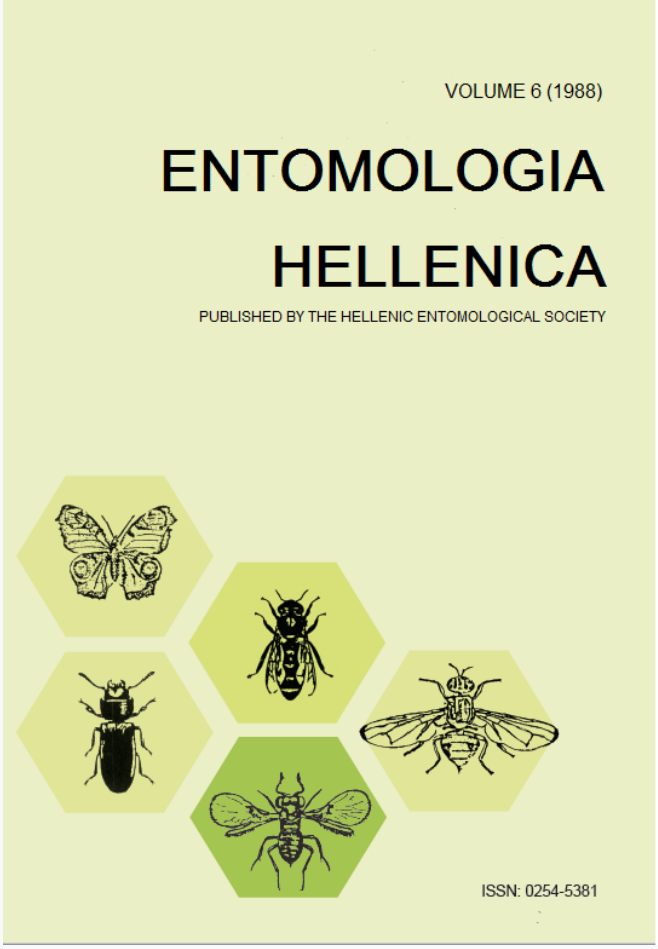
ePublishing

EKT ΕΘΝΙΚΟ ΚΕΝΤΡΟ ΤΕΚΜΗΡΙΩΣΗΣ NATIONAL DOCUMENTATION CENTRE

ENTOMOLOGIA HELLENICA

Vol 6 (1988)



Crumbling of the masonry of ancient settlements on Santorini caused by the Hymenoptera Anthophora crinipes and Osmia latreillei

P.A. Mourikis, L. C. Argyriou, Argyro Tsourgianni

doi: 10.12681/eh.13960

Copyright © 2017, P.A. Mourikis, L. C. Argyriou, Argyro Tsourgianni

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0.

To cite this article:

Mourikis P., Argyriou, L. C., & Tsourgianni, A. (1988). Crumbling of the masonry of ancient settlements on Santorini caused by the Hymenoptera Anthophora crinipes and Osmia latreillei. *ENTOMOLOGIA HELLENICA*, *6*, 59–61. https://doi.org/10.12681/eh.13960

https://epublishing.ekt.gr | **e-Publisher:** EKT | **Downloaded at:** 20/04/2024 13:05:04

ENTOMOLOGIA HELLENICA 6 (1988): 59-61

Crumbling of the Masonry of Ancient Settlements on Santorini Caused by the Hymenoptera *Anthophora crinipes* and *Osmia latreillei*[1]

P. A. MOURIKIS[2], L. C. ARGYRIOU[2] and ARGYRO TSOURGIANNI

Department of Entomology, Benaki Phytopathological Institute, Kiphissia, Greece

One of the most important archaeological findings of recent years has been the discovery of complete buildings of a Bronze Age settlement at Akrotiri on the island of Santorini (Thera). The settlement covers an area of over 200,000 square metres (Doumas 1983). The excavations conducted by Spyros Marinatos brought to light a large number of buildings constructed of stones, mud and straw, with earth roofs. The walls were faced with clay (Doumas 1987).

Almost every exposed mass of masonry in the settlement has been invaded by colonies of Hymenopterous insects consisting nests which are wreaking havoc on the walls, because they bore through the masonry to build their nests and then every time they go in and out of the tunnels, they wear away the dust of the walls which they have build for their own nests.

Observations were carried out at Akrotiri in the spring and summer of 1985, 1986 and 1988. Glass collecting-tubes were placed at entry and exit points and at various places in the tunnels, to sellect the insects when the adults emerged in the spring, and insects also were collected with sweeping nets from the surrounding area and from light traps. Plants which were visited by adults of these species for pollen and nectar were also collected from round about.

The insect species collected by these various methods were the following:
Osmia (Chalcosmia) latreillei Spinola, 1806 (Hymenoptera : Megachilidae), *Anthophora crinipes* Smith, 1884 (Hymenoptera: Apidae), and *Melecta albifrons albovaria* Erichson 1840 (Hymenoptera : Megachilidae).

These three species were collected in all observation years in glass collectintubes. Of these *A. crinipes* and *O. latreillei,* which are solitary species, both build colonies with tunnels a short distance appart but not actually touching each other. The number of such colonies in the walls of the Akrotiri settlement is fairly large, and conspicuous through the holes of entrance and exit of the insects (Fig. 1). *M. albifrons albovaria* is a predator on *A. crinipes* (Tkalcu personal communication). It is known from the literature that all species of the genus *Melecta* prey on *Anthophora* species (Imms 1947, Hobbs et al. 1961).

FIG. 1. Holes of nests of *A. crinipes* and *O. latreillei* in the walls of the archaeological buildings at Akrotiri, Santorini.

The tunnels of both species are made by the females. At the end of each tunnel the female hollows out a number of cells and lays in sup-

[1] Received for publication February 8, 1989.

[2] Present address: 73 Riancour str. 115 23 Athens, Greece.

plies of pollen and nectar on which she deposits her eggs after mating. She then seals off each cell with a mixture of earth and saliva. Finally, when eggs have been deposited in all the cells, she closes the outer entrance of the tunnel. The larvae start developing once the tunnel has been sealed off. Thus after the hatching of the eggs, the insects spend more than thirty days as larvae, later on as prepupae. In this stage they overwinter and early in the spring enter the pupal stage. The first adults appeared from the last days of March. The females mate with the males and then start making tunnels and cells for their eggs. Adults of both sexes visit flowers to feed and also, in the case of the females, to collect pollen and nectar for the cells in which the larvae will develop.

In the neighbourhood of Akrotiri we have observed adults of both species in question visiting flowers of the following species: *Reichardia picroide*(L.) Roth (Compositae), *Echium angustifolium* Miller (Boraginaceae), *Vicia vilosa* Roth (Leguminosae), *Euphorbia* spp. (Euphorbiaceae), *Salvia verticillata* L. (Labiatae), *Rosmarinum officinalis L.* (Labiatae), *Morina persica* L. (Dipsacaceae).

Fahringer (1922) reported only *Anthophora crinipes* in Asia Minor and observed that adults visited the flowers of *Salvia verticillata* and *Morina persica*, but it is not clear if the insects collect pollen or nectar or both of these plants. The adults usually choose sunny days to fly out to the flowers, and during their flight a caracteristic buzzing is heard. The flying season begins in late March and goes on until the end of June, or some time later.

The damage done by these insects to the fabric of the ancient settlement at Akrotiri is posing a serious problem for the preservation of the ruins in their present form. If it continues there is danger that parts of the masonry will be permanently deformed. Little heaps of fine pozzolana dust made by the insects going in and out of the tunnels are found on the ground below the entrance holes. In the last two years the team of archeaeologists (under Professor C. Doumas) has used light traps in and around the ruins, thereby apparently reducing the populations of these insects and limiting the damage done by them. On the basis of the insects collected in May 1988, the population of *A. crinipes* outnumber that of *O. latreillei* (ratio 79:21).

Acknowledgment

We are indebted to Dr B. Tkalcu, of Prague, Czechoslovakia for his help with the identification of *Anthophora crinipes, Osmia latreillei* and *Melecta albifrons albovaria*.

References

Doumas, C. 1983. The excavations at Thera and the Aegean Late Bronze Age. Endeavour 7:144-149.

Doumas, C. 1987. Santorini, a guide to the island and its archaeological treasures. Ekdotike Athens S.A. 128 pp.

Fahringer, J. 1922. Hymenopterologische Ergebnisse einer wissenschaflichen Studienreise nach der Turkei und Kleinasien (mit Ausschluss des Amanusgebges). Archiv für Naturgeschichte 88:149-222.

Imms, A.D. 1947. Insect Natural History. Collins, St. James' Place, London, 317 pp.

Hobbs, G.A., W.O. Nummi and J.F. Virostek. 1961. *Anthophora occidentalis* Cress. (Hymenoptera: Apidae) and its associates at a nesting site in Southern Alberta. Canadian Ent. 93:142-148.

KEY WORDS: *Osmia (Chalcosmia) latreillei, Anthophora crinipes,* Solitary bees, Crumbling of walls, Santorini Greece archaeological settlements

Αποσάθρωση της Τοιχοποιίας των Αρχαίων Οικισμών της Σαντορίνης από τα Υμενόπτερα *Anthophora crinipes* και *Osmia latreillei*

Π.Α. ΜΟΥΡΙΚΗΣ, Λ.Χ. ΑΡΓΥΡΙΟΥ και ΑΡΓΥΡΩ ΤΣΟΥΡΓΙΑΝΝΗ

Τμήμα Εντομολογίας και Γεωργικής Ζωολογίας, Μπενάκειο Φυτοπαθολογικό Ινστιτούτο, Κηφισιά

ΠΕΡΙΛΗΨΗ

Ένα από τα σπουδαιότερα αρχαιολογικά ευρήματα της εποχής του Χαλκού στο Ακρωτήρι της Σαντορίνης έχει υποστεί ζημιές από δύο Hymenoptera, τα *Anthophora crinipes* και *Osmia (Chalcosmia) latreillei*. Τα έντομα αυτά εγκαθιστούν τις αποικίες τους ανοίγοντας στοές στους πλήθινους τοίχους των κτιρίων του οικισμού. Κατά την κατασκευή των στοών εξορύσσουν το υλικό

των τοίχων όταν δε τα έντομα εισέρχονται και εξέρχονται προκαλούν αποσάθρωση των τοιχωμάτων. Λεπτή θηραϊκή γη υπάρχει σε σωρούς κάτω από τις στοές. Η μορφή της προσβολής είναι εμφανής από τις πολυάριθμες οπές που υπάρχουν στους τοίχους. Η προκαλούμενη ζημιά από αυτά τα έντομα στο αρχαιολογικό μνημείο είναι πολύ επικίνδυνη για τη διατήρηση της μορφής του και εάν συνεχιστεί υπάρχει κίνδυνος παραμόρφωσης κατά θέσεις μερών της τοιχοποιίας.