

An Association between Jehovah's ant, *Crematogaster jehovae* For.  
(Hym.: Myrmicidae), and the Fig wax-scale, *Ceroplastes rusci* L.  
(Rhynchota: Coccidae), on grapevines in Israel

by

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"But they shall sit every man under his vine and under his fig tree; and none shall make them afraid: for the mouth of the Lord of hosts hath spoken it."

Micah IV : 4

The habit of many arboreal ants of the genus *Crematogaster* Lund. to build earthen or carton sheds over Coccids has already been reviewed by WHEELER (7) and later by NIXON (5). In Palestine, KLEIN (3) described the construction of "tents" by *Crematogaster jehovae* For. over entire colonies of the citrus mealybug, *Planococcus* (= *Pseudococcus*) *citri* (Risso), on grapefruits. These were "tents" of irregular shape made of wax threads intermingled with green bark chips of the citrus fruit stalk and dead insect bodies.

During late July 1959 the present writer observed at Kabri (northern coastal plain, near the Lebanon Border) worker ants of the above-mentioned species building shelters over individual immature females of the fig wax-scale, sitting on the midribs on the upper surface of leaves of a wild grapevine (*Vitis vinifera* L.). These shelters (see Figure) were of a regular dome shape with a diameter of about 20 mm and a height of some 5 mm. They were made of uniform material, namely fine flakes of the thick tomentum that covers the lower surface of the vine leaf blades. It should be mentioned here that the native grape varieties of Israel are rather characterized by their conspicuous layer of felt-like tomentum on the underside of their leaves. Flakes of this material were carefully scraped off by the worker ants and then deposited around and above each tended Coccid. A narrow entrance-hole was left loosely closed on top of this igloo-shaped shelter, through which a single ant could go in at a time and collect the honey dew which this Coccid excretes profusely.

Besides protection against natural enemies, these shelters also provide the Coccids with an effective shading against direct sun rays. Such shade is of particular advantage to this Coccid, as it normally inhabits the upper surface of leaves of recumbent grapevines. Although the fig wax-scale is thought to be a native of the eastern Mediterranean basin (1), it can hardly survive an exposure to direct radiation of the intensely hot sun and dry air of the Middle Eastern summer. According to BODKIN (2), who studied the life history of this species in Palestine, both these environmental factors, namely natural enemies and extreme climate, are responsible for the fact that no more than 3% of the hatching larvae in each brood succeed to attain maturity, all others perish in the course of their develop-



Cottony igloo-shaped shelter built by *Crematogaster jehovae* For. over an immature female of *Ceroplastes rusci* L. on the upper surface of a grapevine leaf. The shelter on the left has been opened up to show the wax scale. Photographed by D. SCHLEISSNER.

ment. Hence the great ecological significance of the association with these attendant ants towards a better survival of this Coccid species.

Jehovah's ant, like the fig wax-scale and the variety of grapevine concerned, has its origin in the Near East (4). It is therefore not very surprising that an association like this has evolved between a host-plant, a scale insect that feeds on it and an ant attending the latter, all three of which originate in the same geographical zone.

Incidentally, despite its polyphagy (1), the fig wax-scale has hitherto not been recorded on grapevines in Israel, though it is known to occur on this host-plant in other countries (6).

#### References

- (1) BODENHEIMER, F. S., 1951, *Citrus Entomology in the Middle East*. W. Junk, The Hague, 663 pp.
- (2) BODKIN, G. E., 1927, The fig wax-scale in Palestine. *Bull. ent. Res.* 17 : 259—261.
- (3) KLEIN, H. Z., 1936, Citrus mealybugs and ants on grapefruits. *Hadar* 9 : 42—43.
- (4) MENOZZI, C., 1933, Le Formiche della Palestina. *Mem. Soc. ent. Ital.* 12 : 49—113.
- (5) NIXON, G. E. J., 1951, The association of ants with Aphids and Coccids. Commonwealth Institute of Entomology, London, 36 pp.
- (6) SILVESTRI, F., & G. MARTELLI, 1908, La Cocciniglia del Fico (*Ceroplastes rusci* L.). *Boll. Lab. zool. Portici* 2 : 297—358.
- (7) WHEELER, W. M., 1926, *Ants, their structure, development and behavior*. Columbia University Press, New York, p. 223.