

First record of slender red scad, *Decapterus smithvanizi* (Actinopterygii: Perciformes: Carangidae), from the Philippines

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Abstract

Ten specimens (187.3–226.9 mm standard length) of slender red scad, *Decapterus smithvanizi* Kimura, Katahira et Kuriwa, 2013, previously reported from the Andaman Sea, South China Sea, Taiwan, Japan, Thailand, Indonesia, Myanmar, and Pakistan, were collected off Iloilo (Panay Island), the Philippines. The presently reported specimens represent the first record of the species from the Philippines. A detailed description of the specimens is provided, with a comparison to other commonly-caught species of red-fin *Decapterus* in the area.

Keywords

Decapterus kurroides, *Decapterus tabl*, morphology, description, taxonomy

Introduction

The carangid genus *Decapterus* Bleeker, 1851, currently including 11 valid species (Kimura et al. 2013; Fricke et al. 2021), is characterized by having a single finlet behind both the second dorsal and anal fins, absence of scutes on the anterior curved part of the lateral line, two low papillae on the shoulder girdle, and well-developed adipose eyelid (Gushiken 1983; Smith-Vaniz 1999). In 2013, Kimura et al. grouped the *Decapterus* species with red fins and identified *Decapterus smithvanizi* as a new species. Four species have been included in the group:

Decapterus akaadsi Abe, 1958; *Decapterus kurroides* Bleeker, 1855; *Decapterus tabl* Berry, 1968, and *Decapterus smithvanizi* Kimura, Katahira et Kuriwa, 2013.

Specimens of red-fin *Decapterus* were collected by researchers from the University of the Philippines Visayas during an ichthyofaunal survey in Miagao Fish Market in Panay Island in November 2016. The specimens were identified with the help of a taxonomist from the Kagoshima University Museum and included *Decapterus smithvanizi* amongst the specimens collected. However, the collected specimens were poorly preserved and not accessioned. Subsequently, the same fish market

was visited in February–May 2020 and additional specimens of *D. smithvanizi* were obtained. The specimens of *D. smithvanizi*, used in this study, represent the first records of the species from the Philippines with complete examination and description. This report completes the presence of all red-fin *Decapterus* in the country.

Materials and methods

Counts and measurements followed Hubbs and Lagler (1947) and Kimura et al. (2013) with additional measurement, from the snout to the central posterior tip of the sideways “W-shaped” margin at the dorsal head. Measurements were made to the nearest 0.1 mm with a digital caliper (≤ 180 mm) and a manual caliper (> 180 mm). Standard and head lengths are abbreviated as SL and HL, respectively. Curatorial procedures followed Motomura and Ishikawa (2013). Counts of lateral-line scales and scutes followed Kimura et al. (2013) and are defined according to Smith-Vaniz and Carpenter (2007). Characters, such as gill raker, lateral line scale, and scutes, were counted under a dissecting microscope. Identification of specimens followed Kimura et al. (2013). The specimens examined in this study are deposited at the University of the Philippines Visayas Museum of Natural Sciences, Iloilo, Philippines (UPVMI).

Results

Decapterus smithvanizi Kimura, Katahira et Kuriwa, 2013

Material examined. *Decapterus smithvanizi*: UPVMI 3059 through 3068, 10 specimens, 187.3–226.9 mm SL, Miagao Fish Market, Iloilo, Feb.–May 2020, E. Delloro and R. Babaran. *Decapterus tabl*: UPVMI 3069 through 3077, 10 specimens, 185.4–208.96 mm SL, Miagao Fish Market, Iloilo, May 2020, E. Delloro. *Decapterus kurroides*: 9 specimens, UPVMI 3078 through 3086, 166.7–191.3 mm SL, Miagao Fish Market, Iloilo, Feb.–May 2020, E. Delloro and R. Babaran.

Description. Body elongate, compressed, and comparatively slender, deepest between first dorsal and second dorsal fin. Dorsal and ventral profile body slightly convex from tip of snout to caudal-fin base. Mouth terminal, large; posterior tip of maxilla reaching vertical through anterior margin of eye; posterior tip of upper jaw not hooked. Interorbital space slightly convex, with scales. Predorsal scaly area extending to anterior margin of eye. Upper end of pectoral-fin base anterior to vertical through opercular margin; lower end of pectoral-fin base vertical through pelvic-fin origin. Pectoral fin asymmetrical, its posterior tip pointed, reaching beyond vertical through second dorsal-fin origin. Pelvic-fin origin anterior to vertical through dorsal-fin origin. First dorsal fin higher than second; single finlet present both

dorsally and ventrally on caudal peduncle. Caudal fin forked; covered with small scales. Body scales small and ctenoid. Lateral line extends downwards from origin of second dorsal fin; running straight from middle of second dorsal fin to caudal-fin base; curved part longer than straight part, covered with ctenoid scales and scutes at posteriormost area; straight lateral line covered with scutes reaching beyond hypural bone. Head covered with scales, except snout area, mandible and antero-ventral region of head; posteriormost end of scaly head region anterior to vertical through opercular margin; adipose eyelid developed. Teeth on jaws minute, two rows on upper jaw and single row on lower jaw. Lower jaw slightly protruding. Gill rakers slender, covered with spinules at inner surface.

Color when fresh. Head and body bluish to pale black dorsally, pale white to silvery ventrolaterally; black blotch present on upper edge of opercle; both margins of dorsal, caudal, and pectoral fins and finlet red with fine melanophores; anal fin, pelvic fins and ventral finlet pinkish to white with fine melanophores (Fig. 1A).

Color when preserved. Head and body greyish to brownish dorsolaterally, pale white ventrolaterally; black blotch present on upper edge of opercle; both margins of dorsal, caudal, and pectoral fins and finlet brownish to dirty white with fine melanophores; anal fin, pelvic fins, and ventral finlet brownish to white with fine melanophores (Fig. 2A–C).

Distribution. *Decapterus smithvanizi* is distributed in the Andaman Sea, South China Sea, Indonesia, and the western coast of Thailand (Kimura et al. 2013), Taiwan (Smith-Vaniz et al. 2018b), Japan (Iwatsubo et al. 2016; Hata and Motomura 2017), Myanmar (Psomadakis et al. 2020), and Pakistan (Psomadakis et al. 2015). Specimens were collected off Iloilo Province (Panay Island), Philippines. The specimens, used in this study, represent the first record from the Philippines.

Comparison. *Decapterus smithvanizi* can be easily distinguished from the other members of red-fin *Decapterus* group in having fewer cycloid scales along the curved part of the lateral line (54–62), long pectoral fin (25.5%–29.6% SL) reaching beyond a vertical through the origin of second dorsal fin and fewer lower gill rakers (26–28) (Table 1). Melanophores scattered on the pectoral, pelvic and anal fin rays of *D. smithvanizi* (Fig. 2A–C) are more distinct than those of *D. tabl* (Fig. 2D–F) and *D. kurroides* (Fig. 2G–I). Two other species in red-fin *Decapterus* group, *D. kurroides* and *D. tabl*, are commonly caught together with *D. smithvanizi* in Panay Island. Similarities in morphological characters and coloration may lead to confusion and misidentification. However, they can be distinguished from each other with proper examination. In specimens of *D. kurroides*, the body depth is deeper (23.4%–26.6% SL) compared to *D. tabl* (18.4%–21.2% SL) and *D. smithvanizi* (19.7%–22.5% SL) (Fig. 3A; Table 1). The head length of *D. kurroides* (30.8%–31.7% SL) is longer than *D. smithvanizi* (29.3%–31.0% SL) and *D. tabl* (29.0%–30.0% SL) (Fig. 3B; Table 1). The



Figure 1. Species of red-fin *Decapterus* commonly caught in Panay Island. **A:** *Decapterus smithvanizi*, UPVMI-3075, 201.91 mm SL; **B:** *Decapterus tabl*, UPVMI-3061, 205.47 mm SL; **C:** *Decapterus kurroides*, UPVMI-3085, 191.31 mm SL.

pectoral fins of *D. smithvanizi* (25.5%–29.6% SL) and *D. kurroides* (27.6%–32.8% SL) are longer than *D. tabl* (17.6%–20.5% SL) (Fig. 3C; Table 1). Additionally, it was observed that body scales of the specimens extend on to the head dorsally and formed a sideways “W-shaped”

margin (Fig. 4). The distance from the snout to the central posterior tip of the margin was measured. *D. kurroides* is longer in proportion to head length (91.0%–97.1% HL) compared to *D. smithvanizi* (85.0%–87.2% HL) and *D. tabl* (80.0%–87.4% HL) (Fig. 3D; Fig. 4; Table 1).

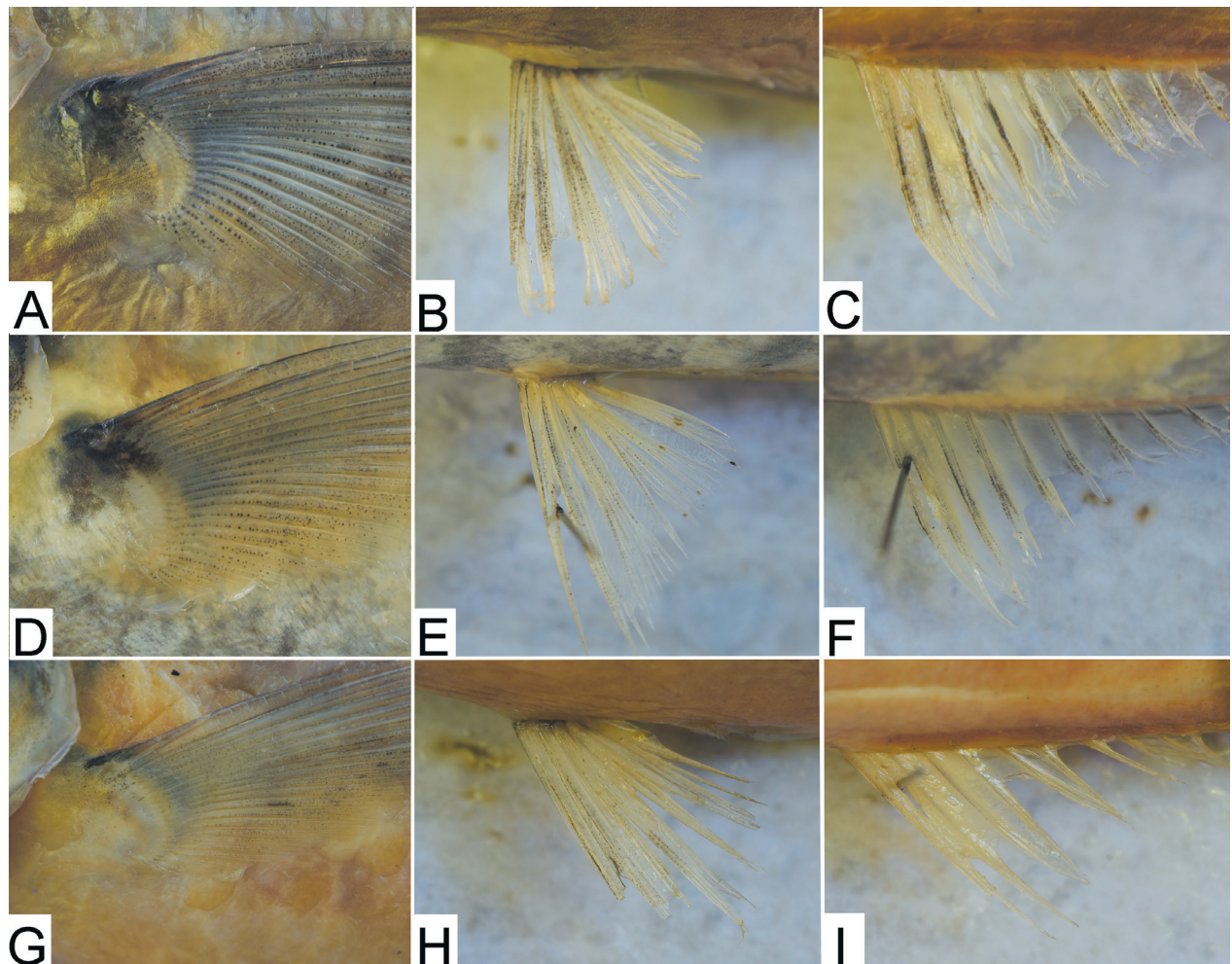


Figure 2. Pectoral, pelvic and anal fins of preserved specimens of *Decapterus smithvanizi* (A–C), UPVMI-3075, 201.91 mm SL, *Decapterus tabl* (D–F), UPVMI-3061, 205.47 mm SL and *Decapterus kurroides* (G–I), UPVMI-3085, 191.31 mm SL.

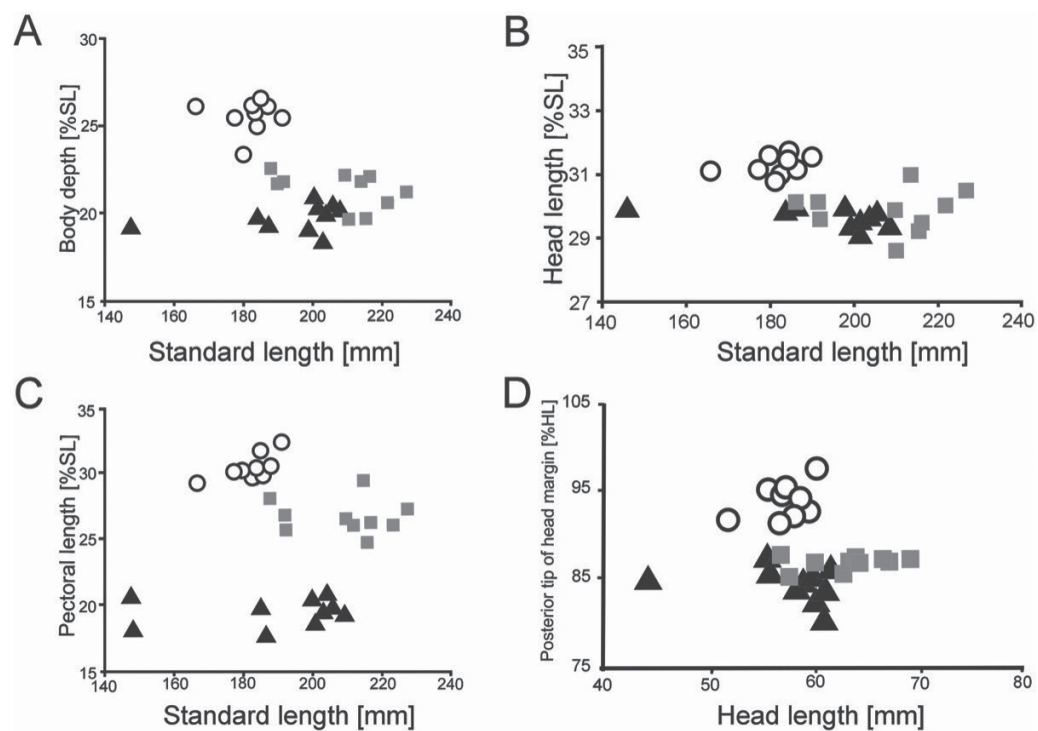
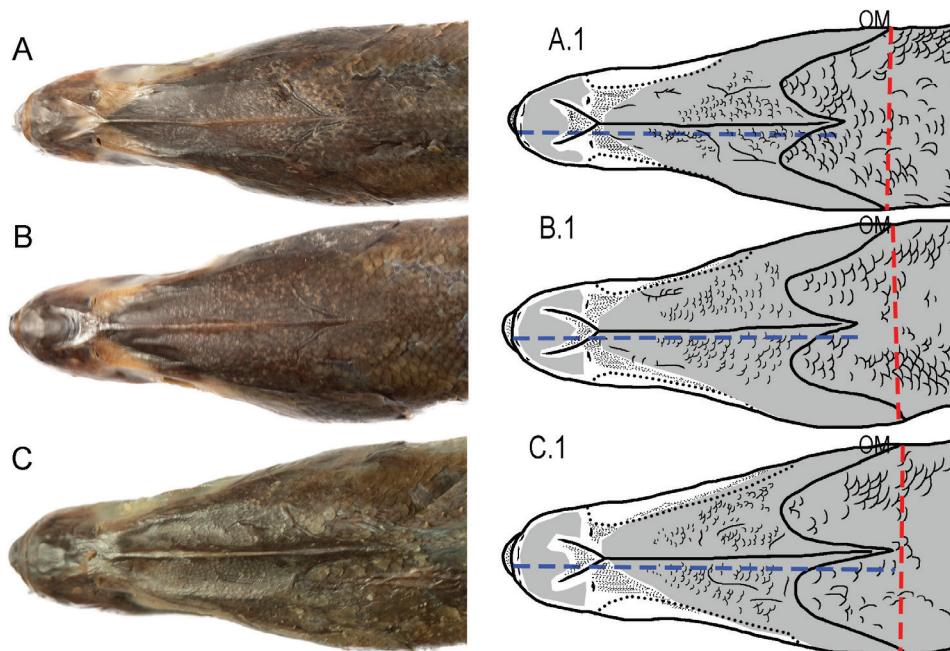


Figure 3. Relation of body depth (A), head length (B), and pectoral length (C) to standard length (SL) and of central posterior tip of dorsal head margin (D) to head length (HL) of *Decapterus smithvanizi* (■), *Decapterus tabl* (▲) and *Decapterus kurroides* (○).

Table 1. Counts and measurements of *Decapterus smithvanizi*, *Decapterus tabl*, and *Decapterus kurroides*.

Character	<i>Decapterus smithvanizi</i>			<i>Decapterus tabl</i>			<i>Decapterus kurroides</i>		
	<i>n</i>	Range	Mean	<i>n</i>	Range	Mean	<i>n</i>	Range	Mean
Standard length [mm]	10	187.3–226.9	208.6	10	147.9–209.0	194.4	9	166.7–191.3	182.3
Measurements									
<i>As % of standard length</i>									
Head length	10	29.3–31.0	30.0	10	29.0–30	29.6	9	30.8–31.7	31.3
Predorsal length	10	34.6–36.8	35.9	10	36.0–37.3	36.4	9	35.9–37.2	36.4
First dorsal-fin base length	10	13.8–15.5	14.4	10	12.8–14.6	13.7	9	15.1–16.0	15.6
Second dorsal-fin base length	10	35.5–36.4	36.1	10	35.1–36.6	35.8	9	34.6–36.6	35.3
Anal-fin base length	10	26.9–28.2	27.5	10	25.9–27.6	26.6	9	26.2–27.9	26.9
Snout to pectoral-fin insertion	10	28.9–31.1	29.9	10	28.7–29.9	29.5	9	30.9–32.4	31.3
Snout to pelvic-fin insertion	10	27.4–32.7	30.1	10	30.2–33.0	31.3	9	31.7–33.7	32.8
Snout to anal-fin origin	10	56.8–60.3	58.6	10	57.4–59.5	58.7	9	55.4–60.2	59.0
Pelvic-fin insertion to anal-fin origin	10	26.4–29.1	27.8	10	26.7–29.3	28.0	9	24.7–27.0	31.9
Snout to anus	10	53.6–57.2	55.8	10	51.4–57.7	55.1	9	53.7–56.6	55.2
Caudal-peduncle length	10	9.0–10.4	9.6	10	9.5–11.2	10.1	9	9.4–11.7	10.4
Body depth	10	19.7–22.5	21.4	10	18.4–21.2	19.7	9	23.4–26.6	25.6
Caudal-peduncle depth	10	2.8–3.4	3.2	10	2.9–3.5	3.1	9	3.5–3.9	3.7
Pectoral-fin length	10	25.5–29.6	27.1	10	17.6–20.5	19.4	9	27.6–32.8	30.4
Pelvic-fin length	10	10.5–12.5	11.8	10	9.9–11.2	10.7	9	12.5–13.7	13.1
Length of second spine of first dorsal fin	10	11.7–14.4	13.4	10	10.7–14.5	12.7	8	14.0–15.3	14.8
First anal-fin spine length	10	3.9–5.5	4.8	10	4.3–5.8	5.2	9	5.1–6.1	5.6
Head length [mm]	10	56.6–69.1	61.8	10	44.2–61.4	57.6	9	51.9–60.3	57.0
<i>As % of head length</i>									
Snout length	10	27.7–31.0	29.3	10	29.3–32.2	30.6	9	27.9–31.0	28.9
Upper jaw length	10	31.7–35.1	33.2	10	31.5–33.0	32.4	9	34.5–36.5	35.5
Eye diameter	10	25.6–31.2	29.0	10	27.4–30.7	28.9	9	29.1–33.9	30.5
Postorbital head length	10	41.5–44.8	44.6	10	41.1–45.9	44.0	9	41.9–44.3	43.2
Interorbital width	10	18.5–29.6	21.3	10	20.1–22.8	21.4	9	20.8–24.2	22.4
Posterior tip of dorsal head margin	10	84.0–87.2	86.1	10	80.0–87.4	84.3	9	91.0–97.1	93.5
Counts									
Dorsal-fin rays	10	VIII + I, 29–31	30.0	10	VIII + I, 29–32	30.8	9	VIII + I, 27–29	28.1
Anal-fin rays	10	II + I, 22–26	24.5	10	II + I, 24–26	24.6	9	II + I, 22–23	22.3
Pectoral-fin rays	10	21–22	21.1	10	22–22	22	9	20–22	21
Pelvic-fin rays	10	1, 5	5	10	1, 5	5	9	1, 5	5
Gill rakers on upper arch	10	9–11	10	10	10–13	11.9	9	10–12	11
Gill rakers on lower arch	10	26–28	27.5	10	31–33	31.9	9	27–31	29.2
Cycloid scales on curved part of lateral line	10	54–62	58.7	10	60–67	62.5	9	45–51	48.7
Scutes on posterior curved part of lateral line	10	0–3	1.4	10	0	0	9	3–4	3.1
Cycloid scales on anterior straight part of lateral line	10	0–4	1.6	10	5–8	6.2	9	0	0
Scutes on straight part of lateral line	10	30–33	32.5	10	34–39	37.6	9	31–33	32.0

n = number of specimens studied.**Figure 4.** Dorsal views of the head of red-fin *Decapterus* with their respective illustration. **A:** and **A.1:** *Decapterus smithvanizi*, UPVMI-3075, 201.91 mm SL; **B:** and **B.1:** *Decapterus tabl*, UPVMI-3061, 205.47 mm SL; **C:** and **C.1:** *Decapterus kurroides*, UPVMI-3085, 191.31 mm SL. The red broken line traced the posterior margin of the operculum. The blue broken line traced the distance from the snout to the central posterior tip of the sideways “W-shaped” margin. OM = operculum margin.

Discussion

Decapterus smithvanizi can be distinguished from other red-fin *Decapterus* by the following combination of characters; lower gill rakers 25–31, curved part of lateral line with 54–62 cycloid scales, body depth 19.4%–22.5% SL, pectoral-fin beyond the level of second dorsal-fin (Kimura et al. 2013). The presently reported specimens were identified as *D. smithvanizi* agreeing closely with the description of the species given by Kimura et al. (2013).

Four species of *Decapterus* with red caudal fins were grouped by Kimura et al. (2013) as red-fin *Decapterus*, *Decapterus kurroides*, *Decapterus akaadsi*, *Decapterus tabl* and *Decapterus smithvanizi*. Three species of red-fin *Decapterus* were reported in the Philippines, *D. akaadsi* (Smith-Vaniz et al. 2018a), *D. kurroides* (Smith-Vaniz 1999; Kimura et al. 2013) and *D. tabl* (Narido et al. 2016; Kimura 2017; Motomura et al. 2017). *Decapterus smithvanizi*, a newly-described species, is previously known from Thailand, Indonesia, Andaman Sea (Kimura et al. 2013), South China Sea, Taiwan (Smith-Vaniz et al. 2018b), Myanmar (Psomadakis et al. 2020) and Pakistan (Psomadakis et al. 2015). The report of *D. smithvanizi* in Iloilo Province confirmed its presence in the Philippines and completed all red-fin *Decapterus* in the country.

Red-fin *Decapterus* species are similar to each other. It was observed that *D. smithvanizi* are commonly caught with other species of red-fin *Decapterus* in Iloilo. Other than the description given by Kimura et al. (2013), it was observed that this species has more melanophores at its dorsal, anal, and pelvic fins compared to other species. Further examination of the specimens showed that

their body scales extend on to the head dorsally, forming a sideways “W-shaped” margin in dorsal view. The distance was taken from the snout to the central posterior tip of the margin and showed that *D. kurroides* has a longer tip compared to *D. tabl* and *D. smithvanizi*. These diagnostics characters can help to identify and differentiate the species from each other, which is necessary for effective conservation and management of this group.

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