

First Distribution Record of North Philippine Temple Pitviper (*Tropidolaemus subannulatus* Gray, 1842) on Cebu Island, Philippines

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This paper presents the newly documented single specimen of the North Philippine temple pitviper (*Tropidolaemus subannulatus*), one of the venomous endemic snakes of the Philippines. The species has never been recorded in Cebu Island in the last two waves of survey in 1986 and 2016. The new record for Cebu Island on 13 Apr 2018 was a male juvenile *T. subannulatus* in a diverse forest over limestone in Mount Lantoy key biodiversity area (KBA), with an elevation of 648 m having geographic coordinates of 9.91395°N and 123.51207°E in Barangay Cansuje, Argao, Cebu, Philippines. The specimen was recorded in the permanent vegetation plot no. 1, established within the secondary natural forest, perching on the vines (*Piper sp.*). Some tree species found within the collection area were the following: *Garcinia rubra*, *Ficus ampelas*, *Canarium asperum*, *Calophyllum blancoi*, *Gomphandra luzoniensis*, and *Goniothalamus almeri*. The distance of occurrence from the ground is approximately 3 m. It seemed that the microhabitat characteristics of Mt. Lantoy KBA, particularly the forest over limestone in Barangay Cansuje, is favoring the survival of *T. subannulatus*.

Keywords: Central Visayas, herpetofauna of Cebu, key biodiversity areas, limestone forest, Mount Lantoy, permanent plots

The Philippines is one of the most important centers of amphibian and reptile diversity in Southeast Asia (Alcala 1986; Diesmos *et al.* 2014). Among the 114 amphibian and 361 reptile species, 86% and 68% are respectively endemic to the country (Diesmos *et al.* 2015; Uetz *et al.* 2018). Cebu island is situated in Central Visayas and is one of the most denuded islands in the region and even in

Asia (Rabor 1959). Several forest species recorded in the late 1950s by Rabor (1959) are now considered extinct at the local level.

There is a dearth of information on herpetofauna distribution and ecology in Cebu island (Supsup *et al.* 2016). In fact, thus far, there are only two published articles on Cebu's amphibians and reptiles to date. The

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first one was the pioneering work of Brown and Alcalá (1986) recording 58 species and, secondly, the most recent work of Supsup *et al.* (2016) documenting 13 amphibians and 63 reptiles. These two previous expeditions did not record the presence of *T. subannulatus*.

Mount Lantoy in Argao, was one of the five study sites during the herpetofaunal survey conducted by Supsup *et al.* (2012) in Cebu. The documented herpetofauna were as follows: *Platymantis dorsalis*, *Draco spilopterus*, *Brachymeles taylori*, *Parvosцинus steerei*, and *Ahaetulla prasina preocularis* (Supsup *et al.* 2016). The current study presents the first distribution record of *T. subannulatus* in Cebu island, particularly in one of our sampling sites in Mount Lantoy KBA – in Cansuje, Argao, Cebu.

The study area was established in four KBAs in Cebu province, Mount Lantoy, Nug-as forest, and Mount Lanaya in southern Cebu, and Mount Capayas in the northeastern part of Cebu. Mount Lantoy KBA (Figure 1) is at 100–800 masl. The KBA cuts across 14 barangays – including Barangays Tabayag, Catang, Usmad, Conalum, and Cansuje – within the vicinities of Mt. Lantoy forest, the epicenter of Mt. Lantoy KBAs.

The permanent plots (20 m x 100 m) (Lillo *et al.* 2019) were used as the basis or reference for the standard strip transect similar to those used by Supsup *et al.* (2016) in

surveying herpetofauna population. Nine transects were established inside and outside the permanent plots of three KBAs (Figure 2). The study of Vogel *et al.* (2007) was used as a reference in the specimen identification.

We documented a male juvenile species of snake (*Viperidae*) on 13 Apr 2018 in the secondary-mixed forest of Cansuje in the transect established within the permanent plot no.1 (628 masl). The specimen was perching on the vines (*Piper* sp. and associated flora). This new specimen has a body length of 312 mm, tail length of 82 mm, and total length of 394 mm and a weight of 132 g. Morphological comparisons of the specimen's characteristics with those described by Vogel *et al.* (2007) showed that it is a juvenile male *T. subannulatus* Gray, 1842 (Figure 3). The specimen had a green background color with red and white variable postocular stripe. The belly had uniform red dots and scales were prominent on the head. The chin was keeled. The upper labial scale (3rd) was separated by one scale from the sub-ocular one. It has 21 mid-dorsal scales, 20 upper labial (including second layer), and 18 lower labial scales (including the second layer). The ratio of tail length to total length was measured 0.208. The aforementioned specimen description conformed with the observations of Vogel *et al.* (2007) in his account of the morphology of *T. subannulatus*. The newly documented species was found to be the North Philippine temple pit viper, which belongs

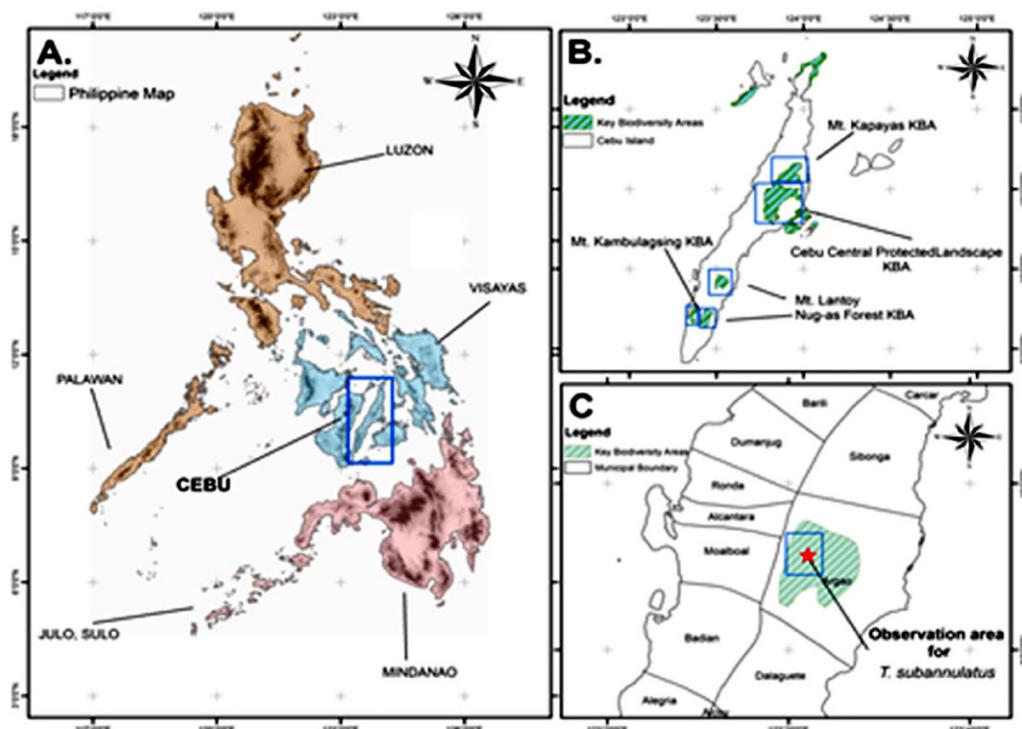


Figure 1. (A) Map of the Philippines showing Cebu Island. (B) Maps showing the five major KBAs of Cebu Island, four of which served as sampling sites: Mt. Kapayas, Mt. Lanaya, Nug-as forest, and Mt. Lantoy (9°54'N, 123°32'E). (C) Map showing Barangay Cansuje (9.91358°N, 123.51128°E), Argao, Cebu – the collection site of the specimen.

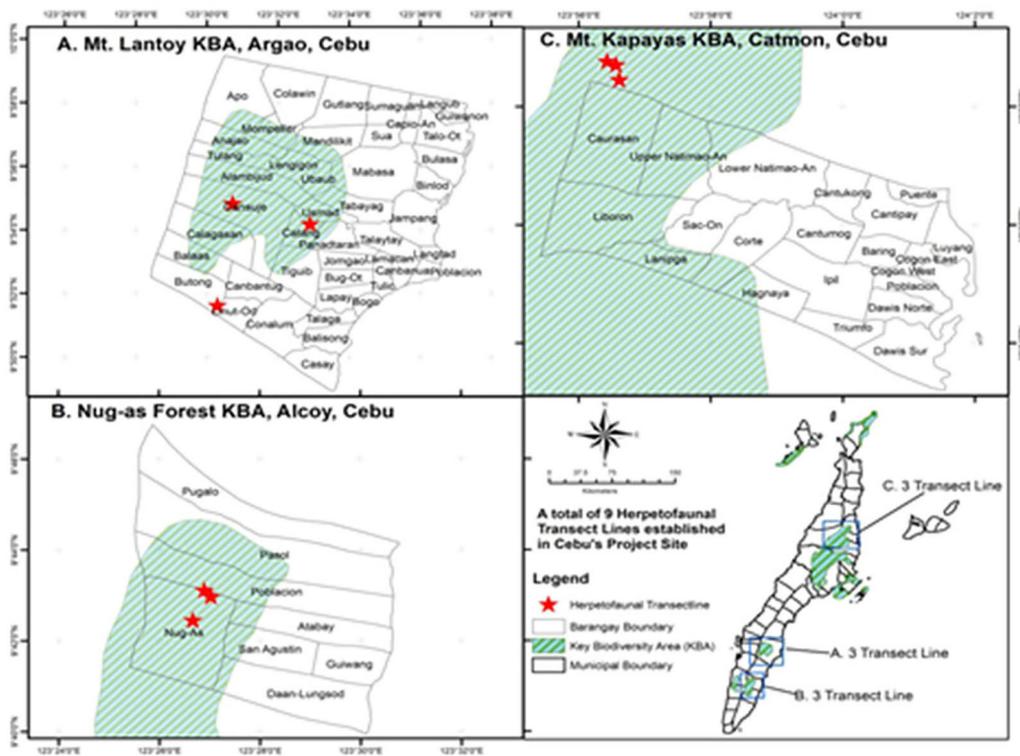


Figure 2. The location of nine herpetofaunal transect lines (red stars) in three KBAs of Cebu Island showing (A) the transect lines located in Mt. Lantoy, (B) Nug-as forest, and (C) Mt. Kapayas (GIS generated map; Landsat 8; www.earthexplorer.usgs.ph; NAMRIA; Phil. GIS data).



Figure 3. Field photographs of *Tropidolaemus subannulatus*: (A) dorso-lateral view; (B) ventral view; (C) portion of the head showing elaborate morphology.

to the order Squamata (locally called “dupong”). It is one of the most venomous snakes endemic to the Philippines (Vogel et al. 2007).

Barangay Cansuje in Argao, Cebu was the locality where the *T. subannulatus* was first documented on 13–24 Apr 2018. The habitat was comprised of an extensive forest cover (ca. 912 ha), the largest among the areas comprising the Cebu KBA. The extensive forest growth is a mixed plantation and secondary natural forests at an elevational range of 500–800 masl. Some dominant vegetation observed associated with the vines serving as perching branch for the viper approximately 3 m from the ground

– including *Garcinia rubra*, *Polyscias aherniana*, *Ficus ampelas*, *Palaquium foxworthyi*, *Canarium asperum*, *Gomphandra luzoniensis*, *Goniotalamus almeri*, and *Suregada glomerulata*.

In the same plot where *T. subannulatus* was spotted, the following common big trees were very dominant and prominent: *Elaeocarpus cumingii*, *Palaquium obovatum*, *Syzygium lineatum*, *Heritiera sylvatica*, *Cinnamomum cebuense*, *Calophyllum blancoi*, and *Diospyros pilosanthera*. The diameter of all big trees measured within the plots ranged from 6–28 cm while the canopy height and canopy cover ranged from 2–7

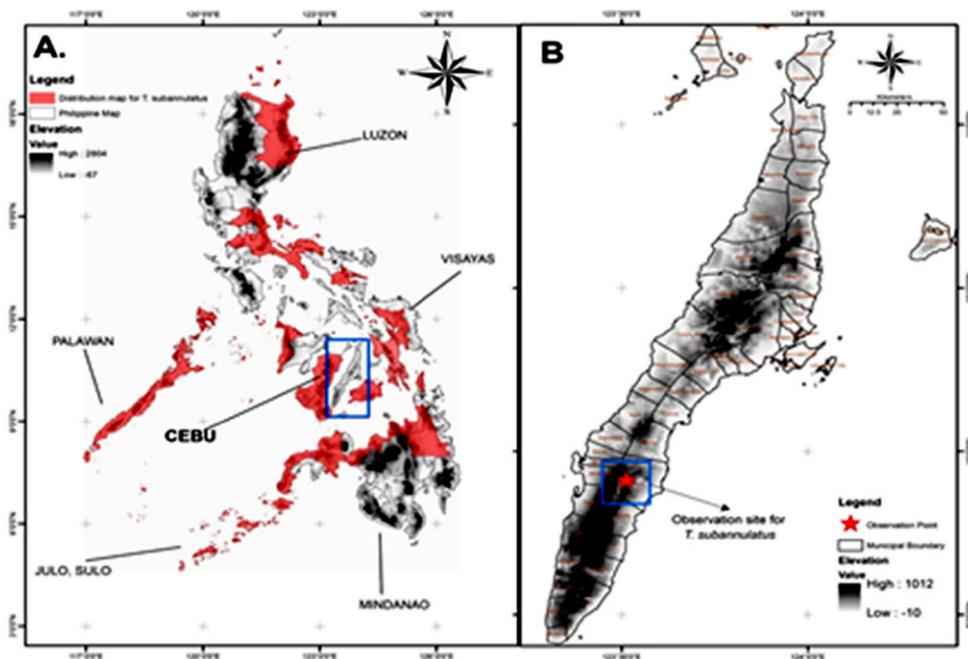


Figure 4. (A) Philippine map showing the distribution of the viper in the country. (B) Map showing Barangay Cansuje (9.91358°N; 123.51128°E), Argao, Cebu – the collection site of the specimen.

m and from 2–7 m, respectively. Other plants found in the area were climbing bamboos, epiphytic ferns, palms, and grasses. Standing dead trees and fallen logs were also noted. Fruiting trees were present in all plots, ranging from 1–7 trees. Generally, the habitat is a typical characteristic of a lowland secondary-mixed forest.

T. subannulatus is recorded in three major islands: Luzon, Visayas, and Mindanao (Figure 4). For Luzon, it is documented in Cagayan, Isabela, Bulacan, Cavite, Quezon, Camarines Norte, and Albay. In the Visayas, it was recorded in Samar, Leyte, Bohol, Negros Occidental, and Negros Oriental. Lastly, in Mindanao, it was documented in Agusan del Norte, Agusan del Sur, Lanao del Norte, Lanao del Sur, Basilan, Dinagat, and Jolo (Alcala 1986; Vogel *et al.* 2007).

Alcala (1986) reported new distribution records of this species in Palawan, Panay, Sibuto, Tumindao, Sulu archipelago, and Balabac. And, for the first time on record, *T. subannulatus* was documented in Cebu Island's Mount Lantoy KBA – particularly in Cansuje, Argao. Since Cebu Island is part of the Greater Negros-Panay Biogeographical Region, the presence of the North Philippine temple pit viper is not that surprising. However, its discovery in the field where it was never documented is, indeed, welcome. It is a new additional reptile record for Cebu island. Species synonyms can be found in the 2018 Reptile Database.

Based on the latest assessment of International Union for the Conservation of Nature (IUCN 2020), it has a “least concern” conservation status. The population trend is still unknown due to the lack of assessment and insufficient data gathered (IUCN 2020). The current discovery of this new distribution record may trigger further studies of this lesser-known organism.

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