

First record of *Odontanthias unimaculatus* (Tanaka 1917) (Perciformes: Serranidae) from Indonesia

TEGUH PERISTIWADY*

Technical Implementation Unit for Marine Biota Conservation, Research Centre for Oceanography, Indonesian Institute of Sciences. Jl. Tandurusa, Kel. Tandurusa, Kec. Aertembaga, Bitung 95527, North Sulawesi, Indonesia. Tel./Fax. 0438 30755. e-mail: ikan_teguh@yahoo.com

Manuscript received: 17 March 2011. Revision accepted: 19 April 2011.

ABSTRACT

Peristiwady T (2011) First record of Odontanthias unimaculatus (Tanaka 1917) (Perciformes: Serranidae) from Indonesia. Biodiversitas 12: 136-140. Seven specimens of *O. unimaculatus* were collected from Bitung, North Sulawesi between 7 January and 18 August 2009. They were caught from depths of about 100 m in association with other deep water fishes as *Epinephelus*, *Pristipomoides* and *Etelis*. *O. unimaculatus* was most similar to *O. grahami*, in sharing the following characters: dorsal fin soft rays 14, anal fin soft rays 7, scales on lateral line 36-37 and gill rakers on upper limb 13-14. If caudal fin shape and coloration were ignored, *O. unimaculatus* would seem most closely related to *O. tapui* and *O. chrysostictus*. Their body proportions were nearly the same. However the later species had longer body width, third dorsal and second anal spine but had shorter longest dorsal ray length, longest anal rays, caudal-fin length and caudal concavity. Other little different characters of *O. unimaculatus* with other seven species were the proportion of upper jaws length and proportion of body depth. Initially this species was described as new species from Tanabe, Wakayama Prefecture, Japan. Other specimens were reported from Suruga Bay, Japan, Keelung and Kaohsiun, Taiwan and Lubang Island, Philippines and now recorded also in Bitung, North Sulawesi, Indonesia.

Key words: *Odontanthias unimaculatus*, Serranidae, Anthiinae, new record, taxonomy, Sulawesi, Indonesia.

INTRODUCTION

Most anthiine fishes are of small size living in hard-bottom habitat at depths of about 100-400 m (Randall and Heemstra 2006) therefore it is rarely taken by scuba diving, gill-netting or trawling. Difficulties of catch, small fish size and little commercial value of the species (Chen and Shao 2002; Randall and Hoese 1995; Randall 1996; Randall and Heemstra 2006, 2007), anthiine fishes are not well represented in museum collections of which some species were described as new species based on a single or several specimens (Anderson 2006, 2008; Anderson and Baldwin 2002; Chen and Shao 2002; Kon et al. 2000; Peristiwady et al. 2010; Randall 1996; Randall and Pyle 2001; Randall and Heemstra 2006, 2007; William 2008; Wu et al. 2011). The anthiine specimens in this studies were taken by hook and line by fishermen who targeting deep water groupers or snappers as *Epinephelus*, *Pristipomoides* and *Etelis*. Although the fish was taken by hook and line but because the fish size was normally small, therefore the fishermen were almost never bring the fish to the market.

The Subfamily Anthiinae of the family Serranidae comprises of about 24 genera and more than 100 species that inhabit coral and deep reef habitats in tropical and warm temperate seas (Akhilesh et al. 2009). The genus *Odontanthias* is characterized as follows: Dorsal fin rays X,12-19; anal fin rays III,7-8; pectoral rays 15-19; lateral line complete or incomplete; vertebrae 26; interorbital space convex; mouth not large; tongue, vomer, palatines

and mesopterygoids with a large patches of small villiform teeth; posterior margin of preopercle strongly serrate with a prominent flat spine or enlarge spine at the angle; and body depth 1.9-2.7, head length 2.35-2.85 both in standard length (SL) (Randall and Heemstra 2006).

In Indo-Pacific region, 13 species of *Odontanthias* were reported by Randall and Heemstra (2006), in Indonesian waters three species were reported by Kimura et al. (2003); Kuitert and Debelius (2006); Masuda et al. (1984); Peristiwady (2006); Randall and Heemstra (2006): *Odontanthias borbonius* (Valenciennes, 1823), *O. chrysostictus* (Günther, 1872) and *O. rhodopeplus* (Günther, 1872). Herein, it was found this species bringing the total number of species of this genus known in Indonesian waters to four.

MATERIALS AND METHODS

The specimens of *Odontanthias unimaculatus* were collected from several fish markets at Bitung, North Sulawesi (Figure 1). The specimens were caught by hook and line. Specimens were photographed when fresh and then preserved in 10% formalin for about one week and transferred to 70% ethanol for permanent preservation and further examination.

Methods of counting and measuring followed Randall and Heemstra (2006) with additional measurement as measurements of all spines and rays length of dorsal and

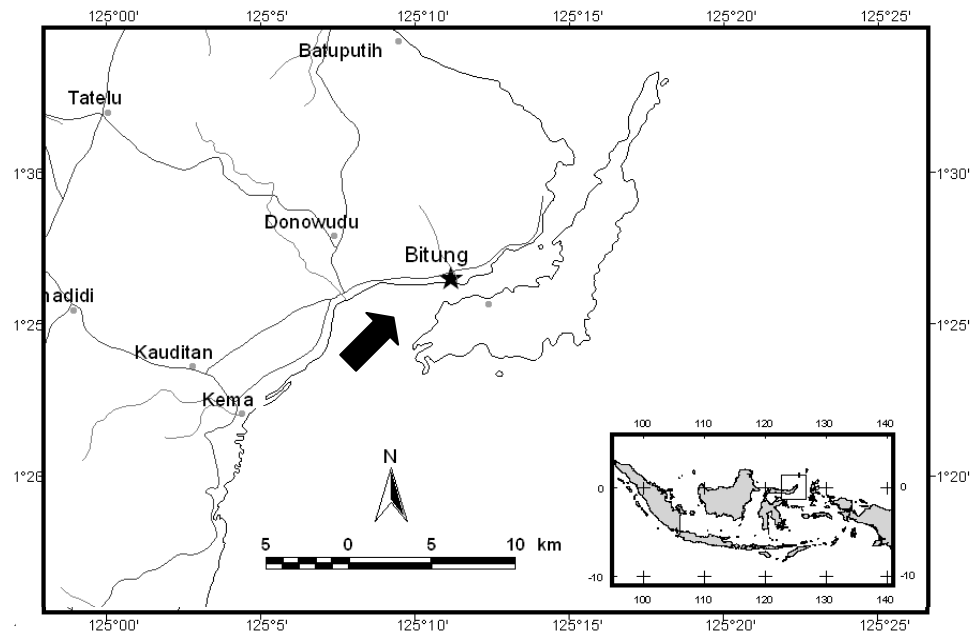


Figure 1. Location of Girian and Winenet, Bitung, North Sulawesi, Indonesia where the specimens were collected (arrow)

anal fins and suborbital width. All measurements were made with digital calipers to the nearest 0.01 mm. Cyanine blue was used to examine and count the scales. All lengths are reported as standard length (SL) and body depth (BD). The specimens are deposited at LBRC-F (References Collection of Technical Implementation Unit for Marine Biota Conservation, Indonesian Institute of Science), Bitung, North Sulawesi, Indonesia.

RESULTS AND DISCUSSION

Odontanthias unimaculatus (Tanaka, 1917) (Figure 2; Table 1).

Holotype: *Anthias unimaculatus* Tanaka 1917: 199 (type locality, Tanabe, Wakayama Prefecture, Japan); Tanaka (1922) in Randall and Heemstra (2006): 23, pl. VI B, Tables 1-3, figs. 1 L, 6, 9.

Material examined: Seven specimens, 93.73-116.52 mm SL, all specimens collected in Bitung, North Sulawesi, Indonesia. LBRC-F 1391, LBRC-F 1394, 93.73-101.71 mm SL, Girian Fish Market, 14 December 2009; LBRC-F 1635, 94.21 mm SL, Girian Fish Market, 29 July 2010; LBRC-F 1704, 116.52 mm SL, Girian Fish Market, 17 September 2009; LBRC-F 1715, 110.8 mm SL, Girian Fish Market, 20 September 2009; LBRC-F 1738, 103.44 mm SL, Girian Fish Market, 25 September 2010; LBRC-F 1747, 97.69 mm SL, Girian Fish Market, 27 September 2010;

Description: Measurements and counts are shown in Table 1. Dorsal-fin rays X,14; anal rays III, 7; all dorsal and anal rays branched, the last joined to base; pectoral-fin ray 17, uppermost rays unbranched; pelvic rays I, 5, all rays branched, second outer rays forming filament; lateral-line scales 36-37 (37); scales above lateral line to origin of dorsal fin 6-8 (7); scales below lateral line to origin of anal

fin 17-20 (19); scales above lateral line to base of middle dorsal fin 3; oblique rows of scales on check 7-8; gill rakers 13-14 + 29 (total rakers (42-43).

Body deep and compressed, the width 2.26-2.54 (2.39) in body depth; head length 2.75-2.95 (2.80) all in SL; eye large, the orbit diameter 2.81-3.31 (3.03) in HL; snout length 4.34-5.07 (4.66) in HL; interorbital space convex, the least bony width 3.41-3.59 (3.52) in HL; least caudal peduncle depth 2.53-2.85 (2.61) in HL; caudal peduncle length 1.43-1.76 (1.61) in HL.

Mouth terminal, oblique and not large, forming an angle of about 45° to horizontal line of head, the lower jaw projecting; maxilla reaching slightly posterior to a vertical through center of pupil, the upper jaw length 2.02-2.30 (2.09) in HL; each anterior of upper jaw with a stout canine teeth, inner upper jaw and lower jaw with rows of minute teeth, outer rows with several teeth longer than inner teeth, half distance of lower jaw with stout and long recurved canines bigger than upper jaw canines.

Nostrils slightly in front of upper horizontal center margin of pupil, the anterior with a flap that almost reaches the anterior of nostril aperture; large sensory pore found in front of anterior nostril, other sensory pores at around lachrymal, infra-orbital and below lower jaw.

Opercle with three flat spines, middle one largest and most posterior, slightly closer to lower than upper spine; upper opercular spine blunt and covered by scale; posterior margin of preopercular edge of preopercle with 15-27, angle of preopercle with a large flat spine about half way to margin of subopercle; serrae on ventral edge of preopercle 1-4; margin of subopercle with 0-3, margin of interopercle with 2-3, opercular flap pointed.

Lateral line complete, broadly arched over pectoral fin closed to dorsal fin base, running parallel to dorsal body contour below dorsal fin; its highest point below base of 6th dorsal spine.

Table 1. Morphometric data and meristic counts for *Odontanthias unimaculatus*. Minimum and maximum measurements are presented as percentages of body depth and mean value between brackets.

Number of specimens	7
Value	min-max (mean)
Standard length (mm)	93.73-116.52 (102.48)
Count	
Dorsal-fin rays	14-14 (14)
Anal-fin rays	7-7 (7)
Pectoral-fin rays	18-18 (18)
Pelvic-fin rays	5-5 (5)
Scales on lateral line	36-37 (36.57)
Scales above lateral line	6-8 (7.07)
Scales below lateral line	16.5-20 (18.64)
Gill rakers on upper limb	13-14 (13.50)
Gill rakers on lower limb	29-29 (29.00)
Total gill rakers	42-43 (42.50)
In % BD	
Head length	81.93-89.24 (84.13)
Body width	39.37-44.34 (41.96)
Predorsal length	73.37-80.20 (76.09)
Prepelvic length	83.19-90.69 (86.53)
Preanal length	144.06-158.07 (152.81)
Dorsal-fin base length	150.88-164.54 (155.64)
Anal-fin base length	44.29-47.60 (45.90)
Longest dorsal ray length	59.87-74.77 (70.53)
Pectoral-fin length	70.43-78.76 (73.73)
Pelvic-fin length	75.13-98.70 (85.95)
Caudal-peduncle depth	31.35-33.11 (32.21)
Caudal-peduncle length	50.38-58.54 (52.44)
1th dorsal spine	16.11-20.48 (17.78)
2nd dorsal spine	24.73-30.33 (26.68)
3th dorsal spine	39.99-56.00 (46.64)
Longest dorsal ray length (3th)	59.87-74.77 (70.53)
First anal spine	19.96-24.86 (22.72)
Second anal spine	36.37-43.74 (40.25)
Third anal spine	32.92-42.01 (37.35)
Longest anal ray	45.47-52.08 (48.94)
Caudal-fin length	79.83-95.31 (86.72)
Pelvic spine length	46.43-48.58 (47.75)
Snout length	16.63-19.24 (18.09)
Orbit diameter	25.26-31.77 (27.84)
Interorbital width	23.00-24.86 (23.91)
Upper-jaw length	38.74-41.41 (40.19)
Sub-orbital width	7.76-9.75 (9.05)
Caudal concav	44.43-56.59 (50.69)

Scales ctenoid; predorsal part of head scaled anteriorly reaching base of upper lip; maxilla and mandible completely naked; preorbital from nostrils to below front of orbit naked; small scales on base of all fins; scales on two upper and lower lobes caudal rays almost reaching tip, base of the middle caudal fin with scales to about one third of caudal fin; base of pectoral and anal fins with small scales.

Origin of dorsal fin above the beginning of posttemporal, predorsal length 1.08-1.14 (1.11) in HL; first dorsal spine short 1.35-1.59 (1.50), about half length of second dorsal spine, second dorsal spine 1.32-2.10 (1.76) in third dorsal spine; third dorsal spine longest, 1.49-2.23

(1.83) in HL; third dorsal ray longest forming filament, 1.10-1.42 (1.20) in HL; origin of anal fin beneath third dorsal ray; first anal spine 1.59-2.16 (1.78) in length of second spine; second anal spine slightly shorter than third, 0.82-0.97 (0.93) in length of third spine; second or third anal ray longest, 1.57-1.84 (1.72) in HL; caudal fin deeply emarginated, the upper and lower lobes not forming filament, the fin length 2.38-3.00 (2.72) in SL; caudal concavity 4.09-5.42 (4.69) in SL; pectoral fin not pointed, the ninth ray longest, reaching base of first anal spine, 1.09-1.19 (1.14) in HL; origin of pelvic fin on a vertical through between base of third and fourth dorsal spine; second pelvic ray longest forming filament reaching the first base of anal spine, the length 0.86-1.11 (0.98) in HL.

Color when fresh (Figure 1): body pink dorsally grading to pale pink ventrally. Upper part of body with white bright spot on scale, lower part of body scale pale red. Head pink dorsally, pale pink ventrally, with a yellow blotches running from interorbital space to anterior of dorsal fin base; a second yellow stripe from upper lip, passing suborbital space to above the biggest flat spine at opercle; yellow bright blotches at pectoral fin base; spinous portion of dorsal fin pale pink, upper part of dorsal spine portion with a large pale yellow area from the first to anterior part of dorsal rays; incised portion of dorsal spine bright yellow, basal soft portion of dorsal fin pale pink, the outer part pale yellow; pectoral fin pale pink; inner rays of pelvic fins pale pink; anal fin yellowish; other rays and membranes pale pink; caudal fin pink, each lobe yellow stripe at inner and outer lobe.

Color after preservation: Head and body uniformly pale whitish, some specimens with three brownish line on body, head with a faint dusky blotch dorsally around preopercle;

Distribution and ecological notes: Initially this species was described as new species from Tanabe, Wakayama Prefecture, Japan. Other specimens were reported from Suruga Bay, Japan (Katayama 1960 in Randall and Heemstra 2006), Keelung and Kaohsiun, Taiwan (Lee 1990 in Randall and Heemstra 2006) and Lubang Island, Philippines (Randall and Heemstra 2006) and now recorded also in Bitung, Sulawesi Island, Indonesia.

Comparison and Remarks: The meristic data of *Odontanthias unimaculatus* was most similar to *O. grahami*, in sharing the following characters: dorsal fin soft rays 14, anal fin soft rays 7, scales on lateral line 36-37 and gill rakers on upper limb 13-14. If caudal fin shape and coloration were ignored, *O. unimaculatus* would seem most closely related to *O. tapui* and *O. chrysostictus*. The body proportions data between *O. unimaculatus* and *O. chrysostictus* are nearly the same, however the later species has longer body width, third dorsal spine and second anal spine but has shorter longest dorsal ray length, longest anal rays, caudal-fin length and caudal concavity. Other little different characters of *O. unimaculatus* with other seven species were the proportion of upper jaws length and proportion of body depth (Figure 3A and B).

The fish were collected using vertical hook and line by fishermen who targeting deep water groupers or snappers as *Epinephelus*, *Pristipomoides* and *Etelis*. The depth of the catch was about 100-150 meter.

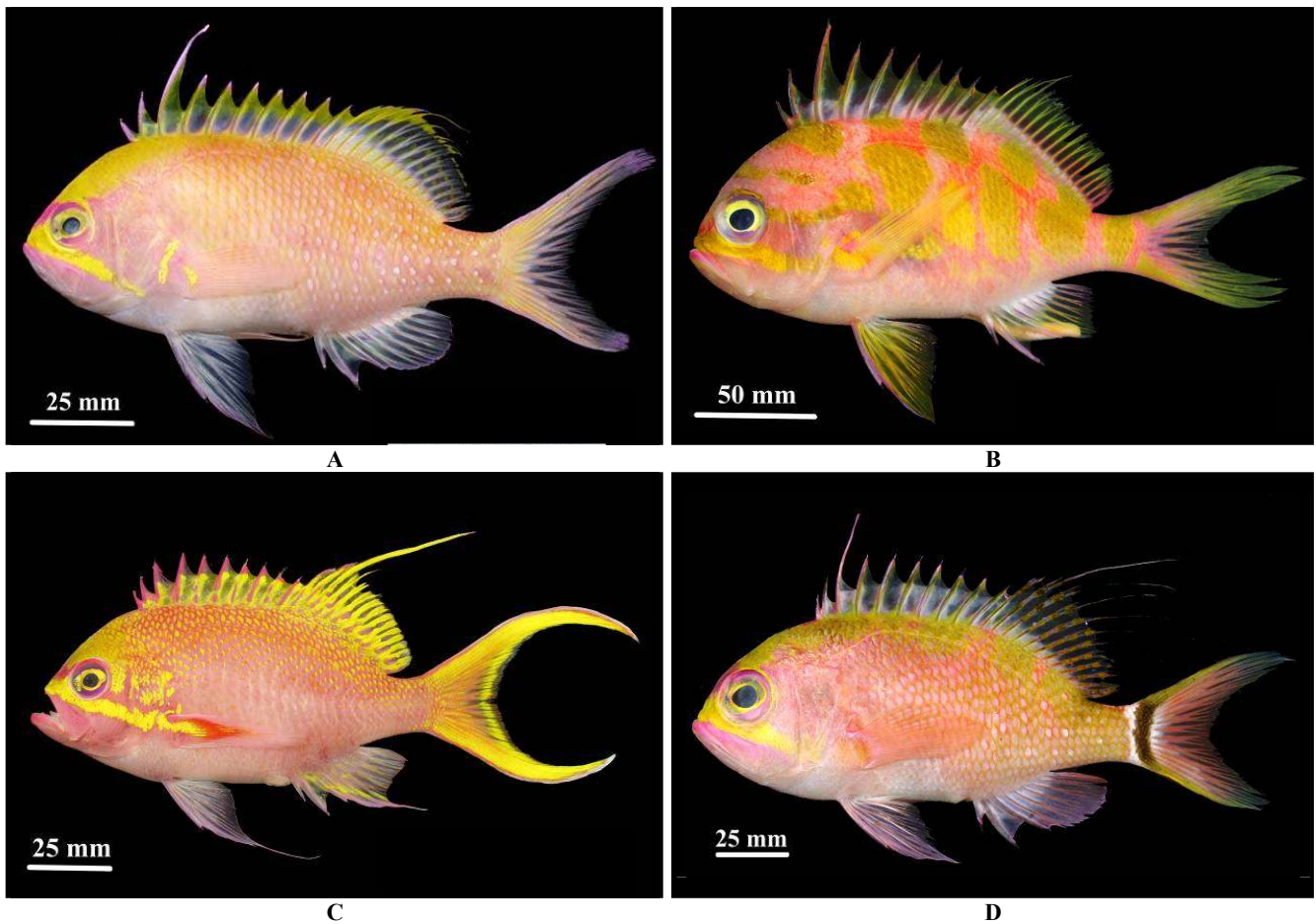


Figure 2. Four species of anthiine fish of the genus *Odontanthias* found from Bitung, North Sulawesi, Indonesia. (A). *O. unimaculatus*; (B). *O. borbonius*; (C). *O. chrysostictus*; (D). *O. rhodopeplus*.

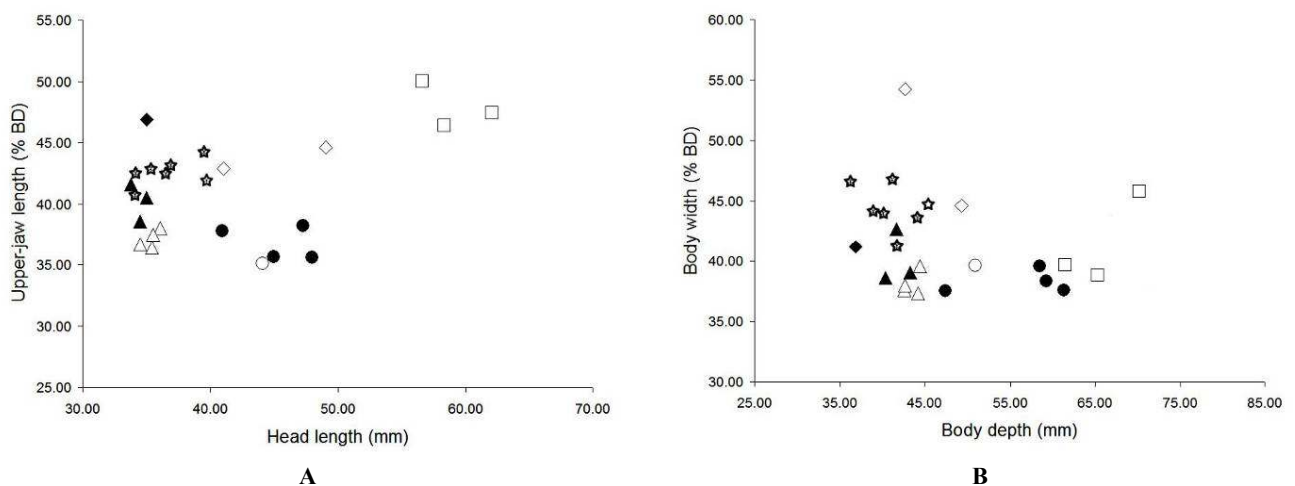


Figure 3. Ratio of upper jaws length (A) and body width (B) of eight species. Note: solid circles (*O. chrysostictus*); open diamond-shapes (*O. dorsomaculatus*); solid diamond-shapes (*O. grahami*); open triangles (*O. katayamai*); open squares (*O. rhodopeplus*); solid triangles (*O. tapui*); star (*O. unimaculatus*); open circles (*O. wassi*).

Comparative materials: *O. chrysostictus*: LBRC-F 001392, 133.3 mm SL, no data on depth, hook and line, Fish market Girian, Bitung, North Sulawesi, Indonesia, 15 December 2009, collected by T. Peristiwady; LBRC-F

001287, 109.66 mm SL, no data on depth, hook and line, Batuputih, Bitung, North Sulawesi, Indonesia, 16 October 2009, collected by T. Peristiwady; FRLM 34846, 134.23 mm SL, no data on depth, hook and line, Bitung, North

Sulawesi, Indonesia, 13 November 2008, collected by S. Kimura, H. Sakakibara and T. Peristiwady; *O. dorsomaculatus*: HUMZ 74194, 134 mm SL, Saya de Malha Bank, 120 m, 3 September 1977; HUMZ 73951, 110 mm SL, Saya de Malha Bank, 120 m, 2 September 1977 (Katayama and Yamamoto 1986); *O. grahmi* Randall & Heemstra: AMS I.32142-010, 94 mm SL, Australia, 126-130 m, collected by Ken J. Graham, 16 February 1991 (Randall and Heemstra 2006); *O. katayamai*: BPBM 8527, 163 mm SL, Mariana Islands, Guam, collected by Fish and Wildlife, Government of Guam, 20 June 1968 (Randall et al. 1979); BPBM 5848, 126.5 mm SL, Mariana Islands, 300 m, collected by Fish and Wildlife, Government of Guam, 7 April 1967 (Randall et al. 1979); URB 78-0148, 145 mm SL, Ryukyu Islands, more than 100 m, collected by T. Yoshino, 6 June 1973 (Randall et al. 1979); MNHN 1978/136, 150.7 mm SL, Ryukyu Islands, collected by T. Yoshino, August 1973 (Randall et al. 1979); *O. rhodopeplus*: UMRP 37795, 167.5 mm, Fish market Okinawa, no data on depth, collected by T. Yoshino; UMRP 0492, 160.5 mm, Fish market, Okinawa, no data on depth, collected by T. Yoshino; UMRP 10524, 159 mm, Fish Market Okinawa, no data on depth collected by T. Yoshino; *O. tapui*: MNHM 1978/459, 141 mm, Society Islands, Tahiti, about 300 m, collected by Jean Tapu, April 1975 (Randall et al. 1979); RUSI 4680, 157 mm SL, Cook Islands, collected by Ronald Powell, July 1964; BPBM 17345, 127 mm SL, Society Islands, Tahiti, collected by Anthony Nahacky, 1973 (Randall et al. 1979); *Odontanthias wassi* Randall & Heemstra: BPBM 29373 (holotype), 1 specimen, 121.0 mm SL, American Samoa, Ofu Island, off Ofu Village, about 100 meters, hook and line, collected by Paul Pedro (local fishermen), 2 September 1983.

CONCLUSION

This species, *Odontanthias unimaculatus*, is the first record of anthiine fish genus *Odontanthias* from Indonesia waters. This record was based from seven specimens captured by using vertical hook and line on deep water groupers or snappers fishing grounds from the depth of about 100-150 meter. This first record is bringing the total number of species of this genus known in Indonesian waters become four species (*O. borbonius*, *O. chrysostictus*, *O. rhodopeplus* and *O. unimaculatus*). In the world, this species was also found from Tanabe, Wakayama Prefecture and Suruga Bay, Japan; Keelung and Kaohsiun, Taiwan and Lubang Island, Philippines.

ACKNOWLEDGEMENTS

I am very grateful to Embo for her assistance to collect the specimens. I wish to express my sincere gratitude to Prof. K. Matsuura (NSMT, Tokyo-Japan), Prof. S. Kimura (FRLM, Mie University, Japan), Dr. M.K. Moosa (CRITC, Jakarta) and JSPS, for their helps and supports. This study was supported in part by a "Fish Biodiversity of the Coral

Reef Ecosystems at Coral Triangle's, financed by the Directorate of Higher Education, Department of National Education, 2009, and Minister of Sciences and Technology Indonesia-Indonesian Institute of Sciences 2010.

REFERENCES

- Akhilesh KV, Pillai NGK, Ganga U, Bineesh KK, Shanis RCP, Manjebayakath H (2009) First record of the anthiine fish, *Meganthias filiferus* (Perciformes: Serranidae) from Indian waters. *JMBA Biodiv Rec* 2:1-3.
- Anderson WD (2006) *Meganthias carpenteri*, a new species of fish from the eastern Atlantic Ocean, with a key to eastern Atlantic anthiinae (Perciformes: Serranidae). *Proc Biol Soc Wash* 119 (3): 404-417.
- Anderson WD (2008) A new species of the perciform fish genus *Plectranthias* (Serranidae: Anthiinae) from the Nazca Ridge in the eastern South Pacific. *Proc Biol Soc Wash* 121 (4): 429-437.
- Anderson WD, Baldwin CC (2002) *Plectranthias lamillai* Rojas and Pequenõ, 1998: A Junior Synonym of *Plectranthias exsul* Heemstra and Anderson, 1983. *Copeia* 1: 233-238.
- Chen JP, Shao KT (2002) *Plectranthias sheni*, a new species and *P. kamii*, a new record of Anthiine Fishes (Perciformes: Serranidae) from Taiwan. *Zool Stud* 41 (1): 63-68.
- Katayama M, Yamamoto E (1986) The Anthiine Fishes, *Odontanthias dorsomaculatus* sp. nov. and *Plectranthias bauchotae* Randall, from the Western Indian Ocean. *Japan J Ichthyol* 32 (4): 387-390.
- Kimura S, Peristiwady T, Suharti SR (2003) Serranidae. In: Kimura S, Matsuura K (eds) Fishes of Bitung. Northern tip of Sulawesi, Indonesia. Ocean Research Institute, University of Tokyo, Tokyo.
- Kon T, Yoshino T, Sakurai Y (2000) A new anthiine fish (Perciformes: Serranidae), *Holanthias kingyo*, from the Ryukyu Islands. *Ichthyol Res* 47 (1): 75-79.
- Kuiter RH, Debelius H (2006) World atlas of marine fishes. Ikan-Unterwasserarchiv, Waldschulstrasse 166, 65933 Frankfurt, Germany.
- Masuda H, Amaoka K, Araga C, Uyeno T, Yoshino T (1984) The fishes of the Japanese Archipelago. Tokai Univ Press, Tokyo, Japan.
- Peristiwady T (2006) Economical Important fish of Indonesia: Fish identification guidebook. Lipi-Press, Indonesian Institute of Sciences, Jakarta (in Indonesian).
- Peristiwady P, Kimura S and Matsuura K (2010) An undescribed species of anthiine fish genus *Odontanthias* (Perciformes: Serranidae) - "New Direction of Ocean Research in the Western Pacific"-Past, Present and Future of UNESCO/IOC/WESTPAC Activity for 50 years and the JSPS Project "Coastal Marine Science". Atmosphere and Ocean Research Institute (AORI), the University of Tokyo Japan, 26-29 October 2010.
- Randall JE (1996) Two new anthiine fishes of the genus *Plectranthias* (Perciformes: Serranidae), with a key to the species. *Micronesica* 29: 113-131.
- Randall JE and Hoese DF (1995) Three new species of Australian fishes of the genus *Plectranthias* (Perciformes: Serranidae: Anthiinae). *Rec Aust Mus* 47 (3): 327-335.
- Randall JE, Heemstra PC (2006) Review of the Indo-Pacific fishes of the genus *Odontanthias* (Serranidae: Anthiinae), with descriptions of two new species and related new genus. *Indo-Pac Fish* 38: 1-31.
- Randall JE, Heemstra PC (2007) *Meganthias filiferus*, a new species of anthiine fish (Perciformes: Serranidae), from the Andaman sea off Southwestern Thailand. *Phuket Mar Biol Cent Res Bull* 68: 5-9.
- Randall JE, Maugé LA, Plessis YB (1979) Two new anthiine fishes of the genus *Holanthias* from the Southern and Western Pacific. *Jap J Ichthyol* 26 (1): 17-25.
- Randall JE, Pyle RL (2001) Four new serranid fishes of the anthiine genus *Pseudanthias* from the South Pacific. *Raffles Bull Zoo* 49 (1): 19-34.
- William Jr. DA (2008) A new species of the perciform fish genus *Plectranthias* (Serranidae: Anthiinae) from the Nazca Ridge in the eastern South Pacific. *Proc Biol Soc Wash* 121 (4): 429-437.
- Wu KY, Randall JE, and Chen JP (2011) Two new species of anthiine fishes of the genus *Plectranthias* (Perciformes: Serranidae) from Taiwan. *Zool Stud* 50 (2): 247-253.