

Pisces, Pleuronectiformes : Flatfishes from the waters around New Caledonia. - A revision of the genus *Engyprosopon*

Kunio AMAOKA, Eiji MIHARA

Laboratory of Marine Zoology
Faculty of Fisheries, Hokkaido University
Hakodate, Hokkaido 041, Japan

&

Jacques RIVATON

ORSTOM
B. P. A5 Nouméa Cedex
New Caledonia

ABSTRACT

Species of the bothid genus *Engyprosopon* collected from the waters around New Caledonia are reviewed. Nine species are described and an identification key provided : *E. septempes* sp. nov., *E. rostratum* sp. nov., *E. bellonaensis* sp. nov., *E. longipterum* sp. nov., *E. macrolepis*, *E. hureaui*, *E. xystrias*, *E. grandisquamum* and *E. maldivensis*. Records of *E. macrolepis*, *E. hureaui*, and *E. xystrias* are new for this region. Sexual dimorphism and relationships are discussed for each species. Based on comparisons of type specimens, *Engyprosopon maculipinnis*, *E. borneensis* and *E. macroptera* are shown to be junior synonyms of *E. maldivensis*.

RÉSUMÉ

Pisces, Pleuronectiformes : Poissons plats des eaux de la Nouvelle-Calédonie. - Révision du genre *Engyprosopon*.

Les neuf espèces du genre *Engyprosopon*, récoltées dans les eaux entourant la Nouvelle-Calédonie, sont ici révisées. Une clé de détermination vient compléter la description des espèces : *E. septempes* sp. nov., *E. rostratum* sp. nov., *E. bellonaensis* sp. nov., *E. longipterum* sp. nov., *E. macrolepis*, *E. hureaui*, *E. xystrias*, *E. grandisquamum* et *E. maldivensis*. *E. macrolepis*, *E. hureaui* et *E. xystrias* sont signalés pour la première fois dans la région. Le dimorphisme sexuel, les caractères méristiques et les données biométriques sont étudiés pour chaque espèce. La synonymie de *E. maculipinnis*, *E. borneensis* et *E. macroptera* avec *E. maldivensis* est établie après comparaison des divers types.

INTRODUCTION

Engyprosopon is a large Indo-Pacific genus (ca. 24 valid species) of small bothid flounders usually occurring at depths of less than 300 m. Some of the more obvious characters distinguishing the genus are ovate body form, large scales (usually less than ca. 50 in lateral line) that are weakly ctenoid or cycloid, deeply clefted parhypural and hypural plates (AMAOKA, 1969, fig. 127 J), and secondary sexual dimorphism with males having a rostral spine, a wide interorbital space and usually a dark color pattern on the blind side. Although the genus is well defined, there are many taxonomic problems. A great deal of this is due to sexually dimorphic characters, since these greatly change with growth and maturation.

From the waters around New Caledonia, three nominal species, *E. grandisquamum* (TEMMINCK & SCHLEGEL, 1846), *E. macroptera* Amaoka, 1963, and *E. longipelvis* Amaoka, 1969, have been recorded in ichthyofaunal lists for the area (RIVATON, 1989, RIVATON & RICHER DE FORGES, 1990).

Recently, we had the opportunity to examine many specimens of *Engyprosopon* species collected from the waters around New Caledonia. We found nine species, including four undescribed species and three new records of known species from these waters. In this paper we describe and present a key to and synonymies for all *Engyprosopon* species known from this area. Special emphasis is placed on description of sexual dimorphism.

MATERIALS AND METHODS

Specimens examined in the present study were collected from various localities in the Coral Sea, mainly New Caledonia, the Chesterfield Plateau, the Bellona Plateau, the Fairway Ridge and Loyalty Islands (Fig. 1).

The specimens examined here are deposited in Muséum national d'Histoire naturelle (MNHN), Paris, and Laboratory of Marine Zoology, Faculty of Fisheries, Hokkaido University (HUMZ). Specimens were fixed in 10 % formalin and preserved in 75 % ethanol. Institutional abbreviations are as listed in LEVITON *et al.* (1985).

Counts and proportional measurements follow those of HUBBS and LAGLER (1958) with the following exceptions: because all rays of dorsal and anal fins are unbranched, all ray elements were counted as individual rays; lengths of pelvic-fin bases were measured from the base of the first ray to the base of the last ray.

The measurements given without indication, especially in the lists of material examined, are the standard lengths (SL).

Counts and measurements were taken from ocular and blind sides of paired structures. The caudal skeleton and number of vertebrae are examined on radiographs. Abbreviations of the meristic and proportional characters are as given in Table 1.

TABLE 1. — Abbreviations of the counts and proportional measurements used in tables.

D	Number of dorsal fin rays	LED	Lower eye diameter
A	Number of anal fin rays	IW	Interorbital width
P1	Number of pectoral fin rays	UJL	Upper jaw length
P2	Number of pelvic fin rays	LJL	Lower jaw length
C	Number of caudal fin rays	DCP	Depth of caudal peduncle
LLS	Number of scales in lateral line	P1L	Pectoral fin length
GR	Number of gill rakers on first arch, (as upper limb + lower limb)	P2L	Pelvic fin length
V	Number of vertebrae, (as abdominal vertebrae+caudal vertebrae)	P2B	Pelvic fin-base length
		LDFR	Length of longest dorsal fin ray
		LAFR	Length of longest anal fin ray
		MCFR	Length of mid-caudal fin ray
		LLCW	Lateral line curve width
TL	Total length	SD	Standard deviation
SL	Standard length	O	Ocular side
HL	Head length	B	Blind side
BD	Body depth	♂	Male(s)
SNL	Snout length	♀	Female(s)
UED	Upper eye diameter		

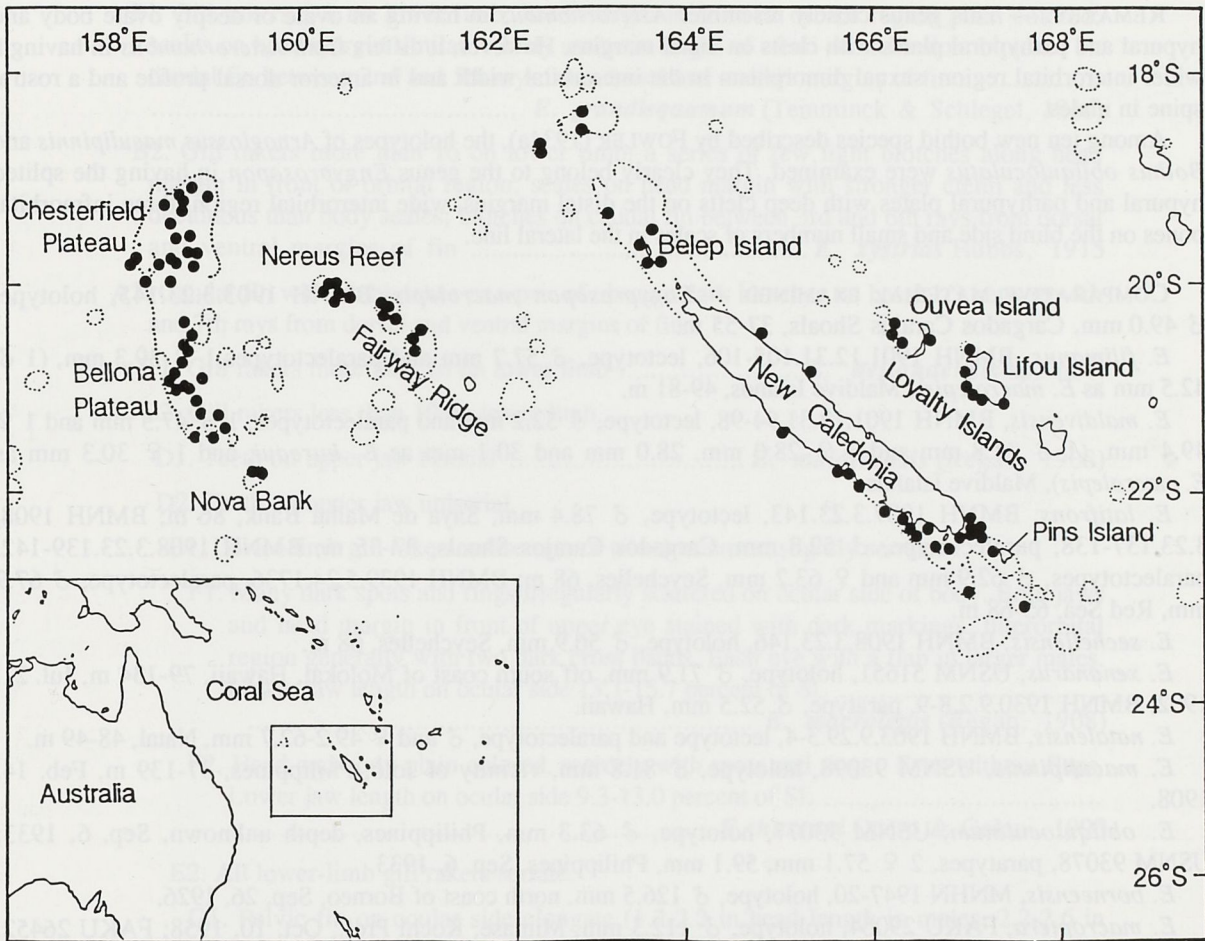


FIG. 1. — Localities where specimens in this study were collected.

Genus *ENGYPROSOPON* Günther, 1862

Engyprosopon Günther, 1862 : 431 (type species by original designation, *Rhombus mogkii* Bleeker, 1854).

Scaeops Jordan & Starks, 1904 : 627 (type species by original designation, *Rhombus grandisquama* Temminck & Schlegel, 1846).

Body ovate or deeply ovate. Tip of isthmus below middle part of lower eye. A strong rostral spine on snout in males, feeble or absent in females. Anterior dorsal profile steeper in mature males than in females and juvenile males. Interorbital space concave, becoming wider with growth, wider in males than in females and juvenile males. Mouth moderate or rather large in size, upper-jaw length on ocular side 2.2-3.6 in head length. Dentition about equally developed on both sides of jaws. Teeth on upper jaw uniserial or biserial; uniserial on lower jaw. Scales large with short and feeble ctenii on ocular side; 36-61 in lateral line. Lateral line developed only on ocular side, curved above pectoral fin. Dorsal-fin origin on blind side, anterior to upper margin of lower eye. Anal-fin origin below posterior margin of head. Pelvic fin on ocular side originating at tip of isthmus. Vent on blind side, immediately above first anal fin ray. Urogenital papilla on opposite side of vent. Three infraorbital bones on blind side. Four caudal plates (i.e., parhypural, two hypurals, and hypural + epural) with deep clefts along distal margins (AMAOKA, 1969, fig. 127 J).

REMARKS. — This genus closely resembles *Asterorhombus* in having an ovate or deeply ovate body and hypural and parhypural plates with clefts on distal margins. However, it differs from *Asterorhombus* in having a wider interorbital region, sexual dimorphism in the interorbital width and in anterior dorsal profile and a rostral spine in males.

Among ten new bothid species described by FOWLER (1934a), the holotypes of *Arnoglossus maculipinnis* and *Bothus obliquiocularis* were examined. They clearly belong to the genus *Engyprosopon* in having the split hypural and parhypural plates with deep clefts on the distal margins, wide interorbital region, three infraorbital bones on the blind side and small numbers of scales in the lateral line.

COMPARATIVE MATERIAL EXAMINED. — *Engyprosopon macrolepis*, BMNH 1903.3.23.145, holotype, ♂ 49.0 mm, Cargados Carajos Shoals, 37-55 m.

E. filimanus, BMNH 1901.12.31.105-106, lectotype, ♂ 57.7 mm and paralectotypes, 1 ♀ 39.3 mm, (1 ♂ 42.5 mm as *E. macrolepis*), Maldives Islands, 49-81 m.

E. maldivensis, BMNH 1901.12.31.94-98, lectotype, ♂ 52.2 mm and paralectotypes, 1 ♂ 47.5 mm and 1 ♀ 49.4 mm, (1 ♂ 31.8 mm and 3 ♀ 28.0 mm, 28.0 mm and 30.1 mm as *E. hureaui*, and 1 ♀ 30.3 mm as *E. macrolepis*), Maldives Islands.

E. latifrons, BMNH 1907.3.23.143, lectotype, ♂ 78.4 mm, Saya de Malha Bank, 86 m; BMNH 1908.3.23.137-138, paralectotype, ♂ 52.8 mm, Cargados Carajos Shoals, 37-55 m; BMNH 1908.3.23.139-142, paralectotypes, ♂ 62.9 mm and ♀ 63.2 mm, Seychelles, 68 m; BMNH 1939.5.24.1736, paralectotype, ♂ 67.9 mm, Red Sea, 65-68 m.

E. sechellensis, BMNH 1908.3.23.146, holotype, ♂ 56.9 mm, Seychelles, 68 m.

E. xenandrus, USNM 51651, holotype, ♂ 71.9 mm, off south coast of Molokai, Hawaii, 79-134 m, Jul. 21, 1902; BMNH 1930.9.2.8-9, paratype, ♂ 52.5 mm, Hawaii.

E. natalensis, BMNH 1903.9.29.3-4, lectotype and paralectotype, ♂ and ♀ 49.2-62.7 mm, Natal, 48-49 m.

E. maculipinnis, USNM 93098, holotype, ♂ 81.8 mm, vicinity of Jolo, Philippines, 37-139 m, Feb. 14, 1908.

E. obliquiocularis, USNM 93077, holotype, ♂ 63.3 mm, Philippines, depth unknown, Sep. 6, 1933; USNM 93078, paratypes, 2 ♀ 57.1 mm, 59.1 mm, Philippines, Sep. 6, 1933.

E. borneensis, MNHN 1947-20, holotype, ♂ 126.5 mm, north coast of Borneo, Sep. 26, 1926.

E. macroptera, FAKU 29064, holotype, ♂ 112.3 mm, Mimase, Kochi Pref., Oct. 10, 1958; FAKU 26452, 29067-29071, paratypes, 6 ♂ 104.3-120.8 mm, collected with the holotype; FAKU 29065, 29066, 29072, paratypes, 3 ♂ 99.1-107.3 mm, Susaki, Kochi Pref., Jul. 21, 1959; FAKU 26453, 29074, 29075, paratypes, 3 ♀ 98.1-110.9 mm, Mimase, Jun. 21-Jul. 10, 1958.

E. longipelvis, FAKU 36624-36628, 36631-36633, 36636, 36637, 36642, 36644, 36645, holotype and paratypes, 10 ♂ and 3 ♀ 49.1-65.7 mm, Mimase, Kochi Pref., Jul. 8, 1960; FAKU 28960, paratype, ♂ 55.3 mm, Mimase, May 10, 1958; FAKU 36623, paratype, ♀ 65.1 mm, Miya, Aichi Pref., Apr. 10, 1960.

E. multisquama, FAKU 28982-28987, 28992-28996, 29046-29049, paratypes, 11 ♂ and 4 ♀ 109.2-137 mm, Mimase, Kochi Pref., June 20, 1958; FAKU 28988-28991, 29050-29055, holotype and paratypes, 4 ♂ and 6 ♀ 113.2-117.1 mm, Susaki, Kochi Pref., Jul. 8, 1959; FAKU 28997-29045, 29056-29063, paratypes, 49 ♂ and 8 ♀ 69-135.1 mm, Mimase and Susaki, Kochi Pref., Jul. 8-19, 1959.

E. xystrius, FAKU 26177, ♂ 87.1 mm, Tanegashima, Kagoshima Pref., Aug. 9, 1956; FAKU 26451, ♂ 73.0 mm, Tanegashima, Kagoshima Pref., Aug. 28, 1956; HUMZ 72390-72391, ♂ and ♀ 97.4-104.8 mm, 11°16'S, 61°02'E, Saya de Malha Bank, 148 m, Sep. 5, 1977; HUMZ 73428, ♂ 102.1 mm, 11°06'S, 61°44'E, Saya de Malha Bank, depth unknown, Sep. 12, 1977.

E. hensleyi, HUMZ 72319-72324, holotype and paratypes, 5 ♂ and 1 ♀ 96.0-117.4 mm, 11°04'S, 62°10'E, Saya de Malha Bank, 187 m, Aug. 31, 1977; HUMZ 74011, paratype, ♂ 104.0 mm, 11°03'S, 62°15'E, Saya de Malha Bank, 254 m, Aug. 31, 1977.

Key to New Caledonian species of *Engyprosopon*

A1. A pair of large jet-black blotches located submarginally on distal half of caudal fin.

B1. Gill rakers 5-8 on lower limb; head margin in front of orbital region plain colored; scales on head margin similar to body scales in length of ctenii and adhesion; blotches on caudal fin between 2nd and 5th rays from dorsal and ventral margins of fin
 *E. grandisquamum* (Temminck & Schlegel, 1846)

B2. Gill rakers more than 16 on lower limb; a series of few light blotches along head margin in front of orbital region; scales on head margin with stronger ctenii and less deciduous than body scales; blotches on caudal fin between 3rd and 6th rays from dorsal and ventral margins of fin *E. xystrius* Hubbs, 1915

A2. Caudal fin with no blotches or a pair of obscure dark blotches on basal 1/3 between 4th and 7th rays from dorsal and ventral margins of fin.

C1. Gill rakers more than 16 on lower limb *E. bellonaensis* sp. nov.

C2. Gill rakers less than 10 on lower limb.

D1. Teeth on upper jaw biserial *E. maldivensis* (Regan, 1908)

D2. Teeth on upper jaw uniserial.

E1. Lower-limb gill rakers not serrate or two dorsalmost slightly serrate.

F1. Many dark spots and rings irregularly scattered on ocular side of body. Both jaws and head margin in front of upper eye stained with dark markings. Interorbital region generally with two dark cross bands. Each eye with a flap in larger males. Lower jaw length on ocular side 13.1-15.7 percent of SL
 *E. macrolepis* (Regan, 1908)

F2. Head and body plain colored, scarcely with spots and rings. Eyes without flaps. Lower jaw length on ocular side 9.3-13.0 percent of SL
 *E. hureai* Quéro & Golani, 1990

E2. All lower-limb gill rakers serrate.

G1. Pelvic fin on ocular side elongate (1.2-2.2 in head length in males, 2.2-2.6 in females) and scattered with many black spots in males; pectoral fin length on ocular side less than 1.2 times as long as head in males, less than 0.7 in females; interorbital region with one or two dark cross bands.

H1. Pelvic fin rays 7 at least on one side of body; interorbital region with two dark cross bands *E. septempes* sp. nov.

H2. Pelvic fin rays 6 on either sides of body; interorbital region with one dark cross band *E. rostratum* sp. nov.

G2. Pelvic fin on ocular side short (3.1-3.2 in head length in both sexes) and with some black spots; pectoral fin length on ocular side about twice as long as head in males, subequal to or more than head in females; interorbital region plain colored...
 *E. longipterum* sp. nov.

Engyprosopon grandisquamum (Temminck & Schlegel, 1846)

Fig. 2

Rhombus grandisquamum Temminck & Schlegel, 1846 : 183, pl. 42, figs 3-4. — BOESEMAN, 1947 : 149.

Rhombus poecilurus Bleeker, 1852a : 293; 1852b : 29.

Rhomboidichthys grandisquamum - GÜNTHER, 1862 : 437. — ISHIKAWA & MATSUURA, 1897 : 25. — REGAN, 1905 : 332.

Pseudorhombus poecilurus - BLEEKER, 1865 : 274.

- Platophrys (Arnoglossus) poecilurus* - BLEEKER, 1866-72 : 13, pl. 5, fig. 1.
Platophrys (Platophrys) grandisquama - BLEEKER, 1873 : 130.
Rhomboidichthys spilurus Günther, 1880 : 47, pl. 21, fig. A.
Rhomboidichthys spiniceps Macleay, 1881 : 127.
Engyprosopon grandisquama - JORDAN & SNYDER, 1901 : 122. — FRANZ, 1910 : 62. — NORMAN, 1926 : 250; 1927 : 25, fig. 5; 1934 : 209, fig. 156; 1939 : 100. — McCULLOCH, 1929 : 276. — CHABANAUD, 1929 : 382. — TANAKA, 1931 : 38. — WU & TANG, 1935 : 392. — KAMOHARA, 1936 : 3; 1938 : 59; 1950 : 240; 1952 : 79; 1958 : 62; 1964 : 82. — OKADA, 1938 : 263; 1955 : 371, fig. 338. — OKADA & MATSUBARA, 1938 : 422. — KURONUMA, 1939 : 85; 1940 : 213; 1961 : 32. — BLEGVAD, 1944 : 202, fig. 123. — LIANG, 1948 : 19; 1951 : 35. — SMITH, 1949 : 159. — KURODA, 1951 : 389. — HERRE, 1953 : 182. — MATSUBARA, 1955 : 1259. — MUNRO, 1955 : 261, pl. 50, fig. 756; 1958 : 128. — MORI, 1956 : 31. — CHEN, 1956 : 99. — FOWLER, 1956 : 167. — TOMIYAMA & ABE, 1958 : 422. — OCHIAI & AMAOKA, 1962 : 133. — BAOSHAN, 1962 : 975, fig. 759. — ZHANG & WANG, 1963 : 519, fig. 387. — AMAOKA, 1963 : 108; 1969 : 79, fig. 44; 1984 : 348, pl. 313, figs A-D. — ABRAHAM, 1963 : 68. — PUNPOKA, 1964 : 16, fig. 3. — PERSTSEVA-OSTROUMOVA, 1965 : 192, fig. 4. — CHEN & WENG, 1965 : 48, fig. 32. — SHEN, 1966 : 181, fig. 51-54; 1983 : 19, fig. 25; 1984 : 135, pl. 135, fig. 438-16. — BESEDNOV, 1970 : 60. — KAILOLA, 1971 : 116, pl. I, fig. C. — CHILVERS & CHAN, 1973 : 110, pl. 4. — NIELSEN, 1974 : 7, fig. — MASUDA, ARAGA & YOSHINO, 1975 : 345, pl. 148-E. — MINAMI & NAKAMURA, 1978 : 37. — GLOERFELT-TARP & KAILOLA, 1983 : 275. — SAINSBURY, KAILOLA & LEYLAND, 1985 : 282, fig. — HENSLEY, 1986 : 858, fig. 259.8. — KURONUMA & ABE, 1986 : 246. — LI & WANG, 1987 : 498, fig. 2557. — RIVATON & RICHER DE FORGES, 1990 : 26, 60.
Rhomboidichthys poecilurus - REGAN, 1902 : 277; 1905 : 332.
Arnoglossus spilurus - JOHNSTON, 1904 : 211.
Scaeops grandisquama - JORDAN & STARKS, 1904 : 627, pl. 8, fig. 2; 1906 : 168, fig. 1. — SNYDER, 1912 : 438. — JORDAN, TANAKA & SNYDER, 1913 : 311. — IZUKA & MATSUURA, 1920 : 116. — FOWLER & BEAN, 1922 : 67. — VON BONDE, 1922 : 6; 1922 : 295. — BARNARD, 1925 : 387. — JORDAN & HUBBS, 1925 : 294. — UI, 1929 : 271. — KAMOHARA, 1931 : 93. — SCHMIDT, 1931 : 123. — KURODA, 1931 : 121. — HERRE, 1932 : 433. — YANAI, 1950 : 21. — TANAKA & ABE, 1955 : 218, fig.
Scaeops poecilura - JORDAN & SEALE, 1905 : 803.
Scaeops spilura - JORDAN & SEALE, 1906 : 412. — FOWLER, 1928 : 92.
Scaeops orbicularis JORDAN & SEALE, 1907 : 45. — JORDAN & RICHARDSON, 1909 : 201. — OSHIMA, 1927 : 179. — WU, 1932 : 91.
Scaeops poecilurus - REGAN, 1908 : 233. — WEBER, 1913 : 429. — BAMBER, 1915 : 485. — FOWLER, 1928 : 92; 1931 : 320.
Rhomboidichthys valderostratus - JENKINS, 1910 : 26 (not *Rhomboidichthys valderostratus* Alcock, 1890).
Platophrys grandisquama - GILCHRIST & THOMPSON, 1917 : 400.
Platophrys spiniceps - McCULLOCH, 1921 : 46; 1934 : 36.
Bothus (Arnoglossus) poecilurus - WEBER & BEAUFORT, 1929 : 131, fig. 31. — SUVATTI, 1936 : 94.
Engyprosopon (Scaeops) grandisquama - McCULLOCH & WHITLEY, 1925 : 343, fig. 1.
Arnoglossus poecilurus - HERRE, 1933 : 11.
Arnoglossus grandisquama - FOWLER, 1934b : 62.

MATERIAL EXAMINED. — 29 specimens.

New Caledonia. Baie de Saint Vincent : 22°04.09'S, 166°05.20'E, 13 m, Aug. 20, 1985, shrimp trawl : 1 ♂ and 1 ♀ 66.8-77.7 mm (MNHN 1993-8, 9). — 22°05'S, 166°05.65'E, 12-16 m, Apr. 22, 1986, shrimp trawl : 1 ♂ and 1 ♀ 71.2-77.3 mm (MNHN 1993-10).

LAGON : stn 48, 22°16.06'S, 166°15.02'E, 28 m, May 25, 1984, dredge : 1 ♀ 46.4 mm (HUMZ 124857). — Stn 533, 19°17.08'S, 163°26.06'E, 50 m, Mar. 6, 1985, dredge : 1 ♀ 36.8 mm (MNHN 1993-142). — Stn 1067, 19°55.08'S, 163°53.00'E, 27-28 m, Oct. 24, 1989, beam trawl : 1 ♂ and 2 ♀ 50.9-88.4 mm (MNHN 1993-21, 22); 1 ♂ and 1 ♀ 87.3-90.5 mm (HUMZ 124860, 124861). — Stn 1068, 19°57.03'S, 163°52.08'E, 25-26 m, Oct. 24, 1989, beam trawl : 1 ♂ and 1 ♀ 32.6-91.9 mm (MNHN 1993-17, 18); 1 ♂ 85.4 mm (HUMZ 124858). — Stn 1069, 19°59.01'S, 163°52.05'E, 24-30 m, Oct. 24, 1989, beam trawl : 1 ♂ and 1 ♀ 85.0-102.9 mm (MNHN 1993-19, 20); 1 ♀ 32.0 mm (HUMZ 124859). — Stn 1072, 19°56.00'S, 164°02.04'E, 20 m, Oct. 24, 1989, dredge : 1 ♂ 75.8 mm (MNHN 1993-11). — Stn 1115, 19°38.02'S, 163°50.09'E, 40-42 m, Oct. 26, 1989, beam trawl : 3 ♂ and 3 ♀ 29.0-86.1 mm (MNHN 1993-14, 15, 16). — Stn 1116, 19°37.02'S, 163°52.06'E, 37-38 m, Oct. 26, 1989, beam trawl : 1 ♂ 34.1 mm (MNHN 1993-12); 1 ♂ and 2 ♀ 28.3-86.3 mm (MNHN 1993-13). — Stn 1191, 19°35.03'S, 163°27.05'E, 45 m, Nov. 1, 1989, dredge : 1 ♂ 46.0 mm (HUMZ 124856).

DIAGNOSIS. — Caudal fin with a pair of jet-black blotches between third and fourth fin rays from dorsal and ventral margins of fin; upper eye diameter longer than snout; no distinct bands in front of interorbital area and upper eye; gill rakers 0-2+5-8.

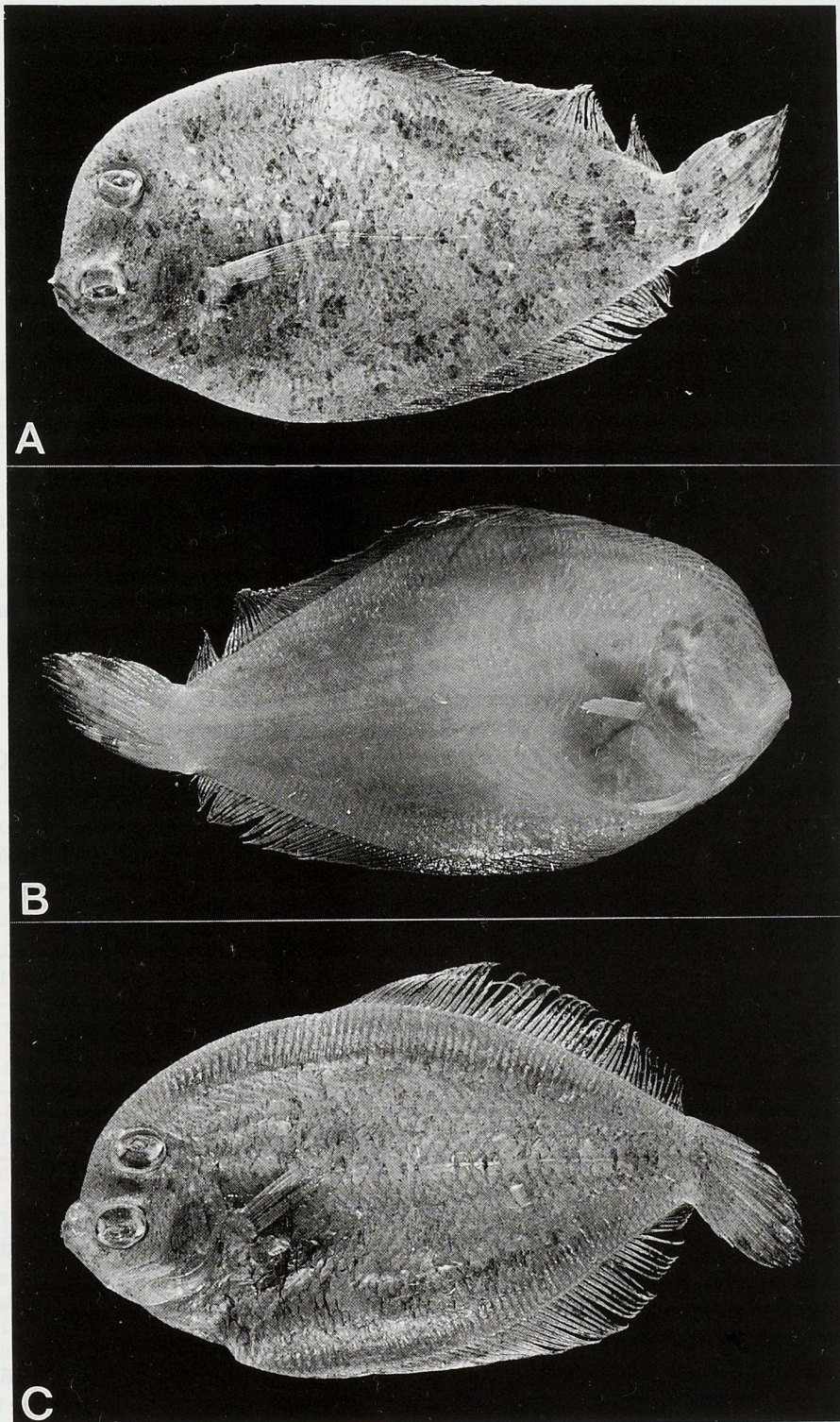


FIG. 2. — *Engyprosopon grandisquamum*. A-B : ♂ 83.0 mm, from northwest of New Caledonia (HUMZ 124776). — C : ♀ 89.9 mm, from northwest of New Caledonia (HUMZ 124777).

DESCRIPTION. — Ranges for proportional data are given first, followed by averages. Counts and proportional measurements as percent of SL are shown in Tables 2 and 3.

Head length 3.45-4.20, 3.82 in SL; body depth 1.75-2.11, 1.89. Snout length 3.66-5.00, 4.39 in head length; upper eye diameter 2.86-3.77, 3.27; lower eye diameter 2.86-3.70, 3.27; interorbital width 2.84-16.80, 5.84 in males, 3.87-17.80, 8.38 in females; upper jaw length 2.77-3.59, 3.18 on ocular side, 2.80-3.83, 3.37 on blind side; lower jaw length 2.13-2.66, 2.33 on ocular side, 1.97-2.51, 2.21 on blind side; depth of caudal peduncle 1.74-2.57, 2.09; pectoral fin length 0.87-1.40, 1.15 on ocular side, 1.95-2.54, 2.22 on blind side; pelvic fin length 2.20-2.78, 2.46 on ocular side, 2.15-2.54, 2.36 on blind side; pelvic fin-base length 2.19-2.97, 2.52 on ocular side, 6.21-8.21, 7.12 on blind side; length of longest dorsal fin ray 1.79-2.15, 1.97; length of longest anal fin ray 1.77-2.07, 1.95; length of middle caudal fin ray 1.03-1.20, 1.11; curved length of lateral line 1.56-2.11, 1.82.

Body ovate, deepest slightly in front of middle of body. Caudal peduncle rather deep, its depth about 18-26 % of body depth. Head small, with a slight concavity in front of interorbital region. Snout short, slightly prominent, its length 63-93 % of upper eye diameter. A strong rostral spine near snout tip in males, absent or feeble in females. Eyes rather large, 93-108 % of upper jaw length on ocular side. An orbital spine on rim of each orbit. Interorbital region shallowly concave, becoming wider proportionally with growth, wider in males than in females.

Mouth oblique and moderate in size; maxilla extending to below anterior part of lower eye; anterior tips of both jaws nearly on same vertical line when mouth closed. A small ventrally directed knob at mandibular symphysis. Teeth on upper jaw biserial, sharp, those in outer series stouter and more widely spaced than those in inner series, and becoming larger and more widely spaced anteriorly; lower jaw teeth uniserial, similar to anterior teeth in inner row of upper jaw in size and space. Gill rakers on first arch short, not serrate, absent on upper limb. Scales large, with short ctenii on ocular side, cycloid on blind side.

Pectoral fin on ocular side somewhat elongated in both sexes, its length subequal to or shorter than length of head, 1.74-2.53 times as long as pectoral fin on blind side. Pelvic fins with six rays, that on ocular side starting at tip of isthmus; approximately fourth or fifth ray on ocular side opposite to first on the blind side. Caudal fin rays branched except two or three upper- and lowermost rays.

TABLE 2. — Frequency distributions of eight meristic characters of *Engyproson grandisquamum*.

A	57	58	59	60	61	62	63	64	65	66	67	68	69							
	1	0	0	0	1	0	1	3	6	4	5	4	4							
D	80	81	82	83	84	85	86	87	88	89	91	P1 (O, B)		8	9	10	11	12	13	
	1	0	0	1	2	1	4	8	3	5	4			0-2	0-10	3-11	14-0	1-0	1-0	
C	3+11+3		3+12+2		2+13+2		LLS		41	42	43	44	45	46	47	48				
	24		4		1				1	3	3	4	8	4	1	2				
GR	1+6	2+6	0+5	0+6	0+7	0+8	V		9+25	10+23	10+24	10+25								
	1	1	3	21	2	1			1	1	24	3								

Coloration in alcohol : Ground color on ocular side light brown; many darker spots and rings irregularly scattered on head and body; two or three obscure dark spots on straight portion of lateral line. Blind side light brown except pale yellowish white head in males, uniformly pale yellowish white in females. Dorsal and anal fins with a series of dark spots; caudal fin with a pair of large prominent jet-black blotches, extending between second and fifth rays from dorsal and ventral margins of fin.

Sexual dimorphism : This species shows sexual dimorphism in the presence or absence of rostral and orbital spines, interorbital width, degree of curve of anterior dorsal profile and pigmentation of the body on the blind side.

DISTRIBUTION. — East Africa, through the Indian Ocean and Indo-Australian Archipelago to Australia, southern Japan and New Caledonia, at depths of about 10-100 m.

TABLE 3. — Proportional measurements as percent of SL in *Engyprosopon grandisquamum*.

Character	Range (N=29) 14♂, 15♀	Average	SD
SL (mm)	28.3-102.9	63.6	24.67
HL	23.8-29.0	26.2	1.4
BD	47.3-57.2	53.1	2.6
SNL	5.4-6.8	6.0	0.4
UED	6.9-9.7	8.1	0.8
LED	7.0-9.7	8.1	0.8
IW (♂)	1.7-8.8	6.4	2.7
IW (♀)	1.5-6.4	4.1	1.8
UJL (O)	6.9-9.9	8.3	0.7
UJL (B)	6.2-9.3	7.8	0.7
LJL (O)	9.7-13.1	11.3	0.9
LJL (B)	10.2-13.4	11.9	0.9
DCP	10.2-14.2	12.6	0.8
P1L (O)	20.0-29.9	23.0	2.0
P1L (B)	10.7-13.1	11.8	0.7
P2L (O)	9.8-11.7	10.7	0.5
P2L (B)	10.3-12.7	11.1	0.6
P2B (O)	8.8-12.4	10.4	0.8
P2B (B)	3.2-4.3	3.7	0.3
LDFR	12.1-14.5	13.2	0.6
LAFR	12.4-14.5	13.3	0.6
MCFR	21.5-25.2	23.2	0.9
LLCW	12.5-16.6	13.9	1.1

REMARKS. — This species closely resembles *Engyprosopon multisquama* Amaoka and *E. xystris* Hubbs from southern Japan in having a pair of jet-black blotches on the caudal fin.

It differs from *E. multisquama* in having the upper eye diameter longer than the snout (as long as or shorter than the snout in *E. multisquama*) and the caudal fin markings between the third and fourth fin rays from the dorsal and ventral margins of the fin (vs. between second and fourth rays).

From *E. xystris* it differs in having no distinct blotches in front of the interorbital area and upper eye (some light blotches in *E. xystris*) and a lower number of gill rakers (0-2+5-8 vs. 0-3+13-18).

Engyprosopon xystris Hubbs, 1915

Figs 3-4

Engyprosopon xystris Hubbs, 1915 : 475, pl. 25, fig. 3. — NORMAN, 1934 : 211, fig. 157. — OKADA & MATSUBARA, 1938 : 422. — MATSUBARA, 1955 : 1259. — AMAOKA, 1969 : 87, fig. 50. — CHILVERS & CHAN, 1973 : 110, pl. 5. — CHAN & CHILVERS, 1973 : 113, pl. 1.

MATERIAL EXAMINED. — 6 specimens.

New Caledonia. SMIB 5 : stn 81, 22°38.2'S, 167°34.8'E, 105-110 m, Sep. 9, 1980, dredge : 1 ♂ 67.0 mm (HUMZ 124863). — Stn DW 82, 22°31.7'S, 167°32.4'E, 150-155 m, Sep. 9, 1989, dredge : 1 ♂ 60.0 mm (MNHN 1993-25).

Loyalty Islands. MUSORSTOM 6 : stn 461, 21°06.00'S, 167°26.20'E, 200-240 m, Feb. 20, 1989, dredge : 1 ♂ 52.1 mm (MNHN 1993-24); 1 ♀ 51.5 mm (HUMZ 124862).

Chesterfield and Bellona Plateaus. CHALCAL 1 : stn CP 10, 20°00.20'S, 158°46.60'E, 225 m, Jul. 27, 1984, beam trawl : 2 ♂ 47.1-66.8 mm (MNHN 1993-23).

DIAGNOSIS. — A series of a few light blotches in front of orbital region; scales on head margin more strongly ctenoid and less deciduous than those on body; caudal fin with a pair of large jet-black blotches; gill rakers on first arch 0-6+13-18.

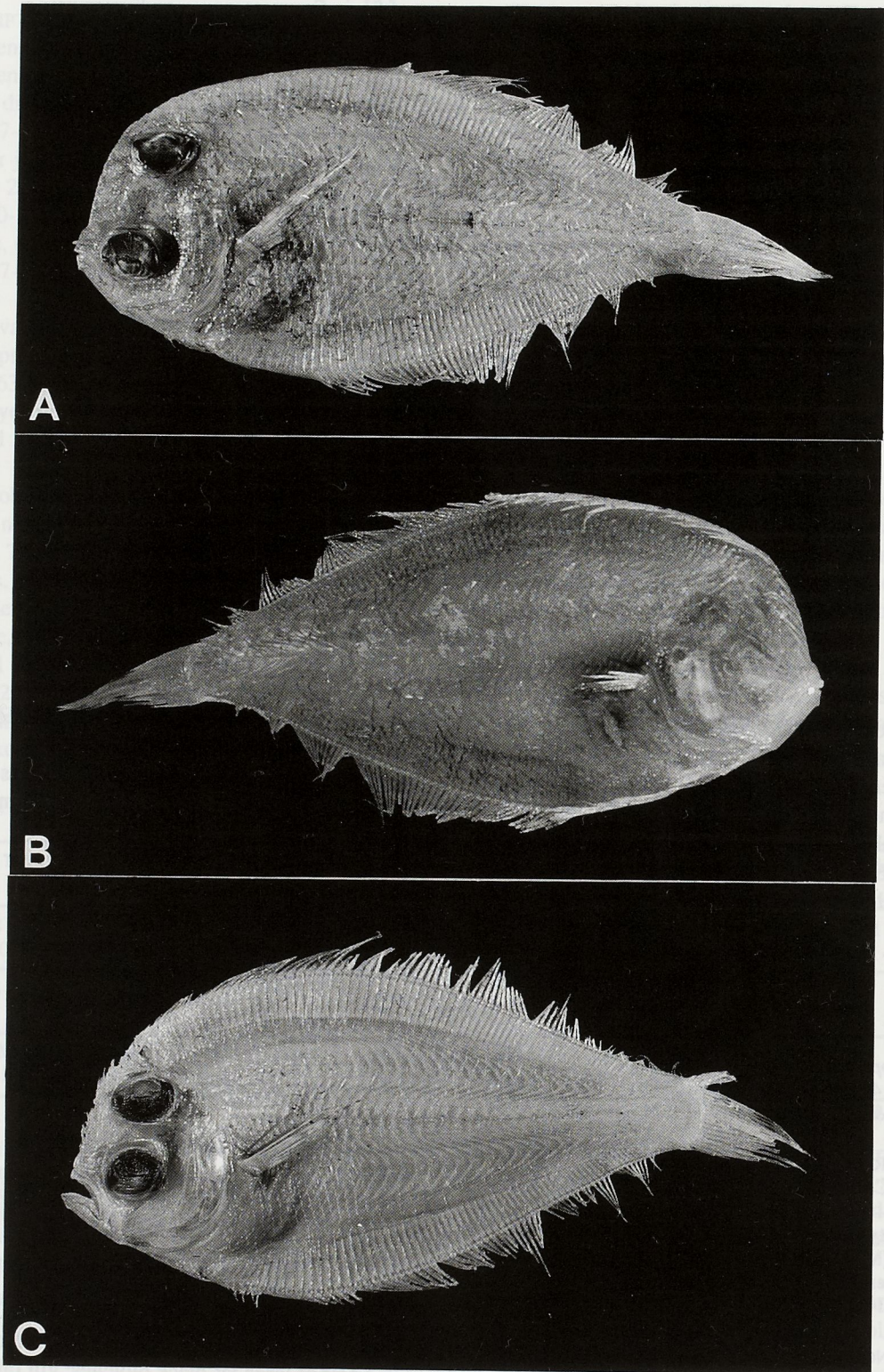


FIG. 3. — *Engyprosopon xystrias*. A-B : ♂, 67.0 mm from the Pins Island, south of New Caledonia (HUMZ 124863). — C : ♀ 52.1 mm, from the Lifou Island, east of New Caledonia (HUMZ 124862).

DESCRIPTION. — Ranges for proportional data are given first, followed averages. Counts and proportional measurements as percent of SL are shown in Tables 4 and 5.

Head length 3.60-4.02, 3.80 in SL; body depth 1.94-2.08, 2.01. Snout length 4.89-5.48, 5.14 in head length; upper eye diameter 2.41-2.74, 2.56; lower eye diameter 2.49-2.86, 2.62; interorbital width 2.95-7.88, 4.60 in males, 6.74, 6.74 in females; upper jaw length 2.51-3.00, 2.67 on ocular side, 2.56-3.00, 2.76 on blind side; lower jaw length 2.03-2.33, 2.18 on ocular side, 2.03-2.30, 2.14 on blind side; depth of caudal peduncle 2.29-2.62, 2.45; pectoral fin length 1.05-1.14, 1.09 on ocular side, 2.12-2.58, 2.33 on blind side; pelvic fin length 2.61-2.95, 2.77 on ocular side, 2.75-3.32, 3.08 on blind side; pelvic fin-base length 2.61-3.00, 2.75 on ocular side, 8.20-9.69, 8.80 on blind side; length of longest dorsal fin ray 1.71-2.04, 1.88; length of longest anal fin ray - ; length of middle caudal fin ray 1.09-1.20, 1.14.

TABLE 4. — Frequency distributions of eight meristic characters of *Engyprosopon xystrias*.

D	93 1	94 1	95 0	96 1	97 2	98 1	A	73 1	74 1	75 1	76 1	77 2	P1 (O, B)	10 0,5	11 0,0	12 3,1	13 3,0
C	3+11+3 6			LLS			46 1	47 2		48 0		49 2	50 1				
GR	3+16 1		3+17 1		4+17 1		4+18 1	5+16 1		6+16 1		V	10+25 1		10+26 1		10+27 4

Body ovate, deepest slightly in front of middle of body, its depth 1.8-2.0 times as long as head length; dorsal and ventral contours gently arched. Caudal peduncle moderate, its depth 21-23 % of body depth. Head small, its length equal to or a little more than 1/4 of SL; upper profile with a very slight concavity in front of interorbital region, steep in mature males, less so in females and juvenile males. Snout short, slightly prominent, 46-56 % of upper eye diameter. A strong rostral spine in males, absent or poorly developed in female (Fig. 4 A,B). Eyes large; upper eye diameter 1.8-2.2 times as long as upper jaw length; lower eye in advance of the upper. Blunt orbital spine on upper margin of lower eye in large males, absent in female and small males (Fig. 4 A,B). Interorbital region shallowly concave, becoming wider with growth, wider in males than in females (Fig. 4 A,B).

TABLE 5. — Proportional measurements as percent of SL in *Engyprosopon xystrias*.

Character	Range (N=6) 5♂, 1♀	Average	SD
SL (mm)	47.1-67.0	57.42	8.44
HL	24.9-27.8	26.3	1.0
BD	48.2-51.5	49.7	1.0
SNL	4.8-5.7	5.1	0.3
UED	9.5-11.3	10.3	0.6
LED	9.1-10.8	10.1	0.6
IW (♂)	3.4-9.4	6.6	2.2
IW (♀)	3.7	3.7	0
UJL (O)	9.3-10.6	9.9	0.5
UJL (B)	9.0-10.0	9.6	0.3
LJL (O)	11.7-13.0	12.1	0.4
LJL (B)	12.0-13.2	12.3	0.4
DCP	10.6-11.0	10.8	0.2
P1L (O)	23.1-25.5	24.4	0.8
P1L (B)	10.7-12.3	11.4	0.6
P2L (O)	9.4-9.6	9.5	0.1
P2L (B)	8.4-9.2	8.7	0.4
P2B (O)	9.3-10.3	9.6	0.3
P2B (B)	2.8-3.3	3.0	0.2
LDFR	13.6-14.8	14.2	0.6
LAFR	-	-	-
MCFR	23.1-24.4	23.8	0.5

Mouth rather large, oblique; maxilla extending to below anterior part of lower eye; anterior tip of upper jaw slightly projecting beyond tip of lower jaw when mouth closed. A small ventrally directed knob at mandibular symphysis. Teeth on upper jaw sharp, biserial, those in outer series larger and more widely spaced than those in inner series, and becoming larger and more widely spaced anteriorly with some anterior canine teeth; lower jaw teeth uniserial, similar to anterior teeth in inner series of upper jaw in size and spacing. Gill rakers on first arch slender, not serrated, those on upper limb small. Most scales on ocular side large, feebly ctenoid and deciduous; scales along head portion in front of interorbital area and upper eye with stronger ctenii and less deciduous; tip of snout and anterior parts of both jaws naked; scales cycloid on blind side.

Pectoral fin on ocular side rather short, somewhat less than length of head, 2.0-2.3 times as long as that on blind side. Pelvic fins with six rays, that on ocular side originating at tip of isthmus; approximately fifth ray on the ocular side opposite to first ray on the blind side. Tip of isthmus below posterior margin of lower eye. Caudal fin rays branched except three upper- and lowermost rays.

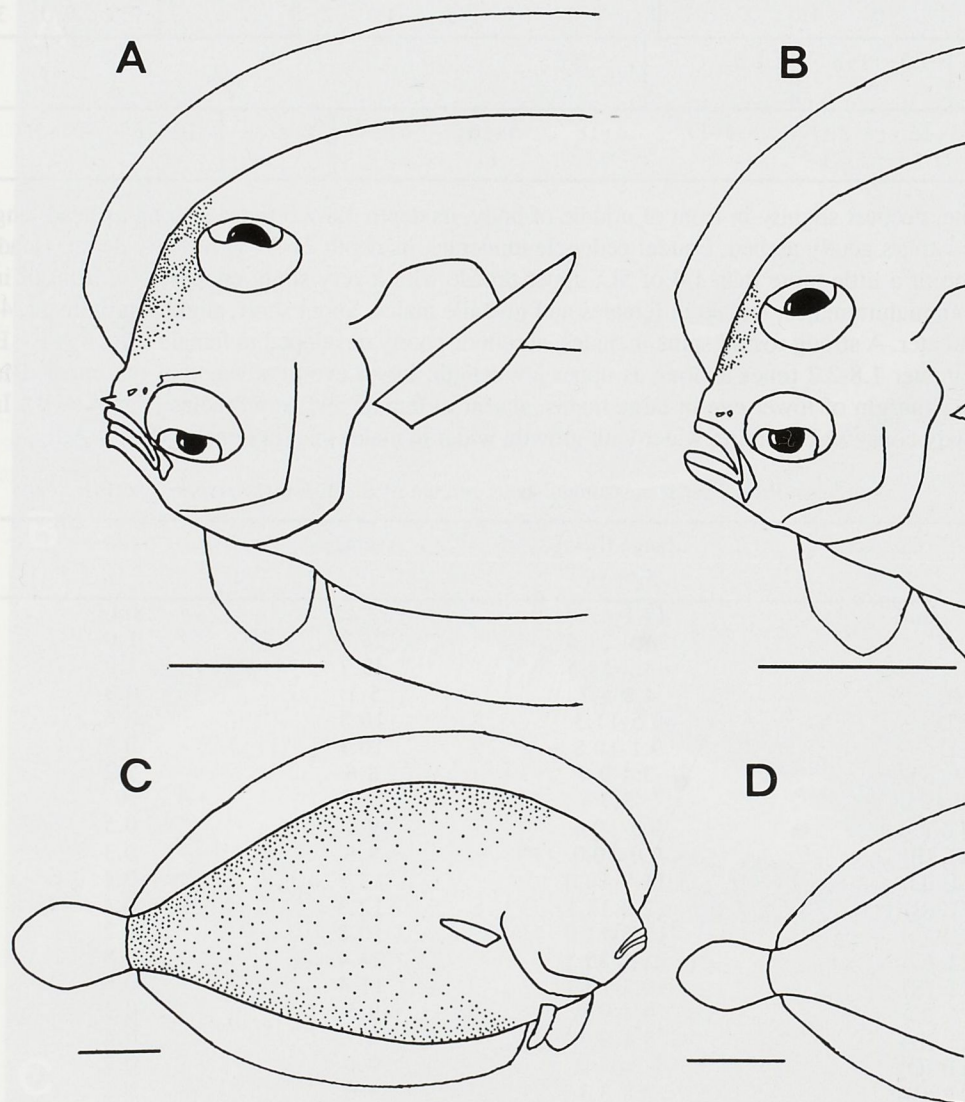


FIG. 4. — Diagrammatic illustration of body parts showing sexual dimorphism in ♂ (A, C) and ♀ (B, D) in *Engyprosopon xystrias*. Scale bars indicate 10 mm.

Coloration in alcohol : Ground color on ocular side light brown; a few light blotches along head portion in front of interorbital area and upper eye; one spot on middle part of straight portion of lateral line. Blind side light brown except pale yellowish-white head in males, uniformly pale yellowish white in female (Fig. 4 C-D). Dorsal and anal fins with a series of dark spots; pectoral fin with some dark bands; pelvic fin with a dark spot; caudal fin with a pair of large jet-black blotches at middle extending between third and fifth rays from dorsal and ventral margins of fin.

Sexual dimorphism : *Engyprosopon xystrias* shows sexual dimorphism in interorbital width, degree of curve of the anterior dorsal profile, presence or absence of rostral and orbital spines and pigmentation of body on the blind side (Fig. 4).

DISTRIBUTION. — Southern Japan (HUBBS, 1915), South China Sea (CHILVERS & CHAN, 1973), Coral Sea and Saya de Malha Bank, at depths of 105-240 m.

REMARKS. — This species is separable from all other known congeners in having rather strongly ctenoid, nondeciduous scales and a few light blotches along the head margin in front of the interorbital area and upper eye, a pair of jet-black blotches on the caudal fin and a large number of gill rakers.

Specimens from the Coral Sea have larger numbers of dorsal and anal fin rays, scales in the lateral line, and gill rakers on the first arch than specimens from other area (Table 6). However, Coral Sea specimens are very similar to specimens from other localities in all other characters. Thus, they are interpreted as representing geographical variation of this species.

TABLE 6. — Comparison of numbers of dorsal and anal fin rays, scales in lateral line and gill rakers on first arch among five localities for *Engyprosopon xystrias*.

Localities	Number of specimens	D	A	LLS	GR	Sources
Coral Sea	6	93-98	73-77	46-50	3-6+16-18	this study
Saya de Malha Bank	3	89-91	70-71	45-47	2+13-15	this study
Southern Japan	1	89	68	35	2+14	HUBBS (1915)
Southern Japan	2	88-91	67-71	39-41	0-3+13-14	AMAOKA (1969)
South China Sea	3	89-94	68-73	-	- +13-14	CHAN & CHILVERS (1973)

This species has been known from the southern Japan and the South China Sea. Specimens examined in the present study are the first records of this species from the Coral Sea and also Saya de Malha Bank, western Indian Ocean.

Engyprosopon bellonaensis sp. nov.

Figs 5-7

MATERIAL EXAMINED. — 4 specimens.

Chesterfield and Bellona Plateaus. CHALCAL 1 : stn CP 3, 20°30.83'S, 161°05.21'E, 80 m, Jul. 15, 1984, beam trawl : 1 ♀ 50.7 mm (HUMZ 124864). — Stn CP 12, 20°35.30'S, 158°47.40'E, 67 m, Jul. 23, 1984, beam trawl : 1 ♀ 72.4 mm (MNHN 1993-26); 1 ♀ 54.6 mm (MNHN 1993-143).

CORAIL 2 : stn 23, 20°30.60'S, 161°03.55'E, 80 m, Jul. 22, 1988, beam trawl : 1 ♀ 26.4 mm (MNHN 1993-27).

TYPES. — The female (MNHN 1993-26, CHALCAL 1, stn CP 12) is the holotype. The other specimens are paratypes.

DIAGNOSIS. — Gill rakers on first arch 1-5+14-15; some dark dots along head margin in front of interorbital area and upper eye; head comparatively large, 3.52-3.59 in SL; body depth 1.89-2.02.

DESCRIPTION. — Data for holotype are given first, followed in parentheses by ranges for the paratypes and averages for proportional data. Counts and proportional measurements as percent of SL are shown in Tables 7 and 8.

Head length 3.62 in SL (3.52-3.59, 3.57); body depth 1.92 (1.89-2.02, 1.95). Snout length 4.35 in head length (4.17-4.77, 4.41); upper eye diameter 2.86 (2.59-2.80, 2.75); lower eye diameter 2.86 (2.50-2.81, 2.74); interorbital width 5.71 (6.22-15.0, 8.54) in females; upper jaw length 2.56 (2.41-2.78, 2.63) on ocular side, 2.53 (2.38-2.78, 2.57) on blind side; lower jaw length 2.00 (1.92-2.04, 2.00) on ocular side, 1.94 (1.90-1.99, 1.94) on blind side; depth of caudal peduncle 2.41 (2.34-2.59, 2.43); pectoral fin length 1.05 (0.87-0.96, 0.95) on ocular side, 2.27 (1.93-2.34, 2.14) on blind side; pelvic fin length - (2.38-2.53, 2.46) on ocular side, 2.44 (2.76-2.80, 2.67) on blind side; pelvic fin-base length 2.67 (2.58-2.65, 2.63) on ocular side, 8.33 (8.44-9.53, 8.92) on blind side; length of longest dorsal fin ray - (-1.63, 1.63), length of longest anal fin ray - (-); length of middle caudal fin ray 1.16 (1.09-1.15, 1.13); curved length of lateral line 1.98 (1.77, 1.87).

TABLE 7. — Frequency distributions of eight meristic characters of *Engyprosopon bellonaensis* sp. nov. Counts for holotype included in italicized numbers.

D	85	86	87	89	90	A	63	64	65	66	67	P1 (O, B)	9	10	11	12
	2	0	0	<i>1</i>	1		1	1	0	0	2		0,1	0,2	1,1	3,0
C	3+11+3		LLS	50	51	52	GR	1+14	2+15	4+14	5+14	V	10+25			
	<i>4</i>			2	<i>1</i>	1		1	1	<i>1</i>	1		<i>4</i>			

Body ovate, deepest slightly in front of middle of body, its depth subequal to or somewhat less than half length of body; dorsal and ventral contours gently arched. Caudal peduncle rather deep, its depth slightly less than 1/4 of body depth. Head rather large, its length barely more than 25 % of SL; upper profile rather steep, with a slight notch in front of upper margin of lower eye. Snout rather long, slightly protruding, its length about 60 % of eye diameter. Rostral or orbital spines absent in females. Eyes large, diameters subequal to or a little less than upper jaw length; lower eye in advance of upper. Interorbital region shallowly concave, becoming wider with growth. Nostrils on ocular side anterior to upper margin of lower eye; anterior one tubular with a flap posteriorly; nostrils on blind side small, below origin of dorsal fin, similar in shape to those on ocular side.

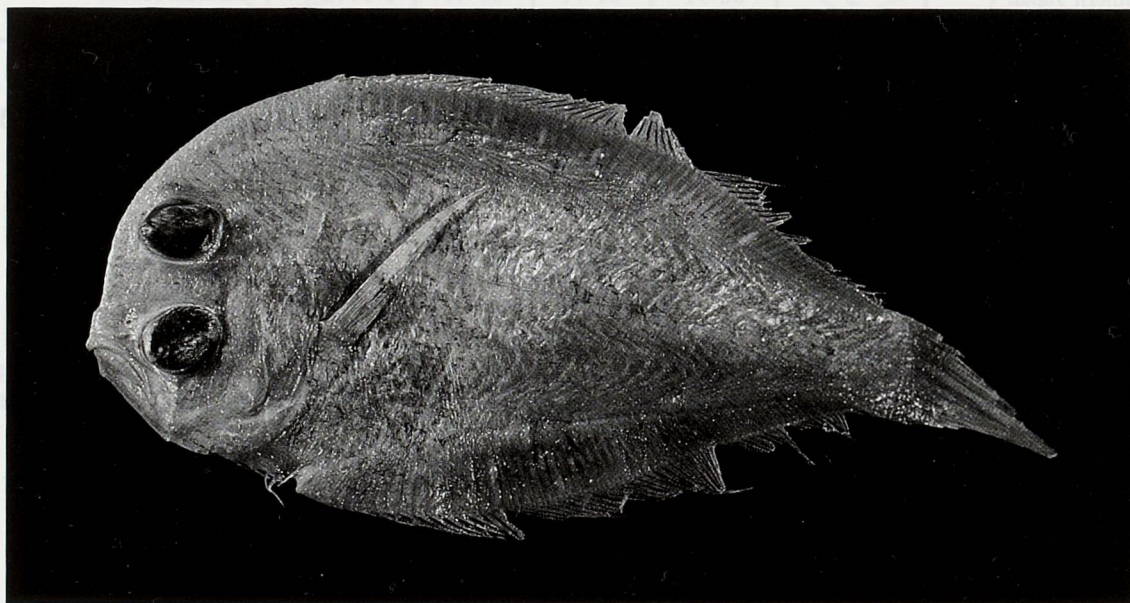


FIG. 5. — *Engyprosopon bellonaensis* sp. nov., holotype, ♀ 72.4 mm from Bellona Plateau, west of New Caledonia (MNHN 1993-26).

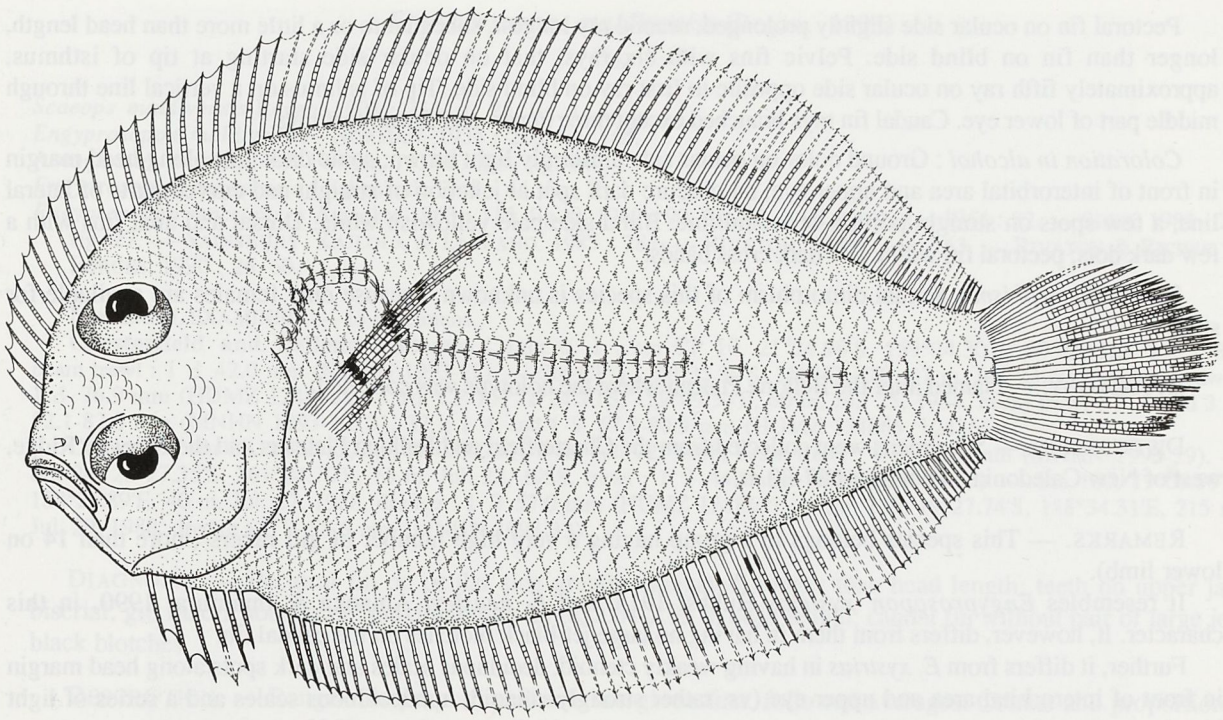


FIG. 6. — *Engyprosopon bellonaensis* sp. nov., holotype, ♀ 72.4 mm, from Bellona Plateau, west of New Caledonia (MNHN 1993-26).

Mouth rather large, oblique; maxilla extending to below anterior part of lower eye; anterior tip of upper jaw projecting slightly beyond tip of lower jaw or anterior tips of both jaws nearly on same vertical line when mouth closed. A small ventrally directed knob at mandibular symphysis. Teeth on upper jaw sharp, biserial, those in outer series larger and more widely spaced than those in inner series, and becoming larger and more widely spaced anteriorly with some anterior canine teeth; lower jaw teeth uniserial, nearly equal to anterior teeth of upper jaw in size and spacing. Gill rakers on first arch slender, not serrate, those on upper limb small (Fig. 7A). Scales on ocular side large, with short ctenii (Fig. 7B); snout and both jaws on ocular side naked; cycloid scales on blind side.

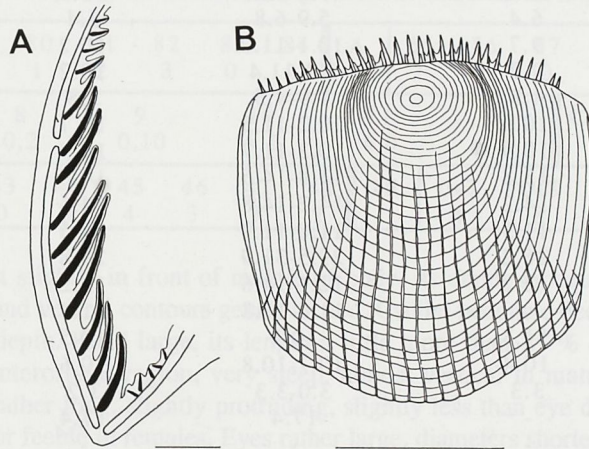


FIG. 7. — First gill arch (A) and a scale (B) from ocular side of *Engyprosopon bellonaensis* sp. nov., paratype, ♀ 54.6 mm (MNHN 1993-143). Scale bars indicate 1 mm.

Pectoral fin on ocular side slightly prolonged, second ray longest, subequal to or a little more than head length, longer than fin on blind side. Pelvic fins with six rays, that on ocular side starting at tip of isthmus, approximately fifth ray on ocular side opposite to first ray on blind side. Tip of isthmus on a vertical line through middle part of lower eye. Caudal fin rays branched except three upper- and lowermost rays.

Coloration in alcohol : Ground color on ocular side uniformly light brown; some dark dots along head margin in front of interorbital area and upper eye; an obscure dark spot at junction of straight and curved parts of lateral line, a few spots on straight portion of lateral line. Blind side pale yellowish white. Dorsal and anal fins with a few dark dots; pectoral fin with a few dark cross bands.

Sexual dimorphism : Sexual dimorphism of this species is unknown, because only females are available for study.

ETYMOLOGY. — Named after the Bellona Plateau where the holotype was collected.

DISTRIBUTION. — Specimens were collected from the Chesterfield and Bellona Plateaus and the Fairway Ridge, west of New Caledonia, at depths of 67-80 m.

REMARKS. — This species belongs to a group having a very high number of gill rakers (more than 14 on lower limb).

It resembles *Engyprosopon xystrius* Hubbs, 1915, and *E. hensleyi* Amaoka & Imamura, 1990, in this character. It, however, differs from them in having no large jet-black blotches on the caudal fin.

Further, it differs from *E. xystrius* in having weakly ctenoid, deciduous scales and dark spots along head margin in front of interorbital area and upper eye (vs. rather strongly ctenoid, nondeciduous scales and a series of light blotches).

From *E. hensleyi* it also differs in having a smaller number of gill rakers (1-5+14-15 vs. 6-9+16-19 in *E. hensleyi*) and vertebrae (10+25 vs. 10+27-28), deeper body (1.89-2.02 vs. 2.35-2.71 in SL) and larger head (3.52-3.59 vs. 3.98-4.16).

TABLE 8. — Proportional measurements as percent of SL in *Engyprosopon bellonaensis* sp. nov. Averages include measurements from holotype.

Character	Holotype (1♀)	Paratypes (3♀)	Average	SD
SL (mm)	72.4	26.4-54.6	51.0	18.96
HL	27.6	27.8-28.4	28.0	0.3
BD	52.2	49.6-52.9	51.3	1.3
SNL	6.4	5.9-6.8	6.4	0.3
UED	9.7	10.1-11.0	10.2	0.5
LED	9.7	9.9-11.4	10.2	0.7
IW (♀)	4.8	1.9-4.5	3.8	1.1
UJL (O)	10.8	10.2-11.5	10.7	0.5
UJL (B)	10.9	10.2-11.7	10.9	0.5
LJL (O)	13.8	13.8-14.5	14.0	0.3
LJL (B)	14.2	14.2-14.8	14.5	0.3
DCP	11.5	11.0-11.9	11.5	0.4
P1L (O)	26.2	29.5-31.9	29.8	2.2
P1L (B)	12.2	12.1-14.6	13.2	1.1
P2L (O)	-	11.0-11.8	11.4	0.4
P2L (B)	11.3	10.1	10.5	0.6
P2B (O)	10.4	10.7-10.8	10.6	0.2
P2B (B)	3.3	3.0-3.3	3.2	0.2
LDFR	-	17.4	17.4	0.0
LAFR	-	-	-	-
MCFR	23.9	24.5-26.1	24.8	0.8
LLCW	14.0	16.0	15.0	1.0

Engyprosopon maldivensis (Regan, 1908)

Figs 8-10

Scaeops maldivensis Regan, 1908 : 234, pl. 25, fig. 1.

Engyprosopon maldivensis - NORMAN, 1934 : 216, fig. 165.

Arnoglossus maculipinnis Fowler, 1934a : 329, fig. 84.

Engyprosopon borneensis Chabanaud, 1948 : 64, fig. 1.

Engyprosopon macroptera Amaoka, 1963 : 115, fig. 5; 1969 : 90, fig. 52. — KAMOHARA, 1964 : 82. — SHEN, 1983 : 21, fig. 27. — SAINSBURY, KAILOLA & LEYLAND, 1985 : 284. — RIVATON, 1989 : 146, 163. — RIVATON & RICHER DE FORGES, 1990 : 26, 60.

MATERIAL EXAMINED. — 13 specimens.

Chesterfield and Bellona Plateaus. CHALCAL 1 : stn CP 10, 21°24.90'S, 159°24.30'E, 60 m, Jul. 25, 1984, beam trawl : 1 ♂ 42.0 mm (MNHN 1993-28). — Stn CP 12, 20°35.30'S, 158°47.40'E, 67 m, Jul. 23, 1984, beam trawl : 1 ♂ 76.9 mm (HUMZ 124868). — Stn CP 15, 21°24.90'S, 159°09.30'E, 60 m, Jul. 25, 1984, beam trawl : 2 ♂ and 3 ♀ 52.1-82.5 mm (MNHN 1993-30, 31, 32.); 1 ♂ and 1 ♀ 67.8-80.9 mm (HUMZ 124865, 124866).

CORAIL 2 : stn 23, 20°25.00'S, 161°05.00'E, 70 m, Jul. 22, 1988, beam trawl : 1 ♂ 52.5 mm (MNHN 1993-29). — Stn 24, 20°27.35'S, 161°04.70'E, 75 m, Jul. 22, 1988, trawl : 1 ♀ 44.8 mm (MNHN 1993-34). — Stn 100, 19°05.99'S, 158°26.89'E, 40 m, Jul. 27, 1988, dredge : 1 ♀ 57.0 mm (HUMZ 124867). — Stn 129, 19°27.74'S, 158°34.31'E, 215 m, Jul. 29, 1988, dredge : 1 ♀ 58.6 mm (MNHN 1993-33).

DIAGNOSIS. — Pectoral fin on ocular side greatly elongated, longer than head length; teeth on upper jaw biserial; gill rakers not serrate; maxilla rather large, 2.64-2.96 in head length; caudal fin without pair of large jet-black blotches.

DESCRIPTION. — Ranges for proportional data are given first, followed averages. Counts and proportional measurements as percent of SL are shown in Tables 9 and 10.

Head length 3.53-3.91, 3.72 in SL; body depth 1.85-2.02, 1.94. Snout length 3.84-4.79, 4.36 in head length; upper eye diameter 3.00-3.53, 3.29; lower eye diameter 3.00-3.56, 3.30; interorbital width 2.63-8.85, 4.25 in males, 4.97-11.55, 6.88 in females; upper jaw length 2.64-2.96, 2.82 on ocular side, 2.69-3.09, 2.89 on blind side; lower jaw length 2.08-2.34, 2.19 on ocular side, 1.98-2.14, 2.07 on blind side; depth of caudal peduncle 1.98-2.31, 2.16; pectoral fin length 0.47-0.90, 0.64 on ocular side, 1.95-2.23, 2.11 on blind side; pelvic fin length 2.12-2.38, 2.27 on ocular side, 2.15-2.60, 2.38 on blind side; pelvic fin-base length 2.22-2.68, 2.47 on ocular side, 7.00-8.86, 7.92 on blind side; length of longest dorsal fin ray 1.78-2.18, 1.92; length of longest anal fin ray 1.72-2.14, 1.91; length of middle caudal fin ray 0.96-1.18, 1.08; curved length of lateral line 1.52-1.99, 1.78.

TABLE 9. — Frequency distributions of eight meristic characters of *Engyprosopon maldivensis*.

D	77	78	79	80	81	82	83	84	A	55	56	57	58	59	60	61	62	63
	1	3	2	1	2	3	0	1		1	1	0	5	3	1	1	0	1
P1 (O, B)				8	9		10	11	12	C		3+11+3		3+12+3				
				0,2	0,10		6,1	6,0	1,0			12		1				
LLS	41	42	43	44	45	46	47	48	GR	0+7	0+8	0+9	V		10+23		10+24	
	1	0	0	0	4	3	3	2		4	8	1			1		12	

Body ovate, deepest slightly in front of middle of body, its depth subequal to or somewhat more than half length of body; dorsal and ventral contours gently arched. Caudal peduncle deep, its depth subequal to or slightly less than 1/4 of body depth. Head large, its length a little more than 25 % of SL; upper profile with a slight concavity in front of interorbital region, very steep, almost vertical in mature males, less so in females and juvenile males. Snout rather long, slightly protruding, slightly less than eye diameter. A strong rostral spine on snout in males, absent or feeble in females. Eyes rather large, diameters shorter than upper jaw length; lower eye in advance of upper. Orbital spine absent in both sexes. Interorbital region concave, becoming wider with growth, wider in males than in females (Fig. 9).

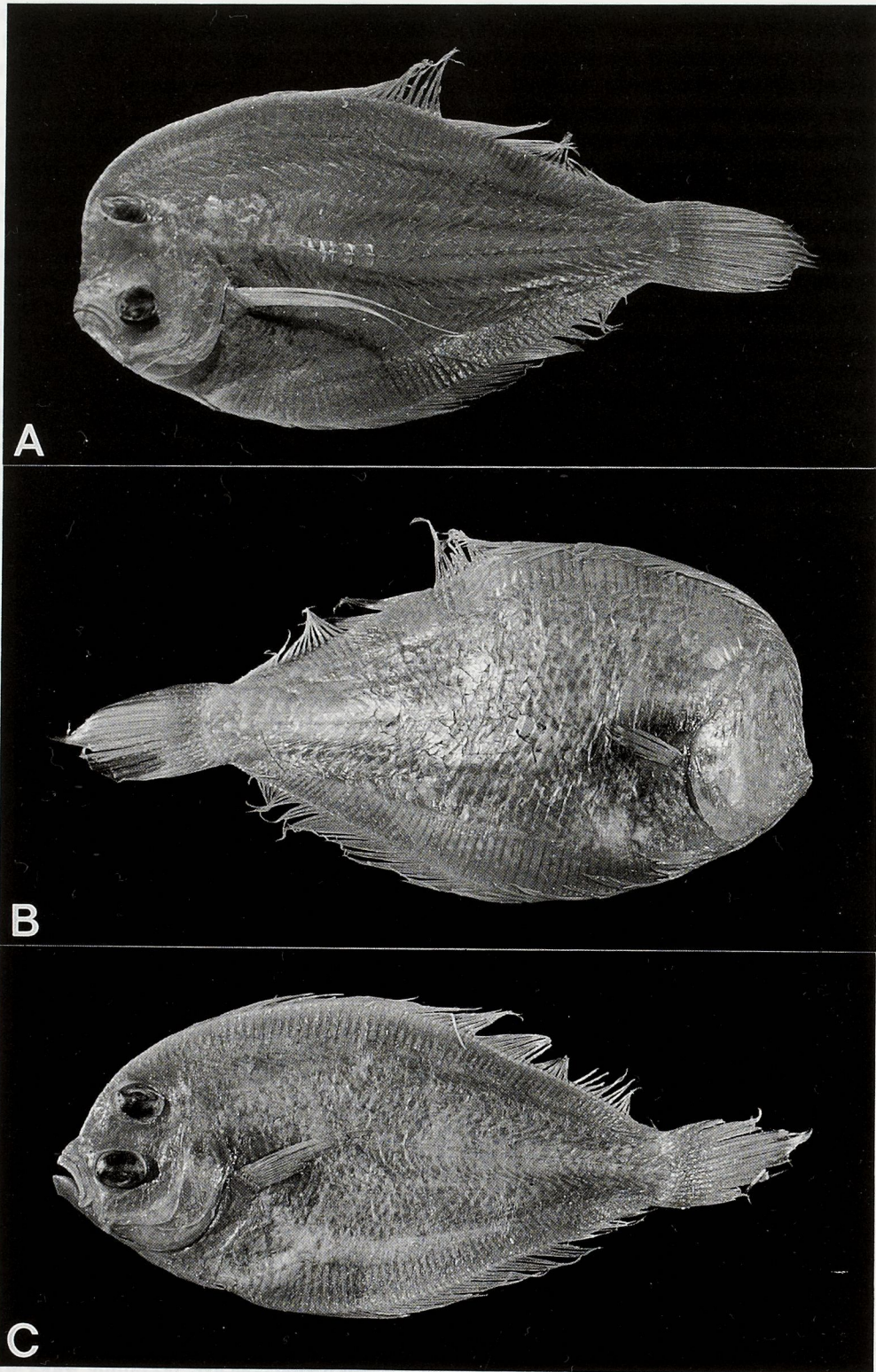


FIG. 8. — *Engyprosopon maldivensis*. A-B : ♂ 80.9 mm, from Bellona Plateau, west of New Caledonia (HUMZ 124865).
— C : ♀ 74.4 mm, from Bellona Plateau, west of New Caledonia (MNHN 1993-30).

Mouth rather large, oblique; maxilla extending to anterior part of lower eye; anterior tips of both jaws nearly on same vertical line when mouth closed. A small ventrally directed knob at mandibular symphysis. Teeth on upper jaw sharp, biserial, those in outer series larger and more widely spaced than those in inner series, and becoming larger and more widely spaced anteriorly with some anterior canine teeth; lower jaw teeth uniserial, nearly equal to anterior teeth of upper jaw in size and spacing. Gill rakers on first arch moderate in size, not serrate, absent on upper limb. Scales on ocular side large, with short ctenii; snout and both jaws naked; cycloid scales on blind side.

Pectoral fin on ocular side elongated in both sexes, longer than head length and fin on blind side, second ray longest. Pelvic fins with six rays, that on ocular side starting at tip of isthmus; fourth to fifth rays on ocular side opposite to first ray on blind side. Tip of isthmus near vertical line through middle part of lower eye. Caudal fin rays branched except three upper- and lowermost rays.

Coloration in alcohol: Ground color on ocular side dark brown; obscure dark spot at junction of straight and curved portions of lateral line, one spot on middle of straight section of lateral line, another spot on lateral line near caudal-fin base; blind side in males dark brown except pale yellowish-white head, females uniformly light brown or pale yellow. Dorsal and anal fins with a series of dark spots; pectoral fin with a few dark cross bands; caudal fin with irregularly scattered dark spots and sometimes with a pair of obscure dark blotches on basal 1/3 of caudal fin.

Sexual dimorphism: This species shows sexual dimorphism in presence or absence of the rostral spine, interorbital width (Fig. 9), degree of curve of anterior dorsal profile and pigmentation of the body on the blind side.

TABLE 10. — Proportional measurements as percent of SL for *Engyprosopon maldivensis*, including types.

Character	Range (N=13) 6♂, 7♀	Average	SD	Lectotype	Paralectotypes	
				♂	1♂	1♀
SL (mm)	42.0-82.5	63.6	13.4	52.2	47.5	49.4
HL	25.6-28.3	26.9	0.8	27.8	27.4	26.1
BD	48.5-54.1	51.3	1.6	48.1	50.1	48.8
SNL	5.3-6.7	6	0.4	7.9	7.8	6.5
UED	7.4-9.3	8.3	0.6	8.4	9.7	8.5
LED	7.3-9.3	8.2	0.6	8.2	9.7	9.1
IW (♂)	3.1-9.9	7.4	2.4	5.2	5.3	-
IW (♀)	2.5-8.6	4.8	1.7	-	-	2.8
UJL (O)	8.9-10.4	9.5	0.4	9.2	10.3	9.5
UJL (B)	8.5-10.4	9.3	0.5	8.6	9.5	9.3
LJL (O)	11.2-13.5	12.3	0.6	11.9	13.1	12.1
LJL (B)	12.1-14.0	13.0	0.6	12.5	13.3	13.0
DCP	11.8-13.4	12.6	0.4	12.1	12.8	11.7
P1L (O)	25.4-57.1	42.4	8.9	35.1	-	26.7
P1L (B)	12.1-13.6	12.8	0.4	13.2	12.8	-
P2L (O)	10.9-12.6	11.8	0.4	10.9	11.6	9.3
P2L (B)	10.4-12.4	11.4	0.6	-	12.4	9.1
P2B (O)	9.8-11.6	10.9	0.5	10.0	10.9	9.3
P2B (B)	3.0-3.8	3.4	0.3	3.4	3.4	3.2
LDFR	12.4-15.2	13.9	0.8	-	-	-
LAFR	12.6-15.0	14.1	0.6	14.4	-	-
MCFR	23.1-26.9	24.9	1.1	2.5	25.3	24.9
LLCW	12.2-17.1	14.6	1.5	15.5	-	-

DISTRIBUTION. — Maldive Islands (REGAN, 1908), Philippines (FOWLER, 1934a), Borneo (CHABANAUD, 1948), northern and north-western Australia (SAINSBURY, KAILOLA & LEYLAND, 1985), Taiwan (SHEN, 1983), Kochi Pref., Japan (AMAOKA, 1963), and the Coral Sea (RIVATON, 1989), at depths of 30-215 m (mainly 30-75 m).

REMARKS. — FOWLER (1934a) originally described *Arnoglossus maculipinnis* based on four specimens taken from the southern Philippines. Comparison of the holotype of *A. maculipinnis* and the types of *E. maldivensis*

indicates that the former has a larger number of dorsal fin rays, gill rakers on the lower limb, caudal vertebrae and scales in the lateral line (Table 11). However, since the numbers of dorsal fin rays, gill rakers on the lower limb and caudal vertebrae in *A. maculipinnis* fall within the ranges of variation of *E. macroptera*, which is considered to be a junior synonym of *E. maldivensis* as discussed below, these counts are considered to be geographical variations for *E. maldivensis* (Table 11). The slight difference in the number of scales in the lateral line does not seem to be sufficient for delimiting species (Table 11). Thus, we consider *A. maculipinnis* to be a junior synonym of *E. maldivensis*.

CHABANAUD (1948) described *E. borneensis* from a large specimen taken on the north coast of Borneo, and the species is still known only from the holotype (MNHN 1947-20, ♂ 126.5 mm). Comparison of the types of *E. borneensis* and *E. maldivensis* shows that the former has a wider interorbital region and larger number of caudal vertebrae (Table 11). The interorbital width of the holotype of *E. borneensis* appears to be close to that predicted for *E. maldivensis* of a similar size (Fig. 9). The vertebral count of *E. borneensis* is within the range of *E. macroptera* (Table 11), which we consider to be a junior synonym of *E. maldivensis* (see below). We interpret *E. borneensis* as a junior synonym of *E. maldivensis*.

AMAOKA (1963) described *Engyprosopon macroptera* based on specimens taken off Kochi Prefecture, Japan. Comparison of this species with *E. maldivensis* indicates that it has a shorter head, wider interorbital region, and larger numbers of dorsal and anal fin rays and caudal vertebrae (Table. 11). However, with growth, the head becomes proportionally shorter and the interorbital region wider in *E. maldivensis*. Proportional measurements of these two characters in *E. macroptera* appear to be within the ranges predicted for *E. maldivensis* of similar size (Fig. 9, 10). Other species of the genus are known to show some geographic variation in meristic characters. We therefore consider differences in dorsal and anal fin ray and vertebral counts between *E. macroptera* and *E. maldivensis* to be geographic variation and *E. macroptera* to be a junior synonym of *E. maldivensis*.

TABLE 11. — Comparison of proportional measurements and counts for *Engyprosopon maldivensis*, *E. macroptera*, *E. borneensis* and *E. maculipinnis*.

	<i>maldivensis</i>				<i>macroptera</i>	<i>borneensis</i>	<i>maculipinnis</i>
	present specimens	lectotype	paralectotypes		holotype + paratypes	holotype	holotype
	6 ♂, 7 ♀	♂	1 ♂	1 ♀	10 ♂, 3 ♀	♂	♀
SL (mm)	42.0-82.5	52.2	47.5	49.4	98.1-120.8	126.5	91.8
Proportions :							
SL/HL	3.53-3.91	3.60	3.65	3.8	4.04-4.44	3.94	3.84
SL/IW (♂)	10.11-32.31	19.33	19.0	-	6.91-8.57	7.35	-
SL/IW (♀)	11.61-40.73	-	-	35.29	11.02-11.67	-	16.04
Counts :							
D	77-84	77	79	82	85-91	86	89
A	55-63	60	55	59	65-68	63	63
GR	0+7-9	1+8	0+7	0+7	0+8-11	2+10	0+10
LLS	41-48	47	42	45	45-47	47	50
V	10+23-24	10+24	10+24	0+24	10+25-26	10+26	10+25
Localities	Coral Sea	Maldive Islands			Japan	Borneo	Philippines

This species resembles *E. multisquama* Amaoka, *E. hensleyi* Amaoka & Imamura, *E. filipennis* Wu & Tang and a new species described in the present paper, *E. longipterum* (see below), in having a greatly prolonged pectoral fin on the ocular side in both sexes. It differs from *E. multisquama* in having no dark blotches on the caudal fin (a pair of large jet-black blotches in *E. multisquama*), from *E. hensleyi* in having a smaller number of gill rakers (0-2+7-11 vs. 6-9+16-19 in *E. hensleyi*) and deeper body (1.85-2.02 in SL vs. 2.35-2.71) (AMAOKA & IMAMURA, 1990). Separation of *E. maldivensis* and *E. longipterum* is discussed in the account of *E. longipterum*.

Although no specimens of *E. filipennis* were available for study, *E. maldivensis* appears to differ from this species in having a smaller upper jaw on the ocular side (2.6-3.0 vs. 2.2-2.4 in head length) (WU & TANG, 1935).

Five paralectotypes of *E. maldivensis* (BMNH 1901.12.31.95-98, 1 male and 4 females, 28.0-31.8 mm SL) differ from the lectotype in having uniserial teeth and a pectoral fin on the ocular side that is much shorter than head. One of them agrees well with the lectotype and additional specimens examined of *E. macrolepis*; the other four specimens are *E. hureai*. Thus, the five paralectotypes should be deleted from the type series of *E. maldivensis*.

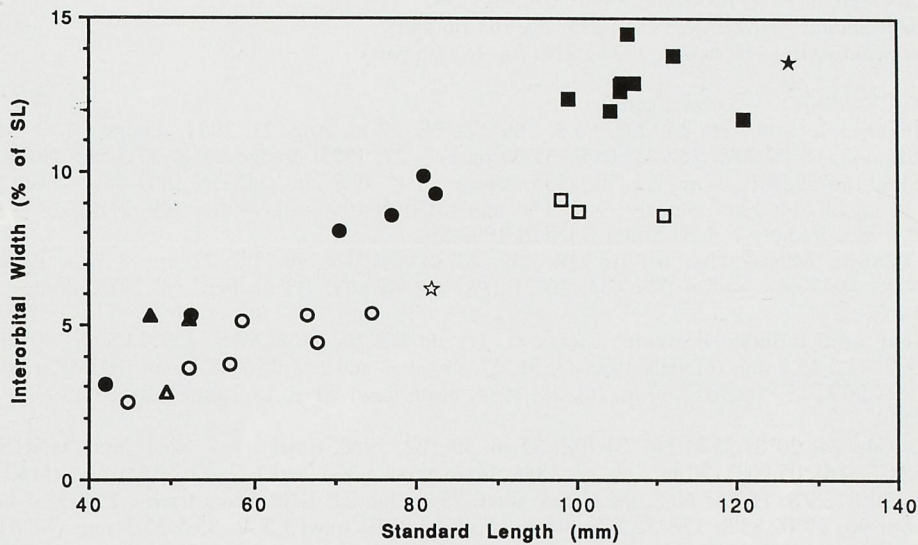


FIG. 9. — Relationships between SL and interorbital width in percent of SL in four nominal species of *Engyprosopon*: *E. maldivensis* (closed triangles for ♂ type specimens, open triangle for ♀ type specimen; closed circles for ♂ of present specimens, open circles for ♀ of present specimens); *E. macroptera* (closed squares for ♂ type specimens, open squares for ♀ type specimens); *E. borneensis* (closed star for holotype); and *E. maculipinnis* (open star for holotype).

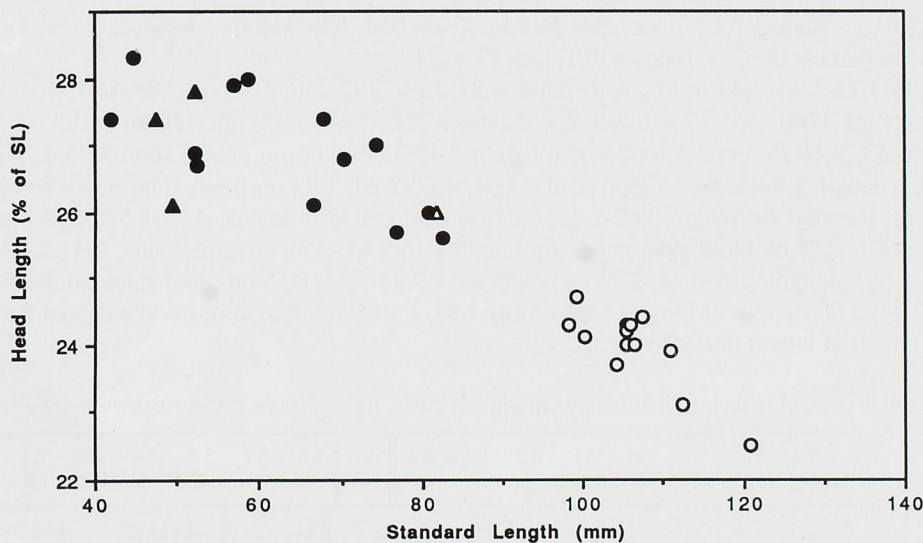


FIG. 10. — Relationships between SL and head length in percent of SL in three nominal species of *Engyprosopon*: *E. maldivensis* (closed triangles for type specimens; closed circles for present specimens), *E. macroptera* (open circles for type specimens), and *E. maculipinnis* (open triangle for holotype).

Engyprosopon macrolepis (Regan, 1908)

Figs 11-13

Scaeops macrolepis Regan, 1908 : 233.*Scaeops maldivensis* Regan, 1908 : 234, pl. 25, fig. 1 (in part).*Scaeops filimanus* Regan, 1908 : 234, pl. 25, fig. 2 (in part).*Engyprosopon macrolepis* - NORMAN, 1934 : 214, fig. 165; 1939 : 100. — FOWLER, 1956 : 168, fig. 87. — HENSLEY, 1986 : 858. — HENSLEY & RANDALL, 1990 : 674, figs 1-4.*Engyprosopon filimanus* - NORMAN, 1934 : 215, fig. 163 (in part).*Engyprosopon maldivensis* - NORMAN, 1934 : 216, fig. 165 (in part).

MATERIAL EXAMINED. — 33 specimens.

New Caledonia. LAGON : stn 83, 22°31.5'S, 166°29.07'E, 22 m, Aug. 21, 1984, dredge : 1 ♀ 56.8 mm (HUMZ 124873). — Stn 443, 18°00.00'S, 162°55.01'E, 35-40 m, Feb. 27, 1985, dredge : 1 ♂ 37.5 mm (MNHN 1993-48). — Stn 549, 22°51'S, 166°55.09'E, 27 m, Jul. 15, 1985, dredge : 1 ♂ 49.8 mm (MNHN 1993-49). — Stn 556, 22°48.00'S, 166°51.09'E, 30 m, Jul. 14, 1985, dredge : 1 ♂ 37.4 mm (MNHN 1993-50). — Stn 709, 21°22.02'S, 166°03.00'E, 39-40 m, Aug. 10, 1986, dredge : 1 ♂ 34.5 mm (MNHN 1993-51).

Loyalty Islands. MUSORSTOM 6 : stn DW 432, 20°20.95'S, 166°10.75'E, 21 m, 18 Feb. 1989, dredge : 1 ♂ 36.9 mm (MNHN 1993-46). — Stn DW 434, 20°21.21'S, 166°08.64'E, 23 m, Feb. 18, 1989, dredge : 1 ♀ 42.1 mm (MNHN 1993-47).

Chesterfield and Bellona Plateaus. CHALCAL 1 : stn CP 10, 21°24.90'S, 159°24.30'E, 60 m, Jul. 25, 1984, beam trawl : 9 ♀ 37.0-55.2 mm (MNHN 1993-35, 36, 37, 38); 1 ♂ and 1 ♀ 45.7-48.7 mm (HUMZ 124869, 124870). — Stn CP 15, 21°24.90'S, 159°09.30'E, 60 m, Jul. 25, 1984, beam trawl : 1 ♂ 54.2 mm (MNHN 1993-44); 1 ♂ 58.7 mm (HUMZ 124872).

CORAIL 2 : stn 24, 20°27.35'S, 161°04.70'E, 75 m, Jul. 22, 1988, trawl : 1 ♀ 45.8 mm (MNHN 1993-144). — Stn 25, 20°25.00'S, 161°05.00'E, 70 m, Jul. 22, 1988, beam trawl : 3 ♂ and 1 ♀ 37.2-46.3 mm (MNHN 1993-40, 41, 42). — Stn 27, 20°21.29'S, 160°58.60'E, the Nereus Reef, 75 m, Jul. 22, 1988, beam trawl : 2 ♀ 33.4-41.3 mm (MNHN 1993-43). — Stn 90, 19°02.83'S, 158°56.26'E, 48 m, Jul. 26, 1988, trawl : 3 ♀ 35.5-37.1 mm (MNHN 1993-45). — Stn 127, 19°27.73'S, 158°27.30'E, 45 m, Jul. 29, 1988, beam trawl : 2 ♀ 38.7-41.0 mm (MNHN 1993-39); 1 ♀ 52.5 mm (HUMZ 124871).

DIAGNOSIS. — Interorbital region with two dark cross bands; an ocular flap without a fringed margin on each eye in larger males; strong orbital spines in front of each eye in males; gill rakers 0+6-8; uniserial teeth on upper jaw.

DESCRIPTION. — Ranges for proportional data are given first, followed by averages. Counts and proportional measurements as percent of SL are shown in Tables 12 and 13.

Head length 3.21-3.72, 3.49 in SL; body depth 1.87-2.14, 2.02. Snout length 3.88-4.64, 4.20 in head length; upper eye diameter 3.00-3.75, 3.37; lower eye diameter 2.92-3.81, 3.35; interorbital width 3.33-7.77, 5.04 in males, 6.00-16.33, 9.16 in females; upper jaw length 2.40-3.00, 2.66 on ocular side, 2.53-3.24, 2.79 on blind side; lower jaw length 1.84-2.26, 2.01 on ocular side, 1.80-2.20, 1.92 on blind side; depth of caudal peduncle 1.94-2.54, 2.28; pectoral fin length 0.62-1.22, 0.84 on ocular side in males, 0.71-1.58, 0.95 on ocular side in females, 2.03-2.64, 2.31 on blind side; pelvic fin length 2.16-2.64, 2.38 on ocular side, 2.31-2.70, 2.52 on blind side; pelvic fin-base length 2.57-3.24, 2.94 on ocular side, 7.35-9.71, 8.56 on blind side; length of longest dorsal fin ray 1.93-2.34, 2.08; length of longest anal fin ray 1.91-2.30, 2.02; length of middle caudal fin ray 1.05-1.31, 1.15; curved length of lateral line 1.88-2.43, 2.12.

TABLE 12. — Frequency distributions of eight meristic characters of *Engyprosopon macrolepis*.

D	74	75	76	77	78	79	80	81	82	83	84	A	56	57	58	59	60	61	62	63	64
	1	1	1	0	6	5	6	4	3	3	3		2	1	2	7	10	6	3	1	1
P1 (O, B)	8		9		10		11		12		C	2+11+3		3+11+3		3+12+2					
	0,1		0,19		1,12		26,0		6,0			1		29		3					
LLS	40	41	42	43	44	45	46	47	48	49	GR	0+6	0+7	0+8	V	10+23	10+24	10+25	11+23		
	3	0	1	0	6	9	6	4	2	1		3	13	17		5	25	2	1		

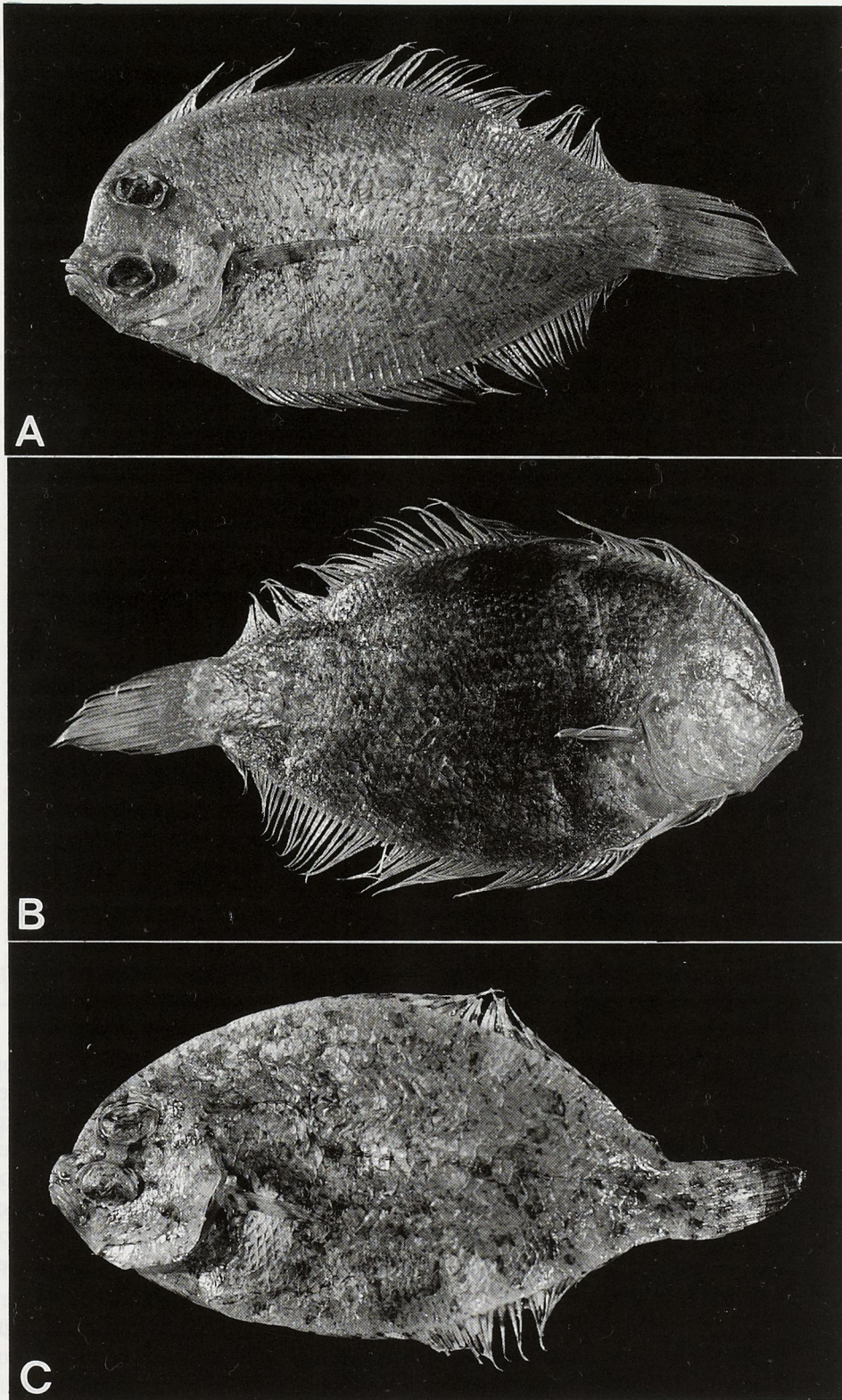


FIG. 11. — *Engyprosopon macrolepis*. A-B : ♂ 58.7 mm, from Bellona Plateau, west of New Caledonia (HUMZ 124872).
— C : ♀ 56.8 mm, from southern New Caledonia (HUMZ 124873).

Body ovate, deepest slightly in front of middle of body. Caudal peduncle rather deep, its depth about 1/4 of body depth. Head rather large; a slight concavity in front of interorbital region. Snout rather short, its length less than eye diameter. A strong rostral spine near snout tip in males, absent in females. Eyes large; upper eye diameter about 70-90 % of upper jaw length on ocular side; adult males with an ocular flap on each eye. One or two orbital spines before each orbit in adult males (Fig. 12 A), absent in smaller males and females. Interorbital region shallowly concave, becoming wider with growth, wider in males than in females (Fig. 13).

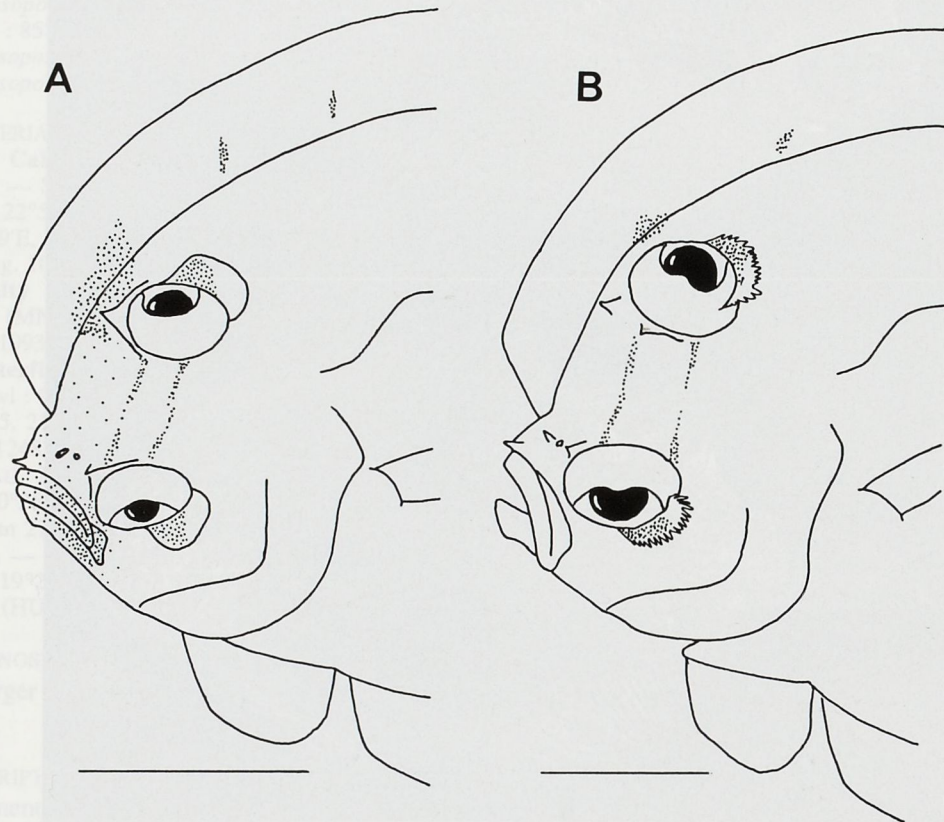


FIG. 12. — Diagrammatic illustration of head parts in *Engyprosopon macrolepis* (A) and *E. xenandrus* (B). Scale bars indicate 10 mm.

Mouth comparatively large; lower jaw slightly projecting beyond tip of upper jaw with mouth closed. A small ventrally directed knob at mandibular symphysis. Teeth on upper jaw sharp, uniserial; lower jaw teeth uniserial, nearly equal to anterior teeth of upper jaw in size and spacing. Gill rakers on first arch moderate in size, not serrate on each margin except dorsalmost two on lower limb, sometimes provided with small teeth on posterior margin, gill rakers absent on upper limb. Scales on ocular side large, deciduous and with short ctenii, cycloid on blind side.

Pectoral fin on ocular side usually rather elongated, its length about 0.6-1.2 in head length in males, 0.7-1.6 in females. Pelvic fin with six rays, that on ocular side originating at tip of isthmus; approximately fourth or fifth ray on ocular side opposite to first ray on blind side. Tip of isthmus below middle part of lower eye. Caudal fin rays branched except two or three upper- and lowermost rays.

Coloration in alcohol : Ground color on ocular side dark brown; many darker spots and rings irregularly scattered; dorsal margin of upper eye and both jaws on ocular side dark; interorbital region with two dark narrow bands (Fig. 12 A); three spots on the straight portion of the lateral line. Blind side dark brown except pale yellowish-white head in males, uniformly pale yellowish-white in smaller males and females. Dorsal and anal fins with a series of dark spots; pectoral fin with some dark bands; caudal fin with a pair of obscure blotches.

Sexual dimorphism. — The specimens we examined show sexual dimorphism in the presence or absence of rostral and orbital spines and ocular flaps, interorbital width (Fig. 13), degree of curve of anterior dorsal profile, length of the pectoral fin on the ocular side and the presence or absence of pigmentation on the blind side. Although HENSLEY and RANDALL (1990) indicated that this species may show sexual dimorphism in the length of the pelvic fin on the ocular side, they were not able to test this using analysis of covariance because of inequality of variances. Sexual dimorphism in this character was not obvious in the specimens examined in the present study.

TABLE 13. — Proportional measurements as percent of SL for *Engyprosopon macrolepis*, including holotype.

Character	Present specimens			Holotype (♂)
	Range (N=33) 11♂, 22♀	Average	SD	BMNH 1908.3.23.145
SL (mm)	33.4-58.7	43.4	6.83	49.0
HL	26.9-31.2	28.7	0.9	28.9
BD	46.7-53.5	49.5	1.7	50.8
SNL	5.9-7.5	6.8	0.4	6.5
UED	7.6-10.0	8.6	0.6	8.4
LED	7.6-10.3	8.6	0.7	8.6
IW (♂)	3.5-8.3	6.0	1.6	9.6
IW (♀)	1.8-4.9	3.3	0.7	-
UJL (O)	9.8-11.8	10.8	0.5	10.2
UJL (B)	9.2-12.2	10.3	0.6	9.6
LJL (O)	13.1-15.7	14.3	0.6	13.5
LJL (B)	13.6-16.4	14.9	0.7	13.9
DCP	11.1-13.9	12.5	0.6	12.7
P1L (O, ♂)	22.5-46.7	35.7	8.3	33.5
P1L (O, ♀)	19.8-40.7	31.4	5.4	-
P1L (B)	10.8-13.8	12.4	0.7	12.9
P2L (O)	11.1-16.3	12.2	0.9	12.2
P2L (B)	10.6-12.3	11.3	0.4	10.8
P2B (O)	8.7-11.0	9.8	0.6	9.2
P2B (B)	2.9-3.8	3.3	0.2	3.5
LDFR	12.3-14.9	13.8	0.7	14.3
LAFR	12.8-16.0	14.2	0.7	13.5
MCFR	22.6-27.0	24.8	1.0	25.7
LLCW	12.0-14.8	13.6	0.8	-

DISTRIBUTION. — Cargados Carajos Shoals, Maldives (REGAN, 1908), Gulf of Aden (NORMAN, 1939), possibly Natal (HENSLEY, 1986), Comoros Islands, Red Sea, the Philippines (HENSLEY & RANDALL, 1990), Coral Sea (Chesterfield Plateau and New Caledonia), at depths of 3-91 m.

REMARKS. — This species is most similar to *Engyprosopon xenandrus* Gilbert, 1905, known only from the Hawaiian Islands, in having two dark bands in the interorbital region, ocular flaps and orbital spines (Fig. 12). It differs from *E. xenandrus* in having fewer gill rakers (0+6-8 vs. 0+11-12 in type specimens of *E. xenandrus*) and ocular flaps without fringed margins (vs. flaps with fringed margins) (Fig. 12).

HENSLEY and RANDALL (1990) were doubtful about identifications of paralectotypes of *E. filimanus* by both REGAN (1908) and NORMAN (1934). Our examination of three type specimens of *E. filimanus* shows that one paralectotype (BMNH 1901.12.31.106, ♂ 42.5 mm SL) differs from the male lectotype (BMNH 1901.12.31.105), and that all its morphometric and meristic characters fall within the ranges of variation of male *E. macrolepis* examined in the present study. Therefore, this specimen should be deleted from the type series of *E. filimanus*.

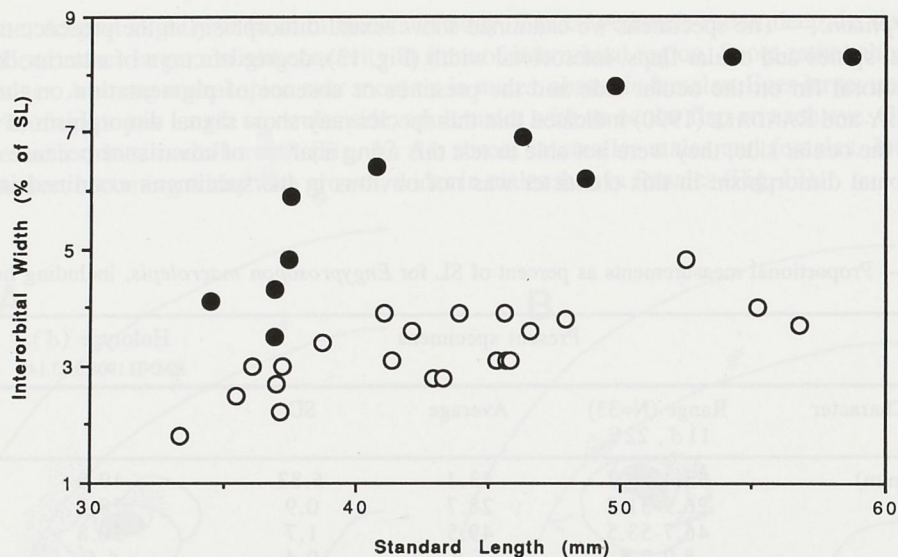


FIG. 13. — Relationship between SL and interorbital width in percent of SL in *Engyprosopon macrolepis* (closed circles for ♂, open circles for ♀).

One paralectotype of *E. maldivensis* (BMNH 1901.12.31.95-98, 1 ♀ 30.3 mm SL) was identified as *E. macrolepis* (see *E. maldivensis*).

This species has been known from the Indian Ocean, the Red Sea and the Philippines. This is the first record of this species from the Coral Sea.

Engyprosopon hureaui Quéro & Golani, 1990

Figs 14-15

Scaeops maldivensis Regan, 1908 : 234, pl. 25, fig. 1 (in part).

Engyprosopon maldivensis - NORMAN, 1934 : 216, fig. 165 (in part).

Engyprosopon hureaui Quéro & Golani, 1990 : 38, fig. 1.

MATERIAL EXAMINED. — 8 specimens.

Chesterfield and Bellona Plateaus. CHALCAL 1 : stn CP 15, 21°24.90'S, 159°24.30'E, 60 m, Jul. 25, 1984, beam trawl : 1 ♀ 39.1 mm (MNHN 1993-52); 1 ♂ 43.1 mm (HUMZ 124874).

CORAIL 2 : Stn 100, 19°05.99'S, 158°26.89'E, 40 m, Jul. 27, 1984, dredge : 1 ♀ 43.9 mm (MNHN 1993-55). — Stn 121, 19°25.08'S, 158°18.00'E, 34 m, Jul. 29, 1988, dredge : 3 ♂ 47.0-49.8 mm (MNHN 1993-53, 54); 1 ♀ 44.0 mm (HUMZ 124875). — Stn 122, 19°28.17'S, 158°17.06'E, 32 m, Jul. 22, 1988, dredge : 1 ♀ 28.5 mm (MNHN 1993-145).

DIAGNOSIS. — Teeth on upper jaw uniserial; gill rakers not serrate; orbital spine absent in both sexes; interorbital width 3.1-3.6 in males, 5.2-8.2 in females; interorbital region without dark bands.

DESCRIPTION. — Ranges for proportional data are given first, followed averages. Counts and proportional measurements as percent of SL are shown in Tables 14 and 15.

Head length 3.50-3.80, 3.64 in SL; body depth 1.78-1.93, 1.83. Snout length 4.15-5.22, 4.64 in head length; upper eye diameter 3.16-3.64, 3.35; lower eye diameter 3.16-3.69, 3.36; interorbital width 3.08-3.56, 3.37 in males, 5.22-8.15, 6.71 in females; upper jaw length 2.96-3.10, 3.02 on ocular side, 2.96-3.04, 3.12 on blind side; lower jaw length 2.02-2.39, 2.29 on ocular side, 2.03-2.20, 2.13 on blind side; depth of caudal peduncle 1.94-2.27, 2.08; pectoral fin length 1.18-1.32, 1.27 on ocular side, 1.95-2.27, 2.11 on blind side; pelvic fin length 1.97-2.24, 2.06 on ocular side, 2.03-2.18, 2.10 on blind side; pelvic fin-base length 2.22-2.62, 2.48 on ocular

side, 6.00-6.95, 6.61 on blind side; length of longest dorsal fin ray 1.64-1.90, 1.77; length of longest anal fin ray 1.68-1.83, 1.74; length of middle caudal fin ray 1.08-1.19, 1.14; curved length of lateral line 1.86-2.01, 1.92.

TABLE 14. — Frequency distributions of eight meristic characters of *Engyprosopon hureaui*.

D	76 2	77 3	78 3	A	55 4	56 2	57 1	58 1	P1 (O, B)	8 0,2	9 0,4	10 1,2	11 5,0	12 2,0	
C	3+11+3 7	3+12+2 1	LLS	36 1	37 0	38 2	39 3	40 2	GR	0+7 6	0+8 2	V	10+22 3	10+23 4	10+24 1

Body ovate, deepest slightly in front of middle part of body, its depth 1.9-2.1 times as long as head length. Caudal peduncle moderate in length, its depth 23-26 % of body depth. Head rather large; a slight concavity in front of interorbital region. Snout rather short, 48-89 % of upper eye diameter. A strong rostral spine near snout tip in males, absent in females. Eyes rather large; upper eye diameter 82-96 % of upper jaw length on ocular side. Orbital spines absent in both sexes. Interorbital region shallowly concave, becoming wider with growth, wider in males than in females (Fig. 15).

Mouth rather large; maxilla extending to below anterior part of lower eye; anterior tips of both jaws nearly on same vertical line when mouth closed. A small ventrally directed knob at mandibular symphysis. Teeth on upper jaw sharp, uniserial; lower jaw teeth uniserial, nearly equal to anterior teeth of upper jaw in size and spacing. Gill rakers on first arch moderate in size, not serrate, absent on upper limb. Scales large, feebly ctenoid and deciduous on ocular side, cycloid on blind side.

Pectoral fin on ocular side rather short, its length 1.6-1.7 times as long as that on blind side, a little less than head length. Pelvic fins with six rays, that on ocular side originating at tip of isthmus. Tip of isthmus below middle part of lower eye. Caudal fin rays branched except two or three upper- and lowermost rays.

Coloration in alcohol : Ground color on ocular side light brown; a few spots on straight portion of lateral line. Blind side uniformly pale yellowish white. Dorsal and anal fins with a series of dark spots on basal part; caudal fin with a pair of obscure blotches near basal part.

TABLE 15. — Proportional measurements as percent of SL in *Engyprosopon hureaui*.

Character	Range (N=8) 4♂, 4♀	Average	SD
SL (mm)	28.5-49.8	42.8	6.63
HL	26.3-28.8	27.5	0.7
BD	51.7-56.0	54.5	1.3
SNL	4.0-6.6	5.8	0.8
UED	7.2-9.5	8.3	0.6
LED	7.2-10.2	8.5	0.8
IW (♂)	7.6-8.6	8.1	0.4
IW (♀)	3.5-5.2	4.3	0.7
UJL (O)	8.8-9.8	9.2	0.3
UJL (B)	8.1-12.5	9.2	1.3
LJL (O)	9.3-13.0	11.6	1.0
LJL (B)	12.0-13.7	12.9	0.4
DCP	12.5-13.9	13.3	0.4
P1L (O)	20.3-23.2	21.6	1.0
P1L (B)	12.2-14.1	13.1	0.7
P2L (O)	12.5-14.2	13.4	0.5
P2L (B)	12.0-13.7	13.1	0.5
P2B (O)	10.6-11.8	11.1	0.5
P2B (B)	4.0-4.9	4.3	0.3
LDFR	14.0-17.1	15.4	1.0
LAFR	15.0-18.6	16.1	1.1
MCFR	22.9-25.3	24.2	0.9
LLCW	13.6-14.4	14.1	0.3

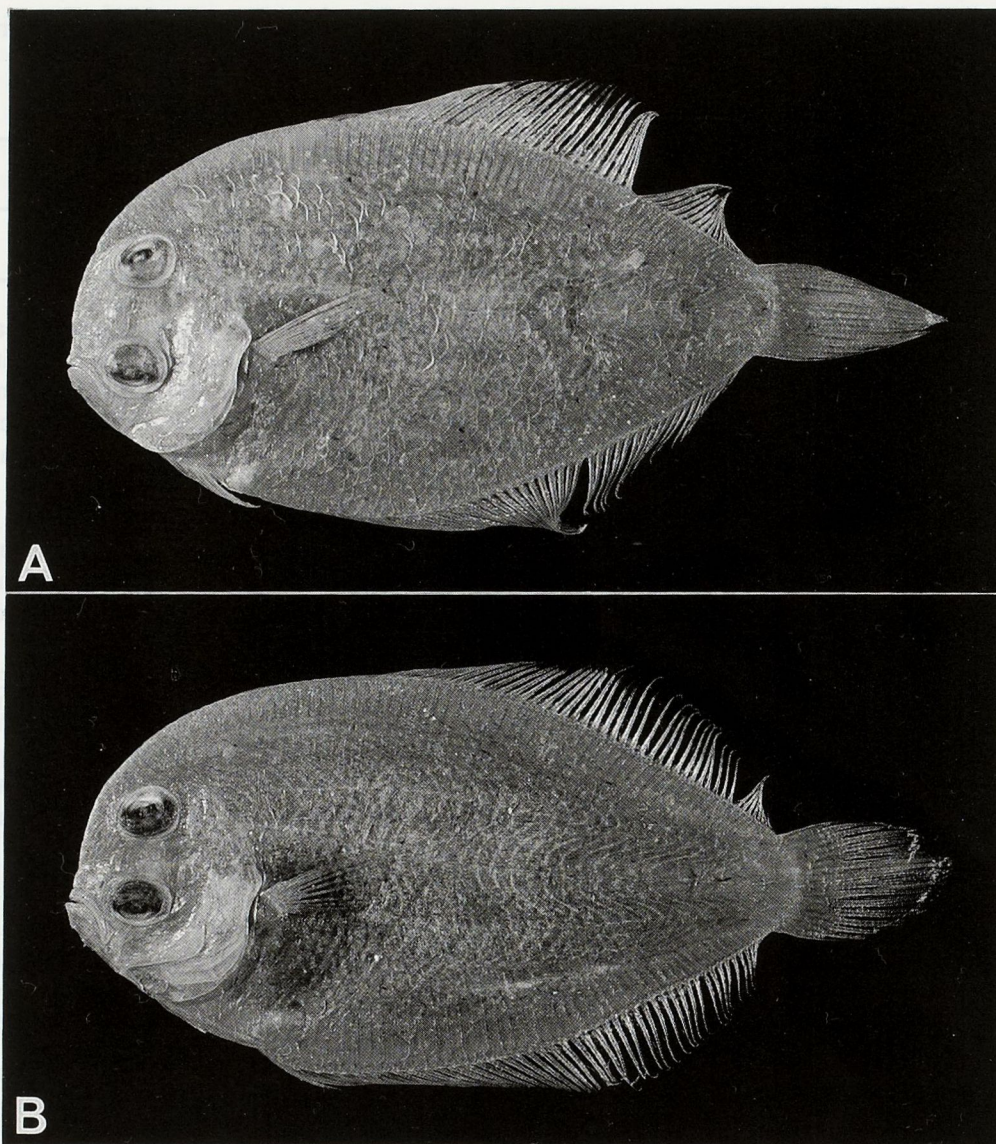


FIG. 14. — *Engyprosopon hureaui*. A : ♂ 47.3 mm, from Chesterfield Plateau, west of New Caledonia (MNHN 1993-54). — B : ♀ 44.0 mm, from Chesterfield Plateau, west of New Caledonia (HUMZ 124875).

Sexual dimorphism : This species shows sexual dimorphism in presence or absence of the rostral spine and the interorbital width (Fig. 15).

DISTRIBUTION. — The Maldive Islands (REGAN, 1908), Gulf of Aqaba, Red Sea (QUÉRO & GOLANI, 1990), Coral Sea, at depths of 1-81 m.

REMARKS. — This species most resembles *Engyprosopon xenandrus* Gilbert, 1905, *E. macrolepis* Regan, 1908, and *E. filimanus* Regan, 1908, in having uniserial upper jaw teeth, gill rakers without serrations and the interorbital region subequal to or wider than eye diameter.

It differs from *E. xenandrus* and *E. macrolepis* in having no particular marking in the interorbital region (two dark cross bands in interorbital region in *E. xenandrus* and *E. macrolepis*) and no ocular flaps (vs. an ocular flap on each eye in males) and no orbital spine (vs. an orbital spine in front of each eye in males).

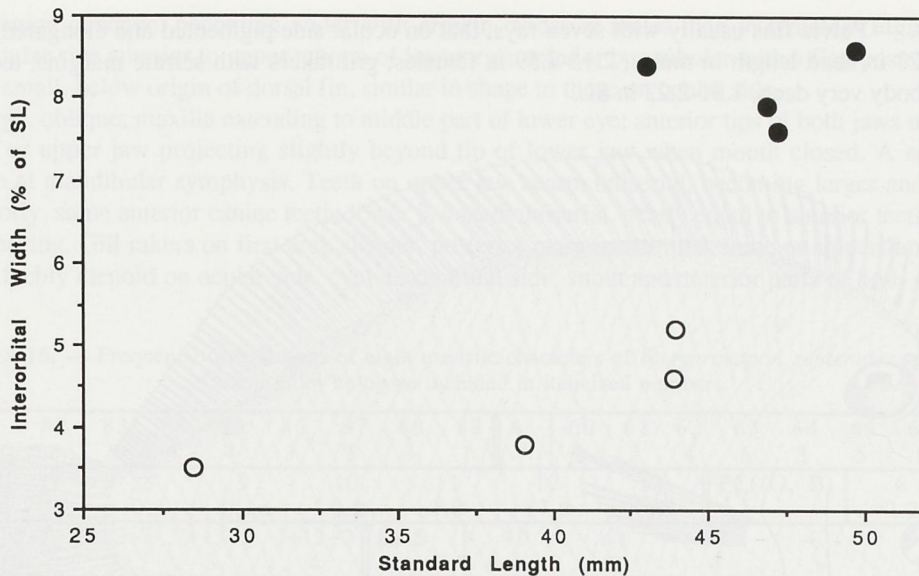


FIG. 15. — Relationship between SL and interorbital width in percent of SL in *Engyprosopon hureaui* (closed circles for ♂, open circles for ♀).

Engyprosopon hureaui can be distinguished from *E. filimanus* due to a shorter pectoral fin on the ocular side (pectoral fin on the ocular side longer than head length in *E. filimanus*) and lack of an orbital spine (vs. an orbital spine in front of each eye in males).

Four paralectotypes of *E. maldivensis* (BMNH 1901.12.31.95-98, 1 male and 3 females, 28.0-31.8 mm SL) were identified as *E. hureaui* (see remarks on *E. maldivensis*).

This species was previously known from the Maldive Islands and Red Sea. This is the first record of this species from the Coral Sea.

Engyprosopon septempes sp. nov.

Figs 16-21, 25

MATERIAL EXAMINED. — 28 specimens.

Chesterfield and Bellona Plateaus. CHALCAL 1 : stn CP 2, 20°31.50'S, 161°06.45'E, 88 m, Jul. 15, 1984, beam trawl : 2 ♂ and 1 ♀ 36.9-46.4 mm (MNHN 1993-60, 61). — Stn CP 3, 20°30.83'S, 161°05.21'E, 80 m, Jul. 15, 1984, beam trawl : 2 ♂ 38.6-39.9 mm (MNHN 1993-62); 1 ♂ 36.1 mm (HUMZ 124879). — Stn CP 12, 20°35.30'S, 158°47.40'E, 67 m, Jul. 23, 1984, beam trawl : 3 ♂ 36.9-60.0 mm (MNHN 1993-64); 1 ♀ 46.1 mm (HUMZ 124880). — Stn DC 48, 20°46.25'S, 158°41.64'E, 70 m, Jul. 23, 1984, dredge : 1 ♂ and 3 ♀ 28.3-46.1 mm (MNHN 1993-65, 66, 67, 68); 1 ♂ 43.8 mm (HUMZ 124881).

CORAIL 1 : stn 5, 19°11.07'S, 158°27.01'E, 58 m, Aug. 20, 1988, fish trawl : 1 ♂ 70.5 mm (MNHN 1993-56). — Stn 7, 20°40.08'S, 158°51.05'E, 78 m, Aug. 21, 1988, beam trawl : 1 ♂ and 1 ♀ 40.0-47.6 mm (MNHN 1993-59).

CORAIL 2 : stn 23, 20°30.60'S, 161°03.55'E, 80 m, Jul. 22, 1988, beam trawl : 1 ♀ 32.9 mm (MNHN 1993-146). — Stn 36, 19°18.49'S, 158°46.78'E, 66 m, Jul. 24, 1988, dredge : 1 ♀ 35.8 mm (HUMZ 124878). — Stn 37, 19°21.51'S, 158°45.33'E, 70 m, Jul. 23, 1984, dredge : 1 ♂ 38.9 mm (MNHN 1993-69). — Stn 45, 19°21.28'S, 158°19.14'E, 44 m, Jul. 23, 1988, dredge : 1 ♀ 43.1 mm (HUMZ 124877). — Stn 67, 19°14.92'S, 158°36.94'E, 66 m, Jul. 24, 1988, dredge : 1 ♂ 57.2 mm (MNHN 1993-58). — Stn 68, 19°15.00'S, 158°34.00'E, 65 m, Jul. 24, 1988, dredge : 1 ♂ 36.3 mm (MNHN 1993-147). — Stn 75, 19°12.00'S, 158°29.50'E, 65 m, Jul. 25, 1984, dredge : 1 ♂ 33.1 mm (MNHN 1993-70). — Stn 112, 19°22.87'S, 158°44.15'E, 74 m, Jul. 28, 1988, beam trawl : 1 ♀ 39.5 mm (MNHN 1993-57); 1 ♂ 47.4 mm (HUMZ 124876). — Stn 133, 19°12.12'S, 158°26.60'E, 62 m, Jul. 25, 1988, dredge : 1 ♀ 36.2 mm (MNHN 1993-63).

TYPES. — The male (MNHN 1993-56, CORAIL 1, stn 5) is the holotype. All the other specimens are paratypes.

DIAGNOSIS. — Pelvic fins usually with seven rays, that on ocular side pigmented and elongated in males, its length 1.23-2.23 in head length in males, 2.15-2.59 in females; gill rakers with serrate margins; teeth on upper jaw uniserial; body very deep, 1.81-2.22 in SL.

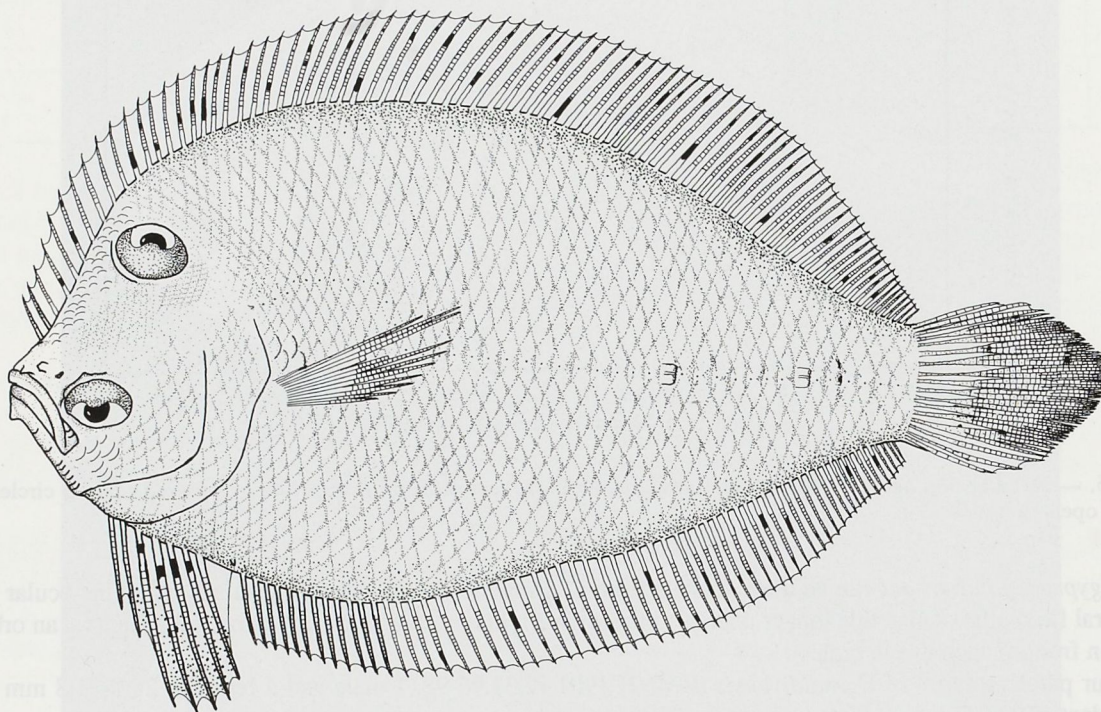


FIG. 16. — *Engyprosopon septempes* sp. nov., holotype, ♂ 70.5 mm, from Chesterfield Plateau, west of New Caledonia (MNHN 1993-56).

DESCRIPTION. — Data for holotype are given first, followed in parentheses by ranges for the paratypes and averages for proportional data. Counts and proportional measurements as percent of SL are shown in Tables 16 and 17.

Head length 3.47 in SL (2.92-3.43, 3.24); body depth 1.81 (1.87-2.22, 2.05). Snout length in head length 4.14 (3.83-4.67, 4.32); upper eye diameter 3.76 (2.92-3.78, 3.32); lower eye diameter 3.76 (2.92-3.70, 3.30); interorbital width 2.71 (2.92-10.50, 5.40) in males, (7.29-16.8, 11.08) in females; upper jaw length 2.64 (2.31-2.74, 2.56) on ocular side, 2.51 (2.31-2.73, 2.55) on blind side; lower jaw length 1.99 (1.82-2.02, 1.93) on ocular side, 1.86, (1.71-1.99, 1.87) on blind side; depth of caudal peduncle 2.21 (2.41-2.98, 2.63); pectoral fin length 1.46 (1.45-1.88, 1.64) on ocular side, 2.71 (2.48-3.29, 2.85) on blind side; pelvic fin length 1.35 (1.23-2.23, 1.76) on ocular side in males, (2.15-2.59, 2.37) in females, 2.14 (2.26-3.16, 2.66) on blind side; pelvic fin-base length 2.67 (2.64-3.50, 3.12) on ocular side, 8.46 (7.17-10.53, 8.44) on blind side; length of longest dorsal fin ray 2.45 (1.85-2.47, 2.10); length of longest anal fin ray 2.28 (1.82-2.33, 2.03); length of middle caudal fin ray 1.34 (1.25-1.53, 1.33); curved length of lateral line - (1.85-2.19, 2.04).

Body deeply ovate, deepest at middle part of body, its depth subequal to half length of body; dorsal and ventral contours gently arched. Caudal peduncle deep, its depth subequal to 1/4 of body depth. Head large, its length 29-34 % of SL; upper profile with a large notch in front of interorbital region, steep in mature males, less so in females and juvenile males. Snout rather long, strongly protruding, its length about 70-90 % of upper eye diameter. A strong rostral spine in males, absent or feeble in smaller males and females (Fig. 18 A-B). Eyes rather large; upper eye diameter about 70-90 % of upper jaw length on ocular side; lower eye in advance of upper. One or two blunt spines on anterior edge of each orbit in males, absent in females and smaller males (Fig. 18 A-B).

Interorbital region concave, becoming wider with growth, wider in males than in females (Figs 18 A-B, 19). Nostrils on ocular side anterior to upper margin of lower eye; anterior one tubular with a flap posteriorly; nostrils on blind side small, below origin of dorsal fin, similar in shape to those on ocular side.

Mouth large, oblique; maxilla extending to middle part of lower eye; anterior tips of both jaws nearly on same vertical line, or upper jaw projecting slightly beyond tip of lower jaw when mouth closed. A small ventrally directed knob at mandibular symphysis. Teeth on upper jaw sharp, uniserial, becoming larger and more widely spaced anteriorly, some anterior canine teeth; lower jaw teeth uniserial, nearly equal to anterior teeth of upper jaw in size and spacing. Gill rakers on first arch slender, posterior margins serrated, none on upper limb (Fig. 18 C). Scales large, feebly ctenoid on ocular side, cycloid on blind side; snout and anterior parts of both jaws on ocular side naked.

TABLE 16. — Frequency distributions of eight meristic characters of *Engyprosopon septempes* sp. nov. Counts from holotype included in italicized numbers.

D	80	81	82	83	84	85	86	87	88	89	A	60	61	62	63	64	65	66	67	68		
	1	0	2	5	4	4	3	5	3	1		2	2	4	6	3	5	1	2	2		
P1 (O, B)	7		8		9		10		11		12		13		P2 (O, B)		6		7			
	0,2		0,4		0,16		0,4		3,0		17,0		8,0				2,2		26,26			
C	3+11+3		2+12+3		2+13+2		3+12+2		LLS		40		41		42		43		44		45	
	19		2		3		4				4		5		8		5		3		3	
GR	0+8		0+9		0+10		1+10		V		10+24		10+25									
	3		18		6		1				8		20									

Pectoral fin on ocular side rather short, about 50-70 % of length of head, second ray longest, longer than that on blind side. Pelvic fins usually with seven rays; that on ocular side starting at tip of isthmus; and elongated in males, less so in females (Figs 18 A-B, 20); fifth to sixth rays on ocular side opposite to first ray on blind side. Tip of isthmus below middle of lower eye. All fin rays simple except caudal fin rays. Caudal fin rays branched except two or three upper- and lowermost rays.

TABLE 17. — Proportional measurements as percent of SL in *Engyprosopon septempes* sp. nov. Averages include measurements from holotype.

Character	Holotype ♂	Paratypes 16♂, 11♀	Average	SD
SL (mm)	70.5	28.3-60.0	41.9	9.06
HL	28.8	29.2-34.3	30.9	1.1
BD	55.2	45.0-53.5	49.0	2.5
SNL	7.0	6.5-8.1	7.2	0.4
UED	7.7	8.5-10.7	9.3	0.7
LED	7.7	8.3-10.7	9.4	0.7
IW (♂)	10.6	3.0-10.8	6.5	2.3
IW (♀)	-	1.8-4.2	2.9	0.7
UJL (O)	10.9	10.6-13.6	12.1	0.7
UJL (B)	11.5	10.9-13.7	12.1	0.6
LJL (O)	14.5	14.7-17.8	16.0	0.7
LJL (B)	15.5	14.9-18.4	16.6	0.8
DCP	13.0	10.8-12.7	11.7	0.5
P1L (O)	19.7	16.3-21.9	18.8	1.2
P1L (B)	10.6	9.4-12.6	10.9	0.8
P2L (O, ♂)	21.3	14.2-25.7	18.1	3.4
P2L (O, ♀)	-	11.2-13.9	13.0	0.8
P2L (B)	13.5	10.0-14.0	11.7	0.9
P2B (O)	10.8	8.5-11.9	9.9	0.8
P2B (B)	3.4	3.0-4.2	3.7	0.4
LDFR	11.8	12.4-16.3	14.7	1.1
LAFR	12.6	13.2-16.6	15.2	1.1
MCFR	21.4	22.0-25.2	23.4	1.0
LLCW	-	13.7-17.1	15.3	1.4

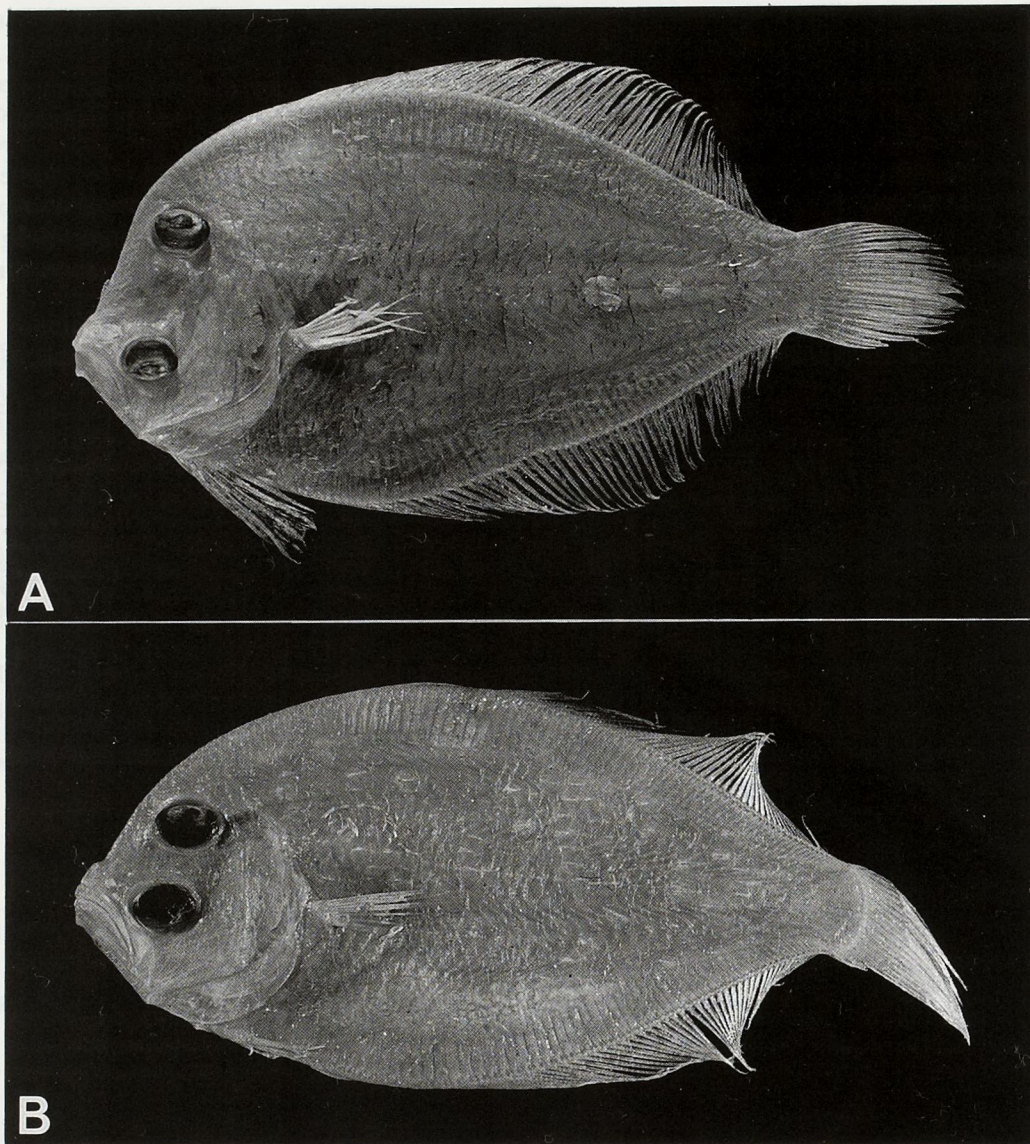


FIG. 17. — *Engyprosopon septempes* sp. nov. **A** : holotype, ♂ 70.5 mm, from Chesterfield Plateau, west of New Caledonia (MNHN 1993-56). — **B** : paratype, ♀ 43.1 mm, from Chesterfield Plateau, west of New Caledonia (HUMZ 124877).

Coloration in alcohol : Ground color on ocular side light brown; interorbital region sometimes with an obscure dark cross band; an obscure dark spot at junction of straight and curved parts of lateral line, a few spots on straight part of lateral line. Blind side uniformly pale yellow. Dorsal and anal fins with a series of dark spots; pectoral fin rarely with a few dark cross bands; pelvic fin on ocular side in males with many small dark spots except for basal portion, a few spots on pelvic fin of ocular side in females; caudal fin with irregularly scattered dark spots.

Sexual dimorphism : This species shows sexual dimorphism in the presence or absence of a rostral spine, the interorbital width, curvature of the anterior dorsal profile and the length and coloration of the pelvic fin on the ocular side (Figs 18 A-B, 19, 20).

ETYMOLOGY. — Named after the seven pelvic fin rays.

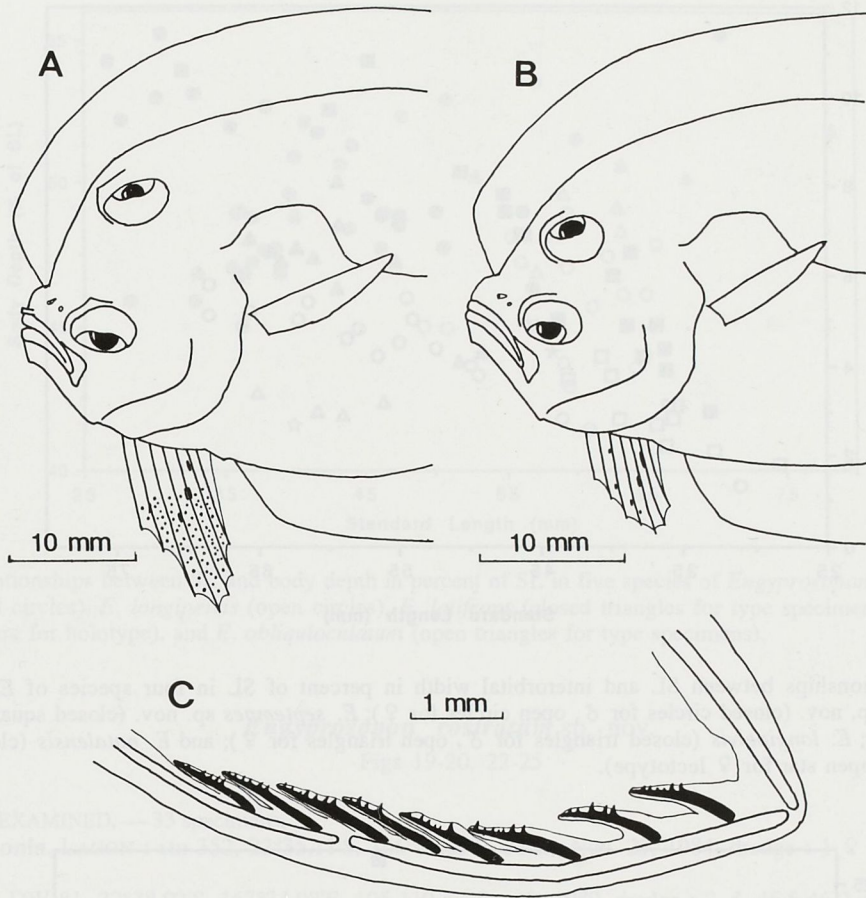


FIG. 18. — Body parts showing sexual dimorphism in ♂ (A) and ♀ (B), and a first gill arch (C) from ocular side in *E. septempes* sp. nov., paratype, 57.2 mm (MNHN 1993-58).

DISTRIBUTION. — The present specimens were all collected from the Coral Sea (the Chesterfield and Bellona Plateaus, the Nereus Reef), at depths of 44-88 m.

REMARKS. — This species is easily separable from all known congeners by pelvic fins usually having seven rays. Apart from the fin-ray counts of the pelvic fin, it superficially resembles *Engyprosopon latifrons* (Regan), *E. sechellensis* (Regan), *E. natalensis* Regan, *E. obliquiocolatum* (Fowler), *E. longipelvis* Amaoka and *E. rostratum* sp. nov.

It differs from *E. latifrons* and *E. obliquiocolatum* in having a deeper body (Fig. 21), longer pelvic fin on the ocular side (Fig. 20), longer caudal fin (21.4-25.2 % of SL vs. 19.6-19.9 in *E. latifrons*, 19.4-21.0 in *E. obliquiocolatum*) and larger eyes (7.7-10.7 % of SL vs. 6.6-7.8, 7.7-8.2); from *E. sechellensis* in having a deeper body (Fig. 21), shorter pectoral fin on the ocular side (Fig. 25), and higher number of gill rakers on the lower limb (Table 20); from *E. natalensis* in having a longer head (28.8-34.3 % of SL vs. 26.9-27.0 in *E. natalensis*), longer snout (6.5-8.1 % of SL vs. 5.5-6.1), larger mouth (upper jaw length on the ocular side 10.6-13.6 % of SL vs. 9.6-10.0, lower jaw length on the ocular side 14.5-17.8 vs. 12.8-13.4), wider interorbital region (Fig. 19) and higher number of gill rakers on lower limb (Table 20); from *E. longipelvis* in having uniserial teeth on upper jaw (biserial in *E. longipelvis*), deeper body (Fig. 21), wider interorbital width (Fig. 19) and longer pelvic fin (Fig. 20).

Differences between *E. septempes* and *E. rostratum* are discussed in the account of that species (see below).

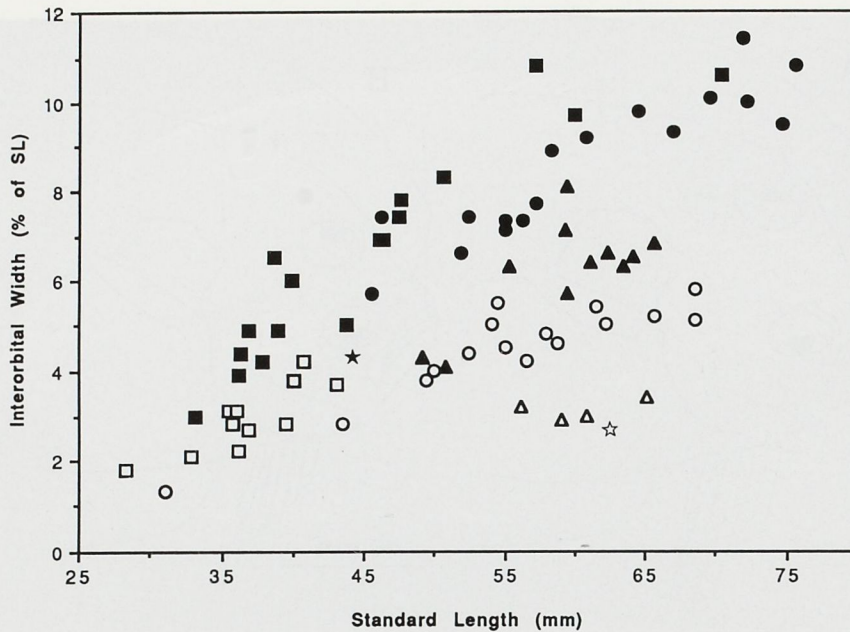


FIG. 19. — Relationships between SL and interorbital width in percent of SL in four species of *Engyprosopon* : *E. rostratum* sp. nov. (closed circles for ♂, open circles for ♀); *E. septempes* sp. nov. (closed squares for ♂, open squares for ♀); *E. longipelvis* (closed triangles for ♂, open triangles for ♀); and *E. natalensis* (closed star for ♂ paralectotype, open star for ♀ lectotype).

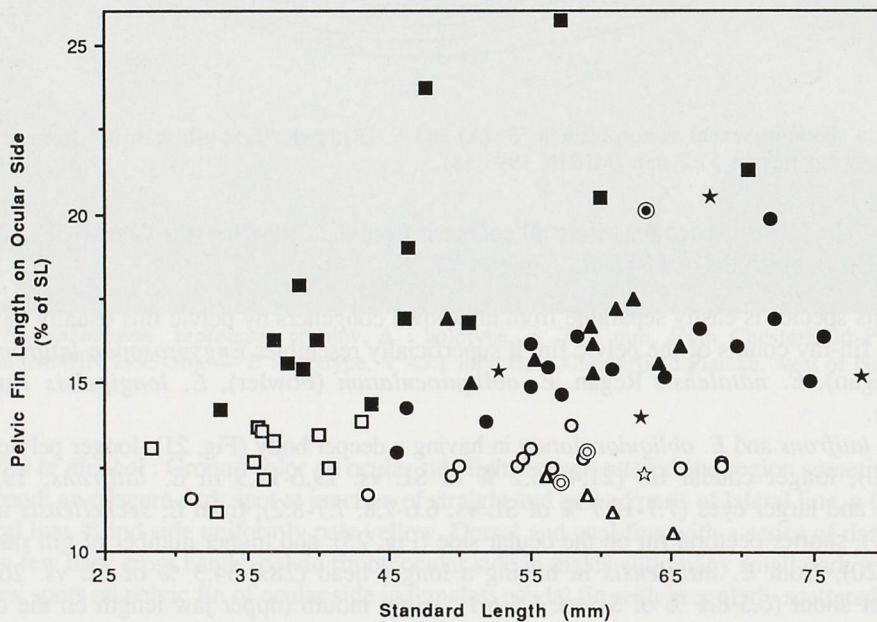


FIG. 20. — Relationships between SL and pelvic fin length on ocular side in percent of SL in five species of *Engyprosopon* : *E. rostratum* sp. nov. (closed circles for ♂, open circles for ♀); *E. septempes* sp. nov. (closed squares for ♂, open squares for ♀); *E. longipelvis* (closed triangles for ♂, open triangles for ♀); *E. latifrons* (closed star for ♂ type specimens, open star for ♀ paralectotype); and *E. obliquiocolatum* (closed double circle for ♂ holotype, open double circles for ♀ paratypes).

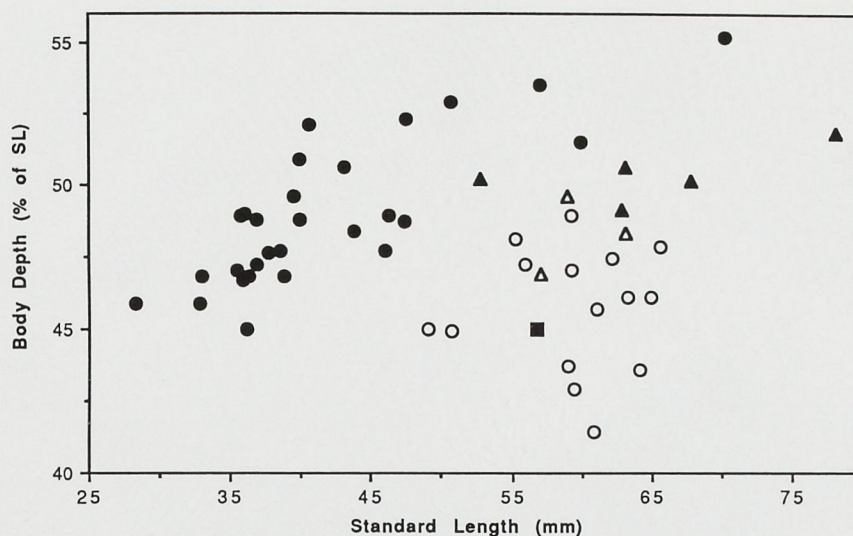


FIG. 21. — Relationships between SL and body depth in percent of SL in five species of *Engyprosopon*: *E. septempes* sp. nov. (closed circles), *E. longipelvis* (open circles), *E. latifrons* (closed triangles for type specimens), *E. sechellensis* (closed square for holotype), and *E. obliquiocularum* (open triangles for type specimens).

***Engyprosopon rostratum* sp. nov.**

Figs 19-20, 22-25

MATERIAL EXAMINED. — 33 specimens.

New Caledonia. LAGON : stn 352, 22°35.11'S, 166°59.05'E, 81 m, Nov. 29, 1984, dredge : 1 ♀ 31.0 mm (MNHN 1993-86).

SMIB 5 : stn DW 81, 22°38.02'S, 167°34.08'E, 105-110 m, Sep. 9, 1989, dredge : 2 ♂ 45.5-46.2 mm (MNHN 1993-84, 85).

Chesterfield and Bellona Plateaus. CHALCAL 1 : stn CP 10, 20°00.20'S, 158°46.60'E, 225 m, Jul. 27, 1984, beam trawl : 1 ♂ 69.6 mm (MNHN 1993-71); 3 ♂ and 4 ♀ 58.0-75.7 mm (MNHN 1993-72, 73); 1 ♀ 62.2 mm (MNHN 1993-148); 1 ♂ and 1 ♀ 54.5-67.0 mm (HUMZ 124882, 124883). — Stn CP 17, 22°34.70'S, 159°15.30'E, 300 m, Jul. 28, 1984, beam trawl : 1 ♂ 72.3 mm (MNHN 1993-87).

CORAIL 2 : stn 73, 19°21.11'S, 158°22.57'E, 41 m, Jul. 25, 1988, dredge : 1 ♂ 55.1 mm (MNHN 1993-83). — Stn 130, 19°27.41'S, 158°34.00'E, 217 m, Jul. 29, 1988, beam trawl : 2 ♂ and 1 ♀ 52.4-58.4 mm (MNHN 1993-79, 80); 1 ♀ 54.1 mm (HUMZ 124887). — Stn 131, 19°25.49'S, 158°37.96'E, 217 m, Jul. 29, 1988, beam trawl : 2 ♂ and 2 ♀ 50.0-55.0 mm (MNHN 1993-75, 76); 1 ♂ 60.9 mm (HUMZ 124886). — Stn 133, 19°31.10'S, 158°25.35'E, 45 m, Jul. 30, 1988, dredge : 1 ♀ 61.5 mm (MNHN 1993-81). — Stn 142, 19°36.16'S, 158°26.79'E, 193 m, Jul. 30, 1988, beam trawl : 2 ♀ 43.5-49.4 mm (MNHN 1993-74); 1 ♂ and 1 ♀ 56.6-57.3 mm (HUMZ 124884, 124885). — Stn 161, 19°46.00'S, 158°26.50'E, 217 m, Aug. 1, 1988, dredge : 1 ♂ 52.4 mm (MNHN 1993-82). — Stn 162, 19°46.24'S, 158°25.67'E, 203 m, Aug. 1, 1988, beam trawl : 1 ♂ and 1 ♀ 58.8-72.0 mm (MNHN 1993-77, 78).

TYPES. — The male (MNHN 1993-71, CHALCAL 1, stn CP 10) is the holotype. All the other specimens are paratypes.

DIAGNOSIS. — Pelvic fins with six rays, that on ocular side pigmented and somewhat elongated in males, its length 1.48-2.24 in HL in males, 2.15-2.53 in females; gill rakers with serrate margins; teeth on upper jaw uniserial; pectoral fin on ocular side slightly prolonged in larger males, its length 0.85-1.45 in head length in males, 1.43-1.65 in females.

DESCRIPTION. — Data for holotype are given first, followed in parentheses by ranges for the paratypes and averages for proportional data. Counts and proportional measurements as percent of SL are shown in Tables 18 and 19.

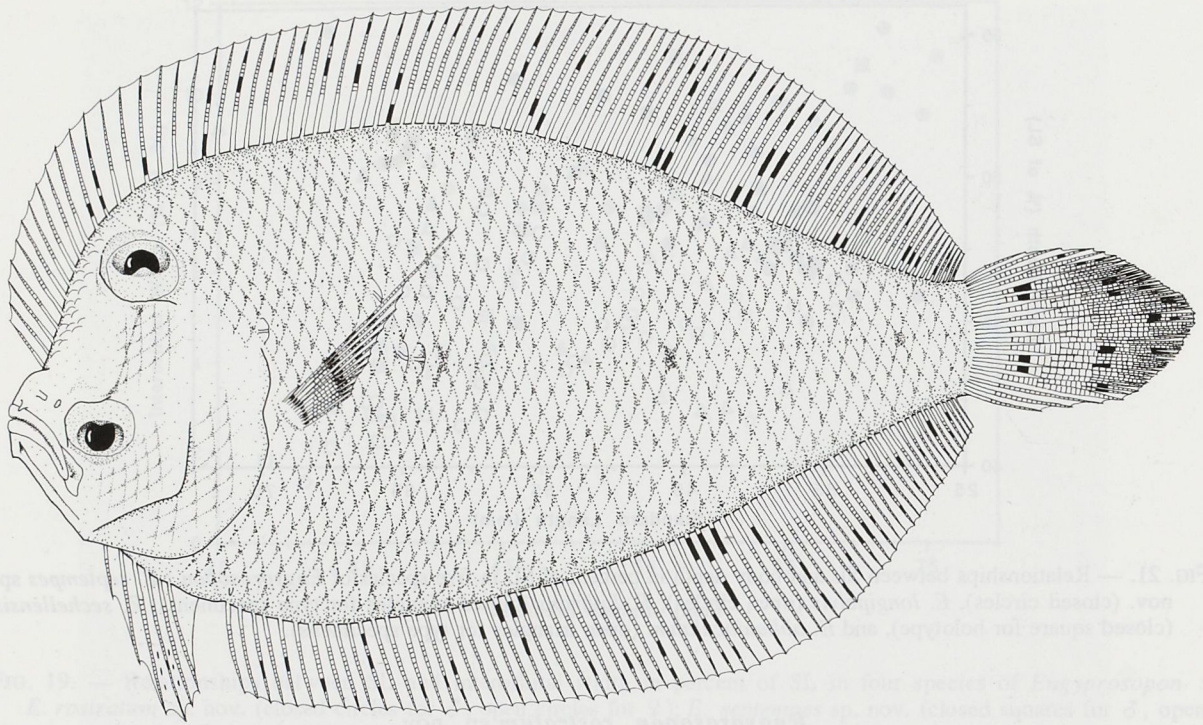


FIG. 22. — *Engyprosopon rostratum* sp. nov., holotype, ♂ 69.6 mm, from Chesterfield Plateau, west of New Caledonia (MNHN 1993-71).

Head length 3.61 in SL (3.23-3.60, 3.45); body depth 2.02 (1.93-2.25, 2.08). Snout length 4.39 in head length (3.93-4.69, 4.33); upper eye diameter 3.78 (3.03-3.82, 3.46); lower eye diameter 3.51 (3.20-3.90, 3.49); interorbital width 2.76 (2.59-5.08, 3.53) in males, (4.83-22.75, 7.40) in females; upper jaw length 2.35 (2.25-2.84, 2.42) on ocular side, 2.27 (2.23-2.76, 2.38) on blind side; lower jaw length 1.86 (1.79-2.07, 1.91) on ocular side, 1.75 (1.69-1.95, 1.81) on blind side; depth of caudal peduncle 2.38 (2.16-2.68, 2.45); pectoral fin length 1.09 (0.85-1.45, 1.14) on ocular side in males, (1.43-1.65, 1.54) in females, 2.41 (2.42-3.25, 2.66) on blind side; pelvic fin length 1.72 (1.48-2.24, 1.87) on ocular side in males, (2.15-2.53, 2.30) in females, 2.61 (2.38-3.06, 2.68) on blind side; pelvic fin-base length 2.97 (2.93-3.47, 3.18) on ocular side, 8.77 (8.00-10.11, 9.01) on blind side; length of longest dorsal fin ray 1.86 (1.76-2.11, 1.93); length of longest anal fin ray 1.80 (1.72-2.11, 1.90); length of middle caudal fin ray 1.16 (1.15-1.33, 1.23); curved length of lateral line 2.12 (1.86-2.36, 2.16).

TABLE 18. — Frequency distributions of eight meristic characters of *Engyprosopon rostratum* sp. nov. Counts from holotype included in italicized numbers.

D	87	88	89	90	91	92	93	94	96	A	67	68	69	70	71	72	73	74	75	76	
	1	1	5	6	3	7	5	2	1		1	1	4	7	5	6	4	2	2	1	
PI (O, B)				7	8	9	10	11	12	13	14										
				0,1	0,2	0,23	0,6	2,0	8,0	12,0	1,0										
C				3+11+3	2+12+3	3+12+2	2+13+2	3+12+3													
				24	1	3	4	1													
LLS	42	43	44	45	46	GR	0+7	0+8	0+9	V	10+25	10+26									
	7	6	7	8	4		4	17	12		18	14									

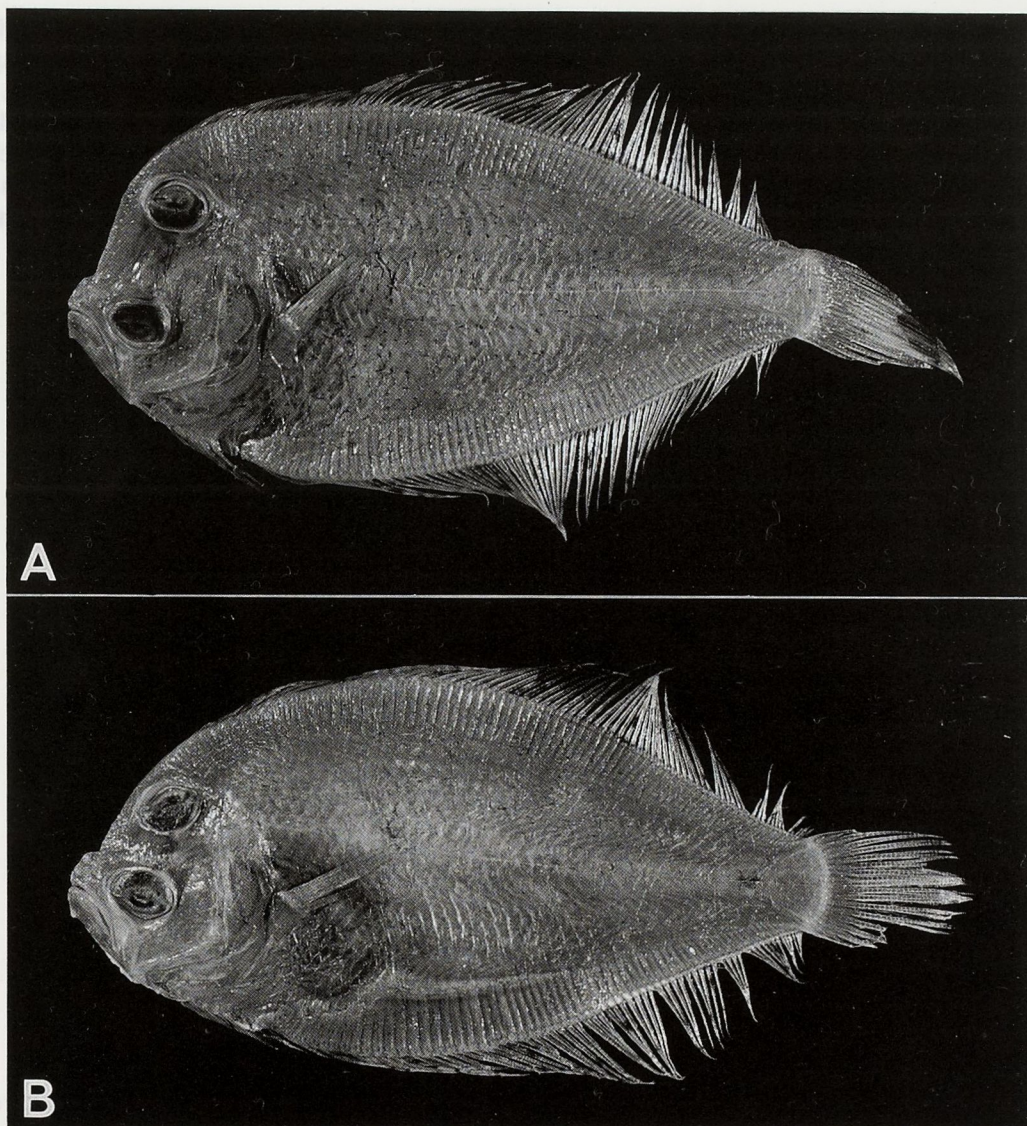


FIG. 23. — *Engyprosopon rostratum* sp. nov. **A** : holotype, ♂ 69.6 mm, from Chesterfield Plateau, west of New Caledonia (MNHN 1993-71). — **B** : paratype, ♀ 68.5 mm, from Chesterfield Plateau, west of New Caledonia (MNHN 1993-72).

Body ovate, deepest slightly in front of middle of body, its depth subequal to half length of body; dorsal and ventral contours gently arched. Caudal peduncle deep, its depth subequal to 1/4 of body depth. Head large, its length subequal to 30 % of SL; upper profile with a large notch in front of interorbital region, steep in mature males, less so in females and juvenile males. Snout rather long, strongly protruding, 70-90 % of eye diameter. A strong rostral spine in males, absent or poorly developed in smaller males and females (Fig. 24 A-B). Eyes rather large; upper eye diameter 60-90 % of upper jaw length on ocular side; lower eye in advance of the upper. One or two blunt orbital spines before each orbit in males, absent in females and smaller males (Fig. 24 A-B). Interorbital region concave, becoming wider with growth, wider in males than in females (Figs 19, 24 A-B).

Mouth large, oblique; maxilla extending to anterior or middle part of lower eye; anterior tips of both jaws nearly on same vertical line when mouth closed. A small ventrally directed knob at mandibular symphysis. Teeth on upper jaw sharp, uniserial, becoming larger and more widely spaced anteriorly, some anterior canine teeth;

lower jaw teeth uniserial, nearly equal to anterior teeth of upper jaw in size and spacing. Gill rakers on first arch slender, posterior margins serrated, none on upper limb (Fig. 24 C). Scales large, feebly ctenoid on ocular side, cycloid on blind side; snout and anterior parts of both jaws on ocular side naked.

Pectoral fin on ocular side slightly prolonged in males, less so in females (Figs 24 A-B, 25), its length in males 0.85-1.45 in head length, 1.43-1.65 in females, second ray longest, longer than that on blind side. Pelvic fins with six rays, starting at tip of isthmus; that on ocular side somewhat elongate in males, less so in females (Figs 20, 24 A-B); approximately fifth ray on ocular side opposite to first ray on blind side. Tip of isthmus below middle part of lower eye. Caudal fin rays branched except two or three upper- and lowermost rays.

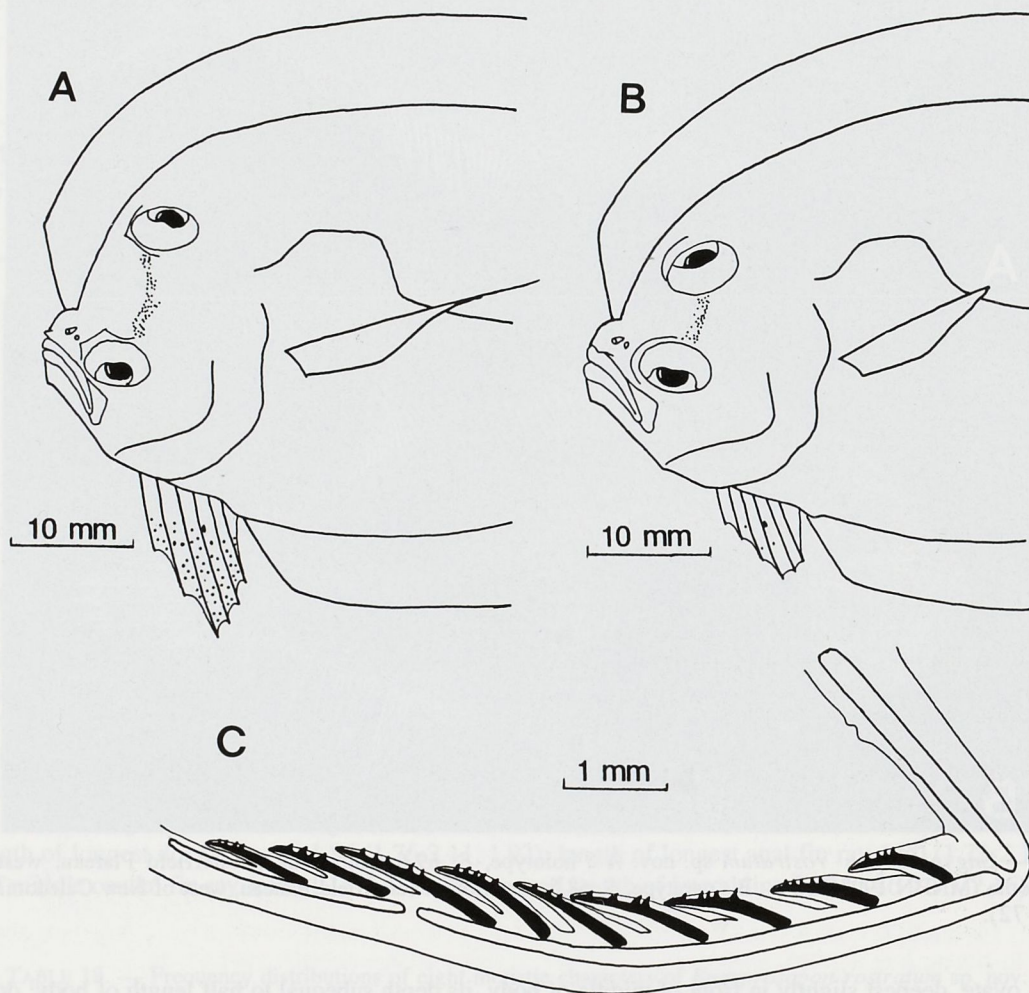


FIG. 24. — Body parts showing sexual dimorphism in ♂ (A) and ♀ (B), and a first gill arch (C) on ocular side in *E. rostratum* sp. nov., paratype, ♂ 67.0 mm (HUMZ 124882).

Coloration in alcohol : Ground color on ocular side light brown; interorbital region with a dark cross band (Fig. 24 A-B); an obscure dark spot at junction of straight and curved parts of lateral line, a few obscure spots on the straight portion of lateral line. Blind side uniformly pale yellow. Dorsal and anal fins with a series of dark spots; pectoral fin with a few dark cross bands; pelvic fin on ocular side in males with many small dark spots except for basal portion, a few spots on pelvic fin of ocular side in females; caudal fin with irregularly scattered dark spots.

Sexual dimorphism: This species shows sexual dimorphism in the presence or absence of the rostral spine, the interorbital width, the degree of curve of the anterior dorsal profile, the length of the pectoral and the pelvic fins on the ocular side, and the degree of spotting on the pelvic fin on the ocular side (Figs 19, 20, 24 A-B, 25).

TABLE 19. — Proportional measurements as percent of SL in *Engyprosopon rostratum* sp. nov. Averages include measurements from holotype.

Characters	Holotype ♂	Paratypes 16♂, 16♀	Average	SD
SL (mm)	69.6	31.0-75.7	58.2	9.75
HL	27.7	27.8-30.9	29.0	0.7
BD	49.4	44.5-51.9	48.1	1.9
SNL	6.3	6.0-7.5	6.7	0.4
UED	7.3	7.6-9.7	8.4	0.5
LED	7.9	7.6-9.0	8.3	0.4
IW (♂)	10.1	5.7-11.4	8.5	1.6
IW (♀)	-	1.3-5.5	4.4	1.1
UJL (O)	11.8	10.3-13.1	12.0	0.6
UJL (B)	12.2	10.6-13.3	12.2	0.6
LJL (O)	14.9	14.1-16.4	15.2	0.6
LJL (B)	15.8	14.9-17.4	16.1	0.6
DCP	11.6	10.8-14.3	11.9	0.7
P1L (O, ♂)	25.4	21.4-34.8	25.9	3.6
P1L (O, ♀)	-	17.0-20.6	18.7	0.9
P1L (B)	11.5	9.0-12.8	11.0	0.8
P2L (O, ♂)	16.1	13.0-19.9	15.6	1.5
P2L (O, ♀)	-	11.6-13.8	12.6	0.5
P2L (B)	10.6	9.2-12.4	10.9	0.6
P2B (O)	9.3	8.3-9.9	9.1	0.4
P2B (B)	3.2	2.9-3.6	3.2	0.2
LDFR	14.9	13.8-16.1	15.0	0.6
LAFR	15.4	13.9-16.4	15.3	0.6
MCFR	24.0	21.5-25.3	23.5	1.0
LLCW	13.1	12.0-15.2	13.3	1.0

ETYMOLOGY. — Named after the long snout.

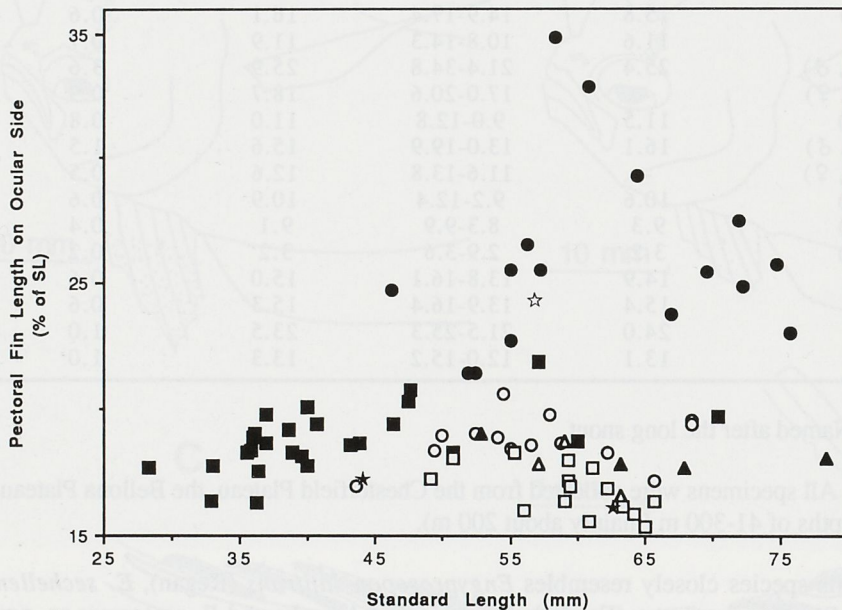
DISTRIBUTION. — All specimens were collected from the Chesterfield Plateau, the Bellona Plateau and southern New Caledonia, at depths of 41-300 m (mainly about 200 m).

REMARKS. — This species closely resembles *Engyprosopon latifrons* (Regan), *E. sechellensis* (Regan), *E. natalensis* Regan, *E. obliquiocolatum* (Fowler), *E. longipelvis* Amaoka and *E. septempes* sp. nov. in having a distinctly protruded and notched snout, an elongated and pigmented pelvic fin on the ocular side in males, and gill rakers with serrate margins.

However, except for *E. sechellensis*, it differs from these species in having a longer pectoral fin on the ocular side in males (Fig. 25) and sexual dimorphism in this characters (Figs 24 A-B, 25). Moreover, it differs from *E. latifrons* and *E. obliquiocolatum* (which we consider to be a junior synonym of *E. latifrons*), in having a longer caudal fin (1.15-1.33 in HL vs. 1.38-1.47 in *E. latifrons*, 1.40-1.49 in *E. obliquiocolatum*) and higher numbers of anal fin rays and scales in lateral line (Table 20); from *E. natalensis* and *E. longipelvis* in having a wider interorbital region (Fig. 19) and higher numbers of dorsal and anal fin rays (Table 20); and from *E. septempes* in having six pelvic rays on both sides (usually 7 rays in *E. septempes*) and a shorter pelvic fin on the ocular side (Fig. 20). In addition, *E. rostratum* differs from *E. natalensis* in having higher numbers of gill rakers on lower limb (Table 20) and from *E. longipelvis* in having uniserial teeth on the upper jaw (biserial in *E. longipelvis*). *E. sechellensis* has smaller numbers of dorsal and anal fin rays and gill rakers on the lower limb than *E. rostratum* (Table 20).

TABLE 20. — Comparison of counts for *Engyprosopon rostratum*, *E. septempes*, *E. latifrons*, *E. sechellensis*, *E. natalensis*, *E. longipelvis* and *E. obliquiocularum*.

	<i>rostratum</i> present specimens	<i>septempes</i> present specimens	<i>latifrons</i> type specimens	<i>sechellensis</i> holotype	<i>natalensis</i> type specimens	<i>longipelvis</i> AMAOKA, 1969	<i>obliquiocularum</i> type specimens
Number of specimens	33	28	5	1	2	15	3
SL (mm)	31.0-75.7	28.3-70.5	52.8-78.4	56.9	44.2-62.7	49.5-65.8	57.1-63.3
D	87-96	80-89	77-88	84	86-87	79-83	82-88
A	67-76	60-68	59-65	62	63-65	60-64	59-66
P2	6	7 (rarely 6)	6	6	6 or 7	6	6
LLS	42-46	40-45	38-40	42	42	40-41	40-41
GR	0+7-9	0-1+8-10	0+7-8	0+6	0+6	0+8-9	0+8-9
V	10+25-26	10+24-25	10+24-26	10+25	10+25	10+24-25	10+24-25

FIG. 25. — Relationships between SL and pectoral fin length on ocular side in percent of SL in seven species of *Engyprosopon*: *E. rostratum* sp. nov. (closed circles for ♂, open circles for ♀); *E. septempes* sp. nov. (closed squares); *E. longipelvis* (open squares); *E. latifrons* (closed triangles for type specimens); *E. obliquiocularum* (open triangles for type specimens); *E. sechellensis* (open star for holotype); and *E. natalensis* (closed stars for type specimens).*Engyprosopon longipterum* sp. nov.

Figs 26-28

MATERIAL EXAMINED. — 7 specimens.

Chesterfield and Bellona Plateaus. CHALCAL 1 : stn CP 2, 20°31.50'S, 161°06.45'E, 88 m, Jul. 15, 1984 : 1 ♂ 73.5 mm (MNHN 1993-88); 2 ♀ 74.5 mm and 74.5 mm (MNHN 1993-90). — Stn CP 12, 20°35.30'S, 158°47.40'E, 67 m, Jul. 23, 1984, beam trawl : 1 ♀ 82.3 mm (MNHN 1993-91); 1 ♀ 85.5 mm (HUMZ 124889).

CORAIL 2 : stn 20, 20°38.97'S, 161°01.01'E, 88 m, Jul. 22, 1988, dredge : 1 ♀ 62.5 mm (MNHN 1993-89). — Stn 22, 20°32.89'S, 161°01.09'E, 85 m, Jul. 22, 1988, beam trawl : 1 ♂ 66.6 mm (HUMZ 124888).

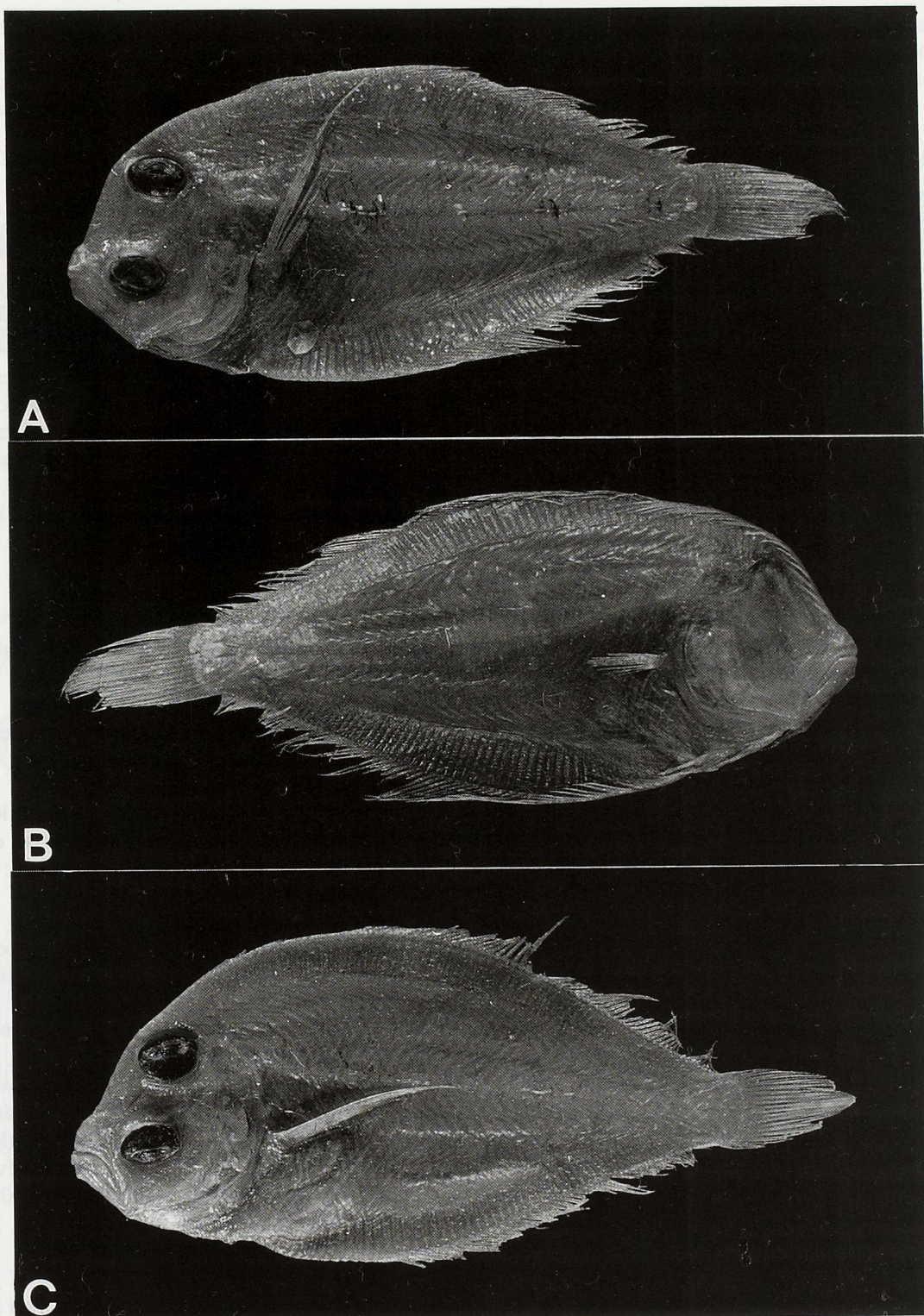


FIG. 26. — *Engyprosopon longipterum* sp. nov. A-B : paratype, ♂ 66.6 mm, from Fairway Ridge, west of New Caledonia (HUMZ 124888). — C : paratype, ♀ 74.5 mm, from Fairway Ridge, west of New Caledonia (MNHN 1993-90).

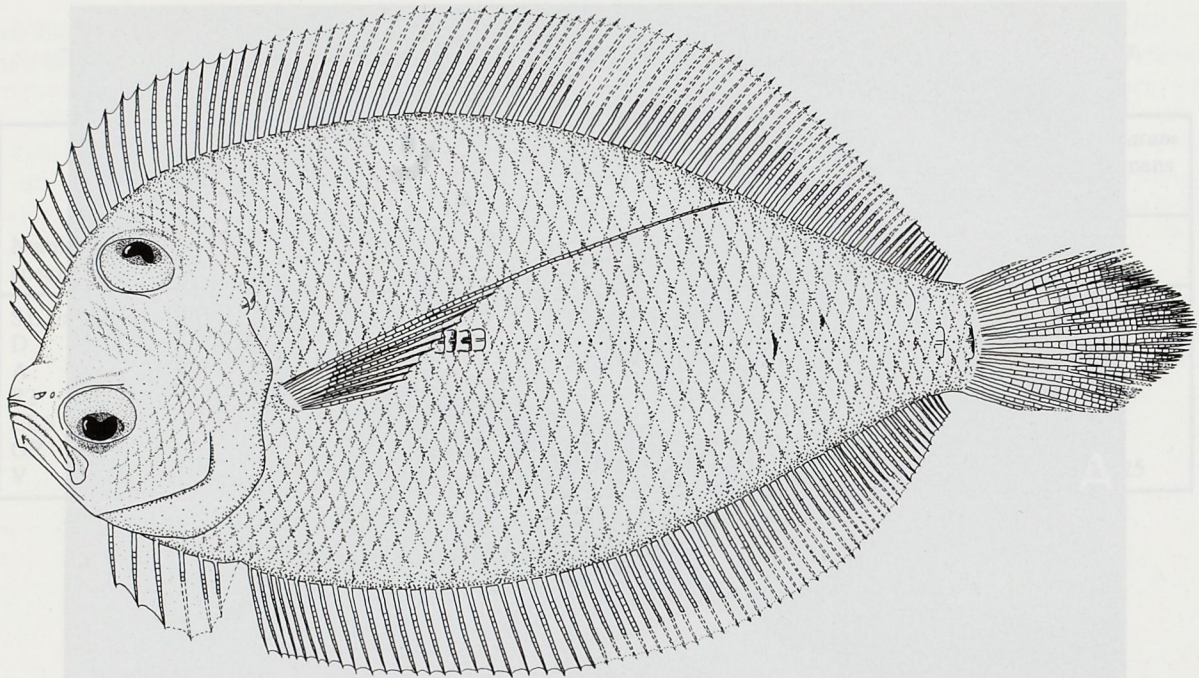


FIG. 27. — *Engyprosopon longipterum* sp. nov., holotype, ♂ 73.5 mm, from Fairway Ridge, west of New Caledonia (MNHN 1993-88).

TYPES. — The male (MNHN 1993-88, CHALCAL 1, stn CP 2) is the holotype. All the other specimens are paratypes.

DIAGNOSIS. — Pectoral fin on ocular side greatly prolonged, its length in males 0.55-0.56 in head length, 0.87-1.01 in females; orbital spines absent in both sexes; gill rakers serrated; teeth on upper jaw uniserial; caudal fin with a pair of obscure dark blotches; head comparatively large, 3.38-3.55 in SL; body depth 2.04-2.16; upper jaw length on ocular side 2.44-2.57 in head length; scales in lateral line 45-51; anal fin rays 64-69.

DESCRIPTION. — Data for holotype are given first, followed in parentheses by ranges for the paratypes and averages for proportional data. Counts and proportional measurements as percent of SL are shown in Tables 21 and 22.

Head length 3.52 in SL (3.38-3.55, 3.47); body depth 2.04 (2.12-2.16, 2.12). Snout length 4.45 in head length (4.19-4.78, 4.52); upper eye diameter 3.48 (3.17-3.43, 3.34); lower eye diameter 3.48 (3.11-3.51, 3.37); interorbital width 3.07 (3.47, 3.27) in males, (3.75-6.22, 5.21) in females; upper jaw length 2.46 (2.44-2.57, 2.50) on ocular side, 2.46 (2.44-2.53, 2.48) on blind side; lower jaw length 1.97 (1.86-2.04, 1.97) on ocular side, 1.92 (1.82-1.96, 1.90) on blind side; depth of caudal peduncle 2.61 (2.60-2.86, 2.71); pectoral fin length 0.55 (0.56, 0.56) on ocular side in males, (0.87-1.01, 0.92) in females; 2.27 (2.27-2.61, 2.38) on blind side; pelvic fin length - (3.10-3.17, 3.13) on ocular side, - (2.71-3.20, 2.92) on blind side; pelvic fin-base length 2.52 (2.60-2.79, 2.66) on ocular side, 9.50 (8.19-11.28, 9.47) on blind side; length of longest dorsal fin ray - (2.10-2.16, 2.13); length of longest anal fin ray - (2.09-2.37, 2.19); length of middle caudal fin ray 1.28 (1.20-1.37, 1.27).

Body ovate, deepest at middle part of body, its depth subequal to or slightly less than half length of body; dorsal and ventral contours gently arched. Caudal peduncle deep, its depth subequal to or slightly less than 1/4 of body depth. Head large, its length slightly more than 25 % of SL; upper profile with a large notch in front of interorbital region, very steep in males, less so in females (Fig. 28 A-B). Snout rather long, strongly protruding, a little less than eye diameter. Strong rostral spine in males, absent in females (Fig. 28 A-B). Eyes rather large,

diameters less than upper jaw length; lower eye in advance of upper. Orbital spines absent in both sexes. Interorbital region concave, becoming wider with growth, wider in males than in females (Fig. 28 A-B). Nostrils on ocular side anterior to upper margin of lower eye; anterior one tubular with flap posteriorly; nostrils on blind side small, below origin of dorsal fin, similar in shape to those on ocular side.

TABLE. — 21. Frequency distributions of eight meristic characters of *Engyprosopon longipterum* sp. nov. Counts from holotype included in italicized numbers.

D	84 1	85 0	86 2	87 1	88 0	89 3	A	64 1	65 1	66 1	67 2	68 <i>1</i>	69 1	P1 (O, B)	9 0,7	10 2,0	11 5,0
C	3+11+3 6	3+10+4 1	LLS	45 1	46 0	47 3	48 1	49 0	50 1	51 1	GR	0+8 1	0+9 4	0+10 2	V	10+24 2	10+25 5

Mouth rather large, oblique; maxilla extending to below anterior part of lower eye; anterior tips of both jaws nearly on same vertical line when mouth closed. A small ventrally directed knob at mandibular symphysis. Teeth on upper jaw sharp, uniserial, becoming larger and more widely spaced anteriorly, some anterior canine teeth; lower jaw teeth uniserial, nearly equal to anterior teeth of upper jaw in size and spacing. Gill rakers on first arch slender, posterior margins serrate, none on upper limb (Fig. 28 D). Scales large, feebly ctenoid on ocular side (Fig. 28 C), cycloid on blind side; snout and both jaws on ocular side naked.

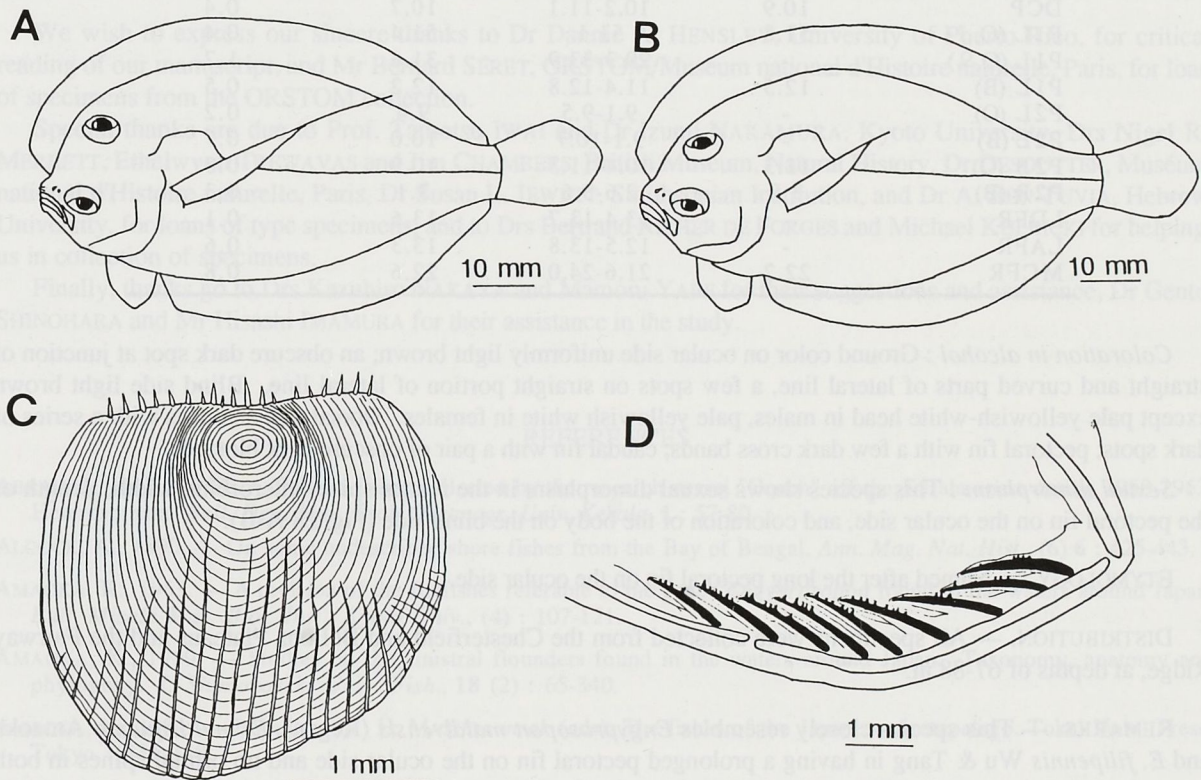


FIG. 28. — Body parts showing sexual dimorphism in ♂ (A) and ♀ (B), and a scale (C) and first gill arch (D) from ocular side in *E. longipterum* sp. nov., paratype, 66.6 mm (MNHN 1993-90).

Pectoral fin on ocular side prolonged in both sexes, longer in males than in females (Fig. 28 A-B); second ray much longer than others, more than length of head, longer than that on blind side. Pelvic fins with six rays, that

on ocular side starting at tip of isthmus, approximately fifth ray on ocular side opposite to first ray on blind side. Tip of isthmus below middle of lower eye. All fin rays except caudal fin rays, simple. Caudal fin rays branched except three or four upper- and lowermost rays.

TABLE 22. — Proportional measurements as percent of SL in *Engyprosopon longipterum* sp. nov. Averages include measurements from holotype.

Character	Holotype ♂	Paratypes 1♂, 5♀	Average	SD
SL (mm)	73.5	62.5-85.5	74.2	8.04
HL	28.4	28.2-29.7	28.9	0.5
BD	49.0	46.3-47.3	47.2	0.8
SNL	6.4	6.0-6.9	6.4	0.3
UED	8.2	8.2-9.13	8.7	0.3
LED	8.2	8.2-9.31	8.6	0.3
IW (♂)	9.3	8.3	8.8	0.5
IW (♀)	-	4.6-6.1	5.6	0.5
UJL (O)	11.6	11.1-11.8	11.5	0.2
UJL (B)	11.6	11.4-12.1	11.7	0.2
LJL (O)	14.4	13.8-15.5	14.6	0.5
LJL (B)	14.8	14.8-15.8	15.2	0.4
DCP	10.9	10.2-11.1	10.7	0.4
P1L (O,♂)	51.8	51.1	51.4	0.4
P1L (O,♀)	-	29.3-33.9	31.6	1.7
P1L (B)	12.5	11.4-12.8	12.2	0.5
P2L (O)	-	9.1-9.5	9.4	0.2
P2L (B)	-	9.1-10.7	10.0	0.7
P2B (O)	11.3	10.4-11.3	10.9	0.3
P2B (B)	3.0	2.6-3.6	3.1	0.3
LDFR	-	13.4-13.7	13.6	0.1
LAFR	-	12.5-13.8	13.3	0.6
MCFR	22.2	21.6-24.0	22.6	0.8

Coloration in alcohol: Ground color on ocular side uniformly light brown; an obscure dark spot at junction of straight and curved parts of lateral line, a few spots on straight portion of lateral line. Blind side light brown except pale yellowish-white head in males, pale yellowish white in females. Dorsal and anal fins with a series of dark spots; pectoral fin with a few dark cross bands; caudal fin with a pair of obscure dark blotches.

Sexual dimorphism: This species shows sexual dimorphism in the rostral spine, interorbital width, length of the pectoral fin on the ocular side, and coloration of the body on the blind side (Fig. 28 A-B).

ETYMOLOGY. — Named after the long pectoral fin on the ocular side.

DISTRIBUTION. — All specimens were collected from the Chesterfield and Bellona Plateaus and the Fairway Ridge, at depths of 67-88 m.

REMARKS. — This species closely resembles *Engyprosopon maldivensis* (Regan), *E. multisquama* Amaoka and *E. filipennis* Wu & Tang in having a prolonged pectoral fin on the ocular side and no orbital spines in both sexes. It differs from *E. maldivensis* and *E. multisquama* in having uniserial teeth on the upper jaw (biserial in *E. maldivensis* and *E. multisquama*) and gill rakers with serrate margins (vs. gill rakers without serrate margins). It can be distinguished from *E. filipennis* in having a higher number of scales in the lateral line, larger head and shallower body (Table 23). *Engyprosopon longipterum* also differs from *E. multisquama* in having a pair of obscure dark blotches submedially on the caudal fin (a pair of large jet-black blotches submarginally in *E. multisquama*).

TABLE 23. — Comparison of proportional measurements and counts between *Engyprosopon longipterum* sp. nov. and *E. filipennis*.

	<i>longipterum</i> present specimens	<i>filipennis</i> WU & TANG (1935)
Number of specimens	7	4
SL (mm)	62.5-85.5	72
Proportions:		
SL/HL	3.38-3.55	3.7-4
SL/BD	2.04-2.16	1.8-1.9
HL/SNL	4.19-4.78	4-4.2
HL/UED	3.17-3.48	3-3.2
HL/UJL(O)	2.44-2.57	2.2-2.4
Counts:		
D	84-89	88-93
A	64-69	66-68
LLS	45-51	39-43
GR	0+8-10	?+11

ACKNOWLEDGMENTS

We wish to express our sincere thanks to Dr Dannie A. HENSLEY, University of Puerto Rico, for critical reading of our manuscript, and Mr Bernard SÉRET, ORSTOM/Muséum national d'Histoire naturelle, Paris, for loan of specimens from the ORSTOM collection.

Special thanks are due to Prof. Tamotsu IWAI and Dr Izumi NAKAMURA, Kyoto University, Drs Nigel R. MERRETT, Ethelwynn TREWAVAS and Jim CHAMBERS, British Museum, Natural History, Dr DESOUTTER, Muséum national d'Histoire naturelle, Paris, Dr Susan L. JEWETT, Smithsonian Institution, and Dr A. BEN-TUVIA, Hebrew University, for loans of type specimens, and to Drs Bertrand RICHER DE FORGES and Michael KULBICKI for helping us in collection of specimens.

Finally, thanks go to Drs Kazuhiro NAKAYA and Mamoru YABE for their suggestions and assistance, Dr Gento SHINOHARA and Mr Hisashi IMAMURA for their assistance in the study.

REFERENCES

- ABRAHAM, D. S., 1963. — Bottom fishes collected by the research vessel "Conch" off the Kerala coast during 1958-1963. Heterosomata. *Bull. Dep. Mar. Biol. Oceanogr. Univ. Kerala*, **1** : 57-80.
- ALCOCK, A., 1890. — On some undescribed shore fishes from the Bay of Bengal. *Ann. Mag. Nat. Hist.*, (6) **6** : 425-443.
- AMAOKA, K., 1963. — A revision of the flatfishes referable to the genus *Engyprosopon* found in the waters around Japan. *Bull. Misaki Mar. Biol. Inst., Kyoto Univ.*, (4) : 107-121.
- AMAOKA, K., 1969. — Studies on the sinistral flounders found in the waters around Japan. -Taxonomy, anatomy and phylogeny. *J. Shimonoseki Univ. Fish.*, **18** (2) : 65-340.
- AMAOKA, K., 1984. — Bothidae. In: H. MASUDA *et al.* (eds), The fishes of the Japanese Archipelago. Tokai Univ. Press, Tokyo : 331-340.
- AMAOKA, K. & IMAMURA, H., 1990. — Two new and one rare species of bothid flounders from Saya de Malha Bank, Indian Ocean (Teleostei: Pleuronectiformes). *Copeia*, 1990 (4) : 1011-1019.
- BAMBER, R. C., 1915. — Reports on the marine biology of the Sudanese Red Sea, from collections made by Cyril CROSSLAND, M. A., D. Sc., F. L. S. - XXII. The fishes. *J. Linn. Soc. London*, **31** : 477-485.
- BAOSHAN, Z., 1962. — Pleuronectiformes. In: CHU *et al.* (eds), The fishes of the South China Sea. Science Press, Peking : 950-1014. (In Chinese).

- BARNARD, K. H., 1925. — A monograph of the marine fishes of South Africa. *Ann. S. African Mus.*, **21** (1, 2) : 1-1065.
- BESEDNOV, L. N., 1970. — On certain peculiarities in the geographical distribution of ichthyofauna in the northwestern parts of the South China Sea. *Izv. tikhookean. nauchno-issled. Inst. ryb. Khoz. Okeanogr.*, **69** : 32-76. (In Russian).
- BLEEKER, P., 1852a. — Bijdrage tot de kennis der ichthyologische fauna van de Moluksche eilanden. Visschen van Amboina en Ceram. *Nat. Tijd. Neder. Ind.*, **3** : 229-309.
- BLEEKER, P., 1852b. — Bijdrage tot de kennis der Pleuronecteoïden van den Soenda-Molukschen Archipel. *Verh. Batav. Gen.*, **24** (9) : 1-32.
- BLEEKER, P., 1854. — Vijfde bijdrage tot de kennis der ichthyologische fauna van Celebes. *Nat. Tijd. Ned. Ind.*, **7** : 225-260.
- BLEEKER, P., 1865. — Enumération des espèces de Poissons actuellement connues de l'île d'Amboine. *Ned. Tijd. Dierk.*, **2** : 270-293.
- BLEEKER, P., 1866-1872. — Atlas ichthyologique des Indes Orientales Néerlandaises, publié sous les auspices du Gouvernement colonial néerlandais, **6**, Amsterdam, 170 pp.
- BLEEKER, P., 1873. — Mémoire sur la Faune ichthyologique de Chine. *Ned. Tijd. Dierk.*, **4** : 113-154.
- BLEGVAD, H., 1944. — Fishes of the Iranian Gulf. Danish scientific investigations in Iran, part 3 : 1-247.
- BOESEMAN, M., 1947. — Revision of the fishes collected by BURGEN and STIEBOLD in Japan. *Zool. Meded. (Leiden)*, **28** : 1-242.
- BONDE, C. VON, 1922. — The Heterosomata (flat fishes) collected by the S. S. "Pickle". *Rep. Fish. Mar. Biol. Surv. Un. S. Afr.*, **2** (1921), Spec. Rept., **1** : 1-29.
- CHABANAUD, P., 1929. — Poissons hétérosomates recueillis en Indochine par M. le Dr. A. KREMPE. *Bull. Mus. Hist. nat. Paris*, (2) **1** : 370-382.
- CHABANAUD, P., 1948. — Notules ichthyologiques. XXXIV. - Description d'un nouveau Bothidé du Pacifique asiatique. *Bull. Mus. Hist. nat. Paris*, (2) **20** : 64-67.
- CHAN, W. L. & CHILVERS, R. M., 1973. — Ichthyological Notes: 3. First records of *Engyprosopon xystrias* Hubbs from the South China Sea, with a description of the male. *Hong Kong Fish. Bull.*, 1973 (3) : 113-114.
- CHEN, J. T. F. & WENG, H. T. C., 1965. — A review of the flatfishes of Taiwan. *Biol. Bull. Tunghai Univ.*, Coll. Sci., **25** and 27 Ichthyl. (5) : 1-103.
- CHILVERS, R. M. & CHAN, L.-Y., 1973. — Ichthyological notes: 2. Observations on ambicoloration in the Psettodidae, Bothidae and Pleuronectidae from the north shelf region of the South China Sea. *Hong Kong Fish. Bull.*, 1973 (3) : 107-112.
- FOWLER, H. W., 1928. — The fishes of Oceania. *Mem. Bernice P. Bishop Mus.*, **10** : i-iii+1-540.
- FOWLER, H. W., 1931. — The fishes of Oceania - Supplement 1. *Mem. Bernice P. Bishop Mus.*, **11** (5) : 311-381.
- FOWLER, H. W., 1933. — A synopsis of the fishes of China. Part V. *The Hong Kong Naturalist*, **4** (2) : 156-185.
- FOWLER, H. W., 1934a. — Description of new fishes obtained 1907 to 1910, chiefly in the Philippine Islands and adjacent seas. *Proc. Acad. Nat. Sci. Philad.*, **85** : 233-367.
- FOWLER, H. W., 1934b. — A synopsis of the fishes of China. Part V. *The Hong Kong Naturalist*, **5** (1) : 54-67.
- FOWLER, H. W., 1956. — Fishes of the Red Sea and southern Arabia. The Weizman Science Press of Israel Jerusalem, 240 pp.
- FOWLER, H. W. & BEAN, B. A., 1922. — Fishes from Formosa and the Philippine Islands. *Proc. U. S. Natn Mus.*, **62** (2) : 1-73.
- FRANZ, V., 1910. — Die japonische Knochenfische der Sammlungen Haberer und Doflein. In : Beiträge zur Naturgeschichte Ostasiens. *Abh. Bayer Akad. Wiss.*, **4**, Suppl. -Bd. **1** : 1-135.
- GILBERT, C. H., 1905. — The aquatic resources of the Hawaiian Islands. Section II. - The deep-sea fishes. *Bull. U. S. Fish Comm. for 1903*, **23** (2) : i-xi+575-713.
- GILCHRIST, J. D. F. & THOMPSON, W. W., 1917. — A catalogue of the sea fishes recorded from Natal. II. *Ann. Durban Mus.*, **1** : 291-431

- GLOERFELT-TARP, T. & KAILOLA, P. J., 1984. — Trawled fishes of southern Indonesia and northwestern Australia. Australian Development Assistance Bureau, Directorate General of Fisheries, Indonesia, and German Agency for Technical Cooperation, xvi+405 pp.
- GÜNTHER, A., 1862. — Catalogue of the fishes in the British Museum. 4, Brit. Mus. Nat. Hist., London, xxi+534 pp.
- GÜNTHER, A., 1880. — Report on the shore fishes procured during the voyage of H. M. S. "Challenger" in the years 1873-76. *Rep. Sci. Expl. Voy. H. M. S. "Challenger"*, Zool., 1 (6), 82 pp.
- HENSLEY, D. A., 1986. — Bothidae. In : M. M. SMITH & P. C. HEEMSTRA (eds), Smith's sea fishes. Springer-Verlag, Berlin, West Germany : 854-863.
- HENSLEY, D. A. & RANDALL, J. E., 1990. — A redescription of *Engyprosopon macrolepis* (Pisces: Bothidae). *Copeia*, 1990 (3) : 674-680.
- HERRE, A. W., 1932. — Fishes from Kwangtung Province and Hainan Island, China. *Lingnan Sci. J.*, 11 : 423-443.
- HERRE, A. W., 1933. — A check list of fishes from Dumaguete, Oriental Negros, P. I., and its immediate vicinity. *J. Pan.-Pacif. Res. Instn.*, 8 (4) : 6-11.
- HERRE, A. W., 1953. — Check list of Philippine fishes. *Res. Rep. Fish Wildl. Serv. U. S.*, 20 : 1-977.
- HUBBS, C. L., 1915. — Flounders and soles from Japan collected by the United States Bureau of Fisheries Steamer "Albatross" in 1906. *Proc. U. S. Natn. Mus.*, 48 (2082) : 449-496.
- HUBBS, C. L. & LAGLER, K. F., 1958. — Fishes of the Great Lakes region. Univ. Michigan Press, Michigan, xv+213 pp.
- ISHIKAWA, C. & MATSUURA, K., 1897. — Preliminary catalogue of fishes including Dipnoi, Cyclostomi and Cephalochorda in the collection of the Natural History Department, Imperial Museum. Tokyo Imperial Museum, Tokyo, 64 pp. (In Japanese).
- IZUKA, A. & MATSUURA, K., 1920. — Catalogue of the zoological specimens exhibited in the Natural History Department, Tokyo Imperial Museum (Vertebrata). Tokyo Imperial Museum, Tokyo, 192+25+23 pp. (In Japanese).
- JENKINS, J. T., 1910. — Report on the fishes taken by the Bengal Fisheries Steamer "Golden Crown", IV. On a collection of Indian Pleuronectidae. *Mem. Indian Mus.*, 3 : 23-31.
- JOHNSTONE, J., 1904. — On the marine fishes. *Suppl. Rep. Ceylon Pearl Oyster Fisheries*, 15 : 201-222.
- JORDAN, D. S. & HUBBS, C. L., 1925. — Record of fishes obtained by David Starr JORDAN in Japan, 1922. *Mem. Carnegie Mus.*, 10 (2) : 93-346.
- JORDAN, D. S. & RICHARDSON, R. E., 1909. — A catalogue of the fishes of the Islands of Formosa, or Taiwan, based on the collections of Dr. Frans SAUTER. *Mem. Carnegie Mus.*, 4 (4) : 159-204.
- JORDAN, D. S. & SEALE, A., 1905. — List of fishes collected by Dr. Bashford DEAN on the Island of Negros, Philippines. *Proc. U. S. Natn. Mus.*, 28 (1407) : 769-803.
- JORDAN, D. S. & SEALE, A., 1906. — The fishes of Samoa. Description of the species found in the Archipelago, with a provisional check-list of the fishes of Oceania. *Bull. Bur. Fisher.*, 25 : 173-455.
- JORDAN, D. S. & SEALE, A., 1907. — Fishes of the Islands of Luzon and Panay. *Bull. Bur. Fisher.*, 26 : 1-48.
- JORDAN, D. S. & SNYDER, J. O., 1904. — Notes on collections of fishes from Oahu Island and Laysan Island, Hawaii, with descriptions of four new species. *Proc. U. S. Natn. Mus.*, 27 (1377) : 939-948.
- JORDAN, D. S. & STARKS, E. C., 1904. — List of fishes dredged by the steamer "Albatross" off the coast of Japan in the summer of 1900, with descriptions of new species and a review of the Japanese Macrouridae. *Bull. U. S. Fish Comm. for 1902*, 22 : 577-628.
- JORDAN, D. S. & STARKS, E. C., 1906. — A review of the flounders and soles of Japan. *Proc. U. S. Natn. Mus.*, 31 (1484) : 161-246.
- JORDAN, D. S., TANAKA, S. & SNYDER, J. O., 1913. — A catalogue of the fishes of Japan. *J. Coll. Sci., Imp. Univ. Tokyo*, 33 (1) : 1-497.
- KAILOLA, P., 1971. — New records of fish from Papua. *Papua New Guin. Agric. J.*, 22 (2) : 116-133.
- KAMOHARA, T., 1931. — Fishes in the vicinity of Kochi-shi. *Zool. Mag.*, 43 (508-509) : 79-95. (In Japanese).

- KAMOHARA, T., 1936. — Food fishes taken off Prov. Tosa by motor trawler. *Suisan Kenkyushi*, **31** (3) : 1-10. (In Japanese).
- KAMOHARA, T., 1938. — On the offshore bottom-fishes of Prov. Tosa, Shikoku, Japan. Maruzen Co., Tokyo, 86 pp.
- KAMOHARA, T., 1950. — Description of the fishes from the Provinces of Tosa and Kishu, Japan. Kochi Insatsu Co., Kochi, 4+288+46+26 pp. (In Japanese).
- KAMOHARA, T., 1952. — Revised descriptions of the offshore bottom-fishes of Prov. Tosa, Shikoku, Japan. *Rep. Kochi Univ. Nat. Sci.*, (3) : 1-122.
- KAMOHARA, T., 1958. — A catalogue of fishes of Kochi Prefecture (Province Tosa), Japan. *Rep. Usa Mar. Biol. St.*, **5** (1) : 1-76.
- KAMOHARA, T., 1964. — Revised catalogue of fishes of Kochi Prefecture, Japan. *Rep. Usa Mar. Biol. St.*, **11** (1) : 1-99.
- KURODA, N., 1931. — A catalogue of the fishes of Shizuura, Suruga, Japan. *Amoeba*, **3** (1-2) : 85-127. (In Japanese).
- KURODA, N., 1951. — A nominal list with distribution of the fishes of Suruga Bay, inclusive of the fresh-water species found near the coast. *Jap. J. Ichthyol.*, **1** (6) : 376-394. (In Japanese).
- KURONUMA, K., 1939. — The miscellaneous notes on the flatfishes preserved at the Kominato Marine Biological Station, Chiba Prefecture. *Suisan Kenkyushi*, **34** (2) : 83-86.
- KURONUMA, K., 1940. — Check list of the flatfishes taken by the "Kisen Sokobiki" along the Pacific coast of Japan from Hokkaido to Kyushu. *Suisan Kenkyushi*, **35** (8) : 211-216.
- KURONUMA, K., 1961. — A check list of fishes of Vietnam. Division of Agriculture and Natural Resources, U. S. Operations Mission to Vietnam, vii+66 pp.
- KURONUMA, K. & ABE, Y., 1986. — Fishes of the Arabian Gulf. Kuwait Inst. Sci. Res., Tokyo, 356 pp.
- LEVITON, A. E., GIBBS, R. H. Jr., HEAL, E. & DAWSON, E. C., 1985. — Standards in herpetology and ichthyology: Part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. *Copeia*, 1985 (3) : 802-832.
- LI, S.-Z. & WANG, H.-M., 1987. — Pleuronectiformes. In: C. QUINGTAI, & Z. BAOSHAN (eds), Systematic synopsis of Chinese fishes. Science Press, Beijing, Peoples Republic of China : 489-513, 1386-1421. (In Chinese).
- LIANG, Y. S., 1948. — Notes on a collection of fishes from Pescadores Islands, Taiwan. *Q. JI Taiwan Mus.*, **1** (2) : 1-20.
- LIANG, Y. S., 1951. — A check-list of the fish specimens in the Taiwan Fisheries Research Institute. *Taiwan Fish. Res. Inst. Lab. Biol. Rep.*, (3) : 1-35.
- MACLEAY, W., 1881. — Descriptive catalogue of the fishes of Australia. *J. Linn. Soc., London*, **13** (65) : 121-139.
- MASUDA, H., ARAGA, C. & YOSHINO, T., 1975. — Coastal fishes of southern Japan. Tokai Univ. Press, Tokyo, 1st ed., 379 pp.; 2nd ed., 1980, 382 pp. (In Japanese and English).
- MATSUBARA, K., 1955. — Fish morphology and hierarchy. Part II, Ishizaki Shoten, Tokyo, v+816 pp. (In Japanese).
- McCULLOCH, A. R., 1921. — Check-list of the fish and fish-like animals of New South Wales. Pts I, II. *Aust. Zool.*, (1-2), 58 pp.
- McCULLOCH, A. R., 1929. — A check-list of the fishes recorded from Australia. *Mem. Aust. Mus.*, **5** (2) : 145-329.
- McCULLOCH, A. R., 1934. — The fish and fish-like animals of New South Wales. Third edition with supplement by Gilbert P. WHITLEY. Royal Zoological Society of New South Wales, 104 pp.
- McCULLOCH, A. R. & WHITLEY, G. P., 1925. — Some little known Australian flat-fishes. *Rec. Aust. Mus.*, **49** : 342-354.
- MINAMI, T. & NAKAMURA, I., 1978. — Seasonal occurrence of pelagic stages of flatfishes (Pleuronectiformes) in the coastal waters of western Wakasa Bay, the Japan Sea. *Mem. Coll. Agric., Kyoto Univ.*, **112** : 29-47.
- MORI, T., 1956. — Fishes of San-in District including Oki Island in the adjacent waters (southern Japan Sea). *Mem. Hyogo Univ. Agric.*, **2** (3) : 1-62. (In Japanese).
- MUNRO, I. S. R., 1955. — The marine and fresh water fishes of Ceylon. Dept. External Affairs, Canberra, v-xiii+351 pp.

- MUNRO, I. S. R., 1958. — The fishes of the New Guinea region. A check-list of the fishes of New Guinea incorporating records of species collected by the Fisheries Survey Vessel "Fairwind" during the years 1948 to 1950. *Papua New Guin. Agric. J.*, **10** (4), (*Fish. Bull.* No.1) : 97-369.
- NIELSEN, J., 1974. — Bothidae. In : W. FISCHER and P. J. P. WHITEHEAD (eds), FAO species identification sheets for fisheries purposes. Eastern Indian Ocean (Fishing Area 57) and western central Pacific (Fishing Area 71). Vol. I : 24 pp. (1-4+10 sheets Both 1 to Pseud 7).
- NORMAN, J. R., 1926. — A report on the flatfishes (Heterosomata) collected by the F. I. S. "Endeavour," with a synopsis of the flatfishes of Australia and a revision of the subfamily Rhombosoleinae. *Biol. Res. Fishing Exped. F. I. S. Endeavour*, **5** (5) : 219-308.
- NORMAN, J. R., 1927. — The flatfishes (Heterosomata) of India, with a list of the specimens in the Indian Museum. *Rec. Indian Mus.*, **29** (1) : 7-48.
- NORMAN, J. R., 1934. — A systematic monograph of the flatfishes (Heterosomata). 1. Psettodidae, Bothidae, Pleuronectidae. Brit. Mus., London, 459 pp.
- NORMAN, J. R., 1939. — Fishes. *Scient. Rep. John Murray Exped.*, **7** (1) : 1-116.
- OCHIAI, A. & AMAOKA, K., 1963. — Description of larvae and young of four species of flatfishes referable to subfamily Bothinae. *Bull. Japan. Soc. Sci. Fish.*, **29** (2) : 127-134. (In Japanese).
- OKADA, Y., 1938. — A catalogue of vertebrates of Japan. Maruzen Co., Tokyo, iv+412 pp. (In Japanese).
- OKADA, Y., 1955. — Fishes of Japan. Illustrations and description of fishes of Japan. Maruzen Co., Tokyo, 434+28 pp.
- OKADA, Y. & MASTUBARA, K., 1938. — Keys to the fishes and fish-like animals of Japan, including Kurile Islands, southern Sakhalin, Bonin Islands, Ryukyu Islands, Korea and Formosa. Sanseido Co., Tokyo and Osaka. 1+584 pp. (In Japanese).
- OSHIMA, M., 1927. — List of flounders and soles found in the waters of Formosa, with descriptions of hitherto unrecorded species. *Jap. J. Zool.*, **1** (5) : 177-204.
- PERTESEVA-OSTROUMOVA, T. A., 1965. — Flatfishes larvae from the Gulf of Tonking. *Trud. Inst. Okeanol.*, **80** : 177-220. (In Russian).
- PUNPOKA, S., 1964. — A review of the flatfishes (Pleuronectiformes = Heterosomata) of the Gulf of Thailand and its tributaries in Thailand. *Kasetsart Univ. Fish. Res. Bull.*, (1) : i-iv+1-86.
- QUÉRO, J. C. & GOLANI, D., 1990. — Description d'*Engyprosopon hureaui* n. sp. (Pleuronectiformes, Bothidae) du Golfe d'Akaba. *Cybium*, **14** (1) : 37-42.
- REGAN, C. T., 1902. — On the fishes from the Maldive Islands. In : J. S. GARDINER, The fauna and geography of the Maldive and Laccadive Archipelagoes, **1** : 272-281.
- REGAN, C. T., 1905. — On a collection of fishes from the Inland Sea of Japan made by Mr. R. Gordon SMITH. *Ann. Mag. Nat. Hist.*, (7) **15** : 17-26.
- REGAN, C. T., 1908. — Report on the marine fishes collected by Mr. J. Stanley GARDINER in the Indian Ocean. *Trans. Linn. Soc. London, Zool.*, Second Ser., **12** (3) : 217-255.
- RIVATON, J., 1989. — Premières observations sur la faune ichtyologique des îles Chesterfield (Mer du Corail). *Cybium*, **13** (2) : 139-164.
- RIVATON, J. & RICHER DE FORGES, B., 1990. — Poissons récoltés par dragages dans le lagon de Nouvelle-Calédonie. *Rapp. sci. & techn., ORSTOM Nouméa, Sciences de la mer, Biol. mar.*, (55) : 1-101.
- SAINSBURY, K. J., KAILOLA, P. J. & LEYLAND, G. G., 1985. — Fishes of northern and north-western Australia. CSIRO Div. Fish. Res., Australia, 375 pp.
- SCHMIDT, P. J., 1931. — Fishes of Japan collected in 1901. *Trans. Pacific Comm. Acad. Sci. USSR*, **2** : 1-179.
- SHEN, S.-C., 1966. — Studies on the flatfishes (Pleuronectiformes or Heterosomata) in the adjacent waters of Hong Kong. *Q. Jl Taiwan Mus.*, **20** (1-2) : 149-281.
- SHEN, S.-C., 1983. — Study on the bothid fishes (family Bothidae) from Taiwan. *J. Taiwan Mus.*, **36** (1) : 1-42.
- SHEN, S.-C., 1984. — Coastal fishes of Taiwan. Dep. Zool. Nat. Taiwan Univ., Taipei, Taiwan, Republic of China, 189 pp.

- SMITH, J. L. B., 1949. — The fishes of southern Africa. Central New Agency, Cape Town, xvi+550 pp.
- SNYDER, J. O., 1912. — Japanese shore fishes collected by the United States Bureau of Fisheries Steamer "Albatross" Expedition of 1906. *Proc. U. S. Natn. Mus.*, **42** (1909): 399-450.
- SUVATTI, C., 1936. — Index to fishes of Siam. *Bull. Fish., Bangkok, B. E.* 2479 : A-F+1-226.
- TANAKA, S., 1931. — On the distribution of fishes in Japanese waters. *J. Fac. Sci., Imp. Univ. Tokyo, Sec. 4, Zool.*, **3** (1) : 1-90.
- TANAKA, S. & ABE, T., 1955. — Illustrated book of thousand useful fishes. Morikita Shuppan, Tokyo, 10+294+12 pp. (In Japanese).
- TEMMINCK, C. J. & SCHLEGEL, H., 1842-1847. — Pisces. SIEBOLD's fauna Japonica, suppl. pl. A. Leiden, 323 pp.
- TOMIYAMA, I. & ABE, T., 1958. — Figures and descriptions of the fishes of Japan. Kazama Shobô, Tokyo, **57** : 1171-1194.
- UI, N., 1929. — Fishes of Kisyu, Wakayama Prefecture. Takahashi Nanekisha, Osaka, 284+45 pp. (In Japanese).
- WEBER, M., 1913. — Die Fische der Siboga-Expedition. *Siboga Rept*, Leiden, **57**, xii+710 pp.
- WEBER, M. & DE BEAUFORT, L. F., 1929. — The fishes of the Indo-Australian Archipelago. V. Anacanthini, Allotriognathi, Heterosomata, Berycomorphi, Percomorphi: Families Kuhliidae, Apogonidae, Plesiopidae, Pseudoplesiopidae, Priacanthidae, Centropomidae. E. J. Brill. Ltd., Leiden, xiv+458 pp.
- WU, H. W., 1932. — Contribution à l'étude morphologique, biologique et systématique des poissons hétérosomes (Pisces Heterosomata) de la Chine. Thesis, Univ. Paris, (A) 244 (268) : 1-179.
- WU, H. W. & TANG, S. F., 1935. — Notes on the fishes of Heterosomata from Hainan. *Sinensia*, **6** (3) : 391-397.
- YANAI, T., 1950. — Fishes of Sanin District. *Zool. Mag.*, **59** (1) : 17-22. (In Japanese).
- ZHANG, C.-L. & WANG, W.-B., 1963. — Pleuronectiformes. In : CHU *et al.* (eds), The fishes of the East China Sea. Science Press, Peking : 510-545. (In Chinese).

