



WWF®

GREATER  
MEKONG  
2021



# NEW SPECIES DISCOVERIES IN THE GREATER MEKONG 2020

WWF is one of the world's largest 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.

Text and additional research: Mia Signs, Sofia Venturini and K. Yoganand

Research by Antonio Cerezo Tomàs



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Cover photo: *Megophrys frigida* by Benjamin Tapley

Photo this page: *Achalinus zugorum* by American Society of Ichthyologists and Herpetologists

## GLOSSARY

IUCN	International Union for Conservation of Nature
Laos	Lao People's Democratic Republic (Lao PDR)
WWF	World Wide Fund for Nature (formerly World Wildlife Fund)

# FOREWORD

The Greater Mekong region is one of planet Earth's most important biodiversity hotspots, highlighted by the endless number of new species discovered there every year. The region's biodiversity richness is a result of its complex geological and climatic history, and its diverse landscapes, including extensive karstic regions. Only by using different methods, including comparing physical characteristics and performing molecular analyses, can researchers determine the true dimensions of this partly hidden biodiversity.

High species richness and ongoing discovery rates also underscore the conservation importance of the Greater Mekong region and its unique inhabitants. To record this treasure trove of biodiversity before it is completely lost, we must accelerate our work and strengthen international cooperation. Greater support is required for local and early-career scientists and conservationists to establish and expand international collaborations, because such networks help to record biodiversity more quickly.

Discovery and description of new species is only the first step. Ecological traits, distribution, and population size also urgently need to be studied to assess a species' conservation status. In particular, species that only occur in highly restricted geographic areas need our concerted support because they are highly vulnerable to direct human-caused threats and face increased extinction risks. In this respect, studying the degree of endemism and existing threats is as important as the work of discovery. Unfortunately, for many species, these data are completely unknown, and we must build the capacity of young researchers to help fill these knowledge gaps.

A better understanding of the protected area coverage of threatened species will greatly assist the conservation prioritisation of neglected wildlife. However, many species are not yet included in IUCN's Red List, and many of the current assessments are outdated. Habitat protection is indispensable, but this often does not happen quickly enough. Here, the "One Plan Approach," supported by the IUCN, is very promising, since it links *in situ* and *ex situ* conservation measures and diverse expertise for the best possible protection. Species with a

limited range that are threatened by imminent extinction can be housed by local facilities or zoos, serving as modern "Noah's Arks," where conservation breeding programs and networks can be established. In parallel, nature conservation in the wild is our ultimate goal, so that this ark has some land where it can dock later.

Nature conservation has been supported by governmental and non-governmental agencies, but more support is needed. The Covid-19 crisis has made it very clear that humans cannot intervene in nature, its networks, food chains and biodiversity with impunity. In an increasingly globalised world, we have to take a step back and reconsider our behaviours. If we learn to use natural resources more carefully and sustainably, then this current crisis may help us make critical progress in conserving wildlife and wild places.

Public outreach reports like this one by WWF are thus crucial to inform people about the rich species diversity of our planet, a precious and limited gift. We must all learn to be more careful and coexist with all the other creatures on our planet, instead of just exploiting and extirpating them. This is the most important conclusion of this report, which spotlights one of the world's richest biodiversity hotspots and its desperate call for improved conservation.

## Prof Dr. Thomas Ziegler



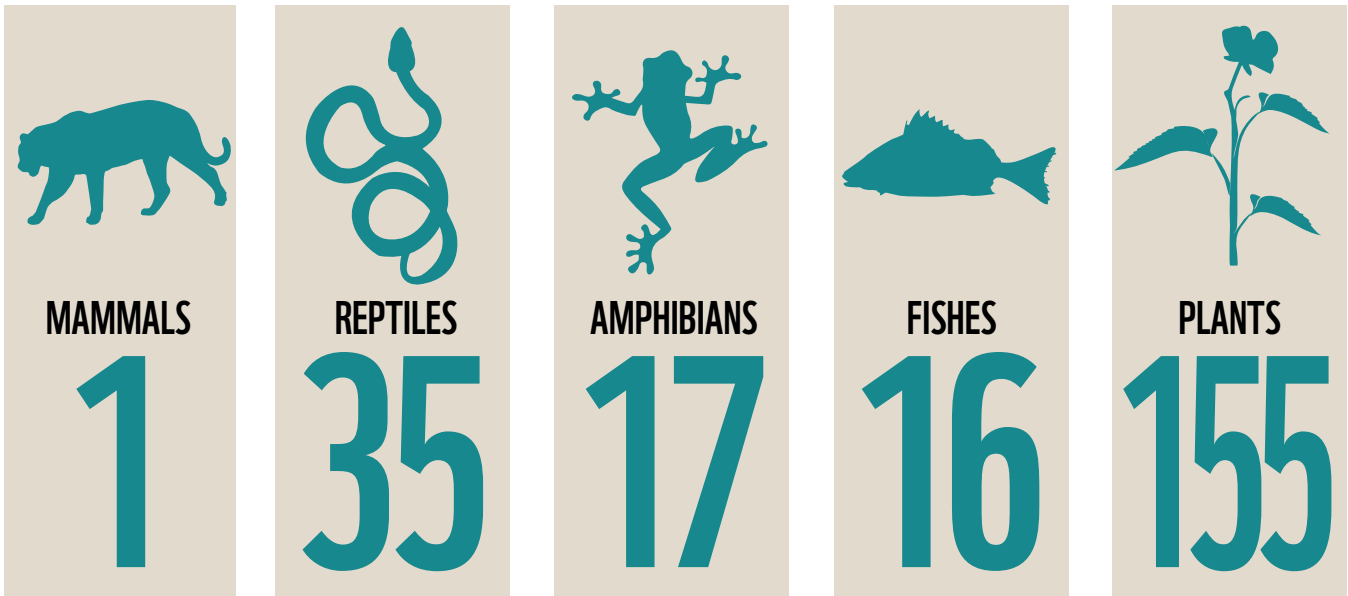
Photo by Rolf Schlosser

Curator for Herpetology, Ichthyology and Invertebrates, Zoological Garden Cologne; and Coordinator of the Zoo's biodiversity and nature conservation projects in Vietnam and Laos  
Adjunct Professor, Institute of Zoology, University of Cologne

# New Species Discoveries in 2020 in the Greater Mekong

## AT A GLANCE

For this report, the Greater Mekong region comprises Cambodia, Laos, Myanmar, Thailand, and Viet Nam, and does not include Yunnan province and Guangxi Zhuang Autonomous Region of southern China.



# TOTAL 224

The sum of the numbers for each country does not equal the total number of new species discovered in Greater Mekong in 2020, because some species have a distribution spanning more than one country.



For this report, we consider the new species currently recorded in only one country as endemic to that country; some of these endemic species are likely to occur in multiple countries but have not yet been recorded outside the country's borders.

# INTRODUCTION



Photo: ©Naw Eh Hser Wah/WWF-Myanmar

An extraordinary 224 new species of vascular plants and vertebrate animals were discovered<sup>i</sup> in the Greater Mekong region in 2020. Among the species newly described by researchers in 2020 are 155 plants, 16 fishes, 17 amphibians, 35 reptiles, and one mammal.

The Greater Mekong region of Southeast Asia, comprising Cambodia, Laos, Myanmar, Thailand, and Viet Nam, is a biodiversity hotspot. It is home to some of the planet's most iconic and endangered species - the tiger, Asian elephant, saola, Gurney's pitta, and Mekong giant catfish. In addition, new species are discovered here with remarkable frequency and this has brought global attention to the region, along with a concern for the future of these species. With the addition of the 2020 discoveries, the total species of vascular plants, fishes, amphibians, reptiles, birds, and mammals described in the region since 1997 now stands at 3,007<sup>ii</sup>.

2020 brought in some amazing new species to the world, including a new primate, the Popa langur; a cavefish that required the creation of a whole new genus; the world's first succulent bamboo, also forming a new genus; and an

iridescent snake that has an odd, non-overlapping scale pattern.

These discoveries, painstakingly identified and recorded by keen naturalists and taxonomists, and compiled here by WWF-Greater Mekong, demonstrate that the region is still a frontline for scientific exploration and a hotspot of species diversity. However, these discoveries also are a stark reminder of what we stand to lose if human settlement and development activities in the region continue to destroy the natural environment. Many species go extinct before they are even discovered, driven by habitat destruction, diseases spread by human activities, predation and competition brought by invasive species, and the devastating impacts of illegal and unsustainable wildlife trade.

The discovery of new species year after year highlights the importance of the remaining natural ecosystems and the continued interest of biological explorers in the Greater Mekong. It also brings into focus the urgent and tremendous need for increasing the protection of species and habitats. Without substantial conservation action, we will continue to lose the species that make our region rich and unique. However, with collective conservation efforts by governments, scientists, NGOs, and local communities, we can ensure that incredible new species, like the ones highlighted here, continue to persist and be discovered in the years to come.

i Refers to the official process by which a species is described in the peer-reviewed scientific literature, once discovered or genetically determined to be distinct from other species, and therefore formally determined as new species.

ii Refers to the official process by which a species is described in the peer-reviewed scientific literature, once discovered or genetically determined to be distinct from other species, and therefore formally determined as new species.

# CAMBODIA



Photo: Thy Néang

# Sonerila cardamomensis

## Plant

Discovered in the Central Cardamom Mountains in Koh Kong province, Cambodia, *Sonerila cardamomensis* is a new species of the largely tropical plant family *Melastomataceae*. About 22 species of this genus are currently documented in the Greater Mekong region, with 13 species existing in Thailand, nine in Viet Nam, and four in Laos. This is the fourth species of the genus to be described in Cambodia.

This species grows on rocky sandstone areas in evergreen forests. It is endemic to Cambodia, and possibly to the country's Central Cardamom Protected Area in Koh Kong province, having been found nowhere else to date. Two big populations have been discovered within the protected area, each with more than 1,000 plants.

It has preliminarily been classified as Data Deficient according to the IUCN Red List criteria, meaning there is insufficient data available to determine its conservation status.

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Shin, J.S., Song, B.K., Phourin, C., Won, H., Lee, K.E., and Cho, S.H. (2020). *Sonerila cardamomensis* (*Melastomataceae*), a new species from Cambodia. *PhytoKeys* 156: 139-144. <https://doi.org/10.3897/phytokeys.156.55866>



Photos: Seong-Hyun Cho

# Leptobrachella neangi

Amphibian



Habitat where *Leptobrachella neangi* was found in Dec 2010

Photos: Thy Neang

In 2010, two adult female leaf-litter frogs were collected in the Cardamom Mountains at Phnom Samkos Wildlife Sanctuary, Pursat Province, Cambodia. Only recently, DNA testing revealed that it was a new species, dubbed the Cardamom leaf-litter frog.

Leaf-litter frogs are often difficult to identify at the species level since many of them look very similar. However, scientists have more recently been able to use genetic and frog call data to describe new species in the genus.

The Cardamom leaf-litter frog has a very narrow range restricted to an incredibly specific location, and is the first species of this genus to be named in the Cardamom Mountains, and only the third in Cambodia.

“This is a very enigmatic species discovery,” said Bryan Stuart of the North Carolina Museum of Natural Sciences. “Species of this genus are found in forested mountainous streams throughout mainland Southeast Asia, but oddly were completely unknown from the Cardamom Mountains and adjacent south-eastern Thailand despite extensive sampling. In 2002 a single specimen in the transition phase between tadpole and adult from the genus was reported from this area, but in the absence of adults or DNA sequence data, its identity remained undetermined.”

“Then in 2010, Cambodian herpetologist Thy Neang found two adult female *Leptobrachellas* on a very cold night in December in Phnom Samkos Wildlife Sanctuary. This was remarkable, because they were the first adult specimens ever found in the Cardamoms, and because both were females

and found far away from streams. Typically, *Leptobrachella* are found close to streams, and males greatly outnumber females.”

“Ten years passed and no additional individuals have been found, so Jodi Rowley and I decided to proceed with describing the species based on only these two female specimens. Fortunately, it is morphologically very distinct from its closest relatives, and we were honoured to name it after its discoverer, Thy Neang.”

“I hope that someday the males of the species will be found and we can learn more about its natural history and distribution. I am also keen to learn if the individual found in 2002 belongs to this species or is yet another enigmatic *Leptobrachella* in the Cardamom Mountains. Why *Leptobrachella* are such a conspicuous component of the amphibian fauna of upland forested regions of mainland Southeast Asia - yet so rare in the Cardamoms - remains a mystery to me,” said Stuart.

Unfortunately, wildlife in the Cardamom Mountains is increasingly under threat from human encroachment, and more efforts are needed to protect this and other key species in the area.

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Stuart, B. L., & Rowley, J. J. (2020). *A new Leptobrachella (Anura: Megophryidae) from the Cardamom Mountains of Cambodia*. *Zootaxa*, 4834(4).  
<https://doi.org/10.11646/zootaxa.4834.4.4>



# Cyrtodactylus phnomchiensis

Reptile

A new species of bent-toed gecko was discovered in the isolated rocky mountain of Phnom Chi in the Prey Lang Wildlife Sanctuary, Cambodia. The researchers who discovered the species were pleasantly shocked, not only because they did not expect to find a new species in the well surveyed Prey Lang Wildlife Sanctuary, but because this bent-toed gecko is the only member of the *C. irregularis* group known to occur west of the Mekong River.

*Cyrtodactylus* is a very species-diverse genus; the *C. irregularis* complex to which this species belongs has at least 19 other species distributed in Laos, Viet Nam and Cambodia. This yellow spotted gecko has a unique elongated body and snout compared to other species in its group.

Cambodia's Prey Lang forest, one of the largest lowland evergreen forests in mainland Southeast Asia, has historically been a vital biodiversity hotspot, home to over 55 threatened wildlife species. However, recent illegal logging, gold mining, and rampant deforestation are threatening the survival of local wildlife. Another lizard, *Sphenomorphus preylangensis*, was also recently described by researchers in this area, further highlighting the importance of conserving this habitat.

Due to its small area of occupancy, threats to its habitats, and rarity, scientists are calling for an urgent assessment of the species under the IUCN Red List.

Neang, T., Henson, A., and Stuart, B. L. (2020). *A new species of Cyrtodactylus (Squamata, Gekkonidae) from Cambodia's Prey Lang Wildlife Sanctuary*. *ZooKeys*, 926, 133–158. <https://doi.org/10.3897/zookeys.926.48671>



Photos: Thy Neang

# LAOS



Photo: K. Yoganand/WWF-Greater Mekong

# Capparis macrantha

Plant



A new shrubby plant species from the caper bush family was discovered in the deciduous forests of the Nam Kading National Protected Area, Bolikhamxay Province, Laos. With long leaves and large white flowers full of stamens, this striking plant is found at 200 to 300m elevation in the Annamite Mountain range that straddles the border between Laos and Viet Nam.

The Annamites are covered by one of the largest blocks of dry evergreen forest in the region, and its steep valleys and mountains have led to it being home to many endemic species. Within this area, the Bolikhamxay conservation landscape is of critical importance in protecting rich species diversity, including crested gibbons and the enigmatic saola. Despite rapid development and land-use change that threaten this natural landscape, the Nam Kading National Protected Area is largely unexplored and difficult to access, providing protection for many species, including this new shrub.

Although it has just been discovered, this new plant is provisionally classified as Vulnerable.

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Souvannakhoummane, K., Fici, S., Lanorsavanh, S., Park, J. H., Kang, H. S., and Bounithiphonh, C. (2020). *Capparis macrantha* sp. nov. (Capparaceae, Brassicales), a new shrub species from a deciduous forest of the Nam Kading National Protected Area (central Lao PDR). *European Journal of Taxonomy*, (656). <https://doi.org/10.5852/ejt.2020.656>

Photos: Soulivanh Lanorsavanh



# Laobambos calcareus

## Plant

This newly discovered bamboo species is the first ever documented case of succulence in bamboos, meaning it can seasonally vary the volume of its stem depending on the quantity of water stored. This is a huge advantage in helping the species adapt to and survive seasonal drought variations. Discovered during a canopy raft scouting expedition through the karst landscape of Khammouane Province, central Laos, the species was observed first in the dry season, where it looked deflated and wrinkly. However, a subsequent visit during the rainy season showed the plant looking very inflated and “bamboo-ey.” This occurred despite the plant having no specific water-storage cells.

This species is likely already threatened according to IUCN’s Red List criteria, given its restricted range and rarity within the range. Only one population has been identified to date. The researchers who discovered the species suggest that, since it is a wild relative of the widely used and economically important tropical bamboo species, further research could help identify possibilities of making commercial bamboo in seasonally dry areas more climate change resilient.

“When reaching remote, unexplored dolines (sinkholes) of the Ban Natan area, we were struck by this bamboo,” said Thomas Haevermans of the Sorbonne University in Paris and lead author on the species discovery. “It looked so normal from a distance, but as we were approaching it, details began to spring to view. The closer I got to it, the more certain I was that this was a unique discovery, especially when I realised it was a succulent plant! All this has been made possible by large international naturalist inventory expeditions, such as the Radeau des Cimes 2012 in Laos.”



Photos: Thomas Haevermans

Haevermans, T., Mantuano, D., Zhou, M. Y., Lamxay, V., Haevermans, A., Blanc, P., and Li, D. Z. (2020). *Discovery of the first succulent bamboo (Poaceae, Bambusoideae) in a new genus from Laos' karst areas, with a unique adaptation to seasonal drought.* *PhytoKeys*, 156, 125–137. <https://doi.org/10.3897/phytokeys.156.51636>

# Pareas geminatus

Reptile

Also found in Thailand



Photo: Parinya Pawangkhanant

This new slug snake was found during field studies in the Golden Triangle, where the borders of Laos, Myanmar, Thailand and Yunnan Province of China meet. Remarkably similar in appearance to a sister species -- the Hampton's slug snake -- this new species was dubbed the twin slug snake, with the Latin *geminatus* meaning "doubled."

This medium-sized snake differs from other members of its genus in having yellow-brown colour and unique patterning, with the stripes behind the eyes merging to form a black collar. It is found in tropical monsoon forests between 1,160 and 2,280 m of elevation. It has been recorded on vines and bushes, and in areas highly modified by tea plantations. The species is anticipated to occur in the eastern corner of the Shan Plateau in Myanmar, but further exploration of that area is needed for confirmation.

Rapid deforestation for tea plantation development in China is a potential threat to the new species. However, additional studies are needed to understand better the distribution,

population trends and conservation status of this snake.

Tan Van Nguyen of Save Vietnam's Wildlife, who led the research team with Associate Professor Nikolay A. Poyarkov and Dr. Gernor Vogel, said of the twin slug snake, "This very cute and unique snake was initially difficult to classify, given its morphological similarity to another species and past confusion about taxonomy. Working collaboratively with many colleagues from many different countries, we have been able to describe four new species and recover and revalidate three rare species from this genus."

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Ding, L., Chen, Z., Suwannapoom, C., Nguyen, T., Poyarkov, N., and Vogel, G. (2020). *A new species of the Pareas hamptoni complex (Squamata: Serpentes: Pareidae) from the Golden Triangle*. *TAPROBANICA The Journal of Asian Biodiversity*, 9: 174-193.  
<https://doi.org/10.47605/tapro.v9i2.230>

# MYANMAR

An aerial photograph of a vast, dense forest in Myanmar. The forest is thick with green trees, and a layer of mist or low clouds hangs over the upper portion of the canopy, creating a sense of depth and mystery. The lighting is soft, highlighting the textures of the leaves and the intricate patterns of the tree trunks.

Photo: Adam Oswell / WWF-Myanmar

# Begonia chenii

Plant



A new species of begonia with reddish flowers and berry-like fruit was discovered in Putao District, Kachin State, northern Myanmar. It was named after Professor Chen Jin, director of the Xishuangbanna Tropical Botanical Garden and Southeast Asia Biodiversity Research Institute of the Chinese Academy of Sciences. This perennial plant was found in a tropical montane forest.

Kachin State in northern Myanmar is one of the most diverse floristic regions in continental Asia, but it is also one of the least explored. Due to this fact, the discovery rate for new species of flora in Myanmar is lower compared to neighbouring countries.

This part of northern Myanmar hosts more than 140 mammal species, some severely threatened. Unfortunately, the illegal extraction of minerals and timber damages the natural habitats of the area and threatens unique endemic species.

Maw, M. B., Ding, H. B., Yang, B., Win, P. P., and Tan, Y. H. (2020). *Taxonomic studies on Begonia (Begoniaceae) in Myanmar I: three new species and supplementary description of Begonia rheophytica from Northern Myanmar*. *PhytoKeys*, 138, 203–217. <https://doi.org/10.3897/phytokeys.138.38721>



Photographs by H.B. Ding and Y.H. Tan

# Apogon fugax

Fish



Photo ©FAO/Oddgeir Alvheim

Only five specimens of this cardinalfish species have been catalogued to date, with two of the specimens having come from the Ayeyarwady Delta in Myanmar. The Latin name, *fugax*, means ‘elusive’ and, despite intensive collection efforts, this reddish-orange fish has evaded detection. Other specimens have been collected in the Red Sea off the coast of Jizan in Saudi Arabia and off Western Australia.

This new species has a larger head than some of its closest relatives in this genus, as well as a longer first dorsal-fin spine and fewer gill rakers. It was also found at deeper ocean depths than the other Indo-West Pacific species of the genus *Apogon*, having been trawled at depths of 54–166 m.

Ofer Gon of the South African Institute for Aquatic Biodiversity and lead author on the discovery, noted that, “The fish was first collected and photographed in the Red Sea by Sergey Bogorodsky in 2014. He approached me for help with identification, and although we agreed that

this specimen was a potentially undescribed species, we needed more specimens to be sure. These came out of the biodiversity surveys undertaken by the EAF-Nansen Programme of FAO in Myanmar, and CSIRO in Western Australia. The genetic analysis performed by Tilman Alpermann confirmed the new species.”

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Gon, O., Bogorodsky, S., Mal, A., and Alpermann, T. (2020). *A new species of the cardinalfish genus Apogon (Teleostei, Apogonidae) from the southern Red Sea and Indian Ocean with comments on phylogenetic relationships within the Apogonini*. *Zootaxa*. 4896. 485-504. <https://doi.org/10.11646/zootaxa.4896.4.2>



# Kayahschistura lokalayensis

Fish



Photo: Maurice Kottelat & Jozef Grego

A new cavefish was discovered in the Lokalay Loku Gu Cave in Kayah State, Myanmar, where exploration of cave biology is still in its infancy. The first cave fish in the family *Nemacheilidae* to have been discovered in Myanmar; it lacks colour, has extremely underdeveloped eyes, and has very unusual pectoral fin rays. Given how distinct it is from other fish in the same family found in South and Southeast Asia, it has been assigned a new genus name, *Kayahschistura*.

Like most *nemacheilids*, this species is small and lives in ponds and streams, feeding and reproducing under stones. The cave where it was found is located in the catchment of a tributary of the Salween River.

The Salween River is one of the last free-flowing rivers in Asia, still uninterrupted by large-scale dams. Roughly 2,400 km long, it supports several critical biodiversity hotspots. Protecting the remaining free-flowing rivers is crucial to saving the biodiversity of freshwater systems, which are some of the most vulnerable in the world.<sup>1</sup>

Kottelat, Maurice & Grego, Jozef. (2020). *Kayahschistura lokalayensis*, a new genus and species of cave fish from Myanmar (Teleostei: Nemacheilidae). *The Raffles Bulletin of Zoology*. Suppl. 35. 179-185. <https://doi.org/10.26107/RBZ-2020-0050>

# Hemiphyllodactylus zalonicus

Reptile

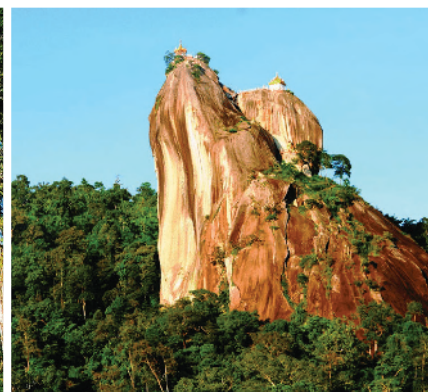
The Mt. Zalon slender gecko was found in the isolated hills near the newly proposed Zalon Taung National Park. Zalon Taung Pagoda is an important religious pilgrimage site on Zalon mountain in the northern part of the Ayeyarwady River basin in Myanmar.

This brownish gecko is the first species in this genus found in this part of Myanmar, with other species in this genus found in the Mangin Mountain range in the Sagaing region. It is the 11th species in the genus discovered in Myanmar.

Despite Zalon Taung Pagoda being a popular pilgrimage destination, the isolated habitats in this mountainous region are proving to be rich in endemic reptiles and amphibians - otherwise known as herpetofauna. Until 2020, a resurgence in herpetological fieldwork in Myanmar had led to a dramatic increase in the descriptions of new geckos, with many of these newly-recognised species representing completely new 'species groups,' or clades, which contain multiple species. However, it is likely that, since many isolated upland areas in Myanmar have not yet been surveyed, many more endemic and unique herpetofauna are yet to be discovered.

Grismer, L.L., Chit, M.T., Pawangkhanant, P., Nazarov, R.A., Zaw, T., and Poyarkov, N.A. (2020) *The phylogeny of Hemiphyllodactylus Bleeker, 1860 (Squamata: Gekkonidae) with a description of a new species from the Mangin Range, Sagaing Region, northern Myanmar*, Journal of Natural History, 54 (29-30): 1913-1931.

<https://doi.org/10.1080/00222933.2020.1833095>



Photos: Prinya Pawangkhanant & May Thu Chit

# Trachypithecus popa

Mammal

The first evidence of the newly described Popa langur species was not found in the wild, but at the Natural History Museum in the United Kingdom. Genetic analysis of specimens gathered from Myanmar over a century ago revealed that the langurs in the museum were a genetic match with more recently collected bones from central Myanmar, indicating that the species was still alive today.

This species is named after the extinct volcano Mount Popa, home to the largest population of this species of approximately 100 individuals. It is found only in Myanmar in the central dry-zone between the Ayeyarwady and Thanlwin (Salween) rivers and extends south up to the western foothills of the Kayah-Karen mountains.

WWF, in collaboration with Fauna and Flora International (FFI), collected images of these primates using cameratrap images in 2018, revealing a distinctive set of markings - broad white rings fully encircling the eyes, a crest of hair, and forward-facing whiskers.

Although the IUCN Red List status of the species is yet to be formally assessed, it is proposed to be listed as Critically Endangered, given that only about 200-250 individuals are suspected of remaining in the wild in four isolated locations. In addition, Popa langurs are threatened by hunting, habitat loss, and forest fragmentation caused by agricultural encroachment and unregulated timber extraction. Ngwe

Lwin, a primatologist at FFI, stated, “Additional field surveys and protection measures are urgently required and will be conducted by FFI and others to save the (Popa) langurs from extinction.”<sup>2</sup>

Roos, C., Helgen, K. M., Miguez, R. P., Thant, N., Lwin, N., Lin, A. K., ... and Momberg, F. (2020). *Mitogenomic phylogeny of the Asian colobine genus Trachypithecus with special focus on Trachypithecus phayrei (Blyth, 1847) and description of a new species*. *Zoological Research*, 41(6), 656–669. <https://doi.org/10.24272/j.issn.2095-8137.2020.254>



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WWF 009

Photos: (top) ©Naw Eh Hser Wah WWF-Myanmar; (middle & bottom) WWF - Myanmar

# THAILAND

A vast landscape of forested mountains in Thailand, with the word 'THAILAND' overlaid in large white letters at the top. The foreground shows a steep, sunlit hillside with dense green forest. In the background, multiple layers of mountain ranges recede into the distance, creating a sense of depth and scale. The sky is a pale, hazy blue.

Photo: K. Yoganand/WWF-Greater Mekong

# Amomum foetidum

## Plant

This new species from the ginger family was discovered in a plant shop in Sakon Nakhon Province in north-eastern Thailand. This new species is considered the “stink bug” of the floral world, given its pungent odour, and is often called “mang khang,” which is the Isan and Lao word for the stink bug, *Tessaratomia papillosa*. In fact, it is used by the Isan people of northern Thailand as a substitute for the stink bugs when making a specific kind of chilli dipping paste served with sticky rice.

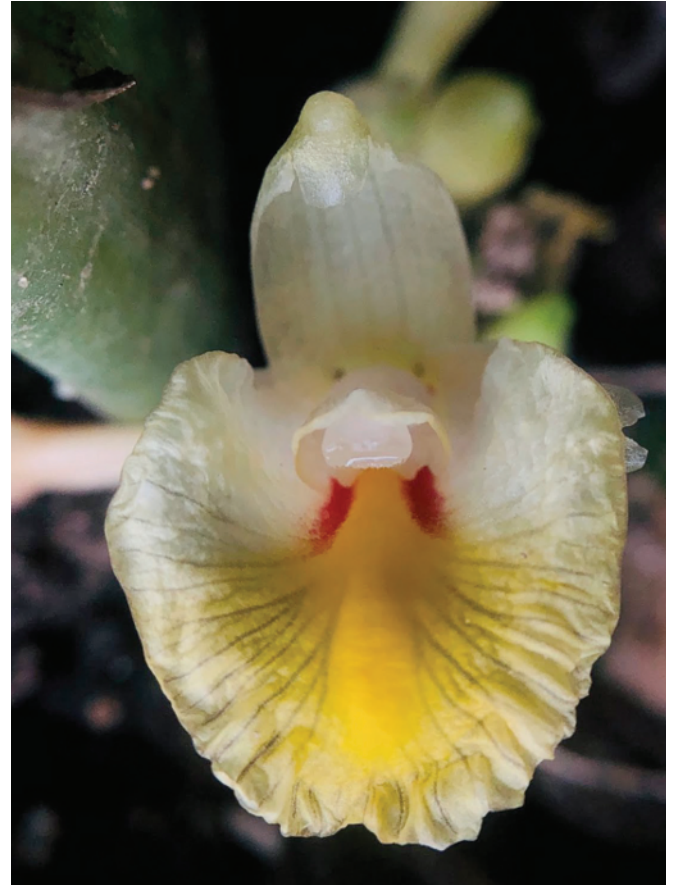
“*Amomum foetidum* is one of the species that indicates that there is still a lot of biodiversity in the Mekong River Basin Area,” said Surapon Saensouk of the WalaiRukhavej Botanical Research Institute, Mahasarakham University. “Every part of this species has a pungent odour like the ‘mangkhang,’ and since the stink bug can only easily be found in the spring, this plant is a popular alternative since it is easier to find throughout the year.”

Species in the *Amomum* genus are widely distributed throughout Asia, with some species used as food and medicine often traded as high-value non-timber forest products.

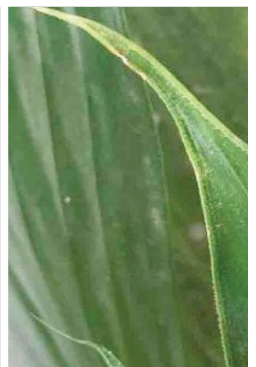
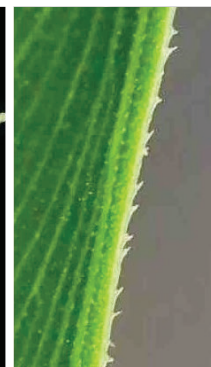
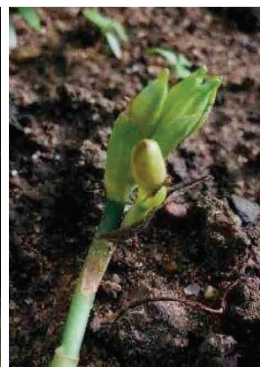
Since its discovery in a plant shop, the species has been cultivated in the Brio Garden in Nakhon Nayok Province since 2017.

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Saensouk, S., Saensouk, P., and Boonma, T. (2020). *Amomum foetidum* (Zingiberaceae), a new species from Northeast Thailand. *Taiwania*. 65. 364-370. <https://doi.org/10.6165/tai.2020.65.364>



Photos: Thawatphong Boonma



# Oreoglanis omkoiense

Fish



Photo: Apinun Suvarnaraksha

Found in Chiang Mai province in the basin of Maetuen River - a tributary of the Ping River, which in turn drains into the Chao Phraya River - this new species of catfish lives in cold, clean and fast-flowing hill streams. Observed in a shaded and stony area, this species prefers streams with pools and about 60% forest canopy cover, and feeds primarily on aquatic insect larvae and algae.

Like many others in this genus, this species has a considerably depressed shape, and large pectoral and pelvic fins. This characteristic makes perfect suction cups that adhere to the bottom of streams and rivers and

resist getting washed away by the fast-flowing streams they inhabit. This species also has a distinctive notch on its lower lip, distinguishing it from other members of the genus. This genus can be found in China, mainland Southeast Asia and the Indian subcontinent.

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Suvarnaraksha, A. (2020) *Oreoglanis omkoiense*: a new torrent catfish from northern Thailand (Pisces: Siluriformes, Sisoridae). *Raffles Bulletin of Zoology* 68: 779-790. <https://doi.org/10.26107/RBZ-2020-0089>

# Tylotriton phukhaensis

Amphibian

A new species of knobby newt was discovered in Doi Phu Kha National Park, Nan province, Thailand. This orange-brown newt, named after the Doi Phu Kha national park, was discovered thriving in the area, a sign of a healthy and intact habitat. More than 50 individuals were found swimming in a swamp covered with vegetation and big rocks at 1,795m above sea level.

According to Dr. Porrawee Pomchote, lecturer of Biology at Chulalongkorn University, a photo of an unknown *Tylotriton* species was found in a travel magazine that was over 20 years old. This photo, which was highlighting Doi Phu Kha National Park, “sparked the research team’s interest in surveying whether this novel newt species really existed.”

With a slim body and thin limbs, this newt is the fifth species described in its genus. Other knobby newts are found in northern, north-eastern, and western Thailand, all in high mountainous areas at 1,000m above sea level. Their habitats are generally pristine, moist, forested areas, making them more likely to be found in national parks and wildlife sanctuaries. Knobby newts can be used as an indicator species for assessing environmental health, according to the researchers who discovered this new species, which lays fertilised eggs on the tips of grasses and big rocks.

Although it was only recently discovered, the Department of National Parks, Wildlife, and Plant Conservation (DNP) believes that this species is threatened by habitat degradation, deforestation and other human activities. Cattle



grazing, illegal hunting and the introduction of invasive species are potential threats. According to the researchers who discovered it, further exploration is needed in the high mountain areas, high marsh and wetlands of northern and north-eastern Thailand, where more newt species are likely to occur.

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Pomchote, P., Khonsue, W., Thammachoti, P., Hernandez, A., Peerachidacho, P., Suwannapoom, C., Onishi, Y., and Nishikawa, K. (2020). *A New Species of Tylotriton (Urodela: Salamandridae) from Nan Province, Northern Thailand*. *Tropical Natural History*, 20(2), 144-161. <https://li01.tci-thaijo.org/index.php/tnh/article/view/240064>



Photos: Porrawee Pomchote

# Protobothrops kelomohy

Reptile

This pit viper was discovered in the dry evergreen forest in Chiang Mai Province, northern Thailand. It has three bold vertical facial stripes and dark reddish-brown scales edged in black. Despite its relatively large size, this unique colouration has provided this species with good camouflage in the dry forest leaf-litter, resulting in its description as a separate species only in 2020.

The species, colloquially called the Omkoi lance-headed pit viper, is the second species of lance-headed pit viper discovered in Thailand after *P. mucrosquamatus*. It prefers spending its days on the ground, especially in rocky, leaf-covered areas, and is threatened by habitat destruction for agricultural expansion. It is also persecuted by humans as a venomous snake.

Although the many surveys conducted in the mountainous forests of northern Thailand have led to the discoveries of many amphibian and reptile species over the years, the fact that such a large pit viper could go undescribed for so long suggests that more herpetological research should be done in this region where Laos, Myanmar and Thailand meet.



Photos: Montri Sumontha

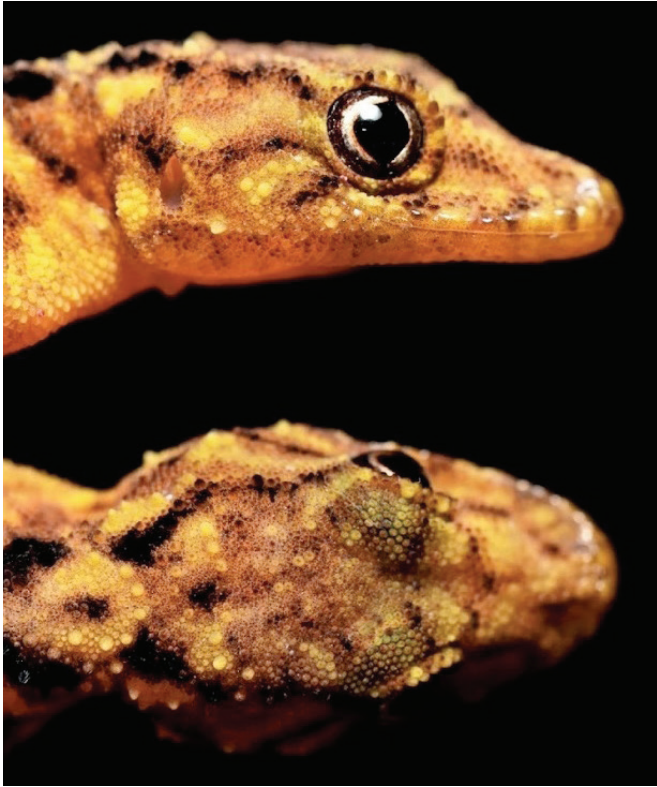


Sumontha, M., Vasaruchapong, T., Chomngam, N., Suntrarachun, S., Pawangkhanant, P., Sompan, W., Smits, T., Kunya, K., and Chanhome, L. (2020). *Protobothrops kelomohy* sp. nov. (Squamata: Viperidae), the Second Known Species of Lance-Headed Pit Viper from Thailand. *Tropical Natural History*, 20(1), 43-59. <https://lio1.tci-thaijo.org/index.php/tnh/article/view/208081>



# Cnemaspis selenolagus

Reptile



Discovered during a herpetofaunal survey in the tropical mountain evergreen forests of Suan Phueng District, Ratchaburi Province, the Suan Phueng rock gecko is the 16th species of this genus discovered in Thailand. Its colouring is distinct from other species in the genus, having a yellow-orange colour on the front half of its body, which abruptly turns grey from the middle of its back to its tail. This unique colouring makes it possible for the gecko to camouflage effectively against the lichen and dry moss covering the surfaces of granite rocks, boulders and large tree trunks where it spends its days. At night, this species takes refuge in the crevices of large rocks or on tree branches.

According to the researchers, the discovery underscores the importance of further field research in the hilly regions of the northern part of the Thai-Malay Peninsula, characterised by a high degree of site-specific endemism. For instance, the gecko group including *C. siamensis* has 11 species endemic to this area.

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Grismer, L., Yushchenko, P., Pawangkhanant, P., Nazarov, R., Naiduangchan, M., Suwannapoom, C., and Poyarkov, N. (2020). *A new species of Cnemaspis Strauch (Squamata: Gekkonidae) of the C. siamensis group from Tenasserim Mountains, Thailand*. *Zootaxa*, 4852: 547-564. <https://doi.org/10.11646/zootaxa.4852.5.3>



Photos: Mali Naiduangchan

# Viet Nam

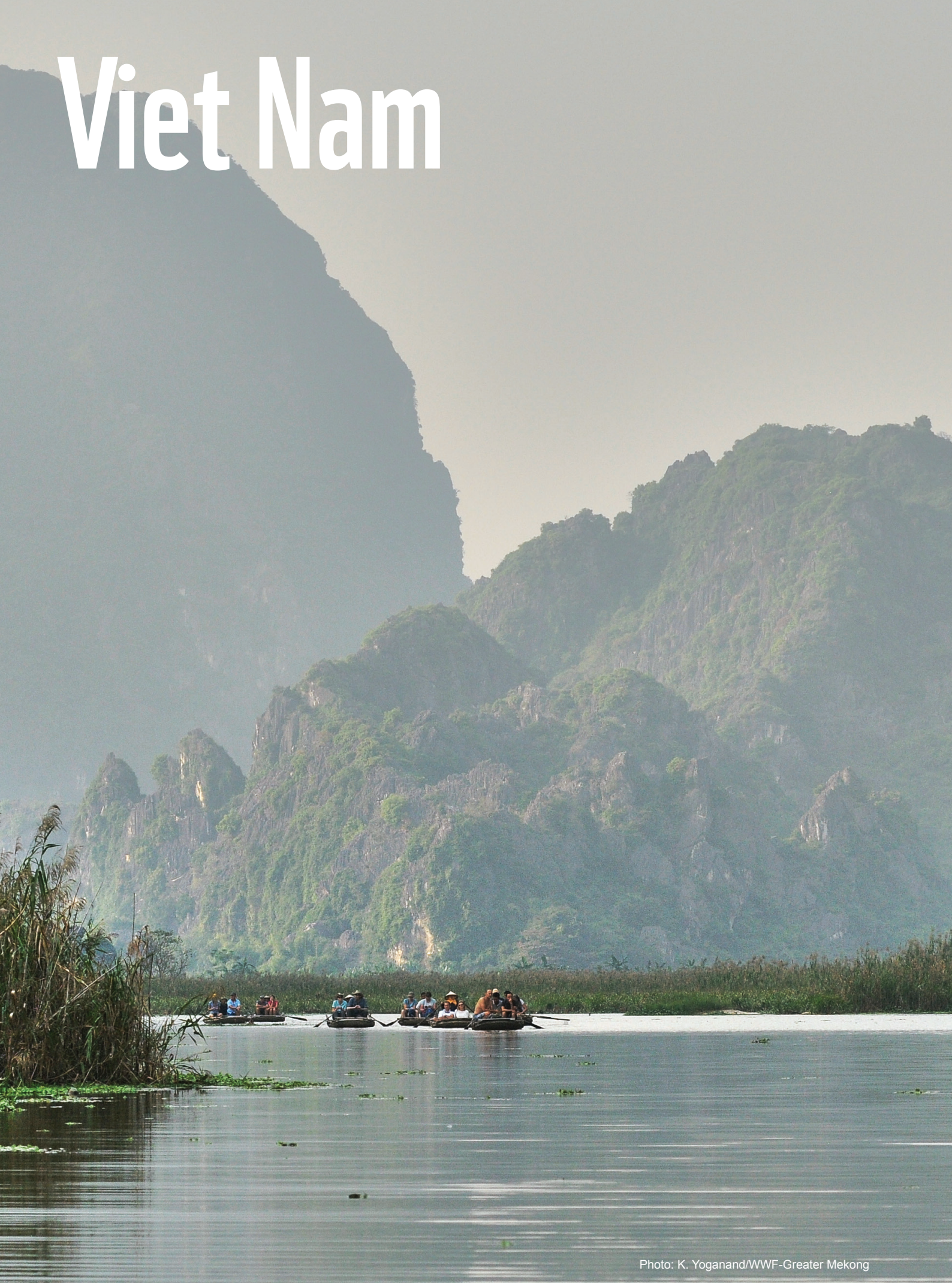


Photo: K. Yoganand/WWF-Greater Mekong

# Artocarpus montanus

Plant

High up in the evergreen mountain forest of a protected area in Kon Tum Province, Viet Nam, a new tree species in the mulberry family, related to jackfruit and breadfruit, was discovered. As its name suggests, it is found in the montane regions of southern and central Viet Nam. This species was first discovered at 800-1600m above sea level in the Central Highlands.

Although botanists collected this species over 70 years ago, it was misclassified as another species with similar vegetative parts but whose distribution is limited to the Malay Peninsula.

“I first came across this species as a dried specimen consisting of just a few leaves in the herbarium of the Missouri Botanical Garden in the USA,” said Elliot Gardner, currently a researcher at the International Center for Tropical Botany at Florida International University. “At the time, I thought the specimen looked a bit unusual, but I was not convinced that it was a new species until I had analysed DNA sequences from that specimen and another similar one collected from the same area.”

Re-examining specimens and genomic analyses have confirmed that this is a distinct species. It may also be found in Thailand, but this has yet to be confirmed. It is assessed as Near Threatened because it has a restricted area of occupancy and mainly occurs in protected areas.

“For me, this species highlights the importance of natural history collections, which remain a major source of new species discoveries,” added Gardner.

Gardner, E., Chaveerach, A., Runglawan, S., and Zerega, N. (2020). *Two new species of Artocarpus (Moraceae) from Thailand and Vietnam*. *Phytotaxa*. 453. 265-274. <https://doi.org/10.11646/phytotaxa.453.3.8>



Photos: Germinal Rouhan



Photo: Shuichiro Tagane

# Kurixalus gracilloides

Amphibian



The gracile frilled tree frog, a golden-brown frog with a distinctive pointed snout, was discovered in the secondary bamboo forest in Pu Mat National Park, Nghe An Province in northern Viet Nam. This frog belongs to a genus of frogs that spans from the Himalayas in eastern India, south and east through Cambodia, Viet Nam and southern China, to Taiwan and Okinawa, Japan. The gracile frilled tree frog has a distinct saddle-shaped dorsal marking and dermal fringes along the outer edges of its limbs, hence frilled.

Found among bamboo leaves and stems in the vicinity of ponds, puddles, and other still bodies of water, this Annamite endemic species is likely to exist in the forests of Laos that border Pu Mat National Park in Viet Nam. However, it is yet to be documented there. This and other amphibian species in the area are threatened by habitat degradation and hunting or capture for food. Despite having just been discovered, scientists recommend that the species be considered as Near Threatened under IUCN's Red List criteria, given its small estimated range, the density of human populations in that range, and the fragmentation of the lowland forest habitats.

“Finding this frog was a total coincidence; I just happened to find it while I was in the process of setting up camera traps in search of pangolins and Owston’s civets as part of my work for Save Vietnam’s Wildlife,” said the lead author Tan Van Nguyen. “The species is interesting because it looks like a combination of the genus *Kurixalus*, or frilled tree frogs, and the genus *Gracixalus*, or bush frogs, hence its Latin name. The area where we found this frog has a lot of local human use, and I haven’t seen this species again during my recent surveys. Hopefully, in the future, there will be more research to study this interesting frog.”

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Nguyen, T.V., Duong, T.V., Luu, K.T., and Poyarkov, N.A. (2020) *A new species of Kurixalus (Anura: Rhacophoridae) from northern Vietnam with comments on the biogeography of the genus*, *Journal of Natural History*, 54 (1-4): 195-223. <https://doi.org/10.1080/00222933.2020.1728411>



Photos: Tan Van Nguyen

# Leptobrachium lunatum

Amphibian

Also found in Cambodia

The crescent moon spadefoot frog was discovered on the Kon Tum Plateau in the Central Highlands of Viet Nam and northeastern Cambodia. It was not initially recognised as a separate species. DNA analyses, calls and body measurements were required to reveal that this red-eyed frog is distinct from two other similar looking species that occur in this region, and is the species found at the highest elevation.

Although difficult to see in their shallow burrows or when hiding under leaf litter near streams, the call of these large frogs -- a deep 'waaaaah' sound -- was distinctive and led the researchers to discover the frog's location. Their tadpoles can be observed at night in small stream pools with rocky or sandy substrate.

This big-headed frog has deep orange irises shaped like a crescent moon (hence the name *lunatum* or crescent moon). Like the other species of the genus *Leptobrachella*, these frogs are found in hill and wet evergreen forests between 600 and 2100 m elevation. Being dependent on forests, they are likely to be negatively impacted by ongoing deforestation and land-use change. Scientists have also observed their tadpoles being harvested for food. Given the restricted geographic distribution and reduction in range of the crescent moon

spadefoot frog, the conservation status of this species and the other two related species should be reassessed.

"This discovery is a great reminder that species do not evolve for the convenience of taxonomists!" said Bryan Stuart of the North Carolina Museum of Natural Sciences. "Analyses of multiple factors - the physical characteristics of adults and larvae, advertisement calls, mitochondrial DNA and nuclear DNA - were required to untangle the complex evolutionary history of these red-eyed *Leptobrachium* and provide the necessary evidence that *Leptobrachium lunatum* represents a distinct species that warrants being recognised and conserved."

This in-depth analysis was not in vain; the publication outlining the discovery of the crescent moon spadefoot frog won the 2021 E.O. Wilson Research Prize.

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Stuart, B.L., Som, H.E., Neang, T., Hoang, H.D., Le, D.T.T., Dau, V.Q., Potter, K., and Rowley, J.J.L. (2020) *Integrative taxonomic analysis reveals a new species of Leptobrachium (Anura: Megophryidae) from north-eastern Cambodia and central Vietnam*, *Journal of Natural History*, 54 (1-4): 225-255. <https://doi.org/10.1080/00222933.2020.1756498>



Photo: Piotr Naskrecki

# Megophrys frigida

Amphibian



The Mount Ky Quan San horned frog was discovered in Bat Xat Nature Reserve on Mount Ky Quan San, Viet Nam's third highest peak. It was collected at more than 2000 m elevation, and in a relatively cold climate for the region, hence its Latin name *frigida*. All of the collected individuals were encountered in forests with relatively open canopies and at night along streams and rocky stream beds.

This species is likely the fourth range-restricted species of this genus described from the Hoang Lien Range since 2017, identifying the area as significant for amphibian diversity. It occurs in the same area as other species of this genus and shares similar physical characteristics.

“The discovery of this species by our international team was extremely exciting,” said Ben Tapley of the Zoological Society of London and the lead researcher on the survey. “Unfortunately, the forest where we found this horned frog is being negatively impacted by fuelwood collection for the tourism industry and by livestock grazing.” As a result, it will likely be assessed as Endangered in the IUCN Red List.



Photos: Benjamin Tapley

Tapley, B., Cutajar, T., Nguyen, L.T., Portway, C., Mahony, S., Nguyen, C.T., Harding, L., Luong, H.V., and Rowley, J.J.L. (2020) *A new potentially Endangered species of Megophrys (Amphibia: Megophryidae) from Mount Ky Quan San, north-west Vietnam*, Journal of Natural History, 54 (39-40): 2543-2575. <https://doi.org/10.1080/00222933.2020.1856952>

# Oligodon rostralis

Reptile

A new species of kukri snake has been described in the eastern part of the Langbian Plateau, in Bidoup-Nui Ba National Park in the southern Truong Son (Annamite) Mountains. Its most distinctive feature is its protruding snout, so the researchers who discovered it have suggested “Long-snouted kukri snake” as its common name, with “*rostralis*” coming from the Latin “*rostrum*” for “snout” or “beak.” Another striking feature is that, although the long-snouted kukri has dark colouring along its back, its underside is bright orange from the base of the head to the tip of the tail.

The mixed-pine forest in which this species was discovered is under intense grazing pressure from livestock, a potential threat to its existence. The kukri snakes are rear-fanged and have jaw articulation adapted for egg-feeding. They use the special teeth at the back of their mouth to cut open eggs for ease of swallowing the contents. The name kukri is derived from a Nepalese knife that has a distinctive curved shape.<sup>3</sup> Although this makes the kukri rather adaptable, it may mean that its egg scavenging would make it unpopular among people raising poultry, and therefore a threat needing to be managed.

This is the 24th

species of kukri snake known in Viet Nam, which is a hotspot for this genus in the region. Despite the apparent abundance of kukri snake species in the region, it is poorly researched and there is a rarity of specimens in museum collections. The challenging access to field sites in the region limits surveys and new species discoveries.

“We found this specimen after several unsuccessful hours of hiking, making it a highlight in an otherwise long and dark night,” said Nguyen Hoang Linh of the Department of Zoology at the Southern Institute of Ecology, Vietnam Academy of Science and Technology.

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Nguyen H.N., Tran B.V., Nguyen L.H., Neang T., Yushchenko P.V., and Poyarkov N.A. 2020. *A new species of Oligodon Fitzinger, 1826 from the Langbian Plateau, southern Vietnam, with additional information on Oligodon annamensis Leviton, 1953 (Squamata: Colubridae)* PeerJ 8:e8332. <https://doi.org/10.7717/peerj.8332>



Photos: Linh Hoang Nguyen

# Acanthosaura prasina

Reptile



Photo: Natalia Ananjeva

A new species of mountain horned dragon was discovered in the evergreen forests of the Vietnamese Central Highlands: in Gia Lai Province, Kon Chu Range Nature Reserve, and Kon Tum Province's Kon Plông and Ngoc Linh Mountain. This small green lizard is well camouflaged among the dense vegetation it inhabits, and has distinctive short spines on each side of its neck. A double row of vertebral scales, long tail and limbs, and white colouring on the lips and shoulder make it distinct from other known species of this genus.

This is the 16th species of genus *Acanthosaura*, and the ninth from Viet Nam to be discovered. The Central Highlands, particularly the forests of Kon Plong district,<sup>4</sup> are home to some of the rarest and most threatened species in Viet Nam, including the grey-shanked douc langur (*Pygathrix cinerea*),

the northern yellow-cheeked gibbon (*Nomascus annamensis*), Owston's palm civet (*Chrotogale owstoni*), the pygmy slow loris (*Nycticebus pygmaeus*) and the golden-winged laughing thrush (*Trochalopteron ngoclinhensis*). The Kon Plong forest also serves as a vital forest corridor connecting the southern Annamites with the eastern Annamites extending to Gia Lai and beyond.

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Ananjeva, N., Nguyen, S., Nguyen, T., Murphy, R., Lukonina, S., and Orlov, N. (2020). *A New Species of Acanthosaura Gray, 1831 (Squamata: Agamidae) from Central Highlands, Vietnam*. *Russian Journal of Herpetology*, 27: 217-230. <https://doi.org/10.30906/1026-2296-2020-27-4-217-230>



# Achalinus zugorum

Reptile



The Zugs' odd-scaled snake was discovered on a small gravel road in Lung Cang Village, Ha Giang Province, Viet Nam, in 2019. It was named after the well-regarded herpetofauna scientists George R. and Patricia B. Zug. This snake's unique evolutionary history, dark purple colouration, and the number of scales on its back and tail underside differentiate it from other species in the genus.

Snakes in this genus, which can be found in Japan, China, Taiwan and Viet Nam, are different from all other snakes because they have a non-overlapping scale pattern; hence the name "odd-scaled snake." They also have other unique features, including teeth adapted for consuming soft-bodied prey, and a type of photoreceptor in their eyes associated with nocturnality.

Only one specimen of this species has been collected so far. As such, it is hard to say anything conclusive about their preferred habitat, but the area in Lung Cang Village where this species was discovered is characterised by highly fragmented and degraded forests as a result of logging, agricultural expansion, housing development, and limestone quarrying. Habitat destruction frequently threatens this and other species in the region. Therefore, research on the biology, ecology and evolution of the Zugs' odd-scaled snake needs to be urgently undertaken before it is driven to extinction.

"When we found the snake curled up in the middle of the road, the research team were a bit puzzled, since none of us was familiar with this particularly odd-looking snake," said Aryeh H. Miller, Research Fellow for the National Museum of Natural History, Smithsonian Institution, who led the research expedition. "Once we realised that it may be part of the rare genus of 'odd-scaled snakes,' you could feel the excitement spread through the team, as we had figured this individual almost certainly represented a new species. Ultimately, the discovery of *Achalinus zugorum* further signifies that we are still only beginning to appreciate the magnitude of biodiversity in Vietnam and broadly in Southeast Asia."

Miller, A.H., Davis, H.R., Luong, A.M., Do, Q.H., Pham, C.T., Ziegler, T., Lee, J.L., De Queiroz, K., Reynolds, R.G., and Nguyen, T.Q. (2020). *Discovery of a New Species of Enigmatic Odd-Scaled Snake (Serpentes: Xenodermidae: Achalinus) from Ha Giang Province, Vietnam*. *Copeia*, 108(4), 796-808. <https://meridian.allenpress.com/copeia/article/108/4/796/449236>

Photos: American Society of Ichthyologists and Herpetologists



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- 2 Agence France- Presse. 11 Nov 2020. New species of primate identified in Myanmar – and is already endangered. The Guardian, World News. <https://www.theguardian.com/world/2020/nov/11/popa-scoop-100-year-old-monkey-faeces-reveals-new-species-in-myanmar>
- 3 Green, Marc & Orlov, Nikolai & Murphy, Robert. (2010). Toward a Phylogeny of the Kukri Snakes, Genus Oligodon. Asian Herpetological Research, 1: 1-21. <http://www.ahr-journal.com/en/oa/DArticle.aspx?type=view&id=20100101>
- 4 Sarah Rakowski. 3 Dec 2021. Time is running out for primates, bears and songbirds in Vietnamese wildlife hotspot. Fauna and Flora International. <https://www.fauna-flora.org/news/time-is-running-out-for-primates-bears-and-songbirds-in-vietnamese-wildlife-hotspot/>

# APPENDIX 1

New species of vertebrate animals and vascular plants discovered / described in the Greater Mekong region in peer-reviewed research articles published in 2020.

## PLANTS

Species	Researchers	Country
<b>Plenasium (Aurealcaulis) elegans</b>	Hiller, P., Böhme, M., Schneider, S., Prieto, J., Bomfleur, B.	Vietnam
<b>Primula gracilituba</b>	Nuraliev, M.S., Kuznetsov, A.N., Kuznetsova, S.P. and Hu, C.-M.	Vietnam
<b>Ardisia daklakensis (Primulaceae)</b>	Nuraliev, M.S., Hu, C.-M., Kuznetsov, A.N., Kuznetsova, S.P.	Vietnam
<b>Capparis macrantha</b>	Souvannakhoummane, K., Fici, S., Lanorsavanh, S., Park, J.H., Kang, H.S. and Bounithiphonh, C.	Laos
<b>Camellia puhoatensis</b>	Nguyễn, D. H., Lương, V. D., Lê, T. H., Trần, Q. T., Đỗ, N. Đ. & Lý, N. S.	Vietnam
<b>Argostemma bachmaense</b>	Do, T.V., Zhe, C. and Yang, N.	Vietnam
<b>Dasymaschalon halabalanum</b>	Jongsook, H., Samerpitak, K., Damthongdee A. & Chaowasku, T.	Thailand
<b>Loxostigma puhoatense</b>	Lý, N. S., Nguyễn, D. H., Lê, T. H., Trần, M. H., Đỗ, N. Đ., Trương, B. V., & Maciejewski, S.	Vietnam
<b>Helicteres binhthuanensis</b>	Dang, V. S., Dang, M. Q., & Hoang, N. S.	Vietnam
<b>Kaempferia nemoralis Insis</b>	Insiengmay, O., Newman, M. F. & Haevermans, T.	Cambodia & Laos
<b>Kaempferia pascuorum Insis</b>	Insiengmay, O., Newman, M. F. & Haevermans, T.	Cambodia & Laos
<b>Psydrax gialaiensis</b>	Quang, B. H., Tran, T. B., Ha, T. D., Do Van, H., Thanh, H. N. T., Thu, H. B., & Dang, V. S.	Vietnam

<b>Schizostachyum dakrongense</b>	Cai, Z. Y., Tong, Y. H., Vu, T. C., Ni, J. B., & Xia, N. H.	Vietnam
<b>Orchidantha anthracina</b>	Trần, H.Đ., Lu'ư, H.T., Leong-Škornicková, J.	Vietnam
<b>Primulina xuansonensis</b>	Chen, W. H., Guo, S. W., Nguyen, H. Q., Chen, L., & Shui, Y. M.	Vietnam
<b>Kaempferia aurora</b>	Nopporncharoenkul, N., Laongsri, W. & Jenjittikul, T.	Thailand
<b>Kaempferia caespitosa</b>	Nopporncharoenkul, N., Laongsri, W. & Jenjittikul, T.	Thailand
<b>Artabotrys longipetalus</b>	Chen, J. & Eiadthong, W.	Thailand
<b>Artabotrys insuræ</b>	Chen, J. & Eiadthong, W.	Thailand
<b>Kaempferia maculifolia</b>	Boonma, T., Saensouk, S. & Saensouk, P.	Thailand
<b>Kaempferia takensis</b>	Boonma, T., Saensouk, S. & Saensouk, P.	Thailand
<b>Ceropegia phuchongensis</b>	Kidyoo, M. & Suwannakote, K.	Thailand
<b>Ceropegia graminea</b>	Suwannakote, K. & Kidyoo, M.	Thailand
<b>Viola umphangensis</b>	Nansai, S., Srisanga, P., Hodgkinson, T.R. & Suwanphakdee, C.	Thailand
<b>Argyreia pseudosolanum</b>	Traiperm, P., & Suddee, S.	Thailand
<b>Winitia thailandana</b>	Chaowasku, T., Aongyong, K., Damthongdee, A., Jongsook, H. & Johnson, D.M.	Thailand
<b>Amomum foetidum</b>	Boonma, T., Saensouk, S. & Saensouk, P.	Thailand
<b>Curcuma cinnabarina</b>	Leong-Skornickova, J., Soonthornkalump, S. & Suksathan, P.	Thailand
<b>Curcuma eburnea</b>	Leong-Skornickova, J., Soonthornkalump, S. & Suksathan, P.	Thailand
<b>Eriocaulon longibracteatum</b>	Khorngton, S., Souladeth, P. & Prajaksood, A.	Thailand & Cambodia
<b>Argostemma lamxayanum</b>	Lanorsavanh, S., Chantaranothai, P. & Souvannakhoummane, K.	Laos
<b>Argostemma lobbioides</b>	Lanorsavanh, S., Chantaranothai, P. & Souvannakhoummane, K.	Laos
<b>Argostemma longisepalum</b>	Lanorsavanh, S., Chantaranothai, P. & Souvannakhoummane, K.	Laos
<b>Argostemma paksongense</b>	Lanorsavanh, S., Chantaranothai, P. & Souvannakhoummane, K.	Laos
<b>Argostemma svengsuksae</b>	Lanorsavanh, S., Chantaranothai, P. & Souvannakhoummane, K.	Laos
<b>Argostemma vientianense</b>	Lanorsavanh, S., Chantaranothai, P. & Souvannakhoummane, K.	Laos
<b>Aspidistra melanaster</b>	Averyanov, L.V., Nguyen, K.S., Son, H.T., Tillich, H.-J., Wynn-Jones, B. & Maisak, T.V.	Vietnam & Laos
<b>Aspidistra obliqua</b>	Averyanov, L.V., Nguyen, K.S., Son, H.T., Tillich, H.-J., Wynn-Jones, B. & Maisak, T.V.	Vietnam & Laos
<b>Begonia laotica</b>	Ding, H. B., Maw, M. B., Yang, B., Bouamanivong, S. & Tan, Y. H.	Laos

<b><i>Begonia hypoleuca</i></b>	Ding, H. B., Maw, M. B., Yang, B., Bouamanivong, S. & Tan, Y. H.	Laos
<b><i>Stemona fimbriepala</i></b>	Rakarcha, S., Pongamornkul, W., Thammarong, W., Maknoi, C., & Souvannakhoummane, K.	Laos
<b><i>Peliosanthes cupuliformis</i></b>	Averyanov, L.V., Tanaka, N., Nguyen, K.S. & Maisak, T.V.	Laos
<b><i>Aspidistra purpureomaculata</i></b>	Xi, H.-C., Yin, J.-T., Ma, X.-D. & Wang, W.-G.	Laos
<b><i>Begonia colliculata</i></b>	Souvannakhoummane, K., Lanorsavanh, S., Park, J. H., Kang, H. S., Ahn, T. H., Xayalath, S. & Phongoudom, C.	Laos
<b><i>Eriocaulon cormosum</i></b>	Souladeth, P., Tagane, S., Newman, M.F & Prajaksood, A.	Laos
<b><i>Eriocaulon vientianense</i></b>	Souladeth, P., Tagane, S., Newman, M.F & Prajaksood, A.	Laos
<b><i>Ophiopogon brevicauli</i></b>	Averyanov, L.V., Tanaka, N., Nguyen, K.S. & Maisak, T.V.	Vietnam
<b><i>Rohdea subcaudata</i></b>	Averyanov, L.V., Tanaka, N., Nguyen, K.S. & Maisak, T.V.	Laos
<b><i>Coleus bolavenensis</i></b>	Suddee, S., Tagane, S., Souladeth, P., Kongxaysavath, D., Rueangruea, S., Suyama, Y. & Suzuki, E.	Laos
<b><i>Capparis lianosa</i></b>	Fici, S. & Souvannakhoummane, K.	Laos
<b><i>Monolophus odontochilus</i></b>	Ding, H. B., Yang, B., Maw, M. B., Win, P. P. & Tan, Y. H.	Myanmar
<b><i>Machilus angustifolia</i></b>	Mase, K., Tagane, S., Chhang, P. and Yahara, T.	Cambodia
<b><i>Machilus cambodiana</i></b>	Mase, K., Tagane, S., Chhang, P. and Yahara, T.	Cambodia
<b><i>Machilus elephantii</i></b>	Mase, K., Tagane, S., Chhang, P. and Yahara, T.	Cambodia
<b><i>Didymocarpus albiflorus</i></b>	Souvannakhoummane, K. & Phonepaseuth, P.	Laos
<b><i>Alangium confertiflorum</i></b>	Ding, H.-B., Yang, B., Wang, P.-Y., Gan, Z.-L., Yan, G., Lu, X.-Q. and Tan, Y.-H.	Laos & China (Yunnan)
<b><i>Kaempferia minuta</i></b>	Jenjittikul, T. and Larsen, K.	Thailand & Laos
<b><i>Kaempferia pardi</i></b>	Jenjittikul, T. and Larsen, K.	Thailand
<b><i>Goniothalamus saccopetaloides</i></b>	Yang, B., Zhu, R.B., Ding, H.B., Bouamanivong, S. & Tan, Y.H.	Laos
<b><i>Laobambos calcareus</i></b>	Haevermans, T., Mantuano, D., Zhou, M. Y., Lamxay, V., Haevermans, A., Blanc, P. & Li, D. Z.	Laos
<b><i>Heterostemma cucphuongense</i></b>	Tran, T.B., Han, L.N., Hai, D.V., Quang, B.H., Huong, N., Ha, B.T., Hai, T.V. & Rodda, M.	Vietnam
<b><i>Diospyros laoensis</i></b>	Tagane, S., Souladeth, P., Yang, C.-J. & Yahara, T.	Laos
<b><i>Begonia phouchomvoyensis</i></b>	Lanorsavanh, S., Hughes, M., Souvannakhoummane, K., & Lamxay, V.	Laos

<b><i>Hoya lamthanhaiae</i></b>	Pham, V.T., Kloppenburg, R.D., Averyanov, L.V., Nguyen, G.S., Nguyen H.T., Le, T.A. & Nguyen, V.C.	Vietnam
<b><i>Apetalanthe gracilis</i></b>	Averyanov, L.V., Truong, B.V., Nguyen, V.C., Maisak, T., Dinh, Q.D., Nuraliev, M.S., Nguyen, K.S. and Chu, V.T.	Vietnam
<b><i>Nervilia appressifolia</i></b>	Averyanov, L.V., Truong, B.V., Nguyen, V.C., Maisak, T., Dinh, Q.D., Nuraliev, M.S., Nguyen, K.S. and Chu, V.T.	Vietnam
<b><i>Ilex bidouensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Ilex hongiaoensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Mastixia hongiaoensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Daphniphyllum hongiaoense</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Platea hongiaoensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Neolitsea bidouensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Neolitsea hongiaoensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Nyssa bidouensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Nyssa hongiaoensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Eriobotrya hongiaoensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Prunus hongiaoensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Luvunga hongiaoensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Illicium viridiflorum</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam

<b><i>Symplocos hongiaoensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Alpinia hongiaoensis</i></b>	Tagane, S., Ngoc, N.V., Binh, H.T., Nagahama, A., Zhang, M., Cuong, T.Q., Son, L.V., Dang, V.-S., Toyama, H., Komada, N., Nagamasu, H. and Yahara, T.	Vietnam
<b><i>Globba amnicola</i></b>	Sangvirotjanapat, S., Đăng, T.H. and Newman, M.	Thailand
<b><i>Globba amplexans</i></b>	Sangvirotjanapat, S., Đăng, T.H. and Newman, M.	Thailand
<b><i>Globba conferta</i></b>	Sangvirotjanapat, S., Đăng, T.H. and Newman, M.	Thailand
<b><i>Globba dasycarpa</i></b>	Sangvirotjanapat, S., Đăng, T.H. and Newman, M.	Thailand
<b><i>Globba grandis</i></b>	Sangvirotjanapat, S., Đăng, T.H. and Newman, M.	Thailand
<b><i>Globba hilaris</i></b>	Sangvirotjanapat, S., Đăng, T.H. and Newman, M.	Cambodia, Laos & Thailand
<b><i>Globba impar</i></b>	Sangvirotjanapat, S., Đăng, T.H. and Newman, M.	Vietnam
<b><i>Globba nitida</i></b>	Sangvirotjanapat, S., Đăng, T.H. and Newman, M.	Thailand
<b><i>Globba verecunda</i></b>	Sangvirotjanapat, S., Đăng, T.H. and Newman, M.	Thailand
<b><i>Globba williamsiana</i></b>	Sangvirotjanapat, S., Đăng, T.H. and Newman, M.	Thailand
<b><i>Capparis florida</i></b>	Souvannakhoummane, K., Fici, S., Lanorsavanh, S. & Lamxay, V.	Laos
<b><i>Peliosanthes oksanae</i></b>	Tanaka, N. and Kalyuzhny, S.	Thailand
<b><i>Dischidia phuphanensis</i></b>	Promprom, W., & Chatan, W.	Thailand
<b><i>Didymocarpus phuquocensis</i></b>	Tran, T.L., Ly, N.S., Tran, M.N., Nguyen, X.T., Cao, N.G. & Pham, H. D.	Vietnam
<b><i>Kaempferia albiflora</i></b>	Jenjittikul, T. & Ruchisansakun, S.	Thailand
<b><i>Octarrhena emarginata</i></b>	Averyanov, L.V., Eskov, A.K., Truong, B.V., Nguyen, V.C., Prilepsky, N.G., Nuraliev, M.S., Maisak, T.V. and Manh, V.	Vietnam
<b><i>Octarrhena perpusilla</i></b>	Averyanov, L.V., Eskov, A.K., Truong, B.V., Nguyen, V.C., Prilepsky, N.G., Nuraliev, M.S., Maisak, T.V. and Manh, V.	Vietnam
<b><i>Begonia chenii</i></b>	Maw, M. B., Ding, H. B., Yang, B., Win, P. P., & Tan, Y. H.	Myanmar
<b><i>Begonia putaoensis</i></b>	Maw, M. B., Ding, H. B., Yang, B., Win, P. P., & Tan, Y. H.	Myanmar
<b><i>Begonia crassitepala</i></b>	Maw, M. B., Ding, H. B., Yang, B., Win, P. P., & Tan, Y. H.	Myanmar
<b><i>Blumea htamanthii</i></b>	Peng, Y., Yang, C., & Luo, Y.	Myanmar
<b><i>Zingiber natmataungense</i></b>	Li, R., Shine, L., Li, W., & Zhou, S. S.	Myanmar
<b><i>Amomum schistocalyx</i></b>	Ding, H. B., Yang, B., Maw, M. B., Win, P. P., & Tan, Y. H.	Myanmar

<b><i>Sonerila cardamomensis</i></b>	Shin, J.-S., Song, B.-K., Phourin, C., Won, H., Lee, K.-E. & Cho, S.-H.	Cambodia
<b><i>Kaempferia caespitosa</i></b>	Nopporncharoenkul, N., Laongsri, W. & Jenjittikul, T.	Thailand
<b><i>Curcuma stolonifera</i></b>	Tanaka, N., Armstrong, K., Aung, M. M., & Naiki, A.	Myanmar
<b><i>Alseodaphnopsis putaoensis</i></b>	Li, L., Tan, Y. H., Meng, H. H., Ma, H., & Li, J.	Myanmar
<b><i>Zingiber purpureoalbum</i></b>	Tanaka, N., & Aung, M. M.	Myanmar
<b><i>Ophiorrhiza monsvictoriae</i></b>	Zhou, S. S., Li, R., Quan, R. C., Shine, L., & Duan, L. D.	Myanmar
<b><i>Colocasia kachinensis</i></b>	Zhou, S. S., Quan, R. C., Li, R., Liu, Q., & Yin, J. T.	Myanmar
<b><i>Pinalia taunggyiensis</i></b>	Ormerod, P., & Kurzweil, H.	Myanmar
<b><i>Typhonium sagaingense</i></b>	Naive, M. A. K., Hein, K. Z., Ma, Z. X., & VAN DU, N. G. U. Y. E. N.	Myanmar
<b><i>Styrax cambodianus</i></b>	Fritsch, P. W., Thomas, P., & Ly, V.	Cambodia
<b><i>Machilus seimensis</i></b>	Mase, K., Tagane, S., Chhang, P., & Yahara, T.	Cambodia
<b><i>Cryptocarya kaengkrachanensis</i></b>	Zhang, M., Yahara, T., Tagane, S., Rueangruea, S., Suddee, S., Moritsuka, E., & Suyama, Y.	Thailand
<b><i>Helicteres oblongifolia</i></b>	Chantaranothai, P., & Poompo, S.	Thailand
<b><i>Helicteres thailandica</i></b>	Chantaranothai, P., & Poompo, S.	Thailand
<b><i>Leptomischus hiepii</i></b>	Wu, L., Averyanov, L. V., Nguyen, K. S., Maisak, T. V., & Hu, Y. H.	Vietnam
<b><i>Capparis kbangensis</i></b>	Sy, D. T., Do Van Hai, R. K. C., Tran, T. B., Chu, H. M., Nguyen, H. Q., Nguyen, T. T. N., Tucker, G. C. & Lee, J.	Vietnam
<b><i>Lasianthus thuyanae</i></b>	Dang, V. S., & Naiki, A.	Vietnam
<b><i>Lasianthus tamdaoensis</i></b>	Dang, V. S., & Naiki, A.	Vietnam
<b><i>Sonerila calcicola</i></b>	Wai, J. S., & Hu, J. M.	Thailand
<b><i>Helicteres daknongensis</i></b>	Hoang, N. S., Bui, D. T., & Nguyen, T. N. T.	Vietnam
<b><i>Rhinacanthus spiciformis</i></b>	Lin, Z. L., Hai, D. V., Hu, X. Y., & Deng, Y. F.	Vietnam
<b><i>Colona rivularis</i></b>	Suddee, S., Rueangruea, S., Poopath, M., Karaket, P., Kiewbang, W., & Middleton, D.	Thailand
<b><i>Gymnosphaera bachmaensis</i></b>	Dong, S. Y., Zuo, Z. Y., Xiao, Y., Huang, L., Pham, V. T., Phan, K. L., & Kang, M.	Vietnam
<b><i>Pittosporum lacrymasepalum</i></b>	Utteridge, T. M.	Thailand
<b><i>Pittosporum maxwellii</i></b>	Utteridge, T. M.	Thailand

<b><i>Ophiopogon brevicaulis</i></b>	Averyanov, L. V., Tanaka, N., Nguyen, K. S., & Maisak, T. V.	Vietnam
<b><i>Diospyros phuwuaensis</i></b>	Duangjai, S., Rueangruea, S., Phutthai, T., Middleton, D., & Suddee, S.	Thailand
<b><i>Capparis kbangensis</i></b>	Truong, B. V., Hsu, T. C., Tu, B. N., Luu, H. T., & Sutsugu, K.	Vietnam
<b><i>Antrophyum nambanense</i></b>	Chen, C. W., Dang, M. T., Luu, H. T., Kao, T. T., Huang, Y. M., & Li, C. W.	Vietnam
<b><i>Aspidistra babensis</i></b>	Nguyen, K. S., Averyanov, L. V., Tillich, H. J., Le, T. M. L., & Nguyen, T. H.	Vietnam
<b><i>Curcuma papilionacea</i></b>	Soonthornkalump, S., Ongsakul, A., Dolaji, A., & LEONG-ŠKORNIČKOVÁ, J. A. N. A.	Thailand
<b><i>Cylindrolobus chienii</i></b>	MAISAK, T. V., & TRUONG, B. V.	Vietnam
<b><i>Paraboea villosa</i></b>	Averyanov, L. V., Xu, W. B., Nguyen, K. S., & Maisak, T. V.	Vietnam
<b><i>Gymnemopsis phuwuaensis</i></b>	Kidyoo, A.	Thailand
<b><i>Scaphochlamys longipedunculata</i></b>	Ruchisansakun, S., Jenjittikul, T., & Maknoi, C.	Thailand
<b><i>Artocarpus rubrosoccatu</i></b>	Gardner, E. M., Chaveerach, A., Sudmoon, R., & Zerega, N. J.	Thailand
<b><i>Artocarpus montanus</i></b>	Gardner, E. M., Chaveerach, A., Sudmoon, R., & Zerega, N. J.	Vietnam
<b><i>Pseuduvaria khaosokensis</i></b>	Yoosukkee, C., Damthongdee, A., Jongsook, H., & Chaowasku, T.	Thailand
<b><i>Primulina elegans</i></b>	Tong, Y. H., Wang, B. M., Vu, T. C., & Xia, N. H.	Vietnam
<b><i>Billolivia lamdongensis</i></b>	Hareesh, V. S., Nguyen, D. D., & Le, T. A.	Vietnam
<b><i>Jasminum kontumense</i></b>	Quang, B. H.	Vietnam
<b><i>Ophiorrhiza hoanglienensis</i></b>	Nguyen, T. T., Wei, Y. G., Wen, F., Le, K. D., & Van Do, T.	Vietnam
<b><i>Bulbophyllum sridithii</i></b>	Truong, B. V., Van Son, D. A. N. G., Hop, T. R. A. N., MAISAK, T. V., & AVERYANOV, L. V.	Vietnam
<b><i>Justicia larsenii</i></b>	Rueangsawang, K., Simpson, D. A., & Chantaranothai, P.	Thailand
<b><i>Justicia saksuwaniae</i></b>	Rueangsawang, K., Simpson, D. A., & Chantaranothai, P.	Thailand
<b><i>Magnolia quangninhensis</i></b>	Vu, Q. N., Xia, N. H., NGUYEN, T., & Khuat, T. H. N.	Vietnam
<b><i>Terminalia santisukiana</i></b>	Pattharahirantricin, N., & Poopath, M.	Thailand
<b><i>Curcuma micrantha</i></b>	Leong-Škorničková, J., Soonthornkalump, S., & Thongbai, W.	Thailand
<b><i>Curcuma globulifera</i></b>	Leong-Škorničková, J., Soonthornkalump, S., & Thongbai, W.	Thailand
<b><i>Curcuma spathulata</i></b>	Leong-Škorničková, J., Soonthornkalump, S., & Thongbai, W.	Thailand
<b><i>Curcuma fimbriata</i></b>	Leong-Škorničková, J., Soonthornkalump, S., & Thongbai, W.	Thailand



# FISHES

<b>Henicorhynchus thaitui</b>	Nguyen, D. T., Ho, A. T., Hoang, N. T., Wu, H., & Zhang, E.	Vietnam
<b>Eptatretus albiderma</b>	Song, Y.S., Kim, J.K.	Vietnam
<b>Thrissina belvedere</b>	Hata, H., Quan, N.V., Ha, T.M. and Motomura, H.	Vietnam
<b>Lepidotrigla firmisquamis</b>	Prokofiev, A.M., Yato, T.	Vietnam
<b>Halicmetus odysseus</b>	Prokofiev, A. M.	Vietnam
<b>Doboatherina iwatsukii</b>	Sasaki, D. & Kimura, S.	Thailand & Vietnam
<b>Doboatherina magnidentata</b>	Sasaki, D. & Kimura, S.	Thailand & Vietnam
<b>Doboatherina salangensis</b>	Sasaki, D. & Kimura, S.	Thailand
<b>Kayahschistura lokalayensis</b>	Kottelat, M., & Grego, J.	Myanmar
<b>Apogon fugax</b>	Gon, O., Bogorodsky, S. V., Mal, A. O., & Alpermann, T. J.	Myanmar
<b>Pomacentrus andamanensis</b>	Allen, G. R., Erdmann, M. V., & Ningsih, E. Y.	Myanmar & Thailand
<b>Antigonia emanuela</b>	Prokofiev, A. M., Psomadakis, P. N., & Gon, O.	Myanmar
<b>Oreoglanis omkoiense</b>	Suvarnaraksha, A.	Thailand
<b>Atractodenchelys brevitrunca</b>	Ho, H. C.	Vietnam
<b>Chlorophthalmus basiniger</b>	Prokofiev, A. M.	Vietnam
<b>Lepidotrigla firmisquamis</b>	Prokofiev, A. M., & Yato, T.	Vietnam

# AMPHIBIANS

<b>Microhyla hongiaoensis</b>	Hoang, V.C., Luong, M.A., Nguyen, Q.T., Orlov, N. L., Chen, Y., Wang, B. and Jiang, J.	Vietnam
<b>Zhangixalus jodiae</b>	Nguyen, T.T., Ninh, H.T., Orlov, N., Nguyen T.Q. and Ziegler, T.	Vietnam
<b>Zhangixalus franki</b>	Ninh, H.T., Nguyen, T.T., Orlov, N., Nguyen, T.Q. and Ziegler, T.	Vietnam
<b>Gracixalus trieng</b>	Rowley, J.J.L., Le, D.T.T., Hoang, H.D., Cao, T.T. and Dau, V.Q.	Vietnam

<b><i>Kurixalus gracilloides</i></b>	Nguyen, T. V., Duongb, T. V., Luud, K. T. and Poyarkov, N. A.	Vietnam
<b><i>Micryletta dissimulans</i></b>	Suwannapoom, C., Nguyen, T. V., Pawangkhanant, P., Gorin, V. A., Chomdej, S., Che, J., & Poyarkov, N. A.	Thailand
<b><i>Tylototriton phukhaensis</i></b>	Pomchote, P., Khonsue, W., Thammachoti, P., Hernandez, A., Peerachidacho, P., Suwannapoom, C., Onishi, Y., & Nishikawa, K.	Thailand
<b><i>Microhyla tetrax</i></b>	Poyarkov, N.A., Pawangkhanant, P., Gorin, V.A., Juthong, W. & Suwannapoom, C.	Thailand
<b><i>Limnonectes phuyenensis</i></b>	Pham, C.T., Do, D.T., Le, M.D., Ngo, H.T., Nguyen, L.T., Ziegler, T. & Nguyen, T.Q.	Vietnam
<b><i>Leptobranchium lunatum</i></b>	Stuart, B.L., Som, H.E., Neang, T., Hoang, H.D., Le, D.T.T., Dau, V.Q., V.Q. Potter, K. & Rowley, J.J.L.	Cambodia & Vietnam
<b><i>Tylototriton pasmansii obsti</i></b>	Bernardes, M., Le, M.D., Nguyen, T.Q., Pham, C.T., Pham, A.V., Nguyen, T.T., Rödder, D., Bonkowski, M. & Ziegler, T.	Vietnam
<b><i>Tylototriton sparreboomi</i></b>	Bernardes, M., Le, M. D., Nguyen, T. Q., Pham, C. T., Pham, A. V., Nguyen, T. T., Rödder, D., Bonkowski, M., & Ziegler, T.	Vietnam
<b><i>Amolops putaoensis</i></b>	Gan, Y. L., Qin, T., Lwin, Y. H., Li, G. G., Quan, R. C., Liu, S., & Yu, G. H.	Myanmar
<b><i>Limnonectes fastigatus</i></b>	Stuart, B. L., Schoen, S. N., Nelson, E. E., Maher, H., Neang, T., Rowley, J. J., & McLeod, D. S.	Cambodia
<b><i>Leptobranchella neangi</i></b>	Stuart, B. L., & Rowley, J. J.	Cambodia
<b><i>Megophrys (Panophrys) frigida</i></b>	Tapley, B., Cutajar, T., Nguyen, L. T., Portway, C., Mahony, S., Nguyen, C. T., Harding, L., Luong, H. V. & Rowley, J. J.	Vietnam
<b><i>Pulchrana sundabarat</i></b>	Chan, K. O., Abraham, R. K., Grismer, L. L., & Brown, R. M.	Thailand

## REPTILES

<b><i>Hemiphyllodactylus bonkowski</i></b>	Nguyen, T. Q., DO QH, Ngo, H. T., Pham A, V., LE MD & Ziegler, T.	Vietnam
<b><i>Hemiphyllodactylus ngocsonensis</i></b>	Nguyen, T. Q., DO QH, Ngo, H. T., Pham A, V., LE MD & Ziegler, T.	Vietnam
<b><i>Goniurosaurus gezhi</i></b>	Zhu, X.Y., Chen, G.Y., Román-Palacios, C., Li, Z., He, Z.Q.	Vietnam
<b><i>Sinomicrurus peinani</i></b>	Liu, Q., Yan, J.-W., Hou, S.-B., Wang, P., Nguyen, S. N., Murphy, R. W., Che, J. and Guo, P.	Vietnam & China
<b><i>Sphenomorphus phuquocensis</i></b>	Grismer, L.L., Nazarov, R.A., Bobrov, V.V. and Poyarkov, N.A.	Vietnam
<b><i>Cyrtodactylus culaochamensis</i></b>	Van, T.N., Grismer, L.L., Thai, P.H., Wood, P.L.J.	Vietnam

<b>Hemiphyllodactylus nahangensis</b>	Pham, C. T., Phan, T. Q., Ziegler, T., & Nguyen, T. Q.	Vietnam
<b>Cyrtodactylus phumyensis</b>	Ostrowski, S., Do, D.T., Le, M.D., Ngo, H.T., Pham, C.T., Nguyen, T.Q., Nguyen, V.T.H. and Ziegler, T.	Vietnam
<b>Oligodon rostralis</b>	Nguyen H.N., Tran B.V., Nguyen L.H., Neang T., Yushchenko P.V., Poyarkov N.A.	Vietnam
<b>Acanthosaura prasina</b>	Ananjeva, N. B., Ermakov, O. A., Nguyen, S. N., Nguyen, T. T., Murphy, R. W., Lukonina, S. A., Orlov, N. L.	Vietnam
<b>Scincella baraensis</b>	Nguyen S.N., Nguyen V.D.H-, Nguyen L.T., Murphy R.W.	Vietnam
<b>Protobothrops kelomohy</b>	Sumontha, M., Vasaruchapong, T., Chomngam, N., Suntrarachun, S., Pawangkhanant, P., Sompan, W., Smits, T., Kunya, K., & Chanhomel, L.	Thailand
<b>Achalinus tranganensis</b>	Luu, V.Q., Ziegler, T., Van Ha, N., Van Lo, O., Hoang, T.T., Ngo H.T., Le, M.D., Tran D.H., Nguyen T.Q.	Vietnam
<b>Cyrtodactylus amphipetraeus</b>	Chomdej, S., Suwannapoom, C., Pawangkhanant, P., Pradit, W., Nazarov, R.A., Grismer, L.L. & Poyarkov, N.A.	Thailand
<b>Dixonius dulayaphitakorum</b>	Sumontha, M. & Pauwels, O.S.G.	Thailand
<b>Dixonius pawangkhananti</b>	Pauwels, O.S.G., Chomngam, N., Larsen, H. & Sumontha, M.	Thailand
<b>Cyrtodactylus maelanoi</b>	Grismer, L. L., Rujirawan, A., Termprayoon, K., Ampai, N., Yodthong, S., Wood, P. L. J., Oaks, J. R. & Aowphol, A.	Thailand
<b>Cnemaspis selenolagus</b>	Grismer, L.L., Yushchenko, P.V., Pawangkhanant, P., Nazarov, R.A., Naiduangchan, M., Suwannapoom, C. & Poyarkov, N.A.	Thailand
<b>Hemiphyllodactylus pardalis</b>	Grismer, L.L., Yushchenko, P.V., Pawangkhanant, P., Naiduangchan, M., Nazarov, R.A., Orlova, V.F., Suwannapoom, C. & Poyarkov, N.A.	Thailand
<b>Hemiphyllodactylus ngwelwini</b>	Grismer, L.L., Wood, P.L.J., Quah, E.S.H., Thura, M.K., Oaks, J.R. & Lin, A.	Myanmar
<b>Hemiphyllodactylus kyaiktiyoensis</b>	Grismer, L.L., Wood, P.L.J., Quah, E.S.H., Thura, M.K., Oaks, J.R. & Lin, A.	Myanmar
<b>Hemiphyllodactylus pinlaungensis</b>	Grismer, L.L., Wood, P.L.J., Quah, E.S.H., Thura, M.K., Oaks, J.R. & Lin, A.	Myanmar
<b>Hemiphyllodactylus zwegabinensis</b>	Grismer, L.L., Wood, P.L.J., Quah, E.S.H., Thura, M.K., Oaks, J.R. & Lin, A.	Myanmar
<b>Cyrtodactylus houaphanensis</b>	Schneider, N., Luu, V.Q., Sitthivong, S., Teynié, A., Le M.D., Nguyen, T.Q. & Ziegler, T.	Laos
<b>Cyrtodactylus ngoiensis</b>	Schneider, N., Luu, V.Q., Sitthivong, S., Teynié, A., Le M.D., Nguyen, T.Q. & Ziegler, T.	Laos
<b>Dixonius lao</b>	Nguyen, T.H., Sitthivong, S., Ngo, H.T., Luu, V.Q., Nguyen, T.Q., Le, M.D., Ziegler, T.	Laos

**Cyrtodactylus  
phnomchiensis**

Neang, T., Henson, A. & Stuart, B.L.

Cambodia

**Pareas geminatus**

Ding, L., Chen, Z., Suwannapoom, C., Nguyen, T.V., Poyarkov, N.A. & Vogel, G.

Golden Triangle (China, Thailand & Laos)

**Cnemaspis lineatubercularis**

Ampai, N., Jr, P., Stuart, B. L. & Aowphol, A.

Thailand

**Smithophis linearis**

Vogel, G., Chen, Z., Deepak, V., Gower, D. J., Shi, J., Ding, L., & Hou, M.

Myanmar & China

**Hemiphyllodactylus zaloncus**

Grismer, L. L., Thu Chit, M., Pawangkhanant, P., Nazarov, R. A., Zaw, T., & Poyarkov, N. A.

Myanmar

**Pareas victorianus**

Vogel, G., Nguyen, T. V., Zaw, T., & Poyarkov, N. A.

Myanmar

**Cyrtodactylus kohrongensis**

Grismer, L. L., Chan, K. O., Oaks, J. R., Neang, T., Sokun, L., Murdoch, M. L., Stuart, B. L. & Grismer, J. L.

Cambodia

**Calamaria dominici**

Ziegler, T., Tran, V. A., Babb, R. D., Jones, T. R., Moler, P. E., Van Devender, R. W., & Nguyen, T. Q.

Vietnam

**Achalinus zugorum**

Miller, A. H., Davis, H. R., Luong, A. M., Do, Q. H., Pham, C. T., Ziegler, T., Lee, J. L., de Queiroz, K., Reynolds, R. G. & Nguyen, T. Q.

Vietnam

# MAMMALS

**Trachypithecus popa**

Roos, C., Helgen, K. M., Miguez, R. P., Thant, N. M. L., Lwin, N., Lin, A. K., Lin, A., Yi, K. M., Soe, P., Hein, Z. M., Myint, M. N. N., Ahmed, T., Chetry, D., Urh, M., Veatch, E. G., Duncan, N., Kamminga, P., Chua, M. A. H., Yao, L., Mataushek, C., Meyer, D., Liu, Z., Li, M., Nadler, T., Fan, P., Queyet, L. K., Hofreiter, M., Zinner, D. & Momberg, F.

Myanmar



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