



# Article

## Systematic position of Dinidoridae within the superfamily Pentatomoidea (Hemiptera: Heteroptera) revealed by the Bayesian phylogenetic analysis of the mitochondrial 12S and 16S rDNA sequences

JERZY A. LIS<sup>1,3</sup>, PAWEŁ LIS<sup>2</sup>, DARIUSZ J. ZIAJA<sup>1</sup>, & ANNA KOCOREK<sup>1</sup>

<sup>1</sup>Department of Biosystematics, Opole University, Oleska 22, 45-052 Opole, Poland

<sup>2</sup>Department of Genetics, Institute of Genetics and Microbiology, University of Wrocław, S. Przybyszewskiego 63/77, 51-14 Wrocław, Poland

<sup>3</sup>Corresponding author. E-mail: cydnus@uni.opole.pl, <http://www.cydnidae.uni.opole.pl>

### Abstract

Mitochondrial 12S and 16S rDNA sequences of five species of Dinidoridae Stål, 1868, a largely Paleotropical family, and 16 other shield bugs (Pentatomoidea) were studied. This was the first molecular examination of the systematic position of this family within the superfamily Pentatomoidea using more than a single dinidorid species. Phylogenetic trees obtained from the Bayesian inference of 12S and 16S sequences of these mitochondrial DNA, identified Dinidoridae as the monophylum and a sister group to the Tessaratomidae. Moreover, results of the study suggested a close molecular affinity of the genus *Eumenotes* to representatives of the subfamily Dinidorinae, which contradicts all previous morphological analyses that placed it within the subfamily Megymeninae. We suggest restoring taxonomic status of the tribe Eumenotini and removing it from the synonymy of Megymenini, leaving the genus with no subfamilial assignment for the moment.

**Key words:** Hemiptera, Heteroptera, Dinidoridae, Eumenotini, Bayesian estimation, phylogeny, restored status, 12S and 16S rDNA

### Introduction

Dinidoridae is a pentatomoid family containing about a hundred species grouped in sixteen genera (Durai 1987; J.A. Lis 1990; Rolston *et al.* 1996; Kocorek and J.A. Lis 2000, 2008). At present, two subfamilies are recognized within the family, *i.e.*, the Dinidorinae and the Megymeninae (Durai 1987; J.A. Lis 1990; Schuh and Slater 1995; Rolston *et al.* 1996; Kocorek and J.A. Lis, 2000). The majority of the Dinidoridae genera belongs to the subfamily Dinidorinae, whereas the subfamily Megymeninae includes only four genera, *i.e.*, *Megymenum* Guérin 1831, *Eumenotes* Westwood 1844, *Byrsodepsus* Stål 1872, and *Doesbergiana* Durai 1987.

The first of these is the richest in species and the last two have only a few species very rarely collected, but their position within the subfamily Megymeninae has never been questioned (Durai 1987; Rolston *et al.* 1996; Kocorek and J.A. Lis 2000). Only the genus *Eumenotes*, because of the unusual morphological characters of its two species, has always been a source of problem. It was initially described in the family Tessaratomidae, and then was given a subfamilial rank within the family Pentatomidae, and was even regarded as a separate family called Eumenotidae, a proposition never justified by either morphological or molecular evidence (for details, see Kocorek and J.A. Lis 2000).

In a modern revision of the family Dinidoridae, Durai (1987) placed the genus *Eumenotes* within the tribe Eumenotini in the subfamily Megymeninae; her decision was accepted in the catalogs of the family (J.A. Lis 1990; Rolston *et al.* 1996).

Recently (Kocorek and J.A. Lis 2000), when all species of the World Megymeninae were analyzed cladistically, the tribe Eumenotini was synonymized with the tribe Megymenini, and the genus *Eumenotes* was regarded as a sister group of the monophylum, consisting of two genera: *Megymenum* Guérin and *Doesbergiana* Durai.