



## External morphology of the egg and the first and fifth instars of *Cyrtocoris egeris* Packauskas & Schaefer (Hemiptera: Heteroptera: Pentatomidae: Cyrtocorinae)

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### Abstract

Cyrtocorinae is an uncommon, small, and exclusively Neotropical group in Pentatomidae, whose immatures are poorly understood. In this paper, the egg and first and fifth instars of *Cyrtocoris egeris* Packauskas & Schaefer are studied with the scanning electron microscopy (SEM). Specimens were collected in Maquiné, Rio Grande do Sul, Brazil. Immatures were analyzed with light stereomicroscope and SEM. The egg's chorion surface is predominantly smooth alternated with granulated areas, and an average of 54 clubbed aero-micropylar processes are arranged in three irregular rows. In the first and fifth instars, organization of the external dorso-abdominal scent efferent system suggests an analogy to the metathoracic external scent efferent system of the adult, because of structures similar to the evaporatorium, evaporatory channel, and auricle peritreme; the last structure is absent in the first instar. Abdominal sterna III–VII have 1+1 (first instar) and 2+2 trichobothria (fifth instar). Ultrastructural observations allowed recognition of unique characters at the egg stage and conserved features at the nymphal stage in *C. egeris*.

**Key words:** aero-micropylar processes, chorion, external scent efferent system, immature stages, trichobothria, Pentatomoidea

### Introduction

Cyrtocorinae is a small and uncommon group in Pentatomidae (Schaefer *et al.*, 2005). This Neotropical subfamily comprises 11 species in four genera, ranging from central Mexico to Argentina (Packauskas & Schaefer, 1998). It has been recently treated as a family (Rolston & McDonald, 1979; Packauskas & Schaefer, 1998), but a cladistic analysis of Pentatomoidea based on morphological characters (Grazia *et al.*, 2008) supported the subfamily ranking.

Few studies have been published focusing on Cyrtocorinae immatures (Schaefer *et al.*, 1998). Brailovsky *et al.* (1988) described the egg and nymphs of *Cyrtocoris egeris* Packauskas & Schaefer [as *Cyrtocoris trigonus* (Germar)] from Mexico, including notes on the biology of the species. Schaefer *et al.* (1998) described 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> instars of *C. egeris* from Ecuador. This is the most widespread species of the subfamily, showing great morphological variation in adult (Packauskas & Schaefer, 1998) and nymphal stages (Schaefer *et al.*, 1998). Despite the description by Brailovsky *et al.* (1988) and Schaefer *et al.* (1998), distribution and placement of abdominal spiracles and trichobothria in all five instars of *C. egeris* remained unclear.

In a recent review of studies on the morphology of eggs of Pentatomidae (Matesco *et al.*, 2009a) 125 species were listed. Three more species should be added to that list, *Aphylum bergrothi* Schouteden (Aphylinae) (Cobben, 1968), *C. egeris* (Brailovsky *et al.*, 1988), and *Banasa maculata* Campos & Garbelotto (Pentatominae) (Campos *et al.*, 2010). Of all that species, less than half (54) were investigated under scanning electron microscopy (SEM) (Matesco *et al.*, 2009a; Candan & Suludere, 2010).