

# Intraspecific Molecular Phylogeny of a Putative Parthenogenetic Pseudoscorpion, *Microbisium pygmaeum* (Iocheirata, Neobisiidae)\*

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*Microbisium pygmaeum* Ellingsen, 1907 is the only member of the pseudoscorpion genus *Microbisium* in Japan, and is distributed over a large area between Hokkaido Island and Kyushu Island. *Microbisium pygmaeum* is generally found in disturbed habitats such as artificial shrubberies. This species is also found in forest habitats in the Urabandai area, which was affected by the hydrovolcanic explosion of Mt Bandai in 1888. *Microbisium pygmaeum* is considered to be a neotenic species (Weygolt, 1969; Sakayori, 1989), and reproduces parthenogenetically due to the rarity of males (Chamberlin, 1930; Lawson, 1969; Kobari, 1984). The reproductive characters of this species may function effectively to rapidly increase the number of individuals in the frequently disturbed habitats in which it occurs. However, although artificial shrubberies and forest in the Urabandai area are both disturbed, the environment of each habitat is clearly different. Generally, it is known that pseudoscorpions can adapt to only narrow ranges of environments and that speciation can occur corresponding to minor environmental variation. Therefore, considering the general characteristics of pseudoscorpions and the specific characteristics of *M.*

*pygmaeum*, it is presumed that the genetically similar individuals of parthenogenetically reproduced *M. pygmaeum* are unlikely to inhabit two types of habitat with dissimilar environments. In this study, we conducted a molecular phylogenetic analysis based on the mitochondrial cytochrome *c* oxidase subunit 1 (COI) sequence to reveal genetic variation in *M. pygmaeum*, and then compared the morphological characteristics of the genetic groups identified by the phylogenetic analysis.

Phylogenetic analysis using 32 individuals collected from eight localities revealed two clades within *M. pygmaeum*. Clade A mainly consisted of the samples collected from artificial shrubberies, and a relatively large number of the samples showed identical haplotypes. The samples collected from forest in the Urabandai area clustered in clade B, and the diversity of haplotypes in this clade was higher than that in clade A. Morphological differences, such as in femur length and width, were observed between the individuals of clade A and clade B. These results suggest that the species *M. pygmaeum* comprises two types of genetically and morphologically distinct individuals.

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