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OPTIMIZING METHODS FOR DUNG BEETLES SAMPLING IN NATIVE AND INTRODUCED PASTURES IN BRAZIL

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In this study, we investigate whether the choice of baits (isolated or combined) and sampling times influences the taxonomic and functional diversity (FDis - functional dispersion and FRic - functional richness) of dung beetles in pastures. We sampled dung beetles in July 2011 (dry season) and January 2012 (rainy season) in four areas of native pastures and four areas of introduced pastures in Aquidauana, Mato Grosso do Sul, Brazil. To collect the insects, we used pitfall traps baited with carcass, cattle dung and human feces. Each bait was repeated 192 times for each pasture type, in rainy and dry season. We considered the dataset of all the baits together as a control. We analyzed four functional traits: nesting behavior, diet preference, breadth of diet and body size. We sampled 7,086 individuals belonging to 32 species. In both pasture types, traps baited with human feces and control captured the highest abundance (Native: $\chi^2_{(3,122)} = 166.85$, $P < 0.001$; Introduced: $\chi^2_{(3,122)} = 91.40$, $P < 0.001$), species richness (Native: $\chi^2_{(3,122)} = 206.13$, $P < 0.001$; Introduced: $\chi^2_{(3,122)} = 148.22$, $P < 0.001$) and functional diversity; Native: FDis ($F_{(3,122)} = 10.53$, $P < 0.001$) and FRic ($F_{(3,122)} = 110.99$, $P < 0.001$), introduced: FDis ($F_{(3,122)} = 17.94$, $P < 0.001$) and FRic ($F_{(3,122)} = 55.71$, $P < 0.001$). In both pasture types, the species richness (Native: $F_{(1,30)} = 46.96$, $P < 0.001$; Introduced: ($F_{(1,30)} = 36.22$, $P < 0.001$)) and functional diversity; Native: FDis ($F_{(1,30)} = 5.18$, $P = 0.03$) and FRic ($F_{(1,30)} = 30.96$, $P < 0.001$); introduced: FDis ($F_{(1,30)} = 97.59$, $P < 0.001$) and FRic ($F_{(1,30)} = 49.29$, $P < 0.001$) was higher in the rainy season. Our results demonstrate that sampling dung beetle with human feces or "control" in the rainy season is the best sampling method in the Brazilian pastures.

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