

5036
Temp.

12-2-50

Reprinted from PSYCHE, Vol. 59, No. 2, June 1952

THE MORPHOLOGY OF THE PROVENTRICULUS OF A FORMICINE ANT

BY T. EISNER and E. O. WILSON
Biological Laboratories, Harvard University

The ant proventriculus is a structure of considerable entomological interest. It is most elaborately developed in those groups of ants which have the highest form of social behavior and has been generally thought to be associated in some way with food storage and trophallaxis. It has been used extensively as a taxonomic character in the classification of higher categories in the Dolichoderinae and Formicinae and in phylogenetic speculation concerning these groups. Yet, despite several involved descriptions of the anatomy of this organ that have appeared in the past, its function and activity have never been properly understood. The following paper contains the results of a concentrated study of the morphology of the proventriculus of one typical species of formicine. An emphasis has been laid on those details that appear to be relevant to its function, and there is offered a new explanation of its mechanics.

The first accurate anatomical study of the dolichoderine-formicine proventriculus was that of Forel (1879). Emery (1888) followed up Forel's work in a classic comparative monograph which is still the basic reference on this organ. He reviewed most of the dolichoderine and formicine tribes, as well as the aberrant myrmicine tribe Cephalotini. Additional brief descriptions of the proventriculus of the Dolichoderinae and Formicinae were given in 1912 and 1925, respectively, in the fascicles of Wytsman's *Genera Insectorum* dealing with those groups. The most recent research on the formicine proventriculus is that of Forbes (1938), whose account is mostly a review of earlier work and adds little information of significance.

The ant chosen for the present study was *Camponotus americanus* Mayr. This species proved especially amenable to this type of anatomical work, since it is large and