

Genotyping of putative *Urobenus brasiliensis* Benham, 1886 (Clitellata: Rhinodrilidae) validates geographically clustered cryptic lineages including the type locality population

Marcos Locatelli¹, Sam James², George Brown³, Marie Bartz⁴, Dilmar Barreta¹, and Andrew Forbes²

¹ UDESC-Chapecó, Brazil

² University of Iowa, USA

³ Embrapa Florestas, Brazil

⁴ Universidade Positivo Curitiba, Brazil

Urobenus brasiliensis is an epigeic or polyhumic endogeic earthworm widely distributed in southern and southeastern Brazil. Motivated by the detection of numerous deeply (>10% K2P distance in COI DNA barcode) divergent lineages, we first obtained DNA barcodes and AFLP genotyping from numerous individuals collected in the region. These two data sets agreed broadly on the existence of 4 main genetically isolated geographic clusters designated as north coastal (NC), north interior (NI), south coastal (SC) and south interior (SI), though these are not monophyletic groups and there are deep divergences within the geographic clusters. Morphological characters varied within, not among, clusters. In the second phase we obtained additional individuals from locations previously and not previously sampled, the latter including the type locality of the species. For these we obtained DNA barcodes only, and used those data to determine geographical cluster membership. Type locality specimens were >16% divergent from all other *Urobenus* sampled, including those of the NC geographical cluster within which they fell. Therefore *U. brasiliensis* must be delimited by genetic markers characteristic of the type locality population. We could not detect any reliable means of morphological assignment of individuals to "true" *Urobenus brasiliensis* as opposed to the other genetically defined lineages. The other lineages of *Urobenus* formerly included within the nominal species will be described as new species, pending review of other described *Urobenus* species. We also observed the type material of *Alexidrilus lourdesae* Righi 1971 and designated the genus as a junior synonym of *Urobenus*.