Vol. 44, Pars 13 **MUSHI** 5. V. 1971

Published by the Fukuoka Entomological Society, c/o Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka

KARYOLOGICAL STUDIES OF JAPANESE ANTS II. SPECIES DIFFERENTIATION IN *APHAENOGASTER*; WITH SPECIAL REGARD TO THEIR MORPHOLOGY, DISTRIBUTION AND CHROMOSOMES[1]

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The species of *Aphaenogaster* are among the most familiar ants in Japan, and three species, *A. osimensis*, *A. famelica*, and *A. smythiesi* have been recognized (Yano, 1910; Teranishi, 1915, 1940; Wheeler, 1928; Morishita, 1945; Okamoto, 1954).

Species-level studies, however, have seldom been made on the *Aphaenogaster* group, except some identification of species on the basis of the external morphology of the worker caste (Emery, 1908; Smith, 1961). As already discussed in part I of this series (Imai, 1969), the combination of geographical distribution and karyotype analysis gives us excellent information contributing to the analysis of species differentiation in ants. In this connection, the three Japanese species of *Aphaenogaster* are especially suitable materials, because they have distinct but interrelated distribution patterns and karyotypes.

In this paper, the detailed species differentiation of *Aphaenogaster* will be analysed by distribution and karyotype studies, and after due consideration, the phylogenetic usefulness of the orthodox external morphology will be examined.

Materials and Methods

The three species used for morphological comparison were collected during July to August in 1966; *A. osimensis* from Manazuru peninsular in Kanagawa Prefecture, *A. famelica* from Mt. Ohoyama in Kanagawa Pref., *A. smythiesi* from Asamushi in Aomori Pref. and Mt. Takao near Tokyo.

Maturated winged males and queens, and workers were fixed with modified

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