

Morphological and Biochemical Aspects of the egg-nests of *Hylesia metabus*. Ulf Lundberg(1), Fredi Sánchez(1), Frances Osborn(2). (1) Department of Structural Biology, Venezuelan Institute for Scientific Investigation (I.V.I.C.), Apartado 21827, San Martín, Caracas 1020^a, Venezuela, E-mail: ulundber@ivic.ve (2) Institute for Biomedicine and Applied Sciences (IIBCA-UDO), Cerro de Medio, Universidad de Oriente, Núcleo Sucre, Cumaná, Edo. Sucre, Venezuela.

Hylesia metabus is a species of moth distributed mainly in the mangrove-swamp forests in north-eastern Venezuela, with especially high populations in the Gulf of Paria. Adult females possess highly urticating abdominal hairs (also called “setae” or “flechettes”) causing a severe vesiculo-papillar dermatitis in exposed persons. The females use these urticating setae to cover and protect their eggs from parasites and depredators. The adult insects are attracted by the lights of nearby villages, spreading copious amounts of the urticating hairs in the environment during their nightly flights. In addition, the egg-nests once deposited in the mangrove-forest, are a constant source of wind-borne urticating material. In the present study we studied the morphology of the egg-nests of *H. metabus* using Scanning Electron Microscopy (SEM) and light microscopy (LM) and have compared these setae with the setae present in adult males and females. We have also analyzed and partly characterized a substance with enzymatic properties present in the egg-nests. Egg-nests were collected from the mangrove swamps of the affected areas. For SEM studies, egg-nests were fixed in 2% glutaraldehyde, postfixed in 1% OsO₄, dehydrated in ethanol, dried by the critical point method, gold-sputtered and directly observed in a Scanning Electron Microscope. For biochemical studies, egg-nests were extracted for 48 hours in Tris-buffer pH 9.0 and subjected to fractional ammonium sulfate precipitation. Precipitated material was further purified by anion exchange HPLC. The egg-nests were divided into two distinct compartments: an inner zone (hatching zone) made up of eggs attached to the underlying surface and an external layer of approximately the same thickness covering and surrounding this inner layer. This external layer was made up of intertwined setae resembling some, but not all of the setae present in the abdomen of the adult female. The most frequently found type of setae were rather large (~1.2 mm) flattened structures with projections resembling spines or thorns along their lateral borders. Also frequent were small arrow-shaped setae with a longitude of 50 – 150 µm which appeared to possess an internal vesicular structure. In addition, slender setae with a longitude of ~600 µm were observed. The setae observed in the egg-nests showed no resemblance to the setae observed in adult males. The biochemical studies revealed the presence of a protease with kallikrein-like properties in the egg-nests and also, but to a lesser extent, in the abdominal setae of the adult females. In contrast, extracts from the adult males did not show any enzymatic activity. In summary, the results of the present study show that the urticating properties of the adult females and egg-nests may be associated with setae of a particular morphology.

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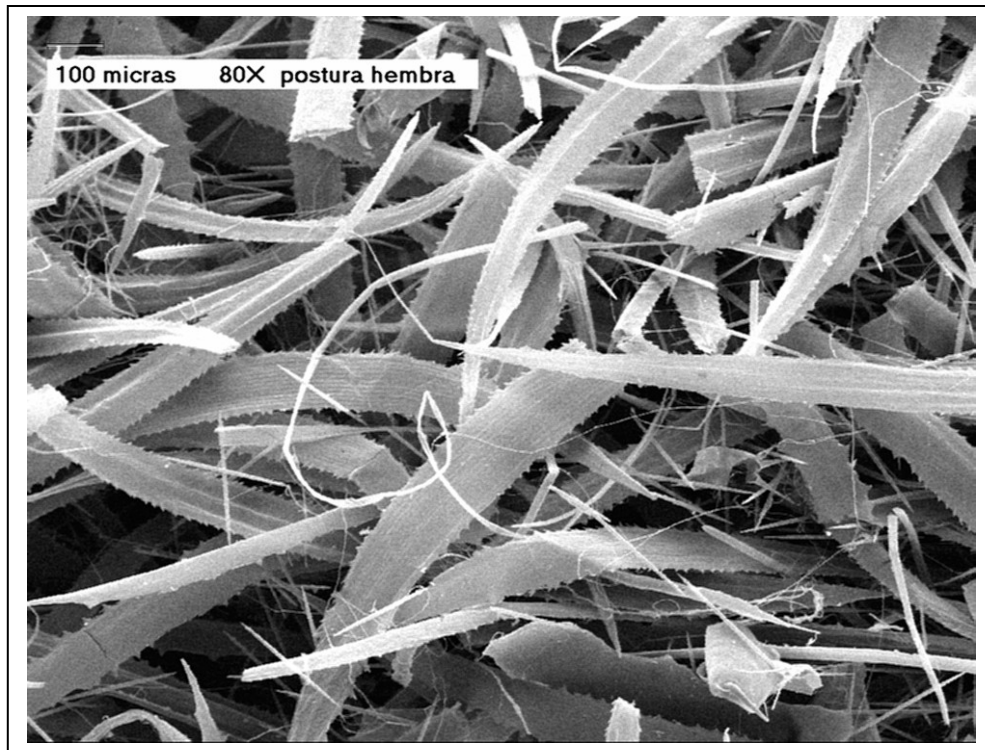


Figure 1: SEM image of egg-nest showing presence of large band-shaped setae with typical serrated lateral border. Smaller dart-shaped setae of approximate 0.2 mm are also present.

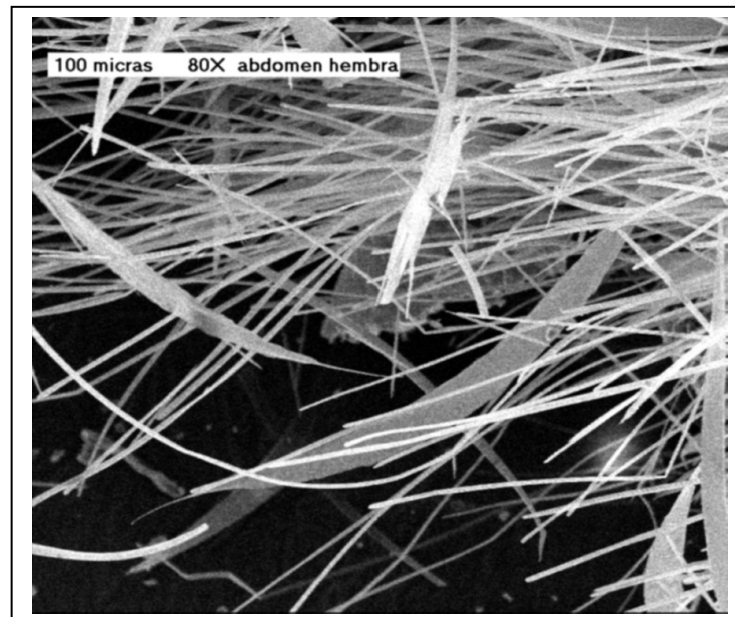


Figure 2: Details of setae present in adult females of *H. metabus*. Note the presence of long slender setae not seen in the egg-nests.