

First Record of the Marine File Snake *Acrochordus granulatus* (Squamata: Acrochordidae) from Japan Based on the Specimen of the Third Higher School

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A specimen of Acrochordidae, *Acrochordus granulatus* (Schneider, 1799) (Squamata), which was collected on Amami-oshima Island, Ryukyu Archipelago, Japan in 1938, was discovered in the historical zoological collection of the Kyoto University, Japan. The specimen was originally included in the “Third Higher School collection” and is now kept in the Kyoto University Museum. The specimen represents the first record of this species from Japan. Morphology of the specimen is described, and the migration route of this individual is briefly discussed.

Key Words: Amamioshima Island, Ryukyu Archipelago, Kyoto University Museum, new record, old museum specimen.

Introduction

File snakes, acrochordids, are aquatic species found in the tropics from India to Australia (McDowell 1975, 1979). The family includes three species in the only valid genus *Acrochordus* Hornstedt, 1787: *A. arafurae* McDowell, 1979 and *A. javanicus* Hornstedt, 1787, inhabit mainly freshwater (McDowell 1979; Stuebing et al. 2014), and *A. granulatus* (Schneider, 1799) inhabits coastal marine and some freshwater lakes (Lillywhite 1991, 2020; Ng 2011).

We examined an acrochordid specimen collected in 1938 on Amamioshima Island (Kagoshima Prefecture, Japan) in the collection of the now defunct Third Higher School housed in the Kyoto University Museum, Japan.

Materials and Methods

According to the original label (Fig. 1a), the specimen was collected on Amamioshima Island in June 1938 (昭和13年; the 13th year of the Showa Era) and made by the Niki Biological Institute (ニキ生物研究所) (Fig. 1). Niki Biological Institute was likely a specimen supplier for education and research, and the Third Higher School collection includes several specimens labelled as Niki Biological Institute in 1937 and 1938. This specimen was originally included in the collection of Third Higher School, which was succeeded by the Biological Laboratory, Yoshida College and then by the Faculty of Integrated and Human Studies of Kyoto University, and is now deposited in the Kyoto University Museum (KUM) since 2000. When the specimen was kept in the Biological Laboratory of Yoshida College, Catalogue No.

3520 was assigned to the specimen (Fig. 1b). The specimen was preserved in formalin and was identified as “Sea snake” (“Umi-hebi” in Japanese; including sea kraits, *Laticauda* Laurenti, 1768) on the older label (Fig. 1a) and as *Hydrophis annandalei* (Laidlaw, 1901) (described as “*Kolpophis annandalei*” on the label) on the latest label (Fig. 1b).

Specimen measurements and scale terminology followed Sanders et al. (2010) and Stuebing et al. (2014). The number of mid-body scale rows was counted at the midpoint from the head to the cloaca. The total length was measured by running a wire along the body axis. The tail length was measured with a ruler.

Acrochordus granulatus (Schneider, 1799)

[English name: Marine File Snake;

Japanese name: Hime-yasuri-hebi]

(Figs 1–3; Table 1)

Materials examined. Third Higher School collection at KUM (No. 3250 of Biological Laboratory, Yoshida College, Kyoto University), collected from Amamioshima Island, Kagoshima Prefecture, Japan in June 1938. Formalin-preserved specimens. Collector: unknown; preparing specimen: Niki Biological Institute.

Description. Table 1 shows the measurement.

Measurements shown in Table 1. Total length, 571 mm; tail length, 68 mm. Head short and rounded, with same width as neck; eyes small; nostrils tubular (Fig. 2). Skin of both body and venter with folds; no enlarged scales on venter; entire body covered with fine scales of about same size (Fig. 3); 156 mid-body scales; 10 scales eye–eye; 5 scales eye–lip on each side; 5/6 (left/right) scales naris–eye; 14 supralabial scales on each side; 18 infralabial scales on each



Fig. 1. Specimen labels and condition of *Acrochordus granulatus*, Third Higher School collection No. 3250 at KUM. (a) Original label; (b) specimen condition and the latest label (No. 3520).

side. Multiple tumors on body surface. Head dark brown with pale yellow spots (Fig. 2); body to tail alternating blackish-brown and pale yellow bands; dark brown bands longer at dorsal midline than toward venter (Fig. 3).

Distribution. *Acrochordus granulatus* is distributed in northern Australia (Cogger 2014), continental coastal areas from the Indian Peninsula to the Malay Peninsula and Indochina Peninsula (Cox et al. 1998; Nguyen et al. 2009; Murthy 2010), Hainan Island (Huang 1963), the Sunda Islands (de Rooij 1917; Stuebing et al. 2014) and the Philippine Islands (Dunson and Minton 1978; Bernstein and Bautista 2020).

Remarks. This specimen agrees well with the morphological characteristics of *A. granulatus* described by Sanders et al. (2010) (Table 1). It was identified as “Sea snake” (including *Laticauda*) and as *H. annandalei* in the past. How-

Table 1. Each measurement and counts of specimens of *Acrochordus granulatus*. Left and right counts are shown as left/right.

	This study	Sanders et al. (2010)
Total length (mm)	571	—
Tail length (mm)	68	—
Mid-body scale	156	123–159
Scale eye–eye	10	10–15
Scale eye–lip	5/5	5–7
Scale naris–eye	5/6	5–7
Supralabial scales	14/14	14–22
Infralabial scales	18/18	12–28

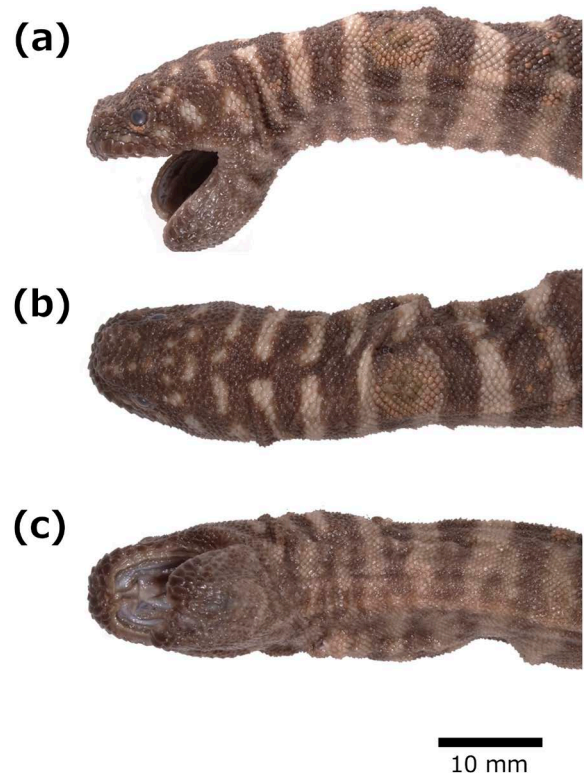


Fig. 2. Enlarged view of the head of *Acrochordus granulatus*, Third Higher School collection No. 3250 at KUM. (a) Lateral, (b) dorsal, and (c) ventral.

ever, the sea snakes including *H. annandalei* are usually characterized by a flat tail and a head covered with relatively large scales (Stuebing et al. 2014), which do not correspond to the characteristics of the specimen. This misidentification may be due to the absence of occurrence records of file snakes in Japan, and also their similarity to sea snakes in both body coloration and habitat.

Acrochordus granulatus is known to have ecologically adapted to shallow water habitats such as mangrove areas (Lillywhite 2020), while they were reported to be captured as far as 10km from the coast (Voris and Glodek 1980). It is quite possible that the natural dispersal by the Kuroshio Current carried this species to Amamioshima Island. The nearest habitat of this species from Japan is the Philippine Islands or Hainan Island (Huang 1963; Dunson and Minton 1978; Bernstein and Bautista 2020). However, since there

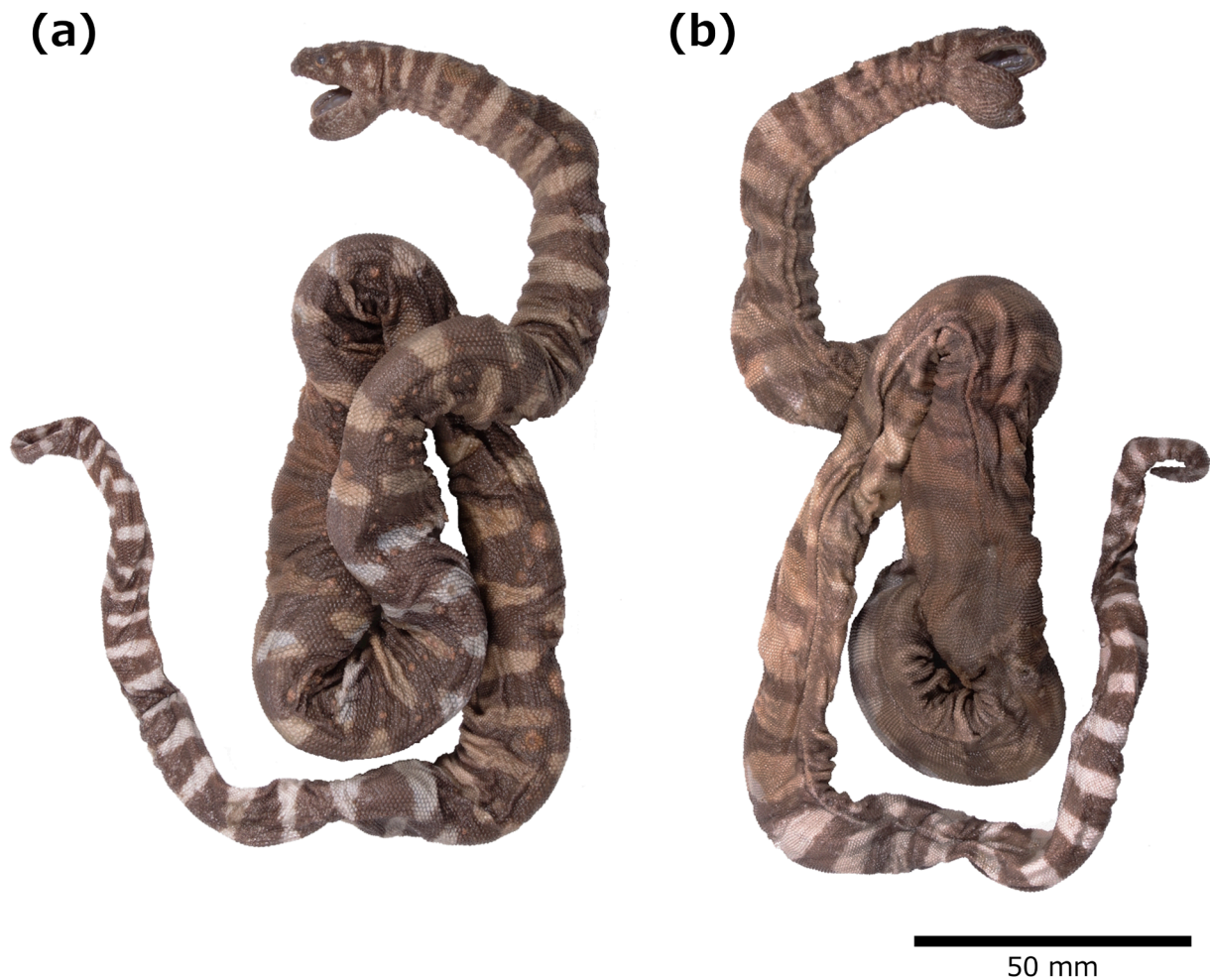


Fig. 3. Dorsolateral (a), and ventrolateral (b) views of *Acrochordus granulatus*, Third Higher School collection No. 3250 at KUM.

is only one record from Hainan Island (Huang 1963; Shi et al. 2011), it is more likely that this individual came from a larger and more stable population in the Philippines. In addition, since many typhoons in June track toward Japan after approaching the Philippines (Japan Metrological Agency 2022), it is possible that a typhoon carried this specimen from the Philippines to Amamioshima Island. On the other hand, *A. javanicus*, a closely related species of *A. granulatus*, has been reported to have been accidentally transported to Japan by hiding in wood from Indonesia (Kagei and Shogaki 1977), so we could not rule out the possibility that this individual was artificially transported to Japan. In either case, there are no solid records of *A. granulatus* in Japan from 1938 to the present. Thus, it is highly likely that *A. granulatus* is very rare in Japan, and it would be difficult to establish a stable population in the archipelago.

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