Comparing Weed Vigour in Indigenous and Non-Indigenous Environments

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An often observed phenomenon is that invasive plants appear to grow more vigorously in their introduced range compared to conspecifics growing in their native range. Indeed, such increases in the vigour of weedy species are a central premise of biological weed control: freedom from natural enemies facilitates the ‘uncontrolled’ growth and population expansion of introduced species. Implicit in this scenario is the assumption that plastic phenotypic responses to changes in key environmental variables are responsible for the increased vigour, although this has been investigated experimentally only rarely. We present data from an experiment aimed at testing the hypothesis that the increased vigour of invasive plants results from a plastic response to a relatively benign environment, free of co-evolved natural enemies. Four species native to Britain and continental Europe but non-indigenous invaders of Australia and New Zealand were grown in a common experimental garden from seeds sampled in both the indigenous and non-indigenous distributions of the species. If the apparent vigour of non-indigenous samples was a plastic response to a novel environment, we expected that the growth of these samples would not differ from their indigenous conspecifics when grown in the same environment. Preliminary analyses suggest that the growth of indigenous and non-indigenous samples does not, in general, differ significantly, thereby supporting the ‘benign environment’ hypothesis. We discuss the results of this experiment and its implications for biological weed control.