

Accidental biocontrol: human-mediated dispersal of insect parasitoids and predators.

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Globalization of human activities has increasingly facilitated the spread of alien species. Insects are among the most numerous and damaging aliens, with widespread impacts on biodiversity, agriculture, and human health. Classical biological control of alien species involves introducing ‘natural enemies’ from their native range to control their population. Current selection processes for biocontrol agents are rigorous, and generally based on host-specificity. However, parasitoid and predatory species are also increasingly introduced accidentally through human-mediated dispersal. Such random introductions may favour generalists that establish more easily due to their broad host range, which could have considerable impacts for both alien and native species. We used a large dataset of border interception records in the United States of America from 1913 to 2019 to assess the human-mediated transport of parasitoid and predatory insects. 94 families of ‘natural enemies’ were detected, with 193 species identified. The insects largely arrived with various plant products, but commodity associations differed between taxa. 12 parasitoid species that are not yet established in the USA either have hosts established there, or also detected at the border. 90 % of intercepted predator species are generalists, making it likely that suitable prey is available. Furthermore, ten of the ‘natural enemy’ species arriving in the USA are listed as invasive species. The surprisingly extensive transport of ‘natural enemy’ species calls into question the rigorous and protracted processes for classical biological control. The insects detected could have significant impacts, both positive and negative, if they eventually become established.