SCIENTIFIC NOTE

Phoretic Association Between *Nanocladius* (*Plecopteracoluthus*) sp. (Chironomidae: Diptera) and *Thraulodes* sp. (Leptophlebiidae: Ephemeroptera)

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Associação Forética entre *Nanocladius* (*Plecopteracoluthus*) sp. (Chironomidae: Diptera) e *Thraulodes* sp. (Leptophlebiidae: Ephemeroptera)

RESUMO - A relação de foresia entre larvas de *Nanocladius* (*Plecopteracoluthus*) sp. e ninfas de *Thraulodes* sp. é relatada pela primeira vez na Região Neotrópica.

PALAVRAS-CHAVE: Insecta, foresia, Região Neotrópica.

ABSTRACT - Phoresy between larvae of *Nanocladius* (*Plecopteracoluthus*) sp. and nymphs of *Thraulodes* sp. is reported for the first time in the Neotropics.

KEY WORDS: Insecta, phoresy, Neotropics.

In the last four decades there has been an increasing interest and records of phoresy associations amongst aquatic organisms. White *et al*. (1980) claimed that phoresy is relatively uncommon among chironomids, while Roback (1977) argued for the opposite. Epler (1995) recorded phoresy of the chironomid larvae *Nanocladius* (*Plecopteracoluthus*) on Megaloptera, Plecoptera and Leptophlebiidae (Ephemeroptera). Vinikour (1982) recorded that *Nanocladius* larvae had increased mobility and protection on their hosts stoneflies, dobsonflies and fishflies. Symbiotic relationship (phoresy) of *Nanocladius* was found primarily on nymphs of *Thraulodes* (Ephemeroptera) in a mountain stream in Arizona. However, evidence of parasitism association was found due to the presence of host hemolymph in the gut contents of larvae and presence of scars at the sites of larval attachment on the hosts (Jacobsen 1998). On the other hand, Hayashi (1998) assumed that *Nanocladius* larvae are not parasitic but are commensal with corydalids (Megaloptera). Direct evidence of phoresy between chironomids and leptophlebiid ephemeropterans are unknown in the Neotropics.

Thraulodes is a common genus of Ephemeroptera, typically found in high quality waters of low order streams. Their nymphs are sensitive to organic contamination and oxygen deficiency (de Cardoso *et al*. 1997),

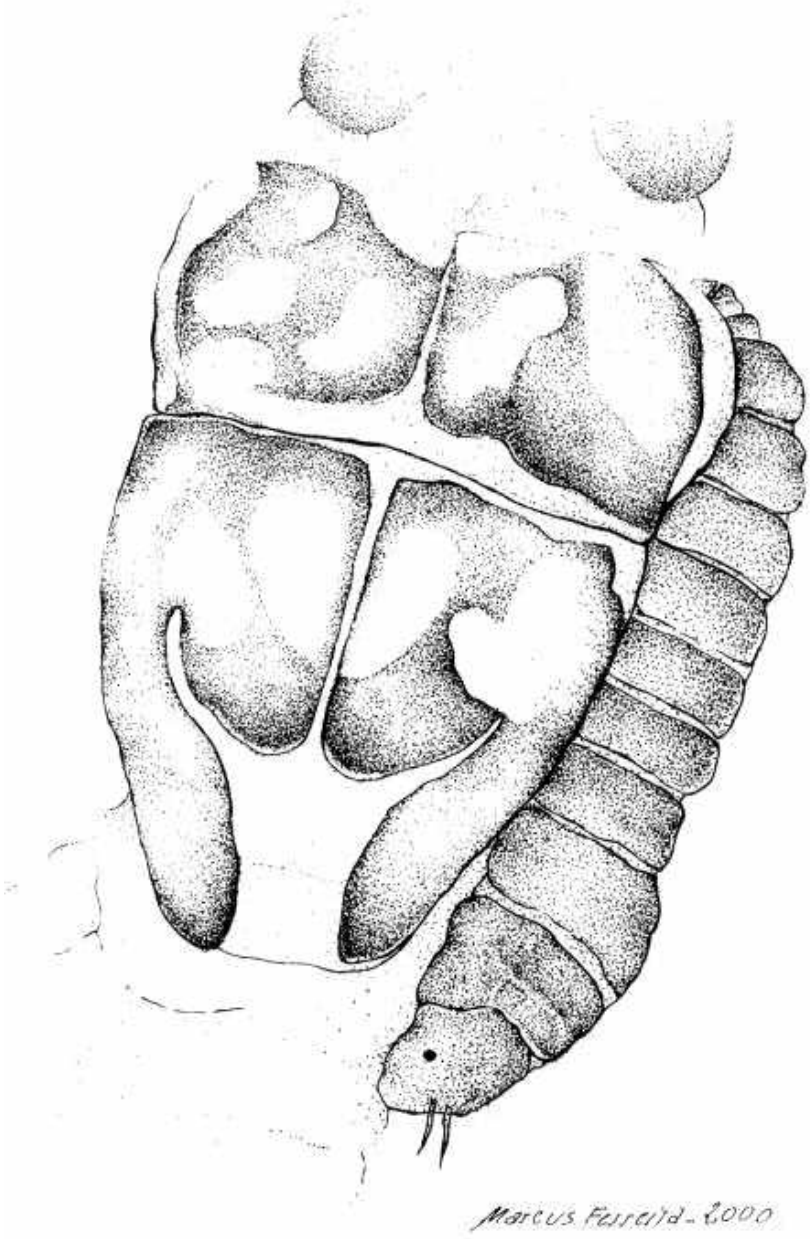

Figure 1. *Thraulodes* sp. 1 nymph with *Nanocladius* (*Plecopteracoluthus*) sp. larva atacched on its body.

live on the surface of rocks, and feed on attached algae (scrapers). Here, we report for the first time phoresy between *Thraulodes* sp. and *Nanocladius* (*Plecopteracoluthus*) sp. in Brazil.

Samples were collected in January, 2000 (rainy season) at the Indaiá stream at Serra do Cipó National Park (19º 12' - 34' S; 43º 27'- 38' W), a stream belonging to the headwaters of Doce River watershed at 1,430 m a.s.l. Waters are blackish, acidic pH (4.0 – 4.5), well oxygenated (> 90% saturation), with low electrical conductivity (< 15.0 µS/cm), and low nutrient concentrations (Galdean *et al*. - in press). The organisms were fixed with 70% alcohol and deposited in the Benthic Macroinvertebrates Collection from the Laboratório de Limnologia/Ecologia de Bentos, Instituto de Ciências Biológicas, Universidade Federal de Minas Gerais, Brazil, following methodology described in Callisto *et al.* (1998).

After reviewing the papers with the scientific descriptions of the taxa considered in this communication, we believe that the *Thraulodes* nymphs and the *Nanocladius* larvae still belong to undescribed species. New collections will be necessary and, after rearing the immatures in laboratory, for obtaining the adults, the material will be sent to specialists in these two taxa.

Two out of the 15 nymphs of *Thraulodes* sp. collected (7.04 and 7.36 mm-long) had fourth instar *Nanocladius* sp. larvae, encased in coarse silken nets, attached dorso-laterally between the mesonoto and the 4th abdominal segment (Fig. 1). White *et al*. (1980) assumed that chironomid cases usually are not located on the ventral side of the nymphs due to their living habit. Chironomid larvae would generally have no access to the venter because of the sprawling activity of *Thraulodes*. Nevertheless, the head and thorax are relatively immobile and therefore seems to be a good site for long lasting attachment.

Vinikour (1982) assumed that phoresy can be related with protection to the midge from dislodgement and sedimentation, but such protection may be secondary due to the increased availability of food to the midge. *Nanocladius* larvae are very common in the Indaiá stream, living on rocks, leaf debris and other objects (Galdean *et al.* - in press). In the rainy season, as the percentage of gravel, leaves and debris are broadly disperse in the stream, phoresy by chironomids on aquatic insects may increase. Further studies shall establish how frequent phoretic association in both the rainy and dry seasons are, as well as according to the existing river altitudinal gradients.

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