

NEW RECORDS OF GOBIOID FISHES FROM PORTO NOVO, SOUTH INDIA

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ABSTRACT.

New distributional records for three species of Gobiids namely *Oxyurichthys papuensis*, *Cryptocentrus russus* and *Waitea mystacina* and *Barbatogobius asanai* from Porto Novo (South-east coast of India) waters are reported along with their descriptions. The first three species are recorded only now for the first time in Indian waters; a single specimen of *B. asanai* has already been recorded from Godavari Estuary (Visweswara Rao, 1971) and now from Porto Novo. The urogenital papillae are flat and conical in the males of all the four species and dot-like in the female of *O. papuensis* (the females of other species being not available for study). The relationships of the four species with other species are also briefly discussed.

INTRODUCTION.

In the course of a recent survey of Gobioid fauna of Porto Novo (South-east coast of India) waters, more than 30 species have so far been collected and the present report deals with four species which are of interest. Three species viz., *Oxyurichthys papuensis* (Valenciennes), *Cryptocentrus russus* (Cantor) and *Waitea mystacina* (Valenciennes) are new records from Indian Seas while *Barbatogobius asanai* Koumans has only very recently been reported to occur for the first time from the eastern coast of India (Godavari Estuary) by Visweswara Rao (1971).

In Indian waters, the genus *Oxyurichthys* Bleeker is represented by three species *O. jaarmani* Weber (Talwar, 1969), *O. microlepis* (Bleeker) and *O. tentacularis*, (Cuvier and Valenciennes); *Cryptocentrus* Valenciennes by *C. leptocephalus* Bleeker *C. pavaninoides* (Bleeker) and *C. gymnocephalus* (Bleeker) (Koumans, 1941) and the monotypic genus *Barbatogobius* by *B. asanai* Koumans (Koumans, 1941; Visweswara Rao, 1971). These four species are briefly described based on seven specimens of *O. papuensis* and one specimen each of the remaining three species. The body measurements (to the nearest 0.5 mm) and meristic counts were made following Böhlke and Robins (1968) and Dawson (1969) and are expressed as per cent in standard length, head length and eye diameter or as mentioned.

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Oxyurichthys papuensis (Valenciennes)

Gobius papuensis Valenciennes, *Hist. Nat. Poissons*, 12: 106 (1837).

Oxyurichthys papuensis Koumans, *Fishes Indo-Australian Archipelago*, 10: 46, fig. 12 (1953); Munro, *Fishes New Guinea*, p. 497 (1967).

Material :

Six males and one female ranging in size from 8.4 to 13.5 cm standard length (total length 12.4 to 18.5 cm) collected in the stake nets operated up to about one kilometre off the shore in August 1969 and January, 1971.

Diagnosis :

L.1. 78 to 82 ; L.tr. 20 to 21 ; total length ca. 170 mm. A low dermal crest on nape ; head in median line and nape naked (Koumans, 1953 ; present study).

Description :

D :VI, I, 12 ; A : I, 13 ; P : 23 ; C : 27 to 30 ; L. 1. 78 to 82 ; L. tr. 21 to 23 ; Predorsal scales 18 to 23. *A* (% in standard length). Total length 137 to 149 ; head length 24 to 27 ; body depth 16 to 17 ; body thickness 57 to 71 (% in body depth) ; pectoral 24 to 29 ; pelvic 21 to 24 ; predorsal 27 to 31 ; snout to D_2 47 to 49 ; prepelvic 24 to 27 ; preanal 45 to 51. *B* (% in head length) : eye 20 to 28.5 ; snout 32 to 38 ; postorbital 45.5 to 54. *C* (% in eye diameter) : interorbital 33 to 50 ; interdorsal 0 to 67 ; urogenital papilla : 17 (male), in female to the body level. Caudal peduncle least depth 69.5 to 84 in its own length.

Mouth terminal, jaws almost equal ; tongue round, tip free ; maxilla extends below to anterior fourth of eye ; teeth in lower jaw, irregularly biserial slightly sub-horizontal in position, pointed to slightly blunt, some are curved inwards, particularly the inner series ; single row in upper jaw, large, pointed, curved and 15 to 18 teeth on each ramus ; pores : nostrils two pairs, anterior ones tubular ; two pores in supraopercular groove, one behind each eye at beginning and another at preopercular margin ; two pores in interorbital, one in front and another behind eyes ; one pore near base (upper side) of anterior tubular nostril and another near posterior nostril on snout ; cephalic sensory system.—A short canal from eye to pore at posterior nostril ; about five rows radiating under eye ; two main longitudinal canals on each side between which are about 5 short canals connecting two main canals, first two of which are in continuation with second and third rows under eye ; a canal along supraopercular groove which divides into six short rows downwards, last one to pectoral base ; few papillae along preopercular margin in a row and another parallel to this on operculum runs down and bifurcates on reaching region of second longitudinal canal on side, one to the base and another towards angle of operculum.

Scales on predorsal and belly (anterior) cycloid, at D_2 origin weakly ctenoid and posteriorly strongly ctenoid ; body light red in colour (in formalin), back slightly dusky ; a dark brown blotch under eye as in *jaarmani*, *microlepis* and *tentacularis* present, but very faint (Koumans, 1941, 1953 ; Talwar, 1969 ; Subrahmanyam, unpublished data) ; dorsals, caudal and pelvic dusky ; pectoral lower portion dusky but colourless above ; anal and pelvic middle rays dark, a deep brown blotch on caudal base in young specimens appears faded in older specimens.

Urogenital papilla well developed and conical in male but reduced in female.

Distribution :

Pulu Weh, Nias, Java, Celebes, Saleger, New Guinea, Hong Kong, Philippines, Ponape, Hawaiian islands ; West New Guinea (Munro, 1967) ; Singapore, Persian Gulf, seas and estuaries (Koumans, 1953) ; East Coast of India (present study).

Remarks :

The present observations differ from those of the earlier authors in the following :

Character	<i>O. papuensis</i> (Fowler, 1928; Koumans, 1953)	<i>O. papuensis</i> (Present study)
Head	4 to 4.25 in total length (23.5 to 25%)	24 to 27% in SL. (16 to 19% in TL.)
Maxilla	Upto middle of eye or more	Upto anterior fourth of eye.
Depth	6 to 6.5 in total length (16 to 16.5%)	16 to 17% in SL. (10.7 to 13% in TL)
Caudal peduncle least depth in its length.	1.20 to 1.33 (120 to 133%)	69.5 to 84%
Pores	One behind eye in supraopercular groove.	Two in supraopercular groove; two in interorbital and two pairs on snout.
Colour	Greenish above, red below. Body with 6 to 8 indistinct transverse bands and many shiny spots.	Bands and spots absent.

Affinities :

In external characters, morphometrics and the digestive system, there are some striking resemblances between the four species of the genus *Oxyurichthys* namely *jaarmani*, *tentacularis*, *microlepis* and *papuensis*. It appears that *papuensis* is more close to *microlepis* and *tentacularis* than to *jaarmani* (Subrahmanyam, unpublished). It is of interest here to note the slightly sub-horizontal position of the outer row of teeth in the lower jaw in *papuensis*.

***Cryptocentrus russus* (Cantor)**

Gobius russus Cantor, *J. Asiat. Soc. Bengal*, 18 : 1168 (1849).

Cryptocentrus russus Koumans, *Fishes Indo-Australian Archipelago*, 10: 88 (1953); Chen, *Taiwan Fish. Res. Inst. Publ.*, 11 : 10 (1960); Munro, *Fishes New Guinea*, p.497 (1967).

Material :

One male specimen (standard length 9.6 cm ; total length 12.5 cm) was collected in a local stake net in August, 1969.

Diagnosis :

Scales anteriorly cycloid, posteriorly weakly ctenoid ; 9 oblique bands on flanks ; vomer edentate (Koumans, 1953 ; present study).

Description :

D : VI, I, 10 ; A: I, 10 ; P: 19 ; C: 25; L.l. 112; L.tr. 44. *A* (% in standard length) : Total length 130.20 ; head length 26.04; depth 17.70; thickness 64.70 (% in body height) ; pectoral 23.95; pelvic 21.87; predorsal 31.25; prepelvic 31.25; preanal 58.33. *B* (% in head length) : eye 28; snout 32; postorbital 56; *C* (% in eye diameter) : interorbital 28.57; interdorsal 28.57 (equal to interorbital space; internal (distance between anus and anal origin) 32.14; urogenital papilla 25 (male); caudal peduncle 16.14 in standard length (equidistant from both D_2 and anal ending), caudal peduncle least depth 67.74 in its length.

Eyes large, nostrils two pairs and anterior ones tubular ; maxilla extends to anterior third of eye ; supraopercular groove distinct ; vomer edentate ; D_1 higher (135) than the body depth ; D_2 and anal anteriorly lower than body height (70 and 59 respectively) ; posterior rays of both D_2 and anal fins prolonged and pointed (100 and 88 respectively) ; pectoral oblong, pelvic round in shape ; caudal pointed (30% in SL) and longer than head ; head and nape (a triangular-shaped notch in front of D_1) naked except for a few rows of scales on either side of nape ; scales on body anteriorly cycloid and weakly ctenoid posteriorly.

Swimbladder oval-shaped, occupying anterior 65% of the body cavity ; gill openings continued forwards slightly ; tongue truncated, free anteriorly ; digestive system of carnivorous type with a short intestine.

Teeth pluriserial in both jaws ; outer row of both jaws and inner row of lower jaw enlarged ; two canines on each side in upper jaw while four canines in right and one on left ramus in lower jaw present.

Body uniform brown (in formalin) ; nine (faded) obliquely descending bands on flanks ; head with light coloured patches (8 to 10 yellow bands and 4 to 5 black spots on sides ; nape and opercle with many purple ocelli, Munro, 1967). Fins dusky ; a dark spot on tip of the D_1 fourth spine ; anal margin dark black ; pelvic fin comparatively darker than others ; pectoral light orange in colour.

Distribution :

Singapore, Sumatra, Nias, Java, Bawean, Celebes, Saleyer, S.E. Africa, Penang, China, Philippines and Australia (Koumans, 1953); Taiwan (Chen, 1960); West New Guinea (Munro, 1967); East Coast of India, (present study).

Remarks :

Cryptocentrus russus (Cantor) has been recorded from the Indo-Australian Archipelago waters by Koumans (1953) ; Chen (1960) and Munro (1967) and the present material differs from the earlier observations in the following :

Character	<i>C. russus</i> (Koumans, 1953 ; Chen, 1960; Munro, 1967)	<i>C. russus</i> (Present study)
Pectoral fin rays.	17 to 18	19
L.l.	82 to 85	112
L.tr	24 to 25	44

Character	<i>C. russus</i> (Koumans, 1953; Chen, 1960; Munro, 1967)	<i>C. russus</i> (Present study)
Maxilla	Upto posterior half to hind margin of eye.	Upto anterior third of eye
D ₁	Lower than body height.	Higher than body height (135%).
Predorsal scales	± 25	Median region of nape naked except for few rows.

The present material agrees with that described by Chen (1960) except in scale counts and maxillary position. The High first dorsal may be due to sexual dimorphism as the observed specimen is a male (Klausewitz, 1960).

Affinities :

C. russus resembles *C. sungami* Klausewitz in the occurrence of ctenoid scales posteriorly and also in the scale count (L.1. 102 to 108). But, *C. sungami* differs in the dorsal (13), anal (13) and pectoral (21) fin ray counts (Klausewitz, 1969).

Klausewitz (1960) noted striking resemblance between *Smilogobius singaporensis* Herre and *Cryptocentrus lutheri* Klausewitz. The two genera are characterized by the presence or absence of the vomerine teeth which is however, considered now as a plastic trait (Gilbert, 1971).

It is interesting to note that, besides *Smilogobius* Herre, the genus *Cryptocentrus* Valenciennes also resembles *Ctenogobius* Gill in the absence of scales on the nape. The genus *Cryptocentrus* is, however, characterised by the large number of cycloid scales and in this respect seems to be more close to *Oxyurichthys* Bleeker. *Oxyurichthys* (teeth uniserial in upper jaw) also closely resembles *Cryptocentrus* (teeth multiserial in upper jaw) in general appearance.

This specimen is closely allied to the variety *C. russus voigtii* (Koumans, 1953).

***Waitea mystacina* (Valenciennes)**

Gobius mystacinus Valenciennes, *Hist. Nat. Poissons*, 12 : 124 (1837).

Waitea mystacina Koumans, *Fishes Indo-Australian Archipelago*, 10 : 107 (fig. 23, p.108) (1953); Smith, *Ichth. Bull.*, 13: 213 (1959).

Material :

One male of standard length of 6.0 cm (total length 7.6 cm) from the local stake nets in August, 1969.

Diagnosis :

Maxilla prolonged posteriorly; head naked; L.1. 30 to 40 ctenoids; D₁ I, 10 (Koumans, 1953).

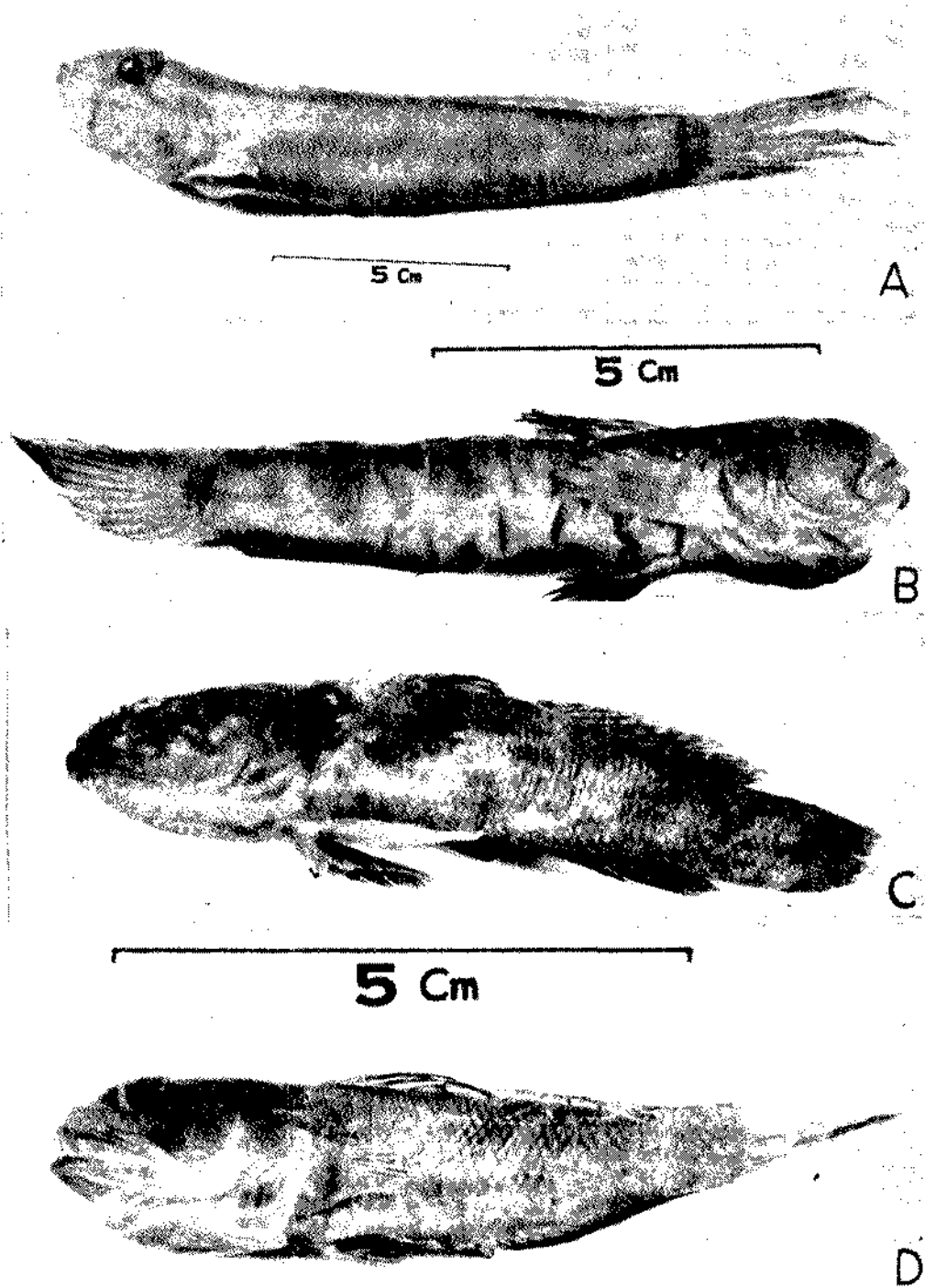


PLATE I. A. *Oxyurichthys papuensis* (Valenciennes) (male); B. *Cryptocentrus russus* (Cantor) (male); C. *Barbatogobius asanai* Koumans (male); and D. *Waitea mystacina* (Valenciennes) (male)

Description :

D:VI, I, 10; A:I, 9; P:18; C: 25; L.1: 48; L.tr. 26; Predorsal scales: 13.

A (% in standard length): Total length 126.66; head length 33.33; depth 26.66; thickness 63 (% in body height); pectoral 31.66; pelvic 25; predorsal 35; prepelvic 38.33; preanal 60; *B* (% in head length): eye 35; snout 35 (equal to eye); postorbital 65; *C* (% in eye diameter): interorbital, interdorsal and internal 35.71; urogenital papilla 14.28 (male). Caudal peduncle least length (between the D_2 end and caudal base) 15% in S.L., and its least depth 83.33% in its own length.

Body short, nape scaled while region below eye and operculum naked; scales on body ctenoid; head and belly (anteriorly) cycloid and smaller in size; swimbladder cylindrical occupying about 65% of body cavity posteriorly; D_1 maximum height slightly more than depth (106.25); D_2 anterior height 62.5 and posteriorly 81.25 in depth; anal anteriorly half of body depth (50) and about 75 posteriorly; two pairs of nostrils, anterior ones tubular; maxilla extends far beyond eye (70% in head); teeth pluriserial, outer in lower jaw enlarged, curved, about 6 on each ramus, rest are all small and pointed; teeth in upper jaw in three rows, small and pointed; tongue short, round and free; digestive system carnivorous type with a short intestine; body brown (in formalin) with five light black transverse bands; pectorals light orange and all others dusky; D_1 margin blackish.

Distribution :

Java, Bali, Ambon, E. Coast of Africa, Siam, Japan, Philippines and Australia (Koumans, 1953); Western Indian Ocean (Smith, 1959); East Coast of India (present study).

Remarks :

This specimen differs from the earlier authors' observations as follows :

Character	<i>W. mystacina</i> (Fowler, 1928; Koumans, 1953; Munro, 1967)	<i>W. mystacina</i> (Present study)
Pectoral rays	16 to 17	18
L.1.	37 (25 Fowler)	48
L. tr.	13 to 15	26
Predorsal scales	7 to 8	13
Nape	naked	scaled
Snout	Shorter than eye, 34% in head.	35% in head, equal to eye.
Pectoral	Equal to head	Shorter by 2% than head
Pelvic	1.25 in head	Smaller by 8% than head

Barbatogobius asanai (Koumans)

Barbatogobius asanai Koumans, *Mem. Ind. Mus.*, 13 (3): 241. (1941); Visweswara Rao, *J. Zool. Soc. Ind.*, 23: 41 (1971).

Material :

One male specimen of total length 8.2 cm (standard length 6.5 cm) in August 1969 from the local stake net.

Diagnosis :

Maxilla prolonged posteriorly and short and thick barbels surrounding the mouth ; L.1. 34 to 42; body with six irregular deep brownish bands (Koumans, 1941; present study).

Description :

D: VI, I, 10; A:I, 9; P:19; C:22;L.1:42; L.tr.:20; Predorsal scales:24.

A (% in standard length) : Total length 126.5; head length 32.30; depth 20; thickness 77 (% in body height); pectoral 27.68; pelvic 21.53; predorsal 40; snout to D_2 60; prepelvic 30.76; preanal 61.53; *B*. (% in head length): eye 19.04; snout 33.33; postorbital (equals depth) 61.90; *C* (% in eye diameter) : interorbital 125; interdorsal 62.5; interanal 75; urogenital papilla 68.75 (male); pectoral base 33% in its length.

Mouth terminal, nearly horizontal, lower jaw slightly prominent ; lips moderately thick ; supraopercular groove distinct ; sensory canals well developed ; interorbital broader than eye ; gill openings continued forwards a little (4 mm from vertical line of pectoral base); barbels six on snout in two rows, of three each (length 25% in eye); a barbel near maxilla below eye on each side ; three vertical rows of short barbels between nostrils ; on ventral side of lower jaw are present five barbels on left side and four on right side ; nostrils two pairs and tubular ; teeth pluriserial, slightly pointed and curved in both jaws and irregularly arranged ; outer and inner rows slightly enlarged ; tongue round and free ; alimentary canal is of 'carnivorous' type with a short intestine ; a small, rounded swimbladder occupying anterior half of body cavity ; scales ctenoid ; snout, cheeks and behind eyes upto the occipital region naked ; scales on nape and belly cycloid ; body brownish (in formalin) with six irregular deep brownish bands running obliquely on sides ; first one in occipital region, second before D_1 , third one below D_1 , fourth in anterior third of D_2 , fifth one in posterior region of D_2 and last one on caudal peduncle ; head dark brown ; D_1 , D_2 and caudal light yellowish-brown ; fin rays marked with dark brown spots ; anal, pelvic and pectoral dark ; base of ventral fin with two light brown blotches, bordered with dark brown ; urogenital papilla in male is well developed and tapering posteriorly.

Distribution :

Kosamba creek near Bulsan, West coast of India (type locality) (Koumans) 1941; Godavari Estuary (Visweswara Rao, 1971) and from Porto Novo (present study, on east coast of India.

Remarks :

The specimen from Porto Novo shows some differences from the ones previously observed :

Character	<i>B. asanai</i> (Koumans, 1941; Visweswara Rao, 1971)	<i>B. asanai</i> (Present study)
Pectoral rays	21	19
L.1.	34, 39	42
L.tr.	14, 16	20
Predorsal scales	18	24

Affinities :

The presence of barbels on the head is a unique feature of this species. Previously, barbels were found in only two monotypic genera viz. *Parachaeturichthys* Bleeker and *Illana* Smith and Seale from Indo-Australian waters and *Barbulifer* Eigenmann and Eigenmann from American waters (Böhlke and Robins, 1968) among the members of the subfamily Gobiinae. However, in *Parachaeturichthys polynema* (Bleeker) the barbels are thin and hair-like and occurs on the ventral side of the head only while only one pair of thin barbels is reported to occur in *Illana bicirrhosus* (Weber). The maxilla is short in both the genera (Koumans, 1953). *Barbatogobius* is close to *Waitea* in the maxillary position (see discussion on *Waitea*).

Barbels of *Barbulifer* Eigenmann and Eigenmann are similar to those of *Barbatogobius*. *Barbulifer*, however, greatly differs in having seven D₁ spines, in lacking scales and in possessing barbels on suborbital region (Böhlke and Robins, 1968).

B. asanai resembles *Parachaeturichthys polynema* Bleeker in its dentition and fin ray counts and resembles species of *Callogobius* Bleeker in possessing the cutaneous papillae and folds on the snout, cheek, opercle and under lower jaw (Koumans, 1953). In squamation *Callogobius* appears to be nearer to *Parachaeturichthys*. Thus these three genera appears to be related to each other.

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