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Natural history notes on the elusive Taylor's Burrowing Snake, *Pseudorabdion taylori* Leviton and Brown 1959, from southern Mindanao, Philippines

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The genus *Pseudorabdion* comprises 15 species of burrowing snakes spread across Southeast Asia, particularly on the islands of Java, Sumatra, Sulawesi, Borneo, Singapore, the Philippines, as well as in Peninsular Malaysia and Thailand (Uetz et al., 2020). At least seven recognised species are known to occur and are largely endemic to the Philippine islands, including *P. ater*, *P. mcnamarae*, *P. montanum*, *P. oxycephalum*, *P. talonuran*, *P. taylori*, and *P.* cf. *collaris* (Weinell et al., 2019). Leviton et al. (2018) reported *P. longiceps* for the Philippines, but no verifiable record of this species exists for the country to date. Weinell et al. (2019) did not include *P. longiceps* but added *P.* cf. *collaris*. The number of species of *Pseudorabdion* known from the Philippines is expected to increase with subsequent fieldwork and increased molecular sampling (Brown et al., 2013a).

The Philippine *Pseudorabdion* are found mostly in forested areas ranging in elevation between sea level and 1600 m, burrowed into the ground, beneath logs and rocks, and in leaf litter (Taylor, 1917, 1922; Leviton and Brown, 1959; Brown et al., 1999; Gojo-Cruz et al., 2018). Among the members of the genus in the Philippines, only *P. taylori* is listed as Data Deficient on the *IUCN Red List of Threatened Species* due to the limited information on the extent of occurrence, ecological requirements, and potential threats to the species (Diesmos and Duya, 2009). This is partly due to its distribution in the southern Philippines, where fieldwork is limited by security reasons and logistical difficulties (for its distribution in the Philippines, see Leviton et al., 2018).

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Pseudorabdion taylori was described from three specimens collected in Saub, Cotabato Province (now Sarangani Province), southern Mindanao, Philippines, on the basis of morphology with no information on its natural history (Leviton and Brown, 1959). Thus, very little is known about the species despite having been recorded several times in southern Mindanao since its description more than six decades ago (Leviton et al., 2018). New information is provided here on aspects of the natural history of *P. taylori* based on two individuals observed in the Busa Mountain Range, Mindanao Island, to improve our understanding of the ecological requirements of this species and to inform future conservation assessments. The first photographs of live individuals, a juvenile and an adult *P. taylori*, are also provided here (Figs. 1, 2).

The juvenile and adult *P. taylori* were observed and captured for closer inspection in the lowland and montane forests, respectively, of the Busa Mountain Range. They were primarily identified by their dorsal body scale colour, high number of subcaudal scales (36 for the adult and 37 for the juvenile), and the presence of an elongated loreal (lori-ocular) scale which is absent in *P. ater*, *P. montanum*, *P. oxycephalum*, and *P. longiceps* (Weinell et al., 2019). The species closely resembles *P. talonuran* and *P. mcnamarae.* However, the latter has fewer subcaudal scales (Weinell et al., 2019) while the former is known only to occur on Panay Island (Leviton et al., 2018), which is a separate sub-zoogeographic region in the Philippines (Brown and Diesmos, 2002; Brown et al., 2013b). The body and head colour of the adult *P. taylori* were also different from what was reported in the literature (Brown and Leviton, 1959; Weinell et al., 2019), probably because earlier descriptions of colouration were based only on ethanol-preserved juvenile or subadult specimens (snout–vent length, SVL = 170–195 mm).

Colouration of the juvenile (SVL = 99 mm; tail length, TL = 23 mm) corresponds to the description by Leviton and Brown (1959) in having iridescent dark brown

Figure 1. Photos of an unsexed juvenile *Pseudorabdion taylori* from the southwestern portion of the Busa Mountain Range, Sarangani, Philippines (snout–vent length = 99 mm; tail length = 23 mm).

dorsal scales, tan ventral scales, and a medium brown head (Fig. 1). The adult (SVL = 304 mm; TL = 50 mm) has dark and iridescent indigo-blue dorsal scales, light to medium yellowish-brown ventral scales, a dark brown colouration on the ventral side of the tail, and a yellow-orange head (except for the light tan ventral side and dark indigo-blue around the frontal region; Fig. 2). The differences between the juvenile and adult colouration suggest that *P. taylori* may undergo ontogenetic colour changes.

The adult was observed at 19:50 h moving on the surface of leaf litter in primary lower montane forest on the slopes of Mount Busa, Sarangani Province (6.1002°N, 124.6781°E, elevation 1570 m; Fig. 3A). It was found in an area with sparse understory vegetation, ca. 15 m from a trail. The juvenile was observed moving across the trail at 19:00 h, at a distance of approximately 10 m from a stream, in primary lowland evergreen forest of the southwestern portion of the mountain range (6.1781°N, 124.5021°E, elevation 204 m; Fig. 3B). Local villagers rarely visit the area of lowland forest where the juvenile was found, and the forest receives little to no anthropogenic disturbance. Despite extensive surveys between May 2019 and October 2020 in other habitats of the Busa Mountain Range (e.g., open-canopy agriculture, mixed early and advanced secondary forests, upper montane forests > 1700 m elevation) as well as neighbouring Mount Melibengoy (also known as Mount Parker), no other individuals of *P. taylori* were found. Most historical records of this species come from these mountains (Leviton et al., 2018).

Our observations suggest that *P. taylori* has a wide elevational range (at least 200–1600 m in elevation) and thrives in primary lowland and montane forests with very little to no disturbance. Its rarity could be attributed to the fossorial and apparently nocturnal nature of the species. In southern Mindanao, the known habitats of *P. taylori* are covered by different levels of protection: the southern slope of the Busa Mountain Range in Sarangani Province was recently declared a Local Conservation Area (currently being proposed as the Mt. Busa-MAKIMA Protected Landscape, MBPL), and the northern slope in South Cotabato Province is within the Strict Protection Zone of the proposed Allah Valley Protected Landscape. Additionally, the lowland forest of the southwestern portion of this mountain range

Figure 2. Photos of an unsexed adult *Pseudorabdion taylori* from Mt. Busa, Sarangani, Philippines (snout–vent length = 304 mm; tail length = 50 mm).

(locally known as the Dakeol Forest) has been proposed as a Wildlife Critical Habitat (DENR, 2020a) and is also within the proposed MBPL. While these designations contribute to the long-term protection of the species, active conservation measures, such as strengthened law enforcement and alternative sustainable livelihood programs, are likely needed to address immediate threats to *P. taylori,* such as illegal timber extraction, forest thinning (e.g., selective cutting of trees for abaca farming), and forest land conversion (e.g., slash-and-burn agriculture).

These records are testament to the importance of undertaking continued field-based investigations in southern Mindanao, which still hosts a significant portion of the remaining primary forests in the Mindanao island (DENR, 2020a,b). Several species of amphibians and reptiles have been described from (Siler et al., 2012; Brown, 2015; Barley et al., 2020) and rediscovered in (Siler et al., 2011; Pitogo and Saavedra, 2021) southern Mindanao during the last decade, highlighting the rich yet understudied diversity in the region. I recommend a renewed survey effort to gather more empirical field data of herpetofauna to support evidence-based species conservation assessments and conservation planning. These data will also help build our understanding of the herpetofaunal communities in southern Mindanao, which remains a knowledge gap in Philippine herpetology.

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Figure 3. Habitat of *Pseudorabdion taylori* in the Busa Mountain Range. (A) Montane forests of the southern slope of Mount Busa (elevation 600–2046 m). (B) Lowland evergreen forest known as Dakeol Forest (elevation 200–500 m).

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