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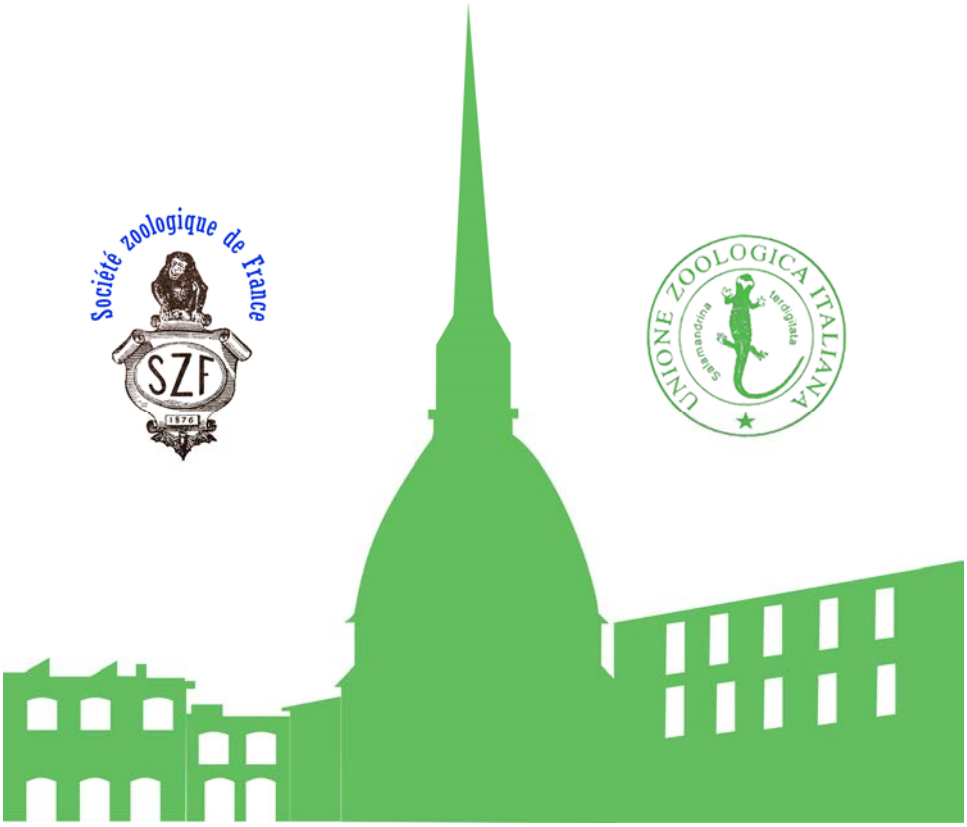
The evolution of animal diversity: a comparative approach

Abstract Book



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Abstract Book

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THE EFFECT OF DUNG BEETLE DENSITIES ON MULTIPLE ECOSYSTEM FUNCTIONS PROVIDED BY SMALL AND LARGE TUNNELER SPECIES

Over the last few decades, rapid biodiversity loss has emphasized the need to understand how species abundance and diversity affect the provisioning of ecological processes. Previous studies have shown that both species abundance and diversity might be necessary for the maintenance of natural ecosystem functioning. In this study, we examine how different densities of a specific group of insects – beetles feeding on cattle dung – affect multiple ecological functions. Specifically, we targeted two dung beetle species representatives of small and large tunnelers species: *Onthophagus illyricus* (Scopoli, 1763) and *Copris lunaris* (Linnaeus, 1758). We investigated the effect of densities on dung removal, seed dispersal and germination. In accordance with natural abundance, we spanned densities from 10 to 90 individuals for the small tunneler and from 2 to 8 for the large one. We have found that, increasing the beetle densities, the large dung beetle species increased the provisioning of all the functions investigated. Contrarily, higher densities of the small tunneler decreased the efficiency in dung removal and did not facilitate germination and seed dispersal. Our findings suggest that small dung beetles at higher densities within the same dung pat competed for the resource and did not remove dung for the nest (i.e. no transportation of dung into soil). On the other side, despite the intraspecific competition at higher densities, large beetles transported dung into soil to construct the nest and, in doing this, they facilitated both seed dispersal and germination. In conclusion, the provisioning of ecological functions depends on densities and sizes of the tunnelers investigated and large species at higher densities perform better than small ones. Given that extinction probability is size-dependent and large species are more prone to extinction than small ones, our results suggest that management measures for the conservation of large dung beetle species should gain priority.

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