

shape has not been studied in detail for any one species. In fact, the shape of the hemocoel and the distribution of the setae are strongly related in that each seta is narrowly connected with the hemocoel.

Of the mouthparts, the mandibles have been most commonly used by taxonomists in the classification of ants. Although mandibular shape and dentition can be indicators of phylogenetic trends within species groups (Brown and Wilson, 1959; Ettershank, 1966; and Wilson, 1955), it is difficult to see such trends in the family Formicidae as a whole. The ant mandible is commonly broad and triangular with a distinct masticatory and basal margin. In the males and females of the dorylines, the mandibles always depart from this pattern, and modifications occur also among some soldiers (e.g. *Eciton*, *Dorylus*). While the mandibles of such soldiers are superficially quite distinct from those of other workers, they may, in fact, be part of a continuous series with respect to shape. Hollingsworth (1960), in refuting Cohic's (1948) contention that the workers of *Dorylus* (*Anomma*) *nigricans* exist in 4 distinct morphological types, was able to arrange the worker mandibles of this species in a completely continuous series. It appears that in *Cheliomyrmex morosus* such a continuous series could also be arranged, but this is less probable for *Eciton*. While the morphological condition of the mandible of workers is probably an adaptation to foraging behavior and perhaps brood care, that of the males may be an adaptation to copulatory behavior. Schneirla (1949) and Rettenmeyer (1963) have both reported matings of *Eciton* species (*hamatum* and *burchelli* respectively), in which the male uses its mandibles to grasp the queen's petiole. Rettenmeyer (1963) suggested that the male's behavior may indicate that contact between the male mandibles and the queen petiole is an important stimulus in mating and perhaps that such contact is even important in preventing interspecies mating. The mandalus is common to all species and castes, although it is sometimes difficult to detect in darkly pigmented mandibles. Ettershank (1966) suggested that the mandalus may contain the orifice of the duct from the mandibular gland, but this was neither confirmed nor disproved in this investigation. The trulleum, a groove or depression that sometimes accommodates a portion of the distal margin of the head, is usually present, but may be absent in falcate mandibles of males and queens. While Ettershank (1966) found the condition of the trulleum quite useful taxonomically among certain myrmicines, it apparently does not vary greatly among the ants as a family. The abundance and pattern of distribution of mandibular setae varies widely, but in general the dorsal surface of the mandible has fewer setae than the ventral surface. On the ventral surface, these setae may form combs.

The number of segments in the maxillary palpus, as pointed out by Kusnezov (1954a, 1954b), is least modified in ants that he believed to be "socially advanced" (Dolichoderinae and Formicinae). But palpal reduction is apparently not affected by level of social development (if this can be satisfactorily defined). Instead, reduction seems to be correlated with