



A New Species of the Freshwater Cladoceran Genus *Scapholeberis* Schoedler, 1858 (Cladocera: Anomopoda) from the Semidesert Northern Mexico, Highlighted by DNA Barcoding

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Abstract

Sequencing of the CO1 mitochondrial gene (barcoding) highlighted a possible different species in the semi-desert region of Mexico. After a detailed morphological analysis we describe *Scapholeberis duranguensis* n. sp. (Cladocera: Anomopoda: Daphniidae). Specimens from the type locality, El Chupadero, Durango, were compared with specimens of *S. armata armata* Herrick, 1882 and *S. armata freyi* Dumont and Pensaert, 1983 from Canada and southeastern, central and northern Mexico. The main characters that differentiate the new species are: (1) a thicker denticulate membrane with a conspicuous underlying hyaline membrane at the posterior rim of the valves, (2) fewer setae in the gnathobase of trunk limb II and (3) longer and more rectilinear ejector hooks in trunk limb I. The presence of a pore-like structure at the top of the head was also observed, however we are not certain whether this can be considered as a distinctive character, as it was not consistent in all SEM scanned organisms. The denticulate membrane, the number of setae in the gnathobase of trunk limb II and the length of the ejector hooks are characters shared with other species, however, the combination of them and in particular the structure and thickness of the double membrane at the posterior rim of the valves lead us to conclude that *S. duranguensis* is a species different from *S. armata* and from other members of this genus. The CO1 sequences of *S. armata freyi* and *S. duranguensis* n. sp. showed a mean divergence of 12.02%, thus supporting the morphological differences between them. Finally, a comparison of the CO1 sequences of *Scapholeberis duranguensis* n.sp. with other Scapholeberinae available in GenBank supported our results.

Key words: Branchiopoda, Cladocera, Daphniidae, barcodes, taxonomy, new species, systematics, North America

Introduction

Within the family Daphniidae Straus, 1820 (Cladocera: Anomopoda), genus *Scapholeberis* Schoedler, 1858 is one of the most peculiar groups as the organisms can hang upside down to the surface film of the water by using a highly specialized structure (so-called sucker-plate) developed at the ventral rim of the valves (Dumont and Pensaert 1983; Fryer 1991). Compared with other daphniids, *Scapholeberis* has a set of presumably apomorphic characters that give it a unique status within the family Daphniidae such as: (1) a sucker-plate, (2) the complete loss of a window-like oval plate at the dorsum of the valves, and (3) the modification of P1 in males, which lost the long anchor-like apical appendix that could be seen sticking out of the valves (Dumont and Pensaert 1983).

From a taxonomic point of view, *Scapholeberis* has a controversial history. This name was first used by Schoedler (1858) to group three species of hyponeustonic daphniids: *S. mucronata* Müller, 1776, *S. cornuta* Schoedler, 1858 and *S. obtusa* Schoedler, 1858 (see Dumont and Pensaert 1983). Later, the composition of this group changed as *S. cornuta* resulted to be the horned form of *S. mucronata*; and *S. obtusa* was synonymized with *Daphnia aurita* Fischer, 1849 (now *Megafenestra aurita*). After the rising of *Scapholeberis*