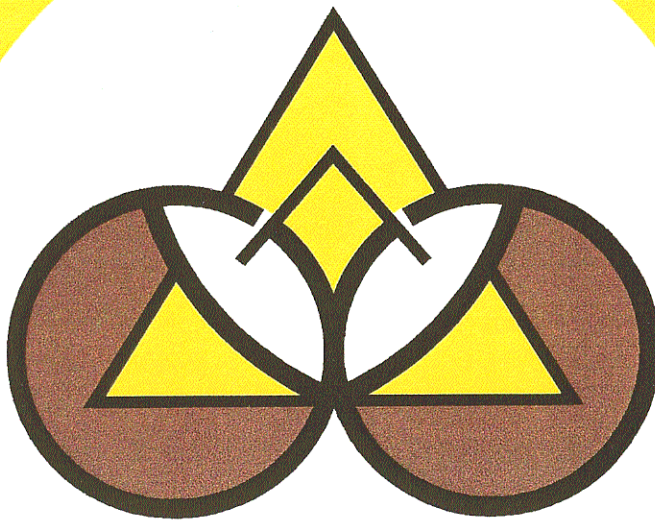


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Estimating ground ant and termite species richness in subtropical forests of Argentina

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Due to their ecological dominance and relative ease of collecting, ants and termites are material of choice for the assessment of species richness (S) patterns. The main aim of the present study was to explore how to obtain ant and termite richness measures that are comparable between sites with a particular emphasis on spatio-temporal variations of the S measure. We based our work on standardized sampling protocols for ants (A.L.L. protocol, 190m long line transects with 20 sampling points: 1 leaf litter + 1 pitfall trap + 1 soil sample per sampling point) and termites (London N.H.M. protocol, 100m x 2m belt transect divided in 20 contiguous sections). Three combined ant and termite transects were conducted in two subtropical forests of northern Argentina. The various collection methods were species-selective, especially for termites. The Winkler extraction of the leaf litter fauna yielded 82% of the ant species collected by the three other methods. We will focus on that method here. The effect of spatial scale on ant species richness measure was investigated by oversampling 8 times one of the A.L.L. transects: 160 1m² quadrats were collected at 1.25m intervals. Spatial scale was decomposed into the distance between sampling points (D, ranging between 1.25 and 200m) and the number of samples collected (N, ranging between 1 and 160). S was strongly positively correlated with N. For a given N, S initially increased with D but reached a plateau for distances over 10m. The S measure obtained with a typical A.L.L. transect placed within this calibration transect could range between 27-33 species with an average of 29.9 representing less than 44% of all species present within the 160 m². One A.L.L. transect per site was replicated at 9-12 months interval. Temporal variations of S were high (29-40%), but could be buffered by adjusting the samples to a common number of species occurrences (rarefaction method). In conclusion, because of the numerous rare species, a standardized A.L.L. transect only reveals a small fraction of the locally present species. For a given sampling effort, increasing the distance between sampling points does not necessarily maximizes S. Although many rare species are missed, one transect may give a fair image of common, dominant, species. According to the shape of the species-area curve, it appears that 3 transects are probably still insufficient to estimate reliably the total species richness of the habitats investigated. In addition to standardization of sampling protocols, rarefaction methods appear useful to buffer against temporal variations of S when comparing species richness values among sites.