Distributional Range Extension of *Xeniamia atrithorax* (Perciformes: Apogonidae) in the northern South China Sea

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The distributional range of *Xeniamia atrithorax* Fraser and Prokofiev, 2016, previously recorded only from central Vietnam, is extended northward to Taiwan on the basis of seven specimens (20.5–31.1 mm standard length). A detailed description is provided for the specimens, including fresh coloration, which was previously unknown for the species.

Key Words: Teleostei, cardinalfish, new records, morphology, taxonomy, fish fauna.

Introduction

The monotypic apogonid genus *Xeniamia* Fraser and Prokofiev, 2016 is characterized by VIII-I, 9 dorsal-fin rays, one supraneural, two epurals, the first and second hypurals fused, the posterior margin of the preopercle smooth, and a large cluster of melanophores anterior to the pelvic-fin origin (Fraser and Prokofiev 2016). *Xeniamia atrithorax* was originally described by Fraser and Prokofiev (2016) from specimens collected from Vietnam. However, there have been no subsequent reports of the species. During an ichthyofaunal study in southern Taiwan, seven specimens of *X. atrithorax* were collected, being the second record of the species. Color photographs taken at the time of collection have enabled the fresh coloration of the species to be described (herein) for the first time.

Materials and Methods

Counts and measurements followed Fraser and Prokofiev (2016). Measurements were made to the nearest 0.1 mm with needle-point digital calipers under a dissecting microscope. Standard length is abbreviated as SL. Curatorial procedures for the collected specimens followed Motomura and Ishikawa (2013). Osteological characters, including vertebral counts, were observed from radiographs of two specimens of *X. atrithorax* (KAUM–I. 110317, 110339). The formula for the configuration of supraneural bones, anterior neural spines and anterior dorsal pterygiophores followed Ahlstrom et al. (1976). The specimens of *X. atrithorax* examined in this study are deposited at the Kagoshima University Museum, Japan (KAUM) and National Museum of Marine Biology and Aquarium, Taiwan (NMMB).
body.

Origin of first dorsal fin posterior to vertical through pelvic-fin base; fourth spine longest. Origin of second dorsal fin anterior to vertical through anal-fin origin; second soft ray of second dorsal fin longest; all dorsal-fin soft rays branched. Anal-fin origin positioned below base of fourth soft ray of second dorsal fin; first spine of anal fin shorter than second. Origin of pelvic fin anterior to vertical through uppermost part of pectoral-fin base. Pectoral fin reaching to vertical through third or fourth soft ray base of second dorsal fin. Posterior tip of depressed pelvic fin extending beyond vertical through sixth spine base of first dorsal fin. Caudal fin rounded.

Coloration when fresh—Body semi-translucent, pinkish orange. Posterior and ventral margins of orbit to anterior part of caudal peduncle silvery, except anal-fin base and upper part of body. Dorsal margin of eye black; pupil black; iris silvery-orange. Black pigmentation scattered from posterodorsal region of eye to nape (KAUM–I. 109976: Fig. 1A, B) or restricted to posterodorsal region of eye (KAUM–I. 110317: Fig. 1C, D). Dorsal and caudal fins translucent reddish. Pectoral and anal fins translucent, colorless. Pelvic fin translucent, reddish basally with black pigmentation. Black blotch anterior to pelvic-fin origin. Ventral body surface scattered with black pigment in KAUM–I. 109976 (Fig. 1A, B), more lightly so in KAUM–I. 110317 (Fig. 1C, D).

Coloration of preserved specimens—Head and body pale; black pigmentation persistent on head and body.

Distribution. Currently known from the following localities: Nha Trang and Van Phong bays, central Vietnam (Fraser and Prokofiev 2016) and Pingtung and Kaohsiung, southern Taiwan (this study).

Remarks. The Taiwanese specimens were identified as Xeniamia atrithorax on the basis of having VIII-I, 9 dorsal-fin rays, the preopercle posterior margin smooth, a large

Table 1. Proportional measurements (as percentages of SL) of *Xeniamia atrithorax*.

| Measurement                          | This study | Fraser and Prokofiev (2016) |
|--------------------------------------|------------|-----------------------------|
|                                      | Non-types  | Holotype                    | Paratypes |
|                                      | Taiwan     | Vietnam USNM 436743         | Vietnam   |
|                                      | n=7        |                             | n=18      |
| SL (mm)                              | 20.5–31.1  | 25.1                        | 22.0–29.5 |
|                                      |            |                             |           |
| Body depth                           | 34.8–38.8  | 38.7                        | 35.7–43.2 |
| Body width                           | 12.5–14.1  | —                           | —         |
| Head length                          | 36.7–44.9  | 37.0                        | 37.9–44.4 |
| Snout length                         | 7.7–8.6    | 5.98                        | 7.20–11.4 |
| Eye diameter                         | 10.6–11.8  | 8.76                        | 9.26–11.4 |
| Interorbital width                   | 8.7–9.9    | 9.16                        | 8.93–11.6 |
| Upper-jaw length                     | 20.9–22.9  | 22.3                        | 20.0–25.0 |
| Caudal-peduncle depth               | 11.0–13.7  | 13.2                        | 12.0–14.9 |
| Caudal-peduncle length              | 21.6–24.3  | 21.9                        | 19.0–25.0 |
| Pre-dorsal-fin length               | 38.8–44.9  | —                           | —         |
| Dorsal-fin base length              | 33.8–39.0  | —                           | —         |
| 1st dorsal-fin spine length         | 1.1–1.6    | 1.2                         | 1.11–3.46 |
| 2nd dorsal-fin spine length         | 7.4–8.7    | 6.77                        | 4.80–13.5 |
| 3rd dorsal-fin spine length         | 14.3–14.8  | 15.9                        | 12.5–18.2 |
| 4th dorsal-fin spine length         | 13.8–15.2  | 16.7                        | 14.0–18.2 |
| 1st spine length of 2nd dorsal fin  | 9.4–10.7   | —                           | 17.3–26.0 |
| Longest dorsal-fin soft ray length  | 18.0–21.4  | —                           | —         |
| Pre-anal-fin length                 | 63.9–68.6  | —                           | —         |
| Anal-fin base length                | 10.9–13.2  | —                           | —         |
| 1st anal-fin spine length           | 2.1–3.7    | 3.57                        | 2.76–4.80 |
| 2nd anal-fin spine length           | 9.0–9.8    | 9.16                        | 8.47–11.4 |
| Longest anal-fin soft ray length    | 18.3–20.3  | —                           | —         |
| Pectoral-fin base length            | 4.9–5.9    | —                           | —         |
| Pectoral-fin length                 | 25.4–29.3  | —                           | 24.6–30.0 |
| Pre-pelvic-fin length               | 35.0–41.5  | —                           | —         |
| Pelvic-fin spine length             | 12.0–13.6  | —                           | —         |
| Longest pelvic-fin soft ray length  | 20.9–22.1  | 20.0–24.1                   | —         |

Fig. 1. Fresh specimens of *Xeniamia atrithorax*, collected off Dong-gang, Pingtung, Taiwan. (A, B) KAUM–I. 109976, 29.9 mm SL; (C, D) KAUM–I. 110317, 28.1 mm SL.
black blotch anterior to the pelvic-fin origin, and black internal organs (Fraser and Prokofiev 2016).

Although morphometric values for the Taiwanese specimens agreed with those of the type specimens of *Xeniamia atrithorax* given by Fraser and Prokofiev (2016), they differed slightly in some morphometric measurements (regarded here as intraspecific variations), as follows: body depth 34.8–38.8% SL (vs. 35.7–43.2% SL in types); head length 36.7–44.9% SL (vs. 37.0–44.4%); eye diameter 10.6–11.8% SL (vs. 8.76–11.4%); interorbital width 8.7–9.9% SL (vs. 8.93–11.6%); caudal-peduncle depth 11.0–13.7% SL (vs. 12.0–14.9%); 1st dorsal-fin spine length 1.1–1.6% SL (vs. 1.11–3.46%); 4th dorsal-fin spine length 13.8–15.2% SL (vs. 14.0–18.2%); and 1st anal-fin spine length 2.1–3.7% SL (vs. 2.76–4.80%) (Table 1). On the other hand, Fraser and Prokofiev (2016: table 2) gave the second dorsal-fin first spine length as 17.3–26.0% SL, clearly longer than those of the Taiwanese specimens (9.4–10.7%). However, the longest dorsal-fin soft ray length being 18.0–21.4% SL in the latter, close to the value for the second dorsal-fin first spine in the type specimens, suggests geographic variation of the species and the need for examination of more specimens representing a wide distributional range.

The largest individual of this species from Vietnam was 29.5 mm SL (Fraser and Prokofiev 2016), slightly shorter than the largest Taiwanese specimen (NMMB-P 27134; 31.1 mm SL). The seven specimens of *X. atrithorax* from Taiwan represent the northernmost record for the species.

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