

Is the noxious *Ambrosia artemisiifolia* L. going to invade Belgium?

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Why study this species?

Ambrosia artemisiifolia L. is an invasive species from North America, causing an health crisis in Europe due to its highly allergenic pollen. First traces of the species in Europe were recorded in the 18th century, and it is now invasive in more than 20 countries. This invasion have a strong cost for governments: in highly invaded areas, more than 20 million euros are annually spend in health costs.

The situation in western Europe

In France, there is a zone where the *A. artemisiifolia* populations are naturalized and invasive (Figure 1). Outside this area, populations are more rare and do not seem to expand.

The reason could be unfavorable climatic conditions and/or a too competitive flora, that makes *A. artemisiifolia* not naturalized yet.





A. artemisiifolia flowering plants

Question

Is the performance of *A. artemisiifolia* varying with competition level, and among geographical zones?



Figure 1: Localization of the sampled populations across the *A. artemisiifolia* pollen density map (Adapted from *the European aeroallergen network pollen database – "ambrosia*

Take-home messages

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Experimental approach

We selected 3 populations in each geographical zone: the first zone is outside the invasion area (Belgium and Netherlands), second and third correspond to the edge of the invasion area, and fourth is located in the centre of the invasion area (Figure 1.).

Performances about growth (biomass, height, and diameter), reproduction (number of seeds), and stress resistance (Specific Leaf Area) have been recorded on 25 plants per population. Furthermore, native flora competition was assessed within 2m² around the plants (covering and mean height).

Generalized Linear Models were performed to determine the performance differences among populations inside studied zones, with competition in covariate. Regressions were performed to highlight relationships between local climatic data (monthly temperatures and precipitations) and population performances.



From left to right: Equipment protection against pollen; quadra used to measure vegetation covering; young A. artemisiifolia plant; Scan of leafs for SLA calculation; A. artemisiifolia seeds.

Results

Although that performances are significantly different among populations (df=8, P<0.001), performances are not different among invasion zone. No evidence of unfavorable climate condition was found.

Furthermore competition by native flora was not significantly more prone to reduce biomass of *A. artemisiifolia*, however known to be less tolerant to competition than other invasive species. Only Specific Leaf Area was impacted by competition (df=1, P<0.001).

Those results mean that populations from Belgium and Netherlands are not less efficient than invasive populations for the measured traits.

No evidence of a limitation from climate or competition were found outside the invasion area.
The spread of the species has to be monitored, in order to avoid a future increase of pollinosis in Belgium.
This poster shows a first study on *A. artemisiifolia* invasion in Belgium. Further experiments are underway!