



Morphology, arrangement and classification of sensilla on the apical segment of labium in Peiratinae (Hemiptera: Heteroptera: Reduviidae)

JOLANTA BROŹEK¹ & DOMINIK CHŁOND²

University of Silesia, Faculty of Biology and Environmental Protection, Department of Zoology, ul. Bankowa 9, 40-007 Katowice, Poland.

E-mails: ¹jolanta.brozek@us.edu.pl, ²dominik.chlond@us.edu.pl

Abstract

The present paper describes sensory structures on the apical segment of the labium in representatives of the subfamily Peiratinae (Heteroptera: Reduviidae), using the scanning electron microscope. The study is based on dry material representing 19 species and 16 genera. Within Peiratinae thirteen morphologically distinct types of sensilla were identified. Among them were four new types of sensilla (porous placodea sensillum [PPLS], multilobate sensillum [MS], dome-elongated sensillum [UDES], and pit peg sensillum type 2 [NPPS2]) were found. Mechanosensilla are evenly distributed on the surface of the labium and form a characteristic pattern in various species. The main characters of the third visible (apical) segment of the labium are: presence of different sized sensilla of the chaetica type 1, 2, and 3; trichodea sensilla (TS); campaniform sensilla (CS); and various types of nonporous pit peg sensilla (NPPS1, NPPS2, and NPPS3). Distally on the apical segment of the labium dome-elongated sensilla (UDES) there are a characteristic arrangements, described as (3+3) and (1+2). Chemical sensilla are grouped on the tip of the labium. The position, number, and types of chemical sensilla on this area are very similar in all studied species.

Key words: Sensory structures, apical segment of labium, new types of sensilla

Introduction

Peiratinae is a medium-sized subfamily of Reduviidae, distributed in almost all zoogeographical regions. So far, there have been described 32 genera and almost 400 species (Putshkov & Putshkov 1985; Cai & Lu 1990; Ren 1990; Vennison & Ambrose 1990; Maldonado Capriles 1990; Coscarón 1995, 1996, 1997; Coscarón & Morrone 1995; Bérenger 1995; Moulet 2001; Gil-Santana & Costa 2003; Cai & Tomokuni 2004; Bérenger *et al.* 2006; Cai & Taylor 2006; Chłond 2008abc). However, only a few papers with data concerning the types and distribution of sensilla in various subfamilies of Reduviidae, mainly on the antennae (McIver & Siemicki 1984; Catalá & Schofield 1994; Catalá 1997; Catalá *et al.* 1998; Weirauch 2003) and the labium (Cobben 1978; Catalá 1996) have been published. Labial sensory structures of representatives of the subfamily Peiratinae have never been documented in a comparative study.

In piercing and sucking insects like Hemiptera, labial sensilla monitor the outer surface of the plant or animal food source. The term *sensillum* refers to the basic structural and functional unit of cuticular mechanoreceptors and chemoreceptors. It includes the cuticular structure, the neuron or neurones, the associated sheath cells with the cavities they enclosed, and the structures they produce. Sensilla often occur singly, but may also be grouped together to form functional units (Chapman 1998).

Most of the sensilla on the mouthparts of insects are contact chemoreceptors, but mechanoreceptors are also common. Cuticular mechanoreceptors fall mainly into two classes: hair-like projections from the cuticle with a basal socket, and dome-like campaniform sensilla. Both types lack pores opening to the outside and have similar arrangements of neurons and sheath cells. The chemosensilla include the olfactory and gustatory sensilla. Olfactory sensilla comprise cuticular components comparable to those on cuticular