

Environmental drivers and (biological) control of invasive ragweed populations across Europe

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Background

The continued spread of the invasive common ragweed, *Ambrosia artemisiifolia*, in Europe, is a growing problem for human health and agriculture. Climate change is expected to aggravate it even more. Within the European Research network SMARTER "Sustainable Management of *Ambrosia artemisiifolia* in Europe", we take a demographic approach to assess the efficacy of alternative management options across the European continent, and on the long term.

We especially focus on the potential for classical biological control by exotic herbivorous insects from the native range of the plant.

Objectives

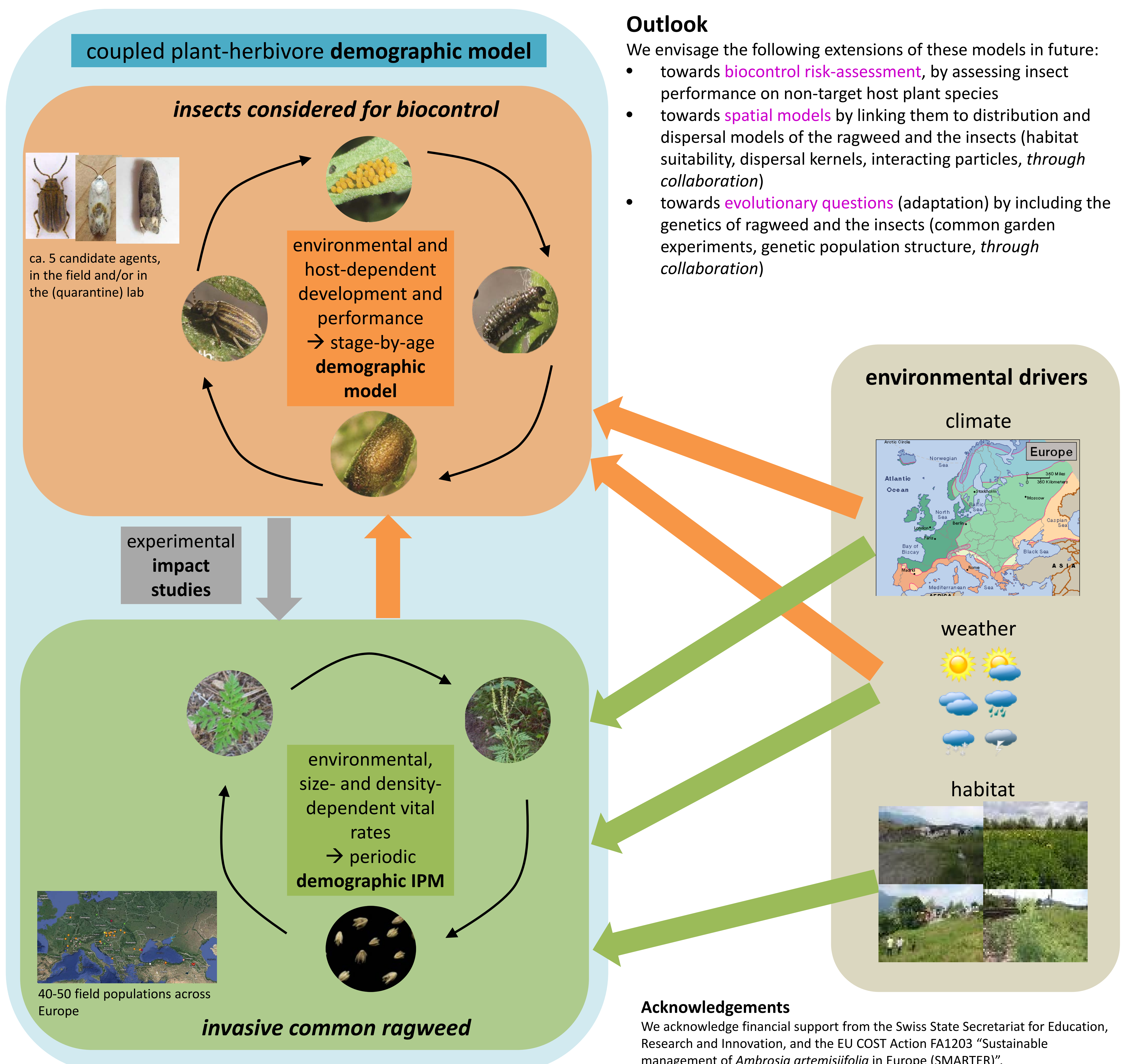
We develop demographic models of

- the **ragweed** to understand the environmental drivers of spatial and temporal variation in local ragweed dynamics (factors: climate, weather, habitat)
- herbivorous **insects that are potential biocontrol agents** to describe their environmental-dependent development and performance (factors: climate, host plant)
- the combination: reciprocal density-dependent **plant-herbivore dynamics** to project the potential long-term impact of these different potential biocontrol agents on ragweed

Outlook

We envisage the following extensions of these models in future:

- towards **biocontrol risk-assessment**, by assessing insect performance on non-target host plant species
- towards **spatial models** by linking them to distribution and dispersal models of the ragweed and the insects (habitat suitability, dispersal kernels, interacting particles, *through collaboration*)
- towards **evolutionary questions** (adaptation) by including the genetics of ragweed and the insects (common garden experiments, genetic population structure, *through collaboration*)



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