



Pretarsal structures in the family Cydnidae *sensu lato* (Hemiptera: Heteroptera: Pentatomoidea)

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Abstract

New data on the pretarsus in Cydnidae *sensu lato* are presented; 56 species of 38 genera are studied based on the SEM techniques. Pretarsal structures in Cydnidae *s.l.* are demonstrated to be not uniform; some are typically pentatomoid, and some are atypical for Pentatomoidea. Structures associated with the unguitactor plate, described for the first time by Weirauch (2005) in Reduviidae, and not reported for Cydnidae *s.l.* in the past, are described for the first time.

Key words: Hemiptera, Heteroptera, Cydnidae *s. lato*, pretarsus, morphology, SEM, taxonomy

Introduction

Though many papers relating to the morphology of pretarsal structures in Heteroptera have already been published (for reviews see: Cobben 1978; Hasan and Nasreen 1994; Schuh and Slater 1995; see also the most recent research on Reduviidae: Weirauch 2005), morphological studies are still lacking for most species of the Cydnidae *s. l.*

The first paper on the pretarsus in which representatives of the Cydnidae *s. l.* were treated was that by Dashman (1953), in which the unguitactor plate was described and schematically figured for two species of the subfamily Cydninae, i.e., *Cyrtomenus mirabilis* (Perty), and *Pangaeus bilineatus* (Say).

Then, some pretarsal structures (i.e., the pulvilli and the unguitactor plate) were studied for a few species of the family (Goel and Schaefer 1970; Goel 1972); regrettably, just schematic figures, and no SEM micrographs were provided. Several years later, Cobben (1978), during a description of the pulvilli in the superfamily Pentatomoidea, mentioned four species of Cydnidae *s.l.*, but, unfortunately, did not specify which representatives of the family he investigated; moreover (same as previously) no figures nor SEM micrographs were presented.

The first paper in which SEM micrographs were provided for species of Cydnidae *s.l.* was that by Hasan and Nasreen (1994). They described the pretarsus for *Cydnus aterrimus* (Forster, 1771), and *Macroscytus subaeneus* [the specimens identified as belonging to the latter species most probably represent *M. brunneus* (Fabricius, 1803); see Lis 1994, 2000]. Moreover, the two first SEM micrographs (one of the empodium, and one of the claws and pulvillus) were provided for *C. aterrimus*. Subsequently, the pretarsus of *C. aterrimus* was very schematically shown also by Derjanschi and Péricart (2005).

Recently, Imura and Ishikawa (2009) provided a description and SEM micrographs of the pretarsus of *Schiodtella japonica* Imura et Ishikawa, 2009, but only indicated the presence of claws and pulvilli, without describing and discussing any fine structures.

In all those fragmentary morphological studies, as well as in the studies on pentatomoid phylogeny, in which characters relating to the pretarsal structures were utilized as characters in phylogenetic analyses (i.e., Hasan and Kitching 1993; Grazia *et al.* 2008), the pretarsus of the Cydnidae *s.l.* was usually treated as typical