Earthworm populations in native forests with *Araucaria angustifolia*, Araucaria and Pine plantations in Brazil

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Native Araucaria forests are a highly fragmented and endangered ecosystem belonging to the Atlantic Forest biome, a global biodiversity hotspot. Only approx. 3% of the original extent remains, and the dominant species of this forest, *Araucaria angustifolia*, is on the red list of Brazilian endangered species. During the 1940's, 50's and 60's, the National Forest system established plantations of both *Araucaria* and *Pinus elliottii* in various sites throughout S and SE Brazil, seeking to reduce environmental degradation and promote the recovery of Araucaria forests.

The present study was undertaken to assess earthworm populations in these planted forests, compared with native Araucaria forests in four National Forests: Três Barras, Irati, Piraí do Sul and Capão Bonito. In each National Forest, three plots of each plantation (Araucaria and Pine) and three of native forest were selected, and earthworms sampled using: A) handsorting of five 40x40x20 cm soil blocks and B) 5-L of dilute formol sprinkled over five 50x50 cm quadrats. Formol and handsorting samples were <5 m from each other. In addition, worms were qualitatively collected in various niches in each ecosystem (i.e., under logs, moss, rocks, in soil, bromeliads, surface litter, etc.). Soil samples were taken from each block and analyzed physico-chemically. Earthworms were counted, weighed and identified to species level, whenever possible. Twelve species were found overall, 4 of them new to science. In all but 3 cases, formalin expulsion resulted in much lower earthworm abundance, confirming that handsorting is a more efficient collection method. Furthermore, handsorting also extracted a greater diversity of species. Highest abundance was found in Capão Bonito (121-416 indiv. m^2; 6-42 g m^2), mainly due to large numbers of peregrine *Pontoscolex corethrurus*. In Irati and Três Barras, abundance in all systems was <60 indiv. m^2 (biomass <27 g m^2), while in Piraí do Sul, it ranged from 0-144 indiv. m^2 (biomass 0-56 g m^2). At all sites except Capão Bonito, significant differences in earthworm abundance between ecosystems were detected with handsorting, with higher abundances generally present in Araucaria plantations, followed by native forests and lowest in Pine plantations. This may be due to negative effects of accumulated Pine needles on the surface and changes in soil properties, as well as to the generally less diverse vegetation cover in these plantations compared with the other ecosystems.