

## Crabs of the Family Parthenopidae (Crustacea: Decapoda: Brachyura) from Taiwan

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**Swee-Hee Tan, Jung-Fu Huang and Peter K. L. Ng (1999)** Crabs of the family Parthenopidae (Crustacea: Decapoda: Brachyura) from Taiwan. *Zoological Studies* 38(2): 196-206. Twelve species and 9 genera of parthenopid crabs are here recorded from Taiwan, of which six are new records, viz. *Aethra scruposa* (Linnaeus, 1764), *Aulacolambrus revibrachiatus* (Shen, Dai and Chen, 1982), *Aulacolambrus hoplonotus* (Adams and White, 1848), *Garthambrus stellata* (Rathbun, 1906), *Heterocrypta transitans* Ortmann, 1893 and *Rhinolambrus contrarius* (Herbst, 1804). Of these, the presence of *G. stellata* is interesting as the species was previously known from Hawaii and French Polynesia. Taxonomic problems associated with several species are clarified, and the value of the male 1st gonopods as taxonomic characters is discussed.

**Key words:** Crab fauna, Crab taxonomy, Parthenopidae.

The study of brachyuran crabs of Taiwan is still in the exploratory phase, with many new records and species being reported over the last few years. Ng and Huang (1997) noted that there were about 330 species of brachyuran crabs in Taiwan from published records. With regards to the Parthenopidae of Taiwan, only 7 extant species have been reported, viz. *Cryptopodia fornicata* (Fabricius, 1781), *Daldorfia horrida* (Linnaeus, 1758), *Parthenope longimanus* (Linnaeus, 1758), *Rhinolambrus lamellifrons* (Adams and White, 1848), *Platylambrus validus* (de Haan, 1839), *Platylambrus echinatus* (Herbst, 1790), and *Platylambrus nummiferus* (Rathbun, 1906) (Horikawa 1940, Lin 1949, Chang 1963, Dai and Yang 1991, Hu and Tao 1996). The present study reports a total of 12 species belonging to 9 genera, a substantial increase in the total parthenopid fauna for the island.

The generic classification of the Parthenopidae generally follows that of Flipse (1930) with some modifications. Following Ng and Rodriguez (1986) and Chia and Ng (1993), most of the subgenera proposed by Flipse (1930) are recognized as full genera. The subfamily Eumedoninae (sensu Flipse 1930) has already been removed and recognized as

a separate family by Stevcic et al. (1988).

Measurements provided are those of the carapace width and length, respectively. The carapace length is measured from the base of the rostrum (if present) to the posterior margin. All specimens examined are deposited in the National Kaohsiung Institute of Marine Technology (NKIMT), Kaohsiung, Taiwan; National Taiwan Ocean University (NTOU), Keelung, Taiwan; Taiwan Museum (TMCD), Taipei, Taiwan; Institute of Oceanology, Chinese Academy of Science (IOCAS), Qingdao, China and the Zoological Reference Collection of the Raffles Museum, National University of Singapore (ZRC), Singapore. The synonymy provided is restricted to those directly related to Taiwan or are of major taxonomic importance.

### Family Parthenopidae *Aethra scruposa* (Linnaeus, 1764) (Fig. 1)

*Cancer scruposa* Linnaeus, 1764: 450.

*Aethra scruposa*: Dai et al. 1986: 158, fig. 89(2), pl. 21(6); Dai and Yang 1991: 175, fig. 89(2), pl. 21(6).

*Material examined*: 1 ♀ (87.0 by 58.2 mm)

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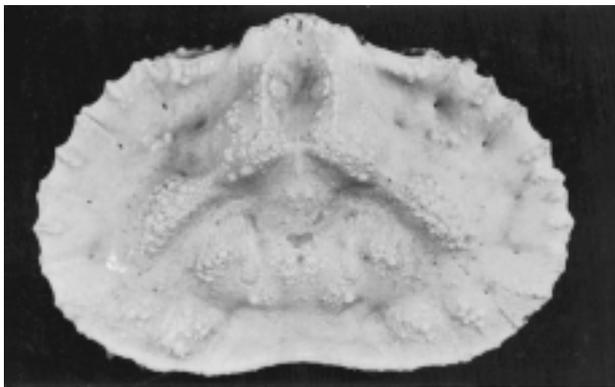
(NKIMT), Keelung, port of Keelung, hook and line, about 7 m, rocky reef, coll. J.-F. Huang, 18 Aug. 1993.

**Remarks:** This species is recorded for the 1st time from Taiwan. A very distinctive genus, *Aethra* can easily be distinguished from all other parthenopid genera in that the carapace is subovate in shape, with all external appendages hidden under the carapace when viewed from the top. The dorsal surface of the carapace of *A. scruposa* is plate-like with the gastric and branchial regions greatly raised, forming a granulated crest. The dorsal surface of the carapace is also granulated, isolated in a few regions only, with granules being low and not very prominent. The periphery of the carapace possesses no spines, tubercles, or granules but is divided into broad rectangular divisions. Within each division, there is a granulated ridge from the periphery to about mid way of the division. These divisions are also fused distally, forming very small holes at the base of adjacent divisions.

*Aethra scruposa* closely resembles *A. scutata* Smith, 1869. It can be distinguished from *A. scutata* by having a more granulated carapace dorsal surface, especially on the branchial and gastric regions (Ng 1999).

*Aethra scruposa* is a very widely distributed species, ranging from the east coast of Africa to New Caledonia and Fiji (Ng 1999). Dai et al. (1986) and Dai and Yang (1991) reported *A. scruposa* from the Xisha Islands (Paracel Is.) in the South China Sea. The presence of this species in Taiwan is therefore not unexpected.

***Aulacolambrus brevibrachiatus***  
(Shen, Dai and Chen, 1982)  
(Figs. 2, 3, 13a)



**Fig. 1.** *Aethra scruposa*. Female (87.0 by 58.2 mm) (NKIMT). Overall view.

*Parthenope (Aulacolambrus) brevibrachiatus* Shen, Dai and Chen 1982: 142, pl. 1:6, fig. 2:5.

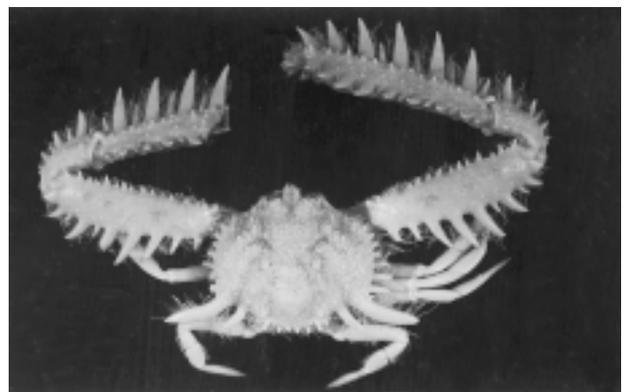
**Material examined:** 1 ♂ (22.0 by 20.1 mm) (NKIMT), Kaohsiung County, Kerliou fish port, coll. Y.-L. Tsai, 3 Aug. 1996.

**Remarks:** The present specimen represents the 2nd record of this species and is a new record for the island of Taiwan. We have examined the holotype male of *A. brevibrachiatus*, which is very small (IOCAS), and have compared it with the present specimen. G1 of *A. brevibrachiatus* (see Shen et al. 1982: fig. 2:5) is straight, and the tip is truncated, with the inner margin higher than the outer, with rather long setae present at the tip. G1 of the present specimen is slightly sinuous, with a rounded tip, and the setae of the tip are relatively shorter. We believe that this is the result of allometric growth, because the present specimen is about 3 times the size of the holotype. Carapaces of both the holotype and the present specimen possess fine granules. The branchial tooth is also relatively long and smooth with no granules on it. The rostrum is triangular in shape with 2 granules on the lateral margins. The rostrum is slightly damaged in the larger specimen, but granules on lateral margins of the rostrum can still be discerned.

G1, carapace, branchial tooth, and rostrum characters easily differentiate this species from its sister species *Aulacolambrus hoplonotus* (Adams and White, 1848). Differences between the 2 species are discussed under the remarks for the latter species.

The authorship of this species follows that proposed by Ng (1994).

**Comparative material:** *Aulacolambrus brevibrachiatus*, holotype male, (8.0 by 6.8mm) (IOCAS), China: South China Sea, Station K123B-99, 8 Feb.



**Fig. 2.** *Aulacolambrus brevibrachiatus*. Male (22.0 by 20.1 mm) (NKIMT). Overall view.

1960; paratypes, 1 ♂, 1 ♀ (IOCAS), China: Beibu Gulf, Station X208B, 15 Apr. 1962.

***Aulacolambrus hoplonotus***  
(Adams and White, 1848)  
(Fig. 4)

*Lambrus hoplonotus* Adams and White 1848: 35, pl. 7, fig. 3.  
*Lambrus (Aulacolambrus) hoplonotus*: Flipse 1930: 44.

**Material examined:** 1 ♂ (damaged) (NTOU), Pingtung County, Kenting, Nanwan, coll. S.-H. Wu, 10 Oct. 1997.

**Remarks:** A new record for Taiwan, this distinctive species can be identified by its rounded shape, relatively short rostrum, and the very large and prominent epibranchial tooth. The carapace dorsal surface is densely granulated with rather large granules. The chelipedal propodus also possesses large blade-like spines, alternating with smaller spines, on the inner and outer margins. The chelipedal merus possesses large regularly spaced spines, but only on the outer margin. Tips of the chelipeds are pigmented with the inner margin lined with small spines. The ambulatory leg dactyli are distinctive in that they are laterally compressed and appear blade-like.

Interestingly, *A. hoplonotus* has not been reported from mainland China (Dai et al. 1986, Dai and Yang 1991). Shen et al. (1982), however, described another related species, *Parthenope (Aulacolambrus) brevibrachiatus* (= *Aulacolambrus brevibrachiatus*) from the South China Sea. According to them, *Aulacolambrus brevibrachiatus* can be differentiated from *A. hoplonotus* by the carapace being more triangular in shape; with 6 spines on the outer margin of the cheliped merus; merus of cheliped 2.65 times longer than broad (vs. 4.1), and the 6th segment of male abdomen longer than broad. We have examined the type series of *A. brevibrachiatus*,

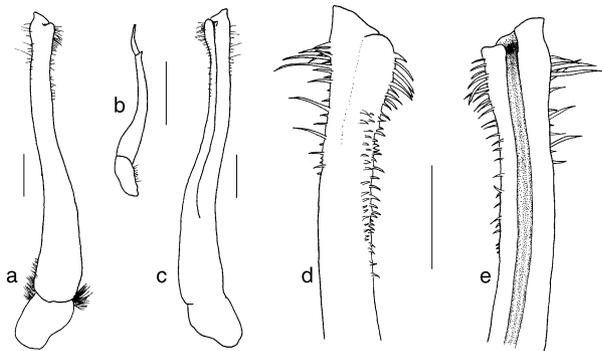
and although *A. brevibrachiatus* is more triangular than *A. hoplonotus*, the number of spines on the outer margin of the cheliped merus appears to be variable within the species in general. The 6th segment of the male abdomen is also not significantly different in either species.

Comparison of *A. brevibrachiatus* and *A. hoplonotus* specimens from Taiwan shows that granules on the carapace of *A. hoplonotus* are much larger than those of *A. brevibrachiatus*. Branchial spines on both species are equally large, but that of *A. hoplonotus* has large granules at the base of the spine, whereas that of *A. brevibrachiatus* is smooth with no trace of any granules basally.

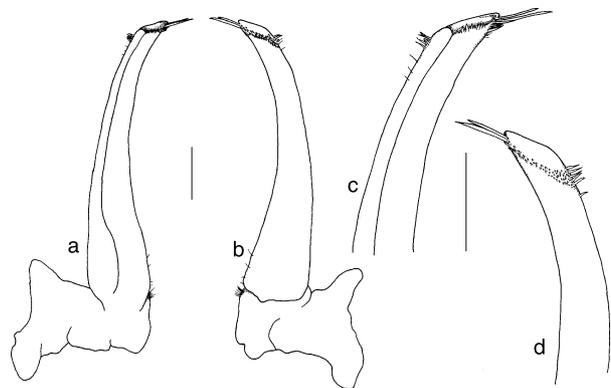
The Taiwanese specimen of *A. hoplonotus* is badly damaged, and further comparisons of *A. hoplonotus* with *A. brevibrachiatus* were made by examining an adult specimen of *A. hoplonotus* from Okinawa, Japan. The outer margin of the palm in *A. brevibrachiatus* has alternating long and short spines. These spines are of equal size in *A. hoplonotus*. The inner margin of the palm is lined with small spines in *A. brevibrachiatus*, whereas these are comparatively larger in *A. hoplonotus*. In both species, the carapace, cheliped, ambulatory legs, sternum, abdomen, and surface of the 3rd maxilliped are covered with setae, but these are much denser and longer in *A. hoplonotus*.

*Aulacolambrus hoplonotus* has been reported from the Red Sea, western and eastern Indian Ocean, Andamans, Sri Lanka, Gulf of Thailand, Singapore to Australia, and Hawaii (Flipse 1930).

**Comparative material:** *Aulacolambrus hoplonotus*, 1 ♂ (23.2 by 17.5mm) (ZRC), Japan, Okinawa: Itoman City, Komeru, coll. 26 Aug. 1976.



**Fig. 3.** *Aulacolambrus brevibrachiatus*. Male (22.0 by 20.1 mm) (NKIMT). Male left G1. A, dorsal view; b, left G2; c, ventral view; d, tip, dorsal view; e, tip, ventral view.



**Fig. 4.** *Aulacolambrus hoplonotus*. Male (NTOU). Male left G1. A, ventral view; b, dorsal view; c, tip, ventral view; d, tip, dorsal view.

***Cryptopodia fornicata* (Fabricius, 1781)**  
(Fig. 13b)

*Cancer fornicata* Fabricius 1781: 502.

*Cryptopodia fornicata*: Lin 1949: 17; Chiong and Ng 1998: 339.

**Materials examined:** 1 ♀ (65.8 by 40.0 mm) (NKIMT), Mitou port, Kaohsiung County, 20-50 m, sand-mud substrate, coll. J.-F. Huang, 22 Oct. 1996; 1 ♀ (dried) (TMCD 2311), Chiading, Kaohsiung County, coll. C. Y. Wei, June 1973; 2 specimens (dried) (TMCD 472, 473), Makung, Penghu Is. (the Pescadores), coll. C. Y. Wei, Apr. 1988.

**Remarks:** Lin (1949) first reported *Cryptopodia fornicata* when he examined the specimens collected by S. Kaneka and C. T. Huang in 1948 from Tingch'ieting, Kaohsiung County. The specimens were purportedly deposited in the Oceanographical Institute of Taiwan, but the specimens are now believed to be lost (C.-H. Wang, Taiwan Museum, pers. comm.). The present specimens examined by us represent the only known Taiwanese specimens of this species. Its presence in Taiwan is, however, not unexpected as it has been reported from the Central Indian Ocean to the South China Sea and Japan (Chiong and Ng 1998). In the East and South Chinese Seas, *C. fornicata* is very distinct and cannot be confused with any other species (Chiong and Ng 1998).

***Daldorfia horrida* (Linnaeus, 1758)**  
(Fig. 13c)

*Cancer horridus* Linnaeus 1758: 629.

*Parthenope horrida*: Flipse 1930: 58; Lin 1949: 17.

*Daldorfia horrida*: Dai et al. 1986: 157, fig. 89(1), pl. 21(5); Dai and Yang 1991: 173, fig. 89(1), pl. 21(5).

**Materials examined:** 1 ♀ (31.7 by 23.9 mm) (NTOU), Taipei County, Guihou (Yeliu), about 10 m depth, hook and line, rocky reefs, coll. Z. Chen; 1 juvenile (NTOU), Lanyu (Orchard Is.), Taitung County, 4-5 m depth, night dive, coll. S.-H. Wu, 10 July 1997.

**Remarks:** The extreme rugosity and sculptured nature of the carapace dorsal surface easily distinguishes *Daldorfia horrida* from other parthenopids in Taiwan. In mature specimens there is a prominent but blunt inter-antennular spine on the underside of the rostrum. This spine, on the juvenile specimen (NTOU) which we examined, is present but consists of 2 granules and is not a single structure. In the same specimen, spines on the ambulatory legs are truncated at the base, with some spines merging basally. In mature specimens, spines on the ambulatory legs are clearly acute and do not merge at the base.

In Taiwan, *D. horrida* apparently prefers to hide under large plate corals and is usually found upside down under coral plates (pers. comm., S.-H. Wu).

*Daldorfia horrida* has been reported from a wide area in the Indo-West Pacific, from Japan to Southeast Asia, Sri Lanka, Mauritius, and the Red Sea (Flipse, 1930).

***Garthambrus stellata* (Rathbun, 1906)**  
(Figs. 5, 13d)

*Parthenope (Platylambrus) stellata* Rathbun 1906: 884 (part), pl. 15 figs. 1, 2; Garth 1993: 786, figs. 3, 4.

*Garthambrus stellata*: Ng 1996: 158.

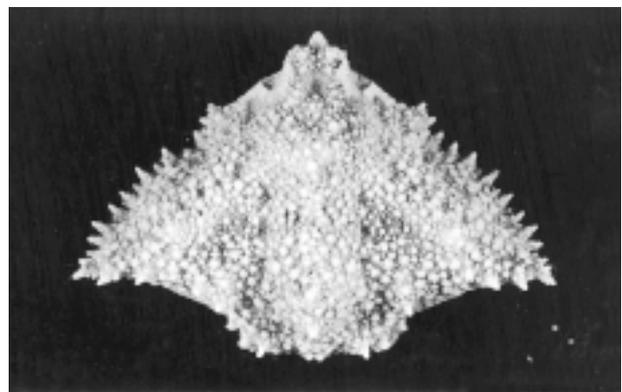
**Material examined:** 1 ♀, gravid (29.8 by 20.3 mm) (NKIMT), Nangfangau, Ilan County, 150 m, trawler, coll. J.-F. Huang, 17 Dec. 1991.

**Remarks:** This interesting species, a new record for Taiwan, was first reported by Rathbun (1906) from Hawaii. The presence of this species in Taiwanese waters extend its range considerably westwards. This species has also been reported from Mururoa, Tuamotu, French Polynesia (Garth 1993).

The carapace is distinctly triangular and heavily granulated, the granules being stellate and distinct. Spines on the anterolateral, posterolateral, posterior margins, mesogastric, metabranchial, cardiac, and intestinal regions are sharp and prominent. These spines usually become eroded and reduced as the specimen grows larger (Ng and Tan 1999).

Lateral margins of the ambulatory legs of the Taiwan specimen are not as heavily granulated as those of a male specimen examined from Hawaii. These differences are probably due to the small size of the present specimen (see also Ng and Tan 1999).

**Comparative material:** *Garthambrus stellata*, 1



**Fig. 5.** *Garthambrus stellata*. Female (29.8 by 20.3 mm) (NKIMT). Overall view.

♂ (70.2 by 45.6 mm) (ZRC), off Pearl Harbor, Oahu Is., Hawaii, 350 m depth.

### *Heterocrypta transitans* Ortmann, 1893

*Heterocrypta transitans* Ortmann 1893: 417, pl. 17, fig. 2.

**Material examined:** 1 ♂ (dried) (TMCD 474), Makung, Penghu Is., coll. C. Y. Wei, Apr. 1988.

**Remarks:** The dried specimen is clearly referable to this species. *Heterocrypta transitans* was described from Sagami Bay in Japan, and has been reported from various parts of Japan, through to China, the Philippines, and India (Flipse 1930, Sakai 1976, Dai et al. 1991). Its presence in Taiwan is thus quite expected.

### *Rhinolambrus contrarius* (Herbst, 1804)

(Figs. 6, 7)

*Cancer contrarius* Herbst 1804: 18, pl. 60, fig. 3.

**Materials examined:** 1 ♂ (28.3 by 19.7 mm) (NKIMT), Changbin Wushi fish port, Taitung County, coral reef, 60 m, gill net, H.-P. Ho and J.-Y. Shy, 11 Oct. 1991; 2 specimens (dried) (TMCD 470, 471), Chshan Harbor, coll. C. Y. Wei, 15 Oct. 1960.

**Remarks:** Members of this genus are very distinctive and can be differentiated from other parthenopid genera due to the presence of a 'neck'. The 'neck' formation is due to the longitudinally elongate epistome, which accounts for about 1/4 the length of the carapace.

*Rhinolambrus contrarius* is easily distinguished from congeners by its distinctive shape. The rostrum is triangular, rather broad, long, and directed downwards at about 45° to the perpendicular. The hepatic region is well demarcated and possesses a rather long, prominent spine. Spines on the gastric, car-

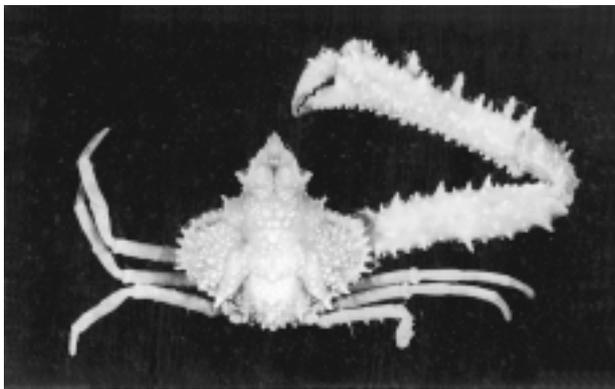
diac, and intestinal regions are sharp and distinct. Spines on the cheliped are long and sharp, whereas those on the ambulatory legs are lower, smaller, fewer in number, and sparsely distributed. Tips of the chelipedal fingers are pigmented. The male telson is equilaterally triangular in shape.

*R. contrarius* is similar to *R. longispinis* (Miers, 1879) but can be differentiated from it by several characters. The hepatic spine of *R. contrarius* is long, whereas it is much lower in *R. longispinis*. The rostrum of *R. longispinis* possesses a median groove which is absent in *R. contrarius*. The spine on the male 6th abdominal segment of *R. longispinis* is blunt, whereas it is sharp in *R. contrarius*. There are considerable differences in gonopodal structures of both species. G1 of *R. contrarius* is long and slender, but is short and stout in *R. longispinis*. G2 of *R. longispinis* is subequal to that of G1, but is only about 1/2 the length of G1 in *R. contrarius*.

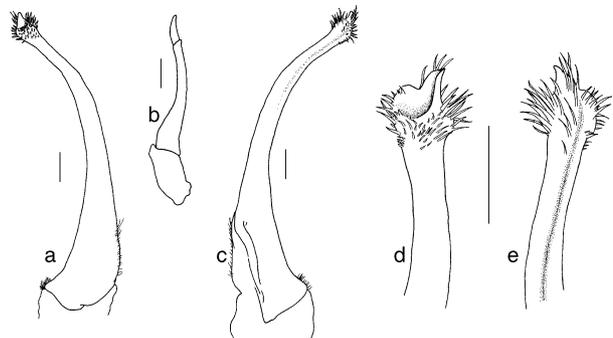
*R. contrarius* also resembles *R. lamellifrons* (Adams and White, 1848) which has also been reported from Taiwan. The 2 species, however, can easily be separated (see Remarks for *R. lamellifrons*).

*R. contrarius* is recorded for the 1st time from Taiwan. The present specimen agrees very well with a male specimen we examined from the Seychelles, which is near the type locality. *R. contrarius* has a wide Indo-West Pacific distribution from Hawaii, Australia, and Japan through various parts of Southeast Asia and to Sri Lanka and India (Sakai, 1976).

**Comparative materials:** *Rhinolambrus contrarius*, 1 ♂ (47.0 by 45.4mm) (MNHN), Seychelles, MUSORSTOM Expedition, St. 27, 53m depth, coll. Reves, 2, 8 Sept. 1980. *Rhinolambrus longispinis*, 1 ♂ (ZRC 1984.6067), Singapore, Singapore Straits, South Siglap.



**Fig. 6.** *Rhinolambrus contrarius*. Male (28.3 by 19.7 mm) (NKIMT). Overall view.



**Fig. 7.** *Rhinolambrus contrarius*. Male (28.3 by 19.7 mm) (NKIMT). Male left G1: a, dorsal view; b, left G2; c, ventral view; d, tip, dorsal view; e, tip, ventral view.

***Rhinolambrus lamellifrons*  
(Adams and White, 1848)**

*Lambrus lamellifrons* Adams and White 1848: 26, pl. 5, fig. 1.  
*Rhinolambrus lamellifrons*: Dai et al. 1986: 152, fig. 85(3), pl. 21  
(2); Dai and Yang 1991: 169, fig. 85(3), pl. 21(2).

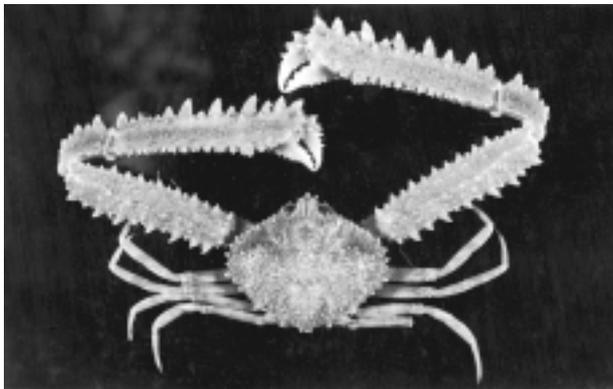
*Material examined*: None from Taiwan.

*Remarks*: Dai et al. (1986) and Dai and Yang (1991) noted that *R. lamellifrons* can be found in Taiwan. However, we have examined no specimen of this species from here. But since this species has a wide Indo-West Pacific distribution, its presence in Taiwan can be expected. The specimen figured by Dai et al. (1986) and Dai and Yang (1991) of this species agrees well with that illustrated by Adams and White (1848) and differs from *R. contrarius* in several characters. The hepatic spine of *R. lamellifrons* is reduced, and not sharp and prominent like that in *R. contrarius*. The chelipedal spines are rather fewer in number and less acute than those found in *R. contrarius*. The spines and granulations on the carapace dorsal surface appear to be fewer in number and lower in *R. lamellifrons*.

*R. lamellifrons* has been previously reported in a wide area, from Andamans, Sri Lanka, India, Seychelles, Zanzibar, and the Red Sea to Southeast Asia, Korea, Japan, China, Australia, Samoa, and New Caledonia (Flipse 1930; Dai and Yang 1991).

***Parthenope longimanus* (Linnaeus, 1758)  
(Figs. 8, 9, 13e)**

*Cancer longimanus* Linnaeus 1758: 629.  
*Lambrus (Lambrus) longimanus*: Horikawa 1940: 24; Lin 1949: 17.  
*Parthenope (Parthenope) longimanus*: Dai et al. 1986: 146; Dai and Yang 1991: 162.  
*Parthenope (Parthenope) sinensis* Shen, Dai and Chen 1982: 139, pl. 1:1, fig. 1:1.

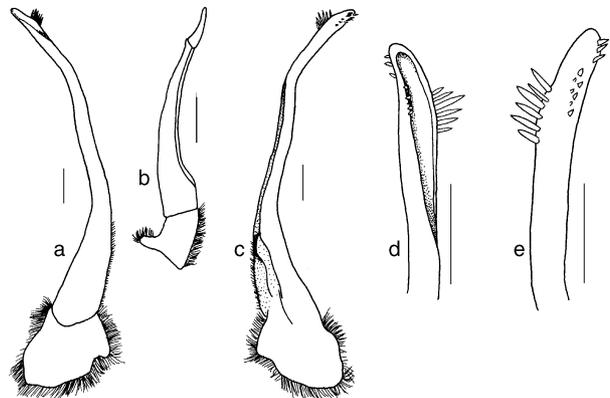


**Fig. 8.** *Parthenope longimanus*. Male (18.4 by 16.3 mm) (NKIMT). Overall view.

*Materials examined*: 1 ♀ (NTOU) Tachi, Ilan County, about 20 m depth, trawl, sandy mud substrate, coll. T.-Y. Chan, 4 Oct. 1984; 3 ♀♀ (NKIMT), Tachi, Ilan County, about 20 m depth, trawl, sandy mud, coll. J.-F. Huang, 24 Oct. 1992; 2 ♀♀ (NKIMT), Tachi, Ilan County, about 20 m depth, trawl, sandy mud, coll. T.-Y. Chan, 10 May 1985; 1 ♂ (31.7 by 28.5 mm) (NKIMT), Mitou, Kaohsiung County, 15-30 m depth, trawl, coll. J.-F. Huang, 11 July 1996; 1 ♂ (18.4 by 16.3 mm), 1 ♀ (23.1 by 20.6 mm) (NKIMT), Kerliou, Kaohsiung County, 15 m, trawl, coll. J.-F. Huang, 10 July 1996; 1 ♂ (NKIMT), Chungyun, Kaohsiung County, coll. J.-F. Huang, 7 Feb. 1995; 1 ♀ (27.9 by 25.0 mm) (NKIMT), Mitou, Kaohsiung County, coll. J.-F. Huang, 16 Oct. 1994; 1 ♂ (29.7 by 26.2 mm) (NKIMT), Mitou, Kaohsiung County, coll. J.-F. Huang, 7 Feb. 1995; 1 ♂ (NKIMT), Lanyu, Taitung County, Tashi fish port, coll. J.-F. Huang, 25 Sept. 1992; 3 ♂♂ (largest 31.7 by 27.9 mm) (ZRC 1997.395), port at Tungkuang, Pingtung County, commercial inshore trawlers, shallow waters, coll. P. K. L. Ng, 5 Aug. 1996.

*Remarks*: This species was placed under the genus *Lambrus* Leach, 1815, by Flipse (1930). Flipse (1930) had argued that the genus *Lambrus* should be used over the senior synonym, *Parthenope* Weber, 1795, because of wider usage. But since *Parthenope* is senior to *Lambrus*, *Parthenope* should have priority over *Lambrus*.

*Parthenope longimanus* is distinctive because of its subpentagonal carapace shape, short rostrum, cheliped with alternating large and small spines on the outer margin, the lower surface of cheliped being relatively smooth except for a row of granules on the merus and 2 rows on the palm, the tips of the fingers of the cheliped not being pig-



**Fig. 9.** *Parthenope longimanus*. Male (31.7 by 28.5 mm) (NKIMT). Male left G1: a, dorsal view; b, left G2; c, ventral view; d, tip, dorsal view; e, tip, ventral view.

mented, the ambulatory leg margins being smooth except for a few small spines on the merus, and a slender ambulatory dactylus which is longer than the propodus. The status of *P. longimanus* is not well settled. Shen et al. (1982) described *Parthenope sinensis* from southern China (see Ng 1994 for comments on authorship) on the basis of 1 male and 1 female, differentiating it from *P. longimanus* by its supposedly less convex carapace with more acute granules, more expanded lateral margins, and the 6th male abdominal segment having only a low median denticle (not acute tooth), and the distal part of G1 having spines (vs. absent). We have examined the holotype of *P. sinensis* and feel that none of above mentioned differences are distinct on the basis of the present series of specimens examined from Taiwan. The difference in the degree of convexity of the carapace does not seem significant, with the size of the granules varying with age (being more prominent in smaller specimens). The lateral carapace margins also vary slightly. In most of the present specimens, the submedian tooth on the 6th male abdominal segment is distinct, being sharp, but it can sometimes be very low and rounded. G1s of the holotype and similar-sized specimens of *P. longimanus* which we have examined are identical. The only character of *P. sinensis* that differs from *P. longimanus* is the spines on the carapace being somewhat sharper. This character we feel represents intra-specific variation. We thus doubt the validity of *P. sinensis* as presently defined and feel that it should be synonymised with *P. longimanus*.

*P. longimanus* was previously recorded by Horikawa (1940) and Lin (1949) from Taiwan. Dai et al. (1986) and Dai and Yang (1991) reported this species from mainland China. It is otherwise known from various parts of the Indian Ocean, Australia, New

Guinea, Japan, Southeast Asia, and China (Dai and Yang 1991).

*Comparitive material:* *Parthenope sinensis*, holotype male (Station X235B-18) (IOCAS), China: Beibu Gulf, 18 Aug. 1962.

### ***Platylambrus echinatus* (Herbst, 1790)**

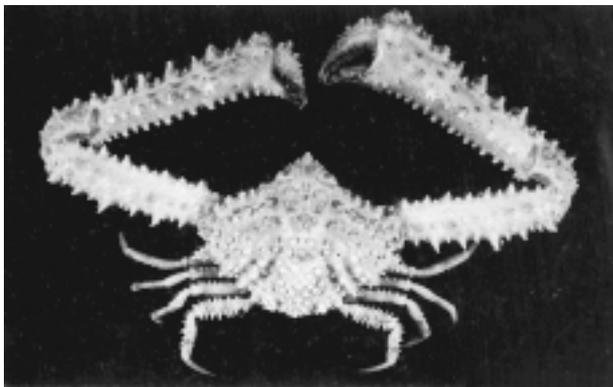
(Figs. 10, 11, 13f)

*Cancer echinatus* Herbst 1790: 255, pl. 19, figs. 108-109.

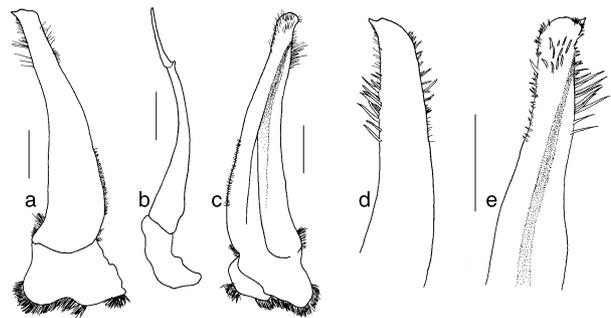
*Lambrus (Platylambrus) echinatus:* Horikawa 1940: 25; Lin 1949: 17; Chang 1963: 97.

*Materials examined:* 1 ♀ (NTOU), Tachi, Ilan County, 29 July 1988; 1 ♀ (39.5 by 31.3 mm) (NKIMT), Tachi, Ilan County, Aug. 1976; 1 ♂ (NKIMT), Tachi, Ilan County, trawl, sandy mud substrate, coll. J.-F. Huang, 23 Aug. 1990; 1 ♂, 2 ♀ (NKIMT), Tachi, Ilan County, trawl, sandy mud substrate, coll. J.-F. Huang, 11 Sept. 1990; 1 ♀ (NKIMT), Mituo, Kaohsiung County, about 20 m depth, trawl, sandy mud substrate, coll. J. F. Huang, 3 Apr. 1990; 1 ♀ (33.0 by 29.2 mm) (ZRC), Tachi, Ilan County, coll. P. K. L. Ng et al., 27 May 1997; 1 ♂ (23.1 by 20.2 mm) (ZRC), Tachi, Ilan County, coll. P. K. L. Ng et al., 28 May 1997; 1 ♀ (24.7 by 20.7 mm) (ZRC), Nangfangau, Ilan County, coll. P. K. L. Ng, 18 Nov. 1997; 1 ♂ (28.2 by 23.2 mm) (NKIMT), Nangfangau Ilan County, coll. J.-F. Huang, 20 Aug. 1991; 1 juv. (11.8 by 9.7 mm) (NKIMT), Nanwan, Pingtung County, coll. J.-F. Huang, 20 Dec. 1990.

*Remarks:* *Platylambrus echinatus* is superficially similar to *P. validus* which is also found in Taiwan. The lower surface of the cheliped of *P. echinatus*, however, is covered with smooth, round granules, whereas the granules in *P. validus* are less distinct and appear to be more deeply embedded in the cheliped. Granules on the dorsal surface of the carapace of *P. echinatus* are predominantly stellate on the posterior 1/2 whereas on the anterior 1/2, the



**Fig. 10.** *Platylambrus echinatus*. Female (33.0 by 29.2 mm) (ZRC). Overall view.



**Fig. 11.** *Platylambrus echinatus*. Male (23.1 by 20.2 mm) (ZRC). Male left G1: a, dorsal view; b, left G2; c, ventral view; d, tip, dorsal view; e, tip, ventral view.

granules are well formed, smooth, and round. On the other hand, granules on the entire carapace dorsal surface of *P. validus* are generally round, not stellate, and not smooth because they are covered with smaller granules. The ambulatory legs of *P. echinatus* are covered with numerous small, sharp spines. The ambulatory legs of *P. validus*, however, are lined with low and relatively blunt spines, and mainly on the merus, with the other segments being entire or lined only with low granules on the upper margin. G1s of the 2 species are similar, but that of *P. validus* is proportionately stouter, and the distal part is more distinctly curved.

The species described and illustrated as *Lambrus tuberculatus* Stimpson, 1857 (as a *Parthenope*, Stimpson 1857:220, Stimpson 1907:29, pl. 4 fig. 4) (see also Dai et al. 1986: 150, fig. 83, pl. 20[5], Dai and Yang, 1991: 165, fig. 83, pl. 20[5]) is almost certainly a synonym of *P. echinatus* (Herbst, 1790). From the published descriptions and figures, there are no obvious characters to separate them. It is important to note, however, that *P. echinatus* was described probably from somewhere in the Indian Ocean while *P. tuberculatus* was obtained from near Hong Kong. As such, specimens from both areas should be directly compared to confirm their conspecificity.

*Platylambrus echinatus* has also been reported from various parts of the Indo-West Pacific, including the South China Sea and Indian Ocean (Flipse, 1930).

### ***Platylambrus validus* (de Haan, 1839)**

(Fig. 12)

*Lambrus (Platylambrus) validus* de Haan 1839: 90; Chang 1963: 97, 107.

*Parthenope (Lambrus) validus*: Dai et al. 1986: 148, fig. 81B(3), pl. 20(3); Dai and Yang 1991: 163, fig. 81B(3), pl. 20(3).

*Parthenope (Platylambrus) valida*: Hu and Tao 1996: 167, pl. 26 (1, 2).

(see Flipse 1930; Dai and Yang 1991 for complete synonymy)

**Materials examined:** 1 ♀ (NTOU) Tachi, Ilan County, coll. S.-H. Wu, Apr. 1997; 1 ♂, 1 ♀ (NTOU), Masha Guo, Tainan County, bottom trawl, 14 Nov. 1994; 1 ♂ (TMCD 2785), 1 ♀ (TMCD 2786), Taipei County; 1 ♀ (51.7 by 42.5 mm) (NKIMT), Tachi, Ilan County, coll. J.-F. Huang, 11 Apr. 1997; 1 ♀ (66.2 by 55.5 mm) (NKIMT), Nangfangau, Ilan County, 35 m depth, trawler, snady mud substrate, coll. J.-F. Huang, 3 July 1992.

**Remarks:** *Platylambrus validus* resembles *P. echinatus*. See remarks under *P. echinatus* for distinguishing characters from *P. echinatus*. This species was previously reported from Taiwan by Chang

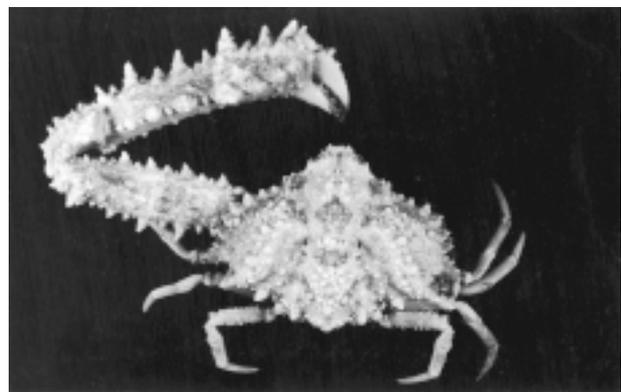
(1963). It has also been reported from Southeast Asia, Samoa, Australia, South and East China Seas, Yellow Sea, Korea, and Japan (Dai and Yang 1991).

## **GENERAL DISCUSSION**

Twelve species in 9 genera of parthenopid crabs are now recorded from Taiwan, viz. *Aethra scruposa* (Linnaeus, 1764), *Aulacolambrus brevibrachiatus* (Shen, Dai and Chen, 1982), *Aulacolambrus hoplonotus* (Adams and White, 1850), *Cryptopodia fornicata* (Fabricius, 1781), *Daldorfia horrida* (Linnaeus, 1758), *Garthambrus stellata* (Rathbun, 1906), *Heterocrypta transitans* Ortmann, 1893, *Rhinolambrus contrarius* (Herbst, 1804), *R. lamellifrons* (Adams and White, 1848), *Parthenope longimanus* (Linnaeus, 1758), *Platylambrus echinatus* (Herbst, 1790), and *Platy. validus* (de Haan, 1839). Of these, *Aethra scruposa*, *A. brevibrachiatus*, *A. hoplonotus*, *G. stellata*, *H. transitans*, and *R. contrarius* are new records for the island.

Hu and Tao (1996: 167, pl. 26 [10, 11]) reported *Platylambrus nummiferus* from Taiwan, but his figures show a male specimen which more closely resembles *Tutankhamen pteromerus* (Ortmann 1893) instead (Sakai 1976, Dai and Yang 1991). Whether the figured specimen was obtained from Taiwan or elsewhere was not stated. It is clearly not *P. nummiferus* (see Rathbun 1906). Until the specimen can be examined, we prefer to exclude this record from the Taiwanese fauna.

Two parthenopid genera found in China are not represented in Taiwan, viz. *Pseudolambrus* Paulson, 1875, *Tutankhamen* Rathbun, 1925 (Dai et al. 1986, Dai and Yang 1991). These 2 genera are also known from Japan, but another genus, *Dairoides* Stebbing,



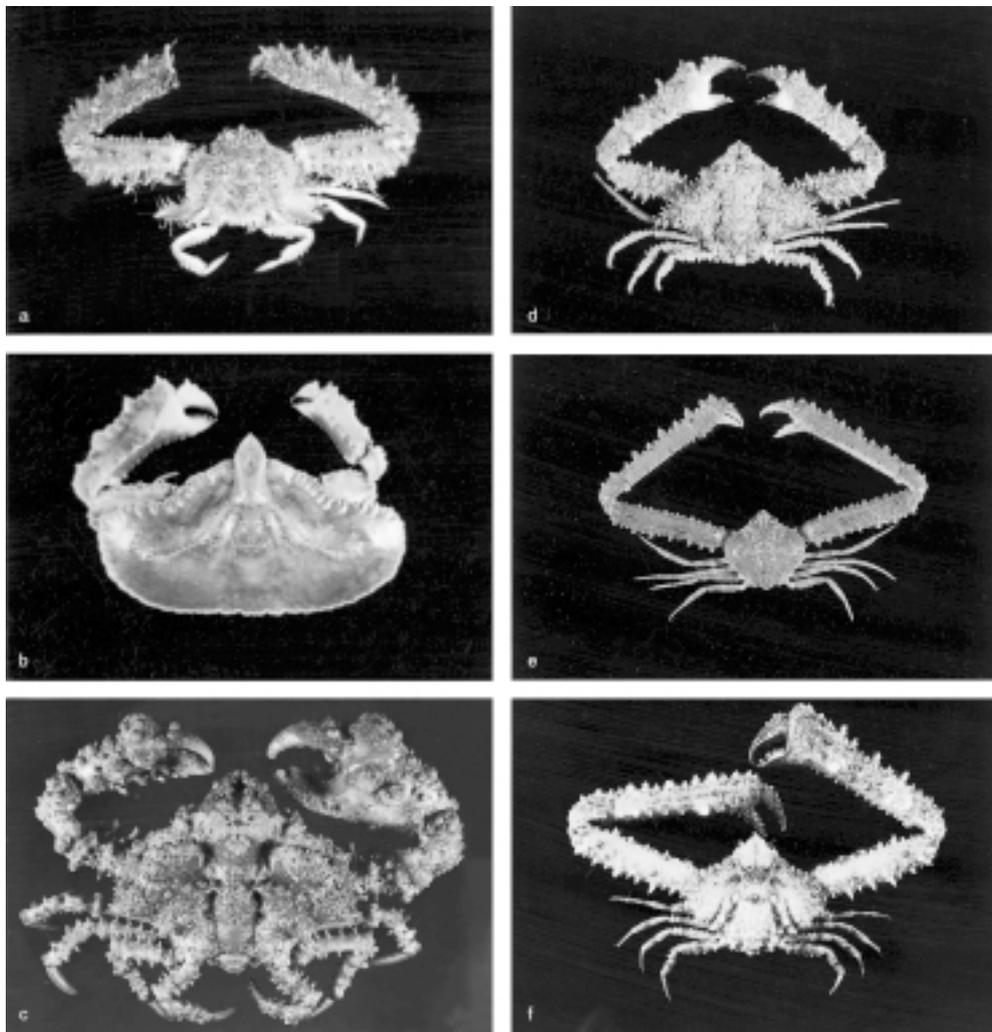
**Fig. 12.** *Platylambrus validus*. Female (51.7 by 42.5 mm) (NKIMT). Overall view.

1920, is also found there (Sakai 1976, Ng and Tan 1999), but not yet known from Taiwan or China. It is highly probable that the parthenopid diversity in Taiwan will increase further as more intensive collections are made.

**Key to Parthenopidae of Taiwan**

- 1a. Lateral margins of carapace strongly expanded, appears plate-like, completely covers ambulatory legs from dorsal view ..... 2
- 1b. Lateral margins of carapace not strongly expanded, never plate-like, ambulatory legs always visible from dorsal view... ..... 4
- 2a. Rostrum very low, not protruding; dorsal surface of carapace may be strongly eroded ..... *Aethra scruposa*
- 2b. Rostrum sharp, protruding forwards; dorsal surface of carapace smooth to granular, never eroded ..... 3
- 3a. Pterygostomian region with granular ridges .....

- ..... *Heterocrypta transitans*
- 3b. Pterygostomian region without granular ridges ..... *Cryptopodia fornicata*
- 4a. Carapace with distinct neck-like structure, epistome distinctly longitudinally rectangular and elongate ..... (5) *Rhinolambrus*
- 4b. Carapace rounded to triangular, without neck-like structure, epistome transversely rectangular ..... 6
- 5a. Carapace dorsal surface with numerous distinct spines and granules; hepatic spine sharp, prominent; chelipedal spines relatively numerous, acute ..... *Rhinolambrus contrarius*
- 5b. Spines and granules on carapace dorsal surface relatively fewer, lower; hepatic spine reduced; chelipedal spines relatively fewer, less acute ..... *Rhinolambrus lamellifrons*
- 6a. Epibranchial spines large, elongate; outer margin of chelipedal propodus with blade-like spines ..... 7
- 6b. Epibranchial spines normal, not strongly elongate; outer margin of chelipedal propodus with scattered spines or teeth which are never blade-like spines ..... 8
- 7a. Carapace granules large; branchial spines with large granules near base; outer margin of chelipedal propodus spines



**Fig. 13.** Live coloration: a. *Aulacolambrus brevibrachiatus*; b. *Cryptopodia fornicata*; c. *Daldorfia horrida*; d. *Garthambrus stellata*; e. *Parthenope longimanus*; f. *Platylambrus echinatus*.

- about equal in size ..... *A. hoplonotus*
- 7b. Carapace granules small; branchial spines smooth, without granules near base; outer margin of chelipedal propodus spines unequal, spines adjacent to long spines about 1/2 size ..... *A. brevibrachiatus*
- 8a. Rostrum with prominent inter-antennular ventral spine .....  
..... *Daldorfia horrida*
- 8b. Rostrum with or without inter-antennular ventral spine ... 9
- 9a. Carapace rounded, lateral margins lined with low tubercles or teeth, never with prominent spines .....  
..... *Parthenope longimanus*
- 9b. Carapace triangular to subtriangular or subovate, lateral margins lined with distinct epibranchial spines ..... 10
- 10a. Carapace distinctly triangular; dorsal surface of carapace and chelipeds uniformly covered with distinctly stellate granules; G2 distal segment elongate, longer than 1/2 length of basal segment ..... *Garthambrus stellata*
- 10b. Carapace subtriangular to subovate; dorsal surface of carapace and chelipeds may have stellate granules but never uniformly over entire surface; G2 distal segment short, less than 1/2 length of basal segment ..... (11) *Platylambrus*
- 11a. Granules on dorsal surface of carapace predominantly stellate on posterior 1/2, granules on anterior 1/2 smooth, rounded; lower surface of cheliped covered with smooth, round granules; merus, carpus and propodus of ambulatory legs covered with numerous small, sharp spines .....  
..... *Platylambrus echinatus*
- 11b. Granules on entire carapace dorsal surface generally rounded, not stellate but covered with smaller granules; lower surface of cheliped covered with less distinct granules which are more deeply embedded in surface; merus of ambulatory legs lined with low, relatively blunt spines, carpus and propodus entire or lined with low granules on upper margin .....  
..... *Platylambrus validus*

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## 臺灣菱蟹科蟹類

陳瑞熙<sup>1</sup> 黃榮富<sup>2</sup> 黃禎麟<sup>1</sup>

本文報導臺灣產菱蟹科蟹類 9 屬 12 種，其中，鋸齒奇淨蟹(*Aethra scruposa*)、短臂側棘蟹(*Aulacolambrus brevibrachiatus*)、武裝側棘蟹(*Aulacolambrus hoplonotus*)、星點展翼蟹(*Garthambrus stellata*)、橫展異隱蟹(*Heterocrypta transitans*)、異形長頸蟹(*Rhinolambrus contrarius*)六種類為臺灣新記錄種。尤其，星點展翼蟹原記錄自夏威夷及法屬玻里尼西亞，此種類在臺灣的發現，其分布值得進一步探討。此外，對於部份種類的分類問題及以雄性第一腹肢作為分類依據在本文亦有論述。

**關鍵詞**：蟹類相，蟹類分類，菱蟹科。

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