Conservation and Ecosystem Services

Seed size effects on seed dispersal and predation by rodents at tree individual level

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Seed predation and dispersal by scatter-hoarding rodents play an important role not only on the seedling regeneration of trees, but also on the spatial distribution and structure composition of the whole forest communities. Both seed size and seed density have been found significantly affect the foraging preferences of rodents, which in turn influence the seed fates themselves. Current studies focusing on how seed size and seed density affect foraging behaviour of scatter-hoarding rodents mainly target one of two scales of comparison: the species scale, with comparisons of dispersal and predation of seeds from multiple species; or the individual seed scale, with comparisons among individual seeds from the same species. Even though individual variation in reproductive success within populations is a key component of evolutionary fitness, variation in seed dispersal and predation at the scale of individual trees is poorly understood. Our study asks how variation in seed mass and number among tree individuals affects the behaviour of animal dispersers and in turn the fitness of the trees. We first surveyed intraspecific variation in seed production of two *Fagaceae* tree species in a natural subtropical forest in south-western China. We then investigated how this variation affects seed predation and dispersal by scatter-hoarding rodents, which were the primary seed dispersers/predators. We weighed and then followed the fate of 11,618 seeds from 54 tree individuals to determine their survival and, if they survived, the distance they were dispersed. Our results showed a large variation of seed production among individuals in both tree species, including number of seeds, mean seed mass, the coefficient of variation (CV) of seed mass. The total number of seeds, the CV of seed mass and the crown size significantly affect the seed fates among tree individuals, but their effects differed between tree species.