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ON A COLLECTION OF FRESHWATER CRABS (CRUSTACEA: BRACHYURA) FROM TERENGGANU, PENINSULAR MALAYSIA, WITH DESCRIPTION OF A SECOND SPECIES OF *GEITHUSA* (PARATHELPHUSIDAE)

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ABSTRACT. - Four freshwater crab species from two families are recorded from the eastern part of the northeastern Malaysian state of Terengganu. A new species of *Geithusa* Ng, 1989 (Parathelphusidae), *G. lentiginosa*, is described, the first record of the genus from mainland Peninsular Malaysia. *Parathelphusa maculata* De Man, 1879, and *Heterothelphusa insolita* Ng & Lim, 1986 (both Parathelphusidae), are recorded for the first time from Terengganu. An unidentified potamid, allied to *Johora thoi* Ng, 1990, was also obtained.

INTRODUCTION

The freshwater crab fauna of the West Malaysian state of Terrengganu is poorly known. Ng (1988) in his synopsis of the Malaysian fauna, could only list four species from the state: *Johora tahanensis* Bott, 1966, *Stoliczia changmanae* Ng, 1988 (both Potamidae), *Irmengardia pilosimana* (Roux, 1936) (Parathelphusidae), and *Geosesarma malayanum* Ng & Lim, 1986 (Grapsidae). Three of these species, *Johora tahanensis*, *Stoliczia changmanae* and *Irmengardia pilosimana*, occur in the Terengganu part of the Taman Negara National Park, on the western edge of the state. A new genus and species of parathelphusid, *Geithusa pulchra* (nec *pulcher*), was recently described from Pulau Redang, an island 25 km east of the state (Ng, 1989). Ng (1990b) subsequently described a new potamid, *Johora thoi*, from Pulau Redang. There are no records of freshwater crabs from other parts.

In March 1992, a preliminary survey of was made of the fresh waters on the eastern part of Terrenganu to ascertain the fish and decapod crustacean fauna present. Four species of freshwater crabs were obtained: *Parathelphusa maculata* De Man, 1879, *Heterothelphusa insolita* Ng & Lim, 1986, *Geithusa lentiginosa*, new species (all Parathelphusidae), and *Johora* sp. (Potamidae). The description of the new species and notes on the four species form the text of the present note.

The abbreviations G1 and G2 refer to the male first and second pleopods respectively. All measurements (in millimetres) are of the carapace width and length respectively. The terms used

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follow those used by Ng (1988). Specimens are deposited in the Zoological Reference Collection (ZRC), Department of Zoology, National University of Singapore and Nationaal Natuurlijke Museum (NNM), Leiden, The Netherlands.

SYSTEMATICS

FAMILY PARATHELPHUSIDAE

Genus *Geithusa* Ng, 1989

The spelling of the name of the type species, *G. pulcher*, should be amended to *G. pulchra* as the gender of the genus *Geithusa* is feminine.

Geithusa lentiginosa, new species
(Fig. 1)

Material. - Holotype male (25.2 by 20.8 mm) (ZRC), forest stream after Kuala Brang, on road to Kuala Terengganu, 5°04'25.0"N, 103°03'19.8"E, Terengganu, Peninsular Malaysia, leg. P. K. L. Ng *et al.*, 19.iii.1992.

Paratypes - 23 males, 36 females (largest 26.3 by 21.7 mm) (ZRC), 1 male, 1 female (NNM), same data as holotype.

Description. - Carapace quadrate, broader than long, cervical grooves broad and very shallow, H-shaped central depression deep, distinct, with six yellow spots (two adjacent to each cervical groove, and one on each external edge of H-shaped groove); dorsal surface very smooth, regions poorly defined. Posterolateral regions with distinct oblique striae. Epigastric and postorbital cristae sharp, separated by broad oblique lateral gap, cristae parallel or subparallel to each other as well as with frontal margin; postorbital cristae with a distinct oblique notch or cleft at beginning of cervical groove before continuing to meet base of second epibranchial tooth. Frontal margin gently sinuous to almost straight; external orbital angle triangular, outer margin about 2 times length of inner margin; first and second epibranchial teeth directed forwards, third epibranchial tooth directed obliquely outwards; posterolateral margins gradually converging. Exopod of third maxilliped exopod with low triangular tooth on inner distal margin and well developed flagellum which is longer than width of merus; merus rectangular; ischium with deep submedial sulcus.

Chelipeds subequal, or slightly asymmetrical in larger males; outer surfaces slightly rugose; fingers of longer than palm, pigmented black, tips yellow; carpus with strong inner distal spine, dorsal surface with distinct low median ridge.

Second pair of ambulatory legs longest; surfaces slightly rugose; merus with distinct, sharp subdistal dorsal spine.

Sternal surfaces smooth; suture between sternites 2 and 3 shallow but distinct, convex towards buccal cavity. Male abdomen T-shaped, reaching beyond imaginary longitudinal line connecting anterior edges of bases of chelipeds, very close to suture between sternal segments 1 and 2; segment 7 shorter than segment 6; lateral margins of segment 7 convex; lateral margins of segment 6 gently sinuous.

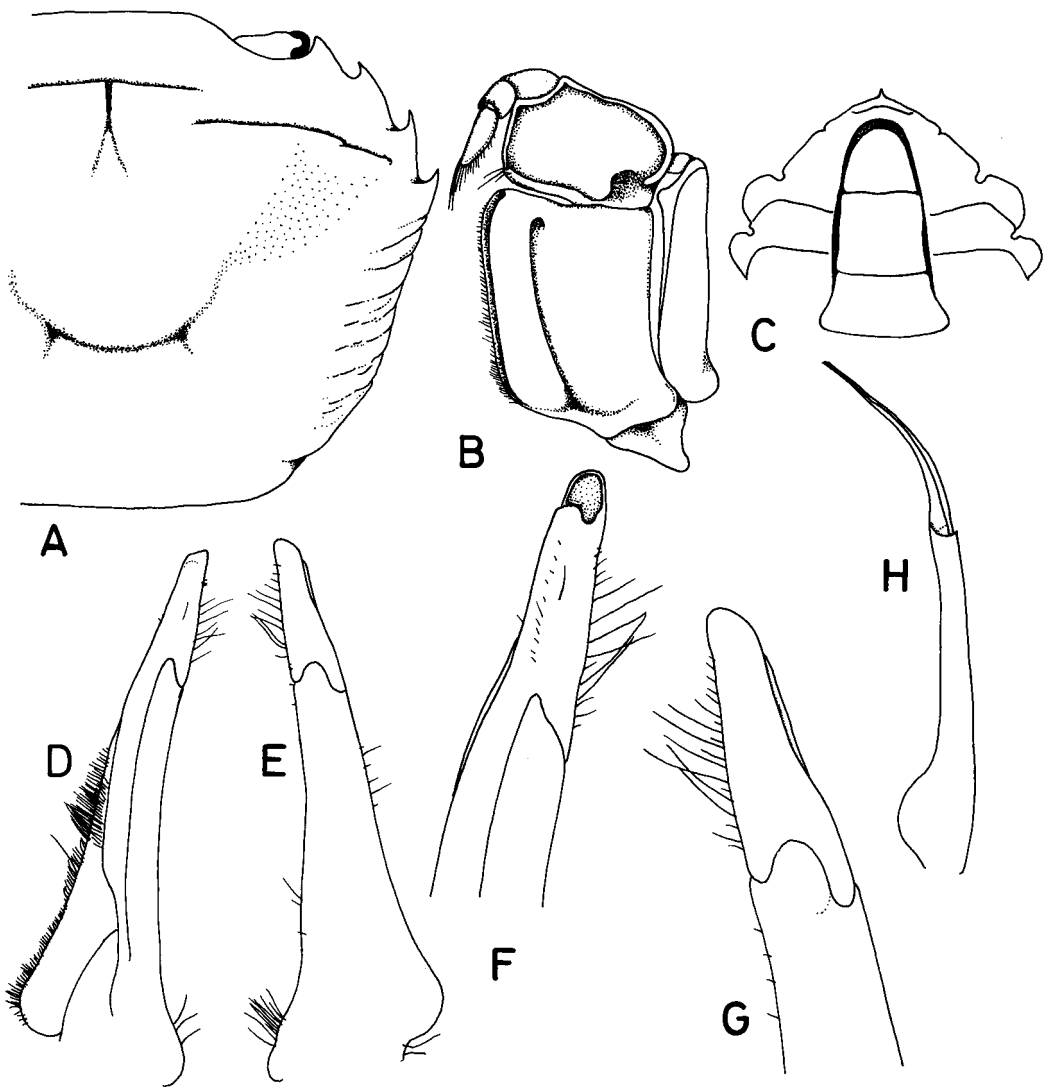

Fig. 1. *Geithusa lentiginosa*, new species. Holotype male, 25.2 by 20.8 mm (ZRC). A, right side of carapace; B, left third maxilliped; C, sternum and last three abdominal segments; D-G, left G1; H, left G2. D, F, ventral view; E, G, dorsal view; F, G, distal part of G1.

G1 slender, terminal and subterminal segments distinctly separated; terminal segment cylinder-shape, 0.36 times length of subterminal segment tip appears truncate from dorsal view, open. G2 distal segment 0.65 times length of basal segment.

Etymology. - The species is named for the numerous black spots on its pterygostomial, suborbital and sub-branchial regions; from the Latin "lentiginosus" for freckled.

Remarks. - The characters of *G. lentiginosa*, new species, conform to those defined by Ng (1989) for the genus (i.e. squarish carapace, postorbital cristae parallel or subparallel to the frontal margin, terminal and subterminal segments of the G1 being distinctly separated, proportionately longer distal segment of the G2). The carapace of *G. lentiginosa* also has the six bright yellow spots (on the cervical groove and central depression) present in *G. pulchra*. The genus *Geithusa* can easily be separated from the allied *Siamthelphusa* by the above characters. The presence of six yellow spots on the carapace of *Geithusa* is a character shared with several species of the allied genus *Somanniathelphusa* Bott, 1968 (e.g. *S. sexpunctata* (Lanchester, 1906), see Ng, 1988). It is however, difficult to ascertain the relationship of these two genera especially since their gonopod and carapace features differ so strikingly.

Geithusa lentiginosa can be easily separated from *G. pulchra* by the differences in the structures of their carapaces and G1s (Table 1). The notch on the postorbital cristae at the beginning of the cervical groove in *G. lentiginosa* is constant for all the specimens examined. In *G. pulchra*, notches are almost always absent, although one of the paratype females has a small notch on the right postorbital crista (absent on the left side).

The habitat of *G. lentiginosa* is among leaf litter and detritus in at base of second epibranchial shallow waters (less than one metre depth) in well shaded forest. The water was a pale tea-colour, with a temperature of 25.9°C and pH of 6.71. *Geithusa lentiginosa* is sympatric with *Parathelphusa maculata* at the type locality, but seems to prefer the more well shaded parts of the stream deeper in the forest.

Table 1. Major differences between *G. pulchra* and *G. lentiginosa*, new species

G. pulchra	*G. lentiginosa, new species*
suborbital, sub-branchial and pterygostomial regions without black spots	suborbital, sub-branchial and pterygostomial regions with numerous distinct black spots
postorbital crista continuous, without notch, stopping at base of second epibranchial tooth	postorbital crista with distinct notch at beginning of cervical groove, stopping at base of second epibranchial tooth
suture between sternites 2 and 3 straight	suture between sternites 2 and 3 convex towards buccal cavity
G1 terminal segment cone-shaped, tip rounded	G1 more slender, terminal segment cylinder-shape, tip appears more truncate

Genus *Parathelphusa* H. Milne Edwards, 1853

Parathelphusa maculata De Man, 1879

Material examined. - 9 males (largest 50.5 by 37.7 mm), 2 females (larger 38.4 by 30.0 mm) (ZRC), river outside Sekayu Waterfalls Park, near Kuala Brang, 4°57'50.6"N, 102°57'45.5"E, Terengganu, Peninsular Malaysia, leg. P. K. L. Ng *et al.*, 19.iii.1992. — 9 males (largest 49.1 by 36.3 mm), 13 females (largest 31.4 by 25.2 mm), 4 juveniles (ZRC), forest stream after Kuala Brang, on road to Kuala Terengganu, 5°04'25.0"N, 103°03'19.8"E, Terengganu, Peninsular Malaysia, leg. P. K. L. Ng *et al.*, 19.iii.1992.. — 5 males (largest 21.6 by 17.9 mm) (ZRC), stream joining Sungei Kemia Hulu Besut, near Jerteh, Terengganu, Peninsular Malaysia, leg. P. K. L. Ng *et al.*, 20.iii.1992.

Remarks. - *Parathelphusa maculata* (and the genus *Parathelphusa*) has not been reported so far north in Southeast Asia before. Previously, specimens have been obtained from the Taiping area in northern Perak (Ng, 1990a). It is common in both forest and open country streams. (See also ecological notes under *Geithusa lentiginosa*)

Genus *Heterothelphusa* Ng & Lim, 1986

Heterothelphusa insolita Ng & Lim, 1986
(Fig. 2)

Material examined. - 3 males (largest 20.1 by 16.8 mm) (ZRC), stream joining Sungei Kemia Hulu Besut, near Jerteh, Terengganu, Peninsular Malaysia, leg. N. Sivasothi & P. K. L. Ng, 20.iii.1992.

Remarks. - The present record of *H. insolita* is the first of the genus for Terengganu. The species was first described from near Sungai Kelantan in Kelantan, which is relatively near the present locality. The present specimens were all obtained from under leaf litter in a clear water shallow stream with a gravel bottom. The water was relatively fast flowing. The margins of the carapace and epibranchial teeth bear scattered short hairs, not obvious in the type, but such differences are often associated with age and size. The G1s of the present specimens agree well with that figured by Ng & Lim (1986) for the holotype of this species which is much larger in size.

FAMILY POTAMIDAE

Genus *Johora* Bott, 1966

Johora sp.

Material examined. - 1 male (14.5 by 11.3 mm) (ZRC), stream joining Sungei Kemia Hulu Besut, near Jerteh, Terengganu, Peninsular Malaysia, leg. P. K. L. Ng et al., 20.iii.1992.

Remarks. - The identity of this species cannot be determined as the specimen is still young and its G1 not well developed. The general form of the carapace resembles that of *J. thoi* Ng,

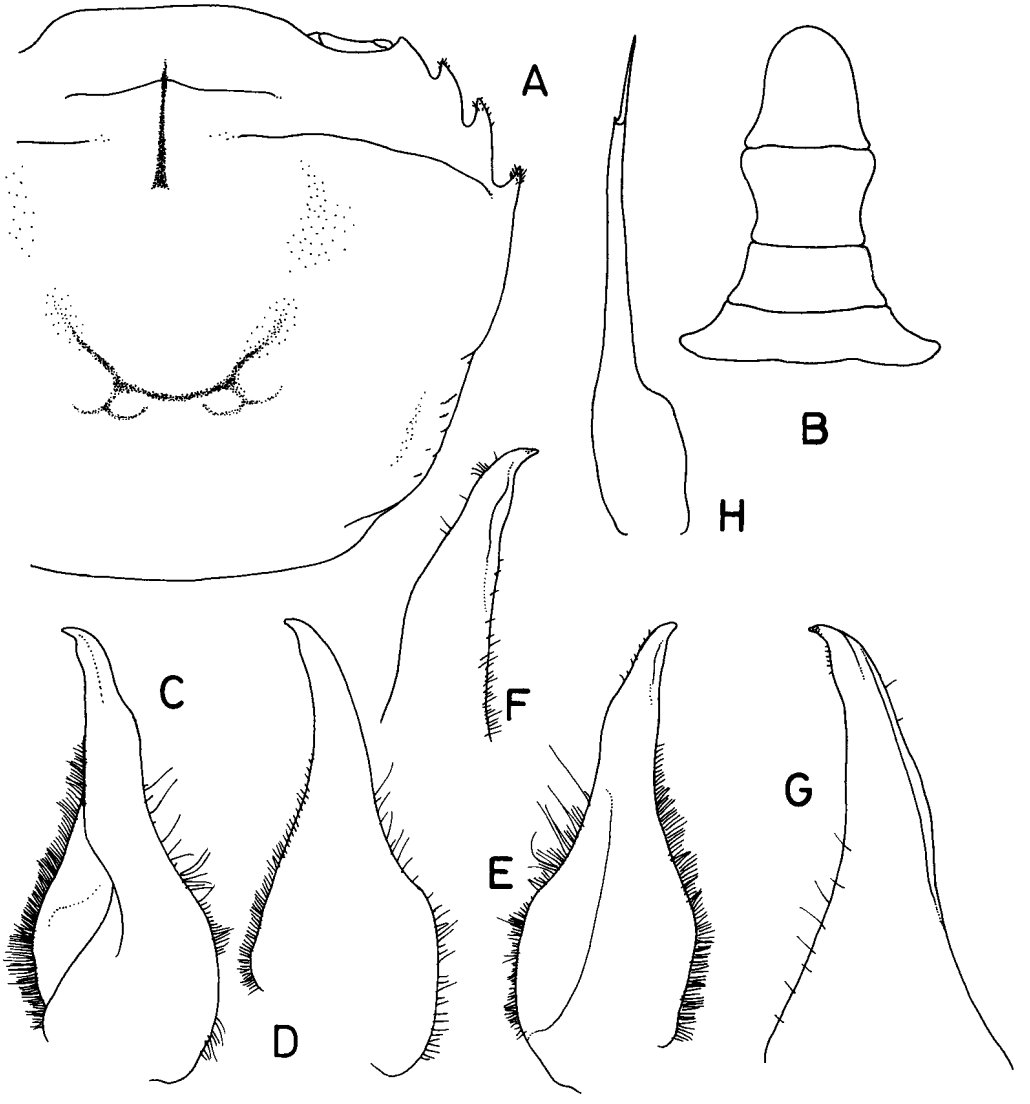

Fig. 2. *Heterothelphusa insolita*. Male, 20.1 by 16.8 mm (ZRC). A, right side of carapace; B, last four abdominal segments; C-G, left G1; H, left G2. C, D, G, ventral view; E, F, dorsal view.

1990, from Pulau Redang, but the ambulatory legs appear to be shorter. Detailed comparisons are however, not possible due to the small size of the specimen. This, together with the record of *J. thoi* from Pulau Redang (Ng, 1990b), is the most northern record known for the genus *Johora*.

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