

# The Freshwater Crab Fauna (Crustacea, Brachyura) of the Philippines

## VI. A New Cavernicolous Crab from Mindanao

Masatsune Takeda<sup>1\*</sup> and Peter K. L. Ng<sup>2</sup>

<sup>1</sup>Department of Zoology, National Science Museum, 3-23-1 Hyakunincho, Shinjuku-ku, Tokyo, 169-0073 Japan; and Department of Biological Sciences, Graduate School of Science, The University of Tokyo, Bunkyo-ku, Tokyo, 113-0033 Japan

<sup>2</sup>Department of Biological Sciences, National University of Singapore, Kent Ridge, Singapore 119260, Republic of Singapore

**ABSTRACT**—A new species of cavernicolous freshwater crab of the genus *Sundathelphusa* Bott, 1969 (Family Parathelphusidae), *S. hades*, is described from Mindanao in the Philippines. The new species has greatly reduced eyes, noticeably elongated ambulatory legs and lack of dark body pigmentation, all representing features associated with an obligate troglodyte. The species can be differentiated from the closest congener, *S. cavernicola* (Takeda, 1983) from Bohol in the Philippines by the form of its carapace and male first pleopod.

**Key words:** *Sundathelphusa*, cavernicolous crab, freshwater crab, Mindanao, Philippines

### INTRODUCTION

During an ongoing study of freshwater crabs from the Philippines, the authors recently received a pair of unusual crabs collected from the Latay Cave in Agusan Del Sur and the Sta. Rita Thinking Cave in Surigao Del Sur, Mindanao. The specimens belong to a typical cavernicolous species characterized by the greatly reduced eyes, elongate ambulatory legs and lack of body pigmentation. On close examination these specimens proved to represent a new species of the genus *Sundathelphusa* Bott, 1969.

In the following description of the new species, the abbreviations G1 and G2 are used for the male first and second pleopods, respectively. All measurements provided are of the carapace width and length. The terminology used essentially follows that by Ng (1988). The holotype is deposited in the National Science Museum, Tokyo (NSMT), and the paratype in the Zoological Reference Collection, Raffles Museum, National University of Singapore (ZRC).

### DESCRIPTION

Family Parathelphusidae Alcock, 1910

Genus *Sundathelphusa* Bott, 1969

*Sundathelphusa hades* sp. nov.

(Figs 1–4)

**Type material.** Holotype male (NSMT; 19.7 by 16.4 mm) from

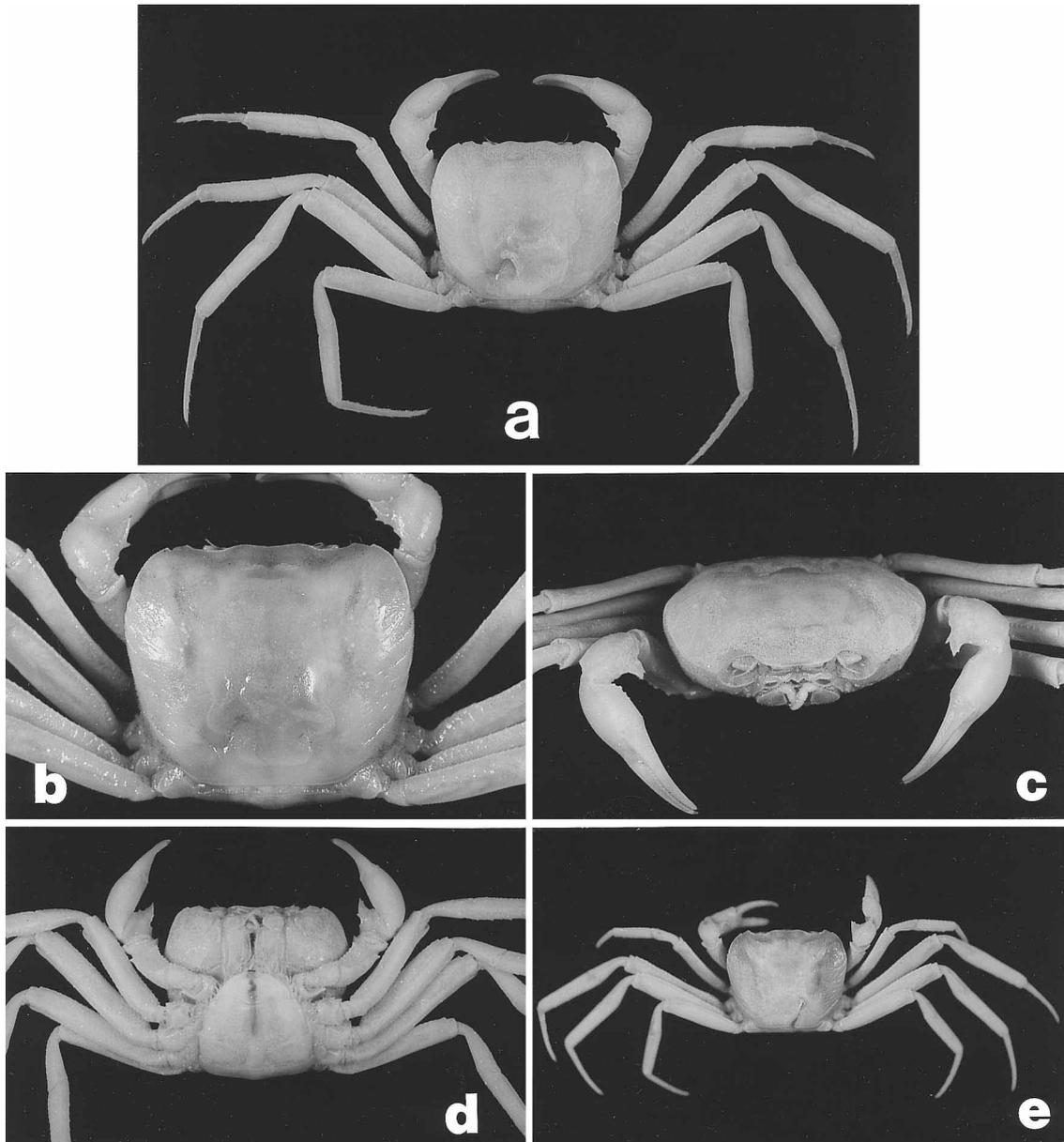
Latay Cave, Agusan Del Sur, Mindanao, 15-II-1998; paratype female (24.9 by 20.8 mm) from Sta. Rita Thinking Cave, Surigao Del Sur, Mindanao, 27-II-1998; coll. Cave Research Group of Meiji University.

**Description of holotype (male).** Carapace (Fig. 1e) rather squarish, widest point at about level of one-third of carapace length; regions poorly demarcated, relatively smooth. Frontal region (Fig. 2a) rather compressed, surface gently granulose to smooth; anterolateral regions (Fig. 2a) with rows of small granules of various lengths. Cervical groove shallow; H-shaped median groove deep. Frontal margin (Fig. 2a) almost straight, granulated, vaguely separated into 2 broad lobes by a shallow median indentation. Frontal median triangle (Fig. 2c) almost complete, its dorsal and lateral margins distinct, but not fused, edges of dorsal margin just touching lateral margins; dorsal margin cristate, crest formed by fused granules. Epigastric cristae (Fig. 2a) low, granulated; some granules sharp, separated from each other by shallow cleft. Postorbital cristae (Fig. 2a) very weak, granulated with some sharp granules; only mesial parts prominent, lateral parts undiscernible, neither reaching edge of epibranchial cristae or cervical groove. External orbital tooth (Fig. 2a) relatively low; outer margin slightly longer than inner margin, granulated, separated from rest of anterolateral margin by small notch. Anterolateral margin (Figs. 1e, 2a) gently convex, granulated, not clearly demarcated from posterolateral margin, merging with it. Posterolateral margin gently concave, converging gradually towards posterior margin of carapace. Suborbital and subbranchial regions covered with scattered oblique short

\* Corresponding author: Tel. +81-3-3364-7123;

FAX. +81-3-3364-7123.

E-mail; takeda@kahaku.go.jp

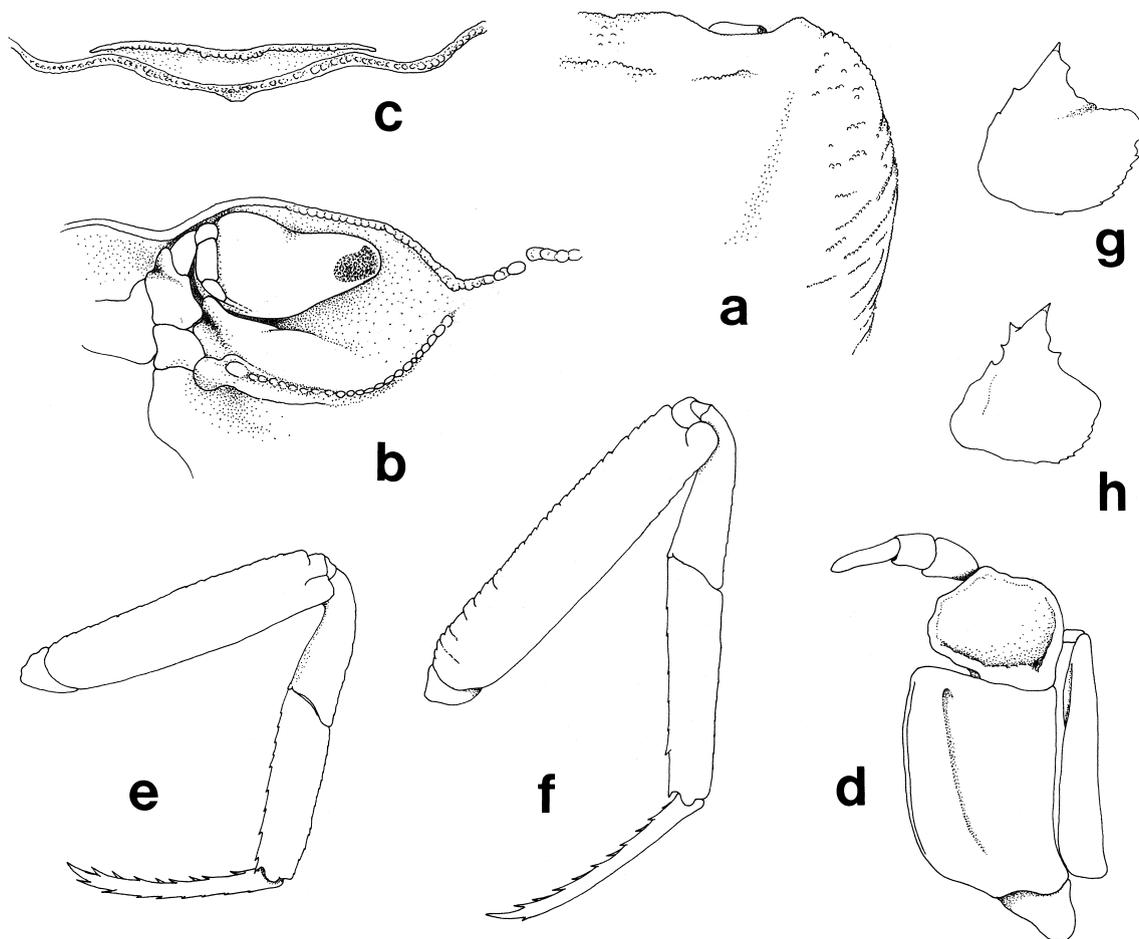


**Fig. 1.** *Sundathelphusa hades* sp. nov. a-d, paratype female (ZRC: 24.9 by 20.8 mm) in dorsal view (a, b), anterodorsal view (c), ventral view (d); e, holotype male (NSMT: 19.7 by 16.4mm) in dorsal view.

striae and small granules. Pterygostomial region smooth. Orbit (Fig. 2a, b) well developed; infraorbital margin beaded with numerous small granules; outer edge almost reaching, but not fused with anterolateral margin. Supraorbital margin (Fig. 2a, b) entire, indistinctly granulated. Eye (Fig. 2a, b) with strongly reduced cornea having only trace of pigmentation; eyestalk stout, not particularly shortened. Basal antennal segment (Fig. 2b) large, subquadrate. Posterior margin of epistome with large, subtriangular median lobe truncated at tip, its lateral margins prominently sinuous. Third maxilliped (Fig. 2d) with ischium rectangular, bearing distinct oblique submedian sulcus; merus subquadrate, with shallow median depression; tip of exopod reaching to midpoint of outer margin of merus, with long flagellum.

Chelipeds (Fig. 1e) not noticeably elongated, subequal. Upper margin of merus indistinctly serrated, without distinct subdistal tooth. Carpus (Fig. 2g) with strong inner distal spine somewhat laterally flattened; its proximal part with small but sharply pointed tubercle, distal margin with several spinules; outer distal margin minutely serrated; dorso-distal surface covered with sharp granules. Outer surface of palm rugose; fingers slender, subequal to length of palm; cutting edges with many sharp teeth.

Ambulatory legs (Figs. 1e, 2e, f) very long, slender; third leg longest. Dorsal margin of each merus indistinctly serrate, without subdistal tooth or spine. Carpi elongate, widened distally, dorsal margins indistinctly serrate. Ventral margins of propodi each with several, sharp but small, serrated teeth.



**Fig. 2.** *Sundathelphusa hades* sp. nov. a-g, holotype male (NSMT: 19.7 by 16.4 mm), h, paratype female (ZRC: 14.9 by 20.8 mm). a, right frontal and anterolateral parts of carapace; b, left orbit and eye; c, frontal median triangle; d, left third maxilliped (setae not drawn); e, f, right third and fourth ambulatory legs in dorsal view; g, h, carpi of right cheliped in dorsal view.

Both margins of dactyli with row of strong, curved spines in first and fourth legs; in second and third legs dactyli armed with strong spines on ventral margins over entire lengths; dorsal margin of dactylus unarmed in second leg, armed with only one small subdistal spine in fourth leg.

Fourth to eighth thoracic sternites smooth, fused without sutures. Abdominal cavity (Fig. 3b) reaching to level of mid-point of coxae of both chelipeds. Male abdomen (Fig. 3a) T-shaped. First segment very narrow longitudinally, its proximal and distal margins weakly sinuous. Second segment transversely subrectangular. Third to fifth segments becoming gradually more trapezoidal; lateral margins of third segment slightly convex; lateral margins of fourth and fifth segments shallowly concave. Sixth segment rectangular, longer than broad, its lateral margins shallowly concave. Telson subtriangular, longer than broad, its lateral margins shallowly concave, with rounded tip.

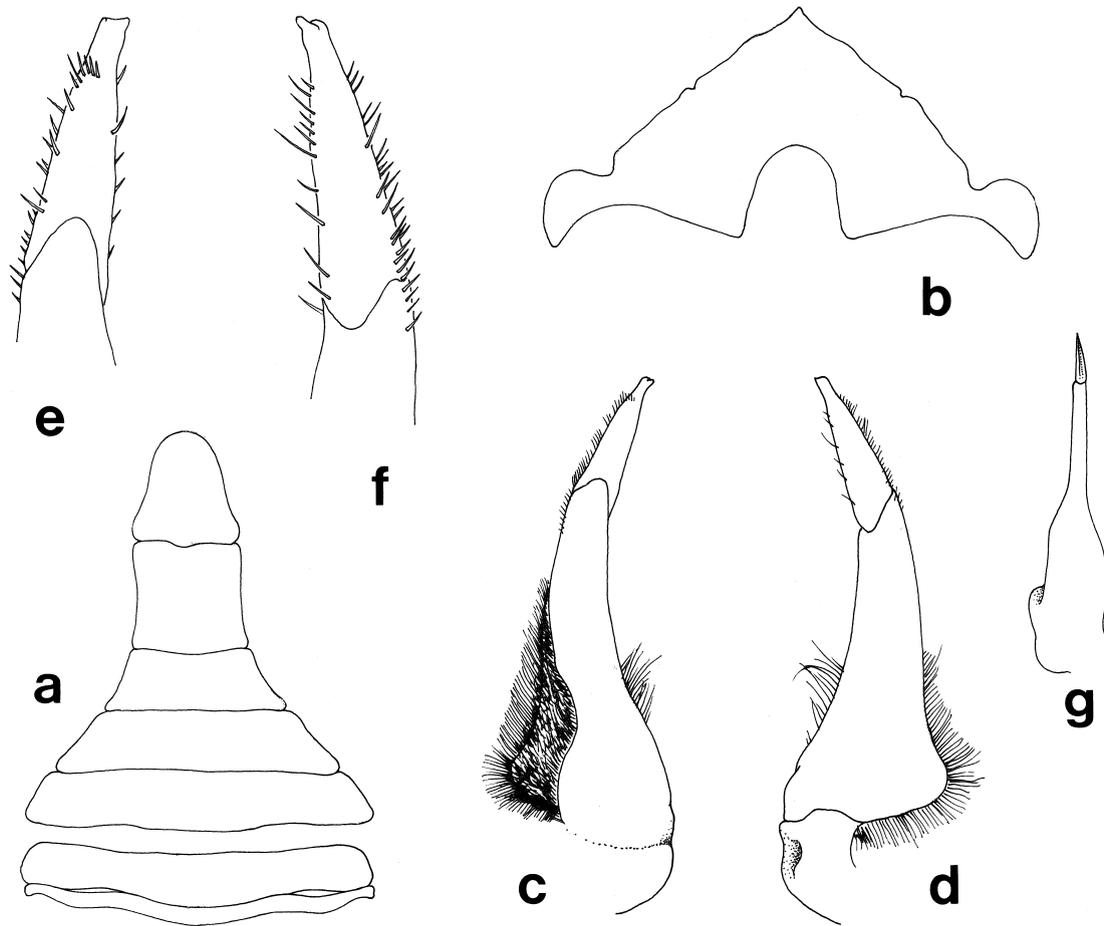
G1 (Fig. 3c-f) relatively slender, weakly curved; subterminal segment with outer margin distinctly concave; terminal segment occupying about 0.3 times total length of G1, nearly straight, tapering, its proximal part evenly cylindrical, with somewhat fluted tip. G2 (Fig. 3g) relatively short, about 0.7

times length of G1; distal segment very short, about 0.2 times length of basal segment.

**Notes on paratype (female).** The female paratype (Fig. 1a-d) is somewhat larger than the holotype male, but agrees in almost all major non-sexual aspects.

Carpus (Fig. 2h) of cheliped with larger inner subdistal tooth, both margins being more strongly dentate; upper margin of merus slightly more serrate; fingers slightly longer than palm. Dorsal margin of ambulatory merus more strongly serrate. Eye similar in form and proportion to those of holotype male, with no trace of any pigmentation.

**Remarks.** Four species of cavernicolous parathelphusids possessing characters of obligate troglodytes (i.e. loss of the body pigmentation and reduction in the size of the cornea and/or length of eyestalk) (see Guinot, 1988, 1994; Ng and Sket, 1996; Ng and Guinot, 1998) have been known from Bohol, the Philippines, viz. *Sundathelphusa cavernicola* (Takeda, 1983), *S. sottoae* Ng and Sket, 1996, *S. urichi* Ng and Sket, 1996, and *S. vedeniki* Ng and Sket, 1996. Of these, *S. urichi* and *S. vedeniki* have relatively short ambulatory legs. The



**Fig. 3.** *Sundathelphusa hades* sp. nov., holotype male (NSMT: 19.7 by 16.4 mm) . a, abdomen in ventral view (setae not drawn); b, anterior part of thoracic sternite; c, d, left G1 in ventral and dorsal views, respectively; e, f, terminal segment of left G1 in ventral and dorsal views, respectively; g, left G2 in ventral view (setae not drawn).

other two species have strongly elongated ambulatory legs, another feature often associated with troglodytes. In the Philippines, four non-cavernicolous species are known to have elongate ambulatory legs, viz. *S. longipes* (Balss, 1937) [Luzon], *S. wolterecki* (Balss, 1937) [Mindanao], *S. sutteri* (Bott, 1970) [Luzon], and *S. celer* (Ng, 1991) [Luzon]. Most of these had originally been assigned to the genus *Archipelothelphusa* Bott, 1969 (see Bott, 1969, 1970; Ng, 1991). However, Ng and Sket (1996) argued that the characters other than the elongate ambulatory legs, there appeared to be no clear features to distinguish the four species from the species of *Sundathelphusa* Bott, 1969, and consequently synonymized *Archipelothelphusa* under *Sundathelphusa*. They also regarded the Sundathelphusidae Bott, 1970, as a junior synonym of the Parathelphusidae Alcock, 1910. This classification is followed here.

The new species, *Sundathelphusa hades*, can easily be distinguished from all congeners by its squarish carapace in which the frontal region is rather compressed, partially due to the relatively low external orbital teeth of both sides. The epigastric and postorbital cristae are very weak. In its greatly reduced eyes, elongated ambulatory legs and lack of body

pigmentation, *S. hades* is similar to *S. cavernicola*, although the carapace of *S. cavernicola* is broader and more ovate than that of the new species. *Sundathelphusa cavernicola* has been described based only on the holotype female (see Ng and Sket, 1996: 697), but the second author has since obtained a good series of specimens also from Bohol, including males. It has been found that the pleopods of *S. cavernicola* differ from those of *S. hades* in that the G1 is distinctly less curved and the distal segment of G2 is proportionately much longer.

Comparison with the other long-legged species of *Sundathelphusa* from the Philippines is also pertinent. A note on the taxonomy of *S. longipes* (Balss, 1937) is necessary. Ng (1991) identified a pair of specimens from Luzon as *S. longipes* (as a species of *Archipelothelphusa*) and characterized a new species, *A. celer*, as being superficially similar but differing from *S. longipes* most markedly in the form of G1. The G1 of *A. longipes* was described and figured as having the terminal and subterminal segments gradually tapering subterminally, while that of *A. celer* was distinctly shorter and stouter, with a swelling on the subterminal segment near the junction with the terminal segment, showing a collar-like structure. The second author since had an opportunity to examine

the syntypes of *S. longipes* deposited in the Museum für Naturkunde an der Humboldt-Universität zu Berlin, and found that the G1 of *S. longipes* s.str. was similar to that of *S. celer*. The specimens referred to "*Archipelothelphusa longipes*" by Ng (1991) actually represent an undescribed species. The taxonomy of these two species will be clarified in a separate paper dealing with this complex of species which includes a number of other undescribed taxa. From *S. hades*, *S. longipes* s.str. and *S. celer* can be easily distinguished by the different shape and ornamentation of the carapace and the normally developed eye which completely fills the orbit, the proportionately shorter ambulatory legs, the more narrowly T-shaped male abdomen with more elongate sixth segment, the relatively stouter G1 with a prominent swelling at the junction between the terminal and subterminal segments, and the longer G2 with the distal segment 0.6 to 0.8 times the length of the basal segment (vs. ca. 0.2 times). On the other hand, in addition to the differences in the carapace and the development of the eye, *Sundathelphusa hades* differs from "*A. longipes*" reported by Ng (1991), in having the narrower male abdomen and more cylindrical terminal segment of G1. From *S. sutteri* known only from the holotype female, *S. hades* can be distinguished also by the different shape of the carapace with the markedly weaker postorbital cristae, and relatively more slender ambulatory meri. From *S. wolterecki*, the only other Mindanao species now known to have the long ambulatory legs, *S. hades* can be separated by the more slender and more curved G1 with the smoothly confluent terminal and subterminal segments as well as the different formation and ornamentation of the carapace.

**Etymology.** The specific name, *hades*, is derived from the Latin for Hell, alluding to the cave habitat of the new species. The name is used as a noun in apposition.

#### ACKNOWLEDGEMENTS

Our cordial thanks are due to the members of the Cave Research Group of Meiji University who provided us with the specimens and information about their localities. We wish to thank the reviewers of the manuscript for their useful comments.

#### REFERENCES

- Alcock A (1910) Brachyura I. Fasc. II. The Indian Freshwater Crabs—Potamonidae. Catalogue of the Indian Decapod Crustacea in the Collection of the Indian Museum. Calcutta, 135 pp 14 pls
- Balss H (1937) Potamoniden (Dekapoda Brachyura) der Philippinen und des Malayischen Archipels. Intern Rev Gesell Hydrobiol Hydrogr 34: 143–187
- Bott R (1969) Flussskribben aus Asien und ihre Klassifikation (Crustacea, Decapoda). Sencken Biol 50: 359–366
- Bott R (1970) Die Süßwasserkrabben von Europa, Asien, Australien und ihre Stammesgeschichte. Eine Revision der Potamoidea und Parathelphusoidea (Crustacea, Decapoda). Abh Sencken Nat Ges 526: 1–338, pls 1–58
- Guinot D (1988) Les crabes cavernicoles du monde. Mém Biospél 15: 3–40
- Guinot D (1994) Decapoda Brachyura. In C. Juberthie, V. Decou (eds.), *Encyclopaedia Biospeologica*. Tome 1. Société de Biospéologie, Moulis (CNRS) and Bucarest (Académie Roumaine), pp 165–179, pl 3
- Milne Edwards H (1853) Mémoire sur la Famille des Ocypodiens. Ann Sci Nat, Zool (3) 20: 163–228, pls 6–11
- Ng P K L (1988) *The Freshwater Crabs of Peninsular Malaysia and Singapore*. Shinglee Press, Singapore, vii + 156 pp 4 color pls
- Ng P K L (1991) On two species of *Archipelothelphusa* Bott, 1969 (Crustacea: Decapoda: Brachyura: Sundathelphusidae) from Luzon, Philippines. Zool Meded 65: 13–24
- Ng P K L, Guinot D (1998) *Geelvinkia darnei*, a new species of cavernicolous crab (Crustacea, Decapoda, Brachyura, Parathelphusidae) from Irian Jaya, Indonesia. Mém Biospél 24: 181–182
- Ng P K L, Sket B (1996) The freshwater crab fauna (Crustacea: Brachyura) of the Philippines. IV. On a collection of Parathelphusidae from Bohol. Proc Biol Soc Wash 109: 695–706
- Takeda M (1983) A new cavernicolous crab from Bohol, the Philippines. Bull Natn Sci Mus, Tokyo (A) 9: 169–173

(Received May 25, 2001 / Accepted August 18, 2001)