Title : Exploring Protozoa in the Intestine and Casts of the African Nightcrawler, *Eudrilus eugeniae* (Kinberg, 1867)

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ABSTRACT

Eudrilus eugeniae (Kinberg, 1867) or African nightcrawler is a tropical earthworm native to West Africa and widely used in vermicomposting due to its rapid growth and efficient organic waste degradation. Its gut hosts diverse microbes, especially protozoa, which enhance decomposition and nutrient cycling. This study aimed to characterize protozoan assemblages in the intestinal tract and vermicast of *E. eugeniae* and to assess their frequency and occurrence. Distinct differences in protozoan diversity and abundance were observed between the intestinal tract of the earthworm and their casts. The intestinal tract contained three dominant ciliate genera including *Anoplophrya*, *Metaradiophrya*, and *Uronema.* In contrast, vermicast samples yielded eleven protozoan taxa, including nine ciliates' genera (*Uronema, Colpidium, Litonotus, Oxytricha, Stylonychia, Uroleptus, Paramecium, Cyclidium,* and *Peranema*), one flagellate (*Acavomonas*), and one rotifer (*Habrotrocha*), the latter exhibiting the highest frequency and abundance. Indicator species analysis identified *Anoplophrya* sp. and *Metaradiophrya* sp. as characteristic intestinal symbionts contributing to substrate breakdown and nutrient turnover. Conversely, *Habrotrocha* sp. dominated

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vermicast, functioning in bacterial grazing and microbial regulation. Notably, *Uronema* sp. occurred in both habitats, suggesting ecological plasticity and potential transmission via defecation. In conclusion, the study demonstrates habitat-specific protozoan assemblages associated with *E. eugeniae,* highlighting their ecological roles in gut function and vermicompost quality control. These findings provide baseline data for understanding earthworm–protozoa interactions and offer practical benefits for optimizing vermicomposting efficiency and microbial management in sustainable waste treatment systems.

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