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Hoplolatilus erdmanni, a new species of sand tilefish (Pisces: Malacanthidae) from western New Guinea

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Abstract

Hoplolatilus erdmanni is described on the basis of two specimens, 129.8-137.2 mm standard length, collected in the vicinity of Triton Bay, Irian Jaya Barat Province (western New Guinea), Indonesia. Approximately 15 individuals were observed on gentle rubble slopes at depths of 42 to 60 m. The fish were seen solitarily, in pairs, or in trios generally in close proximity to large rubble mounds, which they construct. It is most similar to *H. fronticinctus*, a wide-ranging Indo-west and central Pacific species. The new taxon differs in having fewer lateral-line scales as well as several colour pattern features that include about 15 to 17 reddish-brown bars on the side, an obliquely angled, blue-edged yellow-orange stripe behind the eye, a thin blue stripe across the operculum, a neon blue region across the entire caudal peduncle, and vivid red central caudal fin-rays.

Zusammenfassung

Hoplolatilus erdmanni wird auf der Grundlage anhand von zwei Exemplaren mit 129,8-137,2 mm Standardlänge beschrieben, die in der Nähe der Triton-Bucht, Provinz Irian Jaya Barat (West-Neuguinea), Indonesien, gefangen wurden. Rund 15 Exemplare wurden über einem flachen Geröllhang in Tiefen von 42 bis 60 Metern beobachtet. Die Tiere traten einzeln, paarweise oder in Dreiergruppen auf, gewöhnlich in unmittelbarer Nähe großer Steinhaufen, die sie selber errichten. Diese neue Art ähnelt sehr, in erster Linie, *H. fronticinctus,* einer weit verbreiteten Art aus dem Indischen Ozean und dem zentralen Pazifik. Sie unterscheidet sich aber durch eine geringere Zahl an Schuppen in der Seitenlinie und durch mehrere Farbmerkmale: 15 bis 17 rötlich-braune Streifen an der Seite, ein schräger gelb-orangefarbener Streifen mit blauem Rand hinter dem Auge, ein dünner blauer Streifen über dem Kiemendeckel, ein neonblauer Farbbereich über den gesamten Schwanzstiel hinweg sowie lebhaft rote mittlere Schwanzflossenstrahlen.

Résumé

Hoplolatilus erdmanni est décrit sur base de deux spécimens, 129,8-137,2 mm de LS, collectés à proximité de Triton Bay, province de Barat, en Irian Jaya (ouest de la Nouvelle-Guinée), Indonésie. Près de 15 individus ont été observés sur des débris en pente douce, à des profondeurs de 42 à 60 m. Les poissons évoluaient en solitaire, en couple ou en trios, généralement très près de grands amas de débris qu'ils érigent. L'espèce se rapproche le plus de *H. fronticinctus* qui est largement distribué dans l'Indo-Pacifique occidental et central. La nouvelle espèce se distingue par un nombre moins élévé d'écailles sur la ligne latérale ainsi que par plusieurs détails du patron de coloration qui conprennent de 15 à 17 barres brun rougeâtre sur le flanc, une ligne à angle oblique, jaune-orange à liserés bleus, derrière l'oeil, une fine ligne bleur sur l'opercule, une zone bleu néon sur tout le pédoncule caudal et des rayons centraux de la caudale d'un rouge vif.

Sommario

Hoplolatilus erdmanni è descritto sulla base di due esemplari di 129.8-137.2 mm di lunghezza standard, raccolti nelle vicinanze di Triton Bay, Irian Jaya Barat Province (Nuova Guinea occidentale), Indonesia. Altri individui (circa 15) sono stati osservati lungo la parete della scarpata continentale a profondità comprese tra i 42 e i 60 m. I pesci si presentavano solitari, a coppie o in gruppi di tre generalmente presso larghi tumuli di pietrisco, che essi stessi costruivano. La nuova specie è molto simile a *H. fronticinctus,* una forma ampiamente diffusa nell'Indo-Pacifico occidentale e nel Pacifico centrale. Ne differisce per avere un minor numero di scaglie in linea laterale ma anche per molti caratteri distintivi della colorazione che includono 15-17 bande bruno rossastre sui fianchi, una striatura obliqua di colore giallo-arancio con margine blu dietro l'occhio, una sottile stria blu che attraversa l'opercolo, una regione blu neon che attraversa l'intero peduncolo caudale e, infine, raggi caudali centrali di color rosso vivo.

INTRODUCTION

The circumtropical family Malacanthidae, popularly known as tilefishes, is divisible into two subfamilies: Latilinae and Malacanthinae (Nelson 2006). The latter group contains two genera, *Malacanthus* Cuvier, 1829 and *Hoplolatilus* Gün-

ther, 1887, which are common over sand and rubble bottoms in the vicinity of coral reefs. All of the known species, except for *M. plumieri* (Bloch, 1786) of the Atlantic, are distributed in the Indo-west and central Pacific region. The genus *Hoplolatilus* largely escaped attention until the advent of scientific scuba diving due to its relatively deep dwelling habits. These long, slender fishes typically hover above burrows, which they construct in soft substrates.

Randall & Dooley (1974) provided the first taxonomic revision of *Hoplolatilus*, recognizing the following five species (general distribution indicated in parentheses): *H. cuniculus* Randall & Dooley, 1974 (widespread Indo-west and central Pacific), *H. fourmanoiri* Smith, 1963 (Vietnam to Solomon Islands), *H. fronticinctus* Günther, 1887 (widespread Indo-west Pacific), *H. oreni* Clark & Ben-Tuvia, 1973 (Red Sea), and *H. starcki* Randall & Dooley, 1974 (widespread western and central Pacific). Randall (1981) published a second review paper in which three additional species were included: *H. chlupatyi* Klausewitz, McCosker, Randall & Zetzsche, 1978 (Philippines), *H. marcosi* Burgess, 1978 (Philippines and Indonesia to Solomon Islands), and *H. purpureus* Burgess, 1978 (Philippines and Indonesia to Solomon Islands.

The most recent in-depth treatment of the genus was published by Earle & Pyle (1997) in their description of a new species, *H. pohle* from south-eastern Papua New Guinea. They provided a table comparing important diagnostic features for the 10 species mentioned above as well as *H. luteus* Allen & Kuiter, 1989 from eastern Indonesia. They also discussed an additional species, *H. geo* Fricke & Kacher, 1982, described from the Red Sea without type specimens on the basis of photographs taken from a submersible. Coverage of the family was also provided by Dooley (1999), who included a synopsis of defining characters and an illustrated key to the species occurring in the western Pacific with the exception of *H. luteus* and *H. pohle*.

Earle & Pyle (1997) prophetically suggested that more new species would likely be discovered in the future due to the inadequately collected deep sand and rubble habitat that is typical for the genus. The present paper describes the twelfth known member of the genus, which was first noticed by Mark Erdmann during a Conservation International marine biological survey in the vicinity of Triton Bay, Irian Jaya Barat Province (southwest New Guinea) of Indonesia in April 2006. Eight individuals were sighted on rubble bottoms between 42-60 m. Erdmann succeeded in spearing one specimen on this occasion and another was obtained during a second visit to the area in January 2007.

MATERIALS AND METHODS

Lengths of specimens are given as standard length (SL) measured from the anterior end of the upper lip to the base of the caudal fin (posterior edge of hypural plate); head length (HL) is measured from the same anterior point to the posterior edge of the opercular flap; head depth is measured at the level of the posterior margin of the preopercle; cheek depth is measured vertically from the lower rim of the orbit to the lower margin of the preopeculum; opercular length is measured from posterior margin of the preoperculum horizontally to the tip of the opercular spine; suborbital depth is measured vertically from the lower rim of the orbit to the ventral edge of the head; body depth is the maximum depth taken vertically between the belly and base of the dorsal spines; body width is the maximum width just posterior to the gill opening; snout length is measured from the anterior end of the upper lip to the anterior edge of the eye; orbit diameter is the horizontal fleshy diameter, and interorbital width the least fleshy width; upper jaw length is taken from the front of the upper lip to the posterior end of the maxilla; caudal peduncle depth is the least depth, and caudal peduncle length is the horizontal distance between verticals at the rear base of the anal fin and the caudal fin base; caudal fin length is the horizontal length from the posterior edge of the hypural plate to a vertical at the tip of the longest ray; pectoral fin length is the length of the longest ray; pelvic fin length is measured from the base of the pelvic spine to the tip of the longest soft ray. Only the pored scales are counted in the lateral-line between the upper edge of the operculum and the hypural crease (excludes three pored scales on caudal-fin base). Gill raker counts are presented as separate counts for the upper and lower limbs as well as a combined count. The last fin ray element of the dorsal and anal fins is branched near the base and is counted as a single ray.

Counts and proportions appearing in parentheses apply to the paratype if different from the holotype. If counts of bilateral characters differ on each side the values are separated by a slash and given as left/right. Vertebral counts were obtained from radiographs of both specimens. Proportional mea-

surements expressed as percentage of the standard length are provided in Table I. Type specimens are deposited at Pusat Penelitian dan Pengembangan Oseanologi, Jakarta, Indonesia (NCIP) and the Western Australian Museum, Perth (WAM).

SYSTEMATICS

Hoplolatilus erdmanni n. sp.

Triton Tilefish (Figs 1-2; Table I)

Holotype: NCIP 6315, 137.2 mm SL, Northwest entrance to Selat Iris, 03°53.757'S 134°06.638'E, near Triton Bay, Irian Jaya Barat Province, Indonesia, 55 m, spear, M.V. Erdmann, 25 April 2006. **Paratype:** WAM P.32860-012, 129.8 mm SL, Northwest entrance to Selat Iris 03°53.757'S 134°06.638'E, near Triton Bay, Irian Jaya Barat Province, Indonesia, 52 m, spear, M.V. Erdmann, 30 January 2007.

Diagnosis: The new species differs from its congeners in having fewer lateral-line scales; about 15 to 17 reddish-brown bars on the side; an obliquely angled, blue-edged yellow-orange stripe behind the eye; a thin blue stripe across the operculum; a neon blue region across the entire caudal peduncle, and vivid red central caudal fin-rays.

Description: Dorsal rays X,13 (IX,14); anal rays II, 12; pectoral rays 16/17 (17); principal caudal-fin rays 17; gill rakers 8 + 19 = 27 (8 + 18 = 26); pored lateral-line scales 80/76 (81/84); transverse cheek scale rows 11 (12); transverse opercular scale rows 10; scales above lateral line to origin of dorsal fin 21 (22); scales below lateral line to origin of anal fin 33 (36); vertebrae 10 +14.

Body moderately elongate, compressed, its greatest depth 3.7 (3.5) in SL; greatest body width 2.0 (1.9) in greatest depth; caudal peduncle depth 2.3, caudal peduncle length 1.6 (1.7), both in HL; head blunt, its length 3.6 (3.7) in SL; head depth 1.2 in HL; snout length 3.9 (3.8) in HL; upper jaw length 2.2 in HL; cheek depth 4.3 (4.8) in HL; opercular length 3.1 (3.1) in HL; snout to vertical margin of preopercle 1.4 (1.3) in HL; orbit diameter 3.8 (4.1) in HL; suborbital depth 4.0 (3.4) in HL; fleshy interorbital width 2.8 (2.9) in HL.

Mouth inferior, oblique, extending ventro-posteriorly at approximately 28-29 degree angle below horizontal axis of body; maxilla reaching vertical about midway between middle of orbit and posterior rim of pupil; front of upper jaw with 2-3 enlarged, curved canines on each side of symphysis; 4-5 irregular rows of tiny villiform teeth at front of jaws, posterior to canines, tapering to 1-2 rows along side of jaw; posteriormost tooth much enlarged and directed anteriorly; lower jaw with 18-19 enlarged conical teeth in outer row, posteriormost tooth enlarged and directed anteriorly; 3-4 irregular rows of tiny villiform teeth at front of jaws, posterior to enlarged outer row teeth, tapering to 1-2 rows along side of jaw; palatine, vomer, and tongue edentate. A pronounced wart-like projection of white skin on inner edge of clavicle under operculum near pectoral-fin base.

Lateral-line pores in low arching profile; pores of cephalic system clearly visible, arranged in pattern

Fig. 1. *Hoplolatilus erdmanni*, freshly collected male holotype, 137.2 mm SL, near Triton Bay, Irian Jaya Barat Province, Indonesia. Photo by G. R. Allen.

similar to that of *H. fronticinctus* as illustrated by Randall & Dooley (1974), including 4 pores on each dentary, 6 pores on preopercular margin, 8 pores in area immediately above preoperculum-operculum, 9 circumorbital pores, and 4 supraorbital-snout pores; median interorbital pore absent; preoperculum with 17/14 (19/17) serrae, including enlarged spine at preopercular angle; opercular spine flat, broad-based, slight double curvature, roughly forming equilateral triangle with concave sides and thickened centre, less than pupil diameter in length, not extending beyond opercular membrane; scales extending anterior on head to level of posterior rim of orbit; scales generally ctenoid, except mostly cycloid and smaller on head region; most of caudal fin scaled, remaining fins naked except pectoral-fin base with small scales.

Dorsal fin nearly uniform in height except for lower anterior spinous portion; base of dorsal fin 1.7 in SL; origin of dorsal fin over upper pectoral fin base; predorsal length 3.1 (3.3) in SL ; dorsal spines thin, short, increasing in length; first spine about one-third length of fourth spine; last dorsal spine 3.3 (3.5) in HL; soft portion of dorsal fin nearly uniform in height; first soft ray slightly ahead of level of anus; first soft dorsal ray unbranched, remaining rays becoming increasingly branched posteriorly, last ray branched at base; penultimate soft dorsal ray notably longer than adjacent rays, length 1.5 in HL; anal fin nearly uniform in height, rays slightly shorter than dorsal-fin rays; base of anal fin 3.5 (3.4) in SL; origin of fin below base of first or second dorsal soft ray; two short anal spines, the first rudimentary, its length 2.5 (2.2) in length of second spine; branching of first soft anal ray barely detectable, remaining rays becoming increasingly branched posteriorly, last ray branched at base; penultimate soft anal ray notably longer than adjacent rays, length 2.0 in HL; pectoral fins pointed, reaching a vertical at base of first dorsal soft ray; length of longest pectoral ray 3.7 (3.8) in SL; all but uppermost pectoral ray branched; stout upper ray about one-third length of longest pectoral ray; pelvic fins more or less pointed, their origin slightly anterior to lower pectoral-fin base, length 6.9 (6.6) in SL, reaching two-thirds length of pectoral fins; pelvic-fin spine about two-thirds length of longest pelvic ray; all pelvic-fin rays branched; caudal fin emarginate, its length 4.4 (4.9) in SL; upper and lowermost principal caudal rays unbranched, remaining principal rays branched.

Colour of holotype when fresh (Fig. 1): head and body generally blue grey, darker dorsally (especially on head and anterior body); about 15 diffuse, yellow bars along dorsal half of body; a broad, blue-edged yellowish-white stripe from snout to lower edge of eye, then angling upward to upper margin of preoperculum; cheek mauve; anterior portion of lower operculum bright blue; a yellowish band extending posteriorly from upper rear part of eye to region immediately above pectoral fin base; lips charcoal or dark grey; belly and thoracic region yellowish white; dorsal, anal, and caudal fins yellow-orange; tip of upper caudal-fin lobe whitish, separated from yellow-orange colour

Fig. 2. Underwater photograph of *Hoplolatilus erdmanni*, approximately 160 mm TL, 52 m depth, near Triton Bay, Irian Jaya Barat Province, Indonesia. Photo by G. R. Allen.

of fin by diagonal brownish band, which continues along dorsal margin of fin to base; pectoral and pelvic fins translucent whitish except uppermost pectoral ray dusky blackish.

Colour in life (Fig. 2): upper half of head and adjacent antero-dorsal portion of body generally grey, grading to brown along base of posterior half of dorsal fin; about 17, ventrally tapering reddish-brown bars on side, extending just below mid-lateral axis, interspersed with anteriorly-tapering bluish-white bars of about equal width, posteriormost 2-3 light and dark bars very faint and diffuse; lower half of head and side white to bluish-white except caudal peduncle which is brilliant neon blue, more intense on upper half; a blue-edged, yellow-orange stripe from snout to lower edge of eye, then angling upward to upper margin of preoperculum, continued posteriorly as thin blue stripe to lower base of opercular spine; blue margin on edge of operculum above opercular spine; lips and cheek pale blue; dorsal fin red with narrow blue margin; anal fin light blue on basal portion grading to reddish on most of fin; caudal fin red centrally grading to pale brown or dusky yellowish on upper and lower edges; pelvic fins whitish to blue-white on anterior edge grading to translucent posteriorly; pectoral fins translucent whitish except uppermost pectoral ray neon blue and narrow, ventrally tapered wedge of yellow-orange on upper base of fin; a bluish area behind opercular spine, immediately above upper origin of pectoral fin.

Colour in alcohol: head and body greyish brown, darker dorsally with very faint indication of about 15 narrow brown bars along dorsal two-thirds of body; relatively broad whitish stripe from snout to lower edge of eye and continuing behind eye (although faint) to upper margin of preoperculum, its upper and lower margins dark grey, especially pronounced on upper margin of snout stripe; fins translucent whitish except for narrow blackish band along distal margin of dorsal fin and dusky grey rays adjacent to dorsal and ventral margins of caudal fin; also a diagonal band of grey across dorsal lobe of caudal fin that is confluent with dusky grey dorsal edge of fin.

Remarks: Although admittedly lacking genetic evidence, Earle & Pyle (1997) suggested that *Hoplolatilus* was divisible into three groups based on selected meristic and morphological features. The first group containing *H. chlupatyi, H. fronticinctus, H. geo*, and *H. pohle* have relatively few soft dorsal and anal rays (usually 13 and 12 respectively), generally fewer lateral-line scales (81-97), fewer preopercular serrae (1-21) and a relatively deeper body (3.4-4.1 in SL, except 5.1-5.6 in *H. chlupatyi).* Members of this group are also known to construct impressively large mounds at the entrance to their burrows, sometimes approaching 1 m in height and 2-3 m in diameter. *Hoplolatilus geo* is provisionally placed in the group on the basis of photographic evidence (no specimens have been collected).

The second group contains *H. fourmanoiri, H. luteus,* and *H. oren*. It is characterised by a high number of soft dorsal and anal rays (21-23 and 18-20 respectively), moderately high number of lat-

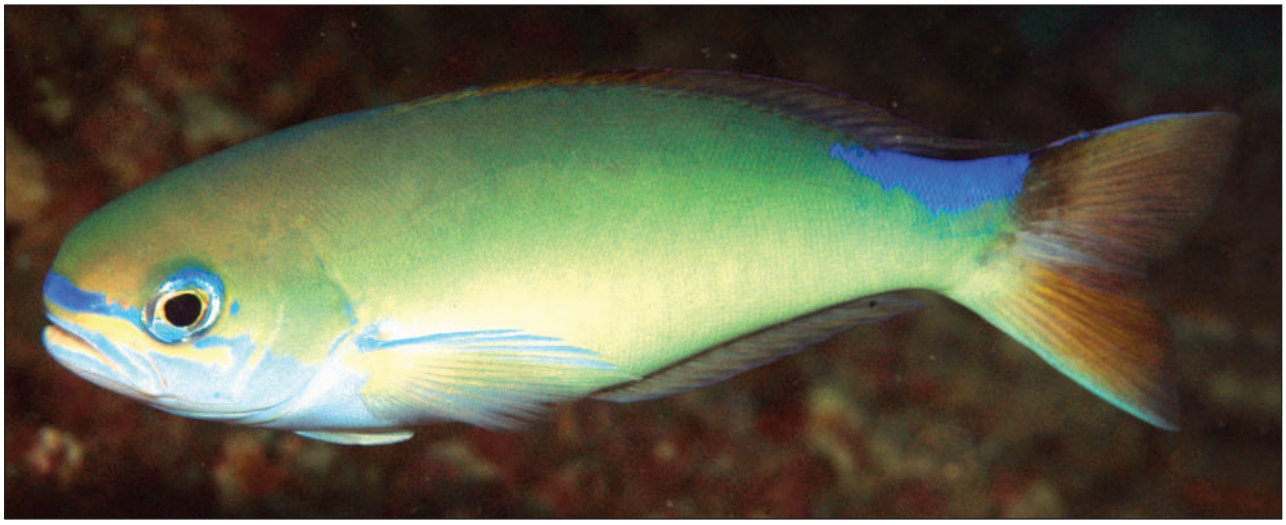

Fig. 3. Underwater photograph of *Hoplolatilus fronticinctus*, approximately 160 mm TL, 40 m depth, Triton Bay, Irian Jaya Barat Province, Indonesia. Photo by G. R. Allen.

eral-lines scales (92-106), relatively few gill rakers on the first arch (16-19), and a slender body (4.9-6.3 in SL). It may also differ in usually having 11 rather than 10 precaudal vertebrae, although the single known specimen of *H. luteus* has 10.

The third group containing *H. cuniculus, H. marcosi, H. purpureus*, and *H. starcki* has a combination of features that include III to IX rather than X dorsal spines, 16-34 soft dorsal rays, 14-20 soft anal rays, 95-140 lateral-line scales, 20-27 gill rakers, and 27-58 preopercular serrae.

The new species is clearly a member of the first group based on its combination of 13 soft dorsal rays, 12 soft anal rays, 76-84 lateral-line scales, 26-27 gill rakers on the first arch, 14-19 preopercular serrae, and relatively deep body (3.5-3.7 in SL). The paratype, which has IX dorsal spines and 14 soft rays, is probably aberrant in this respect. A count of X,13 is also apparent on an uncollected individual photographed at the type locality. Morphologically *H. erdmanni* is most similar to *H. fronticinctus* (Fig. 3). They differ mainly in the number of lateral line scales (76-84 for *H. erdmanni* versus 85-92), although it is difficult to fully assess this feature on the basis of only two specimens. However, the two species exhibit several important colour pattern differences including the presence of about 15-17 reddish-brown bars in *H. erdmann*i (body plain in *H. fronticinctus),* obliquely angled, blue-edged yellow-orange stripe behind eye (horizontal stripe under eye in *H. fronticinctus),* thin blue stripe across the operculum (absent in *H. fronticinctus*), neon blue region across entire caudal peduncle (forming dorsal saddle only in *H. fronticinctus),* and vivid red central caudal fin-rays (paler red in *H. fronticinctus).*

Hoplolatilus erdmanni is known only from the type locality and a nearby location near the entrance of Triton Bay in Irian Jaya Barat Province of western New Guinea. Both areas are exposed to periodic strong currents. About 15 individuals were observed on gentle rubble slopes at depths of 42-60 m. The fish were seen solitarily, in pairs, or trios generally in close proximity to large rubble mounds. These constructions were estimated to range from 50-60 cm in height and 1.8-2 m in diameter. When approached too closely or frightened by spear shots, the fish quickly retreated into their burrow, situated at the apex of the mound. The Triton Bay area is particularly rich for sand tilefishes with regular sightings of *H. chlupatyi*, *H. fronticinctus, H. luteus, H. cuniculus, H. marcosi, H. pohle, and H. purpureus.* Surprisingly, *H. starcki*, which is generally common throughout eastern Indonesia, was not seen. There is a certain degree of depth zonation for the various species with *H. cuniculus* occurring between about 30-40 m, *H. fronticinctus* in about 40-50 m, and the remaining species including *H. erdmanni* below 50 m. The deepest dwelling member of the group, *H. pohle*, was mainly seen below about 55 m. There was no suggestion of behavioural interaction between the morphologically similar *H. erdmanni* and *H. fronticinctus,* which were always seen in conspecific groups.

Etymology: The species is named *erdmanni* in honour of Mark V. Erdmann, who was the first to observe this species and collector of the type specimens. He has also generously assisted with the author's ichthyological investigations of the Bird's Head Peninsula of western New Guinea.

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