

THREE NEW SPECIES AND TWO NEW RECORDS FOR THE  
RED SEA OF INVERTEBRATE ASSOCIATED GOBIES  
(GOBIIDAE, PISCES)

by

Menachem GOREN (1)

ABSTRACT. – Five species of small gobies were collected for the first time in the northern Red Sea. These fish belong to a group of gobies which are usually found upon sessile invertebrates. Two of the species (*Pleurosicya mossambica* Smith, 1959, and *Luposicya lupus* Smith, 1959) are reported as new records for the Red Sea. The others are described as new species. *Pleurosicya sinaia* n. sp. is characterized by the combination of the following meristic counts: LL 26-27; TR 9; D VI, 1.6; A 1.8; P 16-17. *Pleurosicya prognatha* n. sp. is characterized by possessing a long pointed snout and the counts: LL 24-26; TR 7-8; D VI, 1.8; A 1.8. *Lobulogobius bentuviai* n. sp. is characterized by having the anterior interorbital pores directed upward, and the counts: LL 33-34; TR 8-9; D VI, 1.8(9); A 1.8(7); P 14-15.

RESUME. – Cinq petites espèces de Gobies ont été récoltées pour la première fois dans le nord de la Mer Rouge. Ces poissons appartiennent au groupe de Gobies que l'on trouve habituellement sur les Invertébrés sessiles. Les deux espèces *Pleurosicya mossambica* Smith, 1959 et *Luposicya lupus* Smith, 1959, sont nouvelles pour la Mer Rouge. Les autres sont décrites comme espèces nouvelles. *Pleurosicya sinaia* n. sp. est caractérisée par la combinaison suivante : LL 26-27; TR 9; D VI, 1.6; A 1.8; P 16-17. *Pleurosicya prognatha* n. sp. est caractérisée par un long museau pointu et : LL 24-26; TR 7-8; D. VI, 1.8; A 1.8. *Lobulogobius bentuviai* n. sp. est caractérisée par des pores antérieurs interorbitaires dirigés vers le haut et : LL 33-34; TR 8-9; D. VI, 1.8(9); A 1.8(7); P 14-15.

Key-words : ISW Red Sea, Gobiidae, Pisces, New species

The fishes of the genera *Pleurosicya*, *Lobulogobius* and *Luposicya* are usually found associated with invertebrates. These tiny gobies are often seen upon corals, sponges, bivalves and sometimes on sea grass in the Red Sea. Although these fishes are common in the Red Sea (as they probably are all over the tropical Indo-Pacific Ocean) none of them have ever been reported from the Red Sea, and the total number of the described species is relatively low. This is due to their small size which attracts little attention, makes them invisible in the course of massive fish collections and causes difficulty in the process of identification and description. Some genera of this group such as *Pleurosicya* and *Luposicya* have previously been assigned to a distinguished subfamily, Sicydiaphiinae (Koumans, 1953; Smith, 1959) but later this division was ignored by various scientists (Hoese & Winterbottom, 1979; Larson & Hoese, 1980).

During the last decade, in the course of a study of gobies around the Sinai

(1) Department of Zoology, The George S. Wise Faculty of Life Sciences, Tel Aviv University, Tel Aviv 69978, Israel.

Peninsula five species of this group were found. Three of them are described herein as new species and two, *Pleurosicya mossambica* Smith and *Luposicya lupus* Smith, are new records for the Red Sea.

The examined material is deposited in the fish collection of the Zoological Museum of Tel Aviv University (TAU). Measurements were taken by using a stereoscope with an ocular micrometer. Body proportions are related to total body length and are given in percents. The total length (TL) was measured from the snout tip to the end of the longest caudal ray. Standard length (SL) was measured from snout tip to the origin of the caudal fin. Body depth (BD) was taken at the anus. Head depth (HD) and head width (HW) were measured at the upper attachment of the opercular membrane. Head length (HL) was measured from this point to snout tip. SD1, SD2 and SA are the distances between the snout tip and the first, second dorsal and anal fins respectively. Snout (S) was measured from its tip to eye. E is eye diameter. Longitudinal scale counts (LL) were made from the upper attachment of the opercular membrane to hypural. Transverse scale counts (TR) were made from the origin of anal fin, D, A, P, and V are the counts of dorsal, anal, pectoral and ventral fins respectively. Gill rakers (GR) were counted on anterior part of first gill arch.

Terminology for cephalic sensory pore system as in Lachner & Karnella (1978).

#### PLEUROSICYA Weber, 1913

Type species : *Pleurosicya boldinghi* Weber, 1913

#### *Pleurosicya mossambica* Smith, 1959 (Figs. 1a-c)

*Pleurosicya mossambica* Smith, 1959, Ichthyol. Bull., 13. 218, Fig. 37 Pinda.

Material : TAU 9017, 2 spec.: Marsa Barecha (Southern Sinai Peninsula) TL 21.8-26.2 mm, SL 17.5-21.4 mm, leg. M Goren, III. 1979.

**Description** : Body elongate and compressed. Head depressed. Mouth terminal. Maxillae reach to below mid eye. Lips thick. Posterior nostrils about 1/3 eye diameter from eye, anterior nostrils 1/3 eye diameter in front of the posterior one. Lower jaw with a row of labial teeth and a band of fine pointed teeth of which the inner are enlarged. Two pairs of large backcurved canines on the front of the inner row. Upper jaw with a band of fine pointed teeth, the outermost six pairs are enlarged, curved and visible also when mouth is closed. Interorbital distance narrow, less than 1/4 eye diameter.

**Cephalic sensory pore system** : Nasal pores above the front margins of eye, at a distance of 1/2 eye diameter from each other. Anterior interorbital pore above mid eyes. Posterior interorbital pore, which opens backward is located above posterior margins of eyes. Pairs of supraotic and anteriotic behind eyes, and a pair of intertemporal pores above preopercle. Three pores on each hind margin or preopercle. Gill opening wide, reaches a point below midway from eye to hind preopercular margin. GR 1+1+5.

SL 80-82 % TL; BD 10-11 % TL; HL 27-28 % TL; SD1 30-31 % TL; SD2 40-43 % TL; SA 41-43 % TL; HW 48-52 % HL; HD 43-48 % HL.

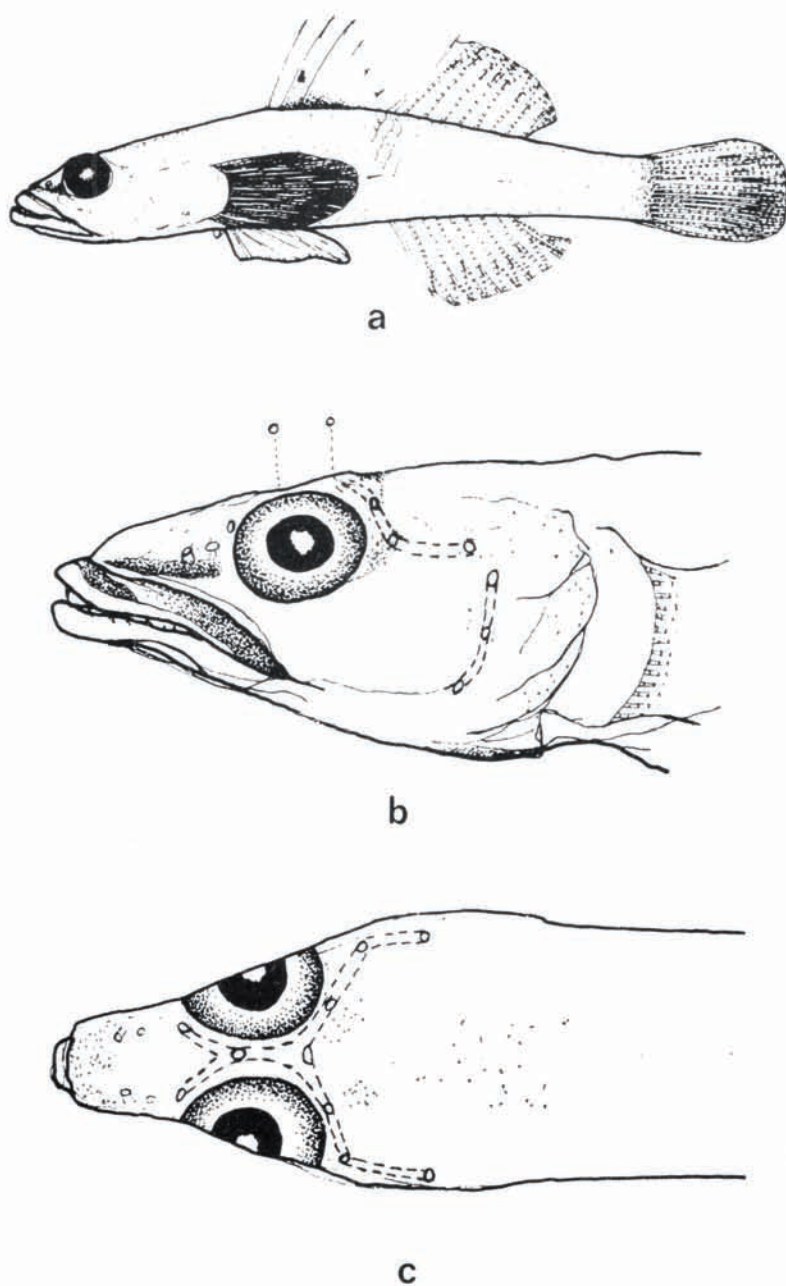


Fig. 1. - a : *Pleurosicya mossambica* TAU 9017. - b and c : lateral and dorsal views of cephalic pores canals.



*Fins* : D VI, 1.8; A 1.8; P 16; V 1,5; First dorsal fin height is equal to body depth. The third spine is the longest. Second dorsal fin inserts above anus. Its height is equal to body depth. Pectoral fins reach to below the end of the first dorsal fin. The lower rays are directed outward to enlarge the attachment surface of the fish.

*Scales* : LL 28; TR 7. Ctenoid scales cover the body and nape. Pectoral and pelvic bases unscaled.

*Colour* (preserved) : Body and head yellowish. Black patches on the first dorsal fin. Two parallel dark bands run from eyes to upper lip.

*Pleurosicya sinaia* n. sp. (Figs. 2a-c)

*Material* : Holotype TAU 6415, Marsa Barecha (Southern Sinai Peninsula), TL 20.7 mm, SL 17.7 mm, leg. M. Goren, 16.X.1979. Paratype TAU 6414, 15 km south of Eilat. TL 19.2 mm, SL 16.4 mm, leg. A. Avidor, X.1976.

*Diagnosis* : A *Pleurosicya* species with LL 26-27; TR 9; D VI, 1.6; A 1.8; P 16-17.

*Description* : Body elongate and compressed. Head triangular in cross section. Mouth opening terminal. Maxillae to below mid-eye, upper lip thick. Posterior nostrils, a very short tube, in front of eye. Anterior nostrils, a tube, at midway between eye and upper lip. Tongue rounded. Upper jaw with a band of pointed teeth. The band is narrow at the posterior part of the jaw and broader anteriorly. The outer teeth (4 pairs) enlarged. Vomer with a considerable protuberance. The lower jaw with a band of pointed teeth, the outer row enlarged. On each side of the angle of the dentary a pair of backward curved canines. Gill opening to below preopercle margin. Gill rakers short, 1+1+5. Interorbital space narrow.

*Cephalic sensory pore system* : Nasal pores (a pair) in front of upper margin of eyes. Anterior interorbital pore above mid of eyes. Posterior interorbital pore, directed backward, above posterior margin of eye. Pairs supraotic, anteroptic pores behind eyes, and a pair of intertemporal pores above preopercle. Three pores on hind preopercular margin.

SL 85 % TL; BD 12 % TL; SD1 31-33 % TL; SD2 46-49 % TL; SA 46-49 % TL; E 21-23 % HL; HD 42-48 % HL; HW 50-52 % HL.

*Scales* : LL 26-27; TR 9; predorsal scales 8. No scales on preopercle and pectoral base. Scales are ctenoid.

*Fins* : D VI, 1.6; A 1.8; P 16-17; Dorsal fins lower than body depth. The second and third dorsal spines are the longest. First dorsal spine is about 2/3 of the second one. Pectoral fins reach to below the origin of the second dorsal fin. Pelvic fins fully

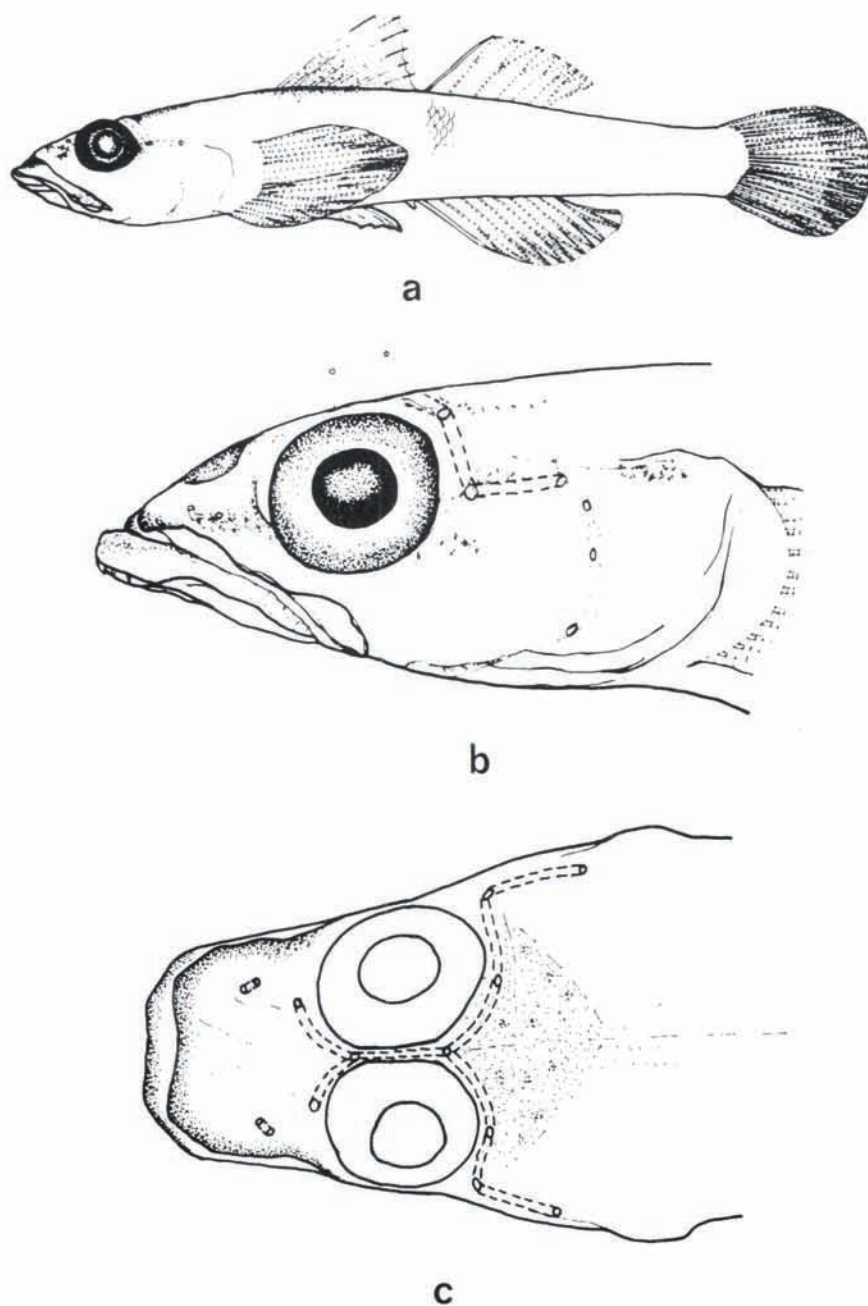


Fig. 2. - a : *Pleurosicya sinaia* n. sp. TAU 6415, holotype. - b and c : lateral and dorsal views of cephalic pores and canals.

united, cup-shape, do not reach the anus. Fraenum, well developed, folded anteriorly to form a pocket. Fleishy lobes at each side of the fraenum. Caudal fin rounded.

*Colour* (preserved) : Body and head yellowish. A pair of broad dark bands from eyes to upper lip. First dorsal fin blackish. Second dorsal fin with two rows of dots.

*Remarks* : *Pleurosicya sinaia* is easily distinguished from all its congeners by its lower dorsal ray count.

*Etymology* : The species is named after the Sinai Peninsula, its type locality.

***Pleurosicya prognatha* n. sp.** (Figs. 3a-c)

*Material* : Holotype : TAU 6478, Marsa Barecha (Southern Sinai Peninsula), TL 16.8 mm, SL 14.1 mm, leg. M. Goren, 16.X.1979; Paratypes : TAU 6416, 3 spec., data as holotype, TL 10.6-14.1 mm; SL 8.8-11.8 mm; TAU 6417, 1 spec., Tiran Island (northern Red Sea), TL 14.7 mm, SL 12.6 mm, leg. M. Goren, 2.VI.1981. TAU 6498, 1 spec., Eilat (20 m), TL 14.9 mm, SL 12.7 mm, leg. O. Sharon, 26.VI.1983.

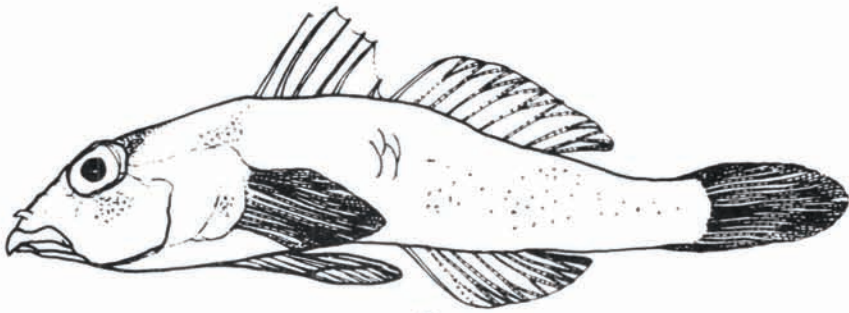
*Diagnosis* : A *Pleurosicya* species with a compressed head and a long pointed snout, a falcon beak shape. A low flap in front of upper-anterior margin of eye. D VI, 1.8; A 1.8; P 14-15; LL 24-26; TR 7-8.

*Description* : Body elongate and compressed. Head compressed. Upper lip extends forward and pointed at the tip, a falcon beak shape. Mouth subterminal. Maxillae to below front of eye. Posterior nostrils, a pore, in front of eye. Anterior nostrils, a short tube, about 1/2 eyediameter in front of eye. Tongue elongate with a rounded tip. A band of tiny pointed teeth on lower jaw. At the inner-anterior part of this band a pair of backward curved large canines. Upper jaw with a band of small pointed teeth. The outermost teeth are large and curved. Vomer with a considerable protuberance. A flap on the upper part of the front margin of eye. Gill opening to below pectoral base. Interorbital space narrow.

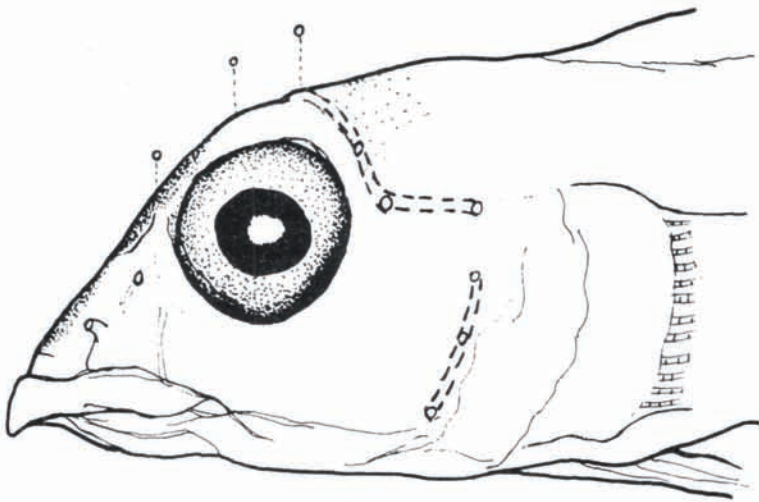
*Cephalic sensory pore system* : Nasal pores (a pair) in front of eye. Anterior interorbital pore at the level of 1/3 anterior front of eye. Posterior interorbital pore, directed backward, at the level of hind eye margin. A pair of supraotic pores at the level of the nasal pores. Anteriorotic and intertemporal pores above upper preopercle margins. Three pores on hind preopercular margins.

SL 83-85 % TL; BD 16-17 % TL; HL 24-26 % TL; SD1 34-36 % TL; SD2 47-53 % TL; SA 47-49 % TL; HW 61-65 % HL; HD 73-75 % HL; S 38-39 % HL; E 29-32 % HL.

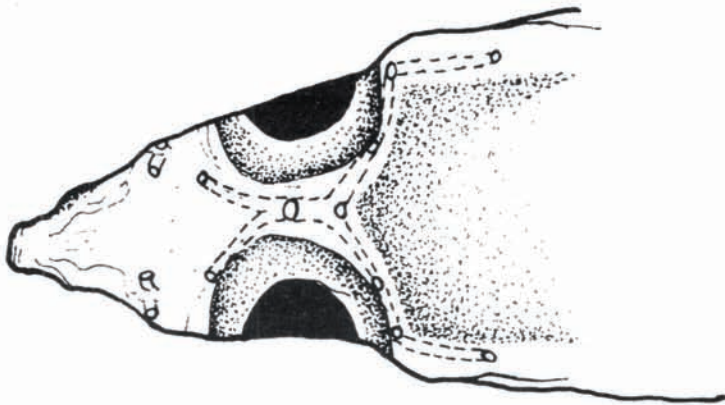




a



b



c

Fig. 3. - a : *Pleurosicya prognatha* n. sp. TAU 6478, holotype. - b and c : lateral and dorsal views of cephalic pores and canals.

*Scales* : LL 24-26; TR 7-8. Ctenoid scales on body to a line from the origin of the first dorsal fin to the upper pectoral base. No scales on nape, pectoral base and pre-pelvic.

*Fins* : D VI, 1.8; A 1.8; P 14-15; 13 caudal segmented rays. Dorsal fins lower than body depth. The 2nd-4th dorsal spines are the longest, reach to the origin of the second dorsal fin. The five anterior spines emerge from the body at approximately equal intervals while the sixth one emerges approximately at triple distance. The second dorsal fin originates at a distance of eyediameter from the sixth dorsal spine. Pectoral fins reach to above the anus. Pelvic fins, fully united, form a cup-shape. Fraenum thick and folded anteriorly.

*Colour* : In living fish the body and the head are completely transparent with black pigmentation around the eyes and a light yellow shade around the viscera. In preserved specimens the body and the head are yellowish to brown, with black chromatophores sprinkled on the head and the body. Dorsal and anal fins with black dots forming diagonal rows. Black dots spread irregularly on caudal fin. Dark pigmentation along the pectoral rays.

*Remarks* : *P. prognatha* differs from all the congeneric species by its unique long pointed snout. It is similar to *Pleurosicya timidis* (Smith, 1959) in the counts of scales and dorsal and anal rays but differs from *P. timidis* by having compressed head, a flap in front of upper margin of eye and by having a sixth dorsal spine at a triple distance from the anterior five. In *P. timidis* all six are at equal distances.

#### LOBULOGOBIUS Koumans, 1944

Type species : *Lobulogobius omanensis* Koumans, 1944.

#### *Lobulogobius bentuviai* n. sp. (Figs. 4a-c)

*Material* : Holotype : TAU 6477, Marsa Barecha (Southern Sinai Peninsula), TL 17.8 mm, SL 14.8 mm; leg. M. Goren, 16.X.1979. Paratypes : TAU 6419, data as holotype, 5 spec. TL 11.2 - 15.0 mm, SL 9.1 - 12.8 mm.

*Diagnosis* : A *Lobulogobius* species with D VI, 1.8 (9 in one specimen); A 1.8 (7 in one specimen); P 14-15; LL 33-34; TR 8-9. The anterior interorbital pores are as wide as the canals and directed upward.

*Description* : Small fish with total length less than 20 mm. Body elongate and compressed. Head depressed. Mouth wide and terminal. Maxillae to below mid of eye. Posterior nostrils, a pore in front of eye. Anterior nostrils, a tube at a distance of about 1/2 eyediameter from the posterior one. Tongue bilobed. Gill



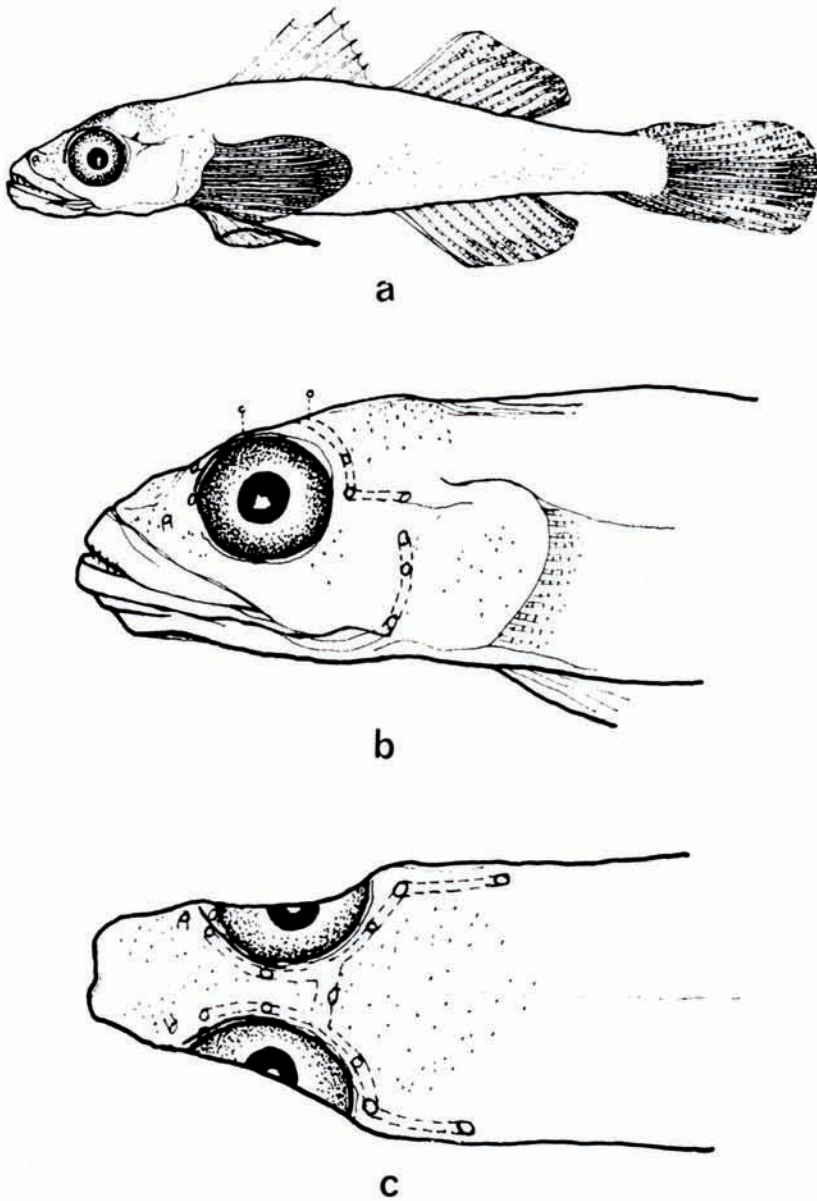


Fig. 4. - a : *Lobulogobius bentuviai* n. sp. TAU 6477, holotype. - b and c : lateral and dorsal views of cephalic pores and canals.

opening wide. First gill slit partly closed by a membrane. Gill rakers 2+1+6. Upper jaw with a band of pointed teeth. The outer row consists of 8-10 large teeth. Lower jaw with a band of pointed teeth. A curved canine on each side of the angle of the dentary. A pair of large, backward-curved canines at front of the inner row of teeth. Interorbital space wide. A body ridge above eye.

*Cephalic sensory pore system* : Nasal pores (a pair) in front of eye. Anterior interorbital pores (a pair) above anterior 1/3 of eyes, opening upward. Posterior interorbital pore is above the posterior margin of eye. Its opening is directed backward. Pairs of supraotic and anteriorotic pores behind eye. A pair of intertemporal pores above preopercle. Three pores on hind preopercle margins.

SL 80-85 % TL; BD 11-12 % TL; HL 19-22 % TL; SD1 32-35 % TL; SD2 46-48 % TL; SA 52-57 % TL; HW 77-82 % HL; HD 65-69 % HL; S 29-33 % HL; E 31-36 % HL.

*Scales* : LL 33-34; TR 8-9. Ctenoid scales on body. Those of the posterior part are larger than the anterior one.

*Fins* : D VI, 1.8 (9 in one spec.); A 1.8 (7 in one spec.); P 14-15; 13 segmented rays in caudal fin. Dorsal fins are about the same height, both lower than body depth. Pectoral fins reach to below the origin of the second dorsal fin. The lower pectoral rays are free at the tip, directed outward to form a better attachment instrument with the pelvic fins. Pelvic fins fully united-cupshaped. Fraenum thick, folded anteriorly. A fleshy lobe on each side of the fraenum.

*Colour* (preserved) : Body and head yellowish. Fins colourless.

*Remarks* : *Lobulogobius bentuviai* differs from its only congener *L. omanensis* Koumans by having less segmented anal rays (9 in *L. omanensis*), less pectoral rays (20-21 in *L. omanensis*) and more longitudinal scales (29-30 in *L. omanensis*). In addition, the anterior interorbital pores in *L. bentuviai* are directed upwards while those of *L. omanensis* are directed toward each other (Larson & Hoese, 1980).

*Etymology* : The species is named in honour of Prof. A. Ben-Tuvia, for his contribution to the knowledge of the fish fauna of the Red Sea and Mediterranean.

#### LUPOSICYA Smith, 1959

Type species: *Luposicya lupus* Smith, 1959.

#### *Luposicya lupus* Smith, 1959 (Figs. 5a-c)

*Luposicya lupus* Smith, 1959, Ichthyol. Bull., 13 : 217, Fig. 36, Pinda.

*Material* : TAU 9016, Foul Bay, Tiran Island (Northern Red Sea), 10 specs., TL 23.0 - 35.1 mm, SL 18.9 - 29.0 mm, 24.IX.1981, leg. M. Goren.

*Description* : Body elongate, posteriorly compressed with a flattish ventral profile. Head depressed. Maxillae to below front of eye. Upper lip spatulate expanded for-

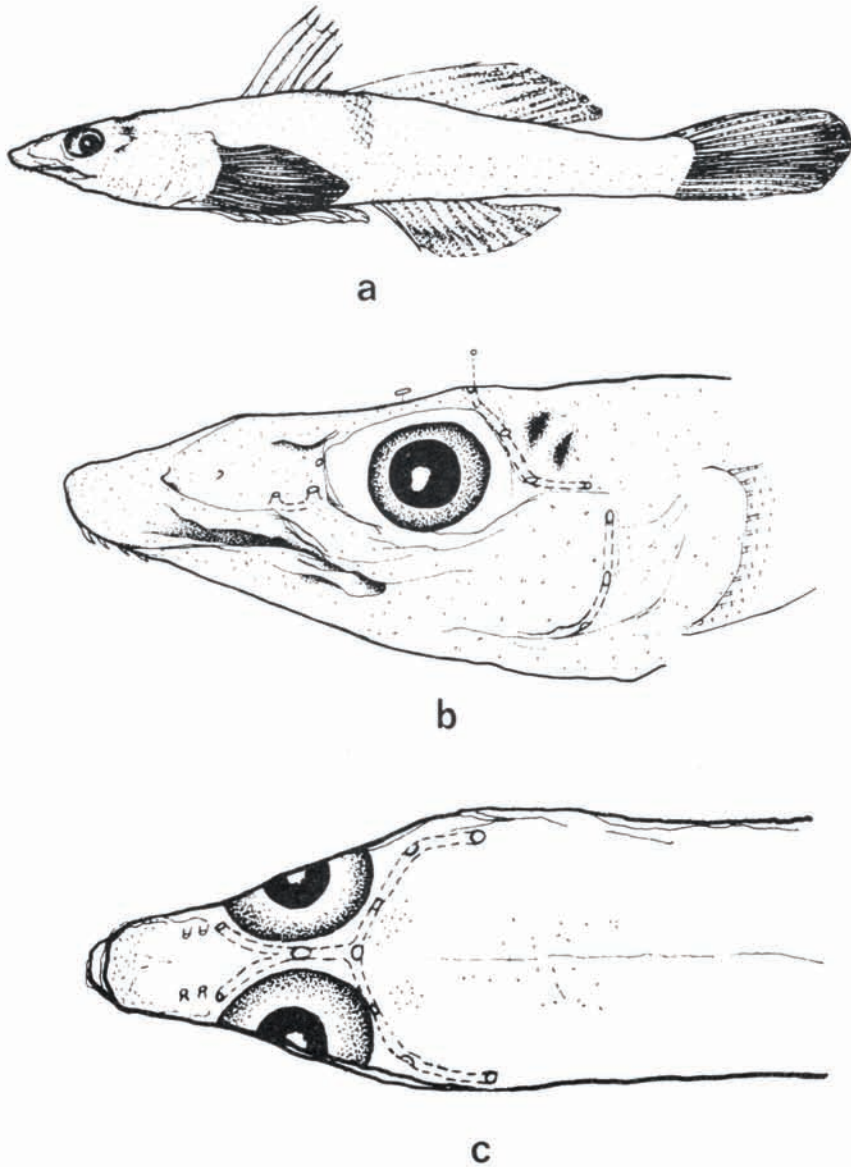


Fig. 5. - a : *Loposicya lupus* TAU 9016. - b and c : lateral and dorsal views of cephalic pores and canals.

ward. Mouth opening subterminal. Both nostrils are tubular, located at a distance of  $1/3$  eyediameter from each other. The posterior nostril is in front of eye. Tongue elongate and pointed. Lower jaw with a row of large labial teeth. 2-3 rows of teeth on lower jaw, the anterior teeth are enlarged, 1-2 canines on each side at the front of lower jaw. Upper jaw with a band of pointed teeth. The outer teeth (4-5 on each



side) are enlarged and extend over the lower lip. Vomer with considerable protuberance. Interorbital space narrow.

*Cephalic pore system* : A pair of nasal pores behind posterior nostrils. Anterior interorbital pore is above anterior 1/3 of eye. Posterior interorbital pore above the level of hind margin of eye. Pairs of supraotic and anteriorotic pores behind eyes and a pair of intertemporal pores above preopercle. Three pairs of pores on hind preopercular margins.

Gill opening reach to below preopercular margins. First gill slit is partially closed by a membrane. No outer rakers on first gill arch. SL 80-83 % TL; BD 11-12 % TL; HL 24-26 % TL; SD1 31-32 % TL; SD2 38-41 % TL; SA 49-51 % TL; HW 40-44 % HL; HD 39-44 % HL; S 38-40 % HL; E 21-24 % HL.

*Fins* : D VI, I.8; A I.8; P 14-15. First dorsal fin little higher than body depth. 3rd spine is the longest. Second dorsal fin higher than the first one. Pectoral fins reach to below the origin of second dorsal fin. The tips of the lower rays free and directed outward to improve the attachment ability of the pelvic fins. Pelvic fins fully united, cupshape. Fraenum curved anteriorly to form a pocket. Fleshy lobes on each side of the fraenum.

*Scales* : LL 28-30. The body is covered with ctenoid scales. No scales on nape, chest and pectoral bases.

*Colour* (preserved) : Body and head yellowish and covered with minute brown speckles. A black patch on occiput. Caudal and dorsal fins with black dots, forming vertical lines. Anal fin blackish.

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