

The pathogenic potential of *Sclerodermus domesticus* and *Cephalonomia gallicola*, two flat wasps that sting the human being in indoor environments



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INTRODUCTION

Sclerodermus domesticus Klug, 1809 and *Cephalonomia gallicola* Ashmead, 1887 (Hymenoptera: Bethyridae) are two aculeate flat wasps, 2-4 mm long, ecto-parasitoids of the immature stages of some Coleoptera and Lepidoptera. These bethylid insects can also sting humans, causing dermatitis characterized by itch and erythematous papular lesions (figs. 1 a-b).¹ In this study we present an evaluation of the real pathogenic potential of this two flat wasps towards humans.

MATERIALS AND METHODS

Between 2018 and 2019, we selected 19 houses, all infested by common furniture beetles belonging to the genus *Oligomerus* Redtenbacher, 1849 and *Anobium* Fabricius, 1775 (Coleoptera: Ptinidae), in which the only pathogenic arthropods were the *S. domesticus* (figs. 2 A-C) and/or the *C. gallicola* (figs. 2 D-F), in order to attribute only to them skin lesions. Their presence, and the absence of other arthropods potentially able of causing dermatitis in humans was confirmed through a microscopic examination of environmental dust.²

The dust samples collected in the houses were sieved (5 mm and 1 mm aperture meshes). Firstly, the sieved material has been observed under stereomicroscope (0,75X-5X) (Motic SMZ 168, Milan, Italy) and then floated utilizing saturated solution of NaCl (20 min). Arthropods fragments have been extracted under stereomicroscope using the tip of a pin and then placed in a drop of Berlese solution, over a microscope slide with cover slip and finally, observed under optical microscope (4X-100X) (Motic BA310, Milan, Italy).² Flat wasps, in particular, have been identified taxonomically by a stereomicroscope and by optical microscope.¹

Skin lesions in patients, when present, have been examined by a dermatologist in order to confirm that they were caused by the bite or sting of arthropods and not by other medical conditions. The removal or disinfestation of all worm-eaten wooden structures (wooden beams and furniture, ecc.) resulted in the resolution of the dermatitis in all cases. The collected data were processed statistically.

RESULTS AND DISCUSSION

In 5 houses on 19 (26,31%) *S. domesticus* and *C. gallicola* did not caused skin lesions. However, one of these houses was inhabited very sporadically and for short periods. Of the 36 persons that lived in the 19 houses infested with these bethylid hymenopterans, 23 (63,88%) were stung and showed recurrent skin lesions (figs. 1 A-B), whereas 13 (36,11%) did not show any lesions.

In some case (21,42%), not all the members of the family showed skin lesions, but most of the time (78,57%) all the people of the infested house were stung. These data indicate that not all people living in an environment infested with these flat wasps must be stung and exhibit skin lesions. Thus, such evidences should not mislead the physician, but they can considered them as normal.

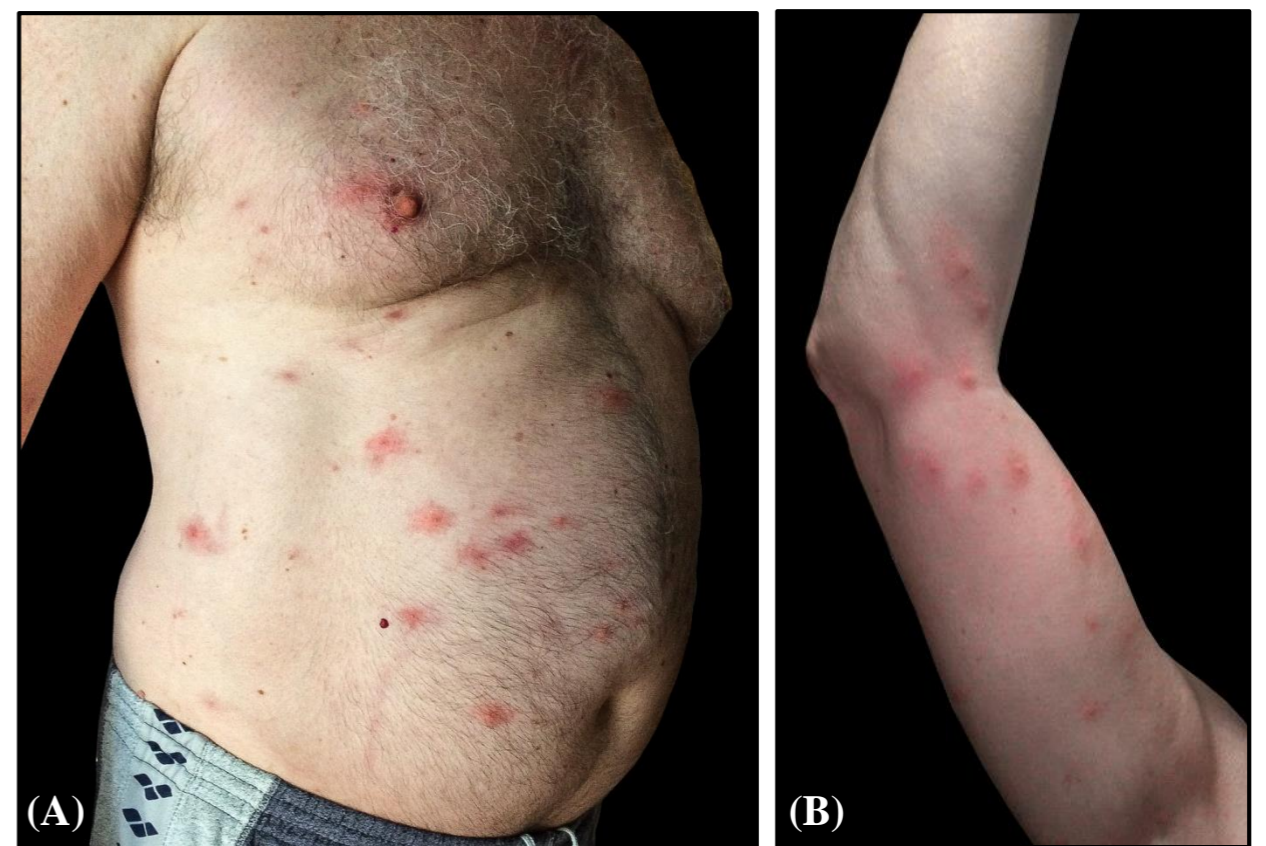


Fig. 1: Erythematous papules with central punctum on the abdomen (a) and on the forearm (b) of two patients caused by *Sclerodermus domesticus*.

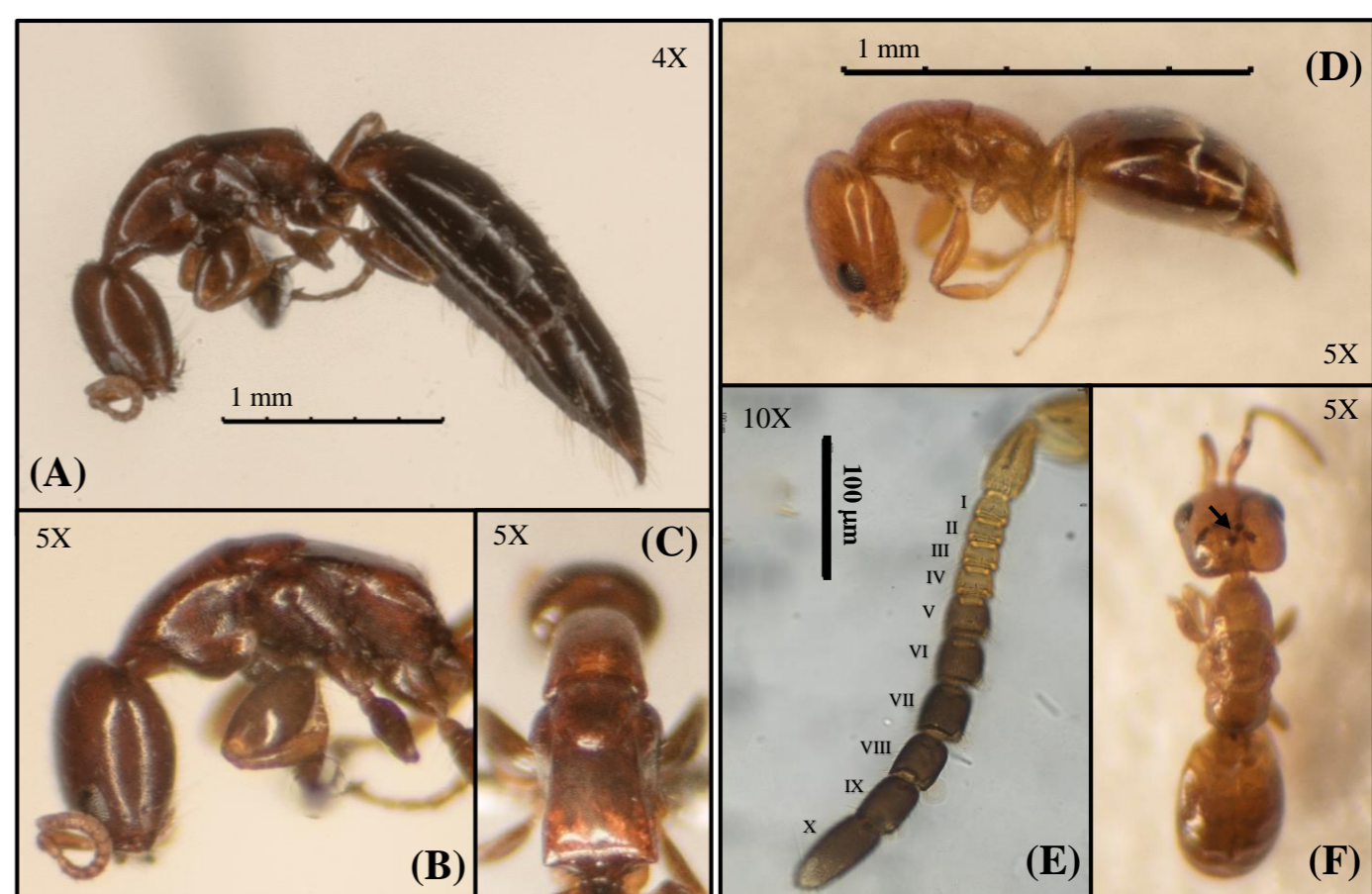


Fig. 2: Light micrographs of flat wasps *Sclerodermus domesticus* (A, B, C) and *Cephalonomia gallicola* (D, E, F); (A) *S. domesticus* female apterous in lateral view (4X); particular of mesosoma in lateral (B) and dorsal (C) view (5X); (D) *C. gallicola* apterous female in lateral view (5X); (E) antenna of *Cephalonomia gallicola* with 10 flagellomery (numbered with roman numerals); *C. gallicola* apterous female in dorsal view, with 3 ocelli on the head (arrow). [(Camera reflex - Canon eos 80D + MP-E 65 mm f/2.8 1-5X) (Optical microscope - Motic BA310, Milan, Italy) (Motic Image Plus 3.0, Milan, Italy)].

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