

## Systematics of the Genus *Geothelphusa* (Crustacea, Decapoda, Brachyura, Potamidae) from Southern Taiwan: A Molecular Appraisal

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(Accepted June 27, 2004)

**Hsi-Te Shih, Peter K. L. Ng and Hsueh-Wen Chang (2004)** Systematics of the genus *Geothelphusa* (Crustacea: Decapoda, Brachyura, Potamidae) from southern Taiwan: a molecular appraisal. *Zoological Studies* 43(3) : 561-570. There are 5 freshwater crab species of the genus *Geothelphusa* Stimpson, 1858 in southernmost Taiwan, *G. albogilva* Shy, Ng and Yu, 1994; *G. ferruginea* Shy, Ng and Yu, 1994; *G. tawu* Shy, Ng and Yu, 1994; *G. lanyu* Shy, Ng and Yu, 1994; and *G. lutao* Shy, Ng and Yu, 1994. Among these, *G. lanyu* and *G. lutao*, are only known from 2 offshore islands, Lanyu (Orchid I.) and Lyudao (Green I.), respectively. Comparisons of the DNA sequences encoding part of the mitochondrial large subunit 16S rRNA gene showed that all 5 species constitute a single monophyletic clade distinct from species in nearby areas. The genetic and morphological differences among *G. tawu*, *G. lanyu*, and *G. lutao* are very small, and further studies may show that all 3 are conspecific. This is supported by the geological history of the area, with both islands having a violent volcanic history, and the presence of freshwater crabs on the island must have been a relatively recent event (~500 000 years), and may even have been the result of human introduction. The phylogeographical patterns of the genus in southernmost Taiwan and adjacent areas were examined at the molecular level, and the isolating effects of mountains on freshwater crab dispersal are discussed. The genetic data also suggest that the 2 species from southwestern Taiwan, *G. pingtung* Tan and Liu, 1998 and *G. neipu* Chen, Jeng and Shy, 1998, are synonymous, with the former name having priority. <http://www.sinica.edu.tw/zool/zoolstud/43.3/561.pdf>

**Key words:** Phylogeography, mtDNA sequence, 16S rRNA.

The East Asian freshwater crabs of the genus *Geothelphusa* Stimpson, 1858, are distributed from Taiwan to Japan (Shy and Yu 1999, Yoshigou 1999) but are absent from continental Asia. Currently, 31 species are known from Taiwan (Shy et al. 1994, Chen et al. 1998, Tan and Liu 1998). In the southern part of Taiwan, 9 species are present: *G. albogilva* Shy, Ng and Yu, 1994; *G. ferruginea* Shy, Ng and Yu, 1994; *G. tawu* Shy, Ng and Yu, 1994; *G. lanyu* Shy, Ng and Yu, 1994; *G. lutao* Shy, Ng and Yu, 1994; *G. cinerea* Shy, Ng and Yu, 1994; *G. bicolor* Shy, Ng and Yu, 1994; *G. pingtung* Tan and Liu, 1998; and *G. neipu* Chen, Jeng and Shy, 1998. Of these, *G. albogilva*, *G. ferruginea*, and *G. tawu* occur on the

Hengchun Peninsula (south of the Fenggang River). *Geothelphusa cinerea* and *G. bicolor* are present on the northeastern portion of the Hengchun Peninsula but are also distributed along much of the east coast of Taiwan (Shy et al. 1994). On the northern Hengchun Peninsula to central Pingtung County, 2 other species, *G. pingtung* and *G. neipu*, have been reported. Two species, *G. lanyu* and *G. lutao*, are known only from the offshore islands of Lanyu (Orchid I.) and Lyudao (Lutao or Green I.), respectively.

*Geothelphusa albogilva* is a large species (adult carapace width ~35 mm) and can be separated from sympatric species in southernmost Taiwan by morphology and coloration. However,

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