



New distribution record of grouper from Maluku waters, Eastern Indonesia

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Abstract. Three specimens of garish hind *Cephalopholis igarashiensis* were collected from Mardika Fish Market and Asilulu village, Ambon, during a research to inventory reef food fishes in Ambon Island, Maluku Province, Indonesia. This species is of the family Serranidae and had never been reported to occur in Maluku waters. The specimens of *C. igarashiensis* were characterized as follows: dorsal fin rays IX,14; anal fin rays III, 9; pectoral rays 17-18. The finding in the present study added to the new range in the distribution of this species in Indonesian waters.

Key Words: *Cephalopholis igarashiensis*, garish hind, Serranidae, new record, Ambon.

Introduction. The serranid subfamily Epinephelinae recognized as groupers are the most important and economical fish in tropical and subtropical countries. Subfamily Epinephelinae comprises about 160 species of marine fishes in 15 genera (Heemstra & Randall 1993) in which 39 species in 7 genera can be found in Indonesian waters (Craig et al 2011; Habibi et al 2011). Even though groupers have the highest economic value, information about their distribution especially for deep water species is still lacking. For example, Heemstra & Randall (1993) observed that a deep water species, *Cephalopholis igarashiensis*, commonly called goldbar grouper or garish hind occurred only in tropical western Pacific: southern Japan, Taiwan, Guam, Philippines, South China Sea, Samoa, and Tahiti; excluding Indonesian waters. Furthermore, Cabanban et al (2008) was of the opinion that any reported occurrence of this species in Indonesia needs to be confirmed. However, recent studies conducted by Peristiwadi et al (2009) showed that *C. igarashiensis* also occurred in Indonesian waters, i.e., in North Sulawesi.

In a research to inventory reef food fish in Ambon (Limmon et al 2017), three specimens of *C. igarashiensis* were collected from Mardika Fish Market and from Asilulu village, Ambon Island, Maluku Province, Indonesia. This species had never been reported in Maluku waters.

Material and Method. Specimens of *C. igarashiensis* were collected at Mardika Fish Market and at Asilulu village, Ambon, Maluku Province. The fishes were captured by traditional fishers of Asilulu Village using fish trap or locally called as "bubu" at the depth of 80-120 m in Pulau Tiga (P. Ela, P. Hatala and P. Lain; Figure 1).

Samples were then brought to marine ecology laboratory, at Maritime and Marine Science Center of Excellence, Pattimura University. Each specimen was measured, tagged, then laid on styrofoam. The fins were spread with nail and arranged for photograph by using Canon EOS 500D camera. The tissue samples were then collected from the right part of the dorsal of the fish and then preserved in 95% ethanol for DNA extraction. Voucher specimens (fish, tissue and photograph) were deposited at Marine Science Center of Excellence, Pattimura University Ambon.

Morphometric and meristic characters were based on Randall & Heemstra (1991) cited in Peristiwadi et al (2009).

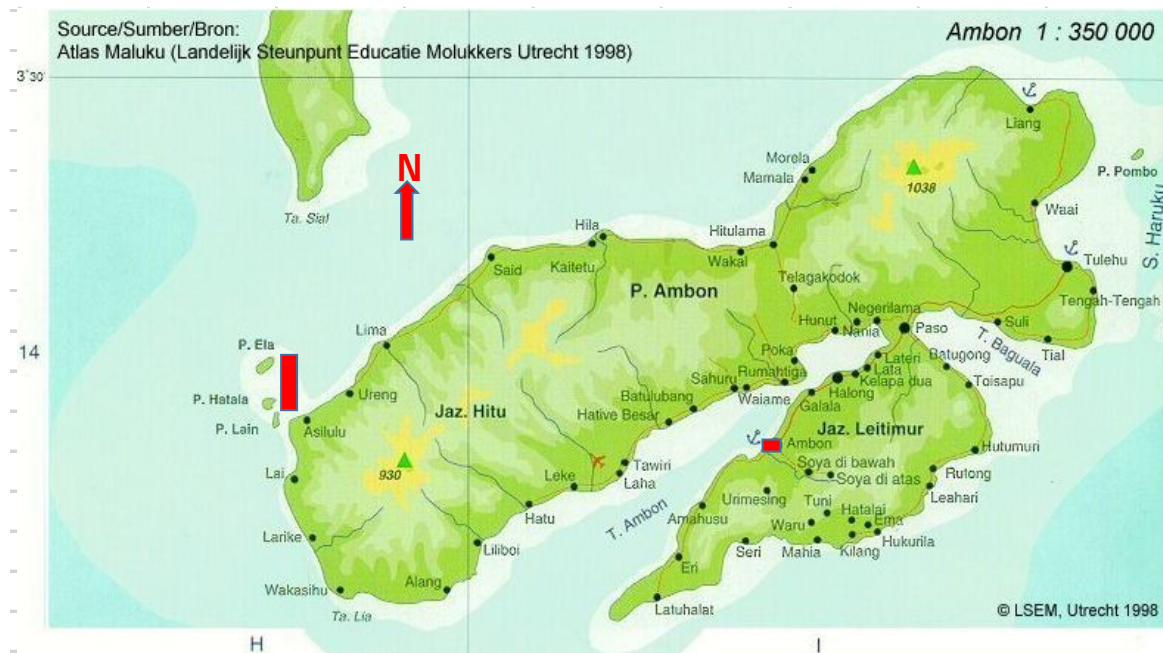


Figure 1. Map of sampling sites (red square) in Ambon Island (LSEM 1998).

Results and Discussion. The genus *Cephalopholis* Bloch & Schneider, 1801 is composed of 22 species (Heemstra & Randall 1993). Descriptions of three specimens of garish hind, *C. igarashiensis* collected during the study are given below.

***Cephalopholis igarashiensis* Katayama, 1957** (Figure 2)

Material examined. Three specimens: BMF 00826, collected on July 1st 2016 at Mardika Fish Market; BMF 01106 collected on July 25th 2016 at Asilulu village and BMF 01351 collected on February 27th 2017 at Mardika Fish Market. Morphological characters (measurement and count) are presented in Table 1.



Figure 2. *Cephalopholis igarashiensis* from Maluku Waters.

Table 1

Meristic and morphometric character (as percentage of standard length) of *C. igarashiensis*

Morphological character	Source		
	Present study	1	2
<i>Measurement</i>			
Total length (mm)	227.50-277.40 (260.60)	(158.83)	-
Standard length (mm)	187.20-237.10 (219.73)	(128.90)	137.0-289.0
Head length	40.40-41.90 (40.96)	41.83-43.00 (42.35)	40.00-43.48*
Body depth	44.49-45.80 (45.15)	44.77-49.06 (46.57)	41.67-50.00*
Body width	17.50-18.43 (18.00)	18.48-20.94 (9.60)	18.12-19.23*
Predorsal length	40.68-44.33 (42.43)	41.19-42.33 (41.86)	36.79-40.46*
Prepelvic length	40.71-43.14 (41.97)	40.35-43.16 (41.52)	41.45-43.17*
Preanal length	68.28-70.73 (69.24)	68.30-71.90 (70.69)	68.85-72.20*
Caudal-peduncle depth	14.39-14.88 (14.57)	13.98-15.58 (14.80)	-
Caudal-peduncle length	17.07-19.50 (18.21)	17.62-22.40 (19.19)	-
Dorsal-fin base	52.04-56.12 (53.68)	54.82-58.67 (56.68)	-
1st dorsal spine	6.60-10.18 (7.89)	6.41-7.85 (6.95)	-
2nd dorsal spine	12.15-13.89 (12.89)	11.58-13.89 (12.72)	-
3rd dorsal spine	14.69-16.16 (15.37)	14.28-16.78 (15.43)	-
4th dorsal spine	13.74-17.31 (15.26)	13.69-15.72 (14.64)	-
5th dorsal spine	13.17-16.19 (14.69)	13.32-15.72 (14.46)	-
6th dorsal spine	13.25-14.66 (13.84)	13.32-14.73 (14.01)	-
7th dorsal spine	12.65-13.46 (13.03)	13.32-14.55 (13.84)	-
8th dorsal spine	11.83-12.63 (12.20)	12.66-13.20 (12.98)	-
9th dorsal spine	11.38-12.02 (11.62)	11.83-13.05 (12.52)	-
Longest dorsal ray length	14.47-16.69 (15.59)	16.12-20.41 (18.21)	-
Anal-fin base	17.74-21.00 (19.15)	20.10-21.15 (20.73)	-
1st anal spine	5.32-6.62 (5.99)	5.31-7.55 (6.56)	-
2nd anal spine	9.71-12.83 (11.69)	10.46-11.79 (11.41)	-
3rd anal spine	11.46-13.64 (12.87)	11.43-12.32 (11.73)	-
Longest anal ray	16.41-19.15 (17.37)	16.99-20.10 (18.45)	-
Caudal-fin length	21.09-26.55 (24.40)	17.99-23.89 (22.31)	-
Pectoral-fin length	23.95-24.57 (24.31)	27.19-28.06 (27.65)	24.15-25.00*
Pelvic spine length	13.30-15.23 (14.46)	13.34-15.79 (14.84)	-
Pelvic-fin length	20.38-22.25 (21.18)	23.25-26.26 (24.06)	-
Snout length	25.65-27.86 (26.67)	24.79-27.11 (25.94)	-
Orbit diameter	18.42-22.32 (20.73)	21.64-23.11 (22.39)	-
Interorbital width	16.53-19.94 (18.57)	17.44-20.85 (19.35)	-
Upper-jaw length	55.30-56.36 (56.01)	53.27-54.77 (54.18)	-
<i>Count</i>			
Dorsal-fin rays	IX, 14	IX, 14	IX, 14
Anal-fin rays	III, 9	III, 9	III, 9
Pectoral-fin rays	17-18	18	18-19
Pelvic-fin rays	I, 5	I, 5	-
Caudal-fin rays	17-18	17-18	18-19
Scales on lateral line	64-65	63-66	60-65
Scales above lat. line	24-28	28-30	-
Scales below lat. line	58-60	57-58	-
Gill rakers on upper limb	9	8-9	8-9
Gill rakers on lower limb	15-16	16-17	16-17
Total gill rakers	24-25	24-26	24-26

1 - Peristiwadi et al (2009); 2 - Randall & Heemstra (1991); Values in bracket are mean; * - recalculated from the ratio in standard length.

Diagnosis. The specimens of *C. igarashiensis* had deep and robust body, rounded caudal fin, with lateral line strongly arched above pectoral fin and nape very convex. Their meristic characters are as follows: continuous dorsal fin with IX spines and 14 rays, anal fin rounded with III spines and 9 rays and pelvic fin with I spine and 5 rays. Rounded pectoral fin rays and caudal fin rays were 17 or 18, scales on lateral line 64 or 65 and

total gill rakers 24 or 25. Body depth 2.2-2.3 times its standard length while head length was 2.4-2.5 times standard length. Pectoral-fin length 1.7 to 1.8 times head length; pelvic fins reached up to or beyond anus, their length, 1.8-2.0 times head length. These morphometric and meristic characters match the description of *C. igarashiensis* given by Randall & Heemstra (1991), Heemstra & Randall (1993) and Peristiwadi et al (2009).

Color: Body continuous light red with seven irregular bright-yellow bars; head redish orange with broad yellow bands radiating from eye; fins red except for extension of yellow bars of body into dorsal fin and membranes at tips of dorsal-fin spines, which are orange.

Distribution: Tropical western Pacific: southern Japan, Taiwan, Guam, Philippines, South China Sea, Samoa, Tahiti, Fiji, Tuvalu (Heemstra & Randall 1993; Chapman & Cusack 1990) and Indonesia: North Sulawesi (Peristiwadi et al 2009), Bali (White et al 2013) and Maluku (present study) (Figure 3).

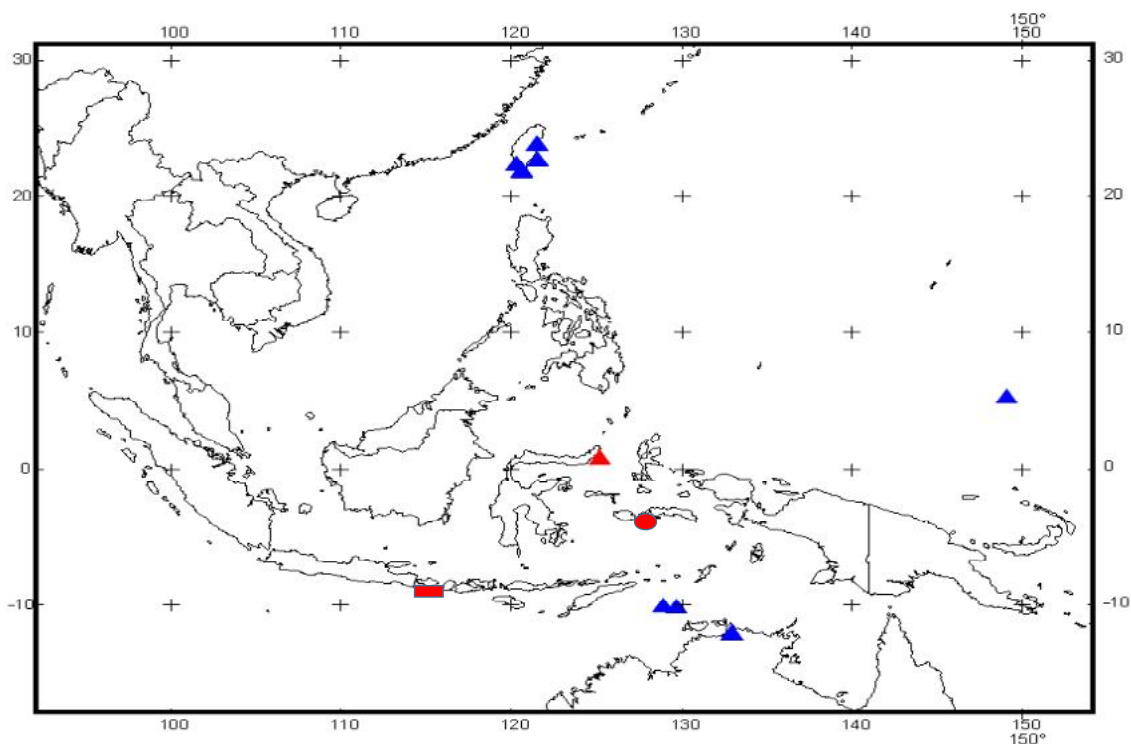


Figure 3. Map showing distribution of *Cephalopholis igarashiensis* Katayama, 1957 in the world, blue triangle (Froese & Pauly (eds) 2006); red triangle (Peristiwadi et al 2009); red square (White et al 2013); red circle (Limmon et al 2017) (Map source: Peristiwadi et al 2009).

Remarks: *C. igarashiensis* is a rare species, listed as Data Deficient by IUCN because its information is scarce (Cabanban et al 2008). It was first described from southern Japan in 1957 and named by Katayama in honor of the collector, Mr. Igarashi (Randall & Heemstra 1991). This fish is a deep water species, can be found at the depth over 80 m; the specimen from Tahiti was caught at 250 m depth (Randall & Heemstra 1991). This species can grow up to 43 cm and it is different from all other species of *Cephalopholis* because of greater body depth and unique color pattern (Heemstra & Randall 1993).

Conclusions. *C. igarashiensis* is reported for the first time in Ambon Island, Maluku Province. The current finding of *C. igarashiensis* of family Serranidae in Maluku waters enrich the marine biodiversity lists of Indonesian waters of reef fishes and provides new information to revise the range of geographical distribution of the groupers.

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