

Opistognathus rufilineatus, a new species of jawfish (Opistognathidae) from the Bird's Head Peninsula, western New Guinea

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Abstract

A new species of Indo-West Pacific jawfish, *Opistognathus rufilineatus*, recently discovered at Triton Bay, Bird's Head Peninsula, Indonesia (western New Guinea) is described. Two specimens were collected in April 2006 and color photographs and observations of other individuals were made in 2007 during biodiversity surveys conducted by Conservation International. One of at least 25 new species of fishes obtained from the area, the new jawfish is described here to help call attention to the special conservation significance of the Triton Bay type locality that is currently under consideration as a marine protected area. The new species is one of more than 20 undescribed Indo-Pacific jawfishes of the genus *Opistognathus* under study by the first author. It is distinguished from all other *Opistognathus* by having uniformly pigmented fins, sides of body with narrow red-brown stripes, outlining each yellow-tan lateral scale row, and cheeks with a few small scattered, dark, brown spots and narrow, short lines.

Zusammenfassung

Beschrieben wird eine neue Art der indo-westpazifischen Brunnenbauer: *Opistognathus rufilineatus*, die vor kurzem in der Triton-Bucht der Halbinsel Bird's Head, Indonesien (westliches Neuguinea), entdeckt wurde. Zwei Exemplare wurden im April 2006 gesammelt, weitere Tiere konnten 2007 während einer Untersuchung zur Biodiversität fotografiert und beobachtet werden, die von Conservation International durchgeführt wurde. Von den mindestens 25 in dieser Gegend neu gefundenen Arten soll dieses Beispiel herausgegriffen werden, um die Aufmerksamkeit auf die besondere Bedeutung der Tritonbucht zu lenken, für die die Einrichtung eines Meeresschutzgebietes beantragt wurde. Die neue Art ist eine von mehr als 20 unbeschriebenen indo-pazifischen Brunnenbauer-Arten der Gattung *Opistognathus*, die gerade von dem zu erst genannten Autor bearbeitet werden. Sie unterscheidet sich von allen anderen Vertretern der Gattung durch gleichförmig pigmentierte Flossen, schmale rotbraune Streifen an den Körperseiten, durch die die bräunlichgelben Seitenschuppenreihen begrenzt werden, sowie durch die Zeichnung der Wangen mit wenigen, unregelmäßig verteilten dunkelbraunen Flecken und schmalen, kurzen Linien.

Résumé

Est décrite une nouvelle espèce d'*Opistognathus*, *Opistognathus rufilineatus*, récemment découverte à Triton Bay, péninsule de Vogelkop, Indonésie (Nouvelle Guinée occidentale). Deux spécimens ont été collectés en avril 2006 et des photos en couleurs et des observations d'autres individus ont été faites en 2007 au cours d'études de biodiversité menées par Conservation International. Faisant partie d'au moins 25 nouvelles espèces de poissons collectées dans la zone, le nouveau spécimen du genre *Opistognathus* est décrit ici pour aider à braquer l'attention sur l'importance de la préservation de la localité type de Triton Bay, acutellement à l'examen pour en faire une zone marine protégée. La nouvelle espèce fait partie de plus de 20 Opistognathidés non décrits de l'Indo-Pacifique du genre *Opistognathus* étudié par le premier auteur. Elle se distingue de tous les autres *Opistognathus* par des nageoires uniformément pigmentées, les flancs avec de fines lignes rouge brun bordant chaque rangée latérale d'écaillés jaune brun et des joues avec quelques petites taches brunes disséminées et de fines petites lignes.

Sommario

Si descrive una nuova specie di opistognatide dell'Indo-Pacifico occidentale, *Opistognathus rufilineatus*, recentemente scoperto a Triton Bay, penisola di Bird's Head, Indonesia (Nuova Guinea occidentale). Due esemplari sono stati raccolti nell'aprile 2006, mentre durante la spedizione del Conservation International condotta nel 2007 sono state effettuate fotografie a colori e osservazioni di altri individui. La descrizione della nuova specie di opistognatide, una delle almeno 25 nuove specie di pesci ottenute dall'area di studio, vuole richiamare l'attenzione sul particolare significato della conservazione naturale di Triton Bay per la quale si sta valutando l'istituzione di un'area marina protetta. La nuova specie rappresenta una delle oltre 20 specie dell'Indo-Pacifico non ancora descritte del genere *Opistognathus* che l'autore sta attualmente studiando. Si distingue da tutte le altre specie del genere per avere pinne uniformemente pigmentate, lati del corpo con sottili striature rosso-marrone che tracciano il contorno delle scaglie giallo rossiccio della linea laterale e guance con alcune piccole e disperse macchioline e sottili e brevi linee marrone scuro.

INTRODUCTION

The Bird's Head Peninsula of far western New Guinea (Fig. 1) has attracted the attention of early naturalists and scientists since first visited by the French vessels (years of visits in parentheses) L'Uranie (1818-1819), La Coquille (1823), and L'Astrolabe (1826). Approximately 70 species of fishes were historically recorded by the French mainly from Waigeo and the surrounding area now known as the Raja Ampat Islands. Allen (2003) provided a summary of the collecting activity and known fauna of this region, which up until 1998 consisted of 236 species. He conducted ichthyological surveys between 1998 and 2007, including extensive underwater observations supplemented with small collections. As a result, the total reef fish fauna was increased to at least 1120 species.

Based largely on the results of rapid biological assessment surveys at the Raja Ampat Islands conducted by Conservation International (McKenna et al. 2002) and The Nature Conservancy (Don-

nelly et al. 2003), the entire Bird's Head region is now recognized as a major hotspot of biodiversity. However, there is scant biological information for large sections of the region, most notably Cenderawasih Bay in the north and the Fak Fak Peninsula and Triton Bay areas in the south. Consequently, CI conducted two, month-long assessment surveys in 2006, visiting both areas as well as a 12-day visit to Triton Bay in January 2007. At least 25 new species were obtained including a jawfish of the genus *Opistognathus* described herein.

The first author is currently preparing a revision of the genus, but was persuaded to describe this new species separately to help draw attention to the special conservation significance of the Triton Bay type locality that is currently under consideration as a marine protected area. A total of 10 jawfishes, seven *Opistognathus* and three *Stalix*, are now known from the Bird's Head region. In addition to the new species described herein, six other *Opistognathus* spp. were observed and photographed:

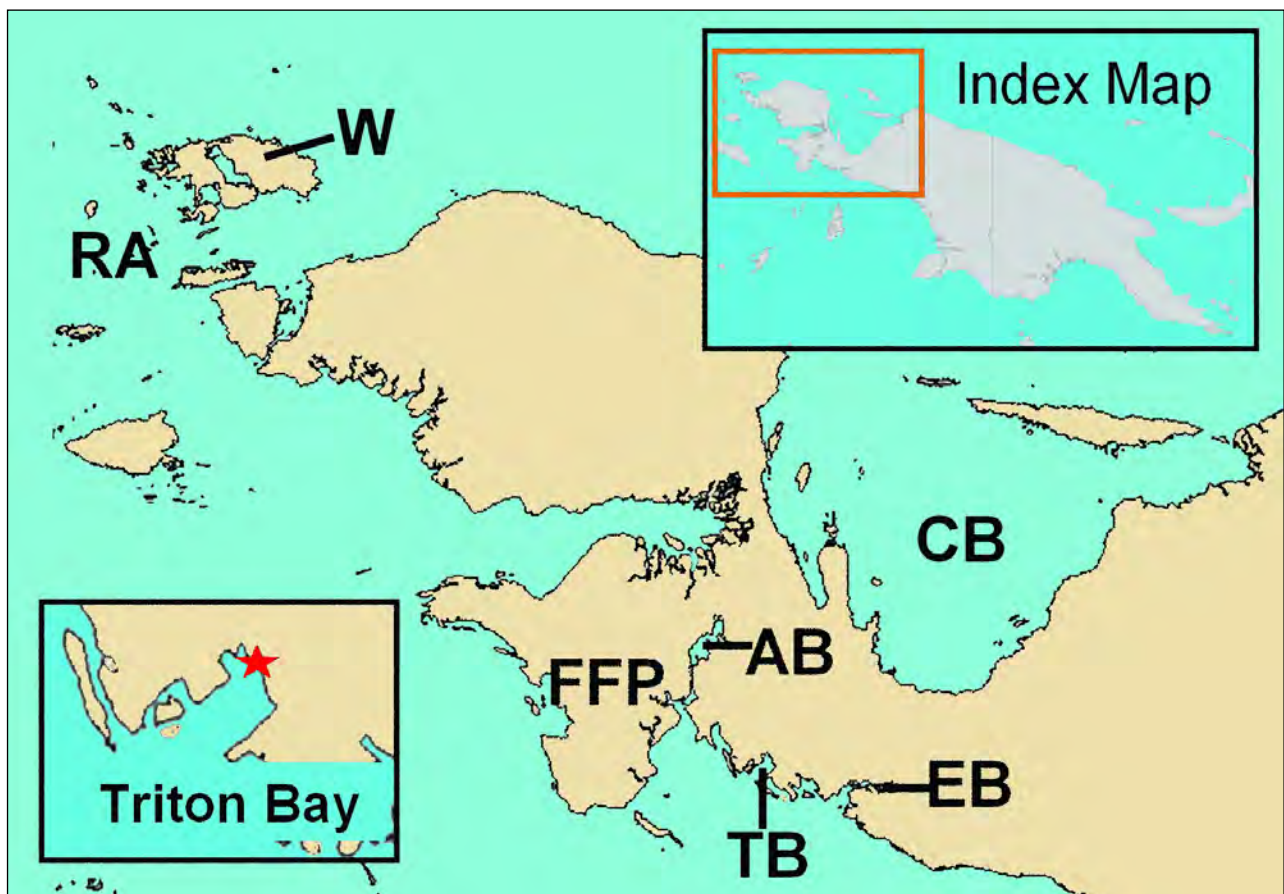


Fig. 1. Map of Bird's Head Peninsula showing locations mentioned in text: Waigeo (W), Raja Ampat Islands (RA), Cenderawasih Bay (CB), Fak Fak Peninsula (FFP), Arguni Bay (AB), Etna Bay (EB) and Triton Bay (TB); the red asterisk indicates type locality of *Opistognathus rufilineatus*.

Opistognathus castelnaui Bleeker, 1851, *O. solorensis* Bleeker, 1853, and four other undescribed species including the dwarf and chinstrap jawfishes of Randall (2005). Except for *Opistognathus rufilineatus* n. sp., the other *Opistognathus* spp. have wide Indo-West Pacific distributions. In contrast, the three jawfishes of the genus *Stalix* collected from the region are all undescribed, apparently endemic species. The only other area that rivals this region in jawfish species richness is the northern end of the Palawan Providence, Philippines (Busuanga and Culion) with seven *Opistognathus* (four shared with Bird's Head Peninsula) and two *Stalix* species, both known only from there.

The complex geological history of the Bird's Head region has apparently contributed to significant isolating events responsible for the evolution of an extraordinary number of endemic species and geographic color variations (Allen & Erdmann 2006). For example, between about three to five million years ago the westward drifting Tosem Block of the South Caroline Arc essentially blocked the entrance of Cenderawasih Bay before eventually accreting along the northern edge of the Bird's Head (Hill & Hall 2003). Persistent high-volume freshwater discharge from Arguni and Etna Bays, may have similarly isolated the Triton Bay area on the south coast.

MATERIALS AND METHODS

Type specimens are deposited at Pusat Penelitian dan Penembagan Oseanologi, Jakarta, Indonesia (NCIP) and the Western Australian Museum, Perth (WAM).

Vertebral, dorsal- and anal-fin ray counts were taken from radiographs. The last element in the dorsal and anal fins has its base in close approximation of the penultimate ray and, although having a separate rudimentary pterygiophore or stay, is not included in the counts. Procurrent and segmented caudal-fin rays are reported as a two-part formula, with rays associated with the dorsal hypural given first, followed by those of the ventral hypural. The lateral line terminus refers to the base of the posteriormost segmented dorsal-fin ray below which the lateral line ends. The short, dorsal-most spine-like element in the pectoral fin is included in the ray counts. The number of oblique scale rows is only an approximation due to the irregular size and arrangement of individual scales. Included in the count are all anteroventrally aligned scale rows in a longitudinal series from above the tip of the

opercular flap to the base of the caudal fin (counts of posteroventrally aligned scale rows will result in lower values). Bilateral scale counts, separated by a slash, are those on the left and then right side of the body. Gill rakers are counted on the first gill arch, those on the upper limb listed first. Rudiments are included in the counts.

Measurements were made with needle-point dial calipers and rounded to the nearest 0.1 mm. Lengths are given as standard length (SL), unless otherwise stated, and measured from the median anterior point of the upper lip to the base of the caudal fin (posterior end of hypural plate). Head length is taken from the middle of the upper lip to the posterodorsal tip of the opercular membrane; upper-jaw length from the same anterior point to the posterior end of the maxilla; orbit diameter is a diagonal (posterodorsal to anteroventral) measurement; the posterodorsal point of origin is the rigid sphenotic margin. Body depth is a vertical measurement from the origin of the anal fin; caudal peduncle depth is the least depth; pelvic-fin length is measured from the base of the pelvic spine to the tip of the longest pelvic ray.

Opistognathus rufilineatus n. sp. (Figs 2-5)

Holotype: NCIP 6313, male (60.4) Indonesia, Irian Jaya (western New Guinea), Barat Providence, North Triton Bay, 34°47'01"S, 134°9'55"E, 22 m, clove oil, Mark V. Erdmann, 25 April 2006. **Paratype:** WAM P.32802-001, female (56.1), taken with the holotype.

Diagnosis: A species of *Opistognathus* with the upper jaw extending about 0.7-0.9 eye diameters behind posterior margin of orbit, maxilla widest at end and without a flexible lamina posteriorly; dorsal fin XI,11; anal fin II,10; body with narrow red-brown stripes outlining each yellow-tan lateral scale row and fins without dark spots are distinctive markings; cheeks with a few scattered, small, dark, brown spots and narrow oblique lines; posterior infraorbital pore positions occupied by multiple pores; most preopercular pore positions bi-pored.

Description: (Values for paratype in parentheses if different for those of holotype): Dorsal-fin rays XI,11; anal-fin rays II,10, pectoral-fin rays (19) or 20; caudal fin: procurrent rays 4 + 4, segmented rays 8 + 8, middle 12 branched, total elements 24; hypural 5 present; vertebrae: 10 + 16; last pleural

rib on vertebra 10; last epineural on vertebra 14; supraneural bones 2; gill rakers 11 + (22) or 23.

Scales absent on head, nape, dorsum above lateral line, and breast; pectoral-fin base partially scaly; belly completely scaly; body with about 44/45 or (46/44) oblique scale rows in longitudinal series; lateral-line terminus below verticals between first or (second) segmented dorsal-fin ray, total element positions 12.0 or (13.0); lateral-line pores mostly arranged in an irregular series along embedded lateral-line tubes; cephalic sensory pores relatively numerous (Fig. 5); mandibular pore positions 1-4 occupied by single pores, fifth position with (2) or 3 pores; most preopercular pore positions bipored.

Anterior nostril positioned closer to anterior margin of posterior nostril than to upper lip, and consisting of a very short tube that, when depressed, does not reach margin of posterior nostril; height of tube about 0.5 or less maximum diameter of posterior nostril; dorsal fin moderately low, gradually increasing in height to about middle of spinous dorsal fin; profile of fin gradually increasing in height posteriorly; dorsal-fin spines moderately stout and straight, a few slightly curved distally but without flexible tips; all except first dorsal- and anal-fin rays branched distally (tip of first dorsal-fin ray very weakly branched in holotype); outermost segmented pelvic-fin ray not tightly bound to adjacent ray, interradiial membrane incised distally. Posterior margin of preopercle distinct, with a free margin; no papillae on inner surface of lips, fifth cranial nerve passes under A1 β section of adductor mandibulae.

Upper jaw extending about (0.7) to 0.9 eye diameters behind posterior margin of orbit; maxilla widest at end and truncate, without a flexible lamina posteriorly; supramaxilla present, moderately enlarged and terminally positioned; premaxilla with an outer row of stout conical teeth anteriorly that become abruptly smaller posteriorly and extend about 2/3 length of jaw; an irregular series of 8-10 smaller teeth behind outer row anteriorly including 1 or 2 somewhat larger inner symphyseal teeth; dentary with an outer row of moderate conical teeth, those on posterior half noticeably larger than anterior ones; 1-3 irregular series of slightly smaller teeth behind outer row on anterior half of dentary; vomerine teeth absent; infraorbital bones relatively slender and tubular; third infraorbital moderately enlarged and without suborbital shelf.

Measurements of the 60.4 mm holotype followed by those of the 56.1 mm paratype, as percent of SL: predorsal length 37.9-35.2; preanal length 64.0-63.3; dorsal-fin base 63.6-62.4; anal-fin base 26.5-26.2; pelvic fin length 28.3-27.3; caudal fin length 29.3-27.1; depth at anal-fin origin 24.3-24.9; caudal peduncle depth 15.6-14.9; head length 37.9-36.9; postorbital head length 20.5-20.3; upper jaw length 26.2-24.2; postorbital jaw length 11.9-9.9; orbit diameter 13.2-13.0. As percent of head length: postorbital head length 54.1-55.1; upper jaw length 69.2-65.7; postorbital jaw length 31.4-26.8; orbit diameter 34.9-35.3.

Color in alcohol: head and body light brown, becoming paler ventrally; lips without



Fig. 2. Paratype of *Opistognathus rufilineatus*, WAM P. 32802-001, female, 56.1 mm SL, Triton Bay, Bird's Head Peninsula, Western New Guinea. Photo by G. R. Allen.

obvious bands or mottling; scales dusky brown dorsally and ventrally with paler centers making scale rows on body appear to form series of narrow brown stripes against a lighter background; fins pale dusky or immaculate; cheeks with a few scattered, small dark spots and narrow oblique lines; inner maxillary and adjacent membranes and buccal area surrounding esophageal opening pale and uniformly pigmented.

Color in life: generally yellowish brown, slightly darker on back; cheek yellowish tan with a few scattered dark brown spots and narrow oblique lines; dorsal half of head with pair of broad brown saddles with narrower yellow-tan areas between (these pale areas on the nape, which make the saddles apparent, are not visible on the preserved specimens, suggesting they are the product of a fright response in live fish); the entire dorsal portion of head with mottling of faint brown spots and lines, as well as tiny white spots; lips with diffuse trans-

verse white and brownish bands; iris blotchy brown with narrow yellow ring outlining pupil; branchiostegals pale yellowish; side of body with series of narrow red-brown stripes outlining each yellow-tan lateral scale row; dark stripes on upper back more or less obscured by yellow-tan blotches and irregular brown transverse bars; dorsal fin yellowish, grading to translucent greenish posteriorly with irregular short brown bars along base of fin and adjacent dorsum; anal fin pale yellowish; caudal, pelvic, and pectoral fins translucent yellow to slightly greenish.

Comparisons: The combination of essentially uniformly pigmented fins, sides of body with narrow red-brown stripes outlining each yellow-tan lateral scale row, and cheeks with a few small scattered, dark, brown spots and narrow, short lines distinguishes *Opistognathus rufilineatus* from all other species of the genus. Only two other Indo-West Pacific species (undescribed) have similarly



Fig. 3. *Opistognathus rufilineatus*, underwater photograph of uncollected adult partially out of its burrow, Triton Bay, Bird's Head Peninsula, western New Guinea. Photo by M. V. Erdmann.

low median fin-ray counts, 16 caudal vertebrae, maxilla without a flexible lamina posteriorly, and fins without dark spots or distinctive markings. Both of these species have fewer head pores, including preopercular pore positions occupied by single pores (versus mostly bipored positions).

Etymology: The specific epithet, from the Latin *rufus* (reddish) and *lineatus* (line), refers to the striped color pattern of the species.

Distribution and habitat: *Opistognathus rufilineatus* is known only from the type locality in the innermost portion of Triton Bay (Fig. 1), Irian Jaya Barat Province (western New Guinea) of Indonesia. The location is situated on the edge of a 200 m-wide channel between the mainland and a small island. It is exposed to periodic strong currents associated with tidal fluctuation. The site is characterized by relatively rich coral grading to rubble in deeper water with a maximum depth of about 50 m. The most noteworthy feature is a series of vents, at depths of about 2-35 m, which issue large volumes of freshwater. These abrupt salinity changes are conspicuous due to the blurring effect of the

fresh- and seawater mixture. About 10 burrows of the new jawfish were detected on rubble bottoms in about 20-25 m depth during the 2006 and 2007 visits. The two type specimens were flushed from their burrows using a clove oil-alcohol solution.

ACKNOWLEDGEMENTS

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Fig. 4. *Opistognathus rufilineatus*, same individual as in Fig. 3, Triton Bay, Bird's Head Peninsula, western New Guinea. Photo by M. V. Erdmann.

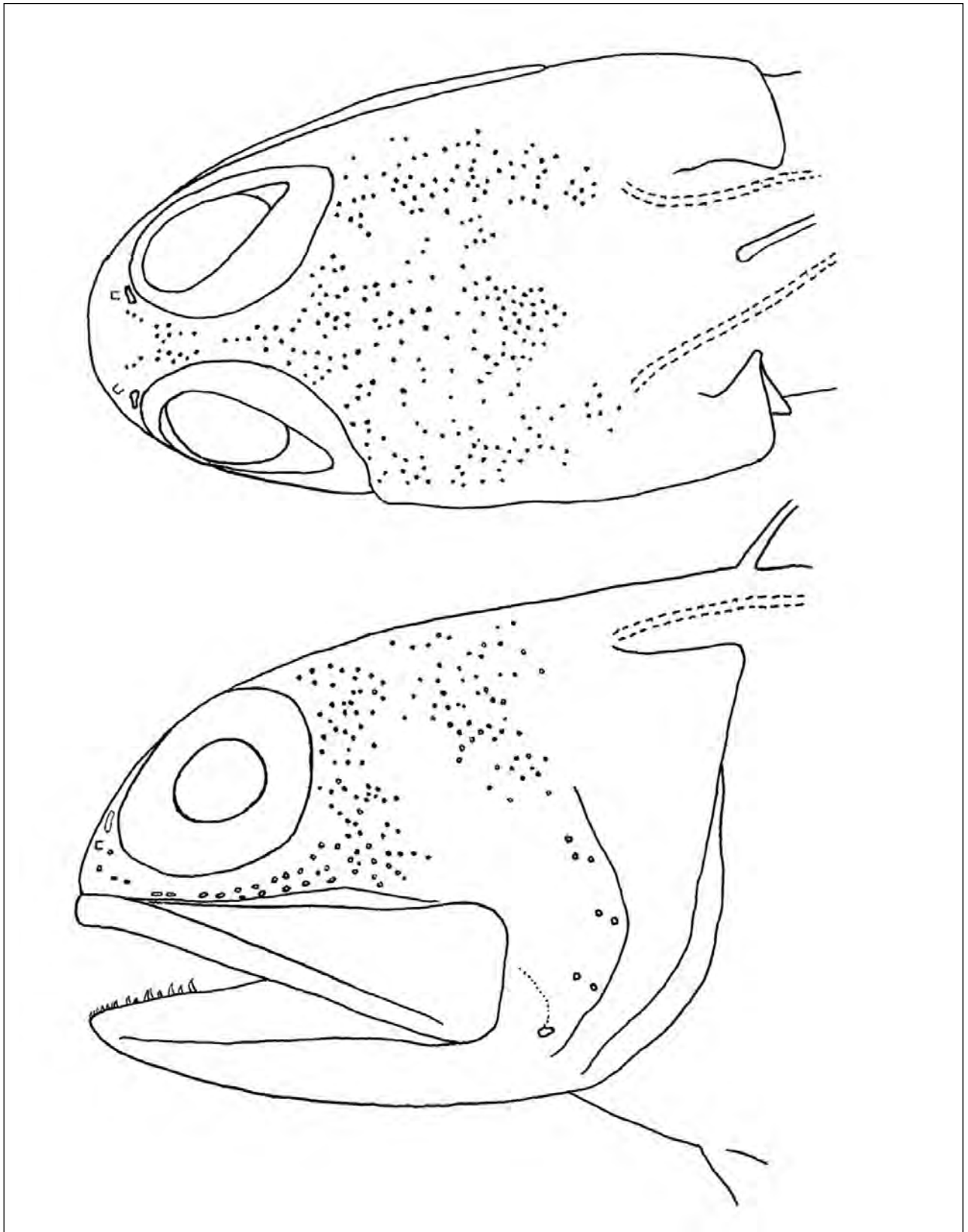


Fig. 5. Cephalic sensory pores of *Opistognathus rufilineatus*, holotype (NCIP 6313), male, 60.4 mm SL.

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ERRATA

aqua International Journal of Ichthyology Vol. 12 (4) 1 August 2007

Revision of the Genus *Symphysodon* Heckel, 1840 (Teleostei: Perciformes: Cichlidae) based on molecular and morphological characters

– Fig. 23 (pag. 150): *Mesonauta* (not: *Mesonata*)

– SUMMARY AND CONCLUSIONS:

2) lectotype for *Symphysodon aequifasciatus* Pellegrin, 1904 (MNHN 1902/135) (not: MNHN 1902-134).

– Missing on page 173 under REFERENCES:

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