



## Immature stages of *Calycopis bellera* (Hewitson) and *C. janeirica* (Felder) (Lepidoptera, Lycaenidae, Theclinae, Eumaeini): Taxonomic significance and new evidence for detritivory

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### Abstract

Details of egg, larval, and pupal morphology are described and illustrated for *Calycopis bellera* (Hewitson) and *C. janeirica* (Felder), with a special emphasis on larval chaetotaxy. Wild-caught *Calycopis* females laid eggs on dead leaves in the laboratory, and the caterpillars successfully completed development on an artificial agar diet to which no leaves were added. Males and females of the sexually dimorphic *C. bellera* had been previously placed in different genera or different species groups. *Calycopis janeirica* had been chronically misidentified (and misspelled *C. jeneirica*). Males and females of this species appear to be correctly associated for the first time. Whereas *C. bellera* has five larval instars—as reported previously for *C. caulonia*—*C. janeirica* has four. Morphological characters of the immatures of *C. bellera* and *C. janeirica* are summarized in a table and compared with those of other reared *Calycopis* species.

**Key words:** artificial diet, chaetotaxy, life history, morphology, rearing, systematics

### Introduction

*Calycopis* Scudder is the largest Neotropical genus of eumaeine hairstreaks (Lycaenidae: Theclinae: Eumaeini) with 64 described and ten undescribed species (Robbins 2004b). The species level taxonomy of *Calycopis*, however, is poorly resolved for two reasons. First, it is difficult to associate the sexes in many species because of sexual dimorphism (Robbins 2004a). With both male and female type specimens, species level taxonomy and nomenclature are a problem. Second, intraspecific variation has been poorly assessed (Robbins 2004a), and in at least one case, two recognized morphological species in *Calycopis* were reared from the same mother (Duarte unpubl.).

Although caterpillars of the vast majority of butterflies eat vascular plants (Ehrlich & Raven 1965), larval detritivory was proposed by S. Johnson (1985) for *Calycopis cecrops* (Fabricius) and *C. isobeon* (Butler & H. Druce), two closely related North and Central American species that may be conspecific (Field 1967a; Robbins 1994). Larval detritivory is uncommon in the Macrolepidoptera (Powell *et al.* 1998), but caterpillars of some species eat dead leaves (Hohn & Wagner 2002) while others eat fungi and algae (Rawlins 1984; Wagner *et al.* 2008). Detritivores may obtain most of their nutrition from detritus or from the micro-organisms living on detritus (e.g., Findlay & Tenore 1982; Hohn & Wagner 2002), but it is unknown which is more important in *Calycopis*.

In accord with the proposal of detritivory, females of *C. cecrops* oviposit on dead leaves on the ground (Gifford & Opler 1983), and its caterpillars are found in the leaf litter (W. Steiner pers. comm.). In the laboratory, females of *C. caulonia* (Hewitson), a species closely related to *C. cecrops* and *C. isobeon* (Field