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Research on invasive-plant traits tells us a lot

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In a recent *TREE* Letter, Thompson and Davis [1] argued that both successful alien and successful native species are those with the good fortune of having the suite of traits that enables them to exploit our disturbed and eutrophic landscape. We think that this is an attractive and logical idea that clearly deserves more attention. However, we do not agree with their conclusions that this would imply that the alien–native distinction might not be very important, and that research on traits of invasive plants tells us very little [1].

We agree with Thompson and Davis [1] that it is likely that many successful native and successful alien species share the same traits. This idea has been suggested several times before for plants [2–4] and also for animals [5]. However, these previous papers did not bring up explicitly the novel argument that, owing to global change, both alien and native plants grow in novel environments. So far, there have been few empirical tests of this idea [2,5] and, consequently, there is no justification yet to conclude that the native–alien distinction is not important.

Many studies testing for traits associated with the invasiveness of plants compared invasive species with native species [6,7]. Interestingly, many of these studies found trait differences, despite the fact that the native comparators might also be considered successful, either at home or elsewhere in the world, in many cases [4]. Therefore, we would caution against ignoring the native–alien distinction in future. Rather, we recommend that future studies should explicitly test whether successful natives and successful aliens share the same set of characteristics that distinguish them from unsuccessful natives and aliens.

We think that the conclusion conveyed by the title of the Letter of Thompson and Davis (i.e. that research on traits of invasive plants tells us very little) is incorrect and, if it finds wide acceptance, could have negative implications for future research in invasion biology. Considerable progress has been made in the search for traits of invasive species [6,7], particularly owing to the larger availability of databases on traits and invasiveness of species, progress in meta-analysis, large multi-species experiments and the availability of methods to incorporate phylogenetic non-independence of species. To conclude that this research tells us very little does not do justice to these recent advances, and ignores its importance for the development of screening protocols for the potential invasiveness of alien species considered for introduction [8].

Interestingly, Thompson and Davis do not present any support for their provocative conclusion. On the contrary, they point out that research has shown that invasive plants are frequently characterized by traits such as fast growth, short generation time and fast germination. It remains to be seen whether this 'live-fast, die-young' trait syndrome [9] is the key to long-lasting global success, and whether it holds both in eutrophic anthropogenic landscapes and in more pristine natural habitats, where novel traits might be advantageous [10]. Moreover, trends in plant introductions and the traits of introduced alien species can change markedly over time [11], so that successful invaders in the future might not always resemble those of the present day. Clearly, this means that more research on traits of current and potential future invaders is required. The fact that Thompson and Davis [1] are able to highlight the trend for globally successful invasive plants to have certain traits clearly demonstrates that such research does tell us a lot.

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