



Confocal microscopy applied to water mite taxonomy with the description of a new genus of Axonopsinae (Acari, Parasitengona, Hydrachnidia) from Central America

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Abstract

Vagabundia sci n. gen. n. sp. of the subfamily Axonopsinae is proposed and described. Confocal Laser Scanning Microscopy, not previously applied to water mite taxonomy, allowed the acquisition and posterior processing of clean optical slices. The new species is compared to other mites that have been described as ‘*Axonopsella*-like’. *Vagabundia sci* n. sp. is named after the Science Citation Index, a sociological tool that, as explained in the text, has done more harm than good to the population of taxonomists.

Key words: *Vagabundia* n. gen., interstitial water mite, confocal optical slicing

Introduction

Taxonomy demonstrates that observation is not a passive process and that the old adage ‘an image is worth a thousand words’ does not always ring true. Words help to focus the observation and observation is aided by images. However, observation and images cannot substitute for one another.

In previous publications (Valdecasas *et al.* 1997, 2001; Valdecasas & Camacho 2005), we have highlighted different microscopy and computer imaging techniques to aid in the interpretation of taxa including Extended Depth of Focus (EDF) images and Environmental Scanning Electron Microscopy (ESEM). To our knowledge, water mite taxonomy has never been examined with Confocal Laser Scanning Microscopy (CLSM), a not so recent technique that has been used sporadically as an aid in the taxonomy of copepods, tardigrades and insects (Galassi 1997; Rusel *et al.* 2001; Klaus *et al.* 2003).

As an application of CLSM, we describe in this publication a new genus and species of the subfamily Axonopsinae, one of the four subfamilies ascribed to the Family Aturidae (Acari, Hydrachnidia, Parasitengona).

To date, 37 genera have been described within the subfamily Axonopsinae, many of them in groups without clear taxonomic rank such as ‘*Axonopsella*-like’, ‘*Axonopsis*-like’ mites, etc., that share a certain appearance and series of characters but await a full revision for proper taxonomic placement (Cook 1974). The *Axonopsella*-like mites include the following eight genera: *Axonopsella*, *Polyaxonopsella*, *Submiraxona*, *Miraxona*, *Miraxonides*, *Neoalbia*, *Stygalbiella*, and *Adelaxonopsella* with a wide distribution in the Neotropical and Australasian realms.

Samples were taken from different streams and rivers during an intensive inventory of the epi- and hypogean environments of the island of Coiba Panama. The Río Escondido has provided a diversified fauna that we are describing in consecutive publications (Valdecasas 2001, 2008). A single specimen with characteristics of the *Axonopsella*-like mites found in Karaman-Chappuis samples is used to describe *Vagabundia sci* n. gen. n. sp.