Phylogenetic relationships of the comb-footed spider subfamily Spintharinae (Araneae, Araneoidea, Theridiidae), with generic diagnoses and a key to the genera

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Abstract

The monophyly of Spintharinae is supported in agreement with previous analysis of Theridiidae by Agnarsson and Arnedo et al. We study the relationships of the genera within Spintharinae. Fourteen species in the genera Chrosiothes, Episinus, Spintharus, Stemmops, and Thwaitesia constituted the ingroup, while five species from the genera Euryopis and Dipoena (Hadrotarsinae), as well as Latrodectus and Steatoda (Latrodectinae), served as outgroup taxa. The character matrix included 49 morphological characters. Parsimony analyses using several character weighting strategies supported the monophyly of Spintharinae with Stemmops as sister to a clade that includes the remaining ingroup taxa. Chrosiothes emerged as sister to Episinus + Spintharus + Thwaitesia which formed a polytomy. The equally weighted, successive weighted, and preferred implied weight topologies, were all logically consistent. A key to the genera of Spintharinae and diagnoses for each genus are given.

Key words: Cobweb spiders, Chrosiothes, Episinus, Spintharus, Stemmops, Thwaitesia, key, diagnosis

Introduction

The Theridiidae, popularly known as cobweb or comb-footed spiders, ranks as one of the most species rich spider families, with 121 genera and 2,351 species distributed worldwide (Arnedo et al. 2004; Agnarsson 2004; Platnick 2013). Theridiids exhibit extreme diversity in morphology, ecology, and behavior, and show a particularly diverse array of web types, from simple to complex (Arnedo et al. 2004; Agnarsson 2004; Eberhard et al. 2008). Despite important recent advances in the systematics and classification of the family (e.g., Arnedo et al. 2004; Agnarsson 2004), generic relationships are not completely understood, and some theridiid genera are poorly delimited and probably para- or polyphyletic (Arnedo et al. 2004).

Theridiids are generalists feeding on whatever prey are caught in their webs; however, some are specialists, such as Chrosiothes tonala (Levi 1954), a predator of termites (Eberhard 1991). Most genera of the subfamily Spintharinae present a modified web. The genera Spintharus, Episinus and Thwaitesia build a web with an “H”-like shape, while Chrosiothes builds a sheet-like web, presumably because of a specialization for their prey (Eberhard 1991; Agnarsson 2004; Eberhard et al. 2008). Although all genera present sexual dimorphism in size, behavior differs considerably among genera. Also, the silken egg sacs are complex and diverse (Eberhard et al. 2008), with the outermost fibers densely spun in Latrodectus, while the outermost fibers are loosely woven in Episinus and Thwaitesia (Agnarsson 2004).

Levi and Levi (1962) made the first comprehensive effort to define the genera of the family Theridiidae. They reduced the number of genera from 140 to 50 and provided a classification. However, they did not address a formal higher classification or phylogeny. It was not until the work by Forster et al. (1990) that a formal proposal was made for two Theridiidae subfamilies, Hadrotarsinae and Spintharinae, with possible defining synapomorphies.