

**REDESCRIPTION OF THE FRESHWATER CRAB
GEOTHELPHUSA NEIPU CHEN, CHENG & SHY, 1998
(CRUSTACEA: DECAPODA: BRACHYURA: POTAMIDAE)
FROM SOUTHERN TAIWAN**

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ABSTRACT. - The Taiwanese potamid freshwater crab, *Geothelphusa neipu* Chen, Cheng & Shy, 1998, is redescribed in detail. The species was originally described in a short abstract and was treated in a recent book on the Taiwanese freshwater crab fauna. Detailed comparisons with allied congeners are also provided.

KEY WORDS. - freshwater crab, Potamid, *Geothelphusa*, Taiwan.

INTRODUCTION

Three families of freshwater crabs, comprising five genera and 34 species are recorded from Taiwan at present (Minei, 1974; Hwang & Mizue, 1985; Shy et al., 1994; Tan & Liu, 1998; Chen et al., 1998; Shy & Yu, 1999). Of these, the majority of species (31) belong to *Geothelphusa*, a genus known only from Taiwan and Japan.

Chen et al. (1998) first announced the discovery of a new species from southern Taiwan (Fig. 1) in a poster at a scientific meeting in Keelung in May 1998. Unfortunately, this poster was not covered in the abstracts published for this meeting (Anonymous, 1998). In a subsequent meeting of the Taiwan Fisheries Society in November 1998, the same findings were presented and on this occasion, an abstract for the poster was published. Although the abstract was brief and only some salient colour features of the proposed new species were mentioned, it is nevertheless valid under current nomenclatural rules. The correct citation for the new species should thus be *Geothelphusa neipu* Chen, Cheng

& Shy, 1998. Ng (1999) clarified the various nomenclatural issues involved. The species was then treated in a guidebook on the Taiwanese freshwater crabs (Shy & Yu, 1999).

The present paper serves to redescribe *Geothelphusa neipu* in detail, with figures and comparisons with allied congeners. The measurements and terms used in this study essentially follow those used by Ng (1988) and Shy et al. (1994). The specimens examined are deposited in Graduate School of Fishery Sciences, National Taiwan Ocean University (NTOU), Keelung, Taiwan and Department of Biology Sciences, National University of Singapore (ZRC), Republic of Singapore.

TAXONOMIC ACCOUNT

Geothelphusa neipu Chen, Cheng & Shy, 1998
(Figs. 2, 3)

Material examined. - Holotype - 1 male, 35.5 by 28.1 mm (NTOU F10301), Pingtung county: Neipu, coll. W.-J. Chen & C.-Y. Lian, 10 Oct. 1997.

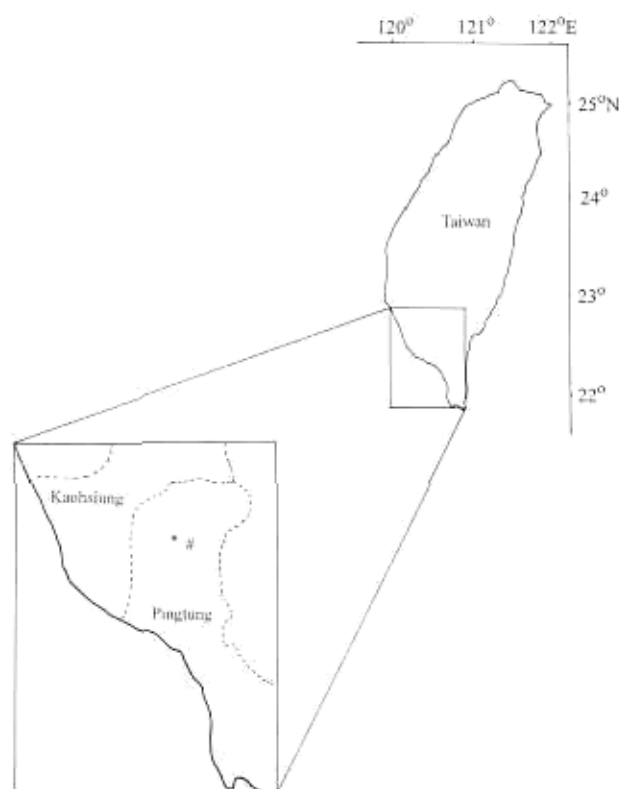


Fig. 1. The type locality of *Geothelphusa neipu* (*) and *G. pingtung* (#) in Taiwan.

Paratypes - Pingtung county: Neipu - 1 male, 1 female (ZRC), coll. W.-J. Chen & C.-Y. Lian, 10 Oct.1997. Pingtung county: Neipu - 1 male, 3 females (NTOU F10302), coll. W.-J. Chen & M.-T. Shiu, 16 Nov.1997. Others - Pingtung county: Liangshan - 3 males, 2 females (NTOU F10303), coll. J.-Y. Shy, K. Lee & W.-J. Chen, 11 Oct.1998.

Diagnosis. - Carapace swollen longitudinally and transversely, dorsal surface smooth, glabrous. Frontal region directed slightly downwards, margins elevated, smooth. Carapace depth 0.60 times length, frontal width 0.28 times carapace width (Table 1). Anterolateral margin with faint, smooth cristae, without epibranchial tooth; marginal crista ends about 2/5 of anterolateral margin, turns slightly inwards terminally. Epigastric crista indistinct, somewhat oblique, 2 halves separated by deep median groove, end of which is divided into 2 short, shallow grooves. Postorbital crista absent, surface of orbital region to progastric and branchial regions smooth. Cervical groove shallow, faint. H-shaped gastric groove indistinct, urogastric region depressed, divided into 2 small, oval-shaped regions. Posterolateral margin broadly rounded with several short, shallow transverse grooves. Suborbital, pterygostomial and subhepatic regions smooth, glabrous. Posterior epistomal margin sinuous, median lobe acutely triangular.

Abdomens of male and female with 7 distinct segments; in male, length of 7th segment 0.71 times width, longer than 6th segment, in female, 6th segment longer than 7th segment. (Table 2). Segments 1-3 almost equal in width, usually all wider than other segments.

Chelipeds unequal; in adult males right chela usually swollen, much larger than left chela. In larger chela, palm smooth, upper margin length 0.54 times length of dactylus, height 0.54 times length of chela (Table 3.). Length of dactylus 0.75 times that of chela. Fingers with a large gape when closed, without conspicuous cutting teeth. Carpus of large chela with one large spine on inner, upper surface, below which there is a much smaller tooth; outer, lower distal margin (near articulation of palm) with a very small, acute spine. Inner and outer surfaces of merus of chelipeds glabrous.

Ambulatory legs slender, glabrous, except dactylus and propodus; second pair longest. Width of second ambulatory propodus 0.34 times length, 0.29 times length of dactylus; length of second ambulatory propodus 0.85 times length of dactylus (Table 4). Dactylus with a row of 4 - 6 spines on each of four longitudinal margins; propodus with 2 ventral rows of 3 - 6 spines.

First male gonopod (G1) slender. Subterminal segment curved outwards; basal outer proximal margin with a small tooth, inner proximal margin dilated, both proximal margins with plumose setae, especially dense along inner proximal margin. Terminal segment of G1 straight, slightly curved inwards, distal part with 8 spinules. Total length of G1 7 times that of terminal segment, 3.6 times width of subterminal segment. Length of terminal segment of G1 1.88 times width, synovial membrane length 4.3 times width. Basal segment of G2 broad. Distal segment of G2 straight, slightly curved outwards, length 0.23 times total G2 length.

Coloration. - Anterior half of carapace dark purple; posterior carapace half, upper surface of ambulatory legs and subhepatic region bright purple, fingers of chelipeds and abdomen whitish, sometimes purplish; all joints of ambulatory legs and chelipeds usually yellowish-orange.

Habitat. - Lives in burrows near small streams.

Size. - Largest male 35.5 mm by 28.1 mm (NTOU F10301). Largest female 39.0 mm by 31.1 mm (NTOU F10302). Male (n=6) - CW: 31.9-35.50mm, CL: 25.6-28.1 mm, CD (or BH): 15.9-16.6 mm. Female (n=6) - CW: 35.4-39.0 mm, CL: 28.1-31.1 mm, CD (or BH): 17.2 -20.2 mm.

Distribution. - Neipu township, Pingtung county, southern Taiwan.

Etymology. - The species is named after the type locality, and the name is used as a noun in apposition.

Table 1. Measurements and proportions of carapaces of the *G. neipu* and *G. miyazakii*.

	<i>G. neipu</i>		<i>G. miyazakii</i> *	
	male	female	male	female
Carapace length (Cl)	28.1	27.9	24.7	26.6
Carapace width (Cw)	35.5	35.4	31.0	34.2
Carapace depth (Cd)	16.9	17.2	14.3	15.1
Frontal width (Fw)	10.1	9.6	10.0	10.0
Front-orbital width (Fow)	23.1	22.9	19.3	20.3
Cl/Cw	0.79	0.79	0.80	0.78
Cd/Cl	0.60	0.62	0.58	0.57
Fw/Fow	0.44	0.42	0.52	0.49
Fw/Cw	0.28	0.27	0.32	0.29

*after Miyake & Chiu (1965)

Table 2. Measurements and proportions of the last two segments of abdomens of the *G. neipu* and *G. miyazakii*.

	<i>G. neipu</i>		<i>G. miyazakii</i> *	
	male	female	male	female
Carapace width	35.5	35.4	31.0	34.2
Length of 7th segment (L7)	5.5	6.4	5.3	7.0
Width of 7th segment (W7)	7.8	14.2	6.2	12.8
Length of 6th segment (L6)	4.7	6.8	4.0	5.4
Width of 6th segment (W6)	9.2	20.0	8.0	15.7
L7/W7	0.71	0.45	0.85	0.55
L7/W6	0.60	0.32	0.50	0.34
L7/L6	1.17	0.94	1.33	1.30
L6/W6	0.51	0.34	0.50	0.34

*after Miyake & Chiu (1965)

Remarks. - With regards to the purple carapace in life, *G. neipu* is perhaps closest to *G. miyazakii* (Miyake & Chiu, 1965), and to a lesser degree, *G. pingtung* Tan & Liu, 1998 (see Shy et al., 1994; Tan & Liu, 1998; Shy & Yu, 1999). *Geothelphusa neipu*, however, can easily be distinguished from *G. miyazakii* in that it is a generally larger species, the anterolateral margin is smooth, the crista faint and the epibranchial tooth absent (against anterolateral margin granulated, crista strong and epibranchial tooth distinct); margins of the ambulatory dactylus and propodus lined only with small spines and without long setae (against margins with strong spines and long setae); G1 is relatively straighter with outer proximal margin of subterminal segment armed with small tooth (against G1 distinctly sinuous with outer proximal margin of subterminal segment without tooth); and G1 terminal segment 1.9 times width and length of the synovial membrane 4.3 times width (against terminal segment 2.2 times width and length of the synovial membrane 2.9 times width) (cf. Tables 1-4, Miyake & Chiu, 1965; Shy et al., 1994).

From *G. pingtung*, *G. neipu* can be distinguished by its evenly dark to bright purple carapace (against yellowish

white to brown and purple); a carapace length to depth ratio of 1.7 (against 1.5), the distance between the tip of the male abdomen and anterior sternite 4 is about 1.1 times the length of sternites 1-3 (against 2.0 times), the G1 terminal segment is more cylindrical in shape (against gently tapering throughout length), and the synovial membrane is about 1.5 times length of the G1 terminal segment (against 2.0 times) (cf. Tan & Liu, 1998)

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Fig. 2. a: dorsal view of *Geothelphusa neipu*; b: frontal view. of *G. neipu*; c: dorsal view of *G. miyazakii*; d: dorsal view of *G. pingtung*

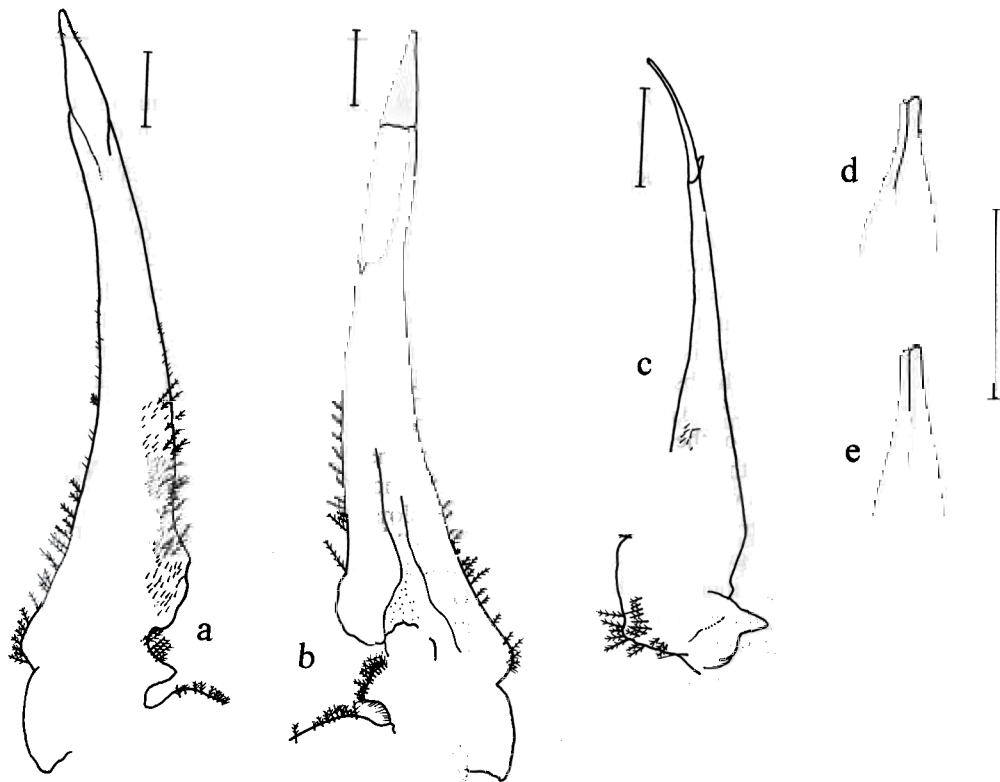


Fig. 3. *Geothelphusa neipu*. Holotype male, 35.5 by 28.1 mm . a: ventral view of right G1; b: dorsal view of right G1; c: ventral view of right G2; d: ventral view of right G1 terminal segment of *G. neipu*; e: ventral view of right G1 terminal segment of *G. pingtung*. Scale = 1.0 mm.

Table 3. Measurements and proportions of the large chelae of the *G. neipu* and *G. miyazakii*.

	<i>G. neipu</i>		<i>G. miyazakii</i> *	
	male	female	male	female
Carapace width	35.5	35.4	31.0	34.2
Length of palm (Lp)	12.8	10.4	10.0	8.5
Height of palm (Hp)	17.1	13.9	14.7	12.5
Length of dactylus (Ld)	23.5	19.7	15.6	15.0
Length of chela (Lch)	31.4	27.1	24.0	23.7
Lp/Hp	0.75	0.75	0.68	0.68
Lp/Ld	0.54	0.53	0.64	0.57
Hp/Lch	0.54	0.51	0.61	0.53
Ld/Lch	0.75	0.73	0.65	0.63

*after Miyake & Chiu (1965)

Table 4. Measurements and proportions of the last two segments of the second ambulatory legs of the *G. neipu* and *G. miyazakii*.

	<i>G. neipu</i>		<i>G. miyazakii</i> *	
	male	female	male	female
Carapace width	35.5	35.4	31.0	34.2
Length of propodus (Lp)	11.1	10.0	7.2	9.2
Width of propodus (Wp)	3.8	3.7	4.0	4.2
Length of dactylus (Ld)	13.0	13.2	8.8	11.8
Wp/Lp	0.34	0.37	0.56	0.46
Lp/Ld	0.85	0.76	0.82	0.78
Wp/Ld	0.29	0.28	0.46	0.36

*after Miyake & Chiu (1965)

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