

AIR SACS IN ANTS (HYMENOPTERA: FORMICIDAE)¹

George C. Wheeler, Jeanette Wheeler²

ABSTRACT: The air sacs in the gaster of *Veromessor lariversi* are described and illustrated. They appear as white spots in the living ant.

During our recent study of the ants of Nevada we brought some living workers of *Veromessor lariversi* M.R. Smith into the laboratory for observation. There we were greatly surprised to see 2 large white spots on the gaster. See Figure 1. We had not noticed spots on workers of this species in the field and there were no spots on any of our preserved workers. The mystery was not solved until we preserved some of the spotted workers in a vial of alcohol. When the stopper was inserted the spots shrank. When the stopper was removed, i.e., pressure released, the spots returned to their original diameter. A trachea could be seen attached to the

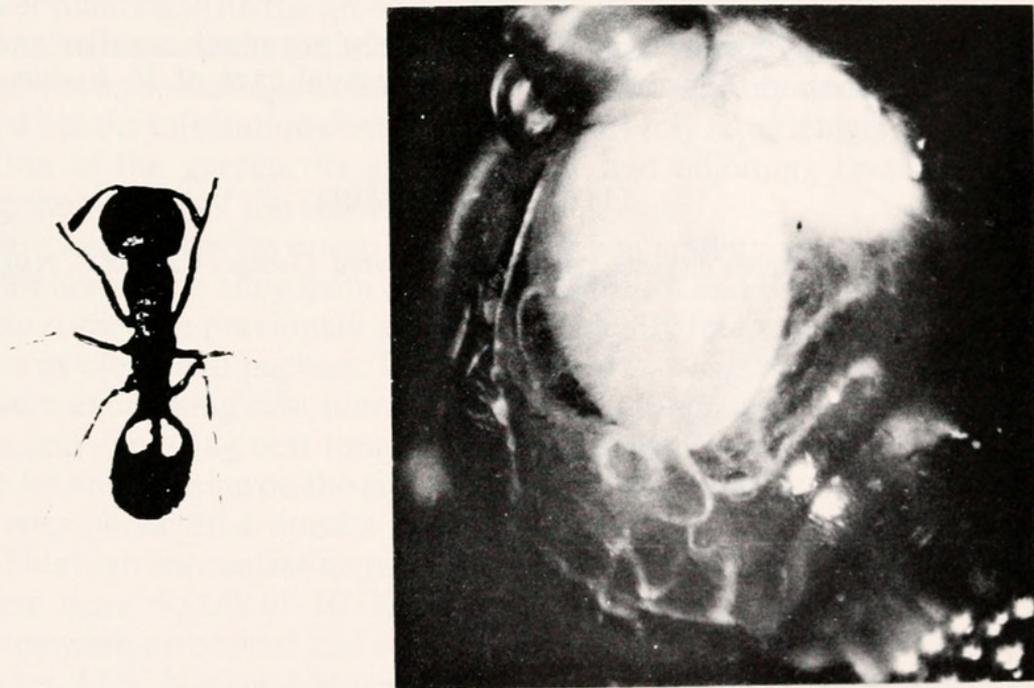


Figure 1. Left: dorsal view of a living worker showing the two air-sacs through the transparent gastric integument, X10; spots retouched slightly to show true color. Right: Anterodorsolateral view of air-sacs in place, X100.

¹Received July 13, 1981.

²Adjunct Research Associates, Desert Research Institute, Reno, Nevada. Present address: 326 Laurel Ridge Road, San Antonio, Texas 78253.

posterodorsal surface of each sac. So we concluded that they must be air sacs.

Having spent most of our academic lives studying the *outsides* of ants, we had almost forgotten that ants also have *insides*. So we began checking the literature for clues to possible tracheal sacs. In books on myrmecology, air sacs are not mentioned. Textbooks on entomology describe and figure air sacs of flying insects. Finally we consulted the publications of that old master of ant anatomy, Charles Janet. It did not take long to find a reference on the gaster of *Myrmica rubra*.

“Just as the esophagus, which, upon reaching the gaster, swells into a spacious crop, so do the two tracheal trunks, at the same level, swell into two spacious respiratory sacs, with very flexible walls, plainly visible because of the transparency in those ants which have a light-colored integument. Under the influence of dilatation and constriction of the chitinous integument of the gaster . . . these sacs swell and then empty, just as our lungs fill under the influence of the movement of our thoracic cage.” (Janet 1902: 30, translated from the French.)

Janet shows these sacs in Pl. II, but they are much smaller and more irregularly shaped than the huge smoothly oval sacs of *V. lariversi*. See Figure 1 (right).

LITERATURE CITED

- Janet, C. 1902. Anatomie du gaster de la *Myrmica rubra*. Georges Carré et C. Naud, Paris. 68 p., 8 pl.



Wheeler, George C. and Wheeler, Jeanette. 1982. "Air Sacs In Ants (Hymenoptera, Formicidae)." *Entomological news* 93, 25-26.

View This Item Online: <https://www.biodiversitylibrary.org/item/20655>

Permalink: <https://www.biodiversitylibrary.org/partpdf/26593>

Holding Institution

Smithsonian Libraries and Archives

Sponsored by

Smithsonian

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: American Entomological Society

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.