



ELAETAO 3

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### **Earthworm seasonal dynamics and secondary production in a native paddock at La Víbora, Mexico**

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Earthworms were sampled throughout a one-year period in a native-pasture near La Víbora, Veracruz, Mexico. Each month 25 samples (25x25 cm, 20 cm depth) were taken and sorted manually in the field. Earthworms were collected, weighed wet, preserved in 10% formalin and then separated into species and weight classes (Gen. nov.) and re-weighed. Seven earthworm species, six native and one exotic were found. A new Glossoscolecidae species (Gen. nov.) was dominant in numbers and biomass, generally representing >80% of total biomass. Soil moisture and earthworms followed a similar pattern, with maximum values in the mid-end rainy season and minimum at the end of the dry season. Throughout the 7 month dry season (Dec.-June) all earthworms collected were in aestivation, mostly in the clayier B horizon (10-20 cm). In laboratory cultures undertaken over 1 year, Gen. nov. earthworms reached maturity after 120 days and cast production decreased with age, from >6 times their body weight daily for newly hatched individuals, to <1x their body weight when adults. Using field population turnover and laboratory growth data, yearly secondary production calculated using the weight frequency method amounted to 23 g m<sup>-2</sup> with P/B of 3.4, respectively. Yearly surface cast production in the pasture was estimated at 63 T ha<sup>-1</sup> and total cast production (based on laboratory cultures), 252 T ha<sup>-1</sup>. Gen nov. castings had more clay and less silt than the bulk soil and were richer in various elements, especially mineral N. The extra N released in Gen. nov. castings was estimated to be as much 38 kg ha<sup>-1</sup> year<sup>-1</sup>. The amount of C and N recycled in Gen. nov. tissues, on the other hand, was low (<0.01 T ha<sup>-1</sup>), although the amount re-circulated internally in mucus was much higher (several T ha<sup>-1</sup>). Therefore, Gen. nov. earthworms appear to play an important role in the nutrient cycling processes, which may have important consequences for plant production in this nutrient-poor tropical pasture system.