



Review: Ants and Plants

Reviewed Work(s):

Ant-Plant Interactions in Australia by Ralf C. Buckley
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comprehensive framework of rigorous models of the evolution of interacting species that can be used to predict the results of coevolution given a specific set of ecological conditions.

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ANTS AND PLANTS

Buckley, Ralf C. (ed.). 1982. **Ant-plant interactions in Australia**. Geobotany 4. Dr. W. Junk Publishers, The Hague, Netherlands. ix + 162 p. \$54.50.

Ants are a greater proportion of the seed movers and consumers in Australia than in any other large land mass. Buckley's editing and writing provide a long and detailed review of what we currently know of ant-plant interactions in Australia (10 of the 11 chapters) and the world (1 large chapter), with an appendix thorough bibliography of the ant-plant literature of the world. The chapters vary from quite descriptive and very specific to a brave multi-faceted dive by Westoby and others into the quagmire of the question: why are so many Australian (and arid South African) sclerophyll plants myrmecochorous? This inquiry is the most intriguing part of the book. It is a rough model of how to carefully wend ones way into the suite of potential and actual selective pressures that generate a "single" habitat-level trait. The primary conclusion (hypothesis) is that the low phosphorous soils of Australian sclerophyll habitats lead to myrmecochory because attracting ants is cheap in phosphorous expenditure. This conclusion is, however, puzzlingly contradicted in the same chapter by the statement that "When phosphorus is the currency, it is therefore dispersal as a whole that is cheap compared to lack of dispersal, rather than myrmecochory that is cheap compared to other methods of dispersal." It also needs to be added for the development of this hypothesis that habitats with poor soils tend to be low in productivity of insects as well as other kinds of vertebrate food, thus rendering them poor in biomass of birds, rodents and other potential animate evolutionary alternatives to ants as dispersal agents. Coupling this observation with one of the paucity of major animal groups in Australia suggests that if, for example, heteromyid rodents were to be added to Australia, the eventual evolutionary equilibrium might well not disproportionately favor ants as dispersal agents.

Ants appear to be *the* seed predators in Australian arid land habitats (though one wonders how their seed consump-

tion compares with what the billions of budgerigars eat (ate) in the outback). The authors appear to be in strong consensus that this trophic assault by ants has been evolutionarily generated by the availability of enormous numbers of seeds (especially of annuals) in dry storage in arid-land soils, which fluctuate in absolute amount much less than do the vegetative parts eaten by herbivores. Understanding the impact of the ants on this soil seed bank (and therefore on the adult plant community properties it will generate) has been poked at both observationally and experimentally. However, it is obvious that the time is ripe for extensive and varied ant exclusion experiments coupled with measurements of the size of the soil seed bank as viewed by the ant colony rather than by the shovel. A major part of the analysis of the intensity of ant seed predation in Australian arid lands reported in this book is seriously weakened by the technical error of correlating ant activity with the seed bank of the top 4 cm of the soil when virtually all ant foraging for seeds occurs within the top 4 mm of the soil surface.

Buckley's thorough litany of ant-plant interactions around the world reminds us once more that ants interact with plants in almost every conceivable manner. However, I take exception to the assertion that ants do not parasitize plants. Not only are there numerous parasites of ant-plant mutualisms, but leaf-cutter ants (Attini) are parasites of plants under any definition of the word.

This book and the recent papers it cites are essential reading for anyone probing animal-plant interactions in general, and ant-plant interactions specifically. Today's beginning evolutionary biologists-ecologists-field naturalists are ever so fortunate to have multi-authored synthetic and analytic reviews of choice topics, such as this book is, to start them out in the library and field. However, they need view the opportunity as vicarious participation in a discussion, not as possession of a description of a mature art.

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