

Biological traits and reproduction of two emerging alien lianas in Southern Switzerland

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Background and Aims

The two ornamental Asian lianas *Fallopia aubertii* and *Reynoutria* (Syn. *Fallopia*) *multiflora* (Polygonaceae) currently appear in an early spread stage in southern Switzerland. Our main goal is to increase our understanding of the functional traits associated with their establishment and spread, thus providing crucial information for risk assessment on invasiveness and management strategies. Specifically, we investigated aspects of their spread status, morpho-anatomy, reproduction strategy and phytopathology.

Methods

Both species were documented in the field for taxonomic identification and phytopathological symptoms. Root and stem samples were analyzed with high-resolution imaging and morpho-anatomical sectioning. Seed germination and resprouting of stems, root tubers and roots were tested. Samples of plant parts with rust fungus (Puccinales) infection-like symptoms were morphologically and genetically analyzed.

Results

Most stands previously attributed to *F. aubertii* were identified as *R. multiflora*, previously unknown in Switzerland. Most stands derive from garden waste deposits. The two liana species can be differentiated by their leaf arrangement and morphology, inflorescence structure, and flower morphology and size. Root tubers occur only in *R. multiflora*. While *R. multiflora* seeds are viable (41%), tests confirmed non-viability of *F. aubertii* seeds. Stems of both species were similarly able to resprout (60%), not so roots and root tubers (0%). A rust fungus, currently unknown from Europe, was identified and corresponds to *Puccinia muehlenbeckiae*.

Conclusions

Our study is the first to comparatively investigate distributional, taxonomic and biological aspects of *F. aubertii* and *R. multiflora* in their alien range. Although these lianas can cover relatively large areas by in-situ horizontal vegetative growth, the only few (not seed-borne) stands suggest that spread to new sites currently depends on dispersal of vegetative fragments. Our results on root and root tuber morpho-anatomy are consistent with published molecular phylogenetic relationships. Finally, the discovery of a rust fungus new to Switzerland highlights the importance of studying alien species as potential reservoirs of plant pathogens.

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