



Notes on two rare conger eel species (Anguilliformes: Congridae) found in Taiwanese waters

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Although Taiwan is a small island, it occupies a strategic biogeographic position between the faunal regions of Japan to the north and the Philippines to the south. As a result, it has an interesting mixture of northern and southern species. In this paper, we report new records of two species of congrid eel, one known previously from Japan and China, and the other known only from the Philippines. The first species, *Promyallantor nezumi* Asano, 1958, was described by Asano (1958) and reassigned to a newly established genus *Acromycter* by Smith & Kanazawa (1977). Zhang (1989) reported the species from east of Hainan Island, China. The second species, *Gnathophis asanoi* Karmovskaya, 2004, was described from the Philippines based on two types. Ho *et al.* (2015) reported one specimen collected from Taiwan but provided one additional specimen was collected more recently.

Counts and measurements are as in Smith & Kanazawa (1977). Proportions are given as percentage or times in total length (TL) or head length (HL). Study material is deposited in the National Museum of Marine Biology and Aquarium, Taiwan (NMMB-P) and the National Museum of Natural History, Smithsonian Institution, USA (USNM). We thank Chen, R.-R., Lin, J.-T., Chang, H.-J. (NMMB-P) for curatorial assistances.

Family Congridae

Acromycter nezumi (Asano, 1958)

Figs. 1A–C

Promyallantor nezumi Asano, 1958:196, fig. 2 (type locality: Owashi, Japan).

Acromycter nezumi (Asano, 1958): Smith & Kanazawa, 1977:542. Zhang *et al.*, 1989:112.

Specimen examined. NMMB-P27327, 257 mm TL, Dong-gang, SW Taiwan, South China Sea, bottom trawl, 13 Oct. 2017.

Description of NMMB-P27327. Head length 12.2% TL; preanal 32.3; predorsal 16.7; trunk length 20.1; tail length 67.7; depth at head 3.8; depth at anus 3.2; width at anus 2.7. Snout length 29.9% HL; eye diameter 8.6; interorbital width 14.0; rictus 31.2; gill opening width 11.5; interbranchial width 16.9; pectoral-fin length 23.6.

Body moderately elongate, oval in cross section anteriorly, becoming more compressed posteriorly; tip of tail moderately pointed but not filiform; anus at about anterior third of total length. Dorsal-fin origin slightly behind tip of appressed pectoral fin, continuous around tip of tail with caudal and anal fins. Anal fin begins immediately behind anus. Pectoral fin well developed, pointed distally with a narrow base. Gill opening relatively large, slightly larger than eye diameter, its upper end nearly opposite middle of pectoral-fin base; interbranchial width greater than gill opening and eye.

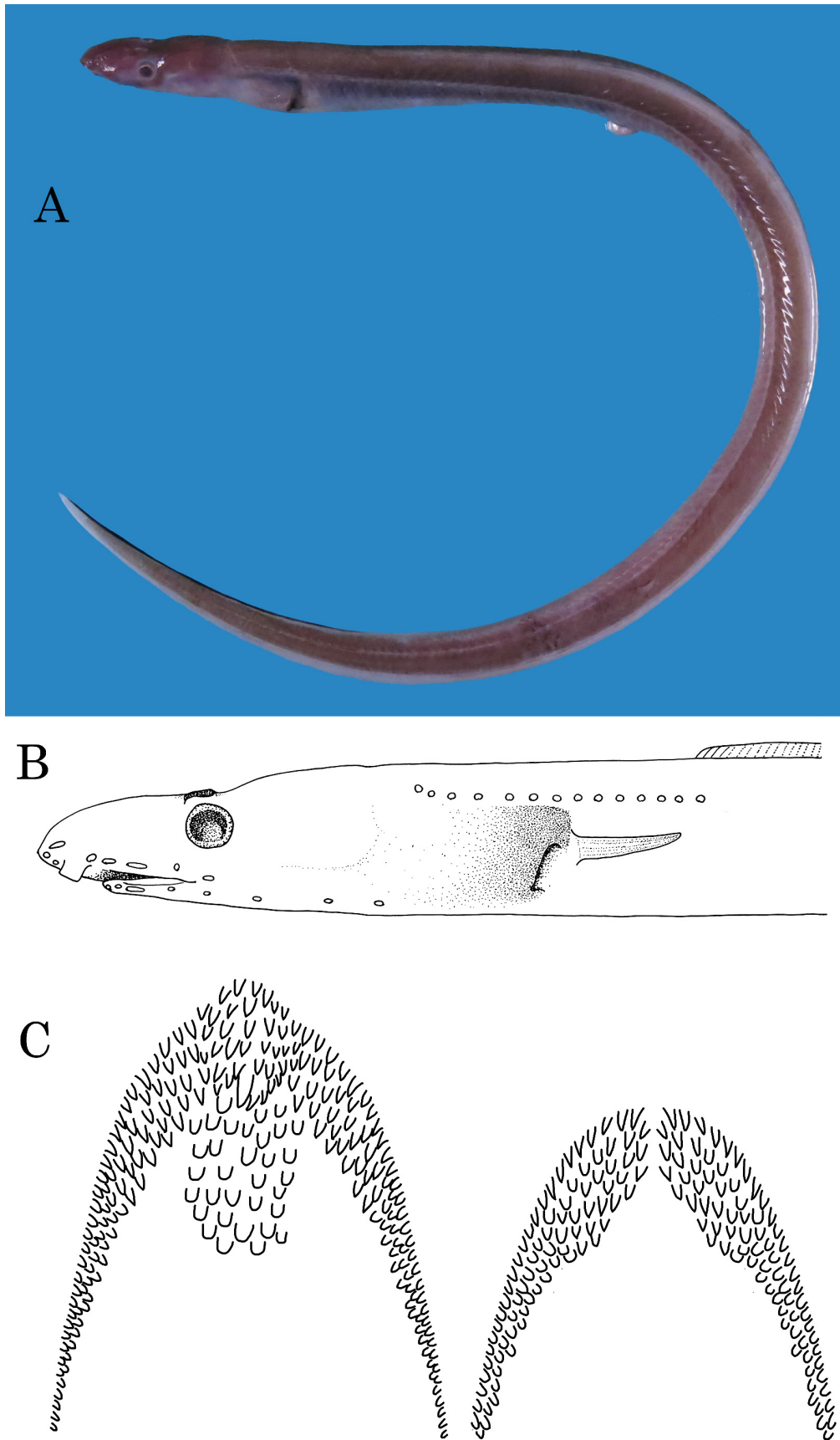


FIGURE 1. *Acromycter nezumi* (Asano, 1958), NMMB-P27327, 257 mm TL. A. lateral view. B. head pores, by Y.-C. Tu. C. tooth pattern, upper jaw (left) and lower jaw (right).

Head small, reflected by the relatively slender body, deepest at about gill opening; snout long, somewhat swollen dorsally, blunt in dorsal view, its length 3.5 times eye diameter, projecting well beyond lower jaw; lower jaw much shorter than snout; fleshy part of snout projecting anteriorly beyond anterior end of intermaxillary tooth patch; rictus below anterior margin of eye. Anterior nostril tubular, near tip of snout, directed ventrolaterally. Posterior nostril large, elliptical, with a slightly raised rim, above eye at anterior portion of interorbital space. Upper lip with a shallow, free, upturned flange, beginning at second infraorbital pore and ending below middle of eye. Lower lip with a well-developed downturned flange. Tongue free, long, and broad.

Lateral line complete, first pore on each side slightly enlarged, the canal extended to caudal-fin base; 7 before pectoral-fin base, 13 before dorsal-fin origin, 38 pores before anal-fin origin; and ca. 140+ total pores.

Head pores vary in size, mostly enlarged (Fig. 1B). Supraorbital canal with 3 pores; the first (ethmoidal pore) small, on ventral side of tip of snout, just above lip; the second enlarged, about twice the size of first, above and slightly anterior to it; the third greatly enlarged and immediately above anterior nostril. Infraorbital canal with 5 pores first 4 pores enlarged, along upper lip; the fifth moderately large and behind rictus. No pore on frontal and behind eye. Preopercular canal with 2 pores; mandibular pores 6, 4 along lower jaw, the first very small, at near anterior tip of lower jaw, the third greatly enlarged; and 2 pores behind rictus. Supratemporal commissure with no pore. Predorsal vertebrae 14; preanal vertebrae 36; precaudal vertebrae 50; total vertebrae 166.

Teeth moderately large, conical to blunt (Fig. 1C). Intermaxillary in about five transverse rows, connected to maxillary and vomerine teeth, its anterior margin at same level of that of maxillary teeth. Maxillary and mandibular teeth in bands, wider anteriorly, roughly in 5 rows on maxillary and 6 rows on mandibular, narrowing to 1 or 2 rows posteriorly. Vomerine teeth blunt, forming a large, broad oval patch, in about 5 transverse rows.

Coloration. When fresh, body almost uniformly grayish brown with ventral surface of abdomen light grayish; gill chamber, gill opening and mouth cavity blackish; black papillae on roof of mouth. Preserved coloration slightly paler, except for gill chamber became more distinctly black.

Remarks. Our specimen agrees well with the original description (Asano, 1958, 1962), except for some minor differences. The predorsal length is slightly longer (16.7% vs. 13.1–16.2% TL) and snout is slightly longer (29.9% vs. 23.1–29.2% HL), compared to those in Asano's specimens. The head length is at the largest value and the eye diameter is at the smallest value compared to Asano's specimens. Moreover, Asano (1958) provided the total lateral-line pores 155–165, whereas we can count about 140 from our specimen. It is likely the pores on posterior section of lateral-line have been dried out and are not countable.

***Gnathophis asanoi* Karmovskaya, 2004**

Figs. 2A–C

Gnathophis asanoi Karmovskaya, 2004:S18, fig. 10 (type locality: Philippines, Sibuyan Sea, 280–440 m). Ho *et al.*, 2015:147.

Specimen examined. NMMB-P25987, 291 mm TL, 13 Oct. 2017, coll. H.-C. Ho; USNM 401080, 343 mm TL, 25 May 2010, coll. H.-C. Ho & Y. Yamanoue; both from Dong-gang, southern Taiwan, South China Sea, bottom trawl.

Description of Taiwanese specimens. Head length 14.4–15.3% TL; preanal length 35.1–37.9; predorsal length 16.8–17.3; trunk length 20.2–22.6; tail length 61.8–64.9; depth at head ~4.2; depth at anus 3.4–4.8; width at anus ~2.7. Snout length 31.3–33.5% HL; eye diameter 14.7–20.6% HL; interorbital width ~11.2; rictus 35.4–41.1; gill opening width 10.5–11.8; interbranchial width 19.6–20.2; pectoral-fin length 23.9–24.2.

Body moderately elongate, cylindrical in cross section anteriorly, becoming more compressed posteriorly; tip of tail moderately attenuate; anus slightly behind anterior third of total length. Dorsal-fin origin slightly ahead tip of appressed pectoral fin, continuous around tip of tail with caudal and anal fins. Anal fin begins immediately behind anus. Pectoral-fin well developed, pointed distally with narrow base. Gill opening relatively small, smaller than eye diameter, its upper end nearly opposite middle of pectoral-fin base; interbranchial broader than gill opening and eye.

Head moderately large reflected by the less slender body, deepest at about gill opening; snout long and pointed, its length 1.6–2.1 times eye diameter, projecting well beyond lower jaw; lower jaw clearly shorter than snout; fleshy part of snout projecting anteriorly beyond anterior end of intermaxillary tooth patch; rictus below anterior half of eye. Anterior nostril tubular, near tip of snout, directed ventrolaterally. Posterior nostril elliptical, with a slightly raised rim, in front of eye at mid-eye level. Upper lip with a shallow, free, upturned flange, beginning at

second infraorbital pore and ending below middle of eye. Lower lip with a well-developed downturned flange. Tongue free, long, and narrow.

Lateral-line complete, first pore on each side slightly enlarged, the canal extended to caudal-fin base; 6 before pectoral-fin base, 10 before dorsal-fin origin, 33–36 pores before anal-fin origin; and ca. 127 total pores (based on NMMB-P25987); no elevated pores above pectoral fin.

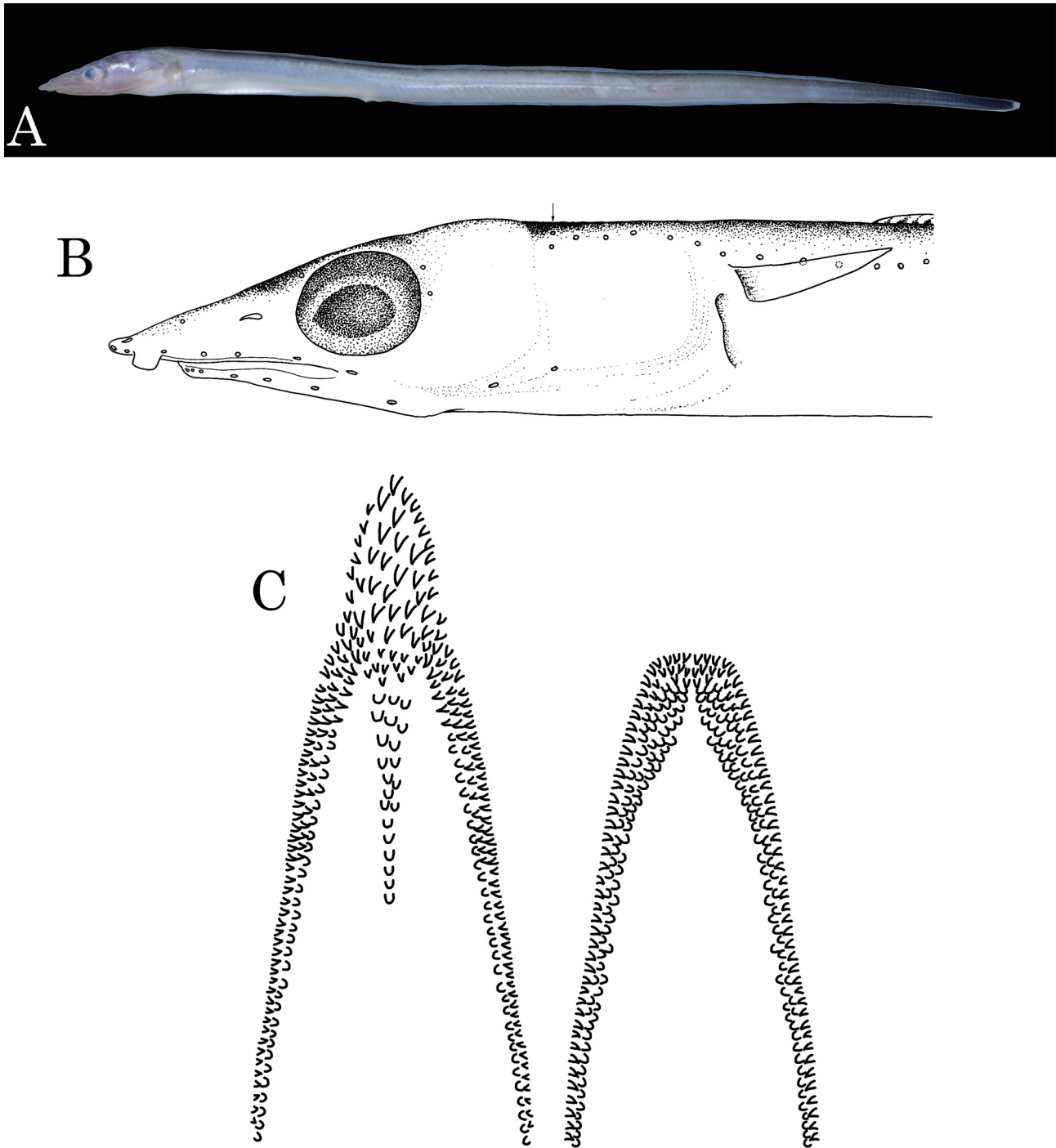


FIGURE 2. *Gnathophis asanoi* Karmovskaya, 2004, NMMB-P25987, 291 mm TL. A. lateral view. B. head pore, by Y.-C. Tu. C. tooth pattern, upper jaw (left) and lower jaw (right).

Head pores small (Fig. 2B); supraorbital canal with 5 pores, the first (ethmoidal pore) and second on ventral side of tip of snout, just ahead the lip. Infraorbital canal with 7 pores, first 4 along the upper lip and the fifth behind the rictus; 2 pores behind eye. No pore on frontal. Preopercular canal with 2 pores; mandibular pores 7, 6 along

lower jaw and the last well behind rictus. Supratemporal commissure with 3 pores, the middle one tiny. Predorsal vertebrae 10; preanal vertebrae 34–36; precaudal vertebrae ~42; total vertebrae 137–141.

Teeth small, conical to blunt (Fig. 2C). Intermaxillary in about four transverse rows, connected to maxillary and vomerine teeth. Maxillary and mandibular teeth in bands, wider anteriorly, roughly in 4–5 rows, narrower posteriorly. Vomerine teeth blunt, forming a long patch, in about 4 transverse rows.

Coloration. When fresh, body light grayish with dorsum darkly brown and abdomen silvery white; posterior fifth of body gradually darker; vertical fins whitish, forming white margin on posterior fifth of the fish. Preserved specimen paler.

Remarks. The vertebral formula and most proportions fit the original description. However, a number of differences are present in Taiwanese specimens. The 343 mm specimen has slightly larger values of preanal length (37.9 vs. 34.3–35.7% TL in type series) and trunk (22.6 vs. 19.7–19.9% TL), smaller eye (14.7 vs. 15.7–17.8% HL) and 137 total vertebrae (vs. 139–140). The 291 mm specimen has a larger eye (20.6 vs. 15.7–17.8% HL). Both Taiwanese specimens have smaller gill openings (10.5–11.8 vs. 14.3–14.7% HL) and shorter pectoral fin (23.9–24.2 vs. 28.6–29.4% HL). There are only 9 POM pores in 291 mm specimen. We are not able to judge these differences, as not many specimens are available at present. More specimens are needed to address the variation of the present species.

Four species of *Gnathophis* Kaup, 1859 are currently known from the northwestern Pacific: *G. heterognathus* (Bleeker, 1858), *G. ginanago* (Asano, 1958), *G. xenica* (Matsubara & Ochiai, 1951), and *G. asanoi*. Of these, *G. heterognathus* has the widest distribution, from Japan to the Philippines (Karmovskaya, 2004). *Gnathophis ginanago* and *G. xenica* have been recorded only from Japan, and *G. asanoi* is now known from the Philippines and Taiwan. *Gnathophis heterognathus* is distinguished from the others by the presence of elevated lateral-line pores (i.e., opening from the top of the canal rather than the bottom) over the pectoral fin; in the others, the pores open from the bottom of the canal. The remaining species are distinguished by their vertebral counts: 126–134 in *G. ginanago*, 137–141 in *G. asanoi*, and 151–157 in *G. xenica*.

Our specimens represent the only known specimens other than the type series and extend the known range of the species northward to southern Taiwan.

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