

**Larvae of two Indo-West Pacific anthiine fishes,
Gigantias immaculatus and *Serranocirrhitis
latus* (Perciformes: Serranidae)**

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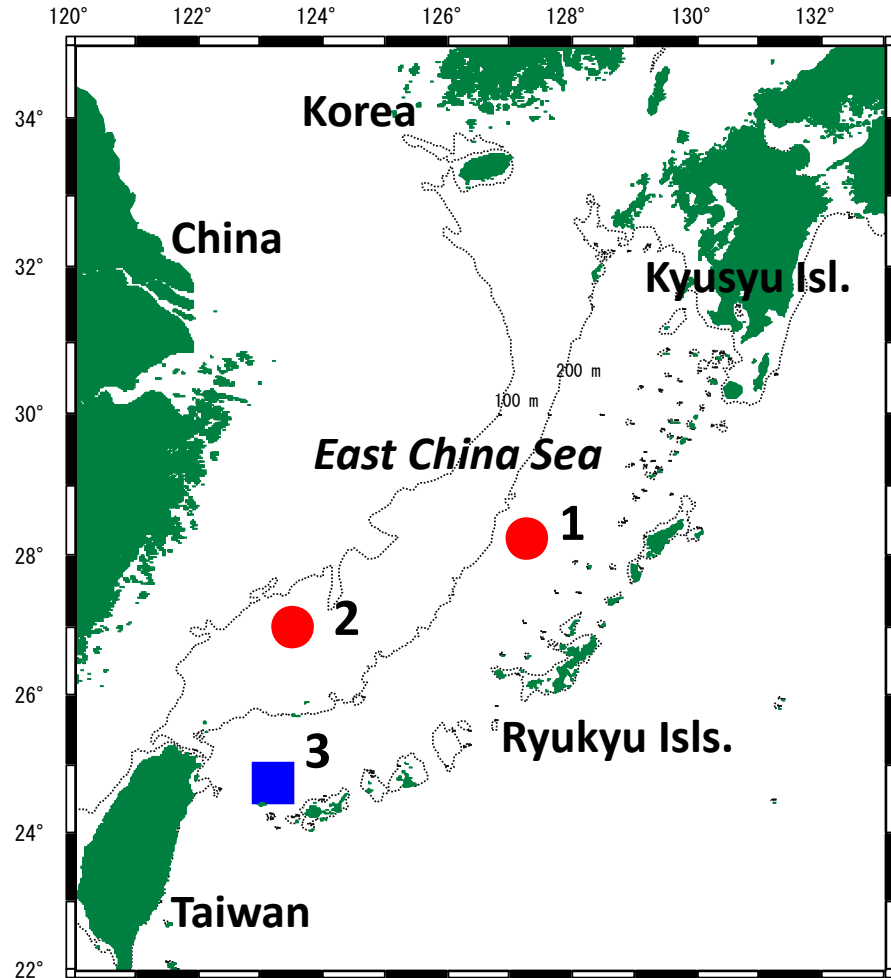
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Introduction

- The subfamily Anthiinae, coral reef and rocky fishes, consists of at least 21 genera with about 170 species in the world, most being Indo-Pacific (Nelson, 2006).
- In Japanese waters, at least 47 species fishes in 13 genera inhabit (Senou, 2013).
- Larval fish Information of Anthiinae in the West Pacific is restricted due to mostly indistinguishable fin-ray counts, only several species larvae being reported so far.
- In this presentation, larvae of two Indo-West Pacific anthiine species with specific fin-ray counts are described based on the three specimens, and their pigmentation and head spination are compared with those of the other species from literatures and specimens collected from the western North Pacific.

Materials

- 1 *Gigantias immaculatus*
 - 5.4 mm SL (postflexion)
 - 10 Feb., 2007
 - Bongo net (oblique, from 153-m depth)
- 2 *Gigantias immaculatus*
 - 4.2 mm NL (flexion)
 - 24 Feb., 2007
 - Bongo net (oblique, from 107-m depth)
- 3 *Serranocirrhites latus*
 - 6.8 mm SL (postflexion)
 - 13 Sept., 1986
 - IKPT net (oblique, from 110-m depth)



Identification (1/2)

1. Morphological characteristics of anthiine larvae

- **Body shape moderate to deep**
- **Anus beyond midbody**
- **Spinous dorsal fin and pelvic fin early forming**
- **Head ornamentation and spination extensive, usually preopercle and interopercle spines well developed**
- **Fin spines sometimes serrate**
- **Pigment not heavy**

Leis and Rennis (2000); Baldwin (1990)

Identification (2/2)

2. Fin-ray counts and number of vertebrae (=myomeres)

Meristics of Japanese anthiine genera

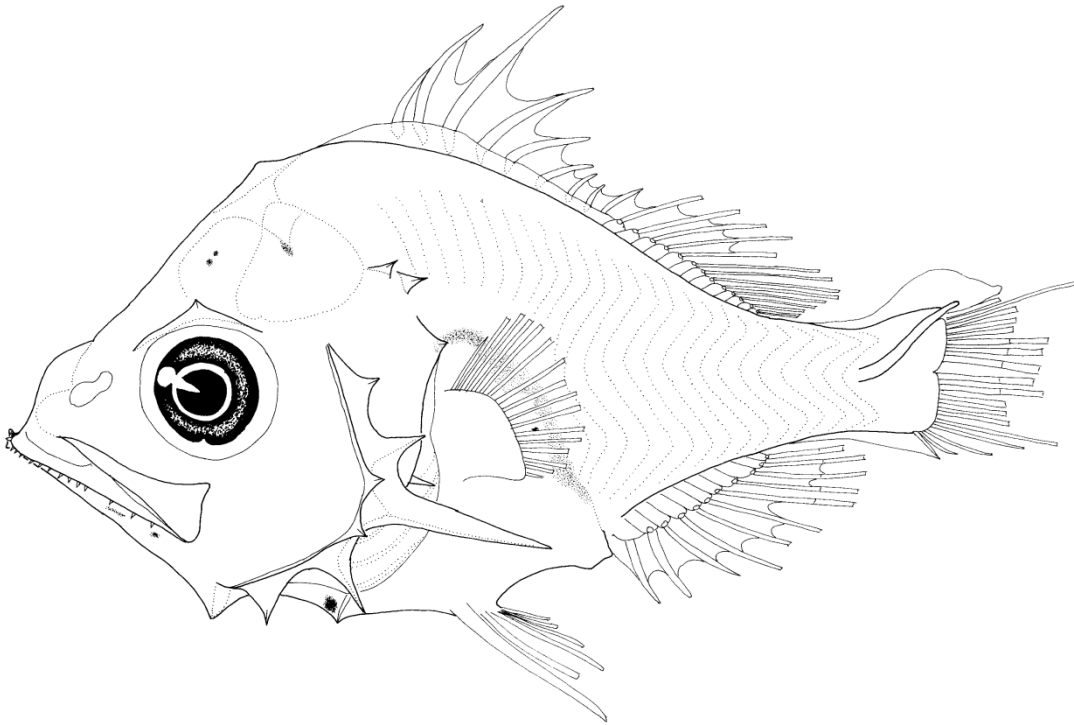
| | Species | D | A | P ₁ | V * |
|-------------------------|---------|----------|----------|----------------|-------|
| <i>Caprodon</i> | 1 | X, 19-21 | III, 7-9 | 16-17 | 26-27 |
| <i>Luzonichthys</i> | 2 | X+15~16 | III, 7-8 | 17-22 | 26 |
| <i>Meganthias</i> | 1 | X, 16-17 | III, 9 | 16 | |
| <i>Odontanthias</i> | 5 | X, 12-18 | III, 7-8 | 16-19 | 26 |
| <i>Plectranthias</i> | 8 | X, 13-18 | III, 6-8 | 12-17 | 26-27 |
| <i>Pseudanthias</i> | 22 | X, 11-18 | III, 6-9 | 15-21 | 26 |
| <i>Rabaulichthys</i> | 1 | X, 16 | III, 7 | 19 | 26 |
| <i>Sacura</i> | 1 | X, 16-18 | III, 7 | 16-18 | 26 |
| <i>Selenanthias</i> | 1 | X, 15-17 | III, 7 | 15 | 26 |
| <i>Tosana</i> | 1 | X, 13-14 | III, 6-7 | 15-16 | 26 |
| <i>Tosanoides</i> | 2 | X, 17 | III, 8 | 13 | 26 |
| <i>Giganthias</i> | 1 | IX, 13 | III, 8 | 16 | 25 |
| <i>Serranocirrhitus</i> | 1 | X, 18-20 | III, 7 | 13-14 | 26 |

Sources: Senou (2013) and * Leis and Rennis (2000)

Descriptions (1/5)

Giganthias immaculatus (5.4 mm SL, Postflexion)

D **IX**, 13; A II, 9; P₁ 16; P₂ I, 5; M 25

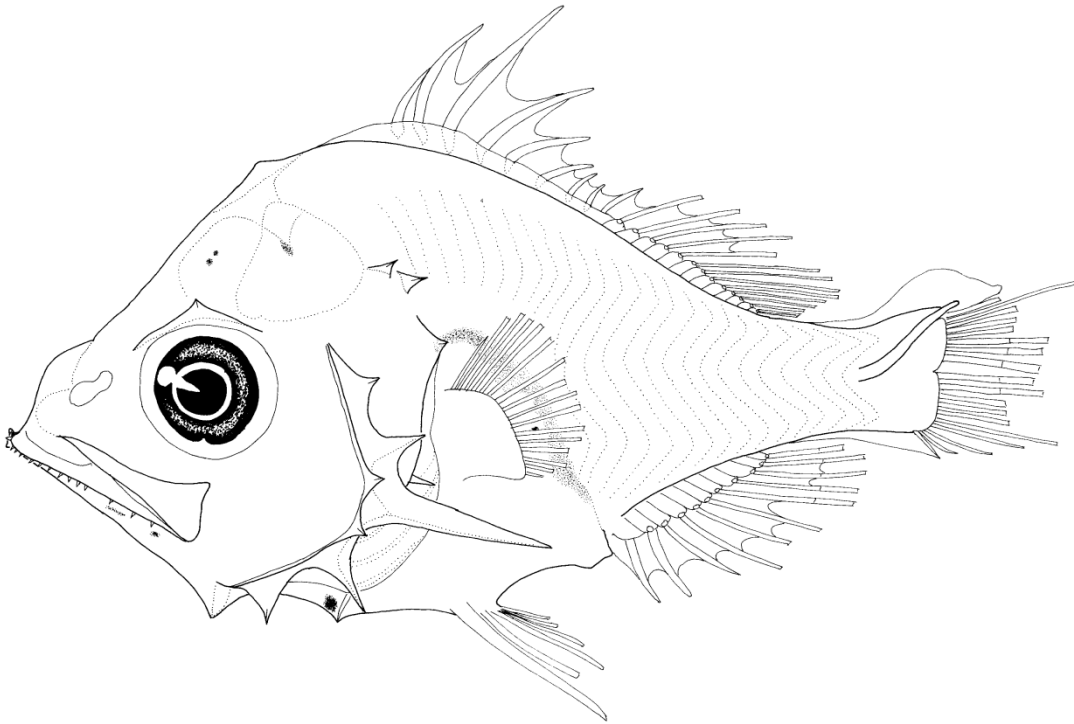


- * Outwardly projecting teeth on premaxilla (Baldwin, 1990)
- ** Head spines smooth without serration

- Body deep, kite-shaped, laterally compressed
- Preanal length 60% SL
- Head large, eye small
- Mouth slightly oblique, large with larval teeth* in premaxilla
- Head spination ** (supra-occipital, supraorbital ridge, preopercle, interopercle, opercle, post-temporal, supracleithrum)
- Frontal, parietal and supraoccipital spines rugose (not illustrated)

Descriptions (2/5)

Giganthias immaculatus (5.4 mm SL, **continued**)



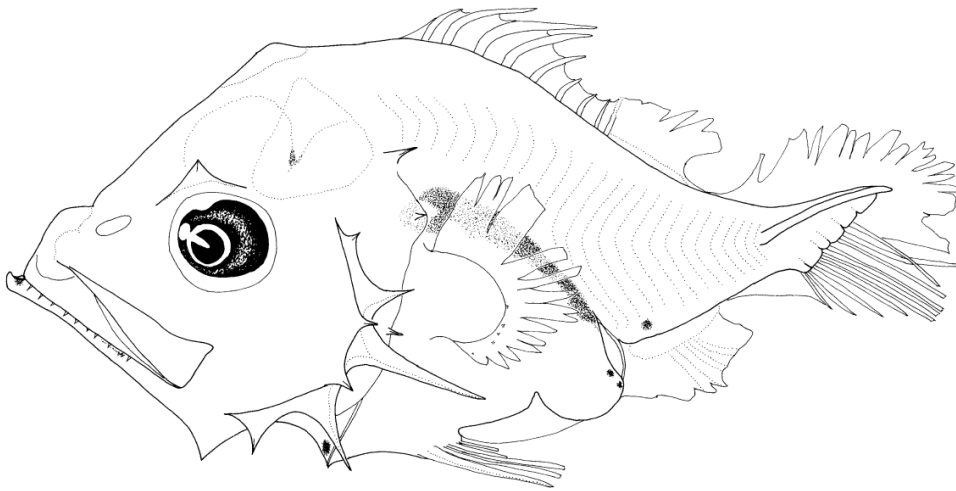
- Fin spines smooth
- Pigment (isthmus, tip of lower jaw, lateral surface of lower jaw, midbrain, pectoral-fin membrane (only left side), dorsal and dorsolateral gut*, boundary between mid and hind brains)

* Blue color indicates internal pigment

Descriptions (3/5)

Gigantias immaculatus (4.2 mm NL, Flexion)

D VIII, 1; A 7; P₁ 7; P₂ I, 4; M 25



- General appearance, head spination and pigmentation nearly same as those of the 5.4-mm postflexion larva
- Spinous dorsal and pelvic fins early forming

Descriptions (4/5)

Serranocirrhitus latus (6.8 mm SL, Postflexion)

D X, **19**; A III, 7; P₁ **13**; P₂ I, 5; M 26

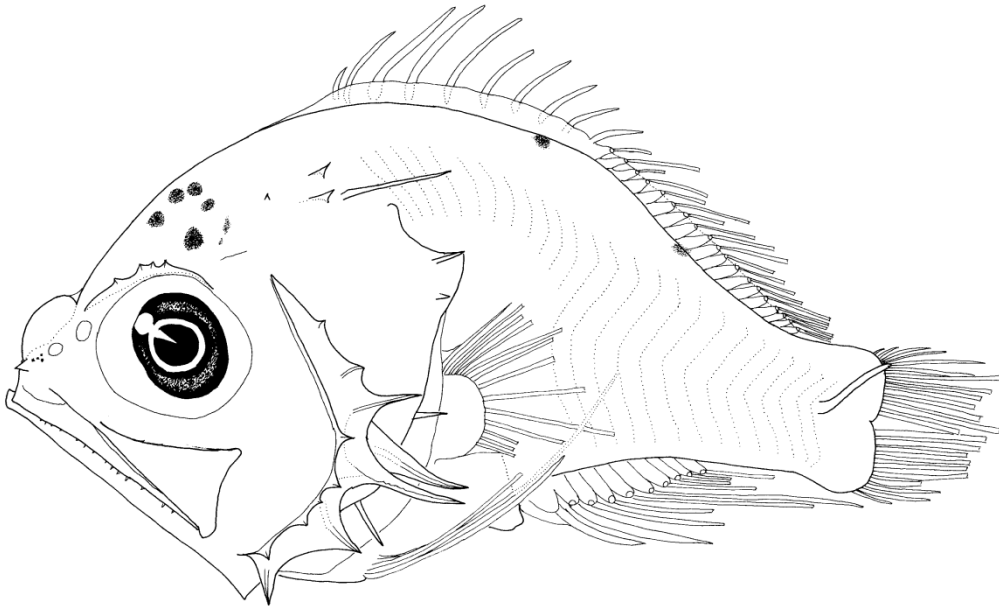


- Body deep and oval
- Head and trunk slightly rotund
- Preanal length 57% SL
- Head large (52% SL)
- Round eye small
- Mouth slightly oblique and large with larval teeth in premaxilla
- Lower jaw slightly projecting
- Head spination * (supra-orbital ridge, preopercle, interopercle, subopercle, opercle, tabular, post-temporal, supracleithrum)
- Frontal and parietal rugose (not illustrated)

* Head spines smooth except preopercle spine at angle laterally with a serrated ridge

Descriptions (5/5)

Serranocirrhitus latus (6.8 mm SL, **continued**)

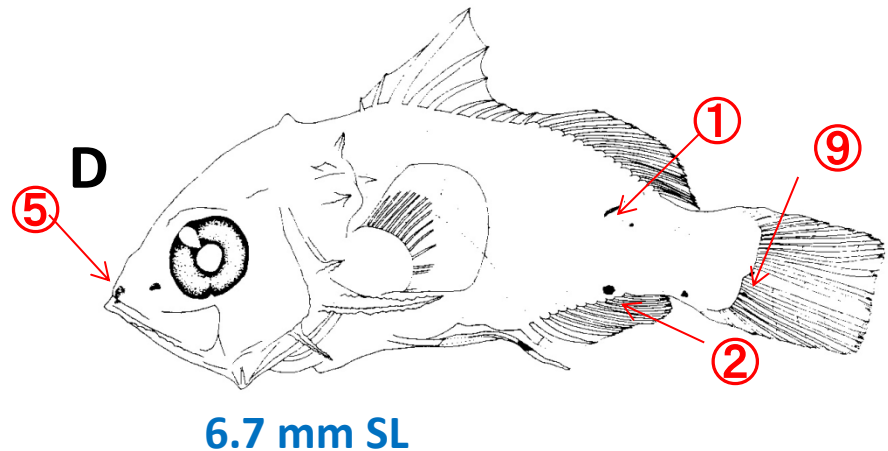
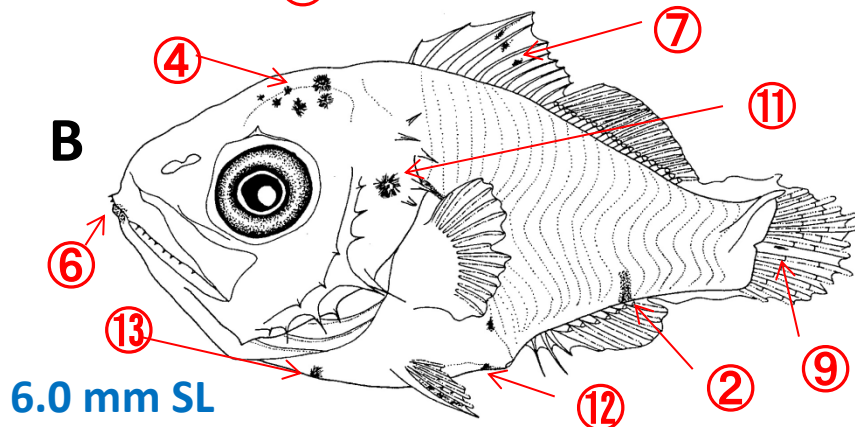
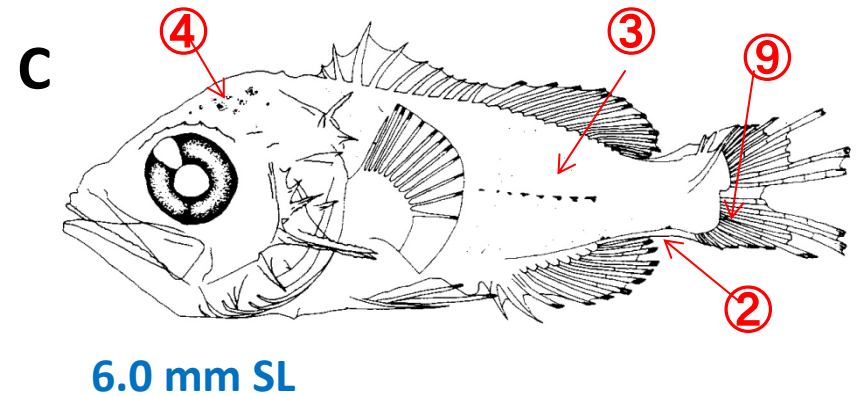
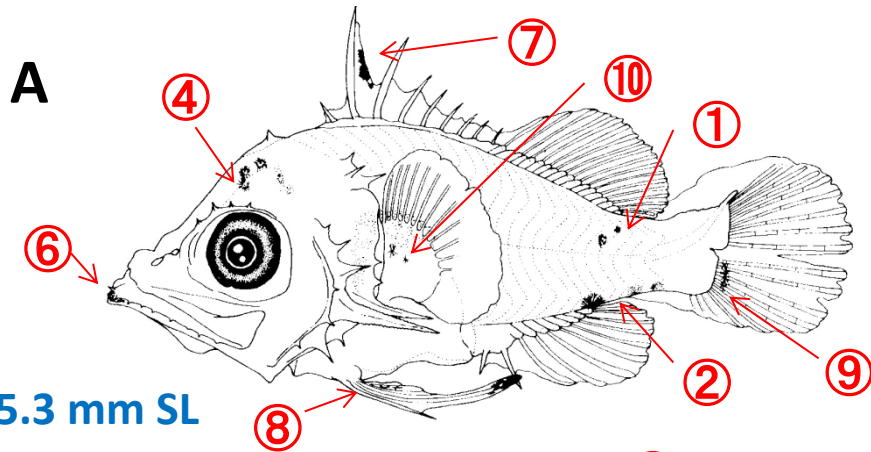


- Pelvic-fin base anterior to pectoral base
- Pelvic fin and several anal soft rays elongate
- Fin spines smooth
- Pigment (brain, tip of snout, dorsal midline beneath anterior and posterior dorsal-fin bases, **boundary between mid and hind brains**)

* Internal pigment on gut indistinct due to fade by long-term preservation

Comparisons of Pigmentation (1/3)

- ① Dorsal portion of trunk and tail ② Ventral midline of tail
 ③ Lateral midline of tail ④ Brain ⑤ Snout ⑥ Lower jaw
 ⑦ Spinous dorsal fin ⑧ Pelvic fin ⑨ Caudal fin ⑩ Pectoral fin
 ⑪ Opercular portion ⑫ Ventral gut ⑬ Isthmus



A *Sacura margaritacea* (Kojima, 1988); **B** *Caprodon schlegelii* (Okamoto, 2003);
C *Hemanthias leptus* (Baldwin, 1990); **D** *Anthias tenuis* (Baldwin, 1990)

Comparisons of Pigmentation (2/3)

A) *Tosanoides* sp.
7.5 mm SL
East China Sea



D X, 17; A III, 8; P₁ 13
Unique pigment:
large blotch at
snout

B) *Plectranthias* sp.?
4.3 mm SL
East China Sea

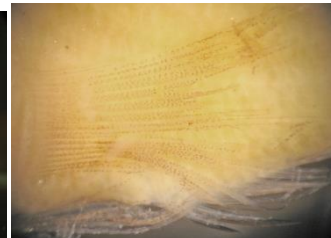


D X, 15; A II, 8; P₁ 14
Unique pigment:
scattered melano-
phores laterally
on trunk and tail

C) *Plectranthias* sp.
6.8 mm SL
East China Sea



Whole body

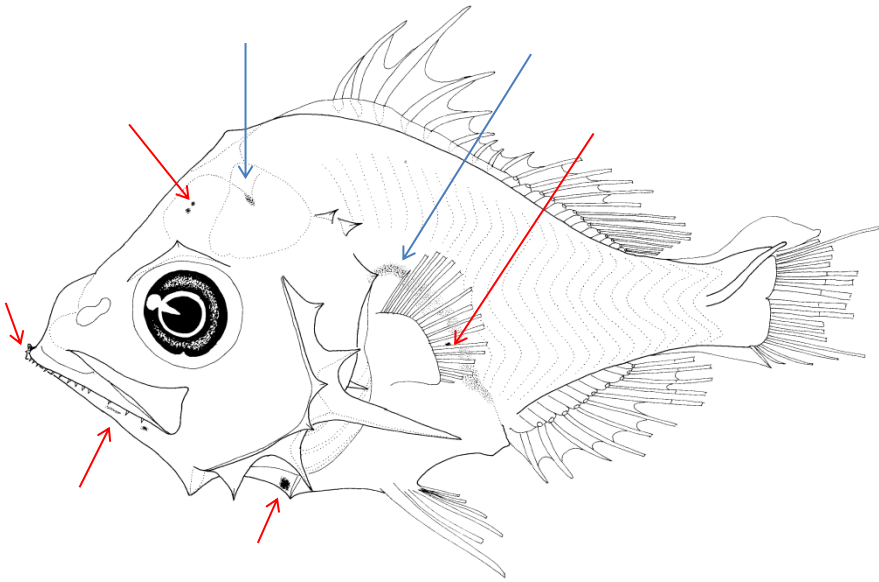


Pectoral fin

D X, 16; A II, 8; P₁ 17
Unique pigment:
scattered melano-
phores on whole
membrane of
pectoral fin

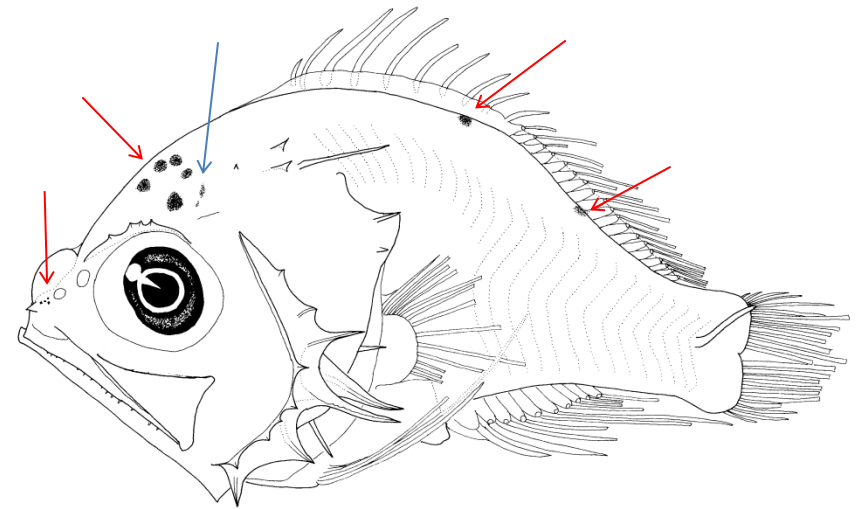
Comparisons of Pigmentation (3/3)

Giganthias immaculatus
(5.4 mm SL, Postflexion)



Low pigment type

Serranocirrhitus latus
(6.8 mm SL, Postflexion)

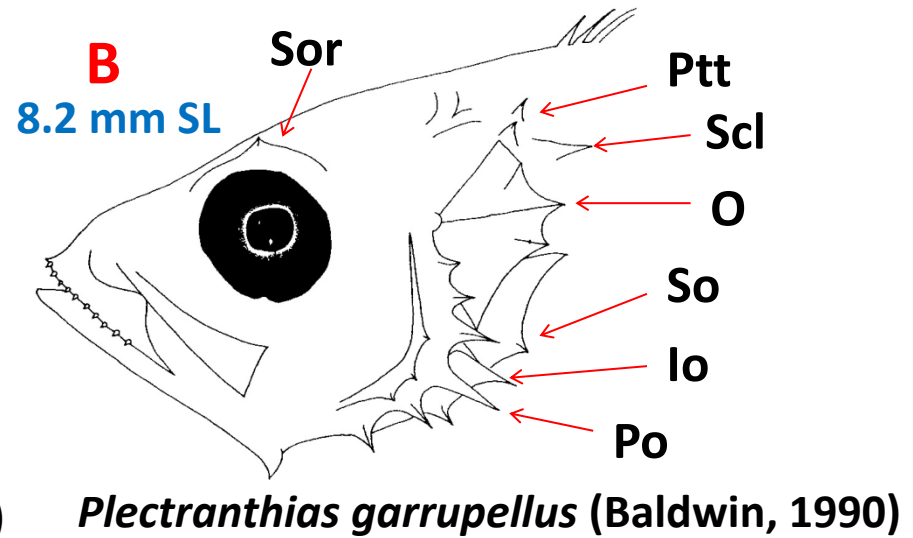
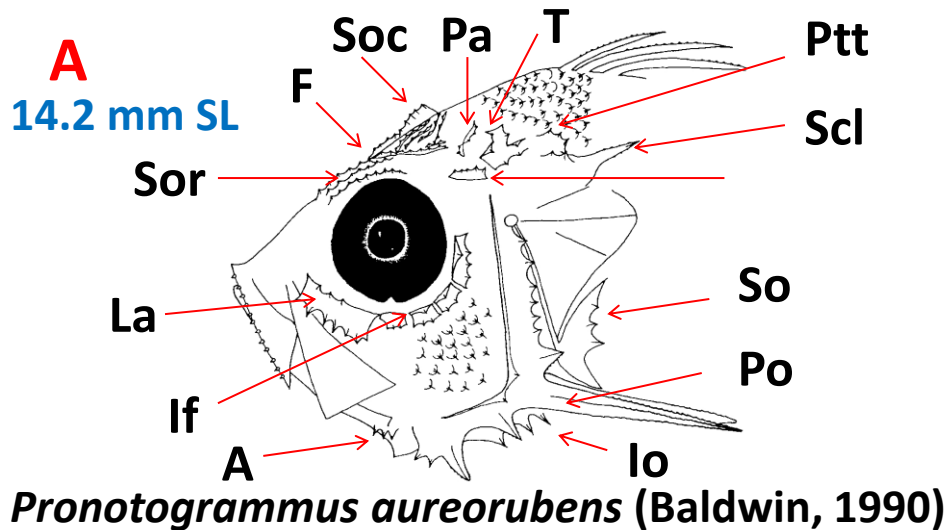


Moderate pigment type

- Arrows indicate pigmented portions (outer pigment in **red color**; the internal in **blue color**)

Comparisons of Head Spination (1/2)

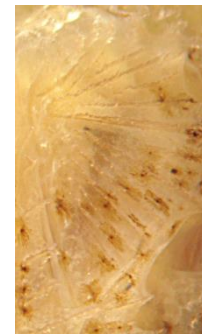
Preopercle (Po); Interopercle (Io); Subopercle (So); Opercle (O); Posttemporal (Ptt); Supracleithrum (Scl); Tabulars (T); Pterotic (Pt); Parietal (Pa); Frontal (F); Supraoccipital (Soc); Supraorbital ridge (Sor); Lacrymal (La); Infraorbitals (If); Articular (A)



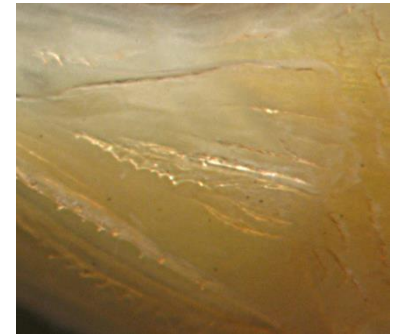
C
Anthiinae sp.
10.7 mm SL
Philippine Sea
D X, 16; A III, 7; P₁ 17



Whole body



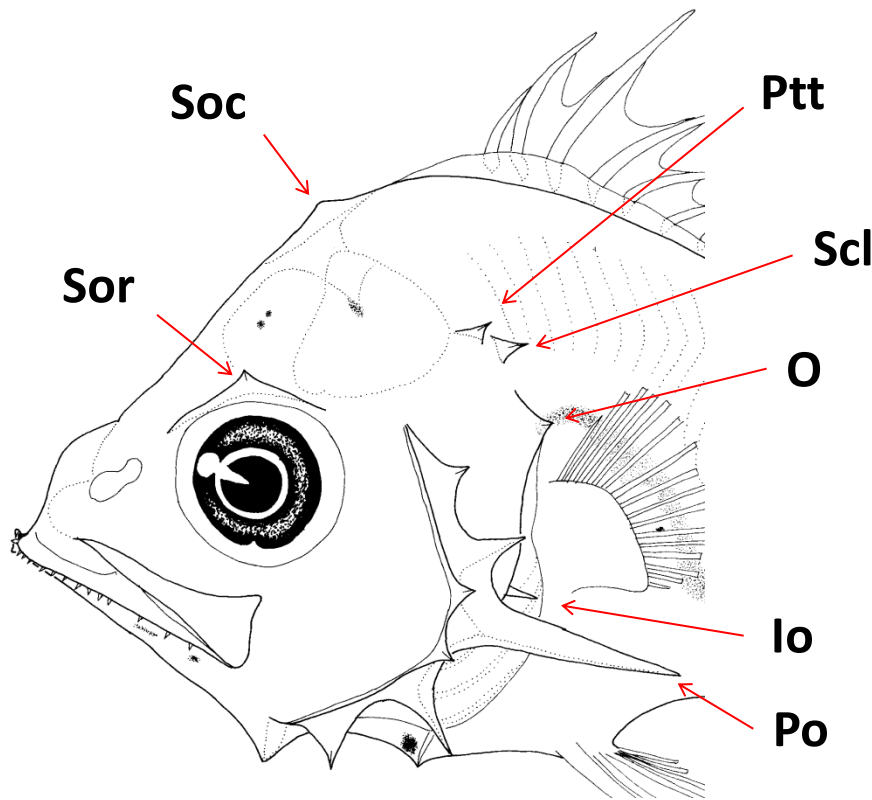
Opercle



Maxilla

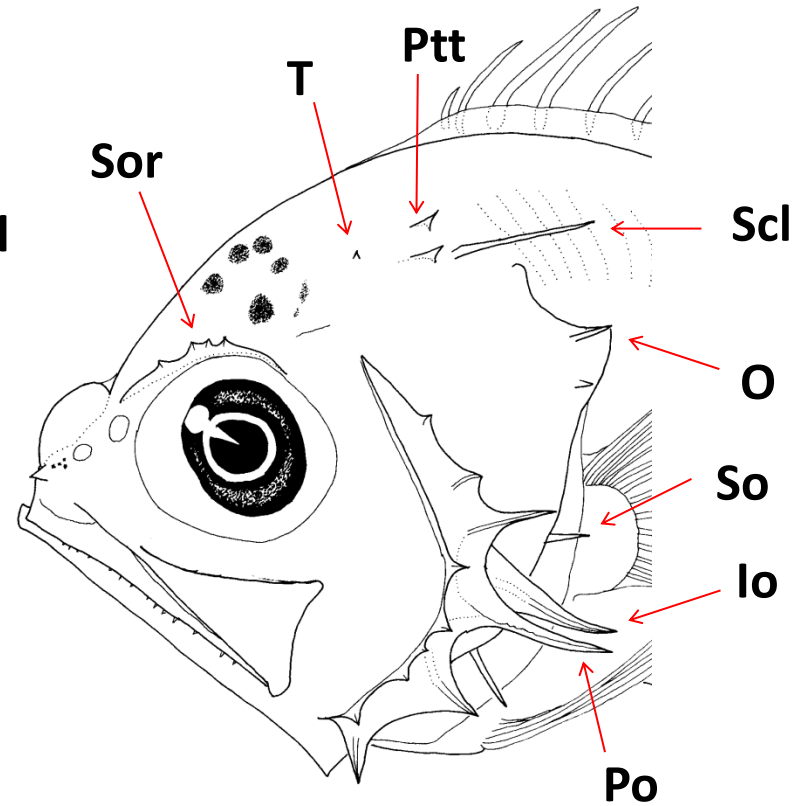
Comparisons of Head Spination (2/2)

Gigantias immaculatus
(5.4 mm SL, Head)



Low spination type

Serranocirrhitus latus
(6.8 mm SL, Head)



Moderate spination type

Conclusions

- Unreported two Indo-West Pacific anthiine larvae, *Gigantias immaculatus* and *Serranocirrhitus latus*, were described based on three specimens from the East China Sea, and their pigment and head spine patterns were compared with those of other anthiine larvae reported and examined.
- Larvae of *G. immaculatus* described share the morphological characters with other anthiine larvae reported so far, although some taxonomists placed this species in the independent family, Giganthiidae, or serranid subfamily, Giganthiinae.
- Some examined anthiine larvae develop characteristic pigment on the snout, pectoral fin and lateral trunk and tail, and head spines on the opercle and maxilla, that are unreported so far.



**Thank you
for your attention**

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