



## Polishing Michael's Shoe: The structure and variability in the genital chamber of Uropodina\*

JEREMY C.B. NAREDO<sup>1</sup>, IAN BRACKETT<sup>1</sup>, ORLANDO COMBITA-HEREDIA<sup>2</sup>, MORGAN ADAMS<sup>1</sup> & HANS KLOMPEN<sup>1</sup>

<sup>1</sup>Department of Evolution, Ecology and Organismal Biology, Museum of Biological Diversity, 1315 Kinnear Rd, Columbus, OH 43212, USA

[naredo.1@osu.edu](mailto:naredo.1@osu.edu); <https://orcid.org/0000-0003-3304-3587>

[brackett.28@osu.edu](mailto:brackett.28@osu.edu); [adams.2565@buckeyemail.osu.edu](mailto:adams.2565@buckeyemail.osu.edu)

[klompen.1@osu.edu](mailto:klompen.1@osu.edu); <https://orcid.org/0000-0002-6717-115X>

<sup>2</sup>Department of Biology, University of Washington, 24 Kincaid Hall, Seattle, WA 98105, USA

[combita@uw.edu](mailto:combita@uw.edu); <https://orcid.org/0000-0001-8523-8998>

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Primary and secondary sexual characters of Mesostigmata are often used in species descriptions and phylogenetic analyses. The use of these characters has been focused almost exclusively on external structures such as the male chelicera and genital plates, while internal structures have only been utilized for lightly sclerotized species. Michael (1890) investigated the internal sexual structures in Uropodina and noted substantial variation among groups in structures such as the endogynium, the shape of which Michael compared to a shoe. There has been little follow-up because of the limitations of microscopy techniques. The use of Micro CT-scanning has allowed us to investigate the internal structure of the female genital chamber in 3-D without laborious dissection and create models to investigate its variability within the group. The aim of our study is to describe the general structure of the female genital chamber of Uropodina and to generate a preliminary estimation of variability among Uropodina with the ultimate goal of using this for descriptive and comparative studies. Based on scans for 42 species examined, the most variable structure concerns the more heavily sclerotized endogynial margins of the female. These structures are well developed in, among others, Trematuridae (*Trematurella*, *Trichouropoda*), Oplitidae, Trichocyllibidae, and Cyllibulidae. In contrast, the “shoe” is absent or very weakly developed in Trachytidae (*Acroseius*, *Afrotrachytes*, & *Trachytes*), Eutrachytidae (*Deraiphorus* & *Loksaphorus*) Diarthrophallidae and Discourellidae. This character distribution suggests that the endogynium evolved within Uropodina. Other notable characters observed include the pair of accessory glands, vagina and sperm storage organ.

**Keywords:** Micro CT-scanning, Sexual dimorphism, functional morphology

### Reference

Michael, A.D. (1890) IV. On the variations of the female reproductive organs, especially the vestibule, in different species of *Uropoda*. *Journal of the Royal Microscopical Society*, 10, 142–152.  
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