

## Short Note

### ***Quadrella maculosa* Alcock, 1898, a Genus and Species of Shallow-water Xanthid Crab (Brachyura: Xanthoidea: Trapeziidae) New to Taiwan**

Hsi-Te Shih\* and Hin-Kiu Mok

*Institute of Marine Biology, National Sun Yat-sen University, Kaohsiung, Taiwan 804, R.O.C.*



## Short Note

### ***Quadrella maculosa* Alcock, 1898, a Genus and Species of Shallow-water Xanthid Crab (Brachyura: Xanthoidea: Trapeziidae) New to Taiwan**

Hsi-Te Shih\* and Hin-Kiu Mok

Institute of Marine Biology, National Sun Yat-sen University, Kaohsiung, Taiwan 804, R.O.C.

(Accepted December 18, 1995)

**Hsi-Te Shih and Hin-Kiu Mok (1996)** *Quadrella maculosa* Alcock, 1898, a genus and species of shallow-water xanthid crab (Brachyura: Xanthoidea: Trapeziidae) new to Taiwan. *Zoological Studies* 35(2): 146-148. This is the 1st record of the genus and species of the xanthid crab, *Quadrella maculosa* Alcock, 1898, to be reported for the carcinological fauna of Taiwan. This species was symbiotically associated with the black coral *Antipathes* sp. (Order Antipatharia), and was collected from the sea bottom at a depth of 53 m depth offshore from Nanwan, Pingtung County in southern Taiwan. It is distinguished from other congeneric species by the armature of the carpus and the merus of the chelipeds, and the dactyls of the pereopods.

**Key words:** New record, Crustacean, Taxonomy, Symbiosis, Antipatharian Coral.

Crabs of the genus *Quadrella* Dana, 1851 are commensal with anthozoans or sponges, and most specimens are obtained from shallow-water depths between 15 and 150 m. Because their deep habitat exceeds the working depth of scuba divers, most specimens have been obtained by dredging (Alcock 1898, Ward 1942, Sakai 1965 1976, Miyake 1983, Serène 1984, Galil and Takeda 1985, Galil 1986). Therefore, knowledge of their natural habitat is incomplete. According to Serène (1984), the composition of the substrate of their habitat includes sand, rocks and shells. The morphology in the genus *Quadrella* is similar to that in *Trapezia* and *Hexagonalia*, except that the chelipeds of *Quadrella* are very long and sub-cylindrical, the entire merus projects beyond the carapace, and the front is cut into 4 triangular lobes. So far, 8 *Quadrella* species have been reported in the world: *Q. bispinosa* Borradaile, 1902; *Q. boopsis* Alcock, 1898; *Q. coronata* Dana, 1852; *Q. lewinsohni* Galil, 1986; *Q. maculosa* Alcock, 1898; *Q. nitida* Smith, 1869; *Q. reticulata* Alcock, 1898; and *Q. serenei* Galil, 1986 (reviewed by Galil 1986).

This report describes the diagnosis and natural habitat of *Quadrella maculosa* which is a new record of distribution of this genus and species from Taiwan. The specimens were taken from a depth of 53 m by the articulator of an ROV (Remotely Operated Vehicle). Carapace length (CL) and carapace width (CW) measurements are included. Specimens were illustrated with the help of a drawing tube attached to a Carl Zeiss Jena stereo microscope. Specimens were preserved in 70% ethyl alcohol, cataloged and deposited at the Institute of Marine Biology, National Sun Yat-sen University (NSYSU), Kaohsiung, Taiwan, R.O.C.

Family Trapeziidae Miers, 1886  
Genus *Quadrella* Dana, 1851  
*Quadrella maculosa* Alcock, 1898  
(Figs. 1, 2)

*Quadrella coronata* var. *maculosa* Alcock, 1898: 226.

*Quadrella maculosa* — Rathbun, 1911: 235 (part); Garth, 1969: 188; Sakai, 1980: 78, 83, Fig. 3, Frontispiece 2: Fig. 3; Serène, 1984: 288, Fig. 194, Pl. 41e; Galil and Takeda, 1985: 203; Galil, 1986: 285, Fig. 5 C-F.

*Quadrella cyrenae* Ward, 1942: 45, Pl. 3: Figs. 5, 6.

**Material examined:** Nanwan, Pingtung County, Taiwan, 21°55'17"N; 120°44'50"E, 1♂ (CL 9.9 mm, CW 11.2 mm), 1♀ (CL 10.5 mm, CW 11.4 mm), Jul. 29, 1994, depth 53 m, NSYSU 940729.

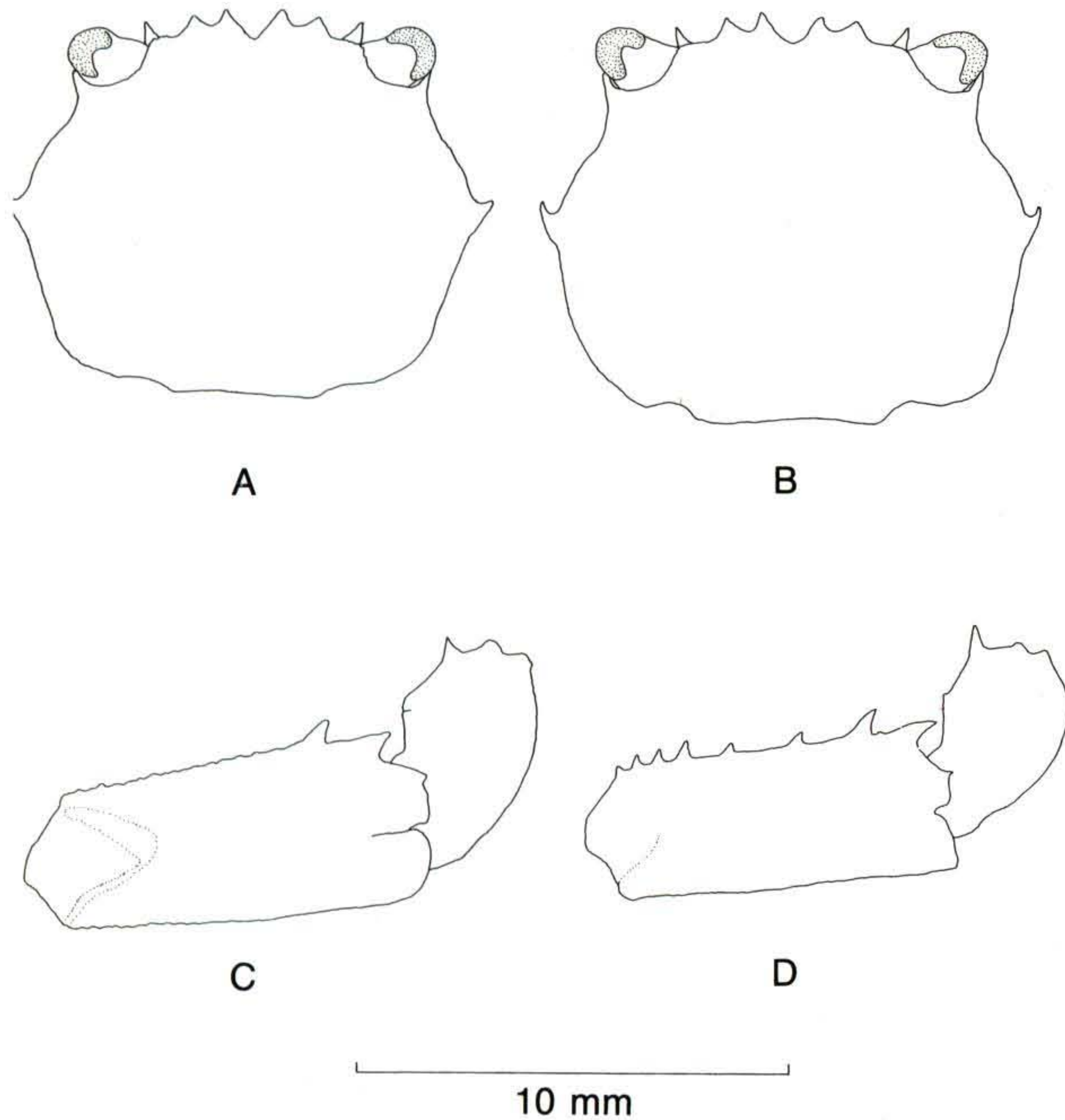
**Diagnosis:** Carapace subhexagonal, constricted behind postorbital spines. Epibranchial spine prominent, projecting outwards and forwards. Submedian frontal sulcus wide and shallow, lateral teeth nearly reaching as far forward as submedian pair (Fig. 1A, B). Chelipeds massive, elongate, the male specimen with right cheliped (the female specimen with left one) more massive and stouter (Fig. 2); fingers closed without space, curved tips crossing; palm swollen, tuberculate; carpus with a spine at mesial distodorsal margin and a weak submedian tubercle on mesial surface (Fig. 1C, D); whole merus projecting beyond edge of carapace, in the male specimen, dorsomesial margin weakly tuberculate with 3 large teeth distally (Fig. 1C) and in the female specimen, dorsomesial margin spinous with distalmost tooth largest (Fig. 1D). Fifth pereopods with 14-16 teeth on ventral margin of dactyl, 6-8

\*To whom all correspondence and reprint requests should be addressed.



distalmost teeth each bearing additional spine mesially; propodi spinous on ventral margin. Dactyls and propodi covered with long setae. First male pleopod slightly sinuous, subdistally spinous with proximal spine largest.

*Color in life:* Whole body light reddish-brown. Carapace brown-red, with a pale band between orbitals, a pair of crescentic pale markings on metabranchial region. Eyes red. Chelipeds light reddish-brown, with some darker lines on surface of palm, finger tips pale. Ambulatory legs brown-red, dactyls yellow, each articulation between segments red.



**Fig. 1.** *Quadrella maculosa* Alcock, A, C, ♂, NSYSU 940729; B, D, ♀, NSYSU 940729; A, B, carapaces; C, D, right chelipeds, carpi and meri.



**Fig. 2.** *Quadrella maculosa* Alcock, 1898 (♂).

*Habitat:* These 2 specimens were symbiotically associated with the black coral *Antipathes* sp. (Order Antipatharia) (Figs. 3, 4). The sampling procedure was monitored by the video system of the ROV (Fig. 4) and the host *Antipathes* sp. specimen was removed from the substrate by the vehicle's articulator. The host black coral lived on the hard bottom which was covered with coarse sand and algae; there were alcyonarians, stony corals, sea fans, sea whips and other gorgonians nearby. The color of the host *Antipathes* sp. was white on the branches and dark brown on the stalk (Figs. 3, 4). According to Sakai (1980), *Q. maculosa* was also symbiotically associated with a colony of gorgonian *Antipathalia* sp. In the host *Antipathes* sp. sampled in this study, there were also many other crustaceans found, e.g., snapping shrimps, anomuran *Petrolisthes* sp., *Allogalatea* sp. and other xanthids.

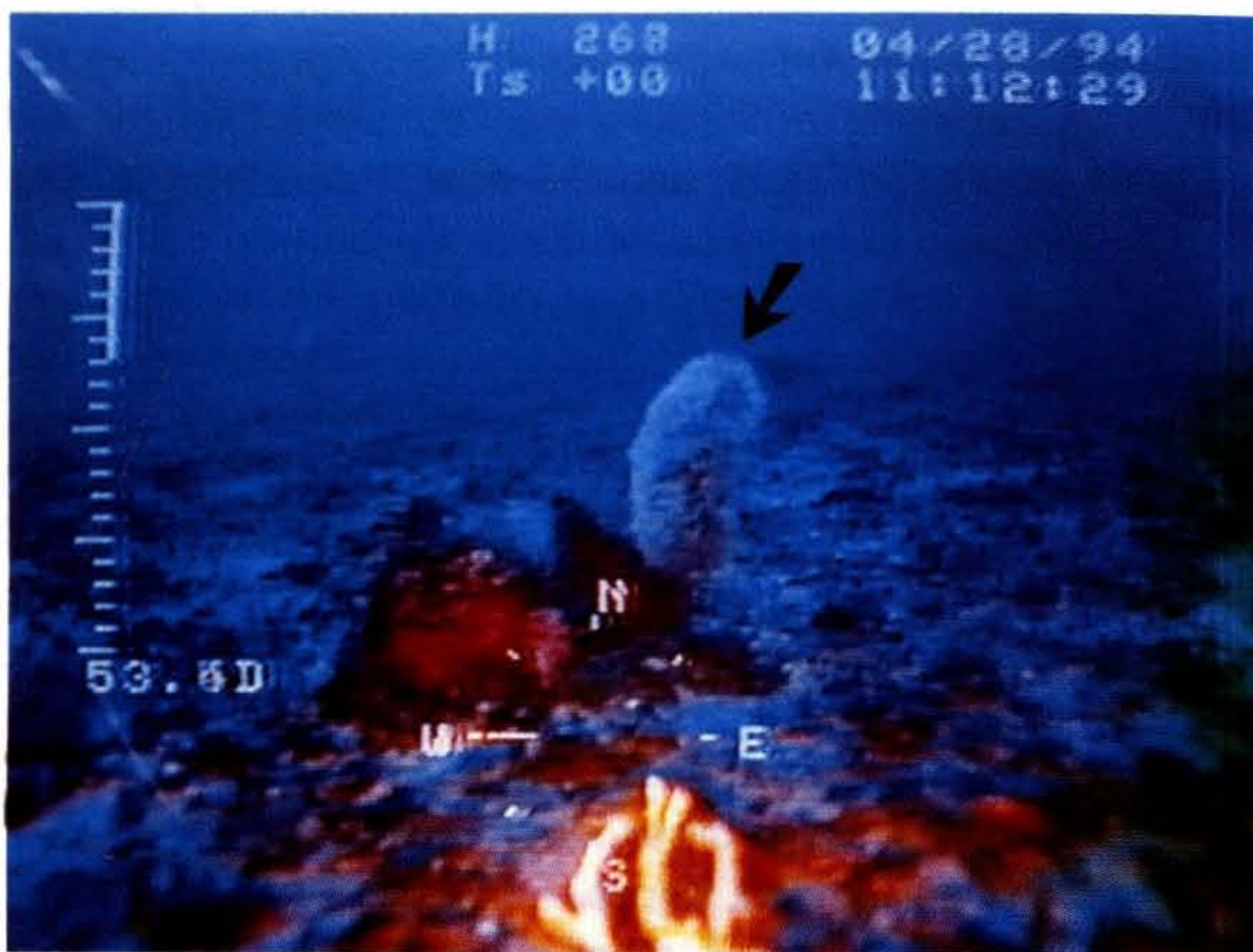
*Distribution:* Red Sea, Kenya, Amirante Island, Madagascar, Mauritius, Maldives Islands, India, Ceylon, Philippines, Moluccas Islands, New Guinea, Indonesia, Ryukyu Islands, Taiwan.

*Remarks:* The morphology of the 2 specimens agrees with the description of Galil (1986). In our specimens, the carpus of chelipeds only possesses a prominent distomesial spine, the submedian one appearing as a weak tubercle. There-



**Fig. 3.** *Antipathes* sp., a black coral, the host of *Quadrella maculosa*. (30 cm in length)





**Fig. 4.** Photograph taken from the video record of the ROV (Remotely Operated Vehicle) showing the host antipatharian (indicated by arrow) and the natural habitat.

fore these 2 specimens are both adults (Galil 1986). According to Galil (1986), the dorsomesial margin (= anterior margin) of the chelipeds' merus is spiniform in young, but obtuse in adult. In our specimens, however, the dorsomesial margin of chelipeds' merus is spinous in the female, but obtuse in the male. The difference may be an expression of sexual dimorphism.

**Acknowledgements**—This study was supported by a grant from the National Science Council, R.O.C (NSC 84-2611-M-110-011) to the junior author. We express our thanks to Mr. Cheng-Wang Chen and Mr. Yu-Yun Chen of the Institute of Marine Biology, National Sun Yat-sen University, for helping to collect specimens and for photography of the crab specimen, respectively; to Dr. Ping-Ho Ho of the Graduate School of Fisheries, National Taiwan Ocean University, for providing the information

on identification; to Mr. Chia-Hsiang Wang of the Department of Zoology, Taiwan Museum and Mr. Chao-Nan Liang of the Department of Zoology, National Taiwan University, for bibliographic help; and to the crews of the R/V Ocean III of the NSYSU for help in deploying the ROV.

#### References

- Alcock A. 1898. Materials for a carcinological fauna of India: No. 3. The Brachyura Cyclometopa. Part 1. The family Xanthidae. J. Asiat. Soc. Bengal **67**: 67-233.
- Galil B. 1986. *Quadrella* (Brachyura: Xanthoidea: Trapeziidae) — review and revision. J. Crust. Biol. **6**(2): 275-293.
- Galil B, M Takeda. 1985. Crabs of the genus *Quadrella* (Crustacea, Decapoda, Trapeziidae) from Japanese waters. Bull. Natn. Sci. Mus., Tokyo (A) **11**(4): 197-207.
- Garth JS. 1969. Borradaile's Maldivian collections revisited. J. Mar. Biol. Ass. India **11**(1&2): 182-190.
- Miyake S. 1983. Japanese crustacean decapods and stomatopods in color. Vol. II. Osaka, Japan: Hoikusha Publishing. (in Japanese).
- Rathbun MJ. 1910. The stalk eyed Crustacea of Peru and the adjacent coast. Proc. U.S. Nat. Mus. **38**: 531-620.
- Sakai T. 1965. The crabs of Sagami Bay collected by His Majesty the Emperor of Japan. Tokyo, Japan: Maruzen Ltd.
- Sakai T. 1976. Crabs of Japan and the adjacent seas. Tokyo, Japan: Kodansha Ltd.
- Sakai T. 1980. On new or rare crabs taken from Japanese and central Pacific waters. Res. Crust. **10**: 73-84, frontispiece. pl. 5.
- Serène R. 1984. Crustacés décapodes brachyours de l'océan Indien occidental et de la Mer Rouge, Xanthoidea: Xanthidae et Trapeziidae. Avec un addendum par Crosnier, A.; Carpiliidae et Menippidae. Faune Tropicale **24**: 1-400. (in French).
- Ward M. 1942. A new genus and eight new species of Brachyura from Mauritius and the Chagos Archipelago. Mauritius Inst. Bull. **2**(2): 39-48.

## 臺灣新記錄之淺海螃蟹：斑點四齒蟹(短尾亞目：扇蟹首科：梯形蟹科)

施習德<sup>1</sup> 莫顯騫<sup>1</sup>

斑點四齒蟹 *Quadrella maculosa* Alcock, 1898 是臺灣新記錄的扇蟹，也是四齒蟹屬的首次發現，棲息在位於水深53公尺的硬質海底的黑珊瑚 *Antipathes* sp. 上面，而該黑珊瑚標本是利用遙控潛航器在南臺灣南灣地區所採集的。斑點四齒蟹的特徵是前額分為4個三角形齒；兩螯粗大且極長，腕節有棘，長節前緣棘狀或遠端棘狀；第五胸足指節和前節覆蓋有長剛毛，指節腹緣有14-16齒，且遠端6-8齒的內側有額外的短剛毛；活時全體為深橙紅色，眼區之間有淡色橫帶，以及後鰓區各有一個新月形淡色斑。

**關鍵詞**：新記錄種，甲殼類，分類，共生，黑珊瑚類。

<sup>1</sup> 國立中山大學海洋生物研究所