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Fluctuating resources, disturbance and plant strategies – mechanisms underlying plant invasions

Ian J. Radford

Abstract

The fluctuating resource hypothesis for plant invasions is an important contribution to invasive plant literature. The hypothesis seeks to identify unifying mechanisms underlying plant invasions, particularly in terms of fundamental plant resource availability (e.g. water, nutrients) and disturbance, and thus provides a potential framework for understanding disparate global invasions. But do all invaders respond similarly to fluctuating plant resources and disturbance, or are the underlying mechanisms diverse? I address this question using case studies conducted in temperate subalpine grasslands in New Zealand and dry tropical savannas in Australia. In each case study, invader and resident species functional profiles were compared in terms of their responses to changes in resource availability and disturbance regimes. Both studies found that invaders had different functional response profiles to resident native species. However in addition, invader groups differed from one another in terms of their functional responses. What this suggests is that plant invaders do not generally benefit in the same way from changes in resource availability or disturbance regimes. In fact, different invader groups (e.g. grasses, legumes, forbs) respond quite differently. This suggests that invader responses to changed resource availability and disturbance regimes will be inherently unpredictable under global change scenarios. The most useful predictions are likely to be made for particular invader functional groups and within particular environmental contexts.