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Cold and hot extraction for enchytraeid abundance estimation in a fragment of mixed Araucaria forest in Brazil

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Enchytraeids (Enchytraeidae, Oligochaeta) are found worldwide in soils where there is sufficient moisture and organic matter, however, information on their diversity, biology and ecology are still very scarce in tropics and subtropics. Enchytraeids are extracted from soil samples with wet-funnel based methods, with or without heat, in temperate climate zones. The ISO guideline 23611-3 describes a simple cold wet extraction for enchytraeids. Our experience with this method in a subtropical zone in Brazil has shown frequent high mortality during the extraction process, which is critical for the determination of abundance and diversity. Therefore, we tested hot and cold extraction methods with soil samples collected in a fragment of Mixed Araucaria Forest in Colombo City, Brazil, in two occasions between September and November, 2011. We compared the enchytraeid abundance estimated by cold and hot extraction based on ISO 23611-3 guideline using soil cores of 7 cm of depth x 5.1 diameter. The period for cold extraction was 67 hours in a room cooled to 17°C and hot extraction was performed for 3 hours in a hot enchytraeid extraction device with adapted funnels and lamps. The extracted worms were immediately counted and the percentage of damaged worms was also recorded. Healthy worms were kept in a Petri dish with a thin layer of sediment and water from the extraction process in a cooled room and identified to genus level on the following 3 days. The first sampling resulted, in average, ca. 12,000 enchytraeids per square meter (sqm) extracted by hot or cold method, coefficients of variation (CV) of 67 and 105% respectively. The second sampling resulted in statistically more enchytraeids by hot (11,565 sqm) than cold (6,119 sqm) method, CV of 44% and 60%. Cold method showed 11% of damaged worms after extraction process in the two occasions. Furthermore, most of the worms were dead on the following day and identification was restricted to only 6% of the cold extracted worms. In contrast, the viability of the worms extracted by hot method was generally good even 3 days later. The genera *Achaeta*, *Enchytraeus*, *Fridericia*, *Guaranidrilus* and *Hemienchytraeus* were found. At least two more samplings will be performed in the same area to confirm the advantages and disadvantages of hot and cold methods of enchytraeid extraction.