Plants creeping to the north are more pest-resistant

As Europe gets warmer, plants from the south are migrating northwards into previously cooler habitats. New research from the Netherlands demonstrates that plant species from river areas which have extended their habitat range into northern Europe are better protected against pests than closely related native species. The findings help to better assess the ecological consequences of climate change.

As the climate changes, a number of plant species are naturally invading new habitats as these habitats become warmer and better suited to colonisation. The research compares the responses to pests of migrating riverside plants from southern regions of Europe with native northern European plants of the same family.

Plants compared included plants from the genus *Angelica* (a group of herbs, including parsley), *Artemisia* (a group including tarragon), *Centaurea* (a group including knapweed and cornflowers), *Senecio* (a group including ragwort and groundsel) and the herb solidago or goldenrod. The research found higher levels of ‘phenolic compounds’, a form of natural pest defence, in plants expanding into new ranges than in native species.

The study also found direct evidence that the southern migrant species suffered less damage from insects. Locusts, for example, reduced the volume of the native species by 38.7 per cent, whereas invasive species lost just 17.3 per cent. Locusts are a pest new to both the native and migrant species of plant studied. It was assumed that both types of plant would suffer equally from the impacts of the pests. Migrant plants also developed fewer root diseases than their native relatives. However, aphids, which eat a wide range of plants, had the same effects on both types of plant.

Rapid expansion in a range and the loss of natural enemies which help keep populations under control are key features of invasive species, whether European natives that are expanding their range or introduced exotic species. These migrant species appear to experience less control from above ground enemies, such as herbivores, or below ground enemies, such as soil-based microbes, than their native counterparts. This may indicate that plants that are able to successfully expand their range interact differently with pests than their native counterparts or possess superior defence traits.

Future studies might also consider whether changes in habitat that result from climate change make native species more susceptible to pests and less robust. Further research is needed into the defences of species such as trees and dry land plants to investigate whether they have similar responses. A better understanding of range-expansion is key to those involved in habitat management, conservation of biodiversity in temperate and northern latitudes and climate change modelling.


Contact: w.vanderputten@nioo.knaw.nl or t.engelkes@nioo.knaw.nl

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Additional information: LIFE has co-financed a number of projects targeting several restricted range endemic plant species that might be affected by climate change. For more information view the LIFE Focus brochure "LIFE and endangered plants - conserving Europe's threatened flora": http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/plants.pdf