

## A new interpretation of the functional morphology of *Uroactinia* sp. (Uropodina: Uroactinidae) using advanced microscopic techniques\*

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Chelicerae of most Parasitiform mites have retained the same general set of plesiomorphic structures and functions. For mesostigmatid mites this represents grabbing, cutting, piercing and, in the males of some groups, transferring sperm (Di Palma 2009). However, the chelicerae of Uropodina are extremely variable, which appears to indicate that this group has evolved a range of divergent feeding mechanisms and behaviors that have not been studied in detail. Based on the combination of Stereomicroscopy, Differential Interphase Microscopy, Confocal Laser Scanning Microscopy, Low-Temperature Scanning Electron Microscopy, Synchrotron X-ray Microtomography, and 3D modeling, it was possible to 1) to analyze in three dimensions the muscular configuration of the chelicerae (Fig. 1A–B), that allow this mite to extend, retract, bent and rotate around the mouth, 2) observe how chelicerae are used to feed in mites of the genus *Uroactinia* (Mesostigmata: Uropodina), and 3) to discuss the evolutionary implications of feeding while simultaneously being able to rotate the chelicerae concentrically around the oral cavity and catch objects around obstacles.

**Keywords:** microscopy, feeding, movement, muscles, internal morphology

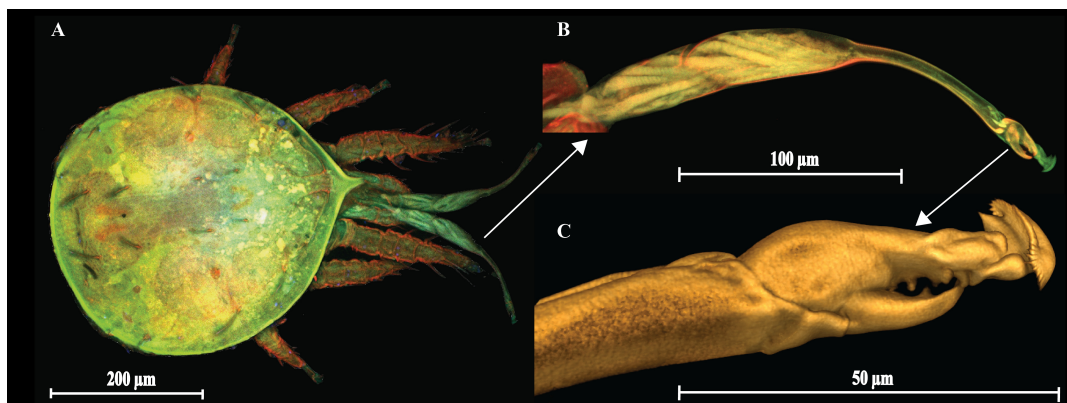


FIGURE 1. *Uroactinia vitzthumihippocrepea* Confocal Laser Scanning Microscopy based images. A Larvae dorsal view. B. Detail of the chelicera and muscles. C. Detail of the tip of the chelicera and the umbrella-like extension on the fixed digit.

### Reference

Di Palma, A., Wegener, A. & Alberti, G. (2009) On the ultrastructure and functional morphology of the male chelicerae (gonopods) in Parasitina and Dermanyssina mites (Acari: Gamasida). *Arthropod Structure & Development*, 38 (4), 329–338.  
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