gruence in the three forms of evidence (morphology, distribution, and karyotype), but the phylogenetic position of *smythiesi* based on morphology alone differed from that based on distribution and karyotype.

The trend in rugosity suggested that *smythiesi* had differentiated from *famelica*. However, the information based on vertical distribution indicates that *smythiesi* is a "Relict" species, that is, an old northern element of the Japanese fauna, while *famelica* was differentiated from *osimensis*, a tropical species that migrated to Japan after the glacial age.

This last conclusion is strongly supported by the karyotype analysis. The karyotype of *famelica* (n=17) could be induced from that of *osimensis* (n=16) by centric dissociation of the largest submetacentric chromosome. On the other hand, *smythiesi* has a primitive karyotype characterized by a low chromosome number (n=11) and many meta- and submetacentric chromosomes. Thus, distributional and karyological considerations suggest a weak phylogenetic discontinuity between *smythiesi* and the *osimensis-famelica* group.

The possible chromosome evolution of these species was discussed, and it was suggested that the karyotype of *smythiesi* has been induced from a common basic number (n=8) by partial polyploidy, while the karyotypes of the other two species were derived by the duplication of chromosome set, pericentric inversion, and centric dissociation, phenomena frequently encountered in the chromosome evolution of ants (Imai, 1969). The limitations of purely morphological evidence in the analysis of phylogeny is demonstrated in this study. It is suggested that the combination of evidence from external morphology, distribution, and karyotype analysis should be used whenever possible in phylogenetic studies of ants.

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