

Family Polymixiidae

Body rather elongated. Head compressed, with decurved profile. Snout short. Mouth cleft lateral and nearly horizontal. Teeth fine, in bands in jaws and on palate. Two barbels at throat. Preopercle serrated. Gill openings large, membranes separate and free from isthmus. Pyloric appendages in moderate number. Air bladder with thin walls, with vestiges of pneumatic duct. Vertebrae 29. Scales ctenoid, not serrated. Lateral line concurrent with dorsal profile of back. Dorsal moderately long, with several spines, graduated posteriorly. Anal opposite hind part of dorsal. Pectoral rays branched. Ventrals thoracic, with spine and 6 or 7 rays.

Genus Polymixia Lowe

Polymixia Lowe, Trans. Cambridge
Philos. Soc., vol. 6, p. 198, 1838.

(Type Polymixia nobilis Lowe, monotypic.)

Hemobrama Valenciennes, Hist. Nat. Canaries,
vol. 2, pt. 2, p. 40, 1836-44. (Type Hemobrama
webbi Valenciennes, monotypic.)

Dinemus Poey, Mem. Hist. Nat. Cuba, vol. 2,
pp. 107, 161, 1860. (Type Dinemus
venustus Poey, monotypic.)

Body compressed, deepest medially. Head moderate, compressed. Snout short, obtuse. Eye high, large. Mouth large, inferior, upper jaw protruding. Maxillary reaches well below to behind eye. Barbels long. Teeth in villiform bands in both jaws, on vomer, palatines and pterygoids. Opercle without spine. Preopercle indistinctly crenulated. Pseudobranchiae present. Gill rakers moderate. Branchiostegals 4. Scales small, rather oblique. Lateral line complete, axial. One dorsal with 4 or 5 spines. Anal with 3 or 4 spines. Caudal forked. Paired fins low, short.

Small fishes living in rather deep water in tropical seas.

Analysis of species

a.¹ Scales small, 40 or more in lateral line.

b.¹ D. V, 28; scales 54 in lateral line to caudal base. lowei.

b.² D. V, 33; scales 42 in lateral line to caudal base. nobilis.

a.² Scales large, 33 to 35 in lateral line to caudal base; D. V or VI, 33 to 36. japonica.

bands; anal with longitudinal band; suborbital depth $1\frac{2}{5}$ in eye; caudal ends in upper filament.

japonicus.

p.² Head slender.

q.¹ Three rows of cheek scales.

r.¹ Single broad yellow median lateral band from snout tip through eye to caudal base; dorsal edged yellow; lower fins yellow; suborbital depth $3\frac{1}{4}$ in eye.

balinensis.

r.² Two longitudinal yellow bands from eye, 1 above and another below lateral line to caudal base; dorsals with 3 yellow longitudinal bands; suborbital depth 5 in eye.

nematopus.

r.³ Three longitudinal yellow bands, upper along edge of back, median along lateral line and lower from pectoral axil; dorsals edge yellow,

Count 3
name
only

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Polymixia lowei Günther

Polymixia lowei Günther, Cat. Fishes
Brit. Mus., vol. 1, p. 17, 1859 (type locality,
Caribbean Sea). — Poey, Repert. Hist.
Nat. Cuba, vol. 2, p. 159, 1865-68.

— Jordan and Evermann, Bull. U. S. Nat. Mus.,
No. 47, pt. 1, p. 854, 1896 (compiled). —

Jordan, Evermann, Clark, Rep. U. S. Comm.
Fishes. Append. pt. 2, 1928 (1930), p. 234
(reference).

Ainemus venustus Poey, Mem. Hist. Nat.
Cuba, vol. 2, pp. 161, 352, pl. 14, fig. 1, 1860
(type locality, Cuba [= Havana]).

— Günther, Zool. Record, Pisces, p. 147,
1868.

Polymixia nobilis (not Lowe) Günther,
Rep. Voy. Challenger, vol. 22, p. 34, 1887 (part).

— Goode and Bean, Oceanic Ichth., p. 243,
1895 (part).

Depth 3; head 3. Snout $4\frac{4}{5}$ in head; eye $2\frac{7}{8}$, greatly exceeds snout or interorbital; maxillary reaches slightly behind eye, expansion 2 in eye, length $1\frac{4}{5}$ in head; barbel $1\frac{1}{5}$, reaches back opposite pectoral origin; preopercle angle finely denticulate;

Scales 60 along lateral line; smaller on head and extend forward nearly to the nostrils.

D. V, 28, graduated up to fifth spine which $3\frac{3}{4}$ in head, front of soft dorsal $1\frac{9}{10}$; A. III, 16, third spine $4\frac{2}{5}$, front of soft anal $2\frac{3}{4}$; caudal $1\frac{1}{10}$, deeply forked, least depth of caudal peduncle $2\frac{2}{3}$; pectoral $1\frac{1}{2}$, rays 18; ventral rays I, 7, fin length $2\frac{1}{4}$ in head.

bands.

c.² Body with ~~dark~~ transverse blotches. smithii.

t.¹ Body with 5 dark transverse violaceous rosy blotches, reaching middle of sides; dorsals edged yellow.

t.² Body with 9 dark brown saddles; apparently giving place to pinkish or purplish longitudinal bands with eye; second and third dorsal spines and caudal filamentous. ovenii.

b.² First two dorsal spines elongated in filaments; body and head with yellow longitudinal bands; yellow band on anal; suborbital depth $\frac{2}{3}$ in eye. luteus.

a.² Odontoglyphis. Membranes of spinous dorsal notched marginally. nematophorus.

u.¹ Body and head with longitudinal yellow bands; fins uniform rosy. corrected

Delicate violet, dark on back and fins with white and golden reflections. Upper edge of orbit and 2 bands on snout above golden green. Maxillary rose. Iris white, with red and blue reflections. Inner edge of each caudal lobe whitish. Length 350 mm. (Poey.)

Caribbean Sea, Cuba. Günther described this species from a specimen 250 mm long. Some features slightly at variance ^{or omitted in} ~~with~~ the above are: Eye 3 in head; interorbital 4; scales 50 in lateral line; D. V, 30.

rays crossing lateral line, another parallel above one row of scales ends below last soft dorsal rays; below lateral line 6 or 7 silvery stripes wide as pupil; upper caudal lobe ends in filament.

1. Suborbital depth greater than eye. vigatus.

2. Suborbital depth half eye. aurifilum.

2. Five greenish yellow horizontal bands below lateral line; brilliant crimson shoulder spot; light blue bar before eye from above and another from below; dorsals bordered golden; anal basal half yellow, terminal half lilac with 3 basal and 2 median pale blue bands. theodorei.

3. Four rows of scales on cheek; 30 dark >-shaped dark bars along lateral line; dorsals with 2 yellow longitudinal caroli.

Polymixia nobilis Lowe

Polymixia nobilis Lowe, Trans. Cambridge Philos. Soc., vol. 6, p. 198, pl. 4, figs. 1-2, 1838 (type locality, Madeira). — Günther, Cat. Fish. Brit. Mus., vol. 1, p. 17, 1859 (Madeira; St. Helena); Proc. Zool. Soc. London, p. 238, 1869 (St. Helena). —

Bleeker, Res. Madagascar Pollen et Van Dam, pt. 4, p. 86, 1874 (Bourbon). —

Melliss, St. Helena, p. 105, 1875. —

Günther, Rep. Voy. Challenger, vol. 22, p. 34, pl. 1, fig. 31, 1887 (Madeira, Canaries, St. Helena). — Steindachner, Sitzs. Ber. Akad. Wiss. Wien, vol. 100, pt. 1, p. 356, 1891 (Las Palmas, Santa Cruz de Teneriffe, Valle de San Andres, 100 to 2500 meters, east coast Grand Canary). — Vinciguerra, Atti Soc. Ital. Sci. Nat., vol. 34, p. 313, 1892 (Canaries).

Hemobrama webbi Valenciennes, Hist. Nat. Canaries, vol. 2, pt. 2, p. 41, pl. 8, 1836-44 (type locality, Canaries).

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Depth $2\frac{3}{4}$; head $3\frac{1}{3}$. Snout $4\frac{1}{5}$ in head; eye $3\frac{2}{5}$, greater than snout; maxillary reaches opposite hind pupil edge, expansion $1\frac{2}{3}$ in eye, length 2 in head; barbel 1, reaches little beyond pectoral base; interorbital low.

Scales about 42 in lateral line to caudal base and 4 more on latter; 4 above, 11 above anal origin, 7 rows on cheek. Scales without basal radiating striae, basal edge with about 6 lobes and basally fine circuli; apically about 10 series of minute uniform denticles, or about 32 in a series.

with 2 bluish submarginal lines of soft fin; 2 pale yellow bands on anal; suborbital depth $1\frac{1}{2}$ in eye.

mesoprius.

r. 4 Five longitudinal yellow bands on head and body; dorsals edged yellow, with 2 bluish submarginal lines; anal with median yellow band; suborbital depth $1\frac{1}{8}$ in eye.

tumbuloides.

r. 5 Five longitudinal yellow bands, upper 2 and lowest from eye, third and fourth from suprascapula; 2 yellow bands on dorsals; suborbital depth $2\frac{7}{8}$ in eye.

sumbawensis.

r. 6 Nine narrow longitudinal yellow bands or lines on body; dorsals edged yellow; suborbital depth $1\frac{1}{3}$ in eye.

gracilis.

r. 7 narrow yellow line from opercle angle to bases of upper caudal

3 narrow

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D. V, I, 33, fifth spine $3\frac{3}{4}$
in head, first simple ray $1\frac{2}{3}$;
A. IV, 16, fourth spine $2\frac{7}{8}$,
first branched ray $1\frac{4}{5}$; caudal
 $3\frac{1}{5}$ in rest of fish, deeply
forked, lobes pointed; least
depth of caudal peduncle
 $2\frac{7}{8}$ in head; pectoral $1\frac{3}{4}$, rays
I, 16 or 17; ventral rays I, 6,
fin 2 in head.

Gray blue above, whitish on
under surface of head, chest,
breast and belly. Muzzle
gray. Iris yellowish and white.
Fins all more or less grayish,
vertical fins and pectoral
dark neutral slate. Barbels
and chin pinkish. Length
383 mm. (Lowe.)

A doubtful species, imperfectly described and only known from the type. Valenciennes says the suborbital is deep, scales on cheeks larger than those on body, 45 scales in lateral line, D. VIII, 9 and A. III, 7.

Madeira, Canaries, St. Helena.
Tremobrama webbiai Valenciennes
 is said to reach 350 mm. Some
 of its characters are shown as:
 Depth $2\frac{7}{8}$; head $3\frac{1}{10}$, width $2\frac{1}{2}$;
 eye $3\frac{4}{5}$ in head; maxillary
 reaches hind edge of orbit;
 barbels long as head, reach
 beyond ventral base; scales
 50 to 54 in lateral line, 4
 above, 9 below, 6 rows on cheek;
 D. V, 38; A. III, 18; pectoral
 rays 16, fin 2 in head; ventral
 rays I, 7. Greenish on back,
 silvery white below. Blue or
 greenish dots form 10 to 12
 longitudinal streaks, more
 distinct above.

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Synagris hexodon (Quoy and Gaimard)

Dentex hexodon Quoy and Gaimard, Voy.

Uranie, Zool., December 15, 1824, p. 301.

Junior. ¹/_m Valenciennes, Hist. Nat. Poiss.,

vol. 6, 1830, p. 242 (Junior). ¹/_m Bleeker,

Atlas Ichth. Ind. Néerland., vol. 8, 1876-77,

p. 84 (copied).

Synagris hexodon Günther, Cat. Fishes

Brit. Mus., vol. 1, 1859, p. 376 (copied).

Elongate ovoid. Snout blunt; eye high; mouth large. Six canines in each jaw with small villiform teeth behind. Scales large, ctenoid, exposures deeper than wide; jaws and caudal base scaly. Lateral line arched high. D. X, 10; A. III, 8; caudal forked, rays 17; pectoral rays 17. Body rosy, nearly uniform and silvery. Eye golden. Length 190 mm. (Quoy and Gaimard.)

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Polymixia japonica Günther

Polymixia japonica Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 20, p. 436, 1877 (type locality, off Inoshima, Japan, 345 fathoms). — Steindachner and Döderlein, Denks. Akad. Wiss. Wien, vol. 47, pt. 1, p. 221, pl. 4, fig. 2, 1883 (Tokyo). — Ishikawa and Matsuura, Cat. Fish. Mus. Tokyo, p. 58, 1897. — Jordan and Fowler, Proc. U. S. Nat. Mus., vol. 26, p. 18, 1902 (Misaki). — Jordan, Tanaka, Snyder, Journ. College Sci. Tokyo, vol. 33, p. 118, 1913 (Misaki). — Fowler, Mem. Bishop Mus., vol. 10, p. 96, 1928 (Honolulu). — Anonymous, Illustrat. Jap. Aquat. Plants and Animals, vol. 1, pl. 23, fig. 5, 1931.

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Polymixia nobilis (not Lowe) Günther,
Rep. Voy. Challenger, vol. 22, p. 34,
1887 (Trochium^{mauritius}). — Alcock, Ann. Mag.
Nat. Hist., ser. 6, vol. 4, p. 381,
November 1889 (Andaman Sea off Ross Island,
~~Wafura Sea~~, 271 fathoms);
ser. 6, vol. 8, p. 23, July 1891 (Wafura
Sea, 188 to 220 fathoms).

— Goode and Bean, Oceanic Ichth.,
p. 243, 1895 (part). — Alcock, Descript.
Cat. Fish. Indian Mus., p. 38, 1899
(Andaman Sea, 185 to 405 fathoms).

— Schmidt, Trans. Pac. Comm. Acad.
Sci. U. S. S. R., vol. 2, p. 38, 1931
(Tokyo; Misaki).

Bleeker, Rés. Madagascar Pollen et Van Dam,
pt. 5, p. 86, 1874 (Bourbon).

Polymixia berndti Gilbert, Bull. U. S. Fish
Comm., vol. 23, pt. 2, p. 616, pl. 78, 1903
(1905) (type locality, Honolulu; off
north west Oahu, 195 to 241 fathoms).

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Depth $2\frac{3}{5}$ to 3; head $2\frac{3}{4}$ to 3, width 2 to $2\frac{1}{10}$. Snout $4\frac{1}{3}$ to $4\frac{3}{4}$ in head; eye 3 to $3\frac{1}{5}$, greater than snout or interorbital; maxillary reaches $\frac{4}{5}$ till opposite hind eye edge, expansion $1\frac{2}{3}$ to 2 in eye, length $1\frac{3}{4}$ to $1\frac{7}{8}$ in head; interorbital $3\frac{4}{5}$ to 4, low, broadly convex; barbels reaches pectoral or ventral origin, $1\frac{1}{8}$ to $1\frac{1}{2}$ in head. Gill rakers 4 or 5 + 8 to 10, lanceolate, about equals gill filaments or half of eye, also ³ more above and 5 below as imperfect rudiments.

Scales 33 to 35 in lateral line to caudal base and 2 to 4 more on latter; 7 or 8 above, 15 or 16 below, 36 to 38 predorsal forward opposite front eye edge; 7 rows on cheeks. Scales with 5 to 7 basal marginal

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Acanthurus ctenodon Valenciennes, Hist.

Nat. Poiss., vol. 10, 1835, p. 178, plate 289.

Caroline Islands; New Guinea. — Günther,

Cat. Fish. Brit. Mus., vol. 3, 1861, p. 342

(Ceylon, Amboina, Ceram, New Hebrides). —

Bleeker, Verslagen ^{medl.} Akad. Wet. Amsterdam,

deel 15, 1863, p. 21 (Hiti, Amboina); deel 2

(2), 1868, p. 284 (Solor); deel 7 (2), 1873, p.

36 (Aru Islands). — Bleeker, Ned. Tijds.

dierk., deel 1, 1863, p. 254 (Wahai, Ceram), p.

271 (Atapupu, Timor). — Playfair, Fishes of

Zanzibar, 1866, p. 57 (Zanzibar). — Guichenot,

mem. Soc. Cherbourg, tome 2 (2), 1866, p. 146

(Madagascar). — Plunzinger, Verh. zool. bot.

Ges. Wien, band 21, 1871, p. 509 (Kosair, Red

Sea). — Meyer, Ann. Soc. Espan. Hist. Nat.

Madrid, vol. 14, 1885, p. 24 (Manado, Celebes).

Ctenodon ctenodon Fowler, Journ. Acad. Nat.

Sci. Phila., vol. 12, series 2, 1904, p. 545 (Padung).

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scallops; 38 to 40 apical denticles,
7 to 9 series transversely; circuli
fine.

D. V or VI, 33, I to 36, I, last
spine 3 to 4 in head, first ray
2 to 2 $\frac{1}{10}$; A. IV, 17, I to 17, I, last
spine 3 $\frac{1}{4}$ to 3 $\frac{1}{3}$, first ray 2 $\frac{2}{5}$ to
2 $\frac{4}{5}$; caudal 1 $\frac{1}{3}$ to 1 $\frac{2}{5}$, forked;
least depth of caudal peduncle 3 $\frac{1}{10}$
to 3 $\frac{1}{4}$; pectoral 1 $\frac{2}{3}$ to 1 $\frac{3}{4}$; ventral
2 $\frac{2}{5}$ to 2 $\frac{1}{2}$.

Olive brown above, below pale
or light brown, whitish when fresh
with silvery tinge. Front lobe terminally
of soft dorsal, fin otherwise brownish,
paler basally. Other fins all black,
more or less brownish, with edges,
including barbels, pale to whitish.
Iris silvery white, fades to yellowish
or brown in alcohol. Inside gill

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Acanthurus (Ctenodon) strigosus Klunzinger,
Fische. Roth. Meer., 1884, p. 85. — Steindachner,
Abhandl. Senckenberg. Gesell., band 25, 1900,
p. 427 (Batjan and Ternate).

Acanthurus striatus (non Duoy and Gaimard)
Valenciennes, Hist. Nat. Poiss., tome 10, 1835, p.
168 (part; Hawaiian Islands).

Ctenochaetus strigosus Fowler and Ball,
Bishop Mus. Bull., no. 26, 1925⁽¹⁹²⁶⁾, p. 19 (Laysan,
French Frigate Shoals, Johnston Island,
Wake Island).

Ctenochaetus striatus Evermann and Seale,
Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 97
(Zamboanga). — Snyder, Proc. U. S. Nat.
Mus., vol. 42, 1912, p. 423 (Misaki). —
Fowler and Bean, Proc. U. S. Nat. Mus.,
vol. 62, 1922, p. 57 (Zamboanga).

Ctenochaetus striatus Fowler, Proc. Acad. Nat.
Sci. Phila., 1923, p. 42 (Madagascar).

opening pale to dusky.

Andaman Sea, Japan, Hawaii.

U. S. N. M., no. 38829. Tokyo market.
Educational Museum. Length 178 mm.

U. S. N. M., no. 51607. Honolulu
market. Albatross Collection.
Length 185 mm, caudal tips broken.
Type of Polymixia berndti.

U. S. N. M., no. 57595. Japan.
P. L. Jouy. Length 181 mm.

U. S. N. M., no. 71273. Shimizu, Japan.
Bureau of Fisheries. Length 213 mm.

- Brit. Mus., vol. 3, 1861, p. 324 (type). —
Peters, Monatsb. Akad. Wiss. Berlin, 1876, p.
 440 (Mauritius). — Günther, Journ. Mus.
 Godeffroy, band 4, 1875, p. 116, plate 79, figs. B-C
 (Red Sea, East Africa, Hawaii, Polynesia).
 — Day, Fishes of India, pt. 2, 1876, p. 207, plate
 47, fig. 2 (Andaman). — Bleeker, Verhand.
 Akad. Wet. Amsterdam, deel 18, no. 3, 1879, p.
 2 (Mauritius). — Günther, Philos. Trans. Roy.
 Soc. London, vol. 168, 1879, p. 470 (Rodriguez). —
Day, l.c., Suppl., 1889, p. 789 (note). — Day,
 Fauna British India, vol. 2, 1889, p. 143. —
Steindachner, Denks. Akad. Wiss. Wien, band 71
 abth. 1, 1907, p. 140 (Bal Haf, South Arabia). —
Regan, Ann. Durban Mus., 1908, p. 246 (Kosi
 Bay). — Pearson, Ceylon Adm. Rep. Marine
 Biol., 1912-13, p. F6. — Weber, Siboga Exped.,
 band 65, 1913, p. 319 (Jawa Laut, Tjur, Kur).

Family Anomalopidae

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Body well compressed, rather deeply ovoid to elongate. Abdomen with median ridge. Head large or moderate, compressed, mucous cavities well developed. Snout short. Eye large, forward in head. Maxillary oblique, reaches below eye. Small teeth in bands in jaws and on palatines, none on vomer. Nostrils large, not separated from eyes by bony interspaces. Branchiostegals 7. Orbitosphenoid present. Scales small, stenoid, rugose. Lateral line axial, complete. Head scaleless, with large subocular ^{usually,} luminous organ. Two dorsals, spinous fin ^{when present} with weak short spines. Second dorsal and anal

preceded by 2 or 3 short spines.
moderate, latter little backward,
Caudal forked. Pectoral moderate
or small, rather low. Ventral
inserted little behind pectoral,
with spine and 5 rays.

Small pelagic or coral reef fishes,
of interest in possessing the
remarkable subocular phosphores-
cent organ, with which the fish is
able to shoot or shut off its beam
of light at will.

yellowish and rosy.

68232 U. S. N. M. Kagoshima, Japan.

Albatross Collection. Length 270 mm.

Type.

75145 U. S. N. M. Kagoshima, Japan.

Albatross Collection. Length 246 mm.

Paratype.

Analysis of Genera

a. Spinous dorsal present; ventrals fall well short of vent; caudal peduncle short.

b. Body deeply ovoid; head large; single fleshy tubercle behind eye; scales minute; lateral line arched in front, with well developed pores; subocular luminous organ with membranous curtain; no interdorsal space; anal spines 3. Kryptophanaron.

b.² Body elongate; head small; series of tubercles border eye posteriorly; scales moderate; lateral line not arched, irregularly straight, without prominent pores; subocular luminous organ without membranous curtain; interdorsal

Dentex marginatus Valenciennes, Hist. nat. Poiss., vol. 6, 1830, p. 245. Vanicolo; Java.

Dentex taeniopterus Valenciennes, Hist. nat. Poiss., vol. 6, 1830, p. 246. no locality. ¹/_m

Bleeker, Nederland. Tijdschr. Dierk., vol. 2, 1865, p. 173 (Siam); Verslagen

Med. Akad. Wetensch. Amsterdam, series 2, vol. 4, 1870, p. 250 (~~Amboina~~ Yang Tse Kiang,

Pa Yang; Kaw, Kiang, King Po); Atlas Ichth. Ind. Néerland., vol. 8, 1876-77, p. 83,

pl. (56) 334, fig. 5 (Sumatra, Singapore, Java, Celebes, Batjan, Amboina, Timor).

¹/₂ Tirant, Service Océanogr. Péch. Indo Chine, 1929, note 6, p. 168 (Phu Yen).

Synagris taeniopterus Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 374 (North east coast Australia; Molucca Sea). ¹/_m

Reise Novara, Fische, 1865, p. 269 (Madras).

¹/_m Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, 1876, p. 272 (off

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space present; anal spines 2.

Anomalops.

a.² Spinous dorsal absent; ventrals reach vent; caudal peduncle long; single fleshy tubercle behind eye; scales very small; lateral line distinctly arched in front, with pores; subocular luminous organ with membranous curtain; anal spines 2.

Photoblepharon.

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Cnemid¹⁷⁹ Synagris furcosus (Valenciennes)
Dentex furcosus Valenciennes, Hist. Nat.
Poiss., vol. 6, 1830, p. 244. Trinqueville, Ceylon.
¹/₂₇ Bleeker, Verhandl. Batavia. Genootsch.
(Nat. Ich. Bengal), vol. 25, 1853, p. 38. ¹/₂₇
Fowler, Mem. Bishop Mus., vol. 10, 1928, p.
220 (copied Day).

Synagris furcosus Günther, Cat. Fishes
Brit. Mus., vol. 1, 1859, p. 373 (Amboina,
Lousiades, Chaumont Island, Lamlay
[Larnley] Island, Australia). ¹/₂₇ Alleyne
and Macleay, Proc. Linn. Soc. New South
Wales, vol. 1, 1876, p. 271 (Palm Islands to
Cape Grenville). ¹/₂₇ Macleay, Proc. Linn. Soc.
New South Wales, vol. 5, 1881, p. 383 (North
and North-east Australia, Palm Islands,
Cape Grenville); vol. 8, 1883, p. 262 (Moresby
Island, New Guinea). ¹/₂₇ Meyer, An. Soc.
Españ. Hist. Nat. Madrid, vol. 14, 1885,
p. 15 (North Celebes).

Genus Kryptophanaron Silvester and Fowler

Kryptophanaron Silvester and Fowler,
Proc. Acad. Nat. Sci. Philadelphia,
vol. 78, p. 246, 1926. (Type
Kryptophanaron alfredi Silvester and
Fowler, orthotypic.)

Body oblong ovoid, compressed,
rather deep. Caudal peduncle
moderate. Head rather large,
compressed. Snout short, obtuse.
Eye large, anterior, high. Mouth
well inclined, mandible protruded.
Premaxillaries notched, protractile.
Maxillary slender anteriorly, abruptly
expanded behind. Bands of
villiform teeth in jaws and on
palatines, none on vomer or tongue.
Nostrils double. Interorbital low.
Gill rakers slender. ^{Pseudobranchiae large.} Stomach
coecal. Pyloric coeca ^{10, large.} present.
Air bladder ^{large,} divided, thin walled.
Gills 4, slit behind fourth.
Clavicle broad, hind edge above
pectoral fin, expanded and

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projecting free. Post-temporal strong. Vertebrae 16 + 14. Scales very small, ctenoid, rather irregular. Series of modified scales along lateral line and at soft dorsal and anal bases. Abdomen serrated. Lateral line little arched at first, axial, pores well developed. Subocular luminous organ with membranous movable curtain. Single fleshy tubercle behind eye. Bones of head entire, scaleless and finely sculptured, divided by naked tubiferous interspaces. Spinous dorsal small, spines weak. Soft dorsal higher and larger. Anal with few small spines, soft fin shorter than soft dorsal. Caudal broad,

Dorsal edged orange, with golden basal band. Length 200 mm. (Day.)

Arabia, India, Ceylon, Singapore.

According to Day close to Synagris notatus, differing in dentition and coloration.

forked, rudimentary rays well developed. Pectoral moderate. Ventrals little smaller than pectorals and placed little backward, behind pectorals.

One species in the West Indies.

conic teeth in last $\frac{2}{3}$ of mandible, anteriorly in jaw short inner villiform band; preorbital depth $1\frac{2}{3}$ in eye; interorbital low; preopercle entire.

Scales 48 in lateral line; 4 above, 11 below (7 above anal origin on figure), 3 rows on cheek and preopercle flange naked, predorsal extend forward opposite eye center.

D. X, 9, third spine 3 in total head length and edge of membranes not notched, first ray $2\frac{1}{5}$; A. III, 7, third spine $3\frac{3}{4}$, first ray $2\frac{1}{3}$; caudal equals head, forked, lobes pointed; least depth of caudal peduncle 3; pectoral $1\frac{1}{5}$; ventral 3 in combined head and body to caudal base.

Reddish above, silvery along sides and below where yellow bands exist. Bluish spot on opercle. Fins reddish.

Kryptophanaron alfredi Silvester and
Fowler

Kryptophanaron alfredi Silvester and
Fowler, Proc. Acad. Nat. Sci.
Philadelphia, vol. 78, p. 246, pl. 18,
fig. 1, pl. 19, fig. 2 (radiograph) and
45 (enlarged head) ¹⁹²⁶ (type locality,
off Kingston Harbor, Jamaica, West
Indies). — Jordan, Evermann, Clark,
Rep. U. S. Comm. Fisher., Append., pt. 2,
1928 (1930), p. 234 (reference).

Depth $2\frac{1}{2}$; head $2\frac{3}{5}$, width 2. ^{to eye}
Snout $3\frac{3}{4}$ in head from snout tip;
eye 4, ~~greatly exceeds snout or~~
~~interorbital~~; maxillary reaches
~~about $\frac{3}{4}$ in eye or $\frac{2}{3}$ in orbit~~
subequal with snout or interorbital;
orbit $2\frac{2}{3}$ in head from snout tip,
greatly exceeds snout or interorbital;
maxillary reaches $\frac{3}{4}$ in eye, $\frac{2}{3}$ in
orbit; interorbital $\frac{3}{4}$ of ~~the~~ orbit,
slightly convex. Gill rakers 7+19.
Scales about 150 in lateral series
along lateral line; 20 above, 60 below.

93a

Island, Ragay Gulf, Luzon. March
10, 1909. Length 124 to 152 mm. [1284.]

Olive and silvery gray, white below.
Large black lateral blotch under
middle of lateral line. Few dashes of
lilac blue about eye, near nostril and
on little of lower edge of orbit.

Opercular flap slightly dusky. Scales
of back and upper sides with pearly
spot in center, olive of sides more or
less bar like and reticulated. Dorsal
very pale olive, clouded with vinaceous.
Anal pale olive, slightly vermilion at
tip of soft portion. Caudal olivaceous
basally, vermilion terminally and 3

997

Lateral line with 34 enlarged scutes. Row of 16 white, possibly luminous scutes along soft dorsal base and median row along abdomen 7. Each scale with several apical spinules, longer or more prominent on scales posteriorly on body.

D. IV, II, 14, soft fin height $2\frac{1}{6}$? in total head length; A. III, 10, ^{soft} fin height $2\frac{1}{5}$?; caudal $1\frac{2}{5}$, deeply forked; least depth of caudal peduncle $3\frac{3}{4}$; pectoral $1\frac{1}{2}$, rays 16 or 17; ventral rays I, 6, fin 2 in total head.

Dark chocolate brown.

Subocular luminous organ light yellow, curtain black. Iris dark.

Synagris notatus Day, Fishes of India,
pt. 1, 1875, p. 93, pl. 24, fig. 3. ^m Ramsay
and Ogilby, Proc. Linn. Soc. New South
Wales, series 2, vol. 1886, p. 8 (Strickland
River, New Guinea).

hemipterus güntheri Ogilby, mem.
Queensland Mus., vol. 6, Dec. 19, 1918, p. 58
(on Synagris furcosus Günther 1859, thought
not of Valenciennes).

Gempyoze rubricauda (de Vis) Kent,
Great Barrier Reef, 1893, p. 281 (369).
Queensland. (no description)

Lutianus rubricaudus (de Vis) Ogilby,
mem. Queensland Mus., vol. 6, Dec. 19, 1918,
p. 58, Somerset, North Queensland. (name
in synonymy; description of type.)

hemipterus robustus Ogilby, Proc. Roy.
Soc. Queensland, vol. 28, 1916, p. 114 (another
new name for Synagris furcosus Günther).

Jamaica. Only known from the type, described above.

Princeton University Museum.
Off Kingston Harbor, Jamaica.
July 1908. Professor Ulric
Dahlgren. Length 104 mm.
Type.

Cape Sidmouth). ~~1~~_m Macleay, Proc. Linn.
Soc. New South Wales, vol. 5, 1881, p. 384

(North east coast Australia and Cape
Sidmouth). ~~1~~_m Károli, Termesz. Füzetek,
Budapest, vol. 5, 1881, p. 154 (Sarangoon).

~~1~~_m Day, Fauna British India, Fishes,
vol. 1, 1889, p. 29. ~~1~~_m Kent, Great Barrier

Reef, 1893, p. 283 (Queensland).

Hemipterus taeniopterus Jordan and
Seale, Bull. Bur. Fisher., vol. 26, 1906

(1907), p. 21. Cavite. ~~1~~_m Evermann and
Seale, Bull. Bur. Fisher., vol. 26, 1906
(1907), p. 82 (Van Fabian).

Dentex (Synagris) notatus Day, Proc. Zool.
Soc. London, 1870, p. 684. Andaman Islands.

Dentex notatus Fowler, Journ. Acad. Nat.
Sci. Philadelphia, series 2, vol. 12, 1904, p.

527 (Padang); Proc. Acad. Nat. Sci.

Philadelphia, 1929 (1913), p. 645 (Padang
example).

Genus Anomalops Kner

Anomalops Kner, Sitzs. Ber. Akad. Wiss. Wien, ^{math.-naturw. Kl.} vol. 58, pt. 1, pp. 26, 294, 1868. (Type Anomalops graeffei Kner, monotypic.)

Body rather elongate, compressed, though robust. Head rather small, deep. Snout short, blunt. Eye large, with row of papillae along superior ^{and posterior} part of preorbital border. Mouth rather large, oblique. Jaws equal in front, with bands of small teeth. Teeth on palatines, absent from vomer. Opercles smooth. Branchiostegals 8. Scales medium, regular, rugose, ctenoid, form serrated ridge on belly. Lateral line not arched, straight, axial along side of back, without prominent pores. Luminous subocular organ without membranous curtain. Two dorsals, first with 5 spines, second fin with spine and 14 rays. Anal with 2 short spines. Caudal small, forked.

1000
Pectoral short. Ventral small,
with weak spine.

Indo Pacific.

380

Depth $2\frac{4}{5}$ to $3\frac{1}{5}$; head $2\frac{4}{5}$ to $3\frac{2}{5}$, width $1\frac{9}{10}$ to $2\frac{1}{4}$. Snout $2\frac{3}{5}$ to $2\frac{4}{5}$ in head; eye $4\frac{1}{8}$ to $4\frac{1}{4}$, $1\frac{2}{5}$ to $1\frac{1}{2}$ in snout, slightly greater than interorbital; maxillary reaches $\frac{1}{3}$ in eye, expansion $1\frac{1}{2}$ to $1\frac{3}{5}$ in eye, length $2\frac{1}{4}$ to $2\frac{2}{5}$ in head; teeth in narrow villiform bands in jaws of 3 or 4 irregular series and outer enlarged lateral row; 6 canines in front of each jaw; palate and tongue toothless; interorbital $3\frac{1}{4}$ to $4\frac{1}{3}$, very slightly elevated, nearly level; preopercle edge entire and both along its flange and preorbital parallel marginal venule; opercular spine short, flat, blunt. Gill rakers 5+8, short flat spinescent tubercles $2\frac{1}{2}$ in gill filaments, which $1\frac{1}{2}$ in eye.

Scales 45 to 47 in lateral line to caudal base and 2 or 3 more on latter;

Anomalops katoptron (Bleeker)

Heterophthalmus katoptron Bleeker,
Act. Soc. Sci. Ind. Néerl., vol. 1,
Manado, p. 43, 1856 (type locality,
Manado, Celebes); Nat. Tijds. Ned.
Indië, vol. 16, p. 253, 1858 (1859)
(); Act. Soc. Sci.
Ind. Néerl., vol. 8, Amboina, p. 9,
1860 (); Atlas
Dch. Ind. Néerl., vol. 9, pl. (1) 455,
fig. 1, 1877. — Vordeman, Nat. Tijds.
Ned. Indië, vol. 59, p. 73, 1899.

Anomalops katoptron Bleeker, Drech.
Néerl. Sci. Nat. Harlem, vol. 13, p. 48,
1878 (Doreh —). — Weber,
Siboga Exped., vol. 57, Fische, p. 189,
fig. 49, B. (Banda —). — Steche,
Zeitschr. Wiss. Zool., vol. 93, p. 355,
1909.

— Silvester and Fowler, Proc. Acad. Nat.
Sci. Philadelphia, vol. 78, p. 247, pl.
18, fig. 2, pl. 19, fig. 1 (radiograph),
1926 (Weber's material).

— Fowler, Mem. Bishop Mus., vol. 10, p. 97, 1928 (Rarotonga). — Weber and Beaufort, Fishes Indo Austral. Archip., vol. 5, p. 225, fig. 65, 1929 (Banda). — Fowler, Mem. Bishop Mus., vol. 11, no. 5, p. 321, 1931 (reference).

Anomalops graeffei Kner, Sitzs. Ber. Akad. Wiss. Wien, vol. 58, pt. 1, pp. 26, 294, pl. 1, fig. 1, 1868 (type locality, Kandavu).

Anomalops palpebratus (not Boddaert) Günther, Journ. Mus. Godeffroy, vol. 5, pt. 11, p. 143, pl. 91, fig. A, 1876 (Paumotu). — Seale, Occas. Pap. Bishop Mus., vol. 4, no. 1, p. 2, 1906 (Fate', New Hebrides; Rarotonga).

Depth $2\frac{7}{8}$; head $2\frac{7}{8}$. Snout $4\frac{3}{4}$
 in head; eye $2\frac{3}{4}$, 3 in snout,
 subequal with interorbital;
 maxillary reaches $\frac{3}{4}$ in eye,
 expansion $2\frac{1}{3}$ in eye, length 2
 in head; interorbital $2\frac{2}{3}$,
 with slight median depression.
 Gill rakers 10 + 23, lanceolate,
 $1\frac{4}{5}$ in eye; gill filaments $\frac{3}{5}$
 of gill rakers.

Scales 74 close along and
 above lateral line to caudal
 base and 7 more on latter;
 tubular scales 55 in lateral
 line to caudal base; 10 above,
 22 below, 16 predorsal.
 narrow band of scales along
 soft dorsal. Scales with 20
 to 25 well developed apical
 denticles, 1 to 4 in transverse

Ann. Soc. Españ. Hist. Nat. Madrid,
vol. 14, 1885, p. 19 (Cebu, Ternate). ¹/_m

Regan, Proc. Zool. Soc. London, pt. 1, 1909,
p. 403 (Christmas Island, Indian Ocean).

Sphaerodon heterodon Elera, Cat.
Fauna Filipinas, vol. 1, 1895, p. 483 (Cebu).

Sphaerodon lunus Günther, Ann.
Mag. Nat. Hist., series 5, vol. 4, 1879, p.

137. Eua, Friendly Islands. — Pöhl,
Cat. Mus. Godeffroy, no. 9, 1884, p. 29 (North Cook Island).

Depth $2\frac{1}{4}$ to $2\frac{3}{5}$; head $2\frac{4}{5}$ to $2\frac{7}{8}$,
width 2 to $2\frac{1}{10}$. Snout $2\frac{1}{10}$ to 3 in head;
eye $2\frac{1}{5}$ to $3\frac{3}{4}$, greater than snout in
young to $1\frac{7}{8}$ with age, greater than
interorbital in young to $1\frac{1}{4}$ with age;
maxillary reaches $\frac{1}{10}$ to $\frac{2}{5}$ in eye,
expansion $1\frac{1}{8}$ to $3\frac{1}{2}$ in eye, length 2
to $2\frac{4}{5}$ in head; upper and lower
front canines, followed by single row
of 7 molars above and below on each
side of jaw, also small patch of

series; circuli fine basally.

D. V - I, 14, third spine $2 \frac{2}{3}$ in head, first branched ray $1 \frac{5}{6}$; A. I, 11, I, first branched ray $2 \frac{1}{5}$; caudal $1 \frac{1}{3}$, well forked; pectoral $1 \frac{4}{5}$; ventral $1 \frac{7}{8}$.

Dark brown. Iris slate. Infraorbital organ white, in black pigment. Spinous dorsal blackish. Soft dorsal pale, with broad, subterminal blackish brown longitudinal band and another less wide basally. Anal blackish brown, edge narrowly whitish. Caudal dusky, upper and lower edges narrowly pale. Paired fins dusky black, hind edges narrowly whitish.

1895, p. 4-1 (compiled).

Monotaxia india Bennett, Life of Raffles, 1830, p. 683. Sumatra.

Lethrinus latidens Valenciennes, Hist.

Nat. Poiss., vol. 6, 1830, p. 316. New Guinea.

¹/_m Richardson, Zool. Voy. Sulphur, ^{Fishes} vol. 1, 1846, p. 145 (probably New Guinea).

¹/_m Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 464 (copied).

Sphaerodon latidens Kner, Reise Novara, Fische, 1865, p. 83, pl. 4, fig. 1 (Australia).

Pagrus heterodon Bleeker, Natuurk. Tijdschr. Nederl. Indië, vol. 6, 1854, p. 54. Singangole, Palmakheira.

Sphaerodon heterodon Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 465

(Amboyna; Ceylon). ¹/_m Schmeltz, Cat. Mus. Godeffroy, no. 4, 1869, p. 14 (Kandavu).

¹/_m Day, Fishes of India, pt. 1, 1875, p. 138.

¹/_m Károli, Termész. Füzetek, Budapest, vol. 5, 1881, p. 157 (Ceylon). ¹/_m Meyer,

East Indies, Melanesia, Polynesia.
I have studied a single example
116 mm. long from Rarotonga,
Cook Islands, now in the
Bishop Museum.

1925, p. 26 (Honolulu). ¹/_m Fowler and
Ball, Bull. Bishop Mus., no. 26, 1925, p. 15
 (Wake Island). ¹/_m Herre and Montalban,
 Philippine Journ. Sci., vol. 33, no. 4,
 Aug. 1927, p. 425, pl. 5, figs. 2-3 (Olongapo,
 Ambil Island, Gaspar Island,
 Simara Island, Agutaya, Samal
 Island, Manila). ¹/_m Fowler, Mem.
 Bishop Mus., vol. 10, 1928, p. 219, pl. 18c
 (Honolulu, Shortland Island, Parotonga,
 Tubuai, Wake Island, Apia, Urhno,
 Elbow Island, Society Islands, Upiang);
 Proc. Acad. Nat. Sci. Philadelphia,
 1929 (1930), p. 644 (Honolulu).
Monotaxis (Sphaerodon) grandoculis Peters,
 Monatsber. Akad. Wiss. Berlin, 1876 (1877),
 p. 834 (Carteret Harbor, New Ireland).
Cantharus grandoculis Suwaq, Hist. Nat.
 Madagascar, Poiss., 1891, p. 192, pl. 20, figs.
 3-3a. ¹/_m Elera, Cat. Fauna Filipinas, vol. 1,

Genus Photoblepharon Weber

Photoblepharon Weber, Siboga Exped.,
 Introduction, p. 108, 1902. (Type
Sparus palpebratus Boddaert,
 monotypic.)

Body deep, compressed. Head rather large, deep. Snout short, obtuse. Eye large, with 2 rows of papillae along superior part of postorbital border. Mouth rather large, very oblique. Jaws equal in front, with bands of small teeth, forming an external patch on each side of symphysis of lower jaw. Few small teeth on palatines, none on vomer. Opercles smooth. Branchiostegals 8. Scales very small, rugose, ctenoid, on belly forming indistinct serrated ridge between vent and ventrals. Lateral line distinctly arched in front, with pores. Luminous subocular organ with membranous curtain. One dorsal, spinous fin absent, with 5

simple and 15 or 16 branched,
of which first 2 simple ones
pungent. Anal with 2 short
weak spines. Caudal forked.
Pectoral moderate, low.
Ventral thoracic, with spine
and 5 branched rays.

One species in the East Indies.

radiating striae; 123 to 135 apical denticles, minute short points, with 2 to 16 transverse series of basal elements; circuli very fine.

D. IX, 9, I, fourth spine $2\frac{7}{8}$ to $3\frac{1}{10}$ in head, seventh ray $1\frac{4}{5}$, last ray 2; A. III, 7, I, third spine $2\frac{7}{8}$ to 3, first ray $2\frac{2}{5}$; lower caudal lobe $1\frac{1}{5}$, fin deeply forked; least depth of caudal peduncle 3 to $3\frac{1}{4}$; pectoral 1 to $1\frac{1}{8}$; ventral $1\frac{1}{10}$ to $1\frac{2}{5}$.

Back light brown with pink tinge, sides and below still paler with silvery white sheen, lower or under edge of body sulphur yellow. Iris light yellowish. Inside gill opening reddish. Dorsals edged grayish, with ill defined submarginal dusky line whole length. Caudal filament of upper lobe $2\frac{1}{5}$ in rest of body, sulphur yellow.

Photoblepharon palpebratus (Boddaert)

Sparus palpebratus Boddaert, Neue Nord. Beiträge, band 2, Petersburg und Leipzig, p. 55, 1781 (type locality, Amboina). pl. 4, fig. 1,

— Bonnaterre, Tabl. Ichth., p. 104, 1788 (Amboina). — Gmelin, Syst. Nat. Linn., ~~vol. 1~~ vol. 1, p. 1274, 1789 (Amboina). — Walbaum, Artedi Pisc., vol. 3, p. 289, 1792 (copied). — Forster, Fauna Indica, p. 15, 1795 (reference).

Kurtus palpebratus Schneider, Syst. Ichth. Bloch, p. 164, 1801 (compiled).

Bodianus palpebratus Lacépède, Hist. Nat. Poiss., vol. 4, pp. 278, 286, pl. 4, fig. 2, 1802 (on Bonnaterre).

Heterophthalmus palpebratus Bleeker, Nat. Tijds. Ned. Indië, vol. 16, p. 253, 1858-59.

1009

Photoblepharon palpebratus Weber,
Siboga Exped., Introduction, p. 108, 1902

— Steche, Zeitschr. Wiss. Zool., vol. 93,
p. 354, 1909 (subocular luminous organ).

— Weber, Siboga Exped., vol. 57, Fische,
p. 190, 1913 (Banda).
figs. 50-51

— Silvester and Fowler, Proc. Acad. Nat. Sci.
Philadelphia, vol. 78, p. 247, pl. 18, fig. 3,
pl. 19, fig. 3 (radiograph), 1926 (Weber's
material). — Weber and Beaufort,
Fishes Indo Austral. Archip., vol. 5,
p. 227, figs. 66-67, 1929 (Banda).

(95b)

13591. Tanakeke Island, Flores Sea.
December 21, 1909. Length 204 mm.

A 1401. Tampungana Island. December
21, 1909. Length 228 mm. General color
dark. Lateral blotch formed by
darkened scale margins. Slight tinge
of blue below eye and in nostril.
Opercular flap without scarlet.
Dorsals with pale mottling on vermilion
hyaline. Caudal similar but markings
more distinct. Paired fins with slight
orange shade.

1010

Depth $2\frac{1}{4}$; head 3. Snout $5\frac{1}{2}$
in head; eye $2\frac{1}{5}$, greatly
exceeds snout; maxillary reaches
about $\frac{2}{5}$ in eye, length $2\frac{1}{4}$ in
head; interorbital low.

Scales about 110 along lateral
line; scales 40 in lateral line.
Lateral line with distinct
anterior arch, with pores.

D. III, 15 or 16, fin height
anteriorly $1\frac{1}{4}$ in head; A. IV, 14
or 15, fin height anteriorly $1\frac{4}{5}$;
caudal 1, deeply forked;
least depth of caudal peduncle
 $2\frac{7}{8}$; pectoral $1\frac{1}{4}$, rays I, 14;
ventral rays I, 5, fin length $1\frac{1}{2}$
in head.

Brown. Iris brown. Subocular
luminous organ white. Fins
brown.

and 4 much smaller lower in front; interorbital $3\frac{3}{5}$ to $4\frac{1}{4}$ very slightly elevated or broadly convex; hind preopercle edge with some very feeble minute serrae, rest of edge below entire; orbital region, interorbital, preorbital and preopercle venulose; opercle with short, broad, flat spine. Gill rakers 6 or 7 + 6 to 8 short flat spinescent tubercles, $\frac{1}{3}$ of gill filaments, which $\frac{1}{2}$ of eye.

Scales 46 or 47 in lateral line to caudal base and 2 to 4 more on latter; 4 or 5 above, 11 to 14 below, 14 or 15 predorsal forward opposite eye center; 3 rows on cheeks, preopercle flange naked. Suprascapula scale venulose, like upper row of occipital scales and forward around eye and interorbital. Scales with 6 to 9 basal

East Indies. Said to reach
90 mm.

Cm 179

Synagris bathybuis (Synoder)hemipterus bathybuis Synoder, Proc. U. S.

Nat. Mus., vol. 40, 1911, p. 532, fig. 6.

Kagoshima, Japan.

Euthyopteroma bathybuis Synoder, ~~Proc.~~

U. S. Geol. Surv.,

~~Proc.~~ vol. 42, 1912, p. 415 (Kagoshima).

(Error.)

Euthyopteroma bathybuis Jordan andThompson, Proc. U. S. Nat. Mus., vol. 41,

1912, p. 566, fig. 6 (type).

Depth 3 to $3\frac{1}{5}$; head 3 to $3\frac{1}{3}$, width $1\frac{4}{5}$ to $1\frac{7}{8}$. Snout 3 to $3\frac{2}{3}$ in head; eye 3 to $3\frac{2}{3}$, greater than snout to $1\frac{1}{5}$, greater than interorbital to $1\frac{1}{8}$; maxillary reach $\frac{1}{8}$ to $\frac{1}{5}$ in eye in young, to front eye edge with age, expansion $\frac{1}{2}$ to 3 in eye, length $2\frac{1}{2}$ to $2\frac{3}{4}$ in head; teeth with inner band villiform, -outer row little enlarged, of which 6 to 9 upper canines anteriorly