



Plectranthias purpuralepis sp. nov., a new anthiadine perchlet from northern Taiwan (Perciformes: Serranidae)

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Abstract

A new species of *Plectranthias* Bleeker is described on the basis of 16 specimens collected from northern Taiwan. The new species, *Plectranthias purpuralepis* sp. nov. can be distinguished from its congeners in having pectoral and pelvic fins mostly covered with small scales, some white scales on dorsum turn purple when preserved, and the following combination of characters: dorsal-fin elements X, 16–17; 3rd dorsal-fin spine longest; pectoral-fin rays 14, all branched except for uppermost simple ray; principal caudal-fin rays 9+8; pored lateral-line scales 33–36; 6 diagonal rows of large scales on cheek; circumpeduncular scales 14; ca. 7 rows of large predorsal scales, 2 irregular rows of small scales extending to a line through posterior nostrils; no scales on maxilla and chin; posterior margin of preopercle serrated, ventral margin with 2 antrorse spines; and the greatest body depth 2.9–3.0 in SL.

Key words: Teleostei, Actinopterygii, taxonomy, ichthyology

Introduction

The genus *Plectranthias* Bleeker, 1873 is a group of anthiadine fishes that inhabit shallow to deep mesophotic rocky reefs or bottoms. The distribution of the group is mainly restricted to the tropical and subtropical Indo-Pacific region, with only one exception, *Plectranthias garrupellus* Robins & Starck, 1961, which inhabits the western Atlantic (Allen & Walsh, 2015). The majority of this group are small-sized fishes (e.g. not exceeding 120 mm SL), with only a few exceptions that can exceed that length (Randall, 1980; Froese & Pauly, 2019). Most of these species have cryptic habits, inhabit rocky bottoms, and occur in deeper waters. They are not easily caught by hook and line or bottom-trawling, and not easily approached by scuba diving. Therefore, these species are not well represented in museum collections (Chen & Shao, 2002).

Currently the genus comprises 56 valid species, with 52 species listed in Anderson (2018). Four species were described subsequently, including *Plectranthias maekawa* Wada, Senou & Motomura, 2018 from Japan, *Plectranthias ahiahiata* Shepherd *et al.*, 2018 from Easter Island, *Plectranthias ryukyuensis* Wada *et al.*, 2020 and *Plectranthias cruentus* Gill & Roberts, 2020.

In Taiwan, 11 species of *Plectranthias* were recognized previously (Lee, 1990; Shen *et al.*, 1993; Lin *et al.*, 1994; Chen & Shao, 2002). Wu *et al.* (2011) described two new species, *Plectranthias elongatus* and *Plectranthias xanthomaculatus*, and brought the total number to 13.

Recently, specimens of an unidentified species were collected by hook and line from deep waters around the “Three Northern Islands” (e.g. Pinnacle islet, Crag islet, and Agincourt islet) and bought in a fish market in Keelung. Compared to all known *Plectranthias* species, they are morphologically similar to *Plectranthias jothyi* Randall, 1996, *Plectranthias anthioides* (Günther, 1872), *Plectranthias kamii* Randall, 1980 and *Plectranthias sheni* Chen & Shao, 2002, but with a certain number of differences. The specimens were recognized as an undescribed species. The purpose of this work is to describe and name the new species and compare it to closely related species.

Methods and materials

Methods for taking counts, measurements, and format of description generally followed Gill *et al.* (2016), except where indicated. Measurements were taken by digital calipers and common calipers based on the length of the measured items, recorded to the nearest 0.1 mm. Standard length (SL) and head length (HL) were used throughout. Caudal-fin length was the length of the lowermost ray of the upper lobe. Meristic data were obtained from the left side of the specimens. Morphometrics data are shown as % SL or HL in the main text and Table 1; selected morphometrics data in Table 3 are given in number of times in SL or HL for easy comparison.

Specimens were deposited at the Pisces Collection of National Museum of Marine Biology & Aquarium, Pingtung, Taiwan (NMMB-P) and National Museum of Marine Science and Technology, Keelung, Taiwan (NMMST). Data for comparison were adopted from Randall (1980, 1996) and Chen & Shao (2002). Specimens were stained by Alizarin Red S to observed skeletal characters and squamation pattern when necessary.

Plectranthias purpurelepis sp. nov.

New English name: Purple-scaled perchlet

Figures 1A, 2, 3A, 4, 5A, 6A, 7A, 8; Tables 1–3

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Holotype. NMMSTP002339 (143.8 mm SL), ca. 25.4–25.6°N, 121.9–122.0°E, Three Northern Islands, Northern Taiwan, northwestern Pacific Ocean, collected by angling boat, purchased at Keelung fish market, 25 Sep. 2019.

Paratypes. Fifteen specimens, 93.6–150.9 mm SL. NMMB-P30975 (143.6 mm SL), NMMSTP002340 (144.7), NMMSTP002341 (146.6 mm SL), collected together with the holotype. NMMB-P032937 (137.4) and NMMB-P033386 (131.1), purchased at Keelung fish market, 30 Dec. 2019; NMMB-P032938–43 (6, 116.9–133.0), purchased at Keelung fish market, 18 Dec. 2019; NMMB-P032944–7 (4, 93.6–145.7), purchased at Keelung fish market, 27 Mar. 2019; all these specimens may have been collected near the type locality.

Diagnosis. A species of *Plectranthias* with pectoral and pelvic fins mostly covered by small scales and scales on the whitish pink blotches turn purple when preserved. It can be further separated from congeners by having the combination of following characters: dorsal-fin elements X, 16–17; 3rd dorsal-fin spine longest; pectoral-fin rays usually 14, all branched except for uppermost ray simple; principal caudal-fin rays 9+8; pored lateral-line scales 32–36; 6 diagonal rows of large scales on cheek; circumpeduncular scales 14; ca. 7 rows of large predorsal scales, 2 irregular rows of small scales extending to a line through posterior nostrils; no scales on maxilla and chin; posterior margin of preopercle serrated, ventral margin with 2 antrorse spines; and greatest body depth 32.6–35.1% SL.

Description. Following data and status are given for the holotype with those of paratypes in parentheses when different, unless otherwise indicated.

Dorsal-fin elements X, 16 (X, 16–17), all rays segmented and branched; anal-fin elements III, 7, all rays branched; pectoral-fin rays 14/14 (13–15), all rays segmented and branched except for the uppermost ray which is segmented and simple; pelvic-fin elements I, 5, all rays segmented and branched; upper procurrent caudal-fin rays 7 (7); lower procurrent caudal fin rays 6 (6–7); principal caudal fin rays 9+8 (branched rays 8+7); total caudal-fin rays 30 (30–31).

Lateral line complete, with 33 tubed scales on both sides (32–34, except 1 paratype with 35 and 1 with 36); 4.5 (4 or 4.5) scale rows between lateral line to origin of dorsal fin (4 and 1 small scale at base of first spine); 2.5 (2.5 or 3.5) scale rows between lateral line to base of middle dorsal spines; scale rows counted from lateral line slanting down posteriorly to origin of anal fin 14 (13–14, except 1 paratype with 17); diagonal rows of large scales on cheek between eye and corner of preopercle 6; ca. 7 (7–9) large predorsal scale rows, with 2 irregular rows of small scales extending to a line through posterior nostrils; circumpeduncular scales 14.

Gill rakers 17 (16–20), including 4 (rudimentary)+1 (developed) (4+1–2) on upper limb and 8 (developed)+4 (rudimentary)=12 (7–8+4–6=11–14) on lower limb; pseudobranch filaments 20 (18–26); branchiostegal rays 7.

Vertebrae 10+16=26; supraneurals 3; predorsal formula 0/0+0/2/1+1; ribs present on the 3rd vertebra to the 10th; epurals 3; epineural bones 11; no trisegmental pterygiophores in either the dorsal or anal fins; numbers of pterygiophores inserting within the 9th through 13th interneural spaces 1/1/2/2/2; single uroneural (posterior uroneural absent).

TABLE 1. Morphometric data of *Plectranthias purpuralepis* sp. nov. and four similar species. Data for comparison were adopted or calculated from Randall (1980, 1996) or original descriptions. D = Dorsal fin, A = Anal fin, HT = holotype.

| | <i>P. purpuralepis</i> sp. nov. | | | <i>P. anthioides</i> | | <i>P. jothyi</i> | | <i>P. sheni</i> | | <i>P. kamii</i> | | |
|------------------------|---------------------------------|-------------------|-----|----------------------|----|------------------|-------|-------------------|--------------|-----------------|-------------------|-----|
| | HT | Selected types | | HT | SD | HT | HT | HT | Mean (Range) | SD | Mean (Range) | SD |
| SL (mm) | 143.8 | 93.6–150.9 (n=12) | | 83.0 | | 92.0 | 106.7 | 108.6–120.5 (n=5) | 215.0 | | 135.1–216.6 (n=6) | |
| %SL | | Mean (Range) | SD | | | | | Mean (Range) | SD | | Mean (Range) | SD |
| Greatest body depth | 34.0 | 33.9 (32.6–35.1) | 0.7 | 35.0 | | 34.8 | 39.4 | 36.9 (34.6–39.0) | 1.5 | 37.1 | 36.0 (34.7–37.7) | 1.1 |
| Body width | 19.1 | 19.2 (18.2–20.2) | 0.7 | – | | 19.2 | 19.1 | 19.2 (17.5–20.2) | 1.1 | 19.5 | 19.3 (18.0–21.8) | 1.3 |
| Head length | 40.8 | 42.0 (40.7–43.4) | 1.1 | 39.8 | | 43.6 | 43.2 | 43.3 (42.8–43.6) | 0.3 | 44.1 | 43.6 (42.8–44.9) | 0.9 |
| Snout length | 9.9 | 10.6 (9.9–11.5) | 0.5 | 10.0 | | 10.8 | 11.2 | 11.9 (11.5–12.3) | 0.3 | 13.0 | 12.4 (10.9–13.7) | 1.1 |
| Orbital diameter | 10.8 | 10.7 (10.1–10.5) | 0.5 | 10.8 | | 11.1 | 11.5 | 10.8 (10.2–11.8) | 0.6 | 9.8 | 10.5 (10.1–11.0) | 0.3 |
| Interorbital width | 4.2 | 4.1 (3.5–4.4) | 0.3 | – | | 4.1 | 4.4 | 4.4 (4.0–4.7) | 0.3 | 4.5 | 4.3 (3.8–4.7) | 0.4 |
| Upper jaw length | 19.0 | 19.0 (17.7–19.8) | 0.6 | – | | 21.2 | 19.5 | 20.2 (19.5–21.4) | 0.8 | 22.1 | 20.7 (19.7–21.8) | 0.7 |
| Caudal-peduncle length | 21.6 | 20.9 (19.8–21.7) | 0.6 | – | | 17.4 | 18.2 | 21.2 (20.4–21.6) | 0.5 | 18.1 | 19.4 (19.0–20.4) | 0.5 |
| Caudal-peduncle depth | 12.3 | 12.6 (11.8–13.6) | 0.5 | – | | 12.7 | 11.5 | 12.2 (11.9–12.5) | 0.2 | 11.6 | 11.7 (10.3–12.3) | 0.7 |
| Predorsal length | 39.5 | 40.6 (38.4–42.7) | 1.2 | – | | 39.1 | 35.6 | 41.6 (39.7–44.1) | 1.7 | 40.5 | 39.9 (38.8–40.7) | 0.7 |
| Preal length | 69.8 | 70.5 (66.9–73.1) | 1.8 | – | | 69.2 | 70.7 | 69.0 (67.3–70.0) | 1.1 | 74.0 | 72.6 (70.0–74.5) | 1.7 |
| Prepelvic length | 38.8 | 38.5 (36.4–42.2) | 1.9 | – | | 38.4 | 36.0 | 38.4 (36.9–40.2) | 1.2 | 40.0 | 39.8 (36.7–45.0) | 2.8 |
| D base length | 49.9 | 51.0 (47.6–55.6) | 2.5 | – | | 50.0 | 53.8 | 53.0 (50.9–54.3) | 1.3 | 51.4 | 53.0 (50.0–56.2) | 2.4 |
| First D spine | 4.9 | 5.3 (4.1–7.2) | 0.8 | 7.4 | | 6.5 | 5.1 | 6.1 (5.4–7.1) | 0.7 | 6.0 | 6.0 (4.0–7.5) | 1.3 |
| Longest D spine (3rd) | 14.3 | 14.4 (12.0–16.3) | 1.2 | 19.5 | | 19.5 | 17.6 | 17.4 (16.9–18.3) | 0.6 | 18.1 | 20.0 (16.9–22.7) | 2.2 |
| Longest D ray | 15.8 | 15.7 (14.3–17.0) | 0.9 | – | | 19.5 | 17.4 | 15.9 (15.3–16.2) | 0.4 | 16.5 | 16.2 (14.9–17.0) | 1.0 |
| A base length | 15.1 | 14.7 (13.2–16.0) | 0.8 | – | | 16.3 | 14.6 | 15.6 (14.8–16.4) | 0.6 | 14.1 | 15.4 (14.6–16.1) | 0.7 |
| First A spine | 7.4 | 7.4 (6.0–8.7) | 0.8 | 10.7 | | 9.3 | 8.0 | 8.2 (7.2–9.4) | 1.0 | 7.3 | 7.2 (6.3–7.7) | 0.6 |
| Second A spine | 14.5 | 14.9 (14.0–15.9) | 0.6 | 19.5 | | 19.6 | 16.6 | 16.6 (15.6–17.4) | 0.8 | 14.2 | 14.9 (13.3–16.3) | 1.1 |
| Third A spine | 12.6 | 12.5 (10.9–14.1) | 0.9 | 16.5 | | 16.2 | 13.4 | 13.5 (12.8–14.2) | 0.5 | 13.1 | 13.0 (12.4–13.7) | 0.6 |
| Longest A ray | 18.6 | 19.1 (17.1–21.4) | 1.2 | – | | 24.4 | 23.4 | 20.7 (20.3–21.4) | 0.5 | 21.9 | 21.6 (19.5–23.0) | 1.4 |
| Caudal fin length | 18.0 | 19.6 (17.5–21.8) | 1.4 | – | | 29.2 | 24.1 | 20.5 (19.0–23.6) | 1.9 | 30.7 | 20.2 (19.1–21.9) | 1.2 |
| Pectoral fin length | 31.0 | 32.0 (30.3–33.7) | 1.3 | 32.3 | | 32.2 | 33.5 | 34.6 (33.7–35.4) | 0.6 | 34.4 | 36.6 (34.9–37.8) | 1.0 |
| Pelvic fin length | 19.8 | 20.5 (18.8–22.0) | 1.0 | 23.0 | | 23.9 | 21.4 | 21.5 (20.8–22.1) | 0.5 | 21.0 | 22.2 (19.7–23.4) | 1.3 |

TABLE 2. Meristic data of *Plectranthias purpuralepis* sp. nov. and four similar species. Frequency of paratypes are provided when available. Data of type specimens for comparison were adopted from Randall (1980, 1996) or the original descriptions. HT = Holotype, PT = paratype, LL = lateral line.

| | <i>P. purpuralepis</i> sp. nov. | | <i>P. jothyi</i> | | <i>P. anthioides</i> | | <i>P. sheni</i> | | <i>P. kamii</i> | |
|-----------------------------|---------------------------------|--|-------------------------------|--------|----------------------|--------|--------------------------|--------|--------------------------|--|
| | HT | Paratypes n=15 (frequency) | HT; PT | HT | HT | HT | Nontypes (Taiwan) n=7 | HT | Nontypes (Taiwan) n=6 | |
| Dorsal-fin rays | X, 16 | X, 16 (3), X, 17 (12) | X, 18; X, 17 | X, 17 | X, 18 | X, 18 | X, 17-18 | X, 18 | X-XI, 17-18 | |
| Anal-fin rays | III, 7 | III, 7 (15) | III, 7 | III, 7 | III, 7 | III, 7 | III, 7 | III, 7 | III, 7 | |
| Pectoral-fin rays | 14 | 13 (1), 14 (13), 15 (1) | 14; 15 | 14 | 13 | 13 | 12-13 | 13 | 13/13 | |
| Pelvic-fin rays | I, 5 | I, 5 (15) | I, 5 | I, 5 | I, 5 | I, 5 | I, 5 | - | I, 5 | |
| Principal caudal-fin rays | 9+8 | 9+8 (15) | - | - | - | - | 9+8 | - | 9+8 | |
| Branched caudal-fin rays | 8+7 | 8+7 (15) | 8+7 | 15 | - | - | 8+7 | 15 | 8+7 | |
| Upper/lower precurrent rays | 7/6 | 7/6 (9), 7/7 (6) | - | - | - | - | 7/6 | - | 7, 6 | |
| Total caudal-fin rays | 30 | 30 (15) | - | - | - | - | 30 | - | 30 | |
| Lateral-line scales | 33 | 32 (2), 33 (3), 34 (7), 35 (1), 36 (1) | 34 | 33/35 | 32 | 32 | 31-34 | 36 | 33-38 | |
| Scale rows above LL | 4.5 | 4 (1), 4.5 (13) | 4 | 3.5 | 4.5 | 4.5 | 4.5 | 5.5 | 5.5 | |
| Scale rows below LL | 14 | 13 (5), 14 (9), 17 (1) | 14 | - | - | - | 13-14 | 18 | 17-18 | |
| Cheek scale rows | 6 | 6 (15) | 7 | 5 | 5 | 5 | 5-6 | 6 | 6-7 | |
| Predorsal scale rows | 7 | 7 (10), 8 (4), 9 (1) | - | - | - | - | 6-8 | - | 7-8 | |
| Circumpeduncular scales | 14 | 13 (1), 14 (13) | 16 | 14 | - | - | 14 | 15 | 14 | |
| Gill rakers (upper limb) | 4+1 | 4+1 (14), 4+2 (1) | 6 | 6 | - | - | 3+2 | 6 | 3+2 or 3+3 | |
| Gill rakers (lower limb) | 8+4 | 7+4 (1), 7+5 (2), 7+6 (1), 8+4 (7), 8+5 (1), 8+6 (1) | 2+10=12 (developed) 18; 19 | 13 | - | - | 7-8+4-6=11-14 | 13 | 9+3-4=12-13 | |
| Gill rakers (total) | 17 | 16-20 | 25; 33 | 19 | 17 | 17 | 16-19 | 19 | 17-19 | |
| Pseudobranchial filaments | 20 | 18-26 | - | - | - | - | 21-25 | 37 | 28-36 | |
| Branchiostegal rays | 7 | 7 (15) | 7 | - | - | - | 7 | - | 7 | |

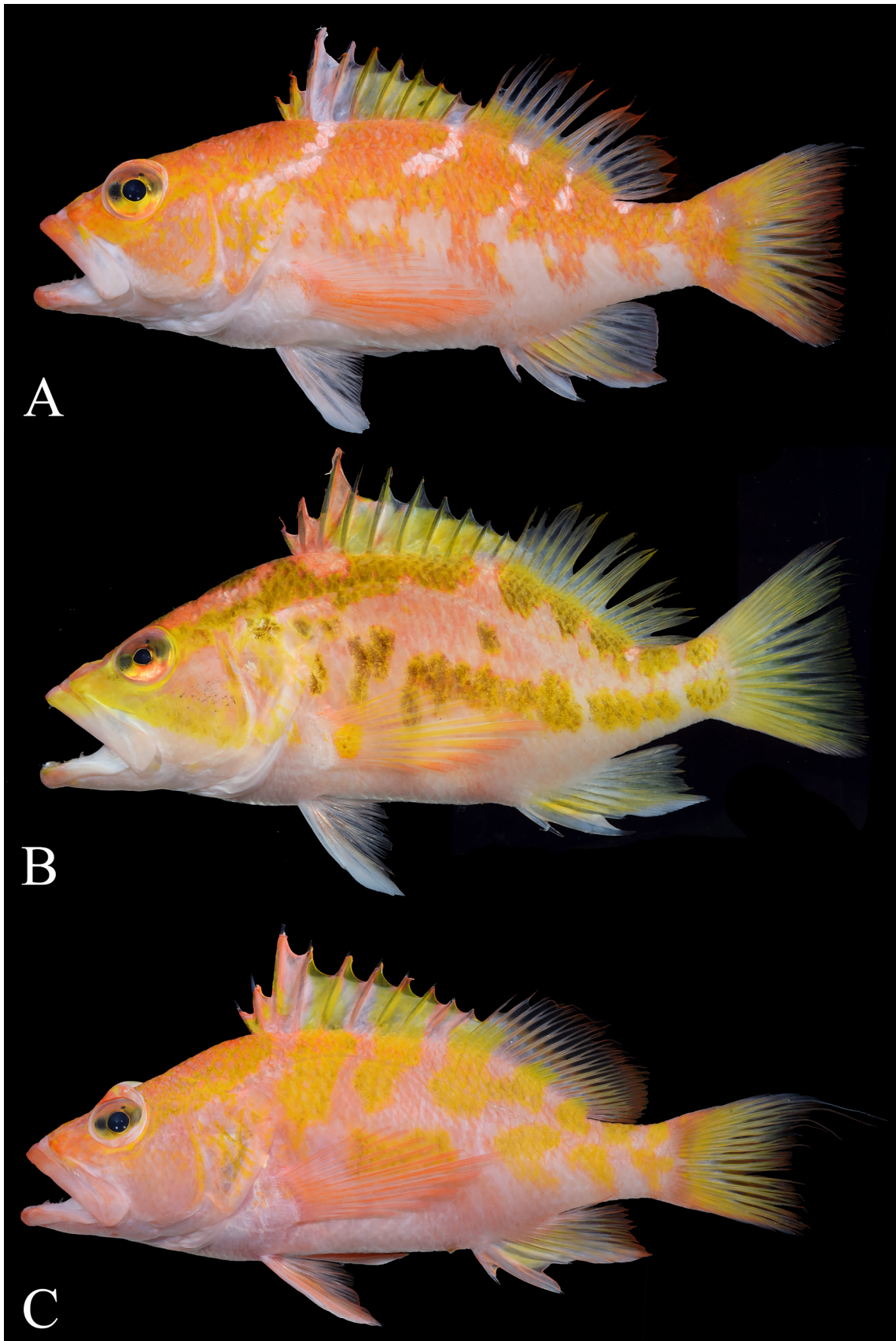


FIGURE 1. Fresh coloration. **A.** *Plectranthias purpuralepis* **sp. nov.**, NMMSTP002339, 143.8 mm SL, holotype. **B.** *P. sheni*, NMMSTP002342, 120.5 mm SL. **C.** *P. kamii*, NMMSTP002338, 152.9 mm SL.

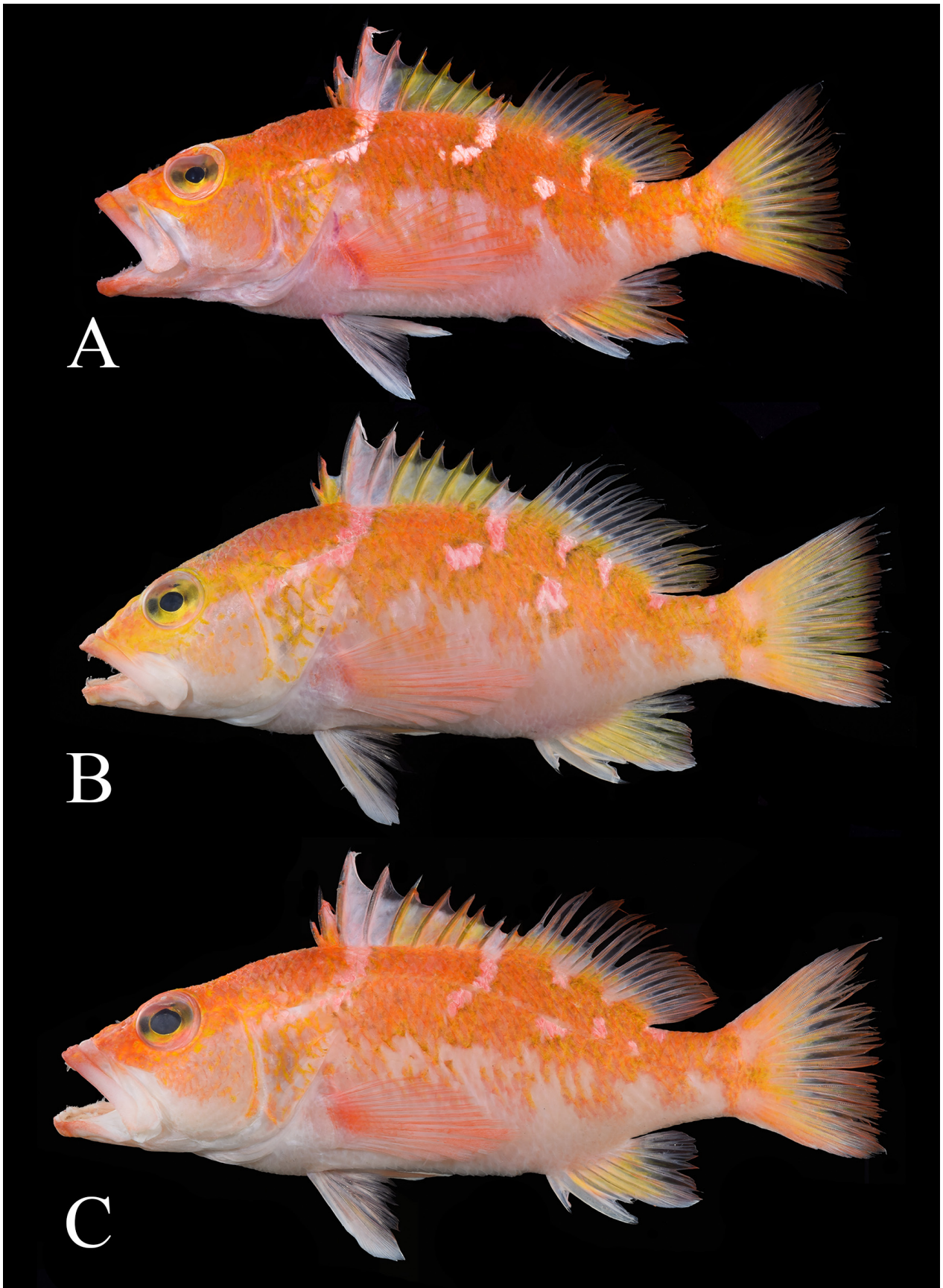


FIGURE 2. Paratypes of *Plectranthias purpuralepis* sp. nov. **A.** NMMB-P32943, 143.6 mm SL; **B.** NMMB-P33386, 144.7 mm SL; **C.** NMMB-P32937, 146.6 mm SL.

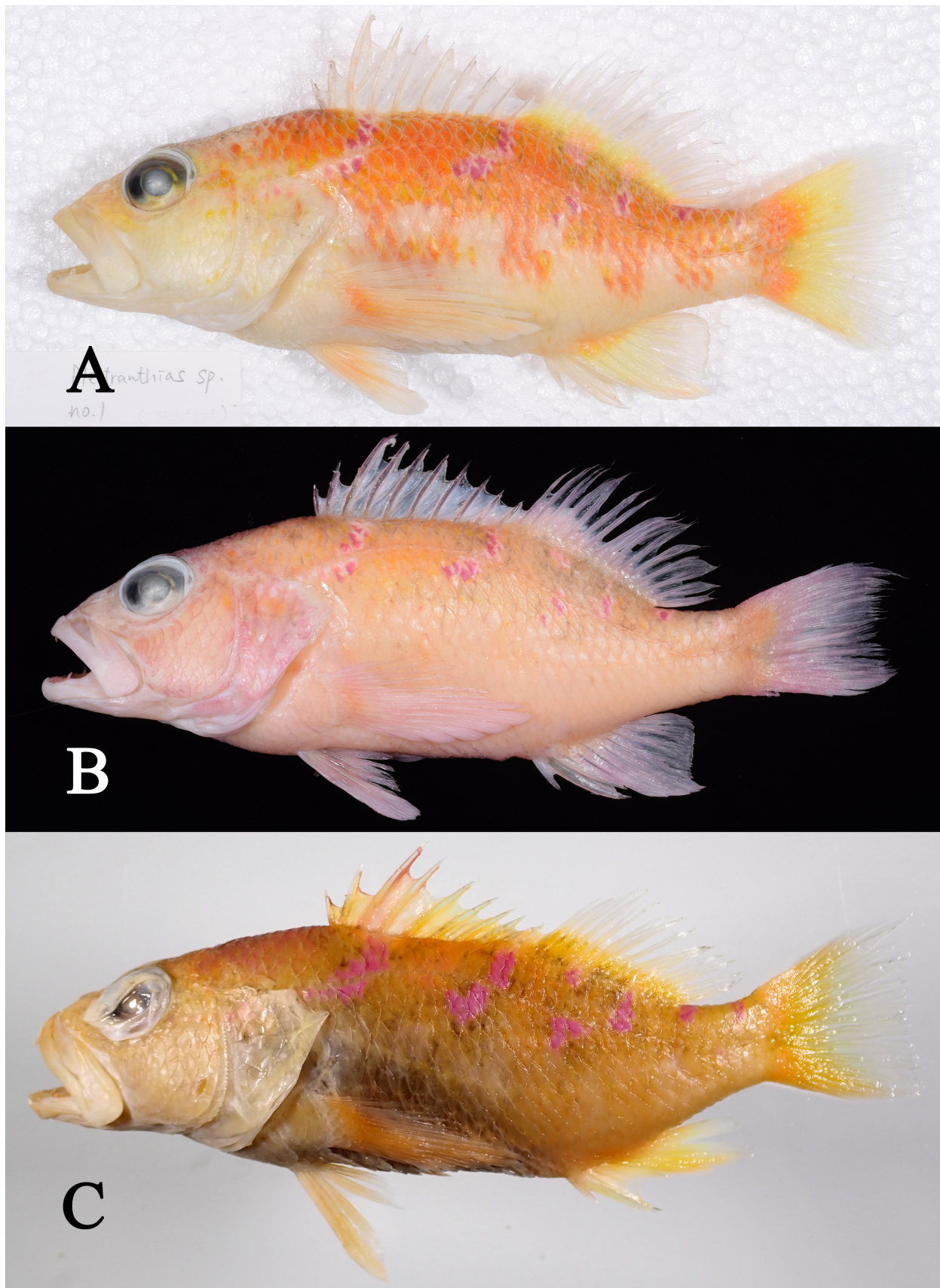


FIGURE 3. Preserved coloration of *Plectranthias purpuralepis* **sp. nov.** A–B. holotype, NMMSTP002339, C. paratype, NMMB-P032946, 140.2 mm SL. A. after two-day and consequently one-week preservation in formalin and 70% ethanol, respectively; B. after one-month preservation in ethanol (note that gill cover and fins are slightly stained by red color artificially); C. after ten-month preservation in ethanol.

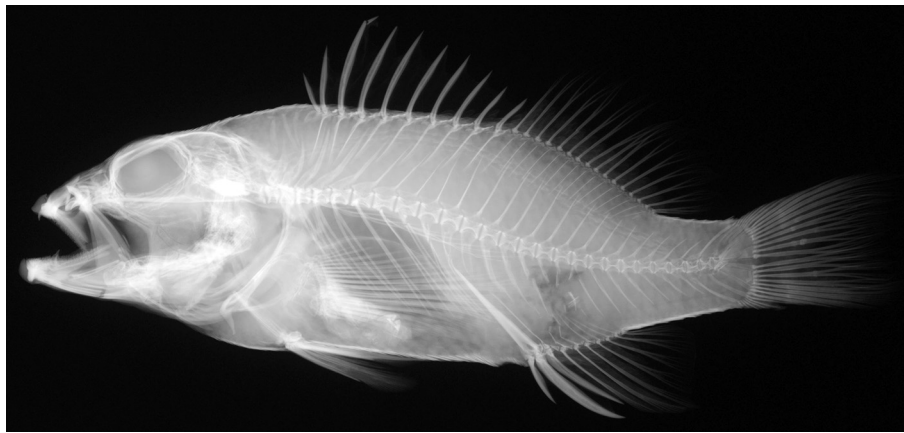


FIGURE 4. *Plectranthias purpuralepis* sp. nov., holotype, NMMSTP002339, radiograph.

Body relatively long, oblong, greatest body depth 34.0% (32.6–35.1%) SL; dorsal profile of head slightly convex, spinous dorsal-fin base nearly straight. Head moderately large, its length 40.8% (40.7–43.4%) SL; snout relatively short, 9.9% (9.9–11.5%) HL; eye moderately large, its diameter 26.4% (23.8–27.2%) HL; interorbital space flatten to slightly concave, its width 10.2% (8.5–10.7%) HL.

Mouth large, slightly oblique, posterior margin of maxilla slightly before the vertical through middle of eye; maxilla expanded posteriorly, with long, low, lateral ridge running parallel to dorsal margin; a small rod-shaped supramaxilla above posterior portion of maxilla; mouth terminal, lower jaw extending slightly beyond tip of upper jaw.

Upper jaw with 1 (1 or 2 in paratypes) large fixed canine on either side of symphysis, flanked internally by villiform band with about 12 (11–14) rows of depressible, smaller, sharp-tipped teeth, with inner rows becoming progressively longer, band reduced to 3 rows posteriorly; lower jaw with 1 or 2 (1 or 2) moderately large fixed canines on either side of symphysis, flanked internally by villiform band of about 9 (7–9) rows of small depressible teeth at symphysis, teeth becoming progressively longer on inner rows, 1 (1 or 2) enlarged, curved canine on middle of jaw on either side, band reduced to single row posteriorly; vomer with roughly V-shaped band of 4 (4; 6 in 1 paratype) rows of sharp-tipped conical teeth; palatine with a band of 3 (3–5) rows of small, sharp-tipped conical teeth; ectopterygoid and mesopterygoid edentate; tongue narrow, pointed and edentate.

Three flat spines on opercle, middle one longest, uppermost one covered by scales, others naked. Posterior margin of preopercle irregular, serrated, about 27/27 (17–26) small serrae; two antrorse spines on ventral margin. Interopercle and subopercle exposed margins smooth. Anterior nostril at middle of snout, tubular, a small flap on posterior rim; posterior nostril at orbit anterior border, rim slightly raised, no flap.

Dorsal fin with fleshy filament only on the tip of third spine; third dorsal-fin spine longest; dorsal fin moderately incised before first ray, the last dorsal-fin spine slightly shorter than the penultimate spine; second anal-fin spine longest and thickest; anal fin pointed with third ray longest; caudal fin truncate, third principal ray on upper lobe slightly elongated, but not filamentous; lower 7 pectoral-fin rays thickened, membranes between these rays deeply incised; ninth (counting from the uppermost) ray thickest and longest, reaching a vertical through base of second dorsal-fin ray (first or second rays in paratypes); pelvic fins short, when appressed far in front of anus, second ray longest.

Body covered by large ctenoid scales, simple, without ctenial bases in posterior field; lateral line broadly arched over pectoral fin following body contour to caudal-fin base, each lateral-line scale with single opening directed dorsoposteriorly; no scales on maxilla, chin, and branchiostegal membranes. All fins partially scaled; dorsal fin with intermittent row of scales along basal 1/3 of soft ray portion; anal fin mostly covered by small ctenoid scales, membranes between the 3rd spine to 4th soft ray nearly entirely covered by scales; pectoral and pelvic fins covered by small ctenoid scales at basal 1/3, scales gradually narrower, smaller and becoming cycloid, extending to more than 2/3 of the fin; caudal fin covered with narrow ctenoid scales extending more than half of the fin.

Coloration. When fresh (Figs. 1A, 2), head and body yellowish to reddish yellow; five to six whitish pink stripes or blotches on dorsum, along dorsal-fin base and caudal peduncle, their width restricted to one scale. First stripe longest, extending from membranes of third and fourth dorsal-fin spines and slanting down to upper portion of

opercle anteriorly; second stripe from membranes between ninth and tenth dorsal-fin spines, extending downward to below lateral line; third stripe divided into 2 blotches, upper blotch at bases of fourth to seventh dorsal-fin rays and lower at lateral line; fourth stripe from bases of the tenth to twelfth dorsal-fin rays, extending right above lateral line; fifth and sixth stripes (blotches) at upper margin of caudal peduncle. Five irregular yellowish red blotches along lower portion of body; abdomen area usually whitish pink or uniformly white. Maxilla white, upper part of lips yellowish to pinkish; iris yellow, with two orange stripes on upper and lower margin, a blackish bar through the iris horizontally; cheek and opercle pinkish, yellowish margins on several scales; margin of preopercle yellowish, white bordered; chin and branchiostegal membranes white.

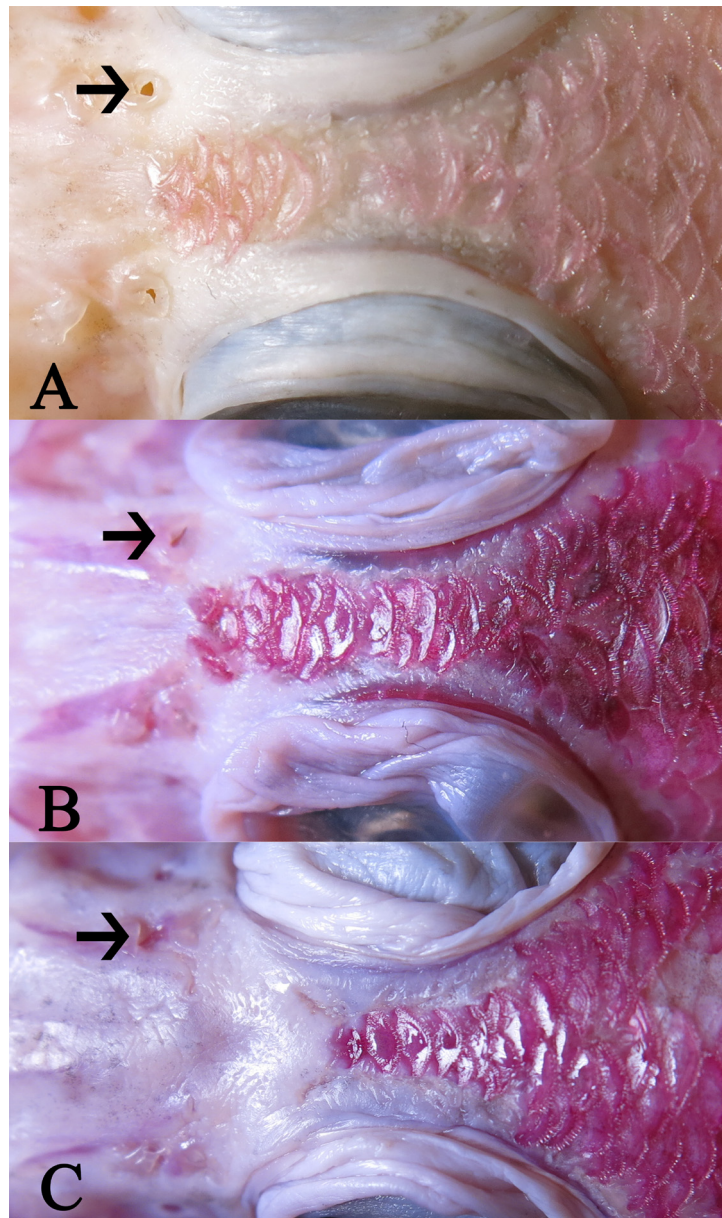


FIGURE 5. Squamation on interorbital space. **A.** *Plectranthias purpuralepis* **sp. nov.**, holotype. **B.** *P. sheni*, NMMSTP002343, 114.4 mm SL. **C.** *P. kamii*, NMMSTP002338, 152.9 mm SL. Arrows indicates the right posterior nostril.

Spinous dorsal fin mostly yellow or reddish yellow, membranes whitish between the second and fourth spines and ninth and tenth spines; soft dorsal fin with red margin, base yellow to reddish yellow with two whitish pink areas between fourth to seventh soft rays and tenth to twelfth soft rays; caudal fin reddish yellow with a broad reddish margin and two whitish pink blotches at caudal fin base; pectoral fin pale crimson; pelvic fin mostly white; anal fin pale to reddish yellow.

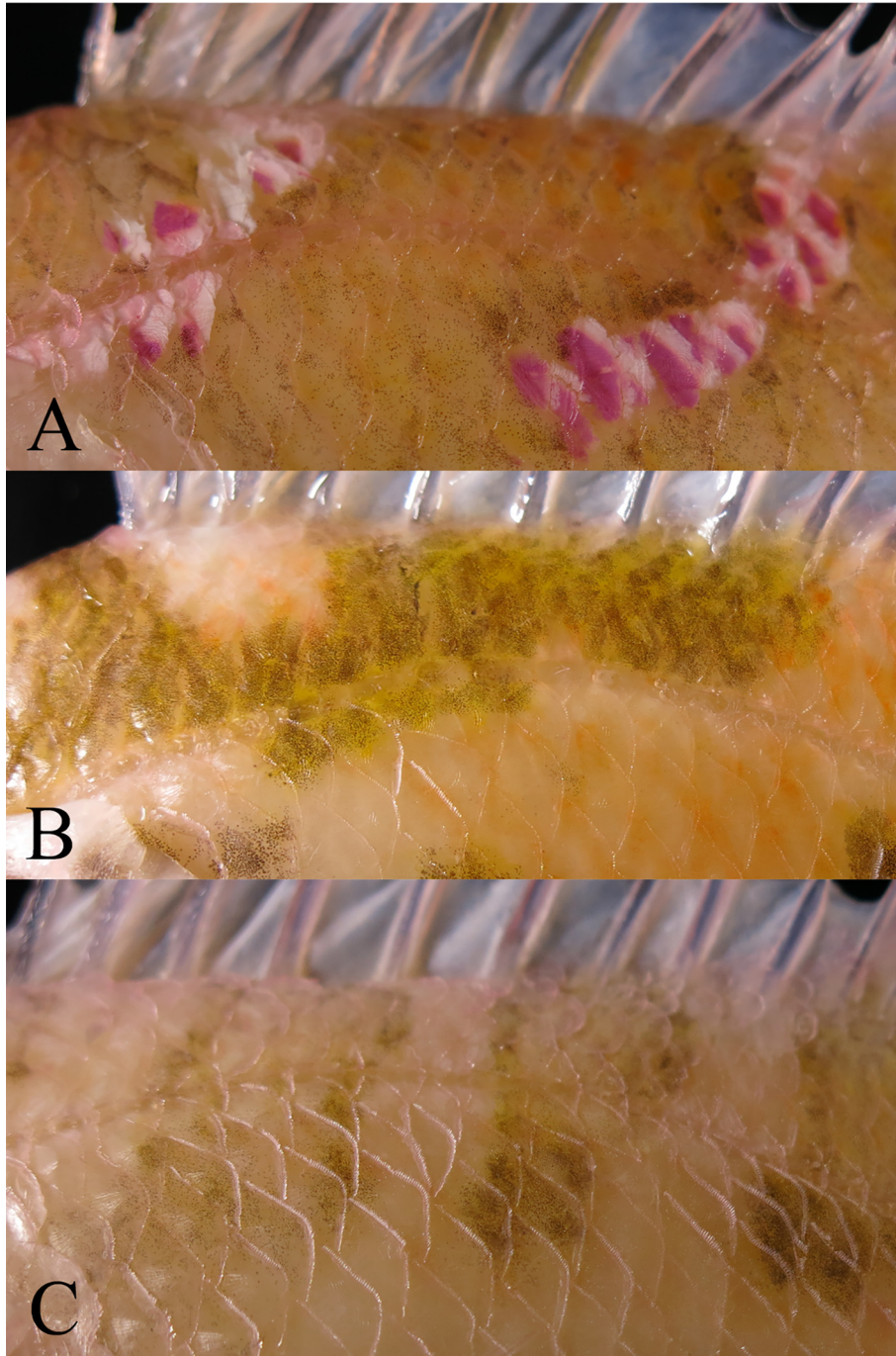


FIGURE 6. Color patterns on dorsum. A. *Plecترanthias purpuralepis* sp. nov., holotype; B. *P. sheni*, NMMSTP002342, 120.5 mm SL; and C. *P. kami*, NMMSTP002333, 158.0 mm SL.

When preserved in alcohol (Fig. 3), body pale; no blackish band along the median line of the nape; reddish yellow pigment above lateral line still present after a month in preservation; white stripes extending from dorsal-fin base become a distinct purple color. One specimen still shows the distinct purple marking after ten months (Fig. 3C); groups of melanophores present below the dorsal base; all fins transparent.

Size. The largest specimen examined is 151 mm SL.

Distribution and habitat. Only known from northern Taiwan, near the “Three Northern Islands,” collected by anglers at depths of 200 m or below, judging from other specimens collected together, such as *Parapercis* spp., *Plecترanthias kamii*, *P. sheni*, and *Helicolenus hilgendorfi* (Döderlein, 1884). The habitat of this species is assumed to be rocky reef bottom or slope in the mesophotic zone.

Etymology. The specific name *purpurelepis* is a combination of the Latin “purpura” and “lepis,” meaning purple scales, in reference to the distinct purple color only present after preservation. The name is treated as a noun in apposition.

Comparison. *Plectranthias purpurelepis* can be distinguished from most members of the genus by the following combination of characters: pectoral and pelvic fin mostly covered by scales; a relatively large body size (up to 151 mm SL); two antrorse spines ventrally on ventral margin of the preopercle; bony interorbital width narrow; no scales on maxilla or chin; 14 circumpeduncular scales; body color reddish yellow, with 5 to 6 white stripes or patches slanting anteriorly from dorsal-fin base.

According to the keys to species of *Plectranthias* provided by Randall (1980, 1996), the species is most similar to *P. jothyi* and *P. anthioides* in having almost the same meristics and body proportions. Table 3 lists selected characters for comparison of the similar species.

TABLE 3. Selected characters for comparing *Plectranthias purpurelepis* **sp. nov.** and four similar species. Morphometric data are shown as a multiple of SL or HL.

| | <i>P. purpurelepis</i> sp. nov. | <i>P. jothyi</i> | <i>P. anthioides</i> | <i>P. sheni</i> | <i>P. kamii</i> |
|--------------------------------------|---|-------------------|-------------------------|-----------------|-----------------|
| Dorsal-fin elements | X, 16–17 | X, 17–18 | X, 17 | X, 17–18 | X, 17–18 |
| Pectoral-fin rays | 14 | 14–15 | 14 | 13 | 13 |
| Unbranched pectoral-fin ray | uppermost | uppermost | uppermost and lowermost | uppermost | uppermost |
| Lateral-line scales | 33 (33–36) | 34 | 33 (35) | 33 (31–34) | 33–38 |
| Greatest body depth in SL | 2.9–3.1 | 2.7–2.9 | 2.9 | 2.6–2.9 | 2.7–2.9 |
| Head length in SL | 2.3–2.4 | 2.25–2.3 | 2.5 | 2.2–2.3 | 2.2–2.3 |
| Length of 3rd dorsal-fin spine in HL | 2.6–3.4 | 2.25–2.4 | 2.0 | 2.3–2.6 | 2.0–2.5 |
| Length of 2nd anal-fin spine in HL | 2.7–3.1 | 2.2–2.55 | 2.0 | 2.5–2.8 | 2.7–3.3 |
| Pelvic-fin length in HL | 1.9–2.3 | 1.8–1.85 | 1.7 | 1.9–2.1 | 1.9–2.2 |
| Data sources | This study | Randall (1996) | Randall (1980, 1996) | This study | This study |

Plectranthias purpurelepis differs from *P. jothyi* from a combination of characters: a shorter head, its length 40.7–43.4% SL (vs. 43.6–44.8% in *P. jothyi*); 3rd dorsal-fin spine much shorter, its length 29.1–38.5 HL (vs. 41.1–44.7%); 2nd anal-fin spine and pelvic fin shorter, their lengths 32.6–37.2% and 43.7–53.0% HL, respectively (vs. 39.1–45.0% and 50.0–54.8%, respectively); circumpeduncular scales 14 (vs. 16); 1+7–8 developed gill rakers on first gill arch (vs. 2+10); two small irregular rows of scales on interorbital space extending to a line through the posterior nostrils (vs. scales extending to middle of interorbital space); no black bars on upper half of body (vs. six diagonal blackish bars present); no whitish patch on nape (vs. a small patch present on nape); three whitish bars, restricted to one scale wide on dorsum below dorsal-fin base, the third usually breaking into three small patches (vs. whitish bars three scales wide and the third bar not broken; see Randall, 1996: fig. 1).

Our specimens have one moderately large canine at each side of front of lower jaw, which is distinctly larger than the neighboring ones, whereas the holotype of *P. jothyi* does not have such a tooth (Randall, 1996: 123); there are 4–6 and 3–5 tooth rows on the vomer and palatines, respectively, in *P. purpurelepis*, whereas there are only 2–3 and 1–2 tooth rows on the vomer and palatines, respectively, in *P. jothyi* (Randall, 1996: 123). However, our specimens are much larger than the holotype of *P. jothyi* and these differences may be attributed to size differences.

Plectranthias purpurelepis can be separated from *P. anthioides* in having a much shorter second anal-fin spine, its length 32.6–37.2% HL (vs. 49.0%, in *P. anthioides*), when appressed, the tip of spine reaching posterior end of anal-fin base (vs. well behind base); and a shorter pelvic fin, its length 43.7–53.0% HL (vs. 57.8% in *P. anthioides*), when appressed, tip of the fin well in front of anus (vs. reaching anus); caudal fin truncated (vs. rounded in *P. anthioides*); no irregular and indistinct blackish spots on back and blackish line along the median line of the nape (vs. present in life color of *P. anthioides* in original description; Randall, 1980).

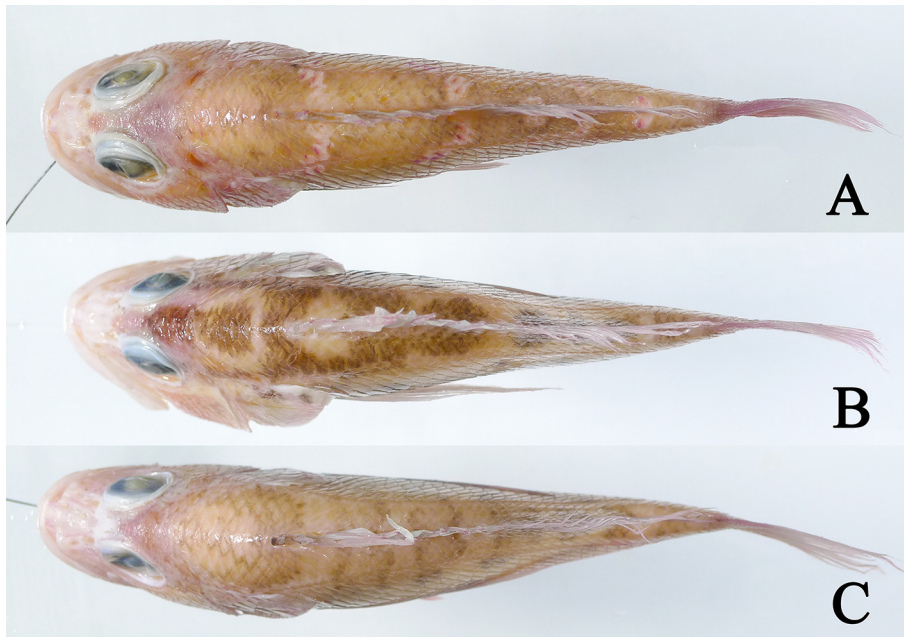


FIGURE 7. Dorsal view of preserved specimens. **A.** *Plectranthias purpuralepis*, NMMSTP002339, holotype. **B.** *P. sheni*, NMMSTP002342. **C.** *P. kamii*, NMMSTP002333.

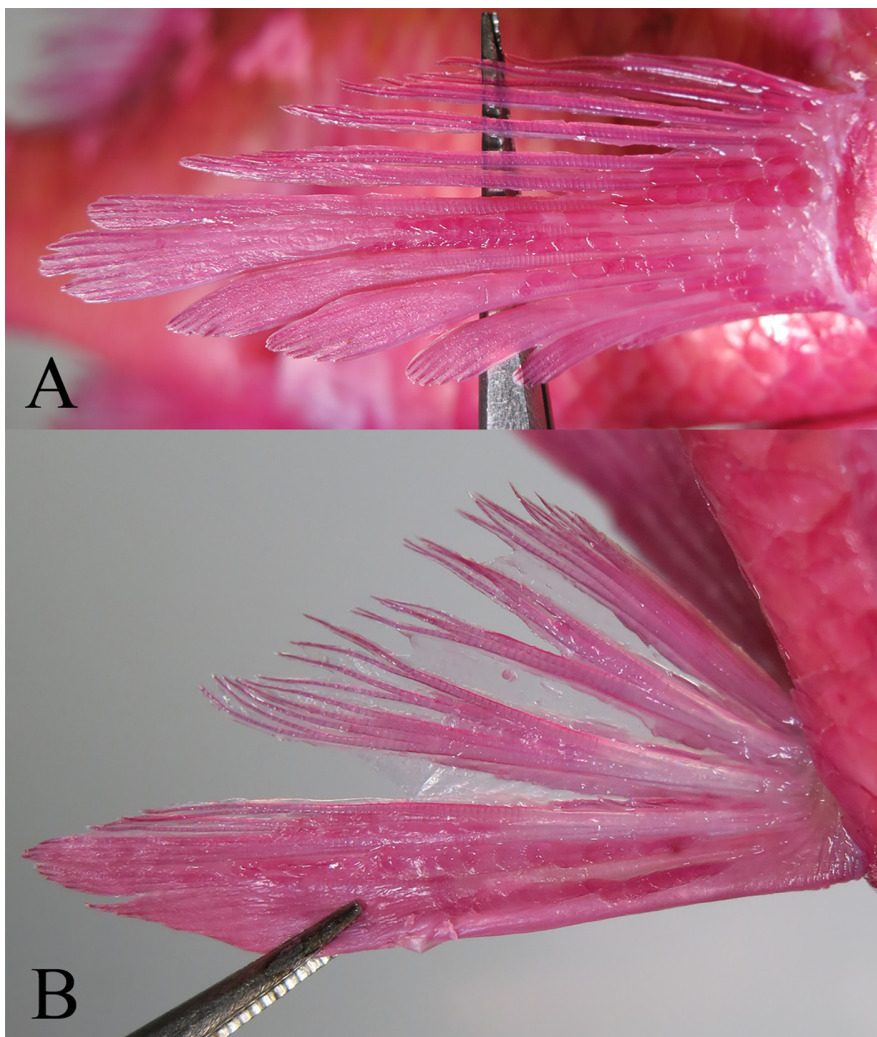


FIGURE 8. Squamation on pectoral fin (A) and pelvic fin (B) fin of *Plectranthias purpuralepis* **sp. nov.**, NMMB-P30975, 143.6 mm SL, stained by Alizarin Red S.

In Taiwan, *P. purpuralepis* is also similar to *P. sheni* and *P. kamii*, but distinctly different in coloration pattern and combination of meristic and morphometric characters. *Plectranthias purpuralepis* can be separated from *P. sheni* and *P. kamii* by having scales covering more than 2/3 of both sides of pelvic fin (vs. scales restricted to base of pelvic fin) and dorsal profile of head relatively convex (vs. nearly straight). Moreover, *P. purpuralepis* differs from *P. sheni* and/or *P. kamii* by having a combination of the following characters: 16 or 17 segmented and branched dorsal-fin soft rays (vs. 18 in *P. kamii*); 14 total pectoral-fin rays (vs. 13 in both *P. sheni* and *P. kamii*); small predorsal scales extending to a line through posterior nostrils (vs. not reaching the line in *P. kamii*); number of scale rows below lateral line to origin of anal fin 13 or 14 (vs. 18 in *P. kamii*); a relatively shallower body, the greatest body depth 32.6–35.1% SL (vs. 34.6–39.0% in *P. sheni* and 34.7–37.7% in *P. kamii*); a shorter head, HL 40.7–43.4% SL (vs. 42.8–43.6% in *P. sheni* and 42.8–44.9% in *P. kamii*); longest dorsal-fin spine (3rd) 29.1–38.5% HL (vs. 38.7–42.7% in *P. sheni* and 39.4–50.7% in *P. kamii*); usually 33 tubed lateral-line scales (vs. 38 in *P. kamii*); pelvic-fin mostly scaled on both sides (vs. not scaled in *P. kamii* and scaled at base of the fin in *P. sheni*); body lacking series of brown blotches (versus 2 series of brown blotches).

Discussion

It is notable that *P. purpuralepis* has some scales associated with the whitish pink stripes or blotches on the dorsum in fresh condition that turned purple when preserved in formalin and ethanol (Figs 2, 6A). Tea *et al.* (2018, 2019) reported that some labrids, *Cirrhilabrus wakanda* Tea *et al.*, 2019, *Cirrhilabrus blatteus* Springer & Randall, 1974, and *Cirrhilabrus earlei* Randall & Pyle, 2001, have purple scales after preservation. However, their scales are purple in color when alive originally and the color is retained after preservation. Accordingly, the purple-colored scales in preserved specimens of *P. purpuralepis* are unique in *Plectranthias*.

All types of *P. purpuralepis* have scales covering more than 2/3 of its pectoral and pelvic fins (Fig. 8), which is likely unique among *Plectranthias* species. Most species of *Plectranthias* only have scales covering the base of their pectoral fins. Randall (1980) mentioned that there were small scales at the base of all fins in *P. kamii*. Our observations show that *P. kamii* has small ctenoid scales extending to 1/3 of the soft rays of the dorsal, anal, and caudal fins, but the pelvic fins are totally naked. The squamation pattern of *P. sheni* is similar to that of *P. kamii*, but there are few small scales extending slightly onto the pelvic fins. The squamation of paired fins of *P. jothyi* and *P. anthioides* are unknown due to the poor conditions of the known specimens (Randall, 1980, 1996).

Scale patterns on the interorbital space differ among *P. purpuralepis*, *P. sheni*, and *P. kamii* (Fig. 5). *Plectranthias purpuralepis* and *P. sheni* have two small irregular rows of scales in the interorbital space extending to a line through the anterior margin of the orbit. However, *P. kamii* has a single row of slightly larger scales extending to the interorbital space, but not reaching a line through the anterior end of the orbit. As the scales in the interorbital space and forward are irregular in size and arrangement, they are not included in the predorsal counts. The scales patch runs to at least the interorbital space in *P. anthioides* (Randall, 1980) and to the middle of the interorbital space in *P. jothyi* (Randall, 1996).

Most members of *Plectranthias* are small, their adults not exceeding 120 mm SL (Randall, 1980; Froese & Pauly, 2019), except *Plectranthias exsul* Heemstra & Anderson, 1983 (158 mm SL), *Plectranthias japonicus* (Steindachner, 1883) (150 mm TL), *P. jothyi* (158 mm SL), *P. kamii* (230 mm SL), *Plectranthias nazcae* Anderson, 2008 (150 mm SL), *Plectranthias kelloggi* (Jordan & Evermann, 1903) (120 mm SL), *Plectranthias taylori* Randall, 1980 (237.5 mm SL), and *Plectranthias yamakawai* Yoshino, 1972 (200 mm SL). The relatively large adult size (up to 151 mm SL) of *P. purpuralepis* can be a useful character to distinguish it from most congeners.

Abdomen of the specimens are opened near the anal position to observe the gonads to determine the sex of the fish. Thirteen specimens show developed gonad, five are males and the other eight are ripe females. Standard length of those male individuals are 131.1–150.9 mm, whereas the four females are 116.9–146.6 mm. As the mature males are generally larger than females, the new species may be protogynous which is a general condition in most serranids (Heemstra & Randall, 1999).

Comparative materials. *indicate specimens with data taken. *Plectranthias kamii*: *NMMB-P17855 (1 specimen, 216.6 mm SL), southeast of Chi-hsin-yan, Kenting (purchased from Heng-chun market), Pingtung, southern Taiwan, ca. 400 m, 22 Sep. 2012. *NMMBP-12143 (1, 146.9), Nan-fang-ao, Yilan, northeastern Taiwan, 11 Mar. 2011. *NMMB-P17678 (1, 135.1), Da-xi, Yilan, northeastern Taiwan, 12 Nov. 2012. *NMMB-P29751 (1, 192.0),

Ho-bi-hu, Pingtung, Taiwan, 1 Jun. 2018. *NMMSTP002333 (1, 158.0), Keelung, northern Taiwan, 25 Sep. 2019. *NMMSTP002338 (1, 152.9), Keelung, northern Taiwan, 04 Oct 2019. *Plectranthias sheni*: *NMMB-P30976 (2, 117.8–118.1), Hengchun, Pingtung, southern Taiwan, 6 Aug. 2019. *NMMB-P3236 (1, 108.6), Kaohsiung Harbor, Kaohsiung, southwestern Taiwan. NMMB-P1733 (1, 79.3), Da-an, Taipei (collection locality unknown), 30 Nov. 2005. NMMB-P2451 (1, 82.4), Kaohsiung, southwestern Taiwan, 9 Sep. 2002. *NMMSTP002342 (1, 120.5), Keelung, northern Taiwan, 25 Sep. 2019; *NMMSTP002343 (1, 114.4), Keelung, northern Taiwan, 25 Sep. 2019.

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