



## 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 *Euryopsis* 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.