
Conservation and Ecosystem Services

Estimation of benefits and losses of seed scatter hoarding behaviour by rodents in a subtropical forest: implications for the evolution of mutualism in seed-rodent systems

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Seed hoarding behaviour of rodents plays an important role in seed dispersal and seedling regeneration of trees, as well as for the evolution of mutualism between trees and rodents in forest ecosystems. There are two opposite views on why rodents adopt a scatter-hoarding strategy: the pilferage avoidance hypothesis predicts that the cache pilferage rate should be very low to ensure benefits of cache owners, while the reciprocal pilferage hypothesis has an opposite prediction. Because it is difficult to identify seed hoarders and pilferers under field conditions by using traditional methods, the full costs incurred and benefits accrued by scatter-hoarding have not been fully evaluated in most seed-rodent systems. Our study aimed to test the two hypotheses at individual level under field conditions. By using infrared camera tracking and seed tagging methods, we investigated the comprehensive benefits and losses of scatter-hoarded *Camellia oleifera* seeds for three sympatric rodent species (*Apodemus draco*, *Niviventer confucianus* and *Leopoldamys edwardsi*) in a subtropical forest of Southwest China 2013-2015. We established the relationships between the rodents and the seeds at the individual level. For each rodent species, we calculated the cache recovery rate of cache owners, as well as conspecific and interspecific pilferage rates. We found all three sympatric rodent species had a cache recovery advantage (recovery rates > 50%) with rates that far exceeded average pilferage rates (<10%) over a 30-day tracking period. The smallest species (*Apodemus draco*) showed the highest rate of scatter-hoarding and the highest recovery advantage compared to the other two larger species. Across species, rates of scatter-hoarding and benefits were positively correlated with each other. Hence species having higher scatter-hoarding preference had higher competitive ability for seeds. Our results suggest that scatter-hoarding benefits the cache owners more in food competition, not the cache pilfers, supporting the pilferage avoidance hypothesis.

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Jens Jacob, Jana Eccard (Editors)

6th International Conference of Rodent
Biology and Management
and
16th Rodens et Spatium

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Book of Abstracts



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