

## STYLODACTYLIDAE AND BATHYPALAEONELLIDAE FROM TAIWAN (CRUSTACEA: DECAPODA: CARIDEA)

Régis Cleva

Muséum National d'Histoire Naturelle, Département Milieux et peuplements aquatiques  
61 rue Buffon, 75231 Paris Cedex 05, France  
Email: cleva@mnhn.fr

**ABSTRACT.** – Seven shrimp species of the family Stylodactylidae are reported here from Taiwanese waters, four of which represent new records for the area. Only three species of this family were previously known from Taiwan: *Styloactylus multidentatus* Kubo, 1942, and *Parastyloactylus bimaxillaris* (Bate, 1888), both present in the collection studied here, and *Bathystyloactylus inflatus* Hanamura & Takeda, 1996, no material in the present collection. *Styloactylus major* Hayashi & Miyake, 1968, is recorded for the second time. The other species are: *Styloactylus libratus* Chace, 1983, *Styloactylus licinus* Chace, 1983, and *Styloactylus tokarensis* Zarenkov, 1968. On another hand, the status of a seventh species, related to *Styloactylus pubescens* Burukovsky 1990, is left unresolved. The rare deep-sea shrimp family Bathypalaemonellidae is added to the Taiwanese decapod fauna, being represented by four species, one of which is new: *Bathypalaemonella hayashii* Komai, 1995; *Bathypalaemonetes brevirostris* (Bruce, 1986); *Bathypalaemonetes pilosipes* (Bruce, 1986) and *Bathypalaemonetes chani*, new species.

**KEY WORDS.** – Styloactylidae, Bathypalaemonellidae, Taiwan, new records, *Bathypalaemonetes chani*, new species.

### INTRODUCTION

The “TAIWAN 2000-2003” cruises, launched by the Taiwanese institutions, the Muséum national d'Histoire naturelle, Paris (MNHN), and the IRD (Institut de Recherche pour le Développement, France) to explore the deep-waters off Taiwan, have collected numerous decapod crustaceans previously unknown from Taiwan. This collection includes specimens of the deep-sea shrimp families Styloactylidae and Bathypalaemonellidae. Only three species of the former family have been recorded from Taiwan before: *Styloactylus multidentatus* Kubo, 1942, and *Parastyloactylus bimaxillaris* (Bate, 1888), reported by Chan & Yu in 1985, and *Bathystyloactylus inflatus* Hanamura & Takeda, 1996, recently described from eastern Taiwan. Three more species of *Styloactylus* have been found in the material of the “TAIWAN 2000, 2001 and 2002” cruises, one more species was recently collected from a local fish market, and another species of *Styloactylus*, from “TAIWAN 2003”, is left unidentified and quoted as *S. sp. aff. pubescens*, Burukovsky, 1990. This brings the styloactylid fauna of Taiwan to a total of eight species and all, except *Bathystyloactylus inflatus*, are dealt with in the present report. The rare, deep-sea shrimp family Bathypalaemonellidae was not known from Taiwan before, but four specimens, each representing a different species, were collected in the recent deep-sea cruises. One

of these four newly-recorded bathypalaemonellid species is new to science.

Specimens are deposited in the NTOU (National Taiwan Ocean University, Keelung); ZRC (Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore); MNHN (Muséum national d'Histoire naturelle, Paris, France). Abbreviations used: CL = carapace length; TL = total length; mxp3, P1, P2, P3, P4, P5: third maxilliped, and first to fifth pereopod; CP = beam trawl; DW = Warén dredge; CD = otter trawl Le Drézen type JUNEUX; CC = shrimp otter trawl.

### SYSTEMATICS

#### STYLODACTYLIDAE BATE, 1888

##### *Styloactylus* A. Milne Edwards, 1881

Type species. – *Styloactylus serratus* A. Milne Edwards, 1881

##### *Styloactylus major* Hayashi & Miyake, 1968

(Figs. 1, 6a)

*Styloactylus major* Hayashi & Miyake, 1968: 590, Figs. 2, 3; Hayashi, 1991a: 42; Cleva, 1994: 56, Fig. 1B.

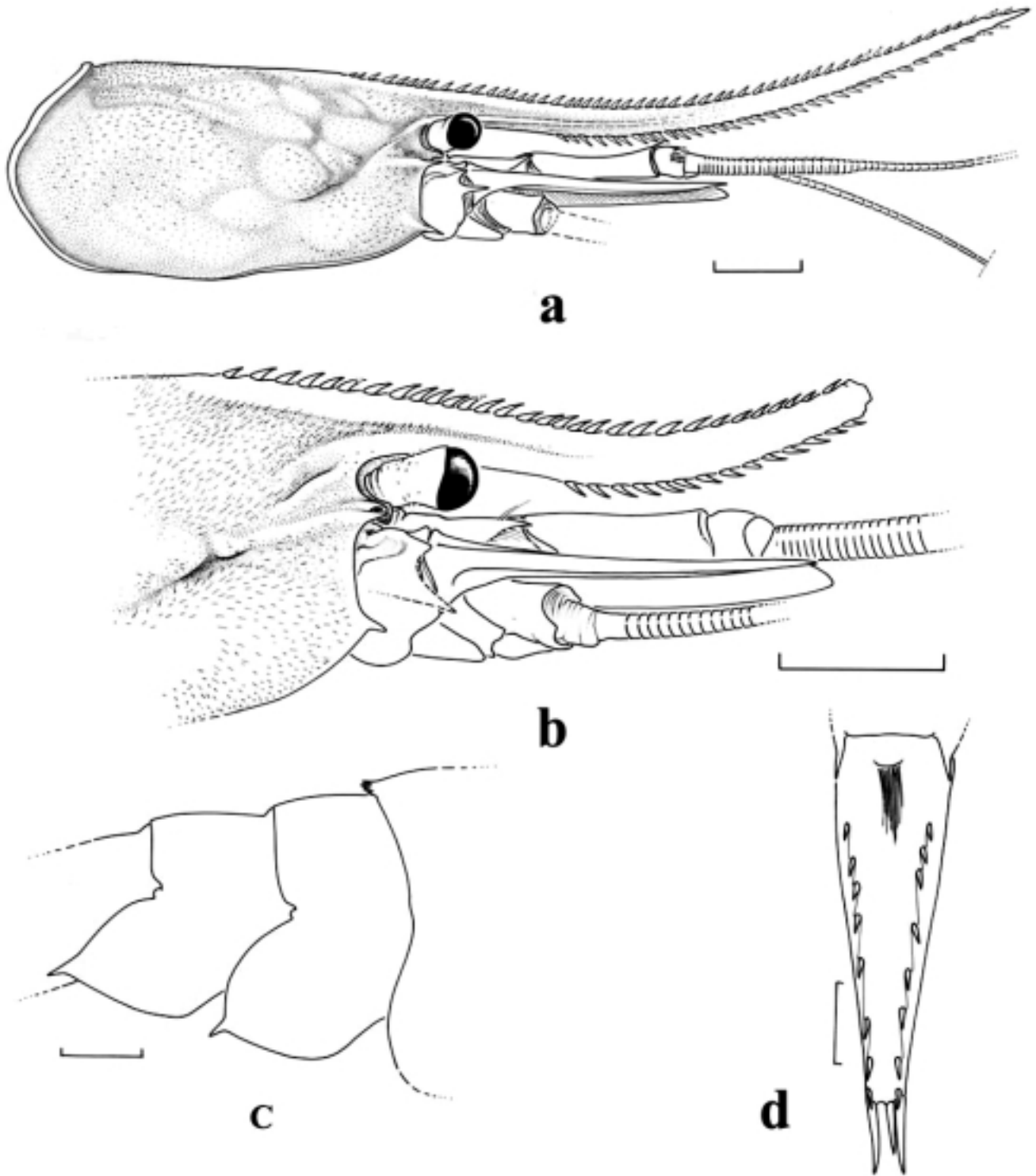


Fig. 1. *Styloactylus major* Hayashi & Miyake, 1968: (a), (b), anterior part of cephalothorax; (c), abdomen (part); (d), telson; (a) male 20 mm, TAIWAN 2002, st. CD 199; (b) male 37 mm, TAIWAN 2001, st. CD 136; (c),(d), male 32 mm TAIWAN 2001, st. CD 136. Scale bars: b= 10 mm; a, c, d = 5 mm.

**Material examined.** – 1 male (CL = 37 mm, TL without rostrum, broken, approx. 135 mm); 1 male (CL 32 mm, TL without rostrum, broken, approx. 118 mm) (NTOU), “TAIWAN 2001”, R.V. “OCEAN RESEARCHER 1”, st. CD 136, 22°7.75'N-120°0.87'E, 1211-998 m, sticky mud, 22 Nov.2001; 1 male (CL 20 mm, TL with rostrum approx. 112 mm) (NTOU), “TAIWAN 2002”, st. CD 199, 24°25.38'N-122°12.41'E, 1138-1187 m, 12 Sep.2002; 1 male (CL= 35 mm, TL without rostrum, broken, approx. 126 mm) (NTOU), “TAIWAN 2003”, st. CD 229, 22°13.35'N-120°01.9'E, 1060-880 m, 30 Aug.2003.

**Description.** – Among these four interesting specimens the two from st. CD 136 have their rostrum broken and many appendages are missing. The male LC = 37 mm retains the two mxp3, the right P1 (dactyl missing), the right P2 (chela partly broken), the right P3, part of the right P4 (ischio-merus only), part of the left P3 (ischio-merus+carpus), and part of the left P5 (ischio-merus); the tip of the telson is missing. The male LC = 32 mm lacks all appendages, except the right mxp3 (ultimate segment broken) and the first segment of the left mxp 3. However, they display features which fit quite well with the description of the type material and allow their identification as *Stylodactylus major* with a reasonable degree of confidence; specimen from st. CD 229 has also its rostrum broken, but many pereopods are still present. The following description is based on these three specimens:

Tegument firm; the whole cephalothorax and the abdomen, along with the telson and uropods, eyestalks, scaphocerites, stylocerites and antennular peduncles covered with numerous fine setae. Remaining part of the rostrum (Fig. 1b) bearing closely articulated spines of nearly equal size, six, eight or nine being situated on the postrostral carinae (seven, nine, ten, in the type material); first ventral rostral spine situated above the basal segment of the antennular peduncle and at the level of the 18<sup>th</sup>, 19<sup>th</sup> (as in the holotype), or 20<sup>th</sup> dorsal rostral spine (including those situated on the postrostral carinae). Supra-orbital spine absent. Third abdominal somite produced backwards, bearing three, four or five marginal spines on the dorsal median line (one, three, four in the type material). Pleura of fourth and fifth abdominal somites acutely produced posteroventrally (Fig. 1c). Telson (excluding the two pairs of long terminal spines) about 1.8 times as long as the sixth abdominal somite, bearing eight-eight, nine-ten and nine-ten dorsal spines (nine-ten and eight-nine in the type material)(Fig. 1d). Antennular peduncle and scaphocerite corresponding to those of the type material. Merus of the last three pairs of pereopods bearing respectively: P3: 11-11, and 17; P4: 12 ; P5: eight or seven outer spines (15 or 16, 11 or 12 on the third and fourth pereopods in the type material). Proportions of P3 articles close to those of the holotype: ischio-merus = 1.8 x propodus; propodus = 2.7 or 2.9 x carpus (terminal lobe of carpus excluded), and 5 or 5.4 x dactylus; dactylus bearing seven ventral spinules. Proportions of P5 articles: ischio-merus = 1.0 propodus ; propodus = 3.0 x carpus and 9.0 x dactylus; dactylus bearing 11 spinules on its lower margin.

The specimen from st. CD 199, which is much smaller in size and has a less robust appearance, is in a very good state

and corresponds well to the description of the type material, displaying the features listed above. Rostrum (Fig. 1a) 1.7 times longer than the carapace (holotype: 1.4 times) with 54 dorsal spines (seven of which situated on the carapace proper) and 34 ventral spines (holotype: 51(7)/30); first rostral ventral spine situated at level of 19th dorsal (as in the holotype); rostrum appearing to be less curved than in the female holotype, a characteristic linked with the sexual dimorphism observed in other species of the family; third abdominal somite with two marginal spines on the dorsal median line; telson with 10-11 dorsal spines; merus of left P3, P4, P5 respectively with 14, 13, 10 outer spines (right appendages missing); proportions of P3 articles: ischio-merus = 5 x carpus (distal lobe of carpus excluded); ischio-merus = 1.7 x propodus; propodus = 3 x carpus and 5 x dactylus; dactylus of P3 and P4 (that of P5 absent) with six ventral spinules.

**Remarks.** – *Stylodactylus major* is closely related to *Stylodactylus brucei* Cleve, 1994, the largest species of the family, collected from Wallis Island (south-west Pacific) at 820-840 m depth, and from the north-west Australian shelf at 900-1000 m (Cleve, 1994: 54). The two species can be separated by a series of differences (Cleve, 1994: 56) that are repeated and augmented as follows:

- i) Cephalothorax and abdomen glabrous in *S. brucei*, pubescent in *S. major*.
- ii) Number, aspect, and disposition of rostral spines: 29-30 dorsal spines and 26-33 ventral spines in *S. brucei* versus 51-54 and 30-34 in *S. major*; proximal dorsal spines of *S. brucei* (including those on the postrostral carinae) clearly longer than the others, those of *S. major* being of nearly equal size (Figs. 1a, b; Cleve, 1994: Figs. 1A, B). In addition, proximal dorsal spines clearly longer and more spaced in *S. brucei* than in *S. major*; distal part of rostrum unarmed dorsally in *S. brucei*, in contrast to *S. major*.
- iii) Posteroventral margin of fourth abdominal pleuron rounded in *S. brucei*, pointed in *S. major*.
- iv) Last three pairs of pereopods less spinulose in *S. brucei*. Proportions between the articles different in the two species: for example, comparison between the holotype of *S. brucei* (CL 37 mm) and the larger Taiwanese specimen, of equal size, of *S. major*, clearly shows that the propodus of P3 is significantly longer, and the dactylus shorter in the former.

**Coloration.** – Entirely red in the two large specimens from st. CD 136 (Fig. 6a), and somewhat orange-red in the smaller specimen from st. CD 199.

**Distribution.** – The type specimens (three females) were collected in the East China Sea (South Japan) at a depth of 122-124 m: as Dr. Komai has pointed out, the depth mentioned is doubtful in view of the other carideans caught at the same station: *Heterocarpus dorsalis* Bate, *Pandalopsis* sp. and *Acanthephyra eximia* Smith, all of which were collected beyond a depth of 500 m. It is worth noting that the four specimens caught in Taiwanese waters, between 880 and 1211 m, represent the second record for this species.

***Stylodactylus multidentatus multidentatus* Kubo, 1942**

*Stylodactylus multidentatus* Kubo, 1942: 34, Figs. 4, 5; Hayashi & Miyake, 1968: 586, Fig. 1; Miyake, 1982: 26, Pl.9, fig. 5 (color photograph); Chace, 1983: 11 (key), 20, Figs. 8a-o; Chan & Yu, 1985: 290, Pl. I E, F (color photographs); Hayashi *in* Baba et al., 1986: 93, Fig. 53 (color photograph); Kensley et al., 1987: 293; Hayashi, 1991a: 43.

*Stylodactylus multidentatus multidentatus* - Cleva, 1990: 100, Figs. 7, 8h-m; 1994: 59; 1997: 391.

*Stylodactylus discissipes* - Balss 1933: 84 (not Bate, 1888).

*Stylodactylus bimaxillaris* - Miyake 1982: Pl. 9, fig. 4 (not Bate, 1888).

*Stylodactylus brevidactylus* - Cleva 1990: 106, Figs. 8a-g.

**Material examined.** – 1 ov. female 18 mm (MNHN-Na.15001), South Taiwan, Tong Kung, fishing port, 20 Sep.1990, coll. T.Y. Chan; 2 females 20 and 21 mm (MNHN.Na-14177), NE Taiwan, Tai Shi fishing port, commercial trawler, 27 May.1997; 1 ov. female 17 mm (MNHN-Na.15002), NE Taiwan, Tai-Shi fishing port, Feb. 2003, coll. T.Y. Chan; 1 ov. female 19 mm (ZRC), NE Taiwan, Tai-Shi fishing port, about 300 m, coll. T.Y. Chan 26 Jun.2003; 1 male 14.5 mm (ZRC), “TAIWAN 2000”, R.V. “FISHERY RESEARCHER 1”, st. CP 27, 22°13.3'N-120°23.4'E, 329-377 m, 30 Jul.2000; 1 female 17 mm (ZRC). “TAIWAN 2001”, commercial trawler, st. CP 91, 24°50.6'N-122°1.39'E, 400 m, 10 May.2001; 1 male 15 mm, 1 ov. female 16 mm (ZRC), “TAIWAN 2002”, commercial trawler, st. CP 159, 22°14.61'N-120°59.94 E, 208 m, 24 May.2002; 1 ov. female 20 mm (MNHN.Na-14197), “TAIWAN 2002”, st. CP 161, 22°09.63'N-120°35.48'E, 302 m, 25 May.2002; 2 males 9.5 & 11 mm (MNHN.Na-14198), “TAIWAN 2002”, st. CP162, 22°09.64'N-120°37.86'E, 190-200 m, 25 May.2002; 1 ov. female 17.5 mm (MNHN. Na-14199), “TAIWAN 2002”, st. CP 163, 22°13.35'N-120°36.03'E, 151 m, 25 May.2002; 2 males 13.5 & 14 mm (ZRC), “TAIWAN 2002”, st. CC 175, 22°14.59'N-120°26.37'E, 210 m, 28 May.2002; 9 males 8 to 15.5 mm, 8 females 7.5 to 14.5 mm (NTOU), “TAIWAN 2003”, st. CP 212, 24°34.60'N-122°5.84'E, 223-260 m, 26 Aug.2003; 3 females (1 ov.) 9 to 16.5 mm (NTOU), “TAIWAN 2003”, st. CP 216, 24°34.71'N-122°04.02'E, 209-280 m, 27 Aug.2003.

**Comparative material.** – Fidji Islands, “Alis”, MUSORSTOM 10, coll. Bouchet & Richer de Forges: 2 ov. females 13 et 15.5 mm (MNHN-Na.14269), st. CP 1327, 17°13'S-177°51'E, 370-389 m, 07 Aug.1998; 1 male 12.5 mm (MNHN-Na.14270), st. CP 1349, 17°31'S-178°38'E, 244-252 m, 11 Aug.1998; 1 female 7.0 mm (MNHN-Na.14273), st. CP 1360, 17°59'S-178°48'E, 402-444 m, 13 Aug.1998; 1 male 12.5 mm (MNHN-Na.14272), st. CP 1389, 18°18'S-178°04'E, 241-417 m, 19 Aug.1998. Fidji Islands, “Alis”, BORDAU 1, coll. Bouchet et al.: 1 female 17 mm (MNHN-Na.14276), st. CP 1429, 17°17'S-179°01'W, 400-410 m, 01 Mar.1999; 1 male 15 mm (MNHN-Na.14275), st. CP 1434, 17°11'S-178°41'W, 400-401 m, 02 Mar.1999; 1 male 15.5 mm, 1 ov. female 15.5 mm (MNHN-Na.14980), st. CP 1444, 17°11'S-178°41'W, 398-409 m, 03 Mar.1999; 1 male 14.5 mm, 1 ov. female 14 mm (MNHN-Na.14268), st. CP 1468, 18°16'S-178°41'W, 478-500 m, 07 Mar.1999; 2 males 15 mm, 1 female 14.5 mm (MNHN-Na.14979), st. DW 1493, 18°43'S-178°24'W, 429-440 m, 11 Mar.1999; 1 male 14 mm (MNHN-Na.14271), st. CP 1504, 18°13'S-178°34'W, 427-440 m, 13 Mar.1999; 2 males 10 & 14.5 mm, 3 females (1 ov.) 14 to 15 mm (MNHN-Na.14981), st. CP 1505, 18°12'S-178°37'W, 420-450 m, 13 Mar.1999. Tonga

Islands, “Alis”, BORDAU 2, coll. Bouchet et al.; 3 males 7.5 to 13 mm, 2 ov. females 13.5 mm (MNHN-Na.14990), 1 male 13.5 mm (MNHN-Na.14992), st. CP 1511, 21°08'S-175°22'W, 384-402 m, 31 May.2000; 3 males 11.5 to 13.5 mm, 2 females (1 ov.) 11.5 & 12.5 mm (MNHN-Na. 14987), st. CP 1560, 19°52'S-174°39'W, 365-372 m, 08 Jun.2000; 3 ov. females 11.5 to 14 mm (MNHN-Na.14983), st. CP 1561, 19°52'S-174°40'W, 383-393 m, 08 Jun.2000; 5 males 13 to 14.5 mm, 5 females (4 ov.) 11 to 14.5 mm (MNHN-Na.14986), 1 ov. female 11.5 mm (MNHN-Na.14994), st. CP 1562, 19°52'S-174°42'W, 417-424 m, 08 Jun.2000; 2 males 13.5 & 15 mm, 1 ov. female 12 mm (MNHN-Na.14984), st. CH 1563, 19°52'S-174°39'W, 362-388 m, 08 Jun.2000; 2 males 13.5 mm, 6 females (5 ov.) 12 to 14 mm (MNHN-Na.14988), st. CH 1564, 19°52'S-174°39'W, 371-387 m, 08 Jun.2000; 6 males 7.5 to 13.5 mm, 4 females (1 ov., 4 juv.) 6.5 to 13 mm (MNHN-Na.14989), 1 male 13.5 mm, 1 ov. female 13 mm (MNHN-Na.14985), st. CP 1572, 19°42'S-174°31'W, 391-402 m, 11 Jun.2000; 1 female (damaged) (MNHN-Na.14995), st. CP 1575, 19°42'S-174°21'W, 232-295 m, 11 Jun.2000; 1 male 8.5 mm (MNHN-Na.14996), st. CP 1578, 19°42'S-174°25'W, 329-331 m, 11 Jun.2000; 3 males 13 mm (MNHN-Na.14991), st. CP 1592, 19°08'S-174°17'W, 391-426 m, 14 Jun.2000; 1 female 12 mm (MNHN-Na.14993), st. CH 1596, 19°06'S-174°18'W, 371-437 m, 14 Jun.2000; 3 males 10.5 to 12 mm, 4 females (2 ov., 1 juv.) 5.5 to 14.5 mm (MNHN-Na.14982), st. CP 1641, 21°09'S-175°22'W, 395 m, 21 Jun.2000.

Solomon Islands, “Alis”, SALOMON 1, coll. Bouchet et al.: 1 male 17 mm (MNHN-Na.14997), st. CP 1802, 9°31.1'S-160°35.0'E, 245-269 m, 02 Oct.2001; 2 males 11.5 & 15.5 mm (MNHN-Na.14998), st. CP 1851, 10°27.6'S-162°00'E, 297-350 m, 06 Oct.2001; 1 male 18.5 mm (MNHN-Na.14999), 1 male 17 mm (MNHN-Na.15000) st. CP 1860, 9°22'S-160°31'E, 620m, 07 Oct.2001.

**Remarks.** – On the Taiwanese specimens, the rostrum/carapace ratio varies from 0.75 to 1.2. The rostrum bears from 34 to 52 dorsal spines (8 to 12 being on the carapace proper) and from 12 to 22 ventral spines. The rostral formula is not clearly related with the specimens size nor with the rostrum/carapace ratio.

**Coloration.** – Typically reddish-pink with red stripes and some white stripes (Chan & Yu, 1985: Pl. 1E, F).

**Distribution.** – Widespread in the Indo-Pacific: Japan (225-300 m); Philippines (152-366 m); Indonesia (146-314 m); Australia (237-412 m); New Caledonia (205-580 m); Vanuatu (314-830m?). It has recently been collected from the Fiji Islands, between 241 and 500 m, by the French Cruises MUSORSTOM 10 and BORDAU 1, from the Tonga Islands (BORDAU 2 cruise) between 232 and 437 m and from the Solomon Islands between 245 and 620 m, the last number being exceptional. This Taiwanese material extends the bathymetric distribution of the species in Taiwan to 150-400 m; Chan & Yu (1985: 291) stated: “rather common in Taiwan waters and usually occurs as by-caught among coastal shrimp fisheries at about 150-250 m depth off north-east and southern Taiwan”.

*Stylodactylus libratus* Chace, 1983

(Figs. 2a, 6b)

*Stylodactylus libratus* Chace, 1983: 12, Fig. 5; Kensley et al., 1987: 292; Cleva, 1990: 108, Figs. 9b, 18a, b (color photographs); Hayashi, 1991a: 40; Cleva, 1997: 393, Figs. 1A, C, E; 2A, C.

**Material examined.** – 1 male 11 mm (NTOU), NE Taiwan, Su-Aou fishing Port, commercial trawler, depth unknown, 17 Jun.1993.

**Comparative material.** – Marquesas Islands, “Alis”, MUSORSTOM 9, coll. Bouchet et al.: 1 male 9.5 mm (MNHN-Na.13458), st. CP 1268, 7°56'S-140°43'W, 285-320 m, 04 Sep.1997; 2 males 11 mm, 1 ov. female 11 mm (MNHN-Na.13457, st. CP 1282, 7°52'S-140°31'W, 416-460 m, 07 Sep.1997. Solomon Islands, “Alis”, SALOMON 1, coll. Bouchet et al.: 1 ov. female 12 mm (MNHN-Na.15008), st. DW 1817, 9°48.2'S-160°54.3'E, 233-269 m, 03 Oct.2001; 1 male 11.5 mm (MNHN-Na.15009), st. DW 1852, 9°46.6'S-

160°53'E, 236-250 m, 07 Oct.2001; 1 female 8.5 mm (MNHN-Na.15010), st. DW 1854, 9°46.4'S-160°52.9'E, 229-260 m, 07 Oct.2001.

**Remarks.** – This single specimen has been identified as *Stylodactylus libratus*. The nearly straight rostrum is 1.35 times longer than the carapace; it bears 39 dorsal spines (six are situated on the carapace proper, behind the orbital level), and 16 ventral spines (Fig. 2a).

In the holotype, a male from Indonesia (CL = 13.5 mm), rostrum only slightly longer than the carapace, bearing 30 dorsal and eight ventral spines. In another Indonesian specimen (Cleva, 1997: 393), rostrum/carapace ratio 1.3, and rostral formulae 39(7)/13. In the specimens from Marquesas Islands, rostrum/carapace ratio ranging from 1.3 to 1.4, and rostral formulae as follows: 34(7)/12, 38(7)/16 and 39(7)/14. In the specimens from Solomon Islands, rostrum/carapace ratio ranging from more than 1.2 to 1.35; rostral formulae:

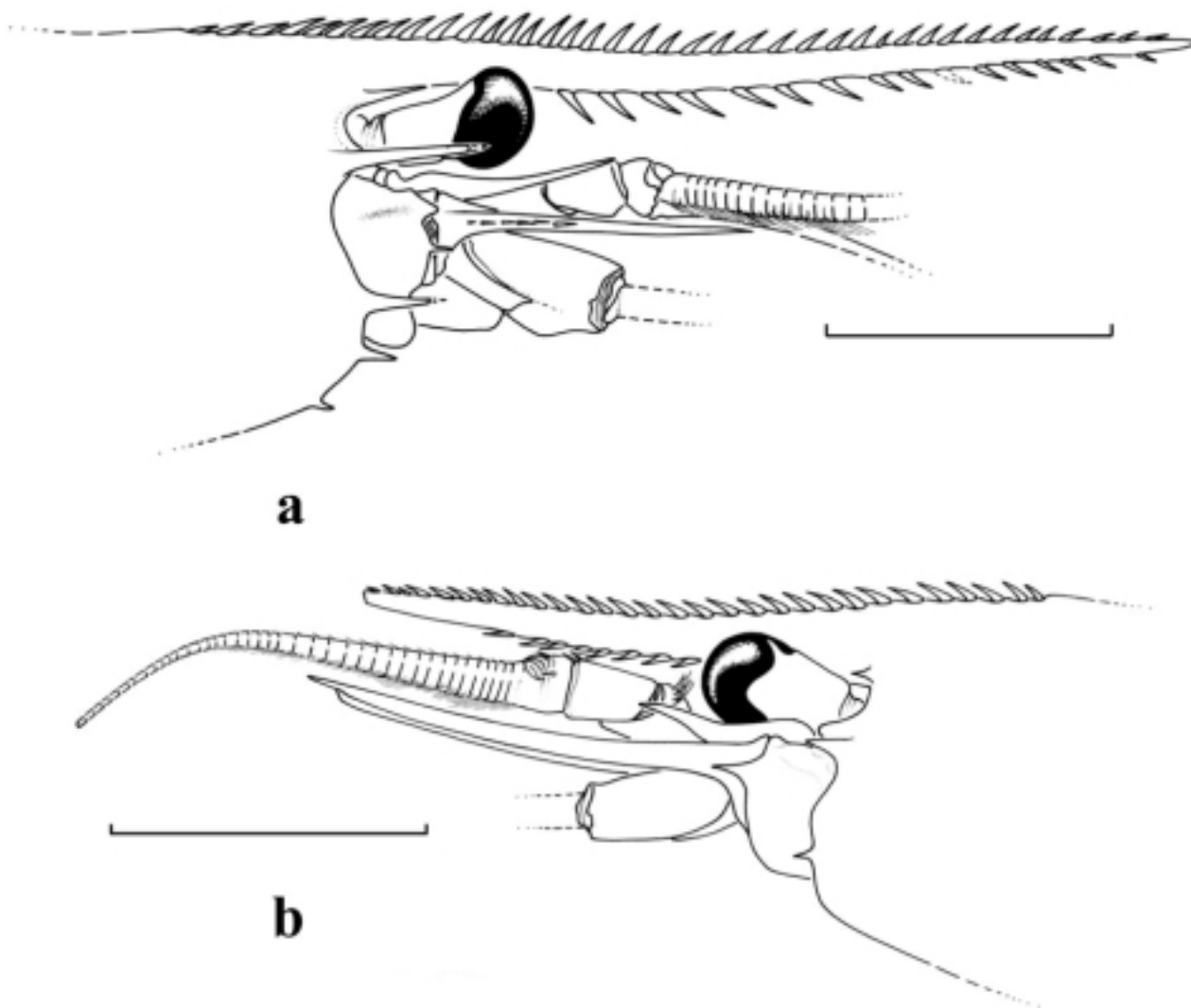


Fig. 2. (a), *Stylodactylus libratus* Chace, 1983, male 11 mm, Su-Aou fishing Port; (b), *Stylodactylus tokarensis* Zarenkov, 1968, male 8.5 mm, TAIWAN 2001, st. CP 115. Scale bars= 5 mm.

38(9)/16 and 39(9)/13 (tip of rostrum missing in the male). These differences could be within the range of variations of the species.

**Coloration.** – On a color photograph of this specimen, one can observe more or less some of the red and white stripes which seem to characterise the color pattern (Cleva, 1990: 133, Figs. 18a, b). It is likely that variations exist, as observed in other species.

**Distribution.** – Indonesia (315-459 m); Japan (depth not mentioned); Australia (540 m); New Caledonia and Loyalty Islands (270-390 m), Chesterfield Islands (360-610 m); French Polynesia, Marquesas Islands (285-460 m); Solomon Islands (229-269 m); Taiwan, first record, depth unknown.

***Stylodactylus* sp. aff. *pubescens* Burukovsky, 1990**  
(Fig. 3)

**Material examined.** – 1 male 14 mm, 1 ov. female 12.5 mm (NTOU), “TAIWAN 2003”, st. CD 210, 24°28.99'N-122°12.79'E, 500-1183 m, 01 Jun.2003.

**Comparative material.** – 2 males 9.5 and 11.5 mm, 3 females 11 to 11.5 mm, paratypes of *Stylodactylus pubescens*, east Pacific, Sala-y-Gomez and Nasca ridges, 25°09'S-96°18'W, 545-800 m, 01 May.1987 (Catalogue number 3/81729); 1 male 9.5 mm, 1 ov. female 8.5 mm, same data (MNHN-Na.15028). 2 females 13 and 15.5 mm (MNHN-Na.12142), Indonesia, “KARUBAR”, st.CP 17, 05°17'S-133°00'E, 459-439 m, 24 Oct.1991. 1 female 8.5 mm (MNHN-Na.10917), New Caledonia, “BIOCAL”, st.DW 51, 23°05'S-167°44'E, 680-700 m, 31 Aug.1985; 1 female 10.5 mm (MNHN-Na.10920), New Caledonia, “CHALCAL 2”, st.DW 72, 24°54'S-168°22'E, 527 m, 28 Oct.1986; 1 male 12.5 mm (MNHN-Na.12159), New Caledonia, “BERYX 11”, st.DW 09, 24°44'S-170°07'E, 790-825 m, 26 Oct.1992; 1 female 11.5 mm (MNHN-Na.14649), New Caledonia, “BERYX 11”, st. CP 53, 23°48'S-168°17'E, 540-950 m, 21 Oct.1992; 1 male 13 mm (MNHN-Na.14647), New Caledonia, “BERYX 11”, st. CP 60, 23°19'S-168°00'E, 580-600 m, 22 Oct.1992; 1 male 10 mm, 1 female carapace damaged (MNHN-Na.14648), same data; 1 male 9 mm, 2 females 5.5 and 10.5 mm (MNHN-Na.14480), New Caledonia, “BATHUS 3”, st. DW 776, 24°44'S-170°08'E, 770-830 m, 24 Nov.1993; 1 female 9 mm (MNHN-Na.12164), New Caledonia, “BATHUS 3”, st. DW 786, 23°54'S-169°49'E, 699-715 m, 25 Nov.1993; 1 female 7.5 mm (MNHN-Na.12163), New Caledonia, “BATHUS 3”, st. DW 794, 23°48'S-169°49'E, 751-755 m, 26 Nov.1993. 1 male 10.5 mm, 1 ov. female 12 mm (MNHN-Na.15029), Tonga, “BORDAU 2”, st.CP 1529, 21°13'S-174°58'W, 688-710 m, 03 Jun.2000; 2 males 8.5 and 10.5 mm, 1 ov. female 11 mm (MNHN-Na.15030), same data; 1 male 11.5 mm (MNHN-Na.15031), Tonga, “BORDAU 2”, st. CH 1557, 20°10'S-174°42'W, 578 m, 07 Jun.2000; 1 male 11.5 mm, 3 females (2 ov.) 11 to 12.5 mm (MNHN-Na.15032), Tonga, “BORDAU 2”, st. CP 1558, 20°10'S-174°43'W, 580-593 m, 07 Jun.2000.

**Remarks.** – These 2 specimens clearly differ from *S. libratus* by the following characters (Figs. 3a, d): 1/ The carapace/rostrum ratio: rostrum is shorter than the carapace (0.85 LC on the female; the tip of the rostrum is broken on the male but it can be easily estimated as being shorter than the carapace); 2/ The number and length of the rostral spines: 26 dorsal spines (6 on the carapace proper) and 5 ventral for the female; 3/ The antennal and branchiostegal spines are longer, along with the spinules of the scaphocerite; 4/ The dactyls of the last three pairs of pereopods are longer; 5/ The eyes are larger. 5/ The coloration is also very different: color photograph of the ovigerous female does not indicate special pattern: the body and appendages are pinkish without any trace of stipe or band; eggs are orange.

These specimens could be related with *Stylodactylus pubescens* Burukovsky, 1990, as are the specimens from Indonesia, New Caledonia, and Tonga mentioned above (Indonesian and New Caledonian specimens have been left unidentified by Cleva, 1997, page 393, under the name *Stylodactylus* sp.). We have examined or reexamined all this material, along with 7 paratypes of Burukovsky species (Figs. 3b, c), in order to try understanding the relationships of these different groups between each other and with *S. pubescens*. Due to rather important individual variations, their status is not easy to establish: do they belong to one species different from *S. pubescens*, or to several different species, or are they different populations of the same species, this species being *S. pubescens* or another one?

Comparison between specimens of the same size leads to the following conclusions:

- 1) Ovigerous female from Taiwan (CL 12.5 mm) appears to be very closed to ovigerous female from Indonesia (MNHN-Na.12142, CL 13 mm): rostral formula, size and disposition of rostral teeth, size of carapace spines, size of abdominal somites, of telson, and of articles of P1 to P5, are perfectly close, all except the dactyls of P3 to P5, being pretty longer on the Taiwanese specimen (propodus/dactyl ratio of P3 to P5 are respectively: 3.7, 4.5 and 6.0 for taiwanese specimen, versus 4.6, 5.9 and 6.8 for indonesian specimen).
- 2) Comparison of ovigerous female from Taiwan (CL 12.5 mm) with males of close size from New Caledonia (MNHN-Na. 14647, male 13 mm and Na.12159, male 12.5 mm) show differences indicating that they probably belong to different species: the taiwanese specimen has got longer rostral teeth, larger abdominal somites ; articles of mxp3, P1, P2, comparable, but P3 to P5 longer, especially propodus and dactyls.
- 3) Comparison of ovigerous female from Taiwan (CL 12.5 mm) with ovigerous females of the same size from Tonga (MNHN-Na.15029 and Na.15032) reveals more or less the same differences observed with New Caledonia specimens: the rostral teeth are here only a little shorter than those of taiwanese specimen, but the latter has got a stronger body and longer P3 to P5 (mainly due to longer propodus and dactyls), articles of mxp3, P1, P2 being of

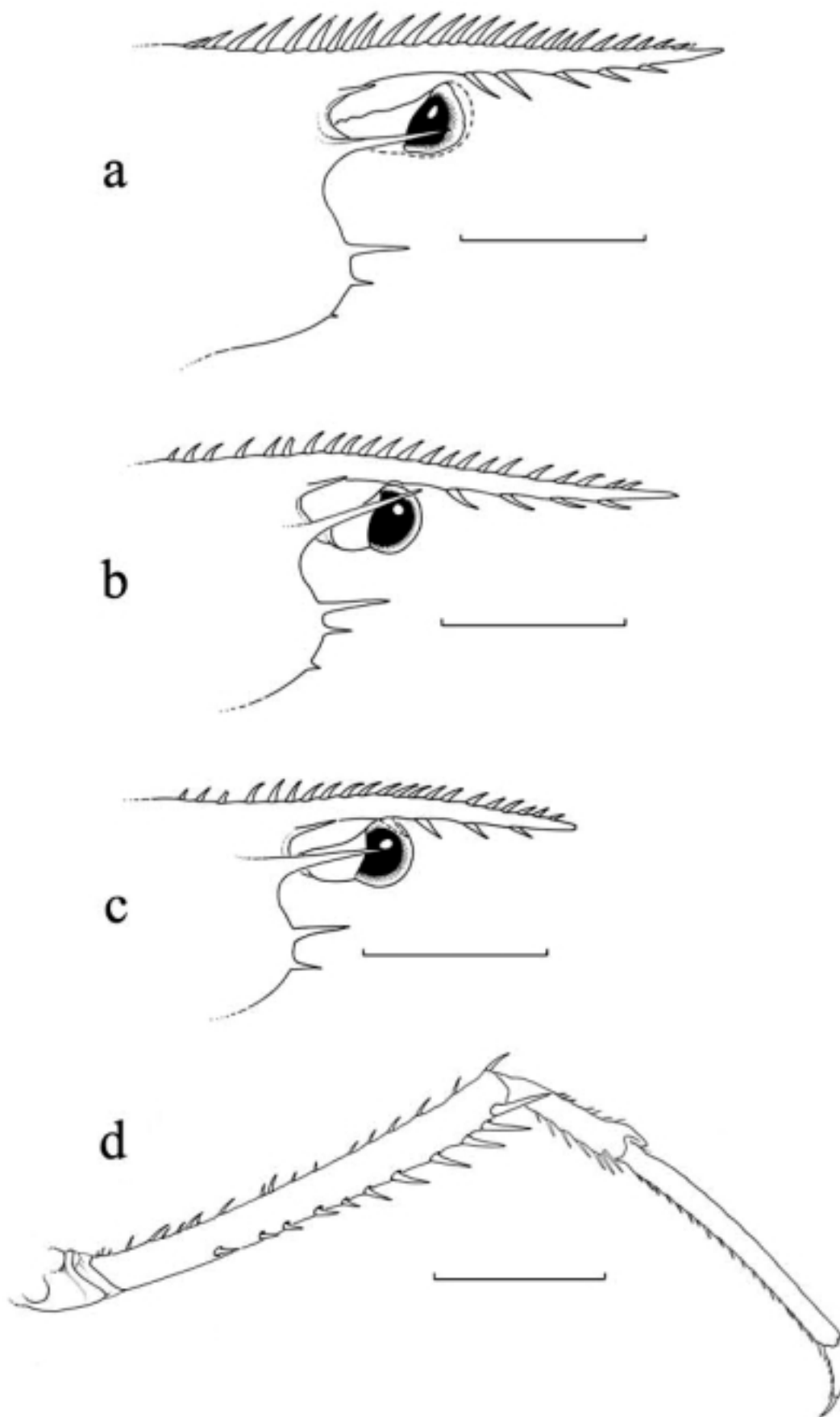


Fig. 3. (a),(d), *Styrodactylus* sp. aff. *pubescens* Burukovsky, 1990, female ov. 12.5 mm, "TAIWAN 2003", st. CD 210: (a), anterior part of cephalothorax; (d), right third pereiopod; (b),(c), *Styrodactylus pubescens* Burukovsky, 1990: (b), male 11.5 mm, Paratype, anterior part of cephalothorax; (c), female 10.5 mm, Paratype, anterior part of cephalothorax. Scale bars = 5 mm.

equal length. Moreover, the coloration of the former differs from the latter: on the photograph the Taiwanese specimen is pinkish uniform, whereas coloration of ovigerous female Na.15029 is summarized as follows: cephalothorax pale pinkish, abdomen greenish, some red stripes on P1 and P2.

- 4) Comparison between specimens from New Caledonia and specimens from Tonga reveals that they could belong to the same species. The variations observed while comparing specimens of the same size seems to be not relevant, at the most indicating 2 populations of the same species.
- 5) Comparison between paratypes of *Stylodactylus pubescens* and specimens of the same size from New Caledonia and Tonga lead to the conclusion that the last two belong to a different species: *S. pubescens* has got generally: smaller eyes, rostral teeth a little smaller and thinner, and longer appendages (mxp3 to P5).
- 6) Comparison between ovigerous female from Taiwan (CL 12.5 mm) and larger paratypes of *S. pubescens* (male and female 11.5 mm) indicates that while all articles of P3 to P5 are logically longer on the former which is larger, on the other hand articles of mxp3, P1, P2 are of the same size or even shorter on the Taiwanese specimen, leading to the conclusion that they probably belong to different species.

To conclude at this stage, one can think that we could have 3 different species: *S. pubescens*, and two related species, one from Taiwan and Indonesia, the other from New Caledonia and Tonga. Molecular analysis could be an important tool to clear up the problem.

#### *Stylodactylus licinus* Chace, 1983

(Fig. 6c)

*Stylodactylus licinus* Chace, 1983: 14, Fig. 6; Hayashi in Baba et al., 1986: 93, Fig. 52 (color photograph); Cleva, 1990: 87, Figs. 3a-j, 18f, g (color photographs); Hayashi, 1991a: 41; Cleva, 1994: 58; Takeda & Hanamura, 1994: 17, Fig. 8a; Hanamura & Evans, 1996: 4; Cleva, 1997: 390, Figs. 4A-D (color photographs).

*Stylodactylus tokarensis*- Zarenkov, 1968: 58 (pro-parte), Fig. 2 (third pereopod) and Fig. 3 (other drawings of Fig. 2 belong to *Stylodactylus tokarensis* Zarenkov, 1968).

*Stylodactylus stebbingi*- Toriyama & Hayashi, 1982: 90, 92, 95, 105 (not Hayashi & Miyake, 1968, fide Hayashi in Baba et al., 1986: 93); King, 1984: 178, 179 (Fig.), 181; King, 1986: 12, Fig. 9 (not Hayashi & Miyake, 1968).

**Material examined.** – 1 ov. female 16 mm (NTOU), “TAIWAN 2001”, R.V. “OCEAN RESEARCHER 1”, st. CD 132, 22°20.98’N-120°6.73’E, 690-700 m, 21 Nov.2001; 1 ov. female 15 mm (NTOU), “TAIWAN 2001”, st. CD 133, 22°15.07’N-120°8.02’E, 748-690 m, 21 Nov.2001; 2 females 7 & 8 mm (NTOU), “TAIWAN 2003”, st. CP 214, 24°28.59’N-122°12.66’E, 490-1027 m, 27 Aug.2003.

**Comparative material.** – 1 ov. female 15.5 mm (MNHN-Na.15003), Fidji Islands, “Alis”, MUSORSTOM 10, coll. Bouchet & Richer de Forges, st. CP 1346, 17°19.6’S-

178°32.4’E, 673-683 m, 11 Aug.1998; 1 female 9.5 mm (MNHN-Na.15004), Fidji Islands, “Alis”, BORDAU 1, coll. Bouchet et al., st. CP 1457, 17°19’S-179°34’W, 942-976 m, 05 Mar.1999; 1 female 8.5 mm (MNHN-Na.15005), Tonga Islands, “Alis”, BORDAU 2, coll. Bouchet et al., st. CP 1565, 20°58’S-175°16’W, 869-880 m, 09 Jun.2000.

**Coloration.** – No typical pattern (Fig. 6c). The general color of the body is more or less red or pink; the rostrum is translucent with sometimes basal and distal reddish areas; the pereopods show red and pink areas.

**Distribution.** – Philippines (550-970 m); Japan (432-826 m); Indonesia (280-810 m); Australia (222-1000 m); New Caledonia and Chesterfield Islands (580-970 m); Vanuatu (541-990 m); Fiji Islands (494 m); Wallis and Futuna islands (580-900 m). The recent French cruises MUSORSTOM 10 and BORDAU 1 in the Fiji Islands have recollected it between 673 and 976 m, and it has also been caught in the Tonga islands (BORDAU 2) at 869-880 m depth. This is the first record for Taiwan, 490-1027 m.

#### *Stylodactylus tokarensis* Zarenkov, 1968

(Figs. 2b, 6 d)

*Stylodactylus tokarensis* Zarenkov, 1968: 58 (pro parte), Fig. 2 (Fig. 2: third pereopod, and Fig. 3 correspond to *Stylodactylus licinus* Chace, 1983); Cleva, 1990: 91, Figs. 3k-p, 4, 5; Hayashi, 1991b: 120; Cleva, 1997: 391.

**Material examined.** – 1 male 8.5 mm (NTOU), “TAIWAN 2001”, commercial trawler, st. CP115, 24°53.87’N-122°02.05’E, 381-440 m, 21 May.2001; 1 male 9.5 mm (NTOU), “TAIWAN 2002”, st. CD 192, 22°17.19’N-120°1.01’E, 960-1302 m, 28 Aug.2002; 1 male, damaged (NTOU), “TAIWAN 2003”, st. CD 210, 24°28.99’N-122°12.79’E, 500-1183 m, 01 Jun.2003.

**Comparative material.** – 1 female 10 mm (MNHN-Na.15006), Fidji Islands, “Alis”, MUSORSTOM 10, coll. Bouchet & Richer de Forges, st. CP 1330, 17°09.5’E-177°56.3’E, 567-699 m, 08 Aug.1998; 1 female 7.5 mm, Salomon Islands, “Alis”, SALOMON 1, coll. Bouchet et al., st. CP 1795, 9°18.8’S-160°22.9’E, 442-451 m, 01 Oct.2001.

**Remarks.** – In the specimen from st. CP 115, rostrum/carapace ratio (=1), as well as number of rostral spines (30 dorsal, of which seven post orbital, and eight ventral) and their arrangement, appearing to be very close to that of the holotype (see Cleva 1990: 92, Fig. 4). The short, stout dactyls of the last three pairs of pereopods are other characteristic features of this species.

The specimen from st. CD 192 probably belongs to this species, but some doubt remains due to its poor condition (rostrum and telson broken, many appendages missing, body more reddish and pereopods without bands). Identification of the specimen from CD 210, damaged and without rostrum remains also uncertain.



**Coloration.** – Body generally yellowish-orange. Pereiopods and telson slightly banded with orange and white (Fig. 6d).

**Distribution.** – *Stylodactylus tokarensis* is known from East China Sea (holotype, 820 m depth), Indonesia (285-595 m), New Caledonia (485-850 m) and the Chesterfield Islands (500-570 m). It has recently been collected in the Fidji Islands (567-699 m) and the Solomon Islands (442-451 m) by the French cruises MUSORSTOM 10 and SALOMON 1. This is the first record for Taiwan, where the species was caught between 381-440 m (or even more, see above under “Material examined” and “Remarks”).

### *Parastylodactylus* Figueira, 1971

Type species. – *Stylodactylus bimaxillaris* Bate, 1888.

#### *Parastylodactylus bimaxillaris* (Bate, 1888)

*Stylodactylus bimaxillaris* Bate 1888: 855, Pl.138, fig. 3; Calman, 1939: 188; Hayashi & Miyake, 1968: 599, Fig. 5; Miyake, 1982: 25 (not Pl.9, fig. 4 = *Stylodactylus multidentatus* Kubo, 1942).

*Parastylodactylus bimaxillaris* - Chace, 1983: 8, Fig. 4; Chan & Yu, 1985: 289, Pl. I A-D (color photographs); Cleva, 1990: 115, Figs. 11a, 12a; Hayashi, 1991b: 121; Cleva, 1994: 62; 1997: 397, Fig. 4F (color photograph).

Not *Stylodactylus bimaxillaris* - Calman, 1925: 16; Barnard, 1950: 652, Figs. 122 f-h (= *Stylodactylus stebbingi* Hayashi & Miyake, 1968).

Not *Stylodactylus bimaxillaris* - Miyake, 1982, Pl. 9, fig. 4 (= *Stylodactylus multidentatus* Kubo, 1942).

**Material examined.** – 2 females (1 ov.) 6 & 6.5 mm (MNHN.Na-14178), NE Taiwan, Ta-Shi fishing port, commercial trawler, 200-400 m, coll. A. Anker, Mar.2000.

“TAIWAN 2000”, R.V. “FISHERY RESEARCHER1”, coll. P. Bouchet, B. Richer de Forges-IRD & T.Y. Chan: 2 females (1 ov.) 6 & 6.5 mm (MNHN.Na-14160), st. CP 27, 22°13.3’N-120°23.45’E, 329-377 m, 30 Jul.2000; 3 ov. females 4 to 5 mm (MNHN.Na-14161), st. CP 58, 24°35.1’N-122°05.8’E, 221-254 m, 04 Aug.2000.

“TAIWAN 2001”, NE coast of Taiwan, commercial trawler, coll. P. Bouchet, B. Richer de Forges-IRD & T.Y. Chan: 1 male 5 mm, 3 ov. females 5.5 to 6 mm (ZRC), st. CC 66, 24°53.6’N-122°03.15’E, 546 m, 05 May.2001; 1 ov. female 5 mm (MNHN.Na-14163), st. CP 67, 24°51.33’N-121°59.03’E, 259 m, 06 May.2001; 4 ov. females 5.5 to 6.5 mm (MNHN.Na-14164), st. CP 73, 24°52.86’N-122°01.98’E, 220-230 m, 07 May.2001; 1 ov. female 5 mm (ZRC), st. CP 74, 24°50.84’N-121°59.28’E, 220 m, 07 May.2001; 2 ov. females 5 & 6 mm (MNHN.Na-14166), st. CP 75, 24°56.72’N-122°01.81’E, 139 m, 07 May.2001; 3 ov. females 5 to 6 mm (ZRC), st. CP.76, 24°56.54’N-122°01.51’E, 115-170 m, 07 May.2001; 6 ov. females 5 to 6 mm (MNHN.Na-14168), st. CP81, 24°50.48’N-121°59.95’E, 205 m, 08 May.2001; 1 ov. female 5.5 mm (MNHN.Na-14169), st. CP 93, 24°50.13’N-121°55.7’E, 66-110 m, 10 May.2001; 2 males 5 mm, 13 ov. females 5 to 6 mm (MNHN.Na-14159), st. CP 95, 24°55.8’N-122°05.73’E, 269-360 m, 18 May.2001; 1 male 6 mm, 2 ov. females 5 & 5.5 mm (ZRC), st. CP108, 24°48.23’N-122°07.74’E, 295-337 m, 20 May.2001; 1 ov. female 5.5 mm (MNHN.Na-14171), st. CP 109, 24°48.29’N-122°83.98’E, 246-256 m, 20 May.2001; 1 ov. female 4 mm (MNHN.Na-14172), st. CP 114, 24°51.03’N-121°58.3’E, 128-250 m, 21 May.2001; 1 male 5.5 mm, 3 ov. females 4.5 to 6 mm (ZRC), st. CP 116, 24°55.4’N-122°00.39’E, 100 m, 21 May.2001; 1 ov. female 8 mm (MNHN.Na-14174),

“TAIWAN 2002”, Tong-Kong Fishing Boat, st. CP160, 22°12.98’N-120°28.78’E, 300 m, 24 May.2002; 1 ov. female 5 mm (NTOU), N.E. Taiwan, I-Lan county, Tai-Shi fishing port, commercial trawler, 17 Apr. 2003; 4 females (3 ov.) 3 to 5 mm (NTOU), « TAIWAN 2003», st. CP 216, 24°34.71’N-122°04.02’E, 209-280 m, 27 Aug.2003.

**Comparative material.** – Madagascar, “Vauban”, coll. A. Crosnier: 1 male 6.5 mm (MNHN-Na.5266), st. 4, 12°52.4’S-48°10.4’E, 400-410 m, 04 Mar.1971; 1 ov. female 7.5 mm (MNHN-Na.5275), st. 7, 12°42.4’S-48°14.1’E, 380-375 m, 05 Mar.1971; 2 females (1 ov.) 5.5 & 7.5 mm (MNHN-Na.5274), st. 31, 12°34’S-48°15’E, 395 m, 13 Sep.1972; 1 ov. female 5.5 mm (MNHN-Na.5276), st. 44, 15°25.7’S-46°01.0’E, 200-210 m, 07 Nov.1972; 1 ov. female 7 mm (MNHN-Na.5277), st. 122, 12°43’S-48°12’E, 500 m, 11 Oct.1974.

Philippines: 1 ov. female 5.5 mm (MNHN-Na.3630), MUSORSTOM 1, st. 5, 14°01.5’N-120°23.5’E, 215-200 m, 19 Mar.1976; 1 female 5.5 mm (MNHN-Na.3629), MUSORSTOM 1, st. 42, 13°55.1’N-120°28.6’E, 379-407 m, 24 Mar.1976; 1 ov. female 4 mm (MNHN-Na.4234), MUSORSTOM 2, st. 35, 13°27.9’N-121°11.6’E, 160-198 m, 24 Nov.1980; 1 ov. female 5.5 mm (MNHN-Na.4235), MUSORSTOM 2, st. 49, 13°38.4’N-121°44.1’E, 425-416 m, 26 Nov.1980; 3 ov. females 6.5 to 7 mm (MNHN-Na.4236), MUSORSTOM 2, st. 83, 13°55.2’N-121°30.5’E, 320-318 m, 02 Dec.1980.

Indonesia, KARUBAR: 1 male 6 mm, 1 ov. female 7 mm (MNHN-Na.12144), st. CP 36, 06°05’S-132°44’E, 268-210 m, 27 Oct.1991; 1 ov. female 8.5 mm (MNHN-Na.12145), st. CC 41, 07°47’S-132°39’E, 401-393 m, 28 Oct.1991; 1 ov. female 6.5 mm (MNHN-Na.12146), st. CP 69, 08°45’S-131°51’E, 356-367 m, 02 Nov.1991; 1 female 6 mm (MNHN-Na.12147), st. CP 76, 08°49’S-131°35’E, 400 m, 03 Nov.1991; 1 ov. female 6.5 mm (MNHN-Na.12148), st. CP 83, 09°24’S-130°59’E, 285-298 m, 04 Nov.1991; 1 female 4.5 mm (MNHN-Na.12149), st. CP 86, 09°23’S-131°14’E, 226-222 m, 04 Nov.1991.

New Caledonia: 1 male 4 mm (MNHN-Na.10776), BIOCAL, st. 42, 23°45’S-167°12’E, 380 m, 30 Aug.1985; 1 male 5.5 mm, 1 female 5 mm (MNHN-Na.10777), BIOCAL, st. 45, 22°47’S-167°14’E, 430-465 m, 30 Aug.1985; 2 ov. females 5.5 & 6 mm (MNHN-Na.10772), MUSORSTOM 4, st. 171, 18°57.8’S-163°14.0’E, 425 m, 17 Sep.1985; 1 ov. female 6 mm (MNHN-Na.10865), MUSORSTOM 4, st. 172, 19°01.2’S-163°16.0’E, 275-330 m, 17 Sep.1985; 2 ov. females 5 & 5.5 mm (MNHN-Na.10774), MUSORSTOM 4, st. 173, 19°02.5’S-163°18.8’E, 250-290 m, 17 Sep.1985; 1 male 4.5 mm (MNHN-Na.10775), MUSORSTOM 4, st. 180, 18°56.8’S-163°17.7’E, 440 m, 18 Sep.1985; 1 ov. female 6.5 mm (MNHN-Na.10773), MUSORSTOM 4, st. 201, 18°55.8’S-163°13.8’E, 490 m, 20 Sep.1985; 1 ov. female 7 mm (MNHN-Na.13219), BATHUS 4, st. CP 910, 18°59’S-163°08’E, 560-608 m, 05 Aug.1994.

Vanuatu: 1 male 4 mm (MNHN-Na.13220), 1 ov. female 5 mm (MNHN-Na.14473), MUSORSTOM 8, st. CP 1091, 15°10’S-167°13’E, 344-350 m, 06 Oct.1994.

Fidji Islands, “Alis”, MUSORSTOM 10, coll. Bouchet & Richer de Forges: 1 ov. female 4.5 mm (MNHN-Na.15013), st. CP 1320, 17°16.8’S-177°53.6’E, 290-300 m, 06 Aug.1998;

1 female 4 mm (MNHN-Na.15014), st. CP 1325, 17°16.4'S-177°49.8'E, 282-322 m, 07 Aug.1998; 1 ov. female 5.5 mm (MNHN-Na.15015), st. CP 1327, 17°13.3'S-177°51.6'E, 370-389 m, 07 Aug.1998.

Solomon Islands, "Alis", SALOMON 1, coll. Bouchet H & al.: 1 ov. female 7.5 mm (MNHN-Na.15016), 1 ov. female 5 mm (MNHN-Na.15017), st. CP 1747, 9°21.8'S-159°58.7'E, 364-402 m, 25 Sep.2001; 1 ov. female 8 mm (MNHN-Na.15018), st. CP 1761, 8°46.5'S-160°01.6'E, 191-290 m, 27 Sep.2001; 1 ov. female 5 mm (MNHN-Na.15019), 1 ov. female 6 mm (MNHN-Na.15020), st. CP 1804, 9°32.0'S-160°37.4'E, 309-328 m, 02 Oct.2001.

**Diagnosis.** – Rostrum 1.4 to 1.8 times longer than the carapace, with 16 to 21 dorsal spines situated on the rostrum proper, plus four to seven spines (usually six) situated on the carapace (behind orbit level), reaching to its middle, and four to seven ventral spines.

**Remarks.** – Examination of specimens in the MNHN collected from different localities (Philippines, Indonesia, Madagascar, New Caledonia, Vanuatu, Fiji, Solomon) shows that the pleura of the fifth abdominal somite are typically pointed, produced into a spine, at the postero-ventral angle, except for occasional specimens in which one or both of the fifth abdominal pleura do not end in a spine: this is the case for example in some Indonesian specimens. It should be noted that this unfrequent characteristic is the commonest in the Taiwanese specimens: it has been found in 45 out of the 58 specimens examined; only three specimens have the fifth abdominal pleura ending in a spine on each side, and the remaining ten showed the spine on one side only.

**Coloration.** – Well described by Chan & Yu (1985: 290, Pl. I A-D), who indicated three different color patterns.

**Distribution.** – Widespread in many Indo-Pacific areas: South Africa, Mozambique, Madagascar, Gulf of Aden, Japan, Korea Strait, East China Sea, Taiwan, Philippines, Admiralty Islands (off New Guinea), Australia, New Caledonia and Vanuatu. It has recently been collected from the Fiji Islands (French cruise MUSORSTOM 10), between 282 and 389 m and from the Solomon Islands (BORDAU 2) between 191 and 402 m. The Taiwanese specimens studied here were collected between 66 and 546 m, extending the known bathymetric range, which was previously 106 to 608 m (Cleva, 1997: 397).

#### BATHYPALAEONELLIDAE DE SAINT LAURENT, 1985

##### *Bathypalaemonella* Balss, 1914

Type species. – *Bathypalaemonella zimmeri* Balss, 1914.

##### *Bathypalaemonella hayashii* Komai, 1995 (Fig. 6e)

*Bathypalaemonella* sp. – Toriyama et al., 1990: 16, Pl.1a.  
*Bathypalaemonella hayashii* Komai, 1995: 40, Figs. 1-4; Cleva, 2001: 763, Figs. 2A-D, 3, 10B (color photograph).

**Material examined.** – 1 female 12.5 mm (NTOU), "TAIWAN 2001", R.V. "OCEAN RESEARCHER 1", st. CD 139, 22°10.73'N-120°14.1'E, 852-718 m, 23 Nov.2001.

**Remarks.** – This single specimen lacks the tip of the rostrum, and, unfortunately, the two second pereopods, but an overall examination leads to the conclusion that it belongs to *Bathypalaemonella hayashii*.

**Coloration.** – Color photographs have been published by Toriyama et al.(1990) and Cleva (2001). No particular pattern (Fig. 6e): body pale pink and with antennules, scaphocerites, pereopods, sixth abdominal somite and tailfan reddish-pink. Rostrum deep-red.

**Distribution.** – This species is known from Japan (311-815 m), Indonesia (439-605 m), New Caledonia (700 m), and Vanuatu (492-520 m). This is the first mention for Taiwan, where it was caught between 718 and 852 m.

#### *Bathypalaemonetes* Cleva, 2001

Type species. – *Bathypalaemonella brevisrostris* Bruce, 1986.

##### *Bathypalaemonetes brevisrostris* (Bruce, 1986) (Fig. 6f)

*Bathypalaemonella brevisrostris* Bruce, 1986: 252, Figs. 1-5.  
*Bathypalaemonetes brevisrostris* – Cleva, 2001: 773, Figs. 7, 8.

**Material examined.** – 1 sp 8.5 mm (abdomen missing) (NTOU), "TAIWAN 2000", R.V. "FISHERY RESEARCHER 1", st. CP 58, 24°35.1'N-122°05.8'E, 221-254 m, 04 Aug.2000.

**Diagnosis.** – Though this specimen is very incomplete (abdomen missing), the cephalothorax and thoracic appendages are well preserved, allowing it to be identified with reasonable certainty, thanks to the following distinctive features: dorsal border of rostrum with both movable spines and fixed teeth; rostrum lateral carinae well-developed and broadly expanded posteriorly; mxp3 ultimate segment densely setose; chela of P1 densely setose along dactylar margin; chela of minor P2 very small and bowed; fingers of major P2 with marked tubercles; unguis and accessory spines of the dactyls of P3, P4, and P5 transversely ribbed.

**Coloration.** – Carapace pinkish, with some faint red longitudinal lines; large cheliped whitish (Fig. 6f). See also Bruce, 1986: 264.

**Distribution.** – North-west Australia (306-308 m); New Caledonia (315-410 m); Indonesia (315-348 m). Taiwan, first record, 221-254 m.

##### *Bathypalaemonetes pilosipes* (Bruce, 1986) (Fig. 6g)

*Bathypalaemonella pilosipes* Bruce, 1986: 257, Figs. 6-10; Chace, 1997: 31, Fig. 17.  
*Bathypalaemonetes pilosipes* – Cleva, 2001: 776, Fig. 9.

**Material examined.** – 1 female 10.5 mm (NTOU), “TAIWAN 2001”, R.V. “OCEAN RESEARCHER 1”, st. CD 139, 22°10.73’N-120°14.1’E, 852-718 m, 23 Nov.2001.

**Remarks.** – This well-preserved specimen fits the previous descriptions. The rostrum is just a little longer than the carapace and overreaches the tip of the scaphocerite; it bears 11 small articulated spines proximally on its dorsal border and five fixed teeth ventrally. Some small differences have been noticed compared to the previously studied specimens: propodus of the major P2 1.10 times carapace length (versus as long as or a little shorter) and tubercles on the fingers more individualized and less blunted.

**Coloration.** – Cephalothorax orange- to red-brownish (rostrum); abdomen, telson, pleopods, caudal fans pink to reddish; pereopods pinkish to reddish (major P2 pinkish, minor P2 more or less translucent) (Fig. 6g). Some differences can be seen from the coloration described by Bruce (1986: 264).

**Distribution.** – *B. pilosipes* is known from north west Australia (390-504 m), New Caledonia (535-560 m), Philippines (410 m), and Japan (350 m). This is the first record for Taiwan and significantly extends the bathymetric range of the species (718-852 m).

***Bathypalaemonetes chani*, new species**  
(Figs. 4, 5, 6h)

**Material examined.** – Holotype- 1 ov. female 15 mm, (NTOU-H-CD132-1), “TAIWAN 2001”, R.V. “OCEAN RESEARCHER 1”, st. CD 132, 22°20.98’N- 120°6.73’E, 690-700 m, 21 Nov.2001.

**Description.** – See Figs. 4 and 5. Carapace integument thick and firm, covered with numerous pairs of triangular setae, as in *B. pilosipes*. Rostrum well developed, particularly large in its middle (about 0.14 of the carapace length), tip missing, probably (more or less) as long as the carapace and overreaching scaphocerite; dorsal border slightly concave,

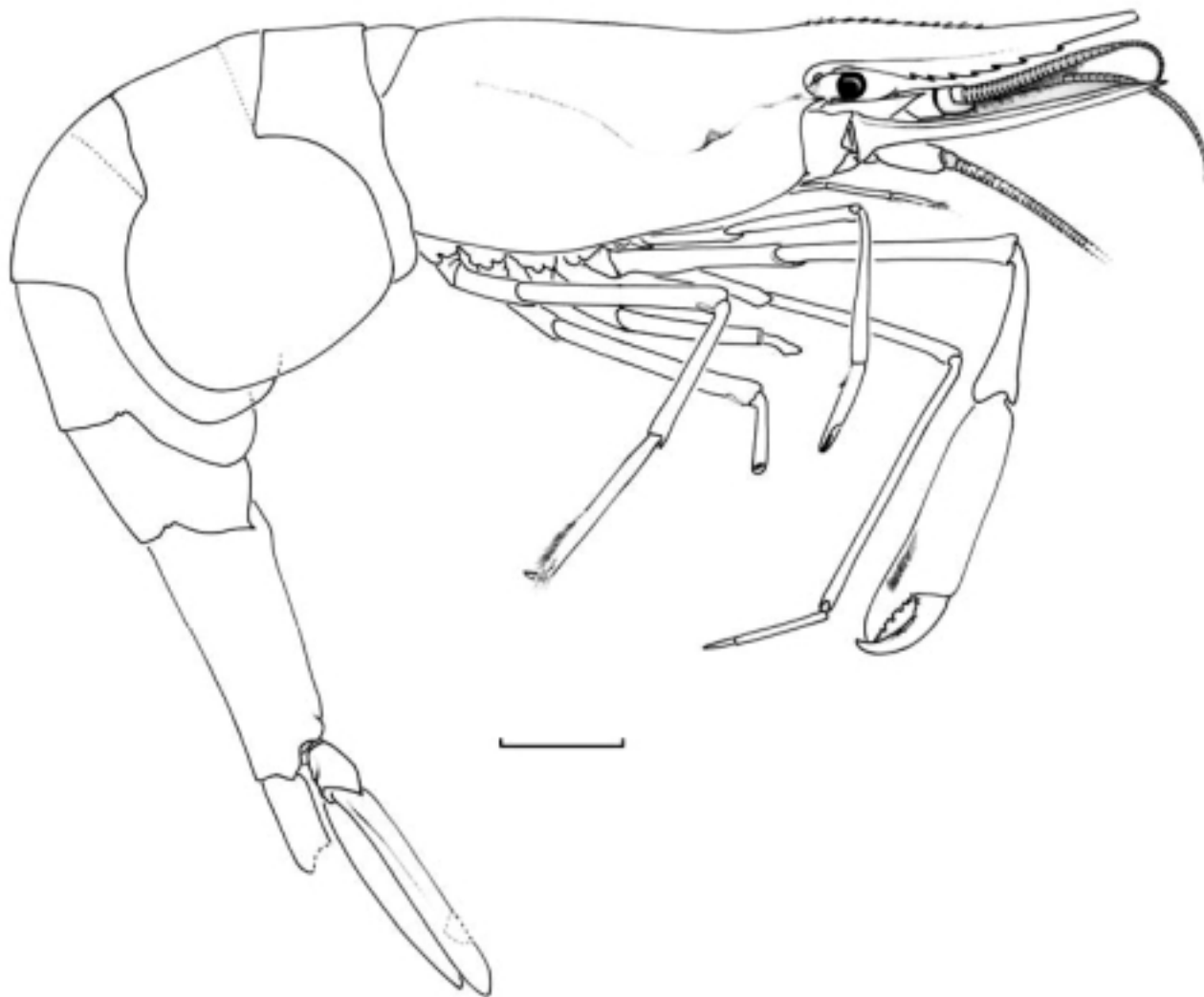


Fig. 4. *Bathypalaemonetes chani*, new species, female ov. 15 mm, Holotype, TAIWAN 2001, st. CD 132. Scale bar = 5 mm.

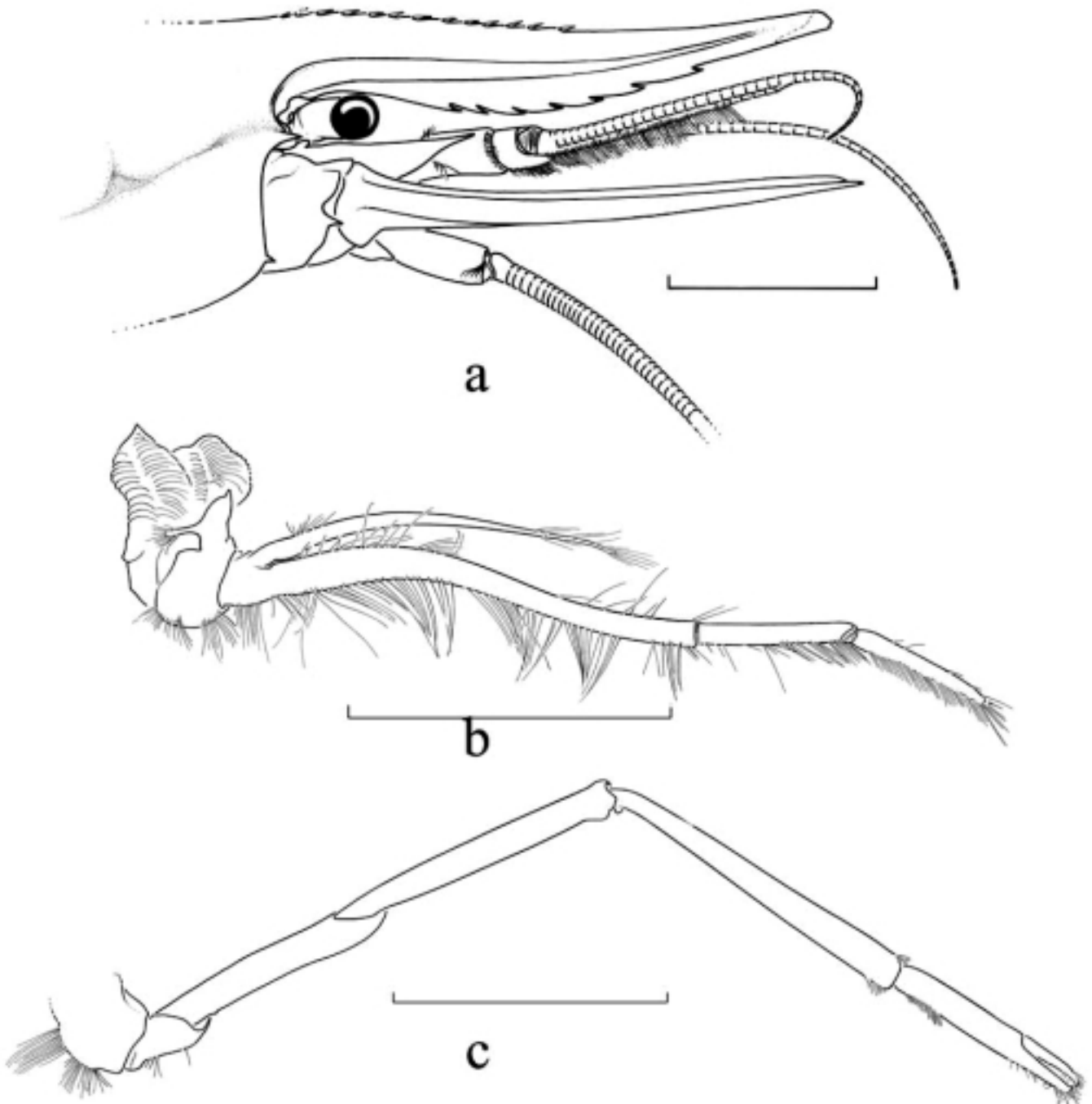


Fig. 5. *Bathypalaemonetes chani*, new species, female ov. 15 mm, Holotype, TAIWAN 2001, st. CD 132: (a), anterior part of cephalothorax; (b), third maxilliped; (c), right first pereiopod. Scale bars = 5 mm.

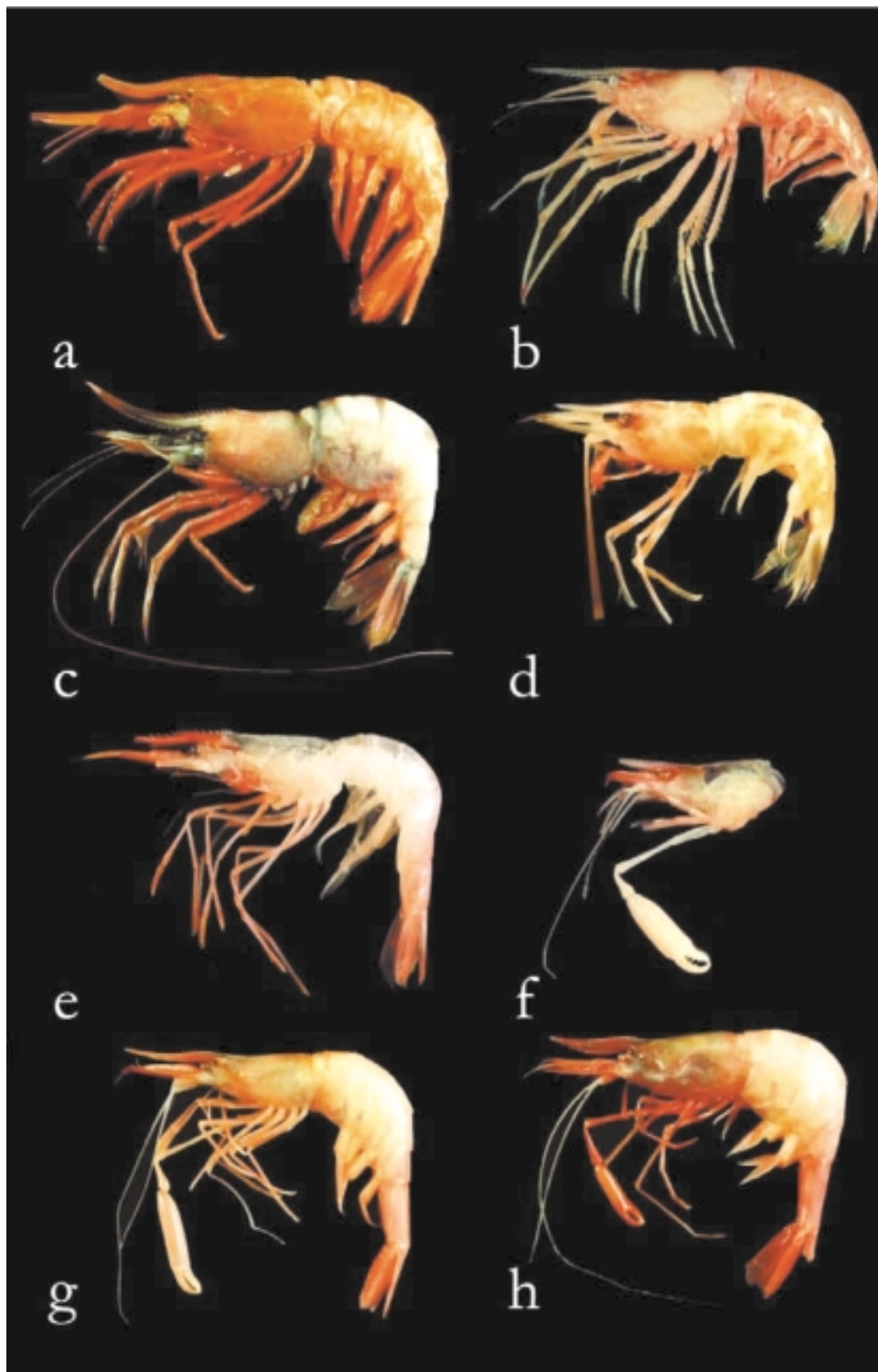


Fig. 6. (a) *Stylodactylus major* Hayashi & Miyake, 1968, male 37 mm, TAIWAN 2001, st. CD136; (b) *Stylodactylus libratus* Chace, 1983, male 11 mm, Su-Aou fishing Port; (c) *Stylodactylus licinus* Chace, 1983, female ov. 16 mm, TAIWAN 2001, st. CD132; (d) *Stylodactylus tokarensis* Zarenkov, 1968, male 8.5 mm, TAIWAN 2001, st. CP115; (e) *Bathypalaemonella hayashii* Komai, 1995, female 12.5 mm, TAIWAN 2001, st. CP139; (f) *Bathypalaemonetes brevisrostris* (Bruce, 1986), 8.5 mm, TAIWAN 2000, st. CP58; (g) *Bathypalaemonetes pilosipes* (Bruce, 1986), female 10.5 mm, TAIWAN 2001, st. CD139; (h) *Bathypalaemonetes chani*, new species, female ov. 15 mm, holotype, TAIWAN 2001, st. CD132.

with 13 small articulated spines distributed on proximal half, similar in size, all anterior to the post-orbital margin; distal half unarmed; lower border with seven close, acute teeth; lateral carina well developed, covering bases of eyestalks. Antennal and branchiostegal spines present, the former with a sort of depression behind it which rejoins the inferior orbital angle, the latter feebly developed. Deep hepatic fossa prolonged backwards by a well defined, although not elevated, lateral carina corresponding with the dorsal part of the branchial chamber. Abdomen smooth, pleura of fifth segment ending in acute tooth; sixth somite about 1.9 times as long as fifth; telson broken, almost completely missing. Antennular stylocerite robust, extending almost to anterior margin of second peduncular segment; antennal basicerite with well developed lateral tooth; scaphocerite well developed, lateral border slightly convex, with strong disto-lateral tooth reaching well beyond anterior margin of blade. Eyes small, cylindrical, with well-pigmented globular cornea, cornea diameter only 0.07 of carapace length, stalk diameter equal to cornea diameter.

Due to the firmness of the tegument and in order not to damage this unique specimen, the mouthparts have not been dissected and the branchial formula has not been checked.

Mxp3 extending to distal border of antennal carapocerite. P1 extending to 3/4 of the scaphocerite length; chela without dense zone of setae along dactylar margin, with serrulate cleaning setae proximally on opposite border; carpus 1.6 x chela; dactylus about half length of palm; carpus 1.1 x merus (measured along dorsal line); merus about 1.5 x ischium. Minor P2 elongate, exceeding scaphocerite by length of chela plus last third of carpus; carpus straight (not bowed), 2.2 x chela; dactylus 1/3 of palm; carpus 1.2 x merus (measured along dorsal line); merus 1.6 x ischium (measured along dorsal line). Major P2 exceeding scaphocerite by 5/6 of the chela; ischium 0.7 x merus; carpus a little more than half of chela; chela about 0.75 of carapace length; locking mechanism present, identical to that of other species of the family (Cleva, 2001: 759, 760). P3, P4 and left P5 missing or incomplete. Right P5 extending to 2/3 of scaphocerite; merus about 1.35 x carpus, and 1.15 x propodus; carpus about 0.85 x propodus; distal third of propodus densely setose; dactylus with nine and 11 ventral spinules on each side of the central line, long and thin, none of them being laterally compressed or flattened as in *B. pilosipes*, each group arranged in a double row.

**Etymology.** – It is a pleasure for me to dedicate this new species to Dr. T.Y. Chan.

**Remarks.** – At first glance, this specimen would be identified as *Bathypalaemonetes pilosipes*. However, a careful examination reveals marked differences that enable it to be recognized as a new species. In fact this new taxon combines features of the two previous species. *Bathypalaemonetes chani*, new species, appears to be close to *Bathypalaemonetes pilosipes*, but it also displays characters of *B. brevisrostris*.

*Bathypalaemonetes chani* differs from *B. pilosipes* by: higher rostrum (0.14 versus 0.10 of carapace length) and smaller cornea (0.07 versus 0.10-0.09 of carapace length); well marked lateral reliefs on the carapace; shape of fifth abdominal pleuron (ending in sharp tooth, versus rounded); mxp3 with ischiomerus about 3 times longer than penultimate segment (versus 2 times) and with exopodite shorter than ischiomerus (versus much longer), chela of P1 devoid of dense zone of setae along dactylar margin; carpus of the minor P2 straight, not strongly bowed; proportions of articles of major P2: shorter chela (0.75 carapace length, versus only a little shorter, or even longer as in the specimen mentioned above), carpus much longer; dactylus with well defined tubercles; proportions of the P5 articles: carpus shorter than propodus, versus longer than the propodus, and dactyl with a different kind of spinulation.

*Bathypalaemonetes chani* differs from *B. brevisrostris* in the following points: higher rostrum (0.14 versus 0.10-0.11 of carapace length), with lateral carina less projecting and with borders not sharp, smaller cornea (0.07 versus 0.10 of carapace length); well marked lateral reliefs on the carapace; mxp3 with ischiomerus about 3 times longer than penultimate segment (versus 2 times), exopodite shorter than ischiomerus, ultimate segment not as densely setose; chela of P1 not densely setose along dactylar margin; chela of minor P2 much longer and not bowed; proportions of the articles of major P2 very different: chela much shorter (propodus = 0.75 x carapace length, versus 1.10 to 1.25), carpus much longer; dactylus of fifth pereopod with a different type of spinulation.

**Coloration.** – No peculiar pattern (Fig. 6h); cephalothorax orange- to red-brownish; abdomen and pleopods pinkish-orange; antennal flagella whitish; rostrum, antennules, scaphocerites, pereopods, sixth abdominal somite and caudal fans deep to dark-red.

**Distribution.** – Taiwan, 690-700 m depth.

## ACKNOWLEDGEMENTS

I would like to express my sincere thanks to Dr. T. Y. Chan of the National Taiwan Ocean University (NTOU) who entrusted me with the study of the material, reviewed the manuscript, added information about the TAIWAN cruises and prepared the color plate; to Jean François Dejouannet, IRD, who inked the drawings; to Laurent Albenga, MNHN, who arranged the figures; to Mark Judson, MNHN, who reviewed the English text. The cruise “TAIWAN 2000” was supported by NTOU, the Taiwan Fisheries Research Institute, National Science Council, Taiwan, R.O.C. (NSC), MNHN and IRD. “TAIWAN 2001” by NTOU, NSC, National Museum of Marine Science & Technology (Taiwan, R.O.C.; NMMST), MNHN and IRD. “TAIWAN 2002” by NTOU, NSC, NMMST, National Museum of Marine Biology and Aquarium (Taiwan, R.O.C.; NMMBA), MNHN and IRD. “TAIWAN 2003” by NTOU, NSC, NMMST and NMMBA.

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