidistra truongii</i>             | Aver. & Tillich                       | 2013 | Vietnam                                 |
| <i>Bauhinia hekouensis</i>             | T.Y.Tu & D.X.Zhang                    | 2013 | China (Yunnan)                          |
| <i>Bauhinia nakhonphanomensis</i>      | Chatan                                | 2013 | Thailand                                |
| <i>Begonia bella</i>                   | Phutthai                              | 2012 | Thailand                                |
| <i>Begonia chongzuensis</i>            | Yan Liu, S.M.Ku & C.I.Peng            | 2012 | China (Guangxi)                         |
| <i>Beilschmiedia turbinata</i>         | Bing Liu & Y.Yang                     | 2013 | China (Yunnan) / Vietnam                |
| <i>Boesenbergia collinsii</i>          | Mood & L.M.Prince                     | 2013 | Thailand                                |
| <i>Boesenbergia kerrii</i>             | Mood, L.M.Prince & Triboun            | 2013 | Thailand                                |
| <i>Boesenbergia kingii</i>             | Mood & L.M.Prince                     | 2013 | China (Yunnan) / Myanmar / Thailand     |
| <i>Boesenbergia maxwellii</i>          | Mood, L.M.Prince & Triboun            | 2013 | Myanmar / Thailand                      |
| <i>Bolbitis lanceolata</i>             | S.K.Wu & J.Y.Xiang                    | 2012 | Laos                                    |
| <i>Briggsia damingshanensis</i>        | L.Wu & B.Pan                          | 2012 | China (Guangxi)                         |
| <i>Bulbophyllum salmoneum</i>          | Aver. & J.J.Verm.                     | 2012 | Vietnam                                 |
| <i>Calamus batoensis</i>               | A.J.Hend. & N.Q.Dung                  | 2013 | Vietnam                                 |
| <i>Calamus flavinervis</i>             | A.J.Hend. & N.Q.Dung                  | 2013 | Vietnam                                 |
| <i>Calamus phuocbinhensis</i>          | A.J.Hend. & N.Q.Dung                  | 2013 | Vietnam                                 |
| <i>Calamus quangngaiensis</i>          | A.J.Hend. & N.Q.Dung                  | 2013 | Vietnam                                 |
| <i>Calanthe bingtaoi</i>               | J.W.Zhai, L.J.Chen & Z.J.Liu          | 2013 | China (Yunnan)                          |
| <i>Calanthe leonidii</i>               | P.J.Cribb & D.A.Clayton               | 2012 | Vietnam                                 |
| <i>Calanthe uenshanensis</i>           | J.W.Zhai, L.J.Chen & Z.J.Liu          | 2013 | China (Yunnan)                          |
| <i>Camchaya thailandica</i>            | Bunwong, Chantar. & S.C.Keeley        | 2012 | Thailand                                |
| <i>Camellia cattienensis</i>           | Orel                                  | 2012 | Vietnam                                 |
| <i>Camellia dalatensis</i>             | V.D.Luong, Ninh & Hakoda              | 2012 | Vietnam                                 |
| <i>Camellia inusitata</i>              | Orel, Curry & Luu                     | 2012 | Vietnam                                 |
| <i>Camellia oconoriana</i>             | Orel, Curry & Luu                     | 2013 | Vietnam                                 |
| <i>Capparis daknongensis</i>           | Sy, G.C.Tucker, Cornejo & Joongku Lee | 2013 | Vietnam                                 |
| <i>Carex paracheniana</i>              | X.F.Jin, D.A.Simpson & C.Z.Zheng      | 2012 | China (Guangxi)                         |
| <i>Carex pengii</i>                    | X.F.Jin & C.Z.Zheng                   | 2013 | China (Guangxi)                         |
| <i>Caryodaphnopsis malipoensis</i>     | Bing Liu & Y.Yang                     | 2013 | China (Yunnan)                          |
| <i>Celastrus yuloensis</i>             | X.Y.Mu                                | 2012 | China (Yunnan)                          |
| <i>Changnienia malipoensis</i>         | D.H.Peng, Z.J.Liu & J.W.Zhai          | 2013 | China (Yunnan)                          |
| <i>Clematis peii</i>                   | L.Xie, W.J.Yang & L.Q.Li              | 2012 | China (Yunnan)                          |
| <i>Cochinchinochloa braiana</i>        | H.N.Nguyen & V.T.Tran                 | 2013 | Vietnam                                 |
| <i>Coelogyne phuinhongklaensis</i>     | Ngerns. & Tippayarsi                  | 2012 | Thailand                                |
| <i>Conchidium dickasonii</i>           | Ormerod                               | 2012 | Myanmar                                 |
| <i>Cordiglossis longipedicellata</i>   | Joongku Lee, T.B.Tran & R.K.Choudhary | 2013 | Vietnam                                 |
| <i>Cremastra malipoensis</i>           | G.W.Hu                                | 2013 | China (Yunnan)                          |
| <i>Curculigo fabrei</i>                | Hul                                   | 2013 | Cambodia                                |
| <i>Curcuma arracanensis</i>            | W.J.Kress & V.Gowda                   | 2012 | Myanmar                                 |
| <i>Curcuma leonidii</i>                | Škorničk. & Luu                       | 2013 | Vietnam                                 |
| <i>Dendrobium cobra</i>                | Ormerod                               | 2012 | China (Yunnan)                          |
| <i>Dendrocalamus cauhiensis</i>        | N.H.Xia & V.T.Nguyen                  | 2013 | Vietnam                                 |
| <i>Dendrocalamus longiligulatus</i>    | N.H.Xia & V.T.Nguyen                  | 2013 | Vietnam                                 |
| <i>Dendrocalamus multiflosculus</i>    | H.N.Nguyen, N.H.Xia & V.T.Nguyen      | 2013 | Vietnam                                 |
| <i>Dendrocalamus nianhei</i>           | V.T.Nguyen & V.L.Le                   | 2012 | Vietnam                                 |
| <i>Dendrocalamus taybacensis</i>       | N.H.Xia, V.T.Nguyen & V.L.Le          | 2013 | Vietnam                                 |
| <i>Dendrocalamus velutinus</i>         | N.H.Xia, V.T.Nguyen & V.D.Vu          | 2012 | Vietnam                                 |
| <i>Dendrokingstonia gardneri</i>       | Chaowasku                             | 2012 | Thailand / Vietnam                      |
| <i>Derris glabra</i>                   | Sirich.                               | 2012 | Thailand                                |
| <i>Derris pseudomarginata</i>          | Sirich.                               | 2012 | Thailand                                |
| <i>Deyeuxia gaotigongensis</i>         | Paszko                                | 2013 | China (Yunnan)                          |
| <i>Diceratothera bracteolata</i>       | J.R.I.Wood & Scotland                 | 2012 | China (Yunnan) / Thailand               |
| <i>Dillenia tetrapetala</i>            | Joongku Lee, T.B.Tran & R.K.Choudhary | 2012 | Vietnam                                 |
| <i>Distichochlamys benenica</i>        | Q.B.Nguyen & Škorničk.                | 2012 | Vietnam                                 |
| <i>Dracaena jayniana</i>               | Wilkin & Suksathan                    | 2012 | Thailand                                |
| <i>Dracaena kaweasakii</i>             | Wilkin & Suksathan                    | 2013 | Thailand                                |
| <i>Elatostema albistipulum</i>         | W.T.Wang                              | 2012 | China (Yunnan)                          |
| <i>Elatostema androstachyum</i>        | W.T.Wang, A.K.Monro & Y.G.Wei         | 2013 | China (Guangxi)                         |

# Plants

| SPECIES                              | SCIENTIST(S)                        | YEAR | COUNTRY                  |
|--------------------------------------|-------------------------------------|------|--------------------------|
| <i>Elatostema angustibracteum</i>    | W.T.Wang                            | 2012 | China (Yunnan)           |
| <i>Elatostema caudiculatum</i>       | W.T.Wang                            | 2012 | China (Yunnan)           |
| <i>Elatostema cucullatoniculatum</i> | W.T.Wang                            | 2012 | China (Yunnan)           |
| <i>Elatostema dacinense</i>          | W.T.Wang & Z.Y.Wu                   | 2013 | China (Guangxi)          |
| <i>Elatostema flexuosum</i>          | W.T.Wang                            | 2012 | China (Yunnan)           |
| <i>Elatostema fugongense</i>         | W.T.Wang                            | 2012 | China (Yunnan)           |
| <i>Elatostema glabribracteam</i>     | W.T.Wang                            | 2012 | China (Yunnan)           |
| <i>Elatostema heterocladum</i>       | W.T.Wang, A.K.Monro & Y.G.Wei       | 2013 | China (Guangxi)          |
| <i>Elatostema heterogrammicum</i>    | W.T.Wang                            | 2012 | China (Yunnan)           |
| <i>Elatostema laevicaule</i>         | W.T.Wang, A.K.Monro & Y.G.Wei       | 2013 | China (Guangxi)          |
| <i>Elatostema longitepalum</i>       | W.T.Wang                            | 2012 | China (Yunnan)           |
| <i>Elatostema lushuiheense</i>       | W.T.Wang                            | 2012 | China (Yunnan)           |
| <i>Elatostema nerifolium</i>         | W.T.Wang & Z.Y.Wu                   | 2012 | China (Yunnan) / Vietnam |
| <i>Elatostema oligophlebium</i>      | W.T.Wang, Y.G.Wei & L.F.Fu          | 2012 | China (Guangxi)          |
| <i>Elatostema parvioides</i>         | W.T.Wang                            | 2012 | China (Yunnan)           |
| <i>Elatostema robustipes</i>         | W.T.Wang, F.Wen & Y.G.Wei           | 2012 | China (Guangxi)          |
| <i>Elatostema sexcostatum</i>        | W.T.Wang, C.X.He & L.F.Fu           | 2012 | China (Guangxi)          |
| <i>Elettariopsis limiana</i>         | Picheans. & Yupparach               | 2012 | Thailand                 |
| <i>Elettariopsis poonsakiana</i>     | Picheans. & Yupparach               | 2012 | Thailand                 |
| <i>Elettariopsis ranongensis</i>     | Picheans. & Yupparach               | 2012 | Thailand                 |
| <i>Epipactis dickasonii</i>          | Ormerod                             | 2012 | Myanmar                  |
| <i>Eremochloa renvozei</i>           | Traiperm & Boonkerd                 | 2012 | Thailand                 |
| <i>Eriocaulon chantaranothaii</i>    | Praj. & J.Parn.                     | 2012 | Thailand                 |
| <i>Eriocaulon Chiangmaiense</i>      | Praj. & J.Parn.                     | 2012 | Thailand                 |
| <i>Eriocaulon nautiliformoides</i>   | Praj. & J.Parn.                     | 2012 | Cambodia / Thailand      |
| <i>Eriocaulon parnellii</i>          | Praj. & Chantar.                    | 2012 | Thailand                 |
| <i>Eriocaulon phatamense</i>         | Praj. & Chantar.                    | 2012 | Thailand                 |
| <i>Eriocaulon phuchongense</i>       | Praj. & Chantar.                    | 2012 | Thailand                 |
| <i>Eriocaulon phuphanoides</i>       | Praj. & J.Parn.                     | 2012 | Thailand                 |
| <i>Erythranthe sinoalba</i>          | G.L.Nesom                           | 2012 | China (Yunnan)           |
| <i>Euphorbia maershanensis</i>       | F.N.Wei & J.S.Ma                    | 2013 | China (Guangxi)          |
| <i>Ferrocalamus fibrillosus</i>      | H.N.Nguyen & V.T.Tran               | 2012 | Vietnam                  |
| <i>Flacourtia turbinata</i>          | H.J.Dong & H.Peng                   | 2013 | China (Yunnan)           |
| <i>Gastrodia albidoides</i>          | Y.H.Tan & T.C.Hsu                   | 2012 | China (Yunnan)           |
| <i>Gentiana zhenxiangensis</i>       | L.H.Wu & Z.T.Wang                   | 2012 | China (Yunnan)           |
| <i>Gigantochloa multifloscula</i>    | H.N.Nguyen, N.H.Xia & V.T.Tran      | 2012 | Vietnam                  |
| <i>Globba sherwoodiana</i>           | W.J.Kress & V.Gowda                 | 2012 | Myanmar                  |
| <i>Greenea adangensis</i>            | Tange                               | 2013 | Thailand                 |
| <i>Greenea montana</i>               | Tange                               | 2013 | Thailand                 |
| <i>Greenea rivularis</i>             | Tange                               | 2013 | Laos / Thailand          |
| <i>Greenea vietnamensis</i>          | Tange                               | 2013 | Vietnam                  |
| <i>Hedychium dichotomatum</i>        | Picheans. & Wongsuwan               | 2013 | China (Yunnan)           |
| <i>Hemiboea pseudomagnibracteata</i> | B.Pan & W.H.Wu                      | 2012 | China (Guangxi)          |
| <i>Hemiboea sinovietnamica</i>       | W.B.Xu & X.Y.Zhuang                 | 2012 | China (Guangxi)          |
| <i>Himalaiella natmataungensis</i>   | Fujikawa                            | 2012 | Myanmar                  |
| <i>Holcoglossum singchianum</i>      | G.Q.Zhang, L.J.Chen & Z.J.Liu       | 2013 | China (Yunnan)           |
| <i>Hoya daimenglongensis</i>         | Shao Y.He & P.T.Li                  | 2012 | China (Yunnan)           |
| <i>Hoya lithophytica</i>             | Kidyoo                              | 2012 | Thailand                 |
| <i>Hoya lockii</i>                   | V.T.Pham & Aver.                    | 2012 | Vietnam                  |
| <i>Hoya longipedunculata</i>         | V.T.Pham & Aver.                    | 2012 | Vietnam                  |
| <i>Hoya mappigera</i>                | Rodda & Simonsson                   | 2012 | Thailand                 |
| <i>Hoya soidaensis</i>               | Kidyoo                              | 2013 | Thailand                 |
| <i>Hoya somadeeae</i>                | Rodda & Simonsson                   | 2012 | Thailand                 |
| <i>Hoya thuathienhuensis</i>         | T.B.Tran, Rodda & Simonsson         | 2012 | Vietnam                  |
| <i>Hoya vanguiengensis</i>           | Rodda & Simonsson                   | 2012 | Laos                     |
| <i>Hydrobryum austrolaoticum</i>     | Koi & M.Kato                        | 2012 | Laos                     |
| <i>Hydrobryum phurueanum</i>         | Werukamkul, Ampornpan, Koi & M.Kato | 2012 | Thailand                 |
| <i>Hydrobryum subcrustaceum</i>      | Koi & M.Kato                        | 2012 | Laos                     |
| <i>Hydrobryum subcylindricum</i>     | Koi & M.Kato                        | 2012 | Laos                     |
| <i>Hydrobryum taeniatum</i>          | Koi & M.Kato                        | 2012 | Laos                     |
| <i>Hydrobryum takakioides</i>        | Koi & M.Kato                        | 2012 | Laos                     |
| <i>Hydrobryum varium</i>             | Ampornpan, Werukamkul, Koi & M.Kato | 2012 | Thailand                 |
| <i>Hydrobryum verrucosum</i>         | Koi & M.Kato                        | 2012 | Laos                     |
| <i>Hymenorchis phitamii</i>          | Aver.                               | 2012 | Vietnam                  |
| <i>Indigofera smitinandii</i>        | Mattapha & Chantar.                 | 2013 | Thailand                 |
| <i>Indigofera udonthaniensis</i>     | Mattapha & Chantar.                 | 2013 | Thailand                 |
| <i>Ischaemum thomasi</i>             | Traiperm & Boonkerd                 | 2012 | Thailand                 |
| <i>Jasminum bhumbolianum</i>         | Chalermglin                         | 2013 | Thailand                 |
| <i>Justicia hansenii</i>             | Rueangs. & Chantar.                 | 2013 | Thailand                 |
| <i>Kaempferia pichansoonthonii</i>   | Wongsuwan & Phokham                 | 2013 | Thailand                 |
| <i>Kaempferia udonensis</i>          | Picheans. & Phokham                 | 2013 | Thailand                 |
| <i>Kaempferia xiengkhouangensis</i>  | Picheans. & Phokham                 | 2013 | Laos                     |
| <i>Korthalsia minor</i>              | A.J.Hend. & N.Q.Dung                | 2013 | Laos / Vietnam           |
| <i>Lagerstroemia huamotensis</i>     | W.J.de Wilde & Duyfjes              | 2013 | Thailand                 |
| <i>Lagerstroemia kratiensis</i>      | W.J.de Wilde & Duyfjes              | 2013 | Cambodia                 |
| <i>Lagerstroemia menglaensis</i>     | C.H.Gu, M.C.Ji & D.D.Ma             | 2012 | China (Yunnan)           |
| <i>Lespedeza cambodianum</i>         | V.D.Nguyen                          | 2013 | Cambodia                 |
| <i>Ligusticum gongshanense</i>       | F.T.Pu, R.Li & H.Li                 | 2012 | China (Yunnan)           |
| <i>Lilium yapingense</i>             | Y.D.Gao & X.J.He                    | 2013 | China (Yunnan)           |
| <i>Liparis damingshanensis</i>       | L.Wu & Y.S.Huang                    | 2012 | China (Guangxi)          |
| <i>Litsea dorsalicana</i>            | M.Q.Han & Y.S.Huang                 | 2013 | China (Guangxi)          |
| <i>Lockia sonii</i>                  | Aver.                               | 2012 | Vietnam                  |
| <i>Maclurochloa tonkinensis</i>      | H.N.Nguyen & V.T.Tran               | 2013 | Vietnam                  |
| <i>Magnolia kwangnanensis</i>        | S.G.Chen & Q.W.Zeng                 | 2013 | China (Yunnan)           |
| <i>Mallotus tokia</i>                | Welzen                              | 2013 | Thailand                 |
| <i>Meconopsis exilis</i>             | Tosh.Yoshida, H.Sun & Grey-Wilson   | 2012 | China (Yunnan) / Myanmar |
| <i>Meconopsis muscicola</i>          | Tosh.Yoshida, H.Sun & Boufford      | 2012 | China (Yunnan)           |
| <i>Meconopsis yaoshanensis</i>       | Tosh.Yoshida, H.Sun & Boufford      | 2012 | China (Yunnan)           |
| <i>Memecylon pseudomegacarpum</i>    | M.Hughes                            | 2013 | Thailand                 |
| <i>Michelia xianianhei</i>           | Q.N.Vu                              | 2012 | Vietnam                  |
| <i>Microchirita albiflora</i>        | D.J.Middleton & Triboun             | 2013 | Thailand                 |
| <i>Microchirita karaketti</i>        | D.J.Middleton & Triboun             | 2013 | Thailand                 |
| <i>Microchirita purpurea</i>         | D.J.Middleton & Triboun             | 2013 | Thailand                 |
| <i>Microchirita suddeei</i>          | D.J.Middleton & Triboun             | 2013 | Thailand                 |
| <i>Microchirita woodii</i>           | D.J.Middleton & Triboun             | 2013 | Thailand                 |
| <i>Musa haekkinenii</i>              | N.S.Ly & Haev.                      | 2012 | Vietnam                  |
| <i>Nervilia khaoyaica</i>            | Suddee, Watthana & S.W.Gale         | 2013 | Thailand                 |
| <i>Neuwiedia malipoensis</i>         | Z.J.Liu, L.J.Chen & K.Wei Liu       | 2012 | China (Yunnan)           |
| <i>Nianhochloa bidoupensis</i>       | H.N.Nguyen & V.T.Tran               | 2012 | Vietnam                  |
| <i>Nomocharis gongshanensis</i>      | Y.D.Gao & X.J.He                    | 2012 | China (Yunnan)           |
| <i>Ophiopogon rupestris</i>          | Aver. & N.Tanaka                    | 2013 | Vietnam                  |
| <i>Ophiopogon tristylatus</i>        | Aver., N.Tanaka & Luu               | 2013 | Vietnam                  |
| <i>Ophiopogon yangshuoensis</i>      | R.H.Jiang & W.B.Xu                  | 2013 | China (Guangxi)          |
| <i>Oreocharis dayaoshanioides</i>    | Yan Liu & W.B.Xu                    | 2012 | China (Guangxi)          |

## Plants

| SPECIES                              | SCIENTIST(S)   | YEAR | COUNTRY                  |
|--------------------------------------|--|------|--------------------------|
| <i>Oreocharis glandulosa</i>         | Y.H.Tan & J.W.Li   | 2013 | China (Yunnan)           |
| <i>Oreocharis jinpingensis</i>       | W.H.Chen & Y.M.Shui  | 2013 | China (Yunnan)           |
| <i>Paraboea angustifolia</i>         | Yan Liu & W.B.Xu   | 2012 | China (Guangxi)          |
| <i>Paraboea arachnoidea</i>          | Triboun  | 2012 | Thailand                 |
| <i>Paraboea axillaris</i>            | Triboun  | 2012 | Thailand                 |
| <i>Paraboea bhumiboliana</i>         | Triboun & Chuchan  | 2012 | Thailand                 |
| <i>Paraboea doitungensis</i>         | Triboun & D.J.Middleton  | 2012 | Thailand                 |
| <i>Paraboea eburnea</i>              | Triboun  | 2012 | Thailand                 |
| <i>Paraboea hekouensis</i>           | Y.M.Shui & W.H.Chen  | 2012 | China (Yunnan)           |
| <i>Paraboea insularis</i>            | Triboun  | 2012 | Thailand                 |
| <i>Paraboea lavandulodora</i>        | Triboun  | 2012 | Thailand                 |
| <i>Paraboea manhaoensis</i>          | Y.M.Shui & W.H.Chen  | 2012 | China (Yunnan)           |
| <i>Paraboea middletonii</i>          | Triboun  | 2013 | Thailand                 |
| <i>Paraboea monticola</i>            | Triboun & D.J.Middleton  | 2012 | Thailand                 |
| <i>Paraboea nana</i>                 | Triboun & Dongkumfu  | 2012 | Thailand                 |
| <i>Paraboea nobilis</i>              | Triboun & D.J.Middleton  | 2012 | Thailand                 |
| <i>Paraboea peninsularis</i>         | Triboun & D.J.Middleton  | 2012 | Thailand                 |
| <i>Paraboea phanomensis</i>          | Triboun & D.J.Middleton  | 2012 | Thailand                 |
| <i>Paraboea quercifolia</i>          | Triboun  | 2012 | Thailand                 |
| <i>Paraboea rosea</i>                | Triboun  | 2012 | Thailand                 |
| <i>Paraboea sanguaniae</i>           | Triboun  | 2012 | Thailand                 |
| <i>Paraboea siamensis</i>            | Triboun  | 2012 | Thailand                 |
| <i>Paraboea takensis</i>             | Triboun  | 2012 | Thailand                 |
| <i>Paraboea tenuicalyx</i>           | Triboun  | 2012 | Thailand                 |
| <i>Paraboea vachareea</i>            | Triboun & Sonsupab   | 2012 | Myanmar / Thailand       |
| <i>Peliosanthes brevicoronata</i>    | M.N.Tamura & Poopath   | 2013 | Thailand                 |
| <i>Peliosanthes cambodiana</i>       | Aver. & N.Tanaka   | 2013 | Cambodia                 |
| <i>Peliosanthes grandiflora</i>      | Aver. & N.Tanaka   | 2012 | Vietnam                  |
| <i>Peliosanthes minutiflora</i>      | N.Tanaka, J.Murata & S.K.Wu                                      | 2013 | China (Yunnan)           |
| <i>Peliosanthes nivea</i>            | Aver. & N.Tanaka   | 2012 | Vietnam                  |
| <i>Peliosanthes nutans</i>           | Aver. & N.Tanaka   | 2012 | Vietnam                  |
| <i>Pendulorchis gaoligongense</i>    | G.Q.Zhang, K.Weil Liu & Z.J.Liu                                  | 2013 | China (Yunnan)           |
| <i>Petrosamea funingensis</i>        | Qiang Zhang & B.Pan  | 2013 | China (Yunnan)           |
| <i>Phaius baolocensis</i>            | Duy, Tao Chen & D.X.Zhang  | 2012 | Vietnam                  |
| <i>Phyllanthus chayamaritiae</i>     | Chantar. & Kantachot   | 2013 | Thailand                 |
| <i>Pilea caevernicola</i>            | A.K.Monro, C.J.Chen & Y.G.Wei                                    | 2012 | China (Guangxi)          |
| <i>Pilea shizongensis</i>            | A.K.Monro, C.J.Chen & Y.G.Wei                                    | 2012 | China (Yunnan)           |
| <i>Piper chantaranothaii</i>         | Suwanph. & D.A.Simpson   | 2012 | Thailand                 |
| <i>Piper doiphukaense</i>            | Suwanph. & Chantar.  | 2012 | Thailand                 |
| <i>Piper khaoyaiense</i>             | Suwanph. & D.A.Simpson   | 2012 | Thailand                 |
| <i>Piper smitinandianum</i>          | Suwanph. & Chantar.  | 2012 | Thailand                 |
| <i>Platanthera dulongensis</i>       | X.H.Jin & Efimov   | 2012 | China (Yunnan)           |
| <i>Platanthera ovatilabris</i>       | X.H.Jin & Efimov   | 2012 | China (Yunnan)           |
| <i>Pleurospermum tripartitum</i>     | F.T.Pu, R.Li & H.Li  | 2012 | China (Yunnan)           |
| <i>Polygala obliqua</i>              | Pendry   | 2013 | Thailand                 |
| <i>Polypleurum pluricostatum</i>     | Koi & M.Kato   | 2012 | Laos                     |
| <i>Polyspora huongiana</i>           | Orel, Curry & Luu  | 2012 | Vietnam                  |
| <i>Polystichum oblanceolatum</i>     | H.He & Li Bing Zhang   | 2012 | China (Guangxi)          |
| <i>Potentilla jiaozishanensis</i>    | Huan C.Wang & Z.R.He   | 2013 | China (Yunnan)           |
| <i>Primulina bullata</i>             | S.N.Lu & F.Wen   | 2013 | China (Guangxi)          |
| <i>Primulina debaoensis</i>          | N.Jiang & Hong Li  | 2013 | China (Guangxi)          |
| <i>Primulina fengshanensis</i>       | F.Wen & Yue Wang   | 2012 | China (Guangxi)          |
| <i>Primulina gongchengensis</i>      | Y.S.Huang & Yan Liu  | 2012 | China (Guangxi)          |
| <i>Primulina guangxiensis</i>        | Yan Liu & W.B.Xu   | 2012 | China (Guangxi)          |
| <i>Primulina guizhongensis</i>       | Bo Zhao, B.Pan & F.Wen   | 2013 | China (Guangxi)          |
| <i>Primulina multifida</i>           | B.Pan & K.F.Chung  | 2012 | China (Guangxi)          |
| <i>Primulina pseudomollifolia</i>    | W.B.Xu & Yan Liu   | 2012 | China (Guangxi)          |
| <i>Primulina sinovietnamica</i>      | W.H.Wu & Qiang Zhang   | 2012 | China (Guangxi)          |
| <i>Primulina yangshuoensis</i>       | Y.G.Wei & F.Wen  | 2012 | China (Guangxi)          |
| <i>Prunus gongshanensis</i>          | J.Wen  | 2012 | China (Yunnan) / Myanmar |
| <i>Pseudosasa xishuangbannaensis</i> | D.Z.Li, Y.X.Zhang & Triplett                                     | 2013 | China (Yunnan)           |
| <i>Pterospermum gracile</i>          | P.Wilkie   | 2013 | Thailand                 |
| <i>Raphiocarpus tamdaoensis</i>      | Phuong, Xuyen & Y.G.Wei  | 2012 | Vietnam                  |
| <i>Rhachidosorus siamensis</i>       | S.Linds.   | 2012 | Thailand                 |
| <i>Rhododendron baihuaiense</i>      | Y.P.Ma   | 2013 | China (Yunnan)           |
| <i>Rhynchosyche burmanicum</i>       | B.M.Anderson   | 2013 | Myanmar                  |
| <i>Rhynchosyche vietnamense</i>      | B.M.Anderson   | 2013 | Vietnam                  |
| <i>Rubia pianmaensis</i>             | R.Li & H.Li  | 2013 | China (Yunnan)           |
| <i>Sarcoglyphis brevilabia</i>       | Aver.  | 2012 | Vietnam                  |
| <i>Saussurea bijiangensis</i>        | Y.L.Chen ex B.Q.Xu, N.H.Xia & G.Hao                              | 2013 | China (Yunnan)           |
| <i>Schizostachyum nghianum</i>       | N.H.Xia & V.T.Tran   | 2013 | Vietnam                  |
| <i>Schoenorchis scolopendria</i>     | Aver.  | 2012 | Vietnam                  |
| <i>Solanum sakharii</i>              | Hul  | 2013 | Cambodia                 |
| <i>Somrania albiflora</i>            | D.J.Middleton  | 2012 | Thailand                 |
| <i>Somrania lineata</i>              | D.J.Middleton & Triboun  | 2012 | Thailand                 |
| <i>Stephania novenantha</i>          | Heng C.Wang  | 2013 | China (Guangxi)          |
| <i>Terniopsis filiformis</i>         | Werukamkul, Ampornpan, Koi & M.Kato                              | 2012 | Thailand                 |
| <i>Terniopsis heterostaminata</i>    | Werukamkul, Ampornpan, Koi & M.Kato                              | 2012 | Thailand                 |
| <i>Theana vietnamica</i>             | Aver.  | 2012 | Vietnam                  |
| <i>Thismia filiformis</i>            | Chantanaorr.   | 2012 | Thailand                 |
| <i>Thismia gongshanensis</i>         | Hong Qing Li & Y.K.Bi  | 2013 | China (Yunnan)           |
| <i>Tribounia grandiflora</i>         | D.J.Middleton  | 2012 | Thailand                 |
| <i>Tupistra theana</i>               | Aver. & N.Tanaka   | 2012 | Vietnam                  |
| <i>Typhonium rhizomatosum</i>        | A.Galloway & Petra Schmidt                                       | 2012 | Thailand                 |
| <i>Typhonium supraneae</i>           | A.Galloway, Petra Schmidt & Sinhab.                              | 2012 | Thailand                 |
| <i>Typhonium viridispathum</i>       | A.Galloway & Sinhab.   | 2012 | Thailand                 |
| <i>Vanilla atropogon</i>             | Schuit., Aver. & Rybková   | 2013 | Vietnam                  |
| <i>Vietorchis furcata</i>            | Aver. & Nuraliev   | 2013 | Vietnam                  |
| <i>Winitia expansa</i>               | Chaowasku  | 2013 | Thailand                 |
| <i>Wrightia calcicola</i>            | D.J.Middleton  | 2013 | Thailand                 |
| <i>Xyris bituberosa</i>              | Phonsena & Chantar.  | 2012 | Thailand                 |
| <i>Xyris emarginata</i>              | Phonsena & Chantar.  | 2012 | Thailand                 |
| <i>Xyris thailandica</i>             | Phonsena & Chantar.  | 2012 | Thailand                 |
| <i>Zingiber popaense</i>             | Nob.Tanaka   | 2012 | Myanmar                  |
| <i>Acanthocobitis pictilis</i>       | Kottelat, M.   | 2012 | Myanmar / Thailand       |
| <i>Balitora ludongensis</i>          | Liu, S.-W., Y. Zhu, R.-F. Wei and X.-Y. Chen                     | 2012 | China (Guangxi)          |
| <i>Betta mahachaiensis</i>           | Kowasupat, C., B. Panijpan, P. Ruenwongsa and N. Sriwattanothai, | 2012 | Thailand                 |
| <i>Channa longistomata</i>           | Nguyen, V.H., T.H.T. Nguyen and T.D.P. Nguyen                    | 2012 | Vietnam                  |
| <i>Draconectes narinosus</i>         | Kottelat, M.   | 2012 | Vietnam                  |
| <i>Erethistoides longispinis</i>     | Ng, H.H., C.J. Ferraris Jr. and D.A. Neely                       | 2012 | Myanmar                  |
| <i>Erethistoides luteolus</i>        | Ng, H.H., C.J. Ferraris Jr. and D.A. Neely                       | 2012 | Myanmar                  |

## Fish

## Fish

| SPECIES                                 | SCIENTIST(S)  | YEAR | COUNTRY         |
|---|---|------|-----------------|
| <i>Erethistoides vesculus</i>           | Ng, H.H., C.J. Ferraris Jr. and D.A. Neely                    | 2012 | Myanmar         |
| <i>Glyptothorax igniculus</i>           | Heok Hee Ng & Sven O. Kullander                               | 2013 | Myanmar         |
| <i>Lates uwisara</i>                    | Pethiyagoda, R. and A.C. Gill                                 | 2012 | Myanmar         |
| <i>Oreias sonlaensis</i>                | Nguyen, T.H., V.H. Nguyen and T.T. Hoang                      | 2012 | Vietnam         |
| <i>Oreias trilineatus</i>               | Nguyen, T.H., V.H. Nguyen and T.T. Hoang                      | 2012 | Vietnam         |
| <i>Oreonectes elongatus</i>             | Tang, L., Y. Zhao and C. Zhang                                | 2012 | China (Guangxi) |
| <i>Parabotia brevirostris</i>           | Zhu, D.-G. and Y. Zhu   | 2012 | China (Guangxi) |
| <i>Phallostethus cuulong</i>            | Shibukawa, K., D.D. Tran and L.X. Tran                        | 2012 | Vietnam         |
| <i>Physoschistura chulabhornae</i>      | Apinun Suvarnaraksha  | 2013 | Thailand        |
| <i>Schistura prolixifasciata</i>        | Zheng, L.-P., J.-X. Yang and X.-Y. Chen                       | 2012 | China (Yunnan)  |
| <i>Scleropages inscriptus</i>           | Roberts, T.R.   | 2012 | Myanmar         |
| <i>Sinocyclocheilus flexuosdorsalis</i> | Zhu, D.-G. and Y. Zhu   | 2012 | China (Guangxi) |
| <i>Tetraodon palustris</i>              | Pasakorn Saenjundaeng, Chavalit Vidthayanon & Chaiwut Grudpun | 2013 | Thailand        |
| <i>Triplophysa huanjiangensis</i>       | Yang, J., T.-J. Wu and J.-H. Lan                              | 2012 | China (Guangxi) |
| <i>Triplophysa huapingensis</i>         | Zheng, L.-P., J.X. Yang and X.-Y. Chen                        | 2012 | China (Guangxi) |
| <i>Triplophysa lihuensis</i>            | Wu, T.-J., J. Yang and J.-H. Lan                              | 2012 | China (Guangxi) |
| <i>Yunnanilus niulanensis</i>           | Chen, Z., J. Yang and J. Yang                                 | 2012 | China (Yunnan)  |

## Amphibians

|                                   |   |      |                           |
|-----------------------------------|---|------|---------------------------|
| <i>Amolops indoburmanensis</i>    | Dever, Fuiten, Konu, and Wilkinson                                      | 2012 | Myanmar                   |
| <i>Ansonia thinthinae</i>         | Wilkinson, Sellas, and Vindum   | 2012 | Myanmar                   |
| <i>Gracixalus nonggangensis</i>   | Mo Y, Zhang W, Luo Y, Zhou S, Chen W                                    | 2013 | China (Guangxi)           |
| <i>Gracixalus waza</i>            | Nguyen TQ, Le MD, Pham CT, Nguyen TT, Bonkowski M, Ziegler T.           | 2013 | Vietnam                   |
| <i>Hoplobatrachus litoralis</i>   | Hasan, Kuramoto, Islam, Alam, Khan, and Sumida                          | 2012 | Myanmar                   |
| <i>Ichthyophis nguyenorum</i>     | Nishikawa, Matsui, and Orlov  | 2012 | Vietnam                   |
| <i>Kaloula inochinensis</i>       | Chan KO, Blackburn DC, Murphy RW, Stuart BL, Emmett DA, Ho CT, Brown RM | 2013 | Cambodia / Laos / Vietnam |
| <i>Kaloula nonggangensis</i>      | Mo Y, Zhang W, Zhou S, Chen T, Tang H, Meng Y, Chen W                   | 2013 | China (Guangxi)           |
| <i>Leptobranchium rakhinensis</i> | Wogan   | 2012 | Myanmar                   |
| <i>Leptobranchium xanthops</i>    | Stuart, Phimmachak, Seateun, and Sivongxay                              | 2012 | Laos / Vietnam            |
| <i>Leptolalax botsfordi</i>       | Jodi J.L. Rowley, Vinh Quang Dau, Tao Thien Nguyen                      | 2013 | Vietnam                   |
| <i>Leptolalax firthi</i>          | Rowley, Hoang, Dau, and Le  | 2012 | Vietnam                   |
| <i>Leptolalax zhangyapingi</i>    | Jiang K, Yan F, Suwannapoom C, Chomdej S, Che J.                        | 2013 | Thailand                  |
| <i>Philautus nianeeae</i>         | Stuart, Phimmachak, Seateun & Sheridan                                  | 2013 | Laos                      |
| <i>Polypedates discantus</i>      | Rujirawan A, Stuart BL, Aowphol A                                       | 2013 | Thailand                  |
| <i>Rhacophorus robertingeri</i>   | Orlov, Poyarkov, Vassilieva, Ananjeva, Nguyen, Sang, and Geissler       | 2012 | Vietnam                   |
| <i>Theلودerma bambusicolum</i>    | Orlov, Poyarkov, Vassilieva, Ananjeva, Nguyen, Sang, and Geissler       | 2012 | Vietnam                   |
| <i>Theلودerma chuyangsinense</i>  | Orlov, Poyarkov, Vassilieva, Ananjeva, Nguyen, Sang, and Geissler       | 2012 | Vietnam                   |
| <i>Tylosotriton parhai</i>        | Kanto Nishikawa, Wichase Khonsue, Porraee Pomchote & Masafumi Matsui    | 2013 | Thailand                  |
| <i>Tylosotriton uyanoi</i>        | Kanto Nishikawa, Wichase Khonsue, Porraee Pomchote & Masafumi Matsui    | 2013 | Thailand                  |
| <i>Tylosotriton ziegleri</i>      | Kanto Nishikawa, Masafumi Matsui, and Tao Thien Nguyen                  | 2013 | Vietnam                   |

## Reptiles

|                                     |   |      |                                   |
|-------------------------------------|---|------|-----------------------------------|
| <i>Azemiope albocephala</i>         | Orlov, Ryabov & Nguyen  | 2013 | China (Yunnan)                    |
| <i>Azemiope kharini</i>             | Orlov, Ryabov & Nguyen  | 2013 | China (Guangxi, Yunnan) / Vietnam |
| <i>Calotes bachae</i>               | Hartmann, Geissler, Poyarkov, Ithow, Galoyan, Rödder & Böhme                                      | 2013 | Vietnam                           |
| <i>Cyrtodactylus astrum</i>         | Grismer, Wood Jr, Quah, Anuar, Muin, Sumontha, Ahmad, Bauer, Wangkulangkul, Grismer & Pauwels     | 2012 | Thailand                          |
| <i>Cyrtodactylus bidoupimontis</i>  | Nazarov, Poyarkov, Orlov, Phung, Nguyen, Hoang & Ziegler  | 2012 | Vietnam                           |
| <i>Cyrtodactylus bintangtinggi</i>  | Grismer, Wood Jr, Quah, Anuar, Muin, Sumontha, Ahmad, Bauer, Wangkulangkul, Grismer & Pauwels     | 2012 | Thailand                          |
| <i>Cyrtodactylus bugiamapensis</i>  | Nazarov, Poyarkov, Orlov, Phung, Nguyen, Hoang & Ziegler  | 2012 | Vietnam                           |
| <i>Cyrtodactylus dati</i>           | Ngo Van Tri   | 2013 | Cambodia / Vietnam                |
| <i>Cyrtodactylus kingsadai</i>      | Ziegler, Phung, Le & Nguyen   | 2013 | Vietnam                           |
| <i>Cyrtodactylus lekaguli</i>       | Grismer, Wood Jr, Quah, Anuar, Muin, Sumontha, Ahmad, Bauer, Wangkulangkul, Grismer & Pauwels     | 2012 | Thailand                          |
| <i>Cyrtodactylus phuketensis</i>    | Sumontha, Pauwels, Kunya, Nitikul, Samphanthamit & Grismer  | 2012 | Thailand                          |
| <i>Cyrtodactylus phuocbinhensis</i> | Nguyen, Le, Tran, Orlov, Lathrop, Macculloch, Le, Jin, Nguyen, Nguyen, Hoang, Che, Murphy & Zhang | 2013 | Vietnam                           |
| <i>Cyrtodactylus sanook</i>         | Pauwels, Sumontha, Latinne & Grismer  | 2013 | Thailand                          |
| <i>Cyrtodactylus taynguyenensis</i> | Nguyen, Le, Tran, Orlov, Lathrop, Macculloch, Le, Jin, Nguyen, Nguyen, Hoang, Che, Murphy & Zhang | 2013 | Vietnam                           |
| <i>Cyrtodactylus thochuensis</i>    | Ngo Van Tri & Grismer   | 2012 | Vietnam                           |
| <i>Dendrelaphis nigroserratus</i>   | Vogel, Van Rooijen & Hauser   | 2012 | Myanmar / Thailand                |
| <i>Gekko adleri</i>                 | Nguyen, Wang, Yang, Lehmann, Le, Ziegler & Bonkowski  | 2013 | China (Guangxi) / Vietnam         |
| <i>Hemiphyllodactylus zugi</i>      | Nguyen, Lehmann, Le Duc, Duong, Bonkowski & Ziegler   | 2013 | China (Guangxi) / Vietnam         |
| <i>Homalopsis merejcoxi</i>         | Murphy, Voris, Murthy, Traub & Cumberbatch  | 2012 | Cambodia / Thailand / Vietnam     |
| <i>Japalura brevicauda</i>          | Manthey, Denzer, Hou & Wang   | 2012 | China (Yunnan)                    |
| <i>Japalura yulongensis</i>         | Manthey, Denzer, Hou & Wang   | 2012 | China (Yunnan)                    |
| <i>Lycodon davidi</i>               | Vogel, Nguyen, Kingsda & Ziegler  | 2012 | Laos                              |
| <i>Lygosoma veunsaiensis</i>        | Geissler, Hartmann & Neang  | 2012 | Cambodia                          |
| <i>Oligodon cattiensis</i>          | Vassilieva, Geissler, Galoyan, Poyarkov Jr, Van Devender & Böhme                                  | 2013 | Vietnam                           |
| <i>Oligodon kampucheaensis</i>      | Neang, Grismer & Daltry   | 2012 | Cambodia                          |
| <i>Oligodon nagao</i>               | David, Nguyen, Nguyen, Jiang, Chen, Teynié & Ziegler  | 2012 | China (Guangxi) / Laos / Vietnam  |
| <i>Ptychozoon kaengkrahanense</i>   | Sumontha, Pauwels, Kunya, Limlikhitakorn, Ruksue, Taokratok, Ansermet & Chanhome                  | 2012 | Thailand                          |
| <i>Sphenomorphus sheai</i>          | Nguyen, Nguyen, Van Devender, Bonkowski & Ziegler   | 2013 | Vietnam                           |

## Birds

|                             |  |      |          |
|-----------------------------|--|------|----------|
| <i>Orthotomus chaktomuk</i> | S. P. Mahood, A. J. I. John, J. C. Eames, C. H. Oliveros, R. G. Moyle, Hong Chamnan, C. M. Poole, H. Nielsen & F. H. Sheldon | 2013 | Cambodia |
|-----------------------------|--|------|----------|

## Mammals

|                               |  |      |          |
|-------------------------------|--|------|----------|
| <i>Biswamoyopterus laevis</i> | Daosavanh Sanamxay, Bounsavane Douangboubpha, Sara Bumrungsri, Sysouphanh Xayavong, Vilakhan Xayaphet, Chutamas Satasook & Paul J.J. Bates | 2013 | Laos     |
| <i>Hipposideros griffini</i>  | Thong, V. D., S. J. Puechmille, A. Denzinger, C. Dietz, G. Csorba, P. J. J. Bates, E. C. Teeling, and H.-U. Schnitzler.                    | 2012 | Vietnam  |
| <i>Murina balaensis</i>       | Pipat Soisook, Sunate Karapan, Chutamas Satasook & Paul J. J. Bates  | 2013 | Thailand |

Total: 367

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# Greater Mekong in numbers

100%  
RECYCLED



Today the Greater Mekong region is an integral part of one of the top five most threatened biodiversity hotspots in the world

**367**

new species were discovered between 2012 and 2013



**60 million**

The Lower Mekong River provides food and livelihoods for 60 million people

**850+**

freshwater fish species live in the Mekong and its tributaries



**Why we are here**

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

[www.panda.org/greatermekong](http://www.panda.org/greatermekong)