

Comparative Morphological Studies of the Ants, with Particular Reference to the Mouthparts (Hymenoptera: Formicidae)¹

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The ants are social insects that occupy a diverse range of habitats and yet maintain a relatively uniform habitus. Taxonomists generally consider them as a single family, Formicidae, in the unifamilial aculeate hymenopteran superfamily Formicoidea. Wheeler recognized 7 formicid subfamilies and later suggested an eighth, the Leptanillinae (1923), but as many as 15 have been proposed by Clark (1951). Brown (1954) reviewed the phylogeny of the ants and recognized 9 subfamilies. However, the phylogeny and subfamilial classification of the ants are, in the opinion of myrmecologists, highly speculative, and require the study of many neglected lines of evidence. The present investigation attempts to add significantly to 2 of these lines, and to apply the new facts to the theory of formicid phylogeny.

The mouthparts and the sclerites of gastral segments 1 and 2 are here analyzed morphologically in representatives of major ant groups with the purpose of determining how the nature of these structures reflects on past and recent interpretations of ant phylogeny and classification. Particular emphasis has been placed on the subfamily Dorylinae, because its own phylogeny presents many intriguing questions regarding the possible role of convergence, particularly in foraging behavior, in ant evolution.

In the study of the mouthparts, 104 species of ants were examined, and in the study of the gaster, 80 species were examined. For several species of the subfamily Dorylinae, the mouthparts of workers, both soldiers and medias, and of males and queens were studied. The mouthparts of females of 3 species of Tiphidae were also examined. A tiphoid ancestor has consistently

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