

山东半岛南部沿岸螺赢蜚属 (*Corophium*) 的一个新种 (甲壳纲、端足目)*

张 伟 权

(中国科学院海洋研究所)

1971—1973 年, 作者在山东省胶南县参加对虾 (*Penaeus orientalis* Kishinouye) 人工养殖, 发现几种无脊椎动物是对虾的优良基础饵料, 其中特别使我们感到有兴趣的是一种底栖端足甲壳类, 它们不仅数量较大, 而且繁殖周期短, 生长快。经过详细鉴定, 作者确认它是端足目、螺赢蜚科、螺赢蜚属中的一个新种, 定名为中华螺赢蜚 (*Corophium sinense* sp. nov.)。该种形态特征描述如下:

中华螺赢蜚 *Corophium sinense* sp. nov.

正模式标本——成熟雄体。1973 年 3 月 15 日, 胶南县潮间带、泥岸。体长 8.6 毫米 (测量标准: 头部前缘至尾节末端, 不包括额角)。模式标本存放于中国科学院海洋研究所 (1973—C—A—001)。

副模式标本——成熟雌体。体长 7.0 毫米。抱卵。1973 年 4 月 20 日同上产地 (1973—C—A—002); 成熟雌体。体长 6.1 毫米。不抱卵。1973 年 4 月 20 日, 产地同上。 (1973—C—A—003); 成熟雄体。体长 11.1 毫米。1973 年 3 月 15 日, 产地同上。 (C—A—004)。

其它使用标本: 24♂♂, 36♀♀, 1973 年 3—4 月, 产地同上。

成体雄性的形态描述——体扁平, 纤细。后体部最末三节间的分界十分清楚 (图 1, K)。额角刺状, 其长度超出头部侧叶的末端, 侧叶颇为突出, 顶端窄圆 (图 1, C)。眼不可见。尾节小, 基部的宽度明显地大于末端; 末缘中部稍稍向内弯曲, 其中部背面向下凹陷; 尾节侧缘近中部处的背面各具很小的刺毛 2—3 根 (图 1, K)。

第一底节板向前方延伸, 顶端尖, 具三根长大的羽状刺毛。

第一触角纤细, 长度大于体长的 1/2, 触鞭的长度与柄长几乎相等, 由 14—20 节组成。第一柄节粗壮, 长度等于或稍长于第二柄节, 其内侧缘的近中部具强大的钝齿状突起一个, 接近前端的腹面另具一粗壮的活动刺; 第二柄节较纤细、无附加刺、棘; 第三柄节更细而短, 其长度约为第二柄节的 1/4 (图 1, C)。

第二触角明显地较第一触角粗大, 其长度与第一触角大致相等。第二触角柄基节的腹面末端具二个长而强大的刺状突起, 其内侧者稍长, 外侧者稍短, 二刺突的基部彼此毗连 (图 1, E—F); 柄部倒数第三节的长度大于宽度, 内侧末端处具一不规则的叶状突起; 倒数第二节特别粗大, 长度约为倒数第三节的 2.5 倍, 下方近中部处具一大的活动刺, 内末角向下前方突出, 形成一大的扁而尖的齿状突起 (图 1, E)。

* 中国科学院海洋研究所调查研究报告第 336 号。曹登官、徐风山、林如杰、梁羡园等同志给本工作以热情支持, 谨此志谢。

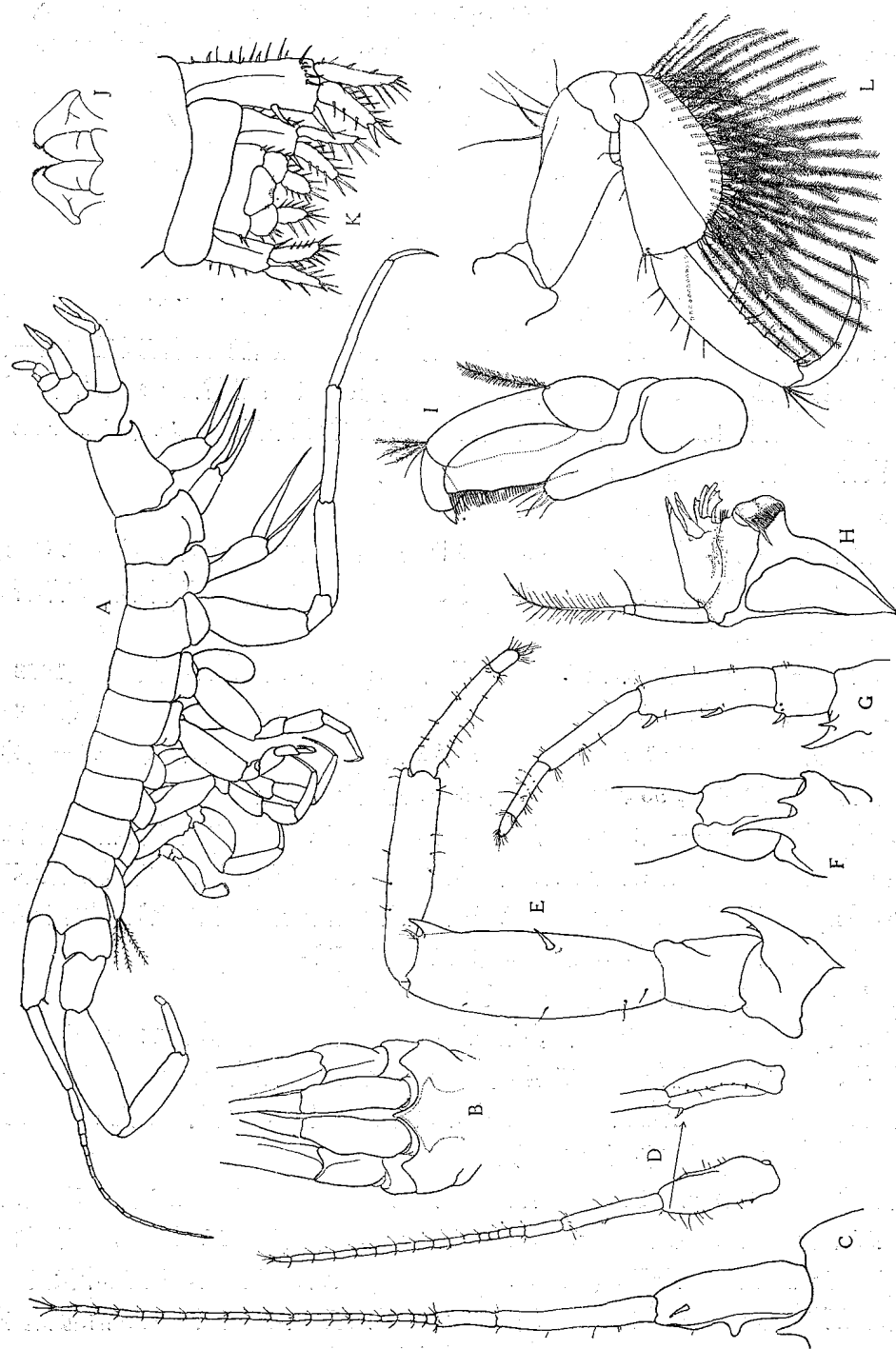


图 1 中华螺赢蚤(新种) *Corophium sinense* sp. nov.

A. 雄性成体侧面观; B. 雌性额角背面观; C. 雌性额角、第一触角背面观; D. 雌性第一触角内侧面观; E. 雌性第二触角内侧面观; F. 雌性第二触角背面观; G. 雌性第二触角外侧面观; H. 雌性大颚; I. 雌性腭足; J. 雄性腭足; K. 雄性下唇; L. 雄性第二腮足。

下唇外叶的外侧缘中部呈明显的角状突出(图 1, J)。

大腭十分发达,触须由大小不等的二节组成,第一节末端侧生有一根小而纤细的刺毛;第二须节十分短小,顶端具一根强大的羽状刺毛(图 1, H)。

第一小腭的内叶退化。第二小腭的外叶大于内叶。腭足的触须由 4 节组成,第一节的外侧缘末端有一根羽状刺毛(图 1, I)。

第一腮足腕节的长度约为指、掌两节之和。指节的下缘呈不明显的锯齿状。

第二腮足大于第一腮足,其基节的前缘近末端处具一明显的齿状突起(图 1, L)。

第一、二对步足的长节正常扩展,其长度与腕节相等。腕节短于掌节,也决不长于指节。

第三、四对步足粗壮,其长节的末端部分稍稍扩大,较腕节为长。

第五步足极为长大,座节短,腕节稍长于长节而短于掌节,掌节的长度约 3 倍于指节。

第一、二两对尾肢的基节粗壮,其末端超出尾节的后缘;内枝略短于外枝。第三尾肢十分短小,基节的长度与尾节大体相等,末端扩大。以上各尾肢的基节及分枝部分的内、外缘皆植有活动刺、棘(图 1, K)。

体微白,背部与触角具明显的黑褐色斑纹。

成体雌性的形态描述——本种雌体的形态与雄性个体有以下不同:额角相对地短,略超出头部侧叶末端的水平;侧叶的末端较为钝尖;第一触角柄的第一节具 2 个活动刺,一个位于下缘近末端处,另一个很小,位置在内缘的基部附近,触鞭由 13—14 节组成;第二触角柄倒数第三节下缘近末端处具一强大的活动刺,倒数第二节具 2 个强大的活动刺,一个在该节的下缘中部,另一个在近末端处(图 1, G)。

中华螺赢蜚与异角螺赢蜚 (*Corophium heteroceratum* Yu, 1938) 在体形大小,头部构造,大腭和 1—2 对小腭,底节板步足和 1—3 对尾肢等方面颇为相似,其主要区别如下:

1. 异角螺赢蜚第二触角柄倒数第二节的下缘中部不具任何刺突,而中华螺赢蜚则具一强刺;

2. 异角螺赢蜚下唇的外叶中部并不延伸成侧突起,而中华螺赢蜚该处具一明显的外侧突起;

3. 异角螺赢蜚(雄性)第二腮足基节的前(上)缘光裸、不具任何附加突起,而中华螺赢蜚该节的前缘近末端部分具一明显的齿状突起;

4. 异角螺赢蜚(雄性)第二触角柄倒数第三节的近末端具一刺状突起,而中华螺赢蜚该处由一个不规则的叶状突起所代替;

5. 此外,在异角螺赢蜚中,腭足的第一须节外缘不具羽状刺毛,而中华螺赢蜚在该节的外缘末端具一根羽状刺毛。

附记 本种生活区的分布范围自潮间带的中潮区至低潮区的下部。以小河床的两岸处最为密集(该处涨潮时完全被海水淹没),它们栖息于硬而稍含砂质的泥底内。栖息地的海水盐度的变动范围在 5—30‰ 之间。1971 年 6 月作者等曾经发现该种的最大栖息密度为每平方米 5,000—20,000 个。

中华螺赢蜚的穴居管道呈“U”字形,上端有两个开孔与外界相通(出、入孔)。有时可看到开孔处的周围堆积有少量的泥丘。“U”形管穴不能从外部看到,其垂直部分的高

度因栖居个体的大小不同而分别为 2—7 厘米,底管部分的长度约为 1.5—5 厘米;栖居管道的内壁光滑、被覆有一层褐灰色、发亮的分泌物质。

中华螺赢蜚通常单居,但是繁殖季节可以看到雌雄同居。

——本种幼体构筑线形巢穴,长度仅几毫米,只有一端与亲体的“U”形管相通。幼体穴居管道的位置通常在成体垂管进出口下 2—3 厘米处(见图 2)。

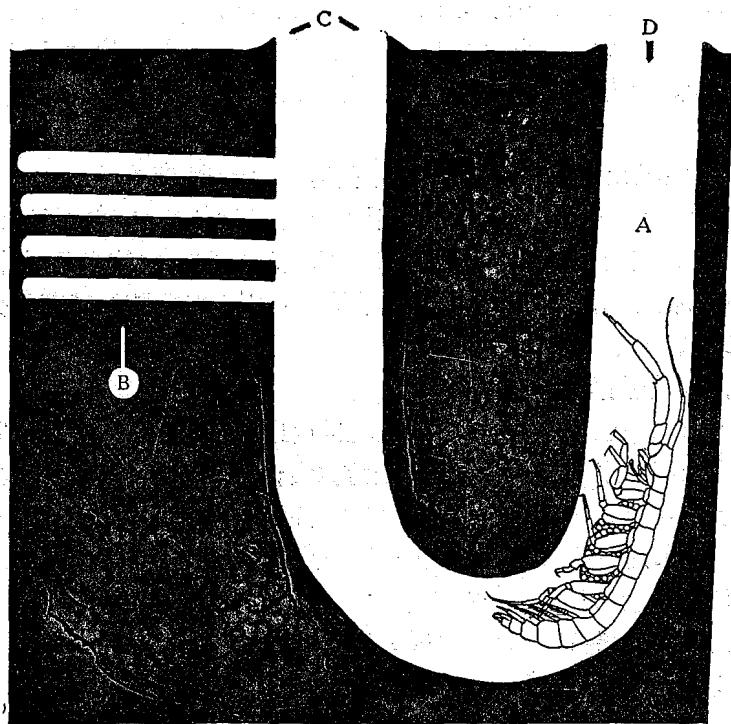


图 2 中华螺赢蜚栖息管示意图

A. 成体巢穴; B. 幼体巢穴; C. 小沙堆; D. 进出口。

成熟的雌体抱囊数目通常为 35—80 枚。

中华螺赢蜚主要以海底有机碎屑为食,但有时也以海水中悬浮性有机碎屑和硅藻为食。

通常,不同性别的个体往往能够同时在捕获物中出现,但是繁殖季节雌性个体的数目经常要多于雄体。

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A NEW SPECIES OF THE GENUS *COROPHIUM* (CRUSTACEA, AMPHIPODA, GAMMARIDEA) FROM THE SOUTHERN COAST OF SHANTUNG PENINSULA, NORTH CHINA

ZHANG WEI-QUAN

(*Institute of Oceanology, Academia Sinica*)

During 1971—1973 the present writer took part in the artificial culture of Chinese prawn *Penaeus Orientalis* Kishinouye in Jiaonan District, Shantung Province and found that several invertebrates are good basic food for the prawn. We were especially interested in a bottom dwelling form of amphipod Crustacean which is very abundant. It grows rapidly and has a short reproductive cycle.

After careful examination, the writer is certain that it is a new species belonging to the genus *Corophium*, Family Corophiidae (Amphipoda, Gammaridea). I designate it *Corophium sinense* sp. n.

The morphological characteristics of this species are presented in the following description.

Corophium sinense sp. nov.

Holotype—A mature male, 8.6 mm. in length (measured from the anterior margin of the head to the end of the telson, excluding the rostrum). Institute of Oceanology, Academia Sinica (1973-C-A-001), Locality: Jiaonan District, Shantung, collected by Cao Deng-gung and Xu Feng-shan, March 15, 1973.

Paratype.—An ovigerous female, 7.0 mm. (IOAS 1973-C-A-002), April 20, 1973; A mature female, 6.1 mm. (IOAS 1973-C-A-003), April 20, 1973; A mature male, 11.1 mm. (IOAS 193-C-A-004), March 15, 1973 Jiaonan District, Shantung, collected by Cao Deng-gung and Xu Feng-shan.

Other specimens: 24♂♂, 36♀♀, March-April, 1973, Jiaonan District, Shantung.

Description of mature male:

Body depressed and slender, the last three segments of the urosome well-defined (Plate 1, K). Cephalon much projected in front to form a spine-shaped rostrum, extending beyond the extremity of the lateral lobe of the cephalon; lateral lobe rather produced and obtuse at the tip (Plate 1, C). Eyes invisible. Telson small, base much broader than the distal end. Medial portion of distal end of telson slightly depressed, the posterior margin concave. Telson armed dorsally with 2—3 small setae on both sides (Plate 1, K). Distal end of the first pair of coxal plates rather produced, tapering, with 3 long and strong plumose setae.

First antennae (Superior antennae) slender and exceeding $\frac{1}{2}$ the length of the body; flagellum nearly as long as the peduncle, composed of 14—20 articulations; 1st joint of peduncle rather stout, about as long as or slightly longer than 2nd joint, its inner lateral margin with a large and obtuse tooth-like process on the middle portion

and another stout movable spine near the lower margin of the anterior end; second joint slender, without any spine or tooth; third joint much slender and shorter than the second and about one-fourth as long as the latter (Plate 1, C).

Second antennae (Inferior antennae) much stronger than and about as long as the first; distal end of basal joint of peduncle with two spine-like processes inferiorly, the inner one long, the outer one short (Plate 1-E—F); antepenultimate joint longer than wide, the inner side of distal end without any spine or tooth, but having instead an irregular lobe-like projection; penultimate joint of the peduncle very large and stout, about $2\frac{1}{2}$ times as long as the antepenultimate joint, the middle portion of its lower border armed with a large movable spine, the distal end produced inferiorly into a large dentiform projection (Plate 1, E).

Middle portion of the outer lobe of the lower lip produced into a distinct lateral angle. (Plate 1, J)

Mandible well developed; the palp composed of two unequal joints, the distal end of the basal joint with a short and slender seta; the distal joint of palp shorter than basal one, with a large plumose seta (Plate 1, H).

First pair of maxillae with the inner lobe degenerate; 2nd pair with the outer lobe larger than the inner lobe.

Palp of the maxillipeds composed of four joints, the lateral border of distal portion of the first joint armed with one plumose seta (Plate 1, I).

Anterior gnathopoda with the carpus about the length of the propodus and dactylus combined. Concave border of dactylus indistinctly serrated.

Posterior gnathopoda larger than the anterior one, superior margin of the distal portion of the basal joint produced into a dentiform process (Plate 1, L).

Anterior two pairs of pereopoda with the meral joint moderately expanded and about as long as the carpus. Carpus shorter than propodus and hardly longer than the dactylus.

Succeeding two pairs of pereopoda stout, the meral joint slightly expanded towards the distal portion and longer than the carpus.

Last pair much elongated, the ischium short, the carpus slightly longer than the merus but shorter than the propodus which is about three times as long as the dactylus.

Anterior two pairs of uropoda with basal joint broadened and extending much beyond the extremity of the telson; the inner ramus slightly shorter than the outer. Third pair of uropoda, smallest, its basal joint much expanded distally, about as long as the telson. The basal joints as well as the rami of all the pairs of the uropoda are armed with spines and teeth on both edges (Plate 1, K).

Body whitish, the back and antennae variegated with distinct dark-brown pigments.

Description of mature female:

The female agrees in structure with the male, except for the following characters:

Rostrum rather short, slightly exceeding the extremity of the lateral lobe; lateral lobe obtuse at the tip; 1st antennae with the first joint of peduncle bearing 2 simple movable spines, one arising ventrally near the distal end, the other arising from the basal portion of the inner lateral side, flagellum composed of 13—14 articulations; Distal end of the antepenultimate joint of 2nd antennae armed with a large spine

ventrally; penultimate joint with 2 large and strong spines, one located at the middle portion of the lower side, the other located inferiorly near the distal end (Plate 1, G).

This species resembles *C. heteroceratum* Yü, 1939, in many respects, but is easily distinguished by the following points:

I. In *C. heteroceratum*, the penultimate joint of the peduncle of the first antennae is without any spine near the middle portion on the lower border, while in the present species there is a large and strong spine.

II. The outer lobe of the lower lip of *C. heteroceratum* is without any prolongation on the lateral edge, while that of the present species has a distinct lateral angle.

III. The basal joint of the 2nd gnathopoda of *C. heteroceratum* (♂) is without any accessory tubercle, while that of the present species has a dentiform projection near the end on the upper border.

IV. In *C. heteroceratum* (♂), the antepenultimate joint of the peduncle of the 2nd antennae is armed with a single spine near the anterior end, while in the present species it is replaced by an irregular lobe-like projection.

V. Besides these, the tip of the first joint of the maxilliped is without plumose seta in *C. heteroceratum*, while in *C. sinense* there is a plumose seta on the tip of the first joint of the maxilliped.

Remarks:

The present species burrows in firm sandy mud. Its range of distribution extends from about mid-tide horizon to low-tide horizon. They are frequently very abundant on banks of the brackish rivulet, which are submerged at high tide. The salinity of the habitat of this species varies from 5–30‰.

In June 1971 the writer found that the number of burrows per square meter was 5,000–20,000.

The burrows of *C. sinense* sp. nov. are U-shaped. Each burrow has two openings, which lead to the exterior. One is an entrance and the other an exit. About the openings of burrows is sometimes found a small heap of mud. The U-shaped tube in which the animal lives is generally found about 2–3 cms. below the opening of the mud-heap and the house is not discernible from the outside. The vertical portion of the tube is 2–7 cms. in length while the basal portion is about 1.5–5 cms. The internal wall of the burrows is smooth, and is coated with a shiny brownish secretion.

C. sinense sp. nov. usually dwells alone, but in the spawning season the female may be seen living in the same tube with the male.

The juveniles of this species form horizontal burrows of a few millimetres in length which lead to the U-shaped tube. These horizontal burrows are usually located at about 2–3 cms. below the openings of the adult (See text-fig 1).

The spawning season of the animal begins in March and lasts till the end of October, reaching its peak from the middle of June to the end of August.

A mature female usually carries 35–80 eggs in its brood pouch.

C. sinense sp. nov. is principally a selective feeder of organic debris, but it also feeds on suspended organic particles and diatoms.

Both sexes are usually present in the collections, but the female is usually rather more common than the male during the spawning season.