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Fine structure of the secretory and sensory organs on the cephalon and the first pereionite of *Trichoniscus alexandrae* Caruso (Crustacea, Isopoda)

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Abstract

Trichoniscus alexandrae Caruso is a blind troglobiont isopod; males possess secretory and sensory organs on the cephalon and 1st pereionite consisting of cuticular pits hosting a tuft of setae and gland openings. Such organs are absent in females. Three types of cuticular structures have been observed: (a) lamellar setae, which likely play a role in protecting the gland openings and favouring the evaporation of secretions; (b) contact chemoreceptors, each provided with six bipolar sensory cells, a scolopale cell and enveloping cells; (c) a secretory cell complex, consisting of a long cylindrical slender duct-forming cell, with the function of transporting to the cuticular surface a secretion produced by two deeper secretory cells. The duct-forming cell is characterized by the presence of numerous microtubules in its cytoplasm, and is provided with a flattened duct. It is suggested that the secretion produced by the secretory cells could serve for sex-recognition.

Keywords: Secretory organs; Sensory organs; Isopoda Ultrastructure; Sex recognition

1. Introduction

Trichoniscus alexandrae is a troglobiont species, described from two caves of the neighbourhood of Palermo (Sicily) (Caruso, 1978). The species is blind and is characterized by the presence, only in the males, of two characteristic organs on the dorsal cephalon and the first pereionite, consisting of a tuft of thick setae placed in small cuticular folds. These organs were formerly described by Schödte (1848: in Verhoeff, 1926), Verhoeff (1926) and Vandel (1951, 1960) as "organes glandulo-pilifères"; the latter Author suggested that the presence of setae could facilitate the spreading of a secretion involved in sex-recognition. A similar function was also hypothesized by Strouhal (1939). The gland organs were described in several other species of different genera of Oniscidea; they were found in 13 species of the genus *Trichoniscus* and can be located in different regions of the body and have the most complex organization (Tabacaru, 1996).

The fine structure of these organs is, however, not known so far, so that their possible secretory activity and the further implication in the sex recognition function remains merely speculative. The aim of this paper is to present ultrastructural evidence to support the suggested secretory function of the organs.

2. Materials and methods

Adult males and females of *Trichoniscus alexandrae* found in the Molara caves (Palermo) were kept in a climate chamber at 20 °C and high humidity. Males and females were dissected in 0.1 M phosphate buffer (PB) pH 7.2 to which 3% sucrose was added. The cephalon and the first pereionite were removed cutting the body with a tweezers behind the first pereionite. After dissection, the material was fixed for 3 h in 2.5% glutaraldehyde in PB at 4 °C. After washing the material was post-fixed in 1% osmium tetroxide in PB for 1–2 h, washed again in PB and used for both scanning (SEM) and transmission (TEM) electron microscopy.

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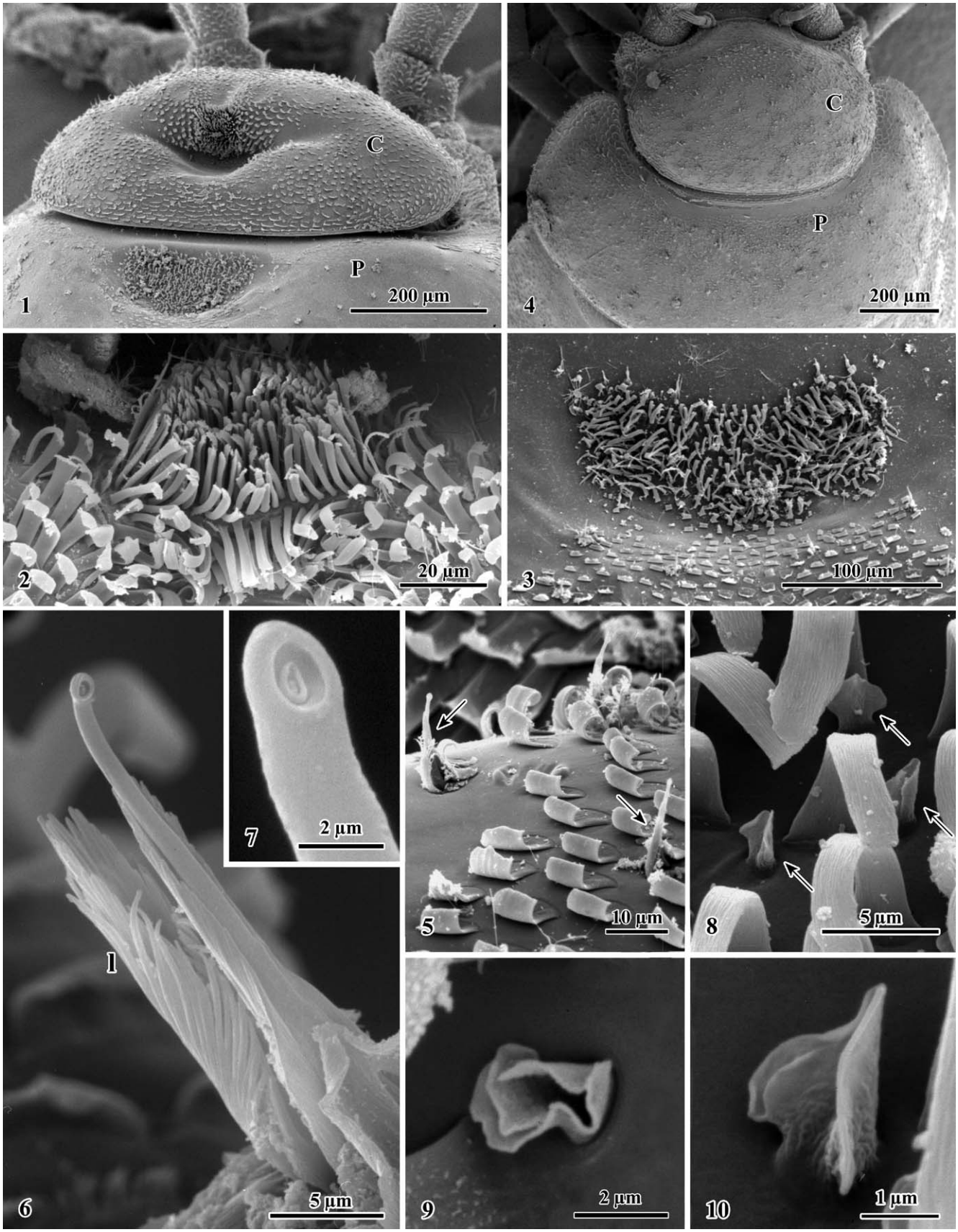
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