



## Adding dimensions to acarology: synchrotron based micro-CT scan and 3D models to study internal morphology in Mesostigmata

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Synchrotron X-ray microtomography (SR-mCT) is a noninvasive technique that has the potential to reduce our knowledge gap on the internal morphology of mites. This technique allows for the creation of three-dimensional representations of organisms and is particularly relevant to taxonomy, evolution, systematics, ecology, and biodiversity. Models can be easily visualized and manipulated in a virtual 3D environment (figure 1), which brings a new perspective on species descriptions and redescrptions. Virtual 3D models that can function as substitutes for types would be easily accessible by users worldwide with no needs to visit a collection or borrow specimens. Here we present a pipeline that has been developed with free software such as FIJI and Drishti (Schindelin *et al.*, 2012, Limaye 2012) at the Ohio State University Acarology Lab. The technique is currently being applied to study the functional morphology of musculature and genital structures of mesostigmatid species in the cohorts Uropodina and Dermanyssina. Additional applications include the development of interactive taxonomic keys and educational tools, the latter being especially useful for the engagement of general audiences.

**Keywords:** Image processing, rendering, biodiversity, outreach, internal morphology

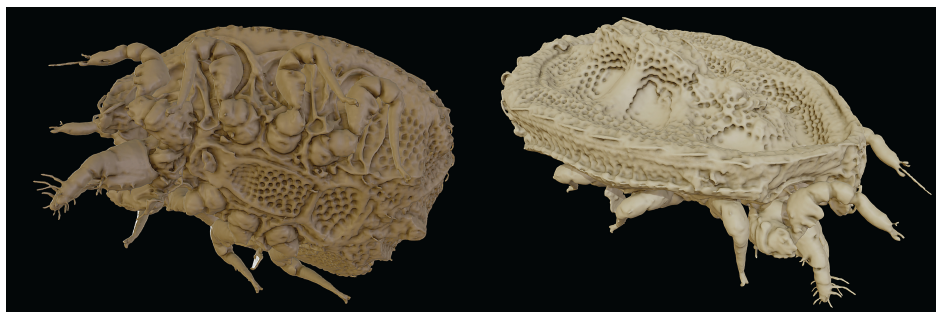


FIGURE 1. *Trachycylliba* sp. Different views of a 3D model generated based on SR-mCT data.

### References

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