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EXTENDED CONDITIONAL PERSISTENCE OF PLANTS FROM FRUGIVORE-MEDIATED SEED DISPERSAL

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Seed dispersal is the movement of seeds away from parent plants, and is a crucial ecological process for plant reproduction, persistence and spatial distribution. Specific interest in frugivorous seed-dispersal has increased due to its importance for plant temporal and spatial dynamics under global change. Empirical studies confirmed that the interaction between fleshy-fruited plants and frugivores is mutualistic and could be fully beneficial for both partners provided that the dispersal cost is low. The animals benefit is quite obvious (food) while the plants benefit is seed dispersal leading to reduced level of plant aggregation among other benefits.

In this talk we will present a process-based mechanistic model of frugivorous seed-dispersal that captures the dynamics of the global and local densities of plants and the density of frugivores. The model considers three essential components of frugivorous seed-dispersal, including the strength of plant-frugivore mutualistic interaction, dispersal efficiency of frugivores and germination probability of seeds. The model is based on pair approximation method. Results show that efficient frugivorous animals allow conditional persistence of plants with low fecundity and natural dispersal ability and reduce the level of plant aggregation. Otherwise, inefficient animal seed-dispersers, with high dispersal risks, will act as seed predators, leading to global extinction of plants. Significantly, our results provide broad theoretical evidence for the paramount importance of the existence of frugivore species in tropical forests.

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