A FIRST FOSSIL RECORD OF THE TERRESTRIAL CRAB, 
*GEOTHELPHUSA TENUIMANUS* (MIYAKE & MINEI, 1965) 
(DECAPODA, BRACHYURA, POTAMIDAE) FROM OKINAWA ISLAND, 
CENTRAL RYUKYUS, JAPAN 

BY 

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ABSTRACT 

Fossils of the terrestrial crab, *Geothelphusa tenuimanus*, are described. These fossils were 
collected from clay within the fissures that rift the limestone of the Middle Pleistocene Ryukyu 
Formation on Okinawa Island, Ryukyu Islands. The geological age of the fossil *G. tenuimanus* was 
estimated as Late Pleistocene, because they occurred in association with a fossil deer (*Cervus* sp.), 
which is already extinct on Okinawa Island. This is the first fossil record of a true freshwater crab 
from the Ryukyu Islands. In both fossil and extant specimens of *G. tenuimanus*, the longer movable 
fingers of the chelipeds usually have a stronger curvature, but the present fossil specimens contain 
higher numbers of strongly curved movable fingers than found in extant specimens. This difference 
may be caused by the fact that no sufficiently large extant specimens have been examined. 

RÉSUMÉ 

Des fossiles du crabe terrestre *Geothelphusa tenuimanus*, sont décrits. Ces fossiles ont été récoltés 
dans l’argile, à l’intérieur de fissures qui traversent le calcaire de la formation de Ryukyu du 
Pléistocène moyen dans l’île d’Okinawa (îles Ryukyu). L’âge géologique du fossile *G. tenuimanus* a 
été estimé au Pléistocène supérieur, car ils ont été trouvés en association avec un cerf fossile (*Cervus* 
sp.) qui est déjà éteint sur l’île d’Okinawa. C’est la première mention de la présence d’un vrai crabe 
d’eau douce fossile aux îles Ryukyu. Chez les spécimens fossiles comme chez les spécimens actuels de 
*G. tenuimanus*, les doigts mobiles des chélicèdes, quand ils sont plus longs, ont habituellement 
une plus forte courbure, mais les spécimens fossiles ont, en plus grand nombre, des doigts mobiles 
plus fortement recourbés que les spécimens actuels. Cette différence peut être dûe au fait que des 
spéimens actuels d’une taille suffisamment grande n’ont pu être examinés. 

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INTRODUCTION

True freshwater crabs are considered by some authors to be good indicators of biogeography, because of their life history and habitat (see Ng, 1988; Ng & Rodriguez, 1995). However, true freshwater crabs are poorly known as fossils (see Karasawa, 1997), and this makes any study of their biogeography difficult. Recently, one of us (MM) found a large number of fossils of *Geothelphusa tenuimanus* (Miyake & Minei, 1965) (Potamidae) in the limestone fissure sediments of the southern part of Okinawa Island, Central Ryukyus, Japan (fig. 1). In this report, we describe the fossils of *G. tenuimanus* and compare a few characters between fossil and extant forms.

MATERIALS AND METHODS

The fossil specimens of *Geothelphusa tenuimanus* were collected from clay deposited in the fissures that rift the limestone of the Middle Pleistocene Ryukyu Group, and which are exposed at Chinen Village (26°09.824′N 127°48.315′E) and Itoman City (26°07.444′N 127°41.597′E) on Okinawa Island (fig. 1). These fissures were recently discovered, because the Ryukyu Limestone has been dug and exploited to be used as a building material. Fossil crabs appeared to occur in the fissure deposits, in association with land snails [*Satsuma cf. mercatoria* (Pfeiffer, 1845), *Aegista cf. scepsasma* (Reeve, 1854), *Zaptyx* sp., and Cyclophoridae gen. et sp. indet.] and a deer (*Cervus* sp.). Fossil crabs are patchily distributed in the fissures, and each patch was found to be densely packed with fossils. Palaeontological and geological studies have yet to be done on the present deposits. However, the occurrence of *Cervus* sp. suggests that the geological age of the deposits was the Late Pleistocene (Hasegawa, 1980; Kamei et al., 1988).

Eventually, a total of 102 specimens (91 fossil and 11 extant specimens) of *G. tenuimanus* was examined for this study. Movable fingers and chelae of both fossil and extant specimens were measured to the nearest 0.1 mm using a digital slide calliper (Mitsutoyo CD-20C).

Abbreviations are as follows: CL, carapace length; MFM, Mizunami Fossil Museum, Gifu, Japan; NSMT, National Science Museum, Tokyo, Japan; *p*, probability for the significance of *r*; *r*, correlation coefficient; RUMF, the Ryukyu University Museum, Fujukan, Okinawa, Japan; ZLKU, Zoological Laboratory, Kyushu University, Fukuoka, Japan (specimens examined have been transferred to the Kitakyushu Museum of Natural History and Human History, Fukuoka, Japan).