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**A NEW GOBIID FISH, *FUSIGOBIUS DUOSPILUS*,
FROM THE TROPICAL INDO-PACIFIC**

by

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A NEW GOBIID FISH, *FUSIGOBIUS DUOSPILUS*,
FROM THE TROPICAL INDO-PACIFIC

by

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ABSTRACT

Fusigobius duospilus is described as a new species from several localities in the tropical Pacific and Indian oceans. This species differs from other species of *Fusigobius* in pectoral ray and gill-raker counts, coloration, reduced pelvic frenum, branching of the pelvic rays, presence of two large black spots on the first dorsal fin and shape of the first dorsal fin. The species is free living on sand. Males average a larger size than females. Sex ratios are uneven, with about twice as many females as males. *Fusigobius longispinus* Goren is recorded from several localities in the western Indian Ocean, where populations differ morphologically from Red Sea populations. *Fusigobius neophytus africanus* is regarded as a synonym of *F. neophytus*.

INTRODUCTION

Few species of *Fusigobius* have been recognized. Koumans (1953) recognized 2 species, but one has been shown to belong in a different genus (Hoese and Obika, MS). Goren (1978) described *Fusigobius longispinus* from the Red Sea, and Hoese and Obika (MS) are describing an additional new species. Studies are currently underway by the senior author to revise the genus, which contains about 11 species.

Species of *Fusigobius* are common on sand around coral reefs in the Indo-Pacific and are similar morphologically and ecologically to the New World genus *Coryphopterus*. Only *Fusigobius neophytus* (Günther, 1877) is normally found in shallow depths of less than 2 metres. The species described here is normally most abundant below 10 metres and has been collected in more than 40 metres. Specimens are not easy to study, since the scales are deciduous and the delicate fins are easily damaged.

METHODS

All measurements were taken with dial calipers and recorded to the nearest 0.1 mm. Methods of measurements and counts follow Hubbs and Lagler (1958), except as noted. The longitudinal scale count (LS) is taken from the upper pectoral origin to the base of the caudal fin and the transverse count (TRB) is taken from the anal origin upward and backward to the second dorsal fin. The number of pelvic ray branches is defined as the number of terminal tips on each pelvic ray. Morphometrics are based on measurements of 30 specimens selected at random.

Material examined is deposited in the following institutions: Academy of Natural Sciences, Philadelphia (ANSP); Australian Museum, Sydney (AMS); Bernice P. Bishop Museum, Honolulu (BPBM); California Academy of Sciences, San Francisco (CAS); Northern Territory Museum and Art Gallery, Darwin (NTM); Queensland Museum, Brisbane (QM); Royal Ontario Museum, Toronto (ROM); J.L.B. Smith Institute of Ichthyology, Grahamstown (RUSI); University of Guam (UG); National Museum of Natural History, Washington, D.C. (USNM), Western Australian Museum, Perth (WAM). Material is listed by country or island group, beginning with the Indian Ocean and extending to the Pacific. On the Great Barrier Reef, material is listed from north to south.

Comparative material - *Fusigobius neophytus*-RUSI 187,49 mm SL male, Ibo (holotype of *Fusigobius neophytus africanus*). RUSI 882, 1 (36), Aldabra and RUSI 883, 1 (31), Zanzibar, paratypes of *Fusigobius neophytus africanus*. *Fusigobius longispinus*- GULF of AQABA, RED SEA: BPBM 27984 (6, 31-41 mm); USNM 263369 (12, 26-38 mm); USNM 263379 (3, 34-44 mm). SEYCHELLES: AMS I. 24662-001 (3, 22-42 mm). ST. BRANDON SHOALS: USNM 263352 (7, 20-48 mm); USNM 263354 (8, 29-47 mm); USNM 263358 (1, 50mm). INHACA, MOZAMBIQUE: RUSI 74-82 (1, 43 mm); RUSI 74-90 (1, 60 mm). NATAL, SOUTH AFRICA: AMS I. 23632-001 (1, 48 mm); RUSI 76-12 (1, 47 mm); RUSI 9386 (1, 48 mm); RUSI 9803 (2, 43-51 mm); RUSI 9936 (2, 28-39 mm); RUSI 11676 (1, 47 mm).

Fusigobius duospilus sp. n.

Figs. 1 & 2

Fusigobius neophytus africanus Smith, 1959: 208 (in part, Aldabra and Pinda, Mozambique only).

HOLOTYPE: AMS I. 22619-026, 33 mm female; Escape Reef, Great Barrier Reef, Australia; 19-22 m; D. Rennis and party, 3 Nov., 1979.

PARATYPES: SEYCHELLES-ANSP 153653 (14, 18-35 mm), D'Arros Is., Amirantes Islands, J. Böhlke and party, 6 Mar., 1964, 21-30 m. ALDABRA -USNM 264344 (1,38 mm), south of La Passe du Bois, H. Felmann and H. Stickley, 25 Aug., 1967, 0-3 m; USNM 263583 (1,39 mm), H. Felmann, 24 Aug., 1967, 0-2 m. COMORO ISLANDS - USNM 264331 (2,24-27 mm), Rogers and party, 27 Nov., 1964, 0-24 m. SOUTH AFRICA - AMS I. 23635-001 (1,34 mm), Sodwana Bay, 22 April, 1979;

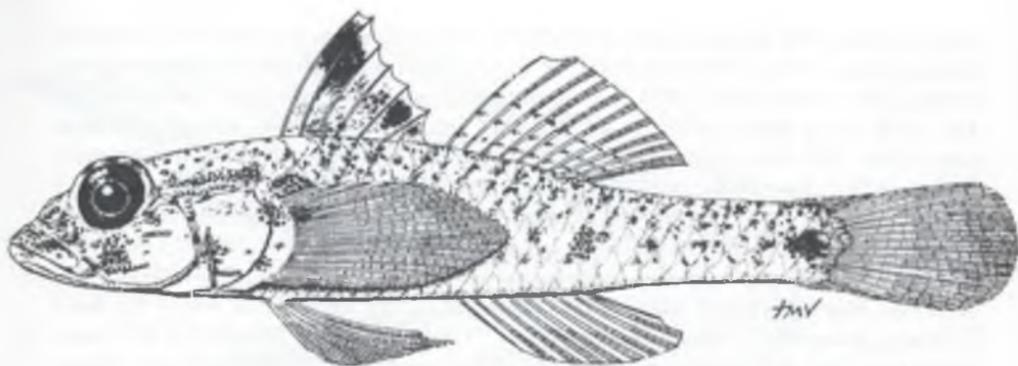


Figure 1. *Fusigobius duospilus*, paratype, 29.3 mm SL, RUSI 9379, from Natal, South Africa. Drawing by J.M. Vinson.

RUSI 9379.2 (30-34), Sodwana Bay; RUSI 9532 (5,14-31 mm), Sodwana Bay; RUSI 9660 (3, 27-34 mm), Sodwana Bay; RUSI 9895 (1,21 mm), Sodwana Bay. MAURITIUS-BPBM 21826 (4, 20-35 mm), off Cannoner's Point, J. Randall and D. Ardill, 13 July, 1973, 22 m. CHAGOS ARCHIPELAGO-AMS I.23338-004(1,24 mm), Salomon Atoll, R. Winterbottom and A. Emery, 16 Mar., 1979, 7-10 m; ROM 37234 (4,20-30 mm), Peros Banhos Atoll, R. Winterbottom and A. Emery, 21 February, 1979, 0. 5-4 m; ROM 37235 (3, 23-29mm), Salomon Atoll, R. Winterbottom and A. Emery, 21 March, 1979, 35-43 m. CHRISTMAS IS., INDIAN OCEAN - AMS I. 20430-019 (1,28 mm), Flying Fish Cove, G. Allen and R. Steene, 15 June, 1978, 5-10 m; AMS I. 20436-011 (1,32 mm), Flying Fish Cove, G. Allen and R. Steene, 27 May, 1978, 25-35 m; AMS I. 20443-009 (3, 24-37 mm), Ethel Beach, G. Allen and R.Steene, 19 May, 1978, 20-40 m; AMS I. 20445-020 (1,30 mm), west of Margaret Beach, G. Allen and R. Steene, 25 May, 1978, 14 m; WAM P. 26087-015 (1,31 mm), Christmas Is., G. Allen, 40-45 m. JAPAN - USNM 263427 (1,18 mm), Igaya Pipeline, Miyakejima, Izu Islands, P.E. Hadley, 10 July, 1977, 3m. TAIWAN - USNM 263459 (2, 31-38 mm), Ch'uan-Fan-Shih, V. Springer, 3 May, 1968, 6-7 m. MARIANAS ISLANDS -BPBM 30334 (1,20 mm), Cocos Is., Guam. J. Randall, 30 June, 1968, 21-30 m; UG 4873 (1,35 mm), Unai Magpi Reef, Saipan, R.S. Jones, R. Tsuda, R. Struck and H. Larson, 18 Aug., 1970. 2-15 m. PHILIPPINES - AMS I. 21908-028 (5, 22-28 mm), Sombrero Is., D. Hoese and E. Murdy, 23 April, 1980, 1-34 m; AMS I. 21914-051 (7,15-29 mm), Caban Is., D. Hoese and E.. Murdy, 24 April, 1980, 9-25 m; AMS I. 21915-051 (3,29-37 mm), Sombrero Is., D. Hoese and E. Murdy, 23 April, 1980, 6 m; AMS I. 21918-064 (3, 24-35 mm) Caban Is., D. Hoese and E. Murdy, 24 April, 1980, 9-25 m. FIJI-USNM 243123 (7,13-30 mm), Lau Islands, V. Springer and party, 2 May, 1982, 12-22 m. WESTERN AUSTRALIA-WAM P. 25369-020 (1,29 mm), off Tantabiddy Creek, G. Allen, 27 June, 1975, 8-10 m; WAM P. 25374-039 (1,38 mm), off Tantabiddi Creek, Northwest Cape, 3-4 m; AC WAM P. 26662-019 (2, 24-29 mm), South Passage, north of Monkey Rock, Sharks Bay, 13-16 m; WAM P. 26671-022 (2,27-46 mm), South Passage, north of Monkey Rock, Sharks Bay, 14 m; WAM P. 27584-002 (1, 44 mm), east side of Long Is., Abrolhos Islands; WAM P. 27587-016 (1,46 mm), south end of Long Is., Abrolhos Islands, G. Allen, 16 April, 1982, 25-32 m; WAM P. 27596-019 (1,40 mm), north end of Dick Is., Abrohlos Islands, G. Allen, 30-32 m; WAM P. 25813-024 (3, 28-35 mm), South Murion Is.: WAM P. 25819-025 (2, 35-42 mm), South Murion Island. GREAT BARRIER REEF, QUEENSLAND, AUSTRALIA-AMS I.20775-115 (12, 22-30 mm), Raine Is., Australian Museum

party, 11 Feb., 1979, 0-20 m; AMS I.20756-084 (7,22-40 mm), Great Detached Reef, Australian Museum party, 11 Feb., 1979, 2-8m; ROM 40633 (1,25 mm), Tjou Reef Australian Museum party, 23 Feb., 1979, 3-12 m; AMS I. 20755-064 (1,25 mm), off Cape Melville, Australian Museum party, 9 Feb., 1979, 3-5 m; AMS I. 20774-126 (2, 24-28 mm), reef off Cape Melville, Australian Museum party, 9 Feb., 1979, 0-8 m; AMS I. 19454-067 (8, 23-34 mm), Yonge Reef, Australian Museum party, 11 Nov., 1975, 1-18 m; AMS I. 19456-089 (18, 15-36 mm), Yonge Reef, Australian Museum party, 12 Nov., 1975, 5-15 m; AMS I. 19472-099 (1, 36 mm), Yonge Reef, Australian Museum party, 23 Nov., 1975, 7-15 m; AMS I. 19481-050 (1, 27 mm), Australian Museum party, 26 Nov., 1975, 2-6 m; AMS I. 20784-026 (6, 24-34 mm), Yonge Reef, D. Hoese and party, 1 Dec., 1978, 1-5 m; AMS I. 19482-144 (3, 30-31 mm), MacGillivay Reef, Australian Museum party, 27 Nov., 1975, 3-25 m; AMS I. 22578-057 (1, 24 mm), Escape Reef, D. Blake and party, 28 Oct., 1979, 6-10 m; AMS I. 22579-065 (2, 22-24 mm), Escape Reef, Australian Museum party, 28 Oct., 1979, 1-4 m; AMS I. 22612-026 (1,24 mm), Escape Reef, G. Allen and W. Stark, 1 Nov., 1979, 20 m; AMS I. 22616-041 (2, 29-35 mm), Escape Reef, J. Paxton and party, 2 Nov., 1979, 5-18 m; AMS I. 22619-023 (2, 28-31 mm), Escape Reef, D. Renniss and party, 3 Nov., 1979, 19-22 m; AMS I. 22621-029 (2, 27-36 mm), Escape Reef, Australian Museum party, 27 Nov., 1981, 5-8 m; ANSP 153654 (2, 30-31 mm), Escape Reef, D. Blake and party, 27 Oct., 1979, 14-17 m; QM 1. 21259 (1, 33 mm), Escape Reef, G. Allen and party, 29 Oct., 1979, 29 m; NTM s. 11403-001 (1, 33 mm), Escape Reef, T. Ayling and party, 31 Oct., 1979, 3-11 m; AMS I. 15486-040 (1,42 mm), Heron Island, H. Choat, 31 Jan., 1966, 9 m GILBERT ISLANDS -AMS I. 18050-058 (4,22-27 mm), Abaiang Atoll, D. Hoese and B. Goldman, 10 Nov., 1973, 7-12 m; AMS I. 18051-003 (28, 16-35 mm), Abaiang Atoll, D. Hoese and B. Goldman, 10 Nov., 1973, 7-11 m. SOCIETY ISLANDS - AMS I. 21646-043 (1, 31 mm), Moorea, B. Goldman, 18 June, 1976, 15-20 m.

Other material: FIJI - ROM 42771 (1,30 mm), Astrolabe Reef. INDONESIA - USNM 263343 (4, 25-32 mm), Great Banda Is. WESTERN AUSTRALIA - WAM P. 26631 (4, 25-28 mm), Northwest Cape. PARATYPES of *Fusigobius neophytus africanus* - RUSI 899 (1, 21 mm), Pinda, Mozambique; RUSI 900 (1, 28 mm), Aldabra; RUSI 901 (1,32 mm), Pinda, Mozambique.

DIAGNOSIS: Second dorsal rays usually 1,9; anal rays usually 1,8; pectoral rays 17-20, usually 18-19; gill rakers on outer face of first gill arch usually 1+1+4-5; lower rakers on outer face of second arch usually 6-7; LS 22-25; TRB usually 7. Pectoral base and prepelvic area covered with large cycloid scales. Midline of nape without scales; scales extend no further forward than just above operculum. First dorsal fin elevated anteriorly, without any filamentous spines, first 3 spines approximately equal in length; first dorsal fin just reaches to second dorsal origin or to first semented dorsal ray, when depressed; pelvic fins connected to form a disc, thin membrane (easily torn) uniting them to or near to tips of fifth rays; ventral frenum connecting pelvic spines rudimentary (Fig. 2); pelvic rays moderately branched, fifth ray usually with 4-6 branches, fourth ray with 4-6 branches in adults, 3-5 in juveniles.

Two large black spots on first dorsal fin, anterior spot often vertically elongate at tip of a thin black vertical line extending from base of fin, second spot between fifth and sixth dorsal spines; a faint black spot above anterior margin of pectoral base; caudal peduncle with round to triangular spot; a thin vertical brown bar or oval blotch below eye.

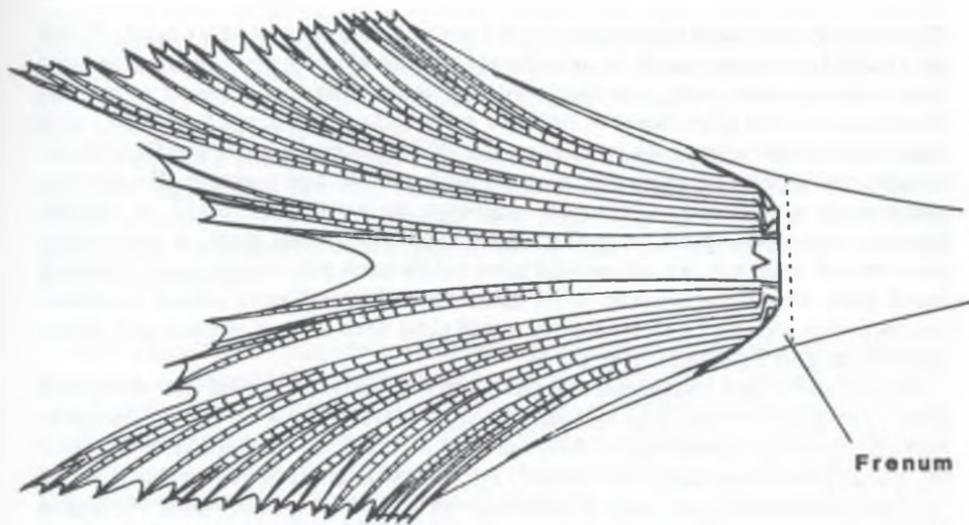


Figure 2. Pelvic fins of *Fusigobius duospilus* to show rudimentary frenum connecting pelvic spines. Dashed line indicates base of frenum.

DESCRIPTION: Based on 179 specimens, 12-46 SL (data not necessarily collected from all specimens). Counts of holotype indicated with an asterisk. First dorsal VI*(in 179); second dorsal 1,8 (4), 1,9*(175); anal 1,7(7), 1,8*(172); pectoral rays 16(1), 17(3), 18(56), 19*(100), 20(15); segmented caudal rays 15 (1), 16 (5), 17*(172), 18 (1); branched caudal rays 6/6*(155), 6/7(12); branchiostegal rays 5(5); vertebrae 10+16 (1). Gill-rakers on outer face of first arch 1+1+3 (3), 1+1+4 (47), 1+1+5 *(67), 1+1+6 (2), 2+1+5 (3); lower gill-rakers on outer face of second gill-arch 4(1), 5(4), 6(66), 7(97), 8(10), 9(2); longitudinal scale series 21(5), 22(11), 23(35), 24(66), 25*(33), 26(2); transverse scale series (TRB) 5(6), 7 *(146), 8 (12).

Morphometrics as percent of SL, proportions of holotype in parentheses: head length 31-36 (34.4), snout length 6-9 (9.4), eye diameter 8-11 (8.9), upper jaw length 10-12 (10.8), body depth at pelvic origin 17-23 (17.2), body depth at anal origin 15-19 (16), caudal peduncle depth 9-12(11), caudal peduncle length 25-28 (27.6), body width behind pectoral base 11-15 (14.7), first dorsal spine length 17-21 (17.2), second dorsal spine length 16-20 (16.2), third dorsal spine length 15-18 (14.7), pectoral fin length 25-31 (30.7), pelvic fin length 20-24 (24), caudal fin length 24-30 (24.6).

Head more or less triangular in cross-section; snout short and pointed; mouth oblique, forming an angle of 20-25° with body axis; rear of jaws below front margin of pupil; tongue tip rounded to truncate, free from floor of mouth; teeth conical, long and curved inwardly at tip; teeth on lower jaw arranged in 4 rows at anterior half and tapering to 1 row posteriorly; teeth on upper jaw in 4 or 5 rows

at anterior quarter and tapering to 2 rows posteriorly; teeth of outer rows of both jaws slightly enlarged, teeth in innermost row also slightly enlarged, but shorter than teeth in outer row; anterior nostril a short tube, just behind upper lip; posterior nostril a pore closer to anterior nostril than to eye; eye 8-11% SL, with relative size decreasing with increasing size of fish; dorsal edge of eye little above dorsal profile of head; interorbital space very narrow and concave. Head pores comprising a posterior nasal pore adjacent to posterior nostril, a median anterior interorbital pore, a median posterior interorbital pore, a postorbital pore behind each eye, an infraorbital pore below each postorbital pore, a lateral canal pore above preopercle, a terminal lateral canal pore above posterior preopercular margin, a short lateral canal tube with a pore at each end above operculum and 3 preopercular pores.

Body slender and compressed, tapering posteriorly. Origin of first dorsal fin above pectoral fin base; first and second fins separated by a very short distance; pectoral fin long, extending to above second or third ray of anal fin; fifth pelvic ray about two-thirds length of fourth ray; ventral frenum of pelvic fins reduced to a thin membrane from base of pelvic spines and developed between the fins as a low fold (sometimes not discernible) behind the large scale between the bases of pelvic spines; caudal fin with a slightly rounded margin. Body covered with ctenoid scales; prepelvic area and pectoral base covered with large cycloid scales; midline of nape naked; sides of nape scaled forward to above posterior half of operculum or to above pectoral base; cheek and operculum without scales.

Coloration of fresh material from Western Australia and the Great Barrier Reef: Head and body translucent in life, fading to an opaque white after death. Head and body covered with scattered yellowish brown to brown small spots; spots often surrounded by a narrow yellow ring. A few small white spots usually scattered ventrally on head and body. A thin brownish line from anteroventral margin of eye extending to and across side of upper lip. Immediately below eye a patch of scattered melanophores, sometimes forming a distinct vertical bar. Often with a brown blotch anteriorly on middle of operculum. A row of elongate brown spots, sometimes connected to form a thin line, from above middle of operculum, arching upward to above pectoral base.

On body a brownish blotch, about equal in size to pupil, immediately above and behind upper pectoral base. A brownish to black round spot or blotch, about equal in size to eye, below middle of first dorsal fin on midside; a second spot, slightly smaller than first spot, on midside just behind second dorsal origin; a third blackish spot, about equal in size to second spot on midside, below posterior end of second dorsal fin; spots on midside sometimes oval and slightly vertically elongate. A black round to triangular spot, slightly smaller than pupil on midside at posterior end of caudal peduncle. Pectoral base with a thin black bar, often embedded in yellow bar, extending horizontally near upper margin; often followed by a similarly coloured elongate bar on base of pectoral rays; a similar brown and yellow mark in an oval shape ventrally on pectoral base.

First dorsal fin with 3 minute brownish flecks along anterior margin of fin; a brownish bar from just behind base of third dorsal spine extending upward, crossing third spine and connecting with an oval or round black spot between

first 3 dorsal spines; spot often broken up into a series of smaller black spots and sometimes faint or indistinct; a second round black spot, with yellow margin, between fifth and sixth dorsal spines; the 2 spots on dorsal fin slightly larger than pupil; a wavy brownish black line often connects 2 dorsal spots. Second dorsal fin clear, with 3 to 4 longitudinal rows of minute yellowish brown spots. Other fins clear; anal fin sometimes grey.

Coloration of preserved material: Similar to fresh colour, head and body becomes white, fins become opaque, white spots become faint or absent, yellowish brown spots become black, and after long preservation black spots fade, except for posterior black spot on first dorsal fin and spot at posterior end of caudal peduncle.

COMPARISONS: *Fusigobius duospilus* differs from *F. neophytus* (Günther) in having a reduced pelvic frenum. The species differs from *F. neophytus* and *F. longispinus* Goren in having the predorsal region less extensively scaled and in reaching a smaller maximum size. *Fusigobius neophytus* has a well developed pelvic frenum, and *F. longispinus* has a reduced frenum. *F. neophytus* and *F. longispinus* have the predorsal scales reaching to near the eye. *Fusigobius longispinus* reaches a maximum size of around 60 mm SL and *F. neophytus* reaches 65 mm, while *F. duospilus* reaches 46 mm, and rarely larger than 35 mm. *Fusigobius longispinus* is distinctive in having filamentous anterior dorsal spines. *Fusigobius neophytus* has an extra lateral canal pore over the preopercle.

VARIATION: The number of pelvic ray branches of the fourth and fifth pelvic rays increases significantly with increasing size. In the fourth pelvic ray, 3 branches occur only in specimens smaller than 17mm SL; 4 branches in specimens 18-35 mm SL; 5 branches in specimens 22-37 mm SL; 6 branches in specimens 24-39 mm SL; 7-9 branches in specimens larger than 39 mm SL. A similar trend was found in the branching of the fifth pelvic ray; 2 or 3 branches occur only in specimens less than 25 mm SL; 4 branches in specimens 18-37 mm SL; 5 branches in specimens 22-39 mm SL; 7-10 branches in specimens larger than 39 mm SL.

Males have an elongate urogenital papilla, while females have a short rounded papilla. No other morphological differences were noted between males and females. However, sex ratios differed significantly from a one-to-one ratio. Of the material examined, there were 98 females and 41 males. Males averaged a much larger size than females. Males ranged in size from 20 to 46 mm SL, averaging 32mm, while females ranged from 17 to 38 mm SL, averaging 25.7 mm. Only 7 males were smaller than 30 mm SL, while only 12 females were larger than 30 mm SL. Hoese and Obika (MS) noted the same trend in another species, and suggested that the data were consistent with a sex change from female to male.

Some geographical variation in coloration and pectoral ray counts was apparent. Specimens from the Indian Ocean, Western Australia, the Gilbert Islands and possibly Fiji average higher pectoral ray counts (usually having 19) than specimens from Queensland, Australia and the Philippines (Table 1).

Table 1. Pectoral ray counts of various populations of *Fusigobius duospilus*.

	Pectoral rays			
	17	18	19	20
Indian Ocean	-	4	15	7
Western Australia	-	1	15	5
Queensland, Australia	1	29	34	1
Philippines	-	12	5	-
Fiji	-	2	4	1
Gilbert Islands	1	6	24	1

Specimens from the Philippines tend to have darker and larger black spots on the body than specimens from other localities. The caudal peduncle spot is slightly vertically elongate in Philippine specimens, with the length of the spot approximately equal to the pupil diameter. In specimens from the Gilbert Islands, the caudal peduncle spot is small, round, and faint, about equal to a quarter of the pupil diameter. In specimens from the Great Barrier Reef, the spot is round, about equal to half the pupil diameter.

The anterior black spot on the first dorsal fin also varied considerably, but the variation was not observed to be obviously related to geographical area. In some specimens the spot is broken into a few smaller dark spots; in others the spot is dark and round; and in others the spot is often vertically elongate. The dark line running along the second dorsal spine, connecting to the anterior spot is faint or absent in pale specimens. Presumably the anterior spot can be turned on or off in life.

DISTRIBUTION: *Fusigobius duospilus* is known from Aldabra, the Seychelles, Comoro Is., Mozambique, South Africa, Mauritius, the Chagos Archipelago, and Christmas Is. in the Indian Ocean, and from Taiwan, Japan, the Marianas, Philippines, Indonesia, Fiji, Australia, the Gilbert Islands and the Society Islands in the Pacific Ocean.

ECOLOGY: This species appears to be an exclusively coral reef species, that lives on sand in depths from 1-42 m, typically on clear water oceanic reefs, or on reef slopes. The species was not found in turbid near shore or coastal reefs on the Great Barrier Reef. Normally the species occurs in small groups or as isolated individuals. The species is cryptic, sheltering under coral and rarely seen.

ETYMOLOGY: Derived from the Latin, *duo* (two)+*spilus* (spot), alluding to the two dark spots on the first dorsal fin.

REMARKS: Smith (1959) described a new subspecies of *Fusigobius* (*F. neophytus africanus*) from Ibo, southern Africa, separating the subspecies on the basis of the presence of a single opercular scale. Examination of material from throughout the Indo-Pacific indicates that the scale is normally present in specimens, but is easily lost or overlooked. Indian Ocean specimens of *F. neophytus* tend to have slightly darker and larger black spots on the body, compared with specimens from the Pacific. However there is considerable variation in the coloration of Pacific material, and further study is required to determine the distinctiveness of the Indian Ocean populations. Provisionally we regard *F. neophytus africanus* as a synonym of *F. neophytus*. Smith (1959) included some specimens of *F. duospilus* as paratypes of *F. neophytus africanus*.

Goren (1978) described *F. longispinus* from the Red Sea. Examination of material from several localities in the western Indian Ocean, indicates that the species is widespread in this area. Goren (1978) noted that the predorsal scales did not cross the midline of the nape in the species. However, material from east Africa and Mauritius clearly have scales across the midline of the nape. In most Red Sea material that we have examined the predorsal scales had been lost. In one sample the scales were intact and the scales on the side of the nape just reach, but do not cross the midline. Specimens from the Red Sea have a slightly elongate black spot on the caudal peduncle, while specimens from other areas have a round spot. No other major differences were noted, but further studies are necessary to clarify the distinctiveness of the two forms.

ACKNOWLEDGEMENTS

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REFERENCES

- GOREN, M. 1978. A New gobiid genus and seven new species from the Sinai coasts (Pisces: Gobiidae). *Senckenb. biol.* 59 (3/4): 191-203, figs. 1-7.
- HOESE, D.F. and Y. OBIKA. MS. A new species of *Fusigobius* from the western tropical Pacific. *Jap. J. Ichth.*
- HUBBS, C.L. and K.F. LAGLER. 1958. *Fishes of the Great Lakes region*. Bull. Crandbrook Inst. Sci., (26), xi+213 pp., 251 figs., 44 pls.
- KOUMANS, F.P. 1953. Gobioidae. In Weber, M. and L. De Beaufort, *Fishes of the Indo-Australian Archipelago*, Vol., 10. Leiden, E.J. Brill. 423 pp. 95 figs.
- SMITH, J.L.B. 1959. Goboid fishes of the families Gobiidae, Periophthalmidae, Trypauchenidae, Taenioididae, and Kraemariidae of the western Indian Ocean. Rhodes University *Ichthyol. Bull.* No. 13: 185-225.