Advancing an interdisciplinary framework to study seed dispersal ecology

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**Abstract**

Although dispersal is generally viewed as a crucial determinant for the fitness of any organism, our understanding of its role in the persistence and spread of plant populations remains incomplete. Generalizing and predicting dispersal processes are challenging due to context dependence of seed dispersal, environmental heterogeneity, and interdependent processes occurring over multiple spatial and temporal scales. Current population models often use simple phenomenological descriptions of dispersal processes, limiting their ability to examine the role of population persistence and spread, especially under global change. To move seed dispersal ecology forward, we need to evaluate the impact of any single seed dispersal event within the full spatial and temporal context of a plant’s life history and environmental variability that ultimately influences a population’s ability to persist and spread. In this perspective, we provide guidance on integrating empirical and theoretical approaches that account for the context-dependency of seed dispersal to improve our ability to generalize and predict the consequences of dispersal, and its anthropogenic alteration, across systems. We synthesize suitable theoretical frameworks for this work and discuss concepts, approaches, and available data from diverse subdisciplines to help operationalize concepts, highlight recent breakthroughs across research areas, and discuss ongoing challenges and open questions. We address knowledge gaps in the *movement ecology* of seeds and the integration of *dispersal and demography* that could benefit from such a synthesis. With an interdisciplinary perspective, we will be able to better understand how global change will impact seed dispersal processes, and potential cascading effects on plant population persistence, spread, and biodiversity.

Read the article in *AoB Plants* [1]

**Associated Project:**
Seed Dispersal [2]

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