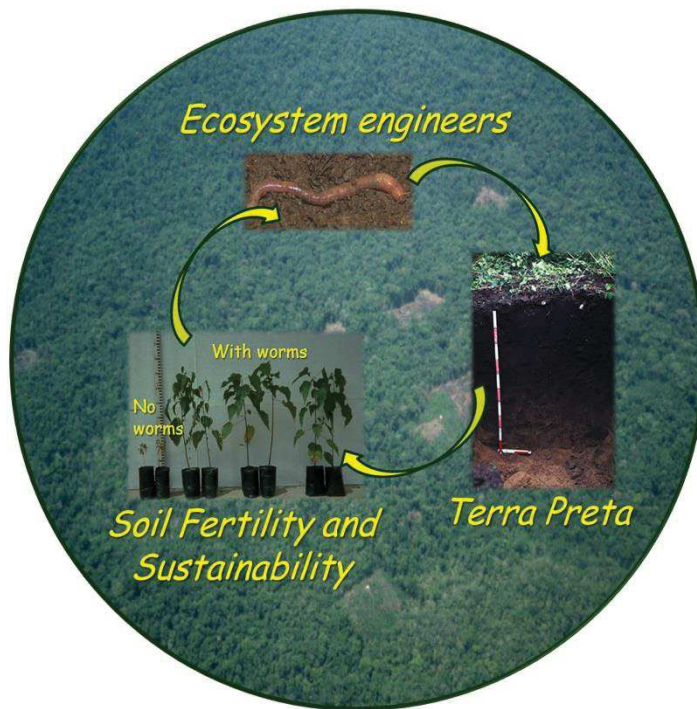


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APOIO:





Local Extinction of Earthworm Diversity in Eastern Amazon Threatens Soil Ecosystem Services

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ABSTRACT - The Belém Endemism Center (CEB), the oldest frontier of Brazilian Amazon, is highly deforested (76%). Forests are fragmented (patches <1,000 ha) within a matrix dominated by degraded pastures and young fallows. Soil macro-invertebrates of the region are largely unknown despite their crucial role in soil ecosystem services provision. This study focused on the effects of soil degradation on earthworm species composition and diversity in the CEB and São Luís island. Climate is tropical humid with a marked dry season and dominant soils are Ultisols. Earthworms were collected from 2007 to 2011 at the end of the rainy season through the TSBF methodology. Four sites were collected in the CEB and one in the São Luís island. At each site young (3-7y) medium (11-15y) and old (20-40y) fallows were sampled, along with forest remnants when present. In addition, other locally relevant soil uses were sampled: pastures (2 sites), agroforestry systems with palm oil (1 site) and chop-and-mulch prepared manioc crop (1 site). A total of 12 genus and 26 morfo-species were identified with an average 7.4 (+/-5.6) species per site. Between-class Principal Component Analysis (BCA) revealed that sites were very contrasted in composition and diversity, site effect accounting for 21% of worm composition and 50% of diversity ($P=0.0001$). Past soil use explained 11% of worm composition and 32% of diversity ($P=0.0001$) while present soil use explained 9.5% of composition and 21% of diversity ($P=0.0001$). Most species were collected in only one site, only *Pontoscolex corethrurus* was present at all sites and *Urobenus sp.* at four sites. In the Tomé-Açu site (Pará State), only *P. corethrurus* was present. The high Beta diversity revealed for earthworms in the CEB reinforces the need for more protected areas while local extinction of native species and *P. corethrurus* invasion threatens the soil ecosystem services provision.