

THE FISHES
OF THE
**INDO-AUSTRALIAN
ARCHIPELAGO**

BY

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XI

SCLEROPAREI, HYPOSTOMIDES, PEDICULATI
PLECTOGNATHI, OPISTHOMI, DISCOCEPHALI
XENOPTERYGII

with 100 illustrations

BY

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INTRODUCTION

This volume comprises the account of the Scleroparei, Hypostomides, Pediculati, Plectognathi, Opisthomi, Discocephali, and Xenopterygii. Herewith that of the Teleostei is brought to a conclusion. A volume on the sharks and rays ought to follow, as was planned originally. As it is impossible to study this group at the hand of the scanty material in museum collections, it was arranged that this last volume should be written in collaboration with an ichthyologist in Indonesia, who could examine large specimens in the fishmarkets. For the moment this is not possible and so Vol. XII has to wait for better days.

I think it unnecessary to repeat what has been said in the introductions of the Volumes II-VIII about the way measurements have been taken. A somewhat different way of measurements has been adopted by Mr. JOHN C. BRIGGS (see p. 345), whose help in giving an account of the Xenopterygii it is a pleasure to acknowledge.

I am grateful to: Dr. F. P. KOUMANS, Dr. M. BOESEMANN (Leiden Museum), Dr. ETHELWYNN TREWAVAS, Mr. N. B. MARSHALL, A. FRASER-BRUNNER, D. TUCKER (British Museum), the late Prof. L. BERTIN (Paris Museum) for their help when I visited these museums.

Most of the figures in this volume have been drawn in former years by Mr. J. F. OBBES, whose beautiful drawings adorn all former volumes of this series too, but now, at the age of over 90, his hands have lost their steadiness, so I had to look out for other sources. Several figures have been reproduced from other works, as acknowledged in the legends, and I am greatly indebted to the editors and authors who gave me permission to do so. Still there were figures missing and I ventured to draw them myself. Although they do by far not attain the perfection of OBBES's drawings, I hope they will serve the purpose.

Finally I gladly avail myself of this opportunity to thank Mr. F. C. WIEDER, Director of the Printing and Publishing Firm E. J. Brill Ltd. of Leiden, for his interest and help.

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Order SCLEROPAREI

Airbladder without open duct. Parietals separated by the supra-occipital. No orbitosphenoid. Suborbitals forming a bony stay for the preopercle, to which the third one is attached in different manners. Preopercle generally with some strong spines along its hind-border. Opercle typically with two divergent ridges, ending in spines. Bony ridges on prefrontal, frontal, parietal, pterotic, and posttemporal generally developed, often bearing rows of spines. Dorsal as a rule consisting of a spinous and a soft part. Anal as a rule with a few spines. Pectorals often with a broad base, one or more of the lower rays sometimes detached. Ventrals thoracic, typically with a spine and five rays, but often with less rays and sometimes rudimentary. Ctenoid or cycloid scales present, or scales totally absent. Dentition generally feeble, without large canines.

Note. The bony ridges and their spines on the head of the *Scleroparei* are of taxonomic importance. I have used the following names: Supraorbital ridges on the frontals along the superior orbital rim, often continued into superior postorbital ridges on the parietals which are flanked by the inferior postorbital ridges on the pterotics and ending on the posttemporal. Suborbital ridges on the suborbitals.

Key to the Indo-Australian families of Scleroparei

- A. Second orbital rigidly attached to first.
Pectoral base subvertical, often procur-
rent below. *Scorpaenoidea*.
 - I. Spinous part of D longer than soft part.
 - a. Gill membranes free from isthmus.
 - a¹. Three, rarely two pungent anal
spines 1. *Scorpaenidae* p. 2.
 - b¹. Three flexible anal spines 2. *Aploactidae* p. 90.
 - b. Gill membranes united to isthmus.
 - a¹. Anal spines flexible. Gill opening
small 3. *Bathyaploactidae* p. 91.
 - b¹. Two or three pungent or flexible
anal spines. Gill opening large. 4. *Synanceidae* p. 93.
 - II. Spinous part of D shorter than soft part,
the two parts sometimes separated.
 - a. Gill membranes free from isthmus.

- a¹. Two or three lower pectoral rays free and more or less rod-like. Anal with one pungent spine or without spine 5. *Triglidae* p. 114.
- b¹. No free pectoral rays. Anal with one spine. Head much depressed 6. *Platycephalidae* p. 127.
- b. Gill membranes attached to isthmus.
 - a¹. Ventrals not rudimentary. Body not much compressed.
 - a². Three or four of the lower pectoral rays free. Body and tail depressed, with bony plates. 7. *Hoplichthyidae* p. 166.
 - b². No free pectoral rays. Body naked 8. *Cottunculidae* p. 167.
 - b¹. Ventrals rudimentary. Body much compressed 9. *Caracanthidae* p. 169.
- B. Second orbital movably articulated with first and with preopercle. Pectoral base very long *Dactylopteroidea* 10. *Dactylopteroideae* p. 173.

I. Family SCORPAENIDAE

Compressed. Head, body, and tail scaled or head naked and body and tail either naked or with rudimentary scales. Two pairs of nostrils. Head often with body ridges which are spiny or not. Spinous part of dorsal longer than soft part. Anal with III pungent spines, exceptionally with II. Ventrals with a spine and 2-5 rays. Pectorals well developed, sometimes extremely long; exceptionally one of the lower rays is free. Gill membranes free from isthmus. Vertebrae 24-40. Ribs present at least on posterior precaudal vertebrae.

Key to the Indo-Australian genera of Scorpaenidae

- A. Head at least with some scales on preopercle and opercle. Body and tail scaled.
 - I. Membranes of dorsal not inserted on base of spines only. Pectorals not reaching to anal or beyond.
 - a. Upper part of head with spiny ridges. Scales generally ctenoid.
 - a¹. Twelve dorsal spines.
 - a². Lateral line only slightly developed on several anterior scales 1. *Phenacoscorpius*, p. 5.
 - b². Lateral line complete.
 - a³. A quadrangular pit on upper part of head, behind eyes. Head scaleless, excepting

- some scales on opercle and preopercle.
- a⁴. Teeth on vomer and palatines. Pectoral rays simple or upper ones divided 2. *Parascorpaena*, p. 7.
- b⁴. Teeth on vomer, none on palatines. Upper pectoral rays divided, lower simple 3. *Scorpaenopsis* p. 12.
- b³. No pit behind eyes. Sides of head scaly, sometimes also occiput. Teeth on vomer and palatines. Upper pectoral rays divided, lower simple or all simple 4. *Sebastapistes* p. 23.
- b¹. Thirteen dorsal spines. Teeth on vomer, none on palatines. Upper pectoral rays divided, lower simple 5. *Scorpaenodes* p. 30.
- b. Upper part of head scarcely spiny. Scales cycloid. Twelve dorsal spines 6. *Setarches* p. 35.
- II. Membranes of dorsal spines inserted on base only of anterior side of spines. Pectorals reaching on anal or beyond.
- a. Anal with three spines. Caudal rounded or somewhat pointed and without prolonged rays 7. *Pterois* p. 37.
- b. Anal with two spines. Caudal truncate, the outer rays filamentous 8. *Parapterois* p. 52.
- B. Head without scales. Body and tail scaly or naked.
- a. Dorsal with 11 spines, anal with 2 spines. A long, branched tentacle above eye. Body
- b. Dorsal with more spines. If with 11 spines there are 3 anal spines, or there are no scales. 9. *Pteroidichthys* p. 54.
- a¹. Pectorals long, inferiorly with a rod-like free ray 10. *Apistus* p. 55.
- b¹. No free pectoral rays.
- a². Much compressed. Height 2. Rudimentary scales, each with a minute spine posteriorly. D.XII.11. 11. *Taenianotus* p. 57.
- b². Not much compressed, or height more than 2.
- a³. Scales totally wanting, but body often covered with more or less distinct tubercles.

- a⁴. No teeth on palatines.
 - a⁵. Origin of D. above eye. A. II-III. 7-11. V. I. 2-3 12. *Erisphex* p. 59.
 - b⁵. Origin of D. above opercle. A. III. 5. V. I. 5. 13. *Scorpaenella* p. 63.
- b⁴. Teeth on palatines. A. III. 5-6. V. I. 5.
 - a⁵. Origin of D. well behind eye. D. XII-XIII. 9-10. A cleft behind the 4th gill. 14. *Gymnapistus* p. 64.
 - b⁵. Origin of D. above eye. D. XIII. 7-8. No cleft behind 4th gill 15. *Tetraroge* p. 67.
- b³. Scales present, at least on part of the body.
 - a⁴. Three anterior dorsal spines remote from rest of fin with which they are connected by a very low membrane only. Mouth very oblique, lower jaw the longer with a symphy-sial knob 16. *Vespicula* p. 71.
 - b⁴. Three anterior dorsal spines not remote from rest of fin, or, if so, connected by well developed mem-brane with rest of fin.
 - a⁵. Anterior dorsal spines much longer than the following. Dorsal fin membrane not incised. 17. *Amblyapistus* p. 75
 - b⁵. Anterior dorsal spines not much longer than the following. Dorsal fin membranes incised.
 - a⁶. Palatine teeth pre-sent.
 - a⁷. Origin of dorsal immediately be-hind eye V. I. 5. A. III. 7 . . . 18. *Neocentropogon* p. 78.
 - b⁷. Origin of dorsal above eye. V. I. 4. A. III. 4-5. 19. *Paracentropogon* p. 80.
 - b⁶. Palatine teeth want-ing. Origin of

dorsal before or
above anterior part
of eye.

a⁷. V. I. 4.

a⁸. Anterior

profile of
head con-
vex. Dorsal
and anal
connected to
caudal pe-
duncle by
membrane . 20. *Cottapistus* p. 84.

b⁸. Anterior

profile of
head
straight.
Dorsal and
anal not
connected
with caudal
peduncle . 21. *Sibogapistus* p. 85.

b⁷. V. I. 5. Ante-

rior profile of
head with a
concavity be-
fore eye. Dor-
sal and anal
connected with
caudal peduncle
by membrane . 22. *Snyderina* p. 88.

Phenacoscorpius Fowler

(Fowler, Proc. U.S. Nat. Mus. LXXXV, 1938, p. 69)

Body compressed, back but little elevated. Head large, compressed, scaly. Snout short. Eye large. Teeth in villiform bands in jaws and vomer, present or absent on palatines. Gill opening wide, membranes scarcely united, free from isthmus. Pseudo-branchiae well developed. Spines of head strongly developed. Scales large, feebly ctenoid. Lateral line very short, only slightly developed on several anterior scales. Dorsal with XII spines and 9 rays. Anal with III spines and 5 rays. Lower 8-11 pectoral rays simple. Ventrals with a spine and 5 rays. Caudal rounded.

Distribution: Two species known, one from the Philip-pines and East Indies, the other from the Gulf of Aden, in depths from 37-366 fathoms.

1. **Phenacoscorpius megalops** Fowler (Fig. 1, p. 6)

Phenacoscorpius megalops Fowler, Proc. U.S. Nat. Mus. LXXXV, 1938, p. 70.

Phenacoscorpius megalops Herre, Philipp. Journ. Sci. 80, No. 4 (1951) 1952, p. 437.

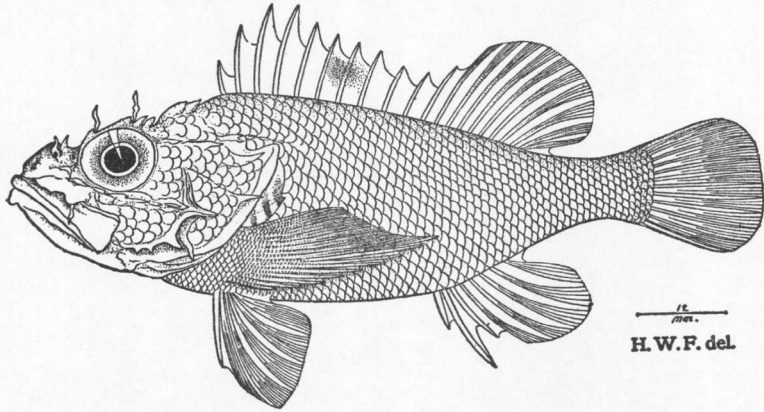


Fig. 1. *Phenacoscorpius megalops* Fowler. After Fowler.

D. XII. 9. A. III. 5. P. 18.8. V. I. 5. Sq. 1. 30 + 3. Ltr. 14—15.
Height 2.8—3. Head 2.2—2.3. Snout 4—4.2 in head. Eye 3.5—3.6, greater than snout or deeply concave interorbital space. Maxillary reaching to below middle of eye. Teeth finely villiform, in bands of moderate width in the jaws and small triangular band on vomer, none on palatines. Strong pair of nasal spines; pair of anterosupraorbitals, 3 pairs of posterosupraorbitals followed by 2 strong occipital and nuchal pairs; 3 postoculars, first small and close behind eye; strong suprascapular spine; 2 very broad obtuse preorbitals, suborbital stay with 6 or 7 spines, of which last may be double; 4 preopercular spines, with small one at outer front edge of uppermost, which longest; 2 widely divergent opercular spines, opposite and lower sometimes extends over gill opening; strong oblique humeral spine. Lateral line extends from suprascapula back on 4 or 5 scales, tubes large, well exposed and simple. Scales much smaller on breast, chest, and belly than on sides. More or less slender, simple, filaments at second supraorbital, occipital and second pre-orbital spines. Fourth dorsal spine $2\frac{7}{8}$ —3 in head, fourth ray $2\frac{1}{6}$ — $2\frac{1}{3}$. Second anal spine $2\frac{3}{5}$ — $2\frac{2}{3}$, third ray $2\frac{1}{8}$ — $2\frac{1}{5}$. Caudal $1\frac{4}{5}$ — $1\frac{7}{8}$, rounded behind. Least depth of caudal peduncle $4\frac{1}{5}$ —

4⁴/₅. Pectorals 1¹/₃—1²/₅, ventrals 1⁷/₈—2 in head. Pale brownish. Fins all pale to whitish. Spinous dorsal with dark brown to blackish blotch on sixth or seventh (or even eighth) membranes. Length 109 mm (after Fowler, not seen by me).

Habitat: Between Halmahera and Kao, 230—265 fathoms. — Philippines, 37–340 fathoms.

2. *Parascorpaena* Bleeker

(Bleeker, Versl. Akad. Amsterdam (2) IX, 1876, p. 296)

Body covered with scales which are cycloid or ctenoid. Throat and entire underside scaled. Head scaleless with exception of some deciduous scales on upper part of preopercle and opercle. Ridges of head with well developed spines. A scaleless pit behind eyes. Villiform bands of teeth in jaws, on vomer, and on palatines. Dorsal originating above posterior part of opercle, with XII spines and 9–10 rays. Anal with III spines and 5 rays. Pectoral rays simple in young, in adults the upper rays are generally divided. Gill openings wide, gill membranes free from isthmus and from each other.

Distribution: Indo-West Pacific.

Note. This genus is close to *Scorpaena*, from which it differs by the scaled throat and breast.

Key to the Indo-Australian species of *Parascorpaena*

- a. Upper rays of pectoral divided, at least in adults.
Scales cycloid 1. *P. picta* p. 7.
- b. All pectoral rays simple. Scales ctenoid. 2. *P. bandanensis* p. 10.

1. *Parascorpaena picta* (C. V.) (Fig. 2, p. 8)

Scorpaena picta (K. & v. H.) Cuvier & Valenciennes, Hist. Nat. Poissons IV, 1829, p. 321.

Scorpaena polyprion Bleeker, Verh. Bat. Gen. XIII, 1850. Bijdr. kennis Scleroparei, p. 7. Bijdr. kennis ichthyol. fauna Bali, p. 5.

Scorpaena picta Cantor, Journ. Asiat. Soc. Bengal XVIII, 1850, p. 1022.

Scorpaena picta Günther, Cat. Brit. Mus. II, 1860, p. 114.

Scorpaena polyprion Günther, l.c.

Scorpaena zanzibarensis Playfair, Fishes of Zanzibar, 1866, p. 47.

Scorpaena aplodactylus Day, Fishes of India, Part II, 1875, p. 149 (nec Blkr.).

Parascorpaena picta Bleeker, Verh. Akad. Amsterdam XVI (1873) 1876.

Mém. Scorpénoïdes, p. 25. — Atl. Ichth. IX, 1879. Tab. CCCCXII, Fig. 5.

Scorpaena bleekeri Day, Fishes of India, Part IV, 1878, p. 747.

Scorpaena picta M. Weber, Siboga Exp. Fische, 1913, p. 493.

Scorpaena bleekeri Giltay, Bull. Mus. Hist. Nat. Belg. IX, no. 14, 1933, p. 12.

Parascorpaena picta Herre, Philipp. Journ. Sci. 80, No. 4, 1952, p. 403.

Parascorpaena picta Munro, The marine and fresh water fishes of Ceylon, 1955, p. 248.

Scorpaena picta Inger. Fieldiana, Zool. 36. no. 3. 1957. p. 375.

D. XII. 9—10. A. III. 5. P. I. 4. 11 or 1. 5. 10 or 1. 6. 10. V.

I. 5. Ll. 34—40. Ltr. $\frac{6-8^1}{11-12}$.

Height 2.5—2.78, 3.1—3.5 in length with caudal. Head 2.3—2.6, 2.7—3.3 in length with caudal. Eye 3.3—4.5. Interorbital space very

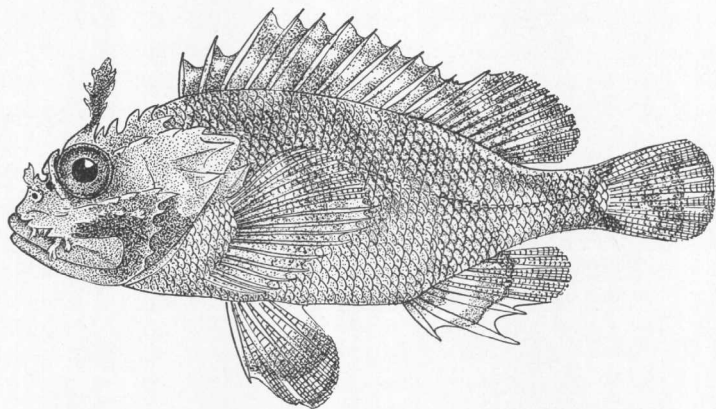


Fig. 2. *Parascorpaena picta* (C. V.). n. s.

concave, 1.2—1.8 in eye. Snout 1—1.5 in eye. Mouth oblique. Maxillary reaching almost to below hindborder of eye or not quite so far. Villiform bands of teeth in the jaws, in a Δ on head of vomer and in an elongate patch on palatines. Head naked, excepting a small patch of cycloid scales on upper part of preopercle and of opercle. Posterior nostril close before eye, anterior nostril with a flap. A blunt erect spine on the innerside of each anterior nostril, the peduncle of the premaxillaries fitting in between them. Supraorbital ridge with 3 spines, directed backwards. The parallel postorbital ridges with 3 spines, directed backwards, a deep depression between the anterior pair of spines. Two similar supraopercular spines. A strong preorbital spine directed forwards, a small spine at its base curved downwards and forwards. A minute spine directed upwards above it. Suborbital ridge with blunt spines in adults, scarcely developed in young ones, ending in a strong but slender preopercular spine. Three or four small spines below it on preopercular edge, the last one knob like. Two strong superior and one small inferior opercular

1) Counted between base of last dorsal spine and origin of anal.

spines. Short filaments along lower side of preorbital, preopercular and opercular edges, upper border of eye, and posteriorly on inter-orbital space. A large supraorbital denticulated tentacle, longer than eye, may be present. Body totally covered with cycloid scales, including the thoracic region anteriorly to isthmus. Four or five rows of scales before dorsal. A few cutaneous filaments at regular distances on lateral line, smaller ones on sides of body. Origin of dorsal above middle of upper border of opercle. First dorsal spine shorter than eye; spines increasing in length to the 4th or to the 5th and 6th which about equal eye and snout. Last dorsal spine longer than the penultimate one, about as long as or longer than snout. Membranes between the dorsal spines deeply incised. Soft dorsal rounded, the longest rays equal in length to 4th dorsal spine. Origin of anal below first dorsal ray. First anal spine about 2.5 in second, which is generally the longest and equal to postorbital part of head. Soft anal slightly rounded, the first ray as long as the second anal spine. Pectorals with a broad base, pointed, consisting of a weak spine, 4—6 branched rays and 10 or 11 thick simple rays, the longest median rays about as long as head without snout. Ventrals somewhat shorter than pectorals, their spine as long as the 4th dorsal spine. Caudal slightly rounded. Colour of preserved specimens brownish or yellowish, marbled with dark, in the form of irregular and indistinct broad transverse bands, down from base of spinous and from soft dorsal. Exceptionally a black blotch on nape. Fins light, mottled and banded with dark. An irregular oblique band on spinous dorsal, two more distinct ones on soft dorsal and anal. Caudal and pectorals with broad irregular transverse bars, which are less distinct on ventrals. Length 170 mm.

Nomen indig.: Lepu-karang (Benkulen).

Habitat: Singapore; Sumatra (Benkulen, Trussan, Ulakan, Priaman, Siboga, Tapanuli); Nias!; Batu Islands; Banka; Java (Jakarta, Karangbolong, Prigi); Bawean; Bali; Borneo (Pulo Bakkungaan Kachil, Pulo Nunuyan Laut); Savu!; Binongka!; Celebes (Macassar, Menado, Tanawanko); Biaru!; Talaut Islands!; Ternate; Ambon; Nusa Laut!; Tiur!; Kei Islands; Aru Islands!; Letti; Timor; New Guinea (Fr. Wilhelmshafen). — Seychelles, Zanzibar, Ceylon, Travancore, Andamans, Indochina, Pinang, Philippines, Fiji.

Note. M. Weber (l.c.) pointed out, that an orbital tentacle may be present in this species. Hence *bleekeri* and *zanzibarensis* can be considered as synonyms of *picta*. One of the two specimens described by Sauvage (Bull. Nouv. Arch. Mus. IX, 1873, p. 49)

from "Indes orientales" as *Scorpaena armata* and which I examined in the Paris Museum differs from *picta* in having the third anal spine the longest, but in the other one the second one is the longest. It has been recorded by Pillay (Journ. Bombay Nat. Hist. Soc. XXXIII, No. 2, 1929, p. 375) from Cape Comorin, and from Southport, Queensland, by Borodin (Vanderbilt Marine Mus. I, Art. 3, 1932, p. 89). Sauvage (Poissons de Madagascar, 1891, p. 291) describes *picta* from the Seychelles as having the second and third anal spines of equal length, hence intermediate between *picta* as described here and *armata*. I find the difference in length between the second and third anal spines of *picta* very variable, although the second is generally the longer.

2. *Parascorpaena bandanensis* (Blkr)

Scorpaena bandanensis Bleeker, Nat. Tijdschr. Ned. Indië II, 1851, 237.

Scorpaena aplodactylos Bleeker, ibid. III, 1852, p. 698.

Scorpaena haplodactylus Günther, Cat. Brit. Mus. II, 1860, p. 117.

Scorpaena bandanensis Kner, Novara Exp. Fische I, 1865-1867, p. 116.

Scorpaena haplodactyla Steindachner, Sitzber. Akad. Wiss. Wien LVI, 1867, p. 311.

Parascorpaena bandanensis Bleeker, Verh. Akad. Amsterdam XVI (1873) 1876, Mém. Scorpénoides, p. 26 — Atl. Ichthyol. IX. Tab. CCCCIV, Fig. 4.

Scorpaena bandanensis Steindachner, Abh. Senckenberg. naturf. Ges. XXV, Heft 11, 1901, p. 423.

Merinthe bandanensis Jordan & Seale, Bull. Bur. Fish. XXV (1905) 1906, p. 374.

Scorpaena bandanensis M. Weber, Siboga Exp. Fische, 1913, p. 495.

Scorpaena bandanensis Fowler, Monogr. Acad. Nat. Sci. Philadelphia II, 1938, p. 202.

?*Scorpaena mcadamsi* Fowler, Proc. U. S. Nat. Mus. LXXXV, 1938, p. 60.

Parascorpaena bandanensis Herre, Philipp. Journ. Sci. 80, 1952, p. 402.

D. XII. 9 (10). A. III. 5. P. 15. V. I. 5. Sq. lat. 34. Ltr. $\frac{5-6}{1}$.
10-11

Height 2.4—2.6, 3.2 in length with caudal. Head 2.2—2.4, 3 in length with caudal. Eye 3.4—3.8. Interorbital space a deep groove between two suborbital ridges, 1.6—2 in eye. Eye 1—1.2 in snout. Mouth somewhat oblique. Maxillary reaching to below hindborder of pupil. Villiform teeth in the jaws, in a Δ on head of vomer, and in narrow bands on palatines. Head naked, with exception of deciduous scales on upper part of opercle. Anterior and posterior nostrils close before eye, each with a short flap. A short, blunt, erect spine on the inner side of each anterior nostril, the peduncle of the premaxillaries fitting in between them. Supraorbital ridge with three recumbent spines. Two similar spines on each postorbital ridge, the ridges