

A new species of the *Pasiphaea sivado* species group from Taiwan (Decapoda, Caridea, Pasiphaeidae)

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ABSTRACT

During a survey of Taiwanese waters a new species, *Pasiphaea mclaughlinae* n. sp., was discovered. This new species belongs to the *P. sivado* species group which is characterized by having a reduced branchial formula. The new species can be distinguished from other members of this group by the combination of the following characters: flat dorsal surface of the second to fifth abdominal somites, unarmed basis and ischium of the second pereopods, and a lower number of meral spines on the first and second pereopods.

RÉSUMÉ

Une nouvelle espèce du groupe des espèces proches de *Pasiphaea sivado* (Decapoda, Caridea, Pasiphaeidae) de Taiwan.

Au cours d'une campagne dans les eaux de Taiwan, une espèce nouvelle, *Pasiphaea mclaughlinae* n. sp., a été trouvée. Elle appartient au groupe des espèces proches de *P. sivado* qui se caractérisent par une formule branchiale réduite. Elle se distingue des autres espèces de ce groupe par: la face dorsale des somites abdominaux 2-5 plate, le basis et l'ischion des seconds périopodes inermes, les épines du mérus des premiers et seconds périopodes moins nombreuses.

KEY WORDS

Crustacea,
Decapoda,
Caridea,
Pasiphaeidae,
Taiwan,
deep sea waters,
new species.

MOTS CLÉS

Crustacea,
Decapoda,
Caridea,
Pasiphaeidae,
Taiwan,
eaux profondes,
espèce nouvelle.

INTRODUCTION

The genus *Pasiphaea* Savigny, 1816 is a large genus which contains more than 60 species, arranged in four species groups (Hayashi 1999, 2004, in press). In most species of the genus five pleuro-

branchiae and three arthrobranchiae are well developed in either side of the gill chamber. One of these species groups, the *P. sivado* species group, contains nine species that are distinguished from the other members of *Pasiphaea* by having a reduced branchial formulae. This species group can

in turn be subdivided into two subgroups (Hayashi 1999), one of which includes six species having four pleurobranchiae, and another that includes three species with five pleurobranchiae, although the last pleurobranchia is small and rudimentary (Hayashi 1999). The former subgroup includes *P. debitusae* Hayashi, 1999, *P. fragilis* Hayashi, 1999, *P. gracilis* Hayashi, 1999, *P. laevis* Hayashi, 1999, *P. maris-rubri* Iwasaki, 1989 and *P. philippinensis* Hayashi, 1999; the latter subgroup includes *P. sivado* (Risso, 1816), *P. propinqua* De Man, 1916 and *P. japonica* Omori, 1976.

During a study of specimens recently collected from waters around Taiwan by joint French and Taiwanese expeditions, an interesting new species referable to the subgroup of the *P. sivado* species group with four pleurobranchiae was discovered. This new species differs from other members of the subgroup in having the second to fifth abdominal somite flat dorsally, unarmed basis and ischium of the second pereopods and fewer meral spines on the first and second pereopod. This new species is described herein.

Size is indicated as carapace length (cl), measured middorsally from the anterodorsal margin to posterior margin of the carapace. The type specimens are deposited at Muséum national d'Histoire naturelle, Paris (MNHN).

SYSTEMATICS

Family PASIPHAEIDAE Dana, 1852

Genus *Pasiphaea* Savigny, 1816

Pasiphaea mclaughlinae n. sp.

(Figs 1-3)

TYPE MATERIAL. — Holotype: SE coast of Taiwan, *Ocean Researcher 1*, TAIWAN 2001, stn CP 126, 22°13.8'N, 121°01.8'E, 1222-1226 m, 21.VIII.2001, 1 ♂ cl 16.1 mm (MNHN-Na 16064).

Paratype: South China Sea, *Ocean Researcher 1*, TAIWAN 2001, stn CP 131, 22°17.3'N, 120°05.5'E, 732-839 m, 22.VIII.2001, 1 ♂ cl 16.0 mm (MNHN-Na 16065).

ETYMOLOGY. — With pleasure I dedicate this new species to Patsy McLaughlin, in recognition for her outstanding contributions to carcinology.

DISTRIBUTION. — Known only from the localities of the type material, on the southern part of Taiwan; depths: 732-839 and 1222-1226 m.

DIAGNOSIS. — Small species. Exoskeleton hard, not fragile. Rostrum spine-like, moderately large. Carapace dorsally rounded; branchiostegal sinus obliquely shallow; branchiostegal spine marginal. First abdominal somite dorsally rounded, second to fifth somites flat dorsally, sixth somite rounded at anterior three-fourths and flat at posterior one-fourth, with distinct posteromedian spine. Telson shallowly grooved dorsally; posterior margin truncate, with three pairs of spines. First pereopod with four to six spines on merus; basis with long, sharply produced tooth at posterodistal angle; fingers shorter than palm; palm with two isolated setae. Second pereopod with five to seven spines on merus; ischium and basis unarmed except for long, sharply produced tooth at posterodistal angle of basis. Four pleurobranchiae and three arthrobranchiae.

DESCRIPTION

Size small (known specimens cl 16.0, 16.1 mm). Rostrum (Fig. 1A) spine-like, moderately large, posterodorsal margin slightly convex, anterior margin weakly concave (Fig. 2A, C); apex just reaching or slightly falling short of anterodorsal margin of carapace (Figs 1A; 2A-C). Carapace dorsally rounded, anterodorsal part thin, short, directed downward in lateral view, anterolateral margin obliquely sinuous in lateral view (Fig. 2C). Branchiostegal spine comparatively large, marginal or submarginal, branchiostegal sinus shallow, long (Fig. 2A, C).

First abdominal somite dorsally rounded, second to fifth somites dorsally flat (Fig. 1B), sixth somite 1.7 times as long as fifth somite, dorsally rounded at anterior three-fourths, flat at posterior one-fourth, with strong posteromedian spine, extending directed posteriorly (Fig. 2D). Telson 0.7 times as long as sixth somite, dorsally grooved throughout (Fig. 2E), posterior margin truncate, with three or four pairs of spines (Fig. 2E, F). Eyes well developed, cornea semispherical attached obliquely on eyestalk in dorsal view (Fig. 2B). Stylocerite falling short of distal margin of first segment of antennular peduncle (Fig. 2A). Antennal scale about four times as long as wide (Fig. 2G), shorter than chela of first pereopod; basicerite with slender spine on ventrodistal corner (Fig. 2A, G). Mouthparts typi-

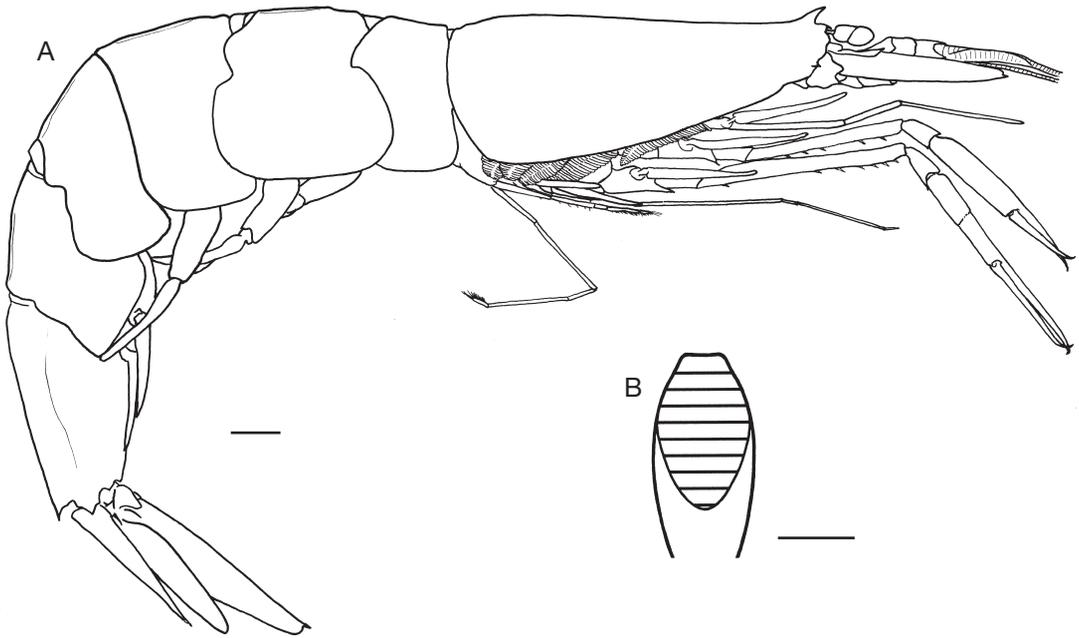


FIG. 1. — *Pasiphaea mclaughlinae* n. sp., ♂ holotype from Taiwan, cl 16.1 mm (MNHN-Na 16064): **A**, lateral view; **B**, transversal section of fifth abdominal somite. Scale bars: 2 mm.

cal of genus (Fig. 3A-F); third maxilliped reaching slightly beyond antennal scale (Fig. 3F).

First pereopod reaching beyond swollen part of antennular flagellum by length of fingers (Fig. 3G); palm with two slender setae on mesial surface near ventral margin, distal one near base of dactylar articulation, proximal one at mid-length of palm (Fig. 2H); fingers 0.7 times as long as palm; merus with four to six spines on nearly entire posterior margin (Fig. 3G); ischium unarmed, anterodistal part slightly broadened; basis with acute tooth on posterodistal corner, anterior margin weakly convex (Fig. 2I). Second pereopod reaching beyond swollen part of antennular flagellum by length of fingers (Fig. 3H), chela of second pereopod slender and long, about 1.2 times as long as first chela; no setae on palm; fingers as long as palm; merus with five to seven spines on posterior margin (Fig. 3H); ischium unarmed, anterodistal part slightly broadened; basis with acute tooth on posterodistal corner (Fig. 2J), tooth on first pereopod more erect than that on second pereopod, anterior margin strongly

convex. Posterior three pereopods typical of genus (Fig. 3I-K). Third pereopod reaching distal margin of first segment of antennular peduncle. Fourth pereopod short, not reaching basal tooth on second pereopod. Fifth pereopod reaching distal margin of cornea. Endopod of male first pleopod and appendix interna and appendix masculina without distinguishing characters (Fig. 3L, M).

Pleurobranchiae present on fourth to seventh thoracic somites, arthrobranchiae present on fourth to sixth somites; eighth somite without gill. All gills composed of developed lamellae. First to fifth pereopods with well developed exopods, but without epipods or podobranchiae (Fig. 2K).

REMARKS

The subgroup to which *P. mclaughlinae* n. sp. belongs is also characterized by the following features: the size of individuals is small, cl less than 15 mm in males and ovigerous females, the rounded dorsal margin of the carapace, the posteromedian spine on the sixth abdominal somite, two setae on the

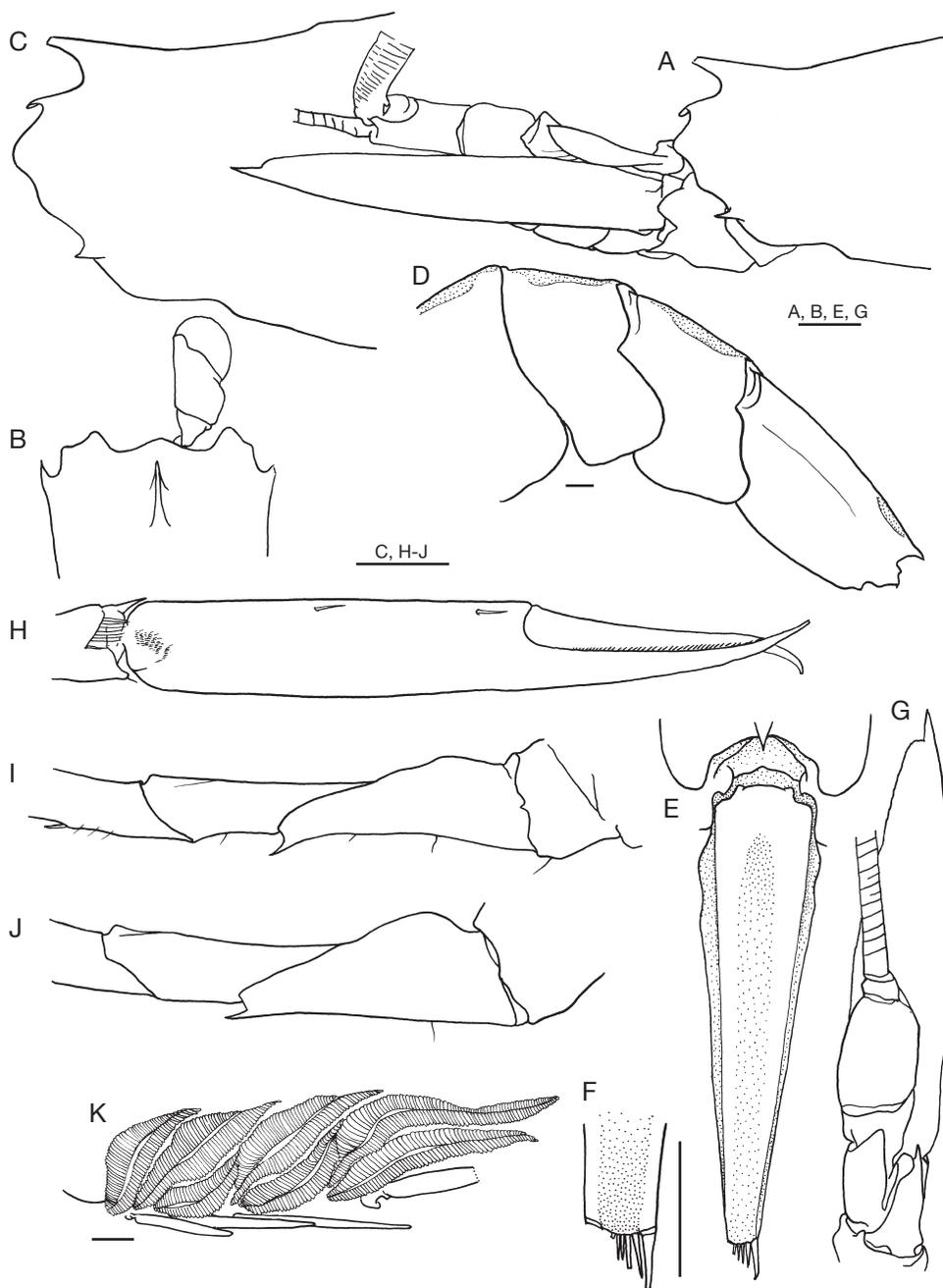


FIG. 2. — *Pasiphaea mclaughlinae* n. sp.: **A-C, E, G-K**, ♂ paratype from Taiwan, cl 16.0 mm (MNHN-Na 16065); **D, F**, ♂ holotype from Taiwan, cl 16.1 mm (MNHN-Na 16064); **A**, anterior part of carapace with antennules and antennal peduncles, lateral; **B**, anterior part of carapace and right eye, dorsal; **C**, anterior margin of carapace, lateral; **D**, posterior part of third to sixth abdominal somites, lateral; **E**, posterior margin of sixth abdominal somite and telson, dorsal; **F**, posterior part of telson, dorsal; **G**, antenna, ventral; **H**, chela of right first pereopod, mesial; **I**, basal part of right first pereopod, mesial; **J**, basal part of right second pereopod, mesial; **K**, right side of gills, pereopods omitted. Scale bars: 1 mm.

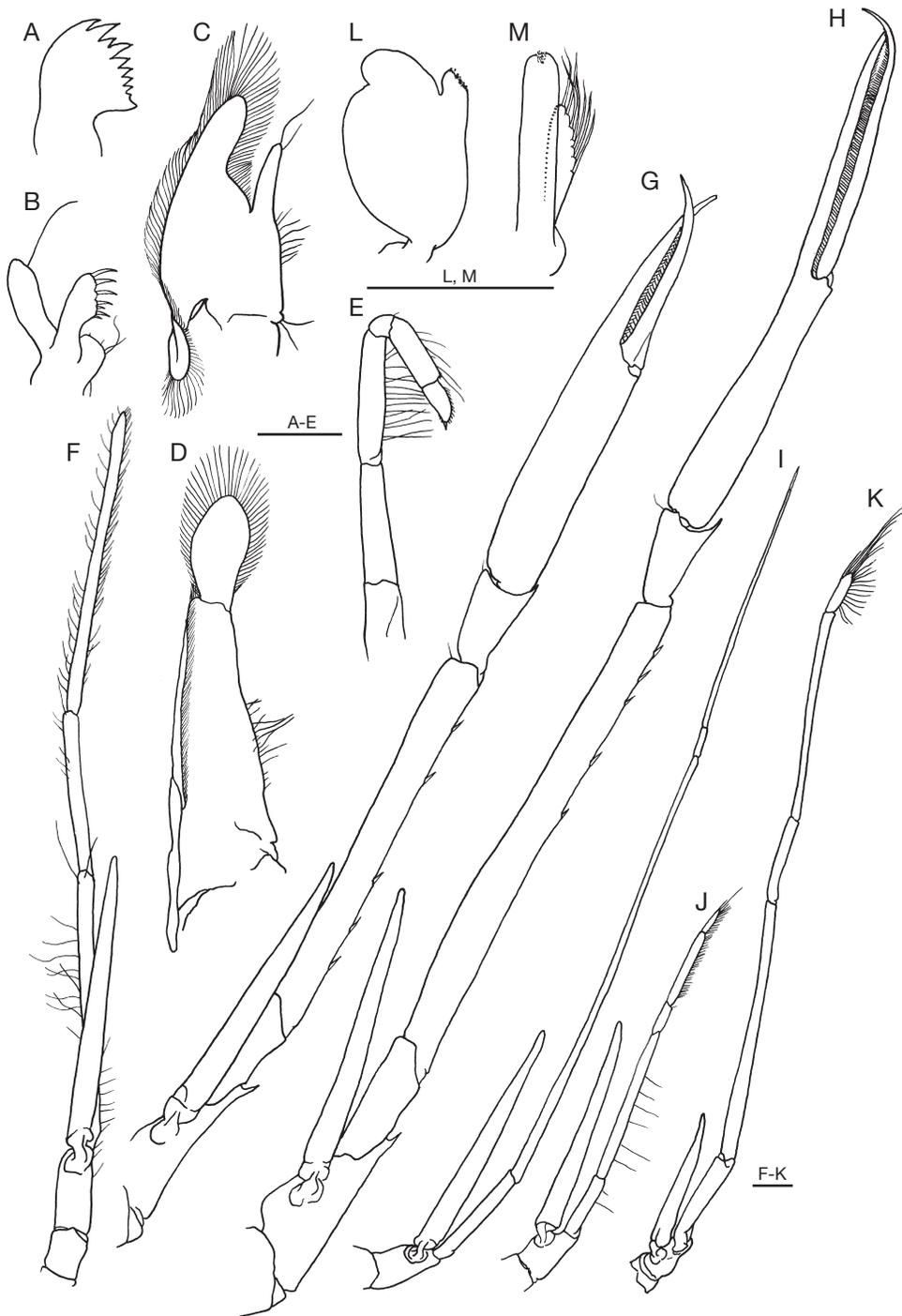


FIG. 3. — *Pasiphaea mclaughlinae* n. sp., ♂ paratype from Taiwan, cl 16.0 mm (MNHN-Na 16065) (all appendages are right side, lateral): **A**, mandible; **B**, maxillule; **C**, maxilla; **D**, first maxilliped; **E**, second maxilliped; **F**, third maxilliped; **G**, first pereopod; **H**, second pereopod; **I**, third pereopod; **J**, fourth pereopod; **K**, fifth pereopod; **L**, endopod of first pleopod; **M**, appendix masculina and appendix interna. Scale bars: 1 mm.

palm of the first pereopod, and a strong tooth on posterodistal corners of the basis of the first and second pereopods. As previously mentioned, this subgroup now includes *P. debitusae*, *P. fragilis*, *P. gracilis*, *P. laevis*, *P. marisrubri*, and *P. philippinensis*, to which *P. mclaughlinae* n. sp. is now added. Of these *P. marisrubri* and *P. philippinensis* bear two to seven spines on the posterior margin of the basis of the second pereopod; *P. debitusae* usually has one spine on the ischium of the second pereopod; *P. fragilis*, *P. gracilis*, *P. laevis*, and *P. mclaughlinae* n. sp. are unarmed on the posterior margin of the ischium and basis of the second pereopod.

The new species differs from *P. fragilis*, *P. gracilis*, and *P. laevis* in features of the abdomen and armature of the second pereopod. The abdomen of the new species is dorsally flat on the second to fifth somites and partly on the sixth somite. It is uncertain whether the posterior margin of the telson is provided with three or four pairs of spines, because five spines remain on the posterior margin in both types (Fig. 2E, F). Judging from these remaining spines, there may be four pairs in the holotype, but clearly three pairs are present in the paratype. The merus of the second pereopod is armed with five to seven spines on the posterior margin in the new species, whereas there are nine or more spines in *P. fragilis*, *P. gracilis*, and *P. laevis*. The meral spines on the first pereopod are also fewer in the new species than in those other three species, although there is overlap in the range of spines (four to six in the new species, six to nine in *P. fragilis*, seven to nine in *P. gracilis* and *P. laevis*). In addition, the rostrum is short and small in *P. fragilis* and *P. gracilis*, and the branchiostegal sinus is barely distinguishable in *P. laevis*.

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