

# First Zoea of *Eriphia sebana* (Crustacea: Decapoda: Xanthoidea: Menippidae) Hatched in the Laboratory

Hyun Sook Ko\*

Department of Biological Science, College of Natural Sciences, Silla University, Busan 617-736, Korea

**Abstract:** The first zoea of *Eriphia sebana* is described and illustrated in detail for the first time. Its morphological characteristics are compared with those of other known species of the Menippidae from the northwestern Pacific Ocean. The general morphology of it corresponds well with other known zoeas of the Menippidae, except that of *Sphaerozius nitidus*. It is found that the zoeas of *E. sebana* and *E. smithi* can be separated by the exopod of the antenna, which has three setae in *E. sebana* and four setae in *E. smithi*.

**Key words:** Brachyura, Menippidae, *Eriphia sebana*, *Eriphia smithi*, *Sphaerozius nitidus*, zoea

*Eriphia sebana* (Shaw and Nodder, 1803) lives in crevices of the rocks and the coral reefs or in the mangrove forests (Sakai, 1976; Miyake, 1983). Its distribution is known from southern Japan and Hawaii to Red Sea and South Africa (Sakai, 1976). In the Indo-West Pacific region three *Eriphia* species, *E. scabricula* Dana, 1852, *E. smithi* MacLeay, 1838, and *E. sebana*, were reported (Serène, 1984).

The larval stages have been known in four species of the family Menippidae from the northwestern Pacific Ocean: *Sphaerozius nitidus* described by Aikawa (1933), *Baptozius vinosus* and *Epixanthus dentatus* described by Saba et al. (1978a, b), and *E. smithi* described by Terada (1982). However, the larval stage of *E. sebana* is unknown. The aims of this paper are to describe the first zoeal stage of this species and to compare its morphology to previously described zoeas of this family.

## MATERIALS AND METHODS

An ovigerous female of *Eriphia sebana* was collected from

Ishigaki Island (24°20'N; 124°12'E) of Japan on June 13th, 2003. The zoeas hatched in the laboratory were reared by using the methods described by Ko (1995), at water temperature of 25±1°C. The zoeas were fixed and preserved in 10% neutral formalin for later use. Dissected appendages were examined using a microscope Leitz Laborlux S and drawings were made with the aid of a camera lucida. Setal counts on appendages and measurements were based on the mean of 10 specimens. The remaining zoeas and the spent female were deposited at Silla University, Korea (SUZ Cr103241).

## RESULTS

### *Eriphia sebana*

#### Zoea I

Size: Carapace length 0.81±0.04 mm. Distance from tip of dorsal spine to tip of rostral spine 1.43±0.02 mm.

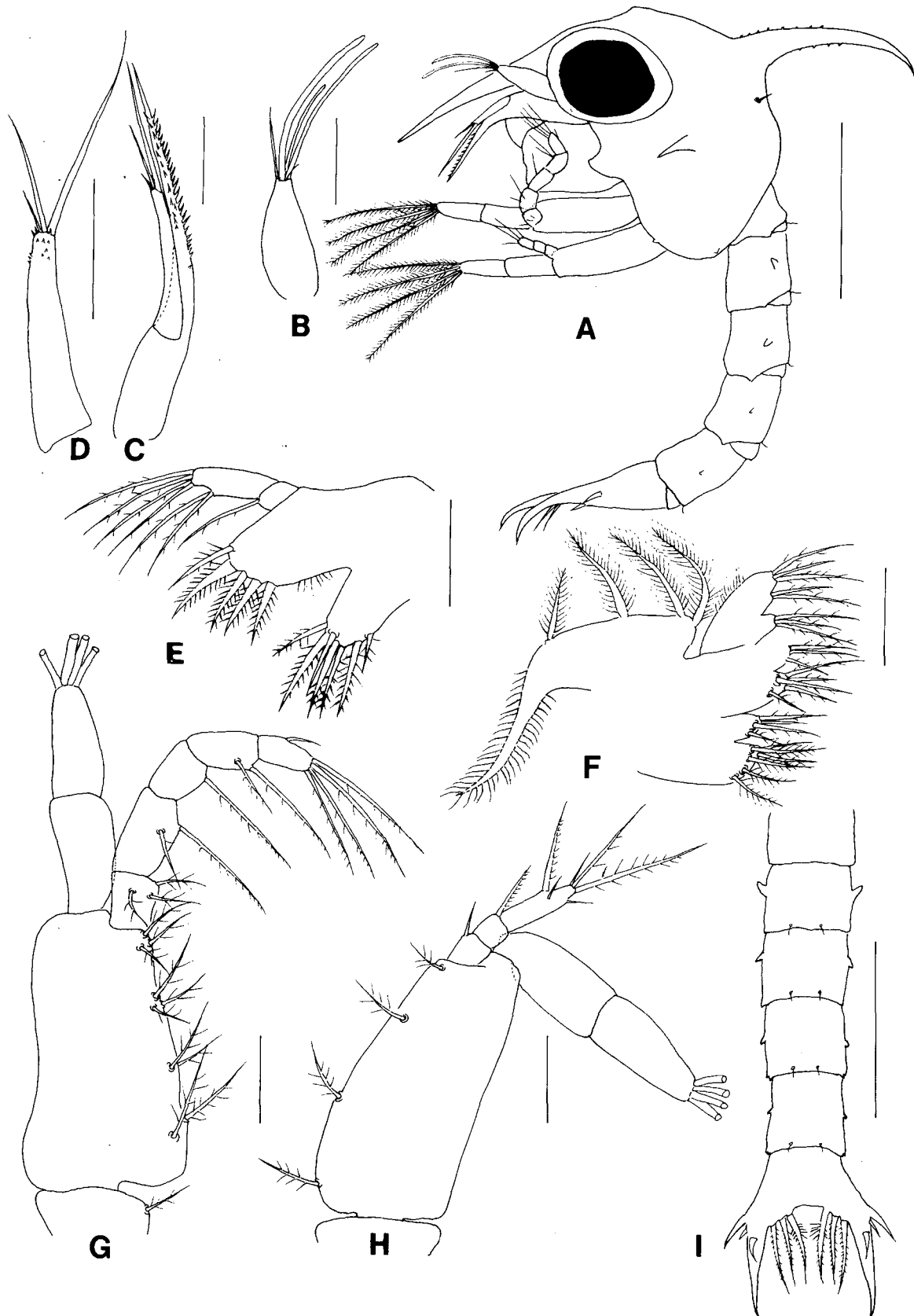
Carapace (Fig. 1A): Dorsal distally curved, spinulate and approximately equal in length to rostral spine; rostral spine straight and slightly longer than antennal protopod; lateral spines present and short; anterodorsal setae absent; 1 pair of posterodorsal setae present; each posteroventral margin with 2 small tubercles; eyes sessile.

Antennule (Fig. 1B): Uniramous; endopod absent; exopod unsegmented with 2 long and 1 short slender aesthetascs, and 1 long and 1 short simple setae terminally.

Antenna (Fig. 1C, D): Protopod spinulate; exopod approximately 3/4 length of protopod, bearing minute spinules to terminal, with 3 terminal simple setae in different lengths.

Maxillule (Fig. 1E): Coxal endite with 7 serrated setae; basal endite with 5 serrated setae; endopod 2-segmented, proximal segment with 1 serrated seta, distal segment with 6 (2 subterminal+4 terminal) serrated setae; exopod seta absent.

\* Tel: 82-51-309-5473, Fax: 82-51-309-5176  
E-mail: hsko@silla.ac.kr



**Fig. 1.** *Erphia sebana*, first zoeal stage. A, Lateral view. B, Antennule. C, Antenna. D, Exopod of antenna. E, Maxillule. F, Maxilla. G, First maxilliped. H, Second maxilliped. I, Dorsal view of abdomen and telson. Scale bars=0.5 mm (A, I) and 0.1 mm (B-H).

**Table 1.** Comparison of the characteristics of the first zoeas in the family Menippidae from the northwestern Pacific Ocean

	Species				
	<i>Sphaerozius nitidus</i> Aikawa, 1933	<i>Baptozius vinosus</i> Saba et al., 1978a	<i>Epixanthus dentatus</i> Saba et al., 1978b	<i>Eriphia smithi</i> Terada, 1982	<i>Eriphia sebana</i> Present study
Antenna					
Terminal setae of exopod	2	3	3	4	3
Maxillule					
Setation of endopod	0, 1+4	1, 2+4	1, 2+4	1, 2+4	1, 2+4
Maxilla					
Setation of endopod	3+3(6)	3+5(8)	3+5(8)	3+5(8)	3+5(8)
Maxilliped 1					
Setation of endopod	3, 2, 1, 2, 5	3, 2, 1, 2, 5	3, 2, 1, 2, 6	3, 2, 1, 2, 5	3, 2, 1, 2, 5
Maxilliped 2					
Setation of endopod	0, 1, 5	1, 1, 6	1, 1, 6	1, 1, 6	1, 1, 6
Abdomen					
Lateral process	Abdominal somites 2, 3	Abdominal somite 2	Abdominal somites 2-5	Abdominal somites 2-5	Abdominal somites 2-5
Telson Fork					
Lateral spine	Absent	Absent	1 small	1 stout, 1 small	1 stout, 1 small

Maxilla (Fig. 1F): Coxal endite bilobed with 6+4 serrated setae; basal endite bilobed with 5+4 serrated setae; endopod bilobed with 3+5 (2 subterminal+3 terminal) serrated setae; exopod (scaphognathite) margin with 4 plumose setae plus distal stout process.

First maxilliped (Fig. 1A, G): Coxa with 1 serrated seta; basis with 10 serrated setae arranged 2, 2, 3, 3; endopod 5-segmented with 3, 2, 1, 2, 5 (1 subterminal+4 terminal) serrated setae, respectively; exopod 2-segmented, distal segment with 4 terminal plumose natatory setae.

Second maxilliped (Fig. 1A, H): Coxa without seta; basis with 4 serrated setae; endopod 3-segmented, with 1, 1, 6 (3 subterminal+3 terminal) serrated setae, respectively; exopod 2-segmented, distal segment with 4 terminal plumose natatory setae.

Abdomen (Fig. 1I): 5 somites; somite 2 with a pair of lateral processes directed anteriorly; somites 3-5 with a pair of lateral processes directed posteriorly; somites 2-5 with 1 pair of posterodorsal setae; pleopods absent.

Telson (Fig. 1I): Each fork long and not spinulate, with 1 stout lateral, 1 smaller lateral and 1 stout dorsomedial spines; posterior margin with 3 serrated setae on each posterior margin.

## DISCUSSION

Guinot (1978) elevated the Xanthidae *sensu lato* to superfamily level (the Xanthoidea) including eight families: Carpiliidae, Menippidae, Platyxanthidae, Xanthidae, Pilumnidae, Trapeziidae, Panopeidae, and Geryonidae. At present, the larval descriptions of the Menippidae are limited to five

species from the northwestern Pacific Ocean (Table 1). Among them, the zoeal description of *Sphaerozius nitidus* by Aikawa (1933) is doubted in having the 0, 1+4 setation on the endopod of the maxillule and the 3+3 setation on the endopod of the maxilla because all known zoeas of the Xanthoidea consistently have the 1, 2+4 setation on the former and the 3+5 setation on the latter (Rice, 1980; Martin, 1984; Ko and Clark, 2002). Therefore, the morphological characteristics of the zoeas of the Menippidae, except that of *Sphaerozius nitidus*, can be summarized as follows: carapace with all spines; exopod of antenna with 3 or 4 terminal setae; endopod of maxillule with 1, 2+4 setae; endopod of maxilla with 3+5 setae; first segment of endopod in first maxilliped with 3 setae; endopod setation of second maxilliped 1, 1, 6, and lateral process on abdominal somite 2 or somites 2-5.

The first zoea of *E. sebana* appears to be very similar to that of *E. smithi*. The zoeas of two *Eriphia* species, however, can be separated by the number of setae on the exopod of the antenna, i. e. 3 in *E. sebana* and 4 in *E. smithi*.

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