

**Species Account of Amphibians and Reptiles
in the Eastern Slope of Mt. Bulanjao Mountain Range,
Southern Palawan, the Philippines, with a New
Geographic Range for the Palawan Eastern
Frog *Alcalus mariae* (Inger, 1954)**

Jake Wilson B. Binaday^{1,2*}, Marvin Jay R. Sarmiento^{1,2}, Janice M. Tupas⁴,
Meljory D. Corvera^{1,2}, Erickson A. Tabayag⁴, Rommel M. Cruz^{3,4},
and Rainier I. Manalo^{1,2,4}

¹Marshland Documentation Services, Puerto Princesa City, Palawan 5300 the Philippines

²Crocodylus Porosus Philippines Incorporated, Kapalong, Davao del Norte 8113 the Philippines

³Wild Expeditions Palawan, Puerto Princesa City, Palawan 5300 the Philippines

⁴Birdwatch Palawan Ornithological Society, Inc.,
Puerto Princesa City, Palawan 5300 the Philippines

Accounts on the amphibians and reptiles in the eastern slope of Mt. Bulanjao Mountain Range, southern Palawan, the Philippines, are presented. Currently, no published account on the herpetofauna of this mountain range exists. With this, we provide an initial overview of the amphibians and reptiles present in Palawan Island's southernmost mountain range. A combination of visual encounter surveys along pre-established transect lines and opportunistic sampling were employed to assess the herpetofaunal diversity of the site. Voucher specimens were collected and photographs were taken for each collected species. Our sampling efforts resulted to a total of 21 species of herpetofauna recorded from the area. It is expected that more species will be documented as further surveys are conducted in other microhabitats within this mountain range. This study highlights the new geographic range and lower elevation limit for *Alcalus mariae*, which was previously recorded only in Mt. Mantalingahan Mountain Range extending the species' range further south.

Keywords: *Alcalus mariae*, amphibians, Bulanjao, new geographic range, Palawan, reptiles

INTRODUCTION

The Palawan Group of Islands has long been thought to have a faunal affinity with the Sunda Shelf Islands; however, recent phylogenetic studies showed that it might be more related to the oceanic regions of the Philippines and even Eurasia (Supsup *et al.* 2020). This resulted in a fauna unique to this region – the Palawan Faunal Region.

In addition, recent taxonomic revisions and new species discoveries as a result of the integration of phylogenetic analysis bring about an improved understanding of the amphibian and reptile diversity of Palawan [*e.g.* Brown *et al.* (2016), Barley *et al.* (2020), Lyu *et al.* (2021)].

Palawan's herpetological diversity has been documented since the 1800s (Everett 1889; Boulenger 1894). However, these old accounts primarily focused on species listings but have limited information on species distribution and

*Corresponding author: jwbinaday@gmail.com

ecology. Since then, limited published accounts focused on the herpetofauna of this region have been known (Diesmos *et al.* 2004; Schoppe and Cervancia 2009; Jose and Beijnen 2017; Supsup *et al.* 2020). Currently, there are a total of 26 amphibians and 70 reptiles documented in the Palawan Island Group (Diesmos and Palomar 2004; Supsup *et al.* 2020).

The Mt. Bulanjao Mountain Range is located at the southern end of mainland Palawan and is under the political boundaries of the Municipalities of Bataraza and Rizal. It reaches an elevation of 1036 meters above sea level (masl). It is primarily covered with primary-growth and secondary-growth forests in the mid and upper elevations (> 500 masl), and agricultural plantations at lower elevations. It serves as a watershed to the two municipalities and has a total of six major rivers. The surrounding forest grows on ultramafic soils, with concentrations of heavy metals like chromium and nickel (IAPAD 2010). Currently, the southeast section of the mountain is being mined for its nickel ores. This assessment was conducted as part of compliance documentation of the Rio Tuba Nickel Mining Corporation (RTNMC) which aimed to determine the flora and fauna within the Upper Mangingidong portion of Mt. Bulanjao under the jurisdiction *Brgy.* Rio Tuba, Municipality of Bataraza.

METHODOLOGY

The survey was conducted from 27–30 Sep 2021 in Upper Mangingidong, *Brgy.* Rio Tuba, Municipality of Bataraza, Palawan, the Philippines, within the amended Mineral Processing Sharing Agreement No. 114-98-IV-Amended I (8°35'16.37"N, 117°23'30.1"E) of RTNMC. The visual encounter method was used to document and assess the herpetofauna of the site while passing through two previously established transect lines by RTNMC. Visual encounter surveys were conducted between 0800–1000h and 1800–2100h. Moreover, opportunistic sampling was also done along riparian systems and ephemeral pools outside of the transect.

Transect 1 (176–447 masl) is characterized by secondary-growth vegetation with remnant patches of old-growth trees. Congregation of bamboo shoots was also observed in a few areas. Transect 2 (272–355 masl) was mostly primary-growth vegetation with several rivers and streams. Visual representations of these transects in maps of Mt. Bulanjao are shown in Figures I and II. Small open fields were present along the transect. In addition, there was one area along the transect that was dominated by Pandaceae. No major anthropogenic disturbances were observed along the two transects except for a few minimal-

impact man-made campsites from previous geological surveys conducted on the site.

Encountered species were documented *in situ via* photo documentation. Representative individuals of some species were collected as voucher specimens. They were placed in specimen bags and were fixed in a 10% solution of formaldehyde mixed with water and preserved in 90% ethanol (C₂H₅OH). Specimens were collected under the Wildlife Gratuitous Permit No. 2021-011 issued by the Palawan Council for Sustainable Development (PCSD). Species identification was primarily based on the following references: Inger (1954), Brown and Alcalá (1978, 1980), and Weinell *et al.* (2019). Voucher specimens were deposited at the National Museum of the Philippines (Accession No. PNM-Herps 2022-01). Photo vouchers of most of the species encountered were deposited and cataloged at the National University of Singapore–Lee Kong Chian Museum of Natural History's digital archive (catalog numbers are presented in the figures under species accounts).

RESULTS

The herpetofaunal survey resulted in the encounter of 21 herpetofauna species (six frogs, eight lizards, and seven snakes), belonging to 18 genera, representing 13 families. The conservation status and endemism of these species are indicated in Table I. This study also highlights the new geographic range record of the endangered *Alcalus mariaae*.

Annotated Species List

Anurans

Bufonidae

Ingerophrynus philippinicus (Boulenger, 1887)

This toad is a common species in lowland habitats, including degraded and man-made environments. It is an endemic toad in Palawan and can easily be distinguished from the introduced *Rhinella marina* with its prominent cranial crest (Inger 1954). The advertisement call of this species is conspicuously heard within residential areas. A few individuals were encountered and several calls were heard around Transect 1.

Ceratrobatrachidae

Alcalus mariaae (Inger, 1954)

The Palawan Eastern Frog is previously known only to occur in the southern slope of Mt. Balabag, Mantalingahan Mountain Range (Diesmos *et al.* 2015) inhabiting streams and rivers within sub-montane and montane forest at an elevation of 500–900 masl. The encounter of this species at c.a. 230 masl of Mt. Bulanjao Mountain Range extends

its geographical range further south of Palawan. This also redefines the known lower elevation limit for the species at 500 masl (IUCN SSC Amphibian Specialist Group 2020a). The Mt. Bulanjao Mountain Range and Mt. Mantalingahan Mountain Range are separated by c.a. 10km of lowland agricultural and residential areas. A paved highway connecting the southwestern and southeastern municipalities also acts as a boundary between the two populations. One individual was encountered perched on a rock along the river bank at night along the path between transects one and two.

Dicroglossidae

Limnonectes acanthi (Taylor, 1923)

This fanged frog species is endemic to the Palawan Group of Islands and has been encountered in elevations of 0–800 masl. It is a common species (Schoppe and Cervancia 2009; Alcalá *et al.* 2012) inhabiting streams, rivers, pools, marshlands, as well as mangrove-forested areas (Dangan-Galon *et al.* 2015). They are also adaptable to disturbed wetlands as long as a natural habitat is present nearby. Like its congener, this species lays its eggs on vegetation and rocks above water pools beside rivers and streams. An individual was observed submerged underwater on a stream near Transect 1. Another individual was encountered on a leaf litter by the river bank in Transect 2.

Megophryidae

Pelobatrachus ligayae (Taylor, 1920)

It inhabits forest floor leaf litter in montane and lowland rainforests, secondary growth forests, and slow-flowing streams at an elevation of 0–1,400 masl (Diesmos *et al.* 2014; IUCN SSC Amphibian Specialist Group 2020b). We have encountered several individuals often in forest floor leaf litter and rivers perched on rocks day and night.

Ranidae

Staurois nubilus (Mocquard, 1890)

The species is a Palawan endemic (Arifin *et al.* 2011) and is usually encountered perched on rocks and boulders along rivers and streams between 0–500 masl (Diesmos and Brown 2011). It is usually active during the day and can sometimes be encountered waving its hind limbs as a form of communication. Tadpoles of this species usually inhabit fast-flowing water (IUCN SSC Amphibian Specialist Group 2020c). Several individuals were encountered in rivers and streams in Transect 2; however, they were more abundant in a man-made dam near Transect 1.

Rhacophoridae

Philautus longicrus (Boulenger, 1894)

One of the two species of *Philautus* in Palawan, it is

known to be forest-dependent (Supsup *et al.* 2020) and occurs in lowland and montane forests between 90–2,900 masl (Diesmos and Brown 2011; IUCN SSC Amphibian Specialist Group 2019). This was the most abundant anuran species during our survey heard calling starting at an elevation of 200 masl. They are conspicuous in terms of auditory presence, but their small size and positioning in the undergrowth vegetation make it hard to spot individuals.

Reptiles

Lizards

Agamidae

Bronchocela cristatella (Kuhl, 1820)

This native species seems to be widespread throughout the country (Hallermann 2005). However, there are some discussions about the existence of both this species and its closely related species *Bronchocela marmorata* on the island of Luzon (McLeod *et al.* 2011), as well as the likelihood of a separate population in Mindanao (Sanguila *et al.* 2016). They are usually encountered in secondary-growth forests and agricultural lands adjacent to forests (Venturina *et al.* 2020). An individual was encountered in Transect 2 sleeping on a branch of a shrub approximately 2 m above the ground. Our individual fits the diagnosis of *Bronchocela cristatella* (Hallermann 2005).

Draco palawanensis McGuire & Alcalá, 2000

This species of flying lizard is a Palawan endemic, although the existence of the species in the Calamianes Group of Islands and the Balabac Group of Islands is yet to be confirmed but is likely to be possible (Brown *et al.* 2019). The species is common in lowland habitats from 0–350 masl, particularly in coconut plantations with undergrowth vegetation (Brown *et al.* 2019). We have encountered a few individuals of this species in Transect 1 gliding between trees.

Gekkonidae

Cyrtodactylus cf. *tautbatorum* Welton, Siler, Diesmos & Brown, 2009

Gecko species under this genus are characterized by their bent toes. Both *Cyrtodactylus redimiculus* and *Cyrtodactylus tautbatorum* are known to occur on the island of Palawan. We referred to the latter species for the individuals that we have encountered as to their similarity in morphology to its phenotypic congener *Cyrtodactylus annulatus* (Welton *et al.* 2009). Four individuals were observed in Transect 2, most commonly near the river edge. However, no individuals were photographed nor collected as each escaped immediately upon approach.

***Gekko gekko* (Linnaeus, 1758)**

This widespread native gecko species has only been recorded in the northernmost island group in the Philippines (Oliveros *et al.* 2011). It is particularly common in rural residential areas adjacent to forest and agricultural habitats (Lwin *et al.* 2019). Individuals have been encountered around the buildings surrounding the dam, while calls were heard in Transect 1.

***Gekko monarchus* (Schlegel, 1836)**

The Palawan population of this widespread Southeast Asian species has been closely associated with pristine forests (Supsup *et al.* 2020). They inhabit a wide variety of microhabitats from forest floor in leaf litter or rotting logs, in living trees and epiphytes, as well as caves and rock crevices (Bauer and Branch 2004; Das 2010). One individual was observed crawling beside the creek near the dam at night.

Scincidae

***Eutropis cf. multifasciata* (Kuhl, 1820)**

It is a widespread species of skink in Southeast Asia and can adapt to different degrees of habitat disturbance (Grismer 2011). It is diurnal and is usually encountered crawling along leaf litter in hunt for food. We have identified this individual as *Eutropis multifasciata* based on its large body size, as compared to its smaller congener *Eutropis sahulinghanganan*. One individual of this species was crawling around the dam during the day. However, the individual was not photographed nor collected as it escaped immediately upon approach.

***Eutropis sahulinghanganan* Barley, Diesmos, Siler, Martinez & Brown, 2020**

Previously, the Palawan population of this species was referred to as *Eutropis indeprensa* (Brown and Alcalá 1980). However, recent taxonomic works of Barley *et al.* (2020) showed that the Palawan population is distinct from *Eutropis indeprensa*, similar to other congeners of this species complex. This species inhabits mangrove forests, primary and secondary-growth forests, reaching elevations of up to 1500 masl (Dangan-Galon *et al.* 2015; Barley *et al.* 2020). During a day survey in Transect 1, we came across several individuals of this species crawling on leaf litter.

***Lamprolepis smaragdina philippinica* Mertens, 1928**

A commonly encountered skink in the country, they usually inhabit lowland agricultural and coastal habitats (Brown and Alcalá 1980). It is an arboreal skink that is usually encountered during the day in coconut plantations (McLeod *et al.* 2011). Individuals of this species were found inhabiting trees in close proximity to the dam.

Snakes

Colubridae

***Ahaetulla prasina prasina* (Reinwardt in F. Boie, 1827)**

This subspecies of *Ahaetulla prasina* is distributed in the Palawan Island Group in the Philippines (Leviton *et al.* 2018). It is active during the day and is usually encountered at night resting in branches in forest habitats (Brown *et al.* 2013). One adult was encountered during the night survey along Transect 1, perched on a branch.

***Dendrelaphis cf. levitoni* Van Rooijen & Vogel, 2012**

This species is confined within the Palawan Group of Islands (Leviton *et al.* 2018). It can easily be distinguished from its sympatric congener *Dendrelaphis marenae* by the presence of black longitudinal stripes along the entire length of its body (Weinell *et al.* 2019). We have encountered one *Dendrelaphis* perched on a branch at night in Transect 1, which we referred to as this species. The individual was not caught nor photographed as it escaped, but it was identified based on the presence of several black longitudinal stripes.

***Dendrelaphis cf. marenae* Vogel & van Rooijen, 2008**

The most widespread *Dendrelaphis* species in the country (Leviton *et al.* 2018), this species is readily identifiable among its congeners by its prominent enlarged vertebral scales (Weinell *et al.* 2019). It has been encountered to an elevation of up to 1000 masl. This arboreal species is active during the day and inhabits a wide range of habitats with varying levels of disturbance (Gillespie *et al.* 2021). Another individual of *Dendrelaphis* was encountered perched on a tree sapling in Transect 2 at night. Though the individual escaped before it was caught, it has been photographed. We referred the individual to this species with the absence of black longitudinal stripes across its body.

***Lycodon philippinus* Griffin, 1909**

Formerly classified under the genus *Dryocalamus*, this species is only found on the island of Palawan in the Philippines. There is still a taxonomic debate about whether this species is the same as *Lycodon tristrigatus* (Leviton *et al.* 2018). We recorded this species on Mt. Bulanjao during the day, where it was actively crawling near along the streambank. We have also encountered two other individuals in different locations on the island of Palawan: one individual was crawling on the ground, while the other was resting on seagrass during low tide near a river estuary (MJRS and RMC observation).

Pareidae

Aplopletura boa (Boie, 1828)

This species of arboreal snake inhabits pristine forests from sea level to around 1500 masl, where they are usually encountered perched on forest vegetation (Grismer *et al.* 2012). David and Vogel (1996) consider this species to be rarely encountered, whereas it has been documented frequently by some after rain when slugs and snails (its preferred prey item) are active. This species is known to occur in Luzon (Sy and Binaday 2016), Balabac, Basilan, Bohol, Mindanao, Palawan, and Samar (Taylor 1922; Grismer *et al.* 2012). One individual was observed in Transect 2 within a *Pandanus*-dominated vegetation actively hunting at night. It is to be noted that a downpour occurred in the afternoon the day it was encountered.

Pseudaspidae

Psammodynastes pulverulentus (Boie, 1827)

It is a widely distributed snake in the Philippines (Leviton *et al.* 2018) and inhabits pristine forests tolerating low levels of disturbance (Brown *et al.* 2012). It has been encountered in high numbers in a forest edge surrounding a lake in Luzon (Binaday *et al.* 2017). We observed a single individual in Transect 1 during the day probably searching for prey items.

Viperidae

Trimeresurus schultzei (Griffin, 1909)

This is a Palawan endemic pit viper (Leviton *et al.* 2018), where it has been encountered in forest habitats ranging from primary growth to degraded secondary growth forests of elevations up to 700 masl (Brown *et al.* 2009). One individual was encountered in Transect 1 perched on a dead branch not more than 1 ft above the ground.

DISCUSSION

This paper presents the first published account of the amphibians and reptiles present in the southernmost mountain range of mainland Palawan. Despite the limited survey time (4 d) and sampling effort (only within certain microhabitats and elevation ranges), a total of six amphibians and 15 reptiles were recorded in the study site, where 12 species are restricted to the Palawan Faunal Region. This might be due to the fact that these sites are located in low-elevation areas, where there is typically high diversity of reptiles and amphibians. In comparison, a well-surveyed mountain range in central Palawan recorded 41 species of amphibians and reptiles (Supsup *et al.* 2020). Further north, Schoppe and Cervancia (2009) recorded 43 species in the Pagdanan Mountain

Range and Dumarán Island. The study site had a mix of forest-dependent species such as *Trimeresurus schultzei*, *Philautus longicrus*, *Bronchocela cristatella*, and *A. boa*, as well as habitat generalist species like *Ingerophrynus philippinicus*, *Staurois nubilus*, *Pelobatrachus ligayae*, *Polypedates leucomystax*, and *Dendrelaphis marenae*. Notably, common stream frogs found in other riparian habitats within Palawan like *Sanguirana sanguinea* and *Pulchrana moellendorffi* were not observed during the survey, possibly due to limited survey efforts in the streams. Among the frequently encountered species in the site were *Staurois nubilus*, *Philautus longicrus*, and *Pelobatrachus ligayae*. It is worth noting that *Philautus longicrus* is present in our study site. It was not documented by Schoppe and Cervancia (2009) in the Pagdanan Range in the northern part of the island province but has been recorded in Cleopatra's Needle to the south, as well as in the vicinity of Dumarán and Taytay municipalities to the northeast (IUCN SSC Amphibian Specialist Group 2019). This species is quite common during surveys in the southern mountain ranges, including the Mt. Victoria-Anepahan Mountain Range and Mt. Mantalingajan Mountain Range.

The species account includes four species that require taxonomic confirmation because they were not captured. Though, they were observed to have morphological similarity to the species suggested in this paper, so "cf." is used as a caution. This species list will greatly increase as more extensive surveys are conducted in additional microhabitats such as nearby agricultural plantations. Additional records of species with specialized microhabitat preferences if additional sampling methods are employed (*e.g.* pitfall traps). This study, though limited only in terms of sampling effort, provides an initial list of the herpetofauna that could be found in the southernmost mountain range of the island of Palawan.

This study also highlights the presence of the endangered Palawan eastern frog (*Alcalus mariae*) in Mt. Bulanjao Mountain Range. This confirms the impression that this species might be distributed more widely which was only recorded so far in Mt. Balabag within Mt. Mantalingahan Mountain Range (IUCN SSC Amphibian Specialist Group 2020a), which is c.a. 35 km from our study site. The two mountain ranges are part of the Palawan Ophiolite, which is a 320-km dismembered ophiolitic terrane stretching from central to southern Palawan, which formed during the Cretaceous Period (MMAJ-JICA 1988). Both Mt. Balabag and the area in Mt. Bulanjao where *Alcalus mariae* was encountered were part of the Beaufort Ultramafic Complex of the Palawan Ophiolite. Furthermore, the two mountain ranges are currently separated by agricultural lands, residential areas, and a paved highway (Figures XVIII and XIX), which may act as a potential barrier to

the gene flow between the two populations. It would be interesting to know if the species were likely to occur in lower elevations, as long as there is a suitable habitat available (*i.e.* streams with rocks and boulders surrounded by pristine forests), as observed here in Mt. Bulanjao. In fact, we believe it may actually have occurred before in lower elevations, but due to habitat degradation as a result of anthropogenic activities, the species is now limited to undisturbed habitats in higher elevations. With this, we recommend the conduct of further surveys in Mt. Bulanjao Mountain Range, as well as other riparian systems of Mt. Mantalingahan Mountain Range to know the extent of the species' occurrence.

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APPENDICES

Table I. Amphibians and reptiles encountered in the eastern slope of Mt. Bulanjao mountain range, Palawan, the Philippines.

Taxon	IUCN status (2022)	Endemicity	Digital catalog no.
Amphibia			
<u>Bufonidae</u>			
<i>Ingerophrynus philippinicus</i> (Boulenger, 1887)	Least concern	Palawan endemic	ZRC(IMG) 1.256
<u>Ceratrobatrachidae</u>			
<i>Alcalus mariae</i> (Inger, 1954)* ⁺	Endangered	Palawan endemic	ZRC(IMG) 1.255
<u>Dicroglossidae</u>			
<i>Limnectes acanthi</i> (Taylor, 1923)	Near threatened	Palawan endemic	ZRC(IMG) 1.257
<u>Megophryidae</u>			
<i>Pelobatrachus ligayae</i> (Taylor, 1920)*	Near threatened	Palawan endemic	ZRC(IMG) 1.258
<u>Ranidae</u>			
<i>Staurois nubilus</i> (Mocquard, 1890)	Near threatened	Palawan endemic	ZRC(IMG) 1.260
<u>Rhacophoridae</u>			
<i>Philautus longicrus</i> (Boulenger, 1894)*	Vulnerable	Native	ZRC(IMG) 1.259
Reptilia (lizards)			
<u>Agamidae</u>			
<i>Bronchocela cristatella</i> (Kuhl, 1820)*	Least concern	Native	ZRC(IMG) 2.586
<i>Draco palawanensis</i> McGuire & Alcala, 2000	Least concern	Palawan endemic	ZRC(IMG) 2.588
<u>Gekkonidae</u>			
<i>Cyrtodactylus cf. tautbatorum</i> Welton, Siler, Diesmos & Brown, 2009	Not listed	Palawan endemic	–
<i>Gekko gecko</i> (Linnaeus, 1758)	Least concern	Native	–
<i>Gekko monarchus</i> (Schlegel, 1836)*	Least concern	Native	–
<u>Scincidae</u>			
<i>Eutropis cf. multifasciata</i> (Kuhl, 1820)	Least concern	Native	–
<i>Eutropis sahulinghanganan</i> Barley, Diesmos, Siler, Martinez & Brown, 2020	Not listed	Palawan endemic	ZRC(IMG) 2.589
<i>Lamprolepis smaragdina philippinica</i> Mertens, 1928	Least concern	Philippine endemic subspecies	–
Reptilia (snakes)			
<u>Colubridae</u>			
<i>Ahaetulla prasina prasina</i> (Reinwardt in F. Boie, 1827)*	Least concern	Native	ZRC(IMG) 2.584
<i>Dendrelaphis cf. levitoni</i> Van Rooijen & Vogel, 2012	Not listed	Palawan endemic	–
<i>Dendrelaphis cf. marenae</i> Vogel & Van Rooijen, 2008	Least concern	Native	ZRC(IMG) 2.587
<i>Lycodon philippinus</i> Griffin, 1909	Data deficient	Palawan endemic	ZRC(IMG) 2.591
<u>Pareidae</u>			
<i>Aplopletura boa</i> (Boie, 1828)*	Least concern	Native	ZRC(IMG) 2.585
<u>Pseudaspidae</u>			
<i>Psammodynastes pulverulentus</i> (Boie, 1827)	Least concern	Native	ZRC(IMG) 2.590
<u>Viperidae</u>			
<i>Trimeresurus schultzei</i> (Griffin, 1909)*	Least concern	Palawan endemic	ZRC(IMG) 2.592

[*] Voucher specimens collected (accession no. PNM-Herps 2022-01)

[⁺] New species geographic range

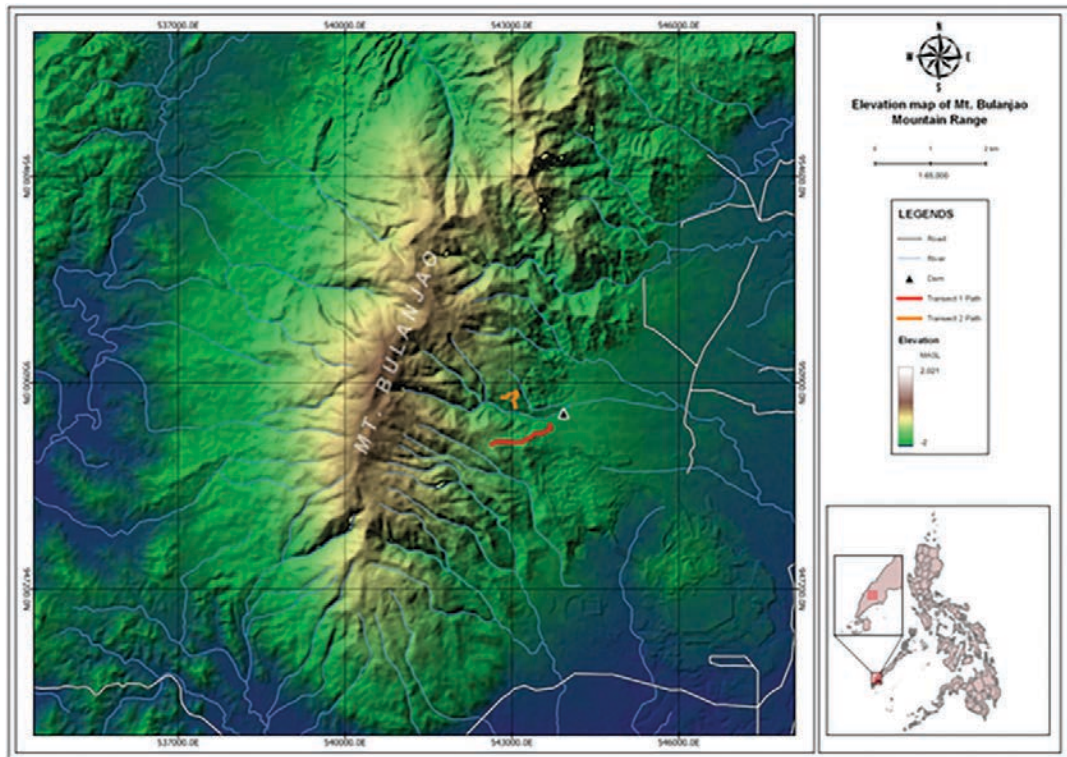


Figure I. Elevation map of Mt. Bulanjao mountain range showing river systems and transect paths surveyed.

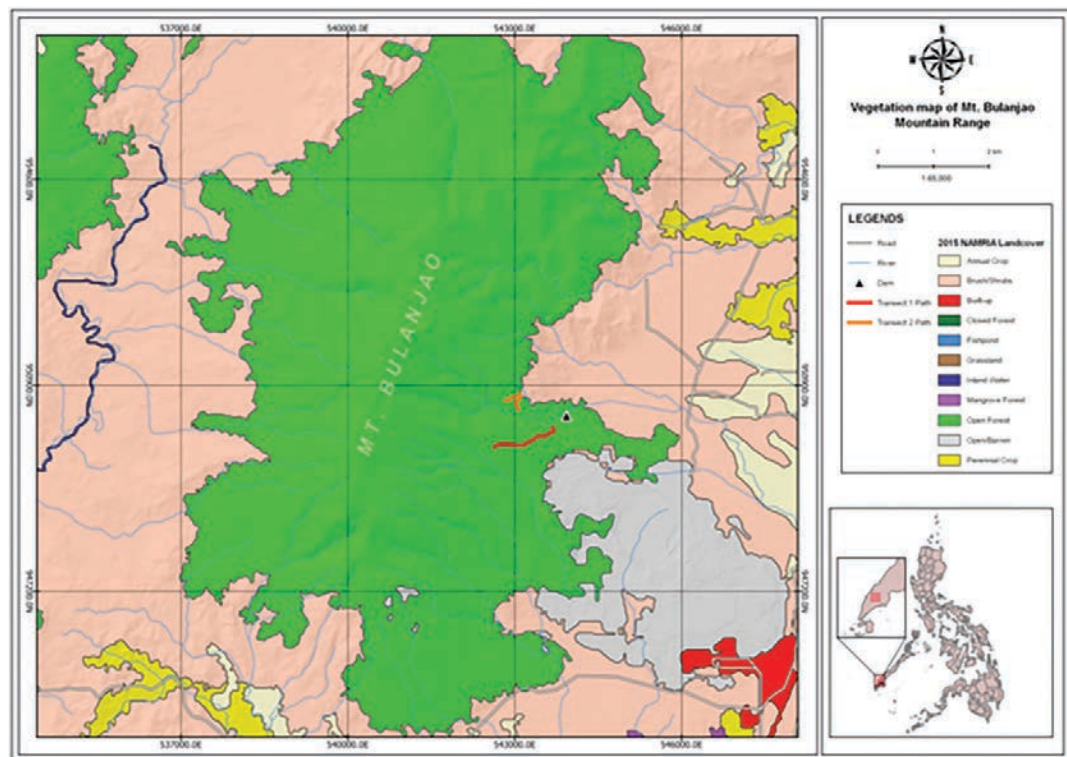


Figure II. Vegetation map of Mt. Bulanjao mountain range showing river systems and transect paths surveyed.



Figure III. *Ingerophrynus philippinicus* (ZRC [IMG] 1.256) at Transect 1. Photo by JWBB.



Figure IV. *Alcalus mariae* (ZRC [IMG] 1.255) encountered along the river between Transects 1 and 2 at c.a 230 masl. Photo by JWBB.



Figure V. *Limnonectes acanthi* (ZRC [IMG] 1.257) on leaf litter at Transect 2. Photo by JWBB.



Figure VI. *Pelobatrachus ligayae* (ZRC [IMG] 1.258) at Transect 1. Photo by JWBB.



Figure VII. *Staurois nubilus* (ZRC [IMG] 1.260) at the dam. Photo by JWBB.



Figure VIII. *Philautus longicrus* (ZRC [IMG] 1.259) at Transect 1. Photo by JWBB.



Figure IX. *Bronchocela cristatella* (ZRC [IMG] 2.586) at Transect 2. Photo by JWBB.



Figure X. *Draco palawanensis* (ZRC [IMG] 2.588) at Transect 1. Photo by JWBB.



Figure XI. *Eutropis sahulinghanganan* (ZRC [IMG] 2.589) at Transect 1. Photo by JWBB.



Figure XII. *Ahaetulla prasina prasina* (ZRC [IMG] 2.584) at Transect 1. Photo by JWBB.



Figure XIII. *Dendrelaphis cf. marenae* (ZRC [IMG] 2.587) at Transect 2. Photo by JWBB.



Figure XIV. *Lycodon philippinus* (ZRC [IMG] 2.591) at Transect 1. Photo by JWBB.



Figure XV. *Aplopeltura boa* (ZRC [IMG] 2.585) from Transect 2. Photo by JWBB.



Figure XVI. *Psammodynastes pulverulentus* (ZRC [IMG] 2.590) at Transect 1. Photo by RMC.



Figure XVII. *Trimeresurus schultzei* (ZRC [IMG] 2.592) at Transect 1. Photo by JWBB.

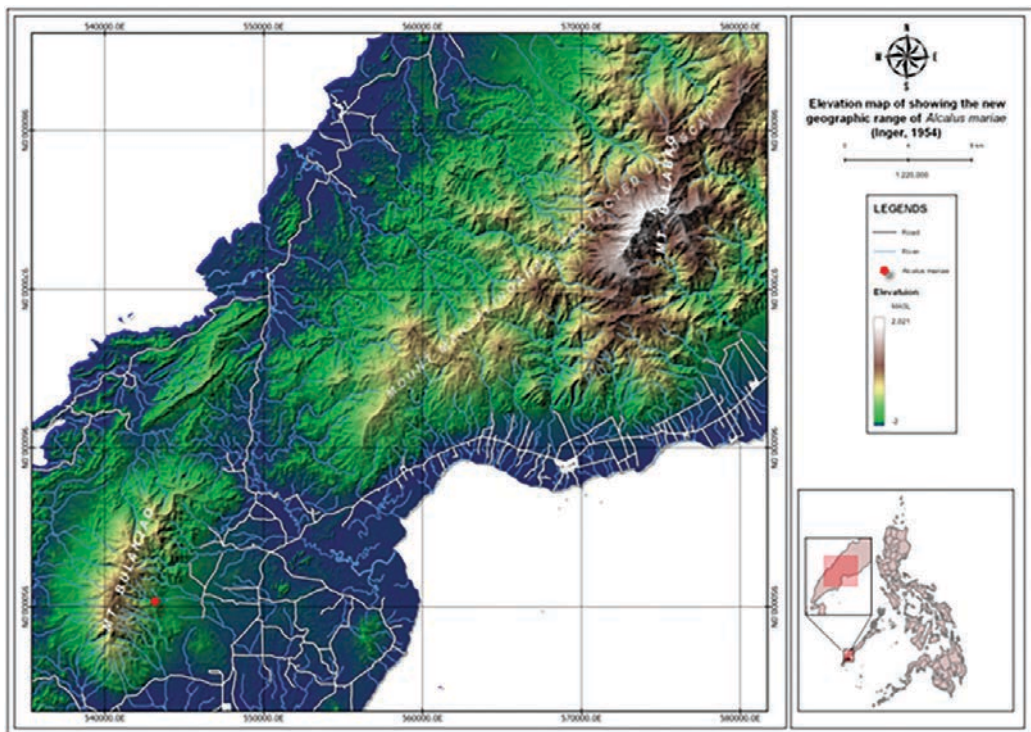


Figure XVIII. Elevation map showing the new geographic range of *Alcalus mariae* (Inger, 1954) in reference to Mt. Balabag within Mt. Mantalingahan mountain range, where the species is currently known to occur.

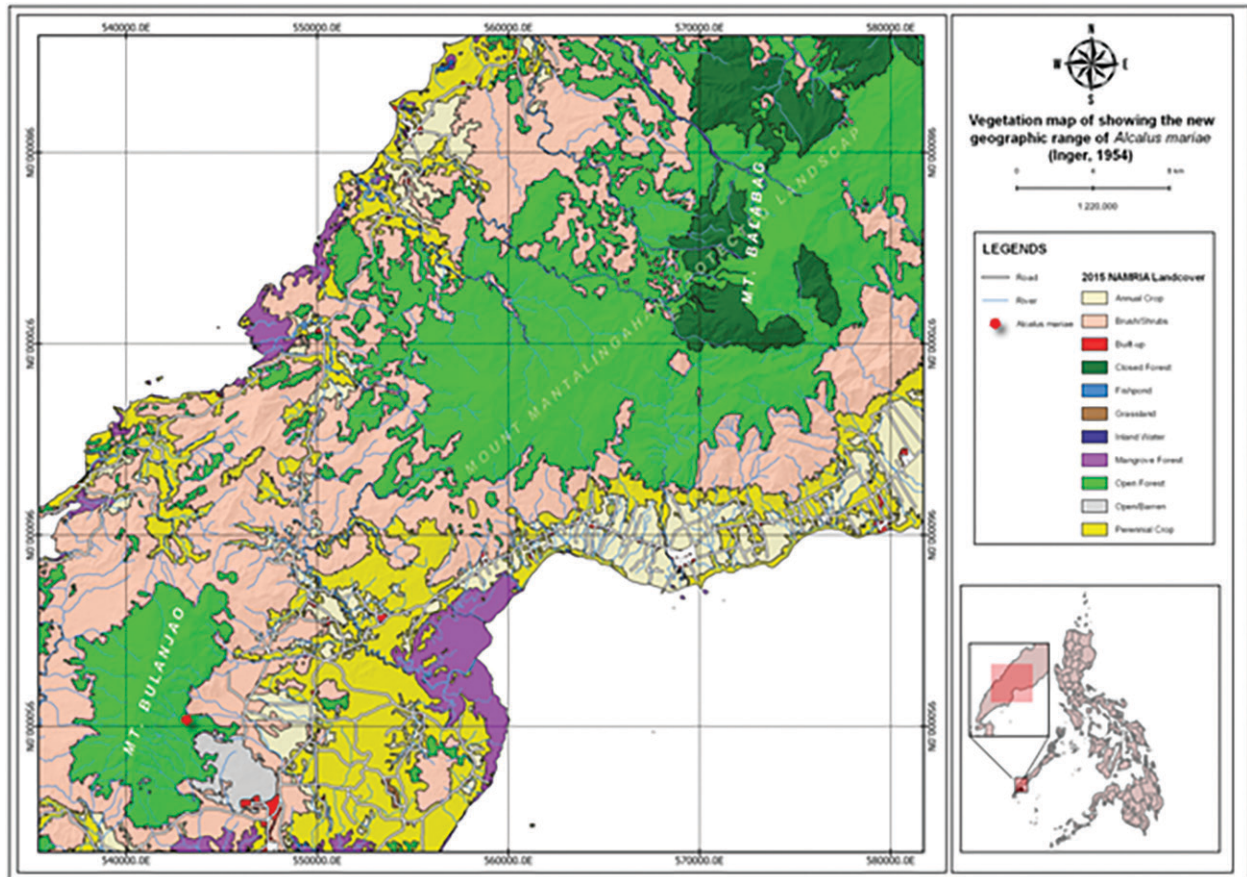


Figure XIX. Vegetation map showing the new geographic range of *Alcaeus mariae* (Inger, 1954) in reference to Mt. Balabag within Mt. Mantalingahan mountain range, where the species is currently known to occur.