Can fruit handling by birds affect secondary diaspose removal? An experimental view in campo rupestré

João Vitor S. Messeder1*, Lisieux F. Fuzessy1, Roberta L. C. Dayrell1, André J. Arruda1, Fernando A. O. Silveira1, Tadeu J. A. Guerra1

1. Departamento de Botânica, Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, Minas Gerais, Brasil. *Correspondence to joao_vitor_messeder@hotmail.com

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The way frugivores handle diaspores and where they deposit them can directly affect seed fate, including both patterns of predation and secondary seed dispersal. These effects remain unclear for tropical grassland species, such those found in campo rupestré ecosystems in south-eastern Brazil. Here we present results from a field experiment to evaluate the effects of handling by birds and dispersal distance on the removal rates of diaspores of Miconia irwinii (Melastomataceae). We conducted a randomized block factorial experiment varying the way handled diaspores are dropped on the ground by avian frugivores (cleaned seeds, seeds embedded in bird feces, within beaked fruits, and within intact fruits), varying the distances (below parent plant and 25 meters distant), and varying the accessibility to vertebrate (exclusion and open access). We established 12 removal stations for each treatment and monitored diaspoare removal during 48 hours. The removal of seeds was low with no significant differences between the treatments. For fruits, we found higher removal rates underneath the parent plants, but no differences between other treatments. We also conducted focal observation on diaspores and found 16 species of ants interacting with them. The ants Camponotus rufipes, Cephalotes pusillus, and Pheidole radoszkowskii were the most frequent species. The former was the most frequent in seed removal events, dispersing seeds to a maximum distance of three meters. However, ant species that preferred seeds in bird feces are mainly interested in feces instead of seeds, acting as seed dispersers, whereas some other ant species were clearly interested in cleaned seeds, being considered as predators. Ants were the most important group in secondary removal of seeds. However, we also recorded footprints in sand stations indicating that vertebrates such as lizards, birds and small mammals could also be involved in removal of seeds.

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