

# Causal networks in invasion biology

## Background

Invasion biology has the aim to explain why species are able to establish and spread outside of their native ranges. Many hypotheses have been formulated that could potentially deliver such explanations. The interactive webpage [hi-knowledge.org/invasion-biology](http://hi-knowledge.org/invasion-biology) (Fig. 1) summarizes existing knowledge on twelve such major hypotheses in invasion biology. It shows a network connecting the hypotheses based on their conceptual connections. Clicking on the nodes reveals hierarchical representations that summarize the level of evidence for or against each of the hypotheses.

Although the color coding allows to quickly assess how likely it is that a certain hypothesis, or one of its sub-hypotheses, is a good explanation for a specific case of invasion, the network does not really tell about underlying causes.

## Aims of the thesis

Major hypotheses, like e.g. the ‘enemy release’ hypothesis (see Fig. 2), are often formulated as if they would address simple causal relationships (e.g., “The absence of enemies in the exotic range is a cause of invasion success”). These simplifications, however, hint to longer chains or networks of hypothesized causal relationships. Aim of the thesis will be to look into ways how some of these hypotheses could be reformulated as nested causal networks.

## Methods

Literature reviews on how to build causal networks (this may include texts from philosophy of science), and on a chosen set of hypotheses; conceptual work.

If you are interested,  
or have further questions, please contact:  
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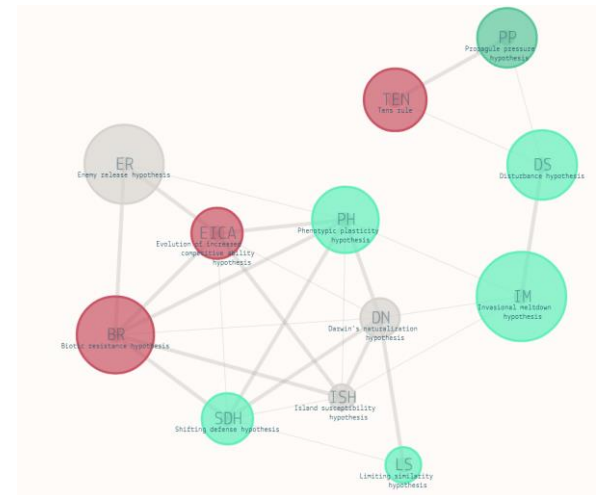


Fig. 1: Screenshot [hi-knowledge.org/invasion-biology](http://hi-knowledge.org/invasion-biology)

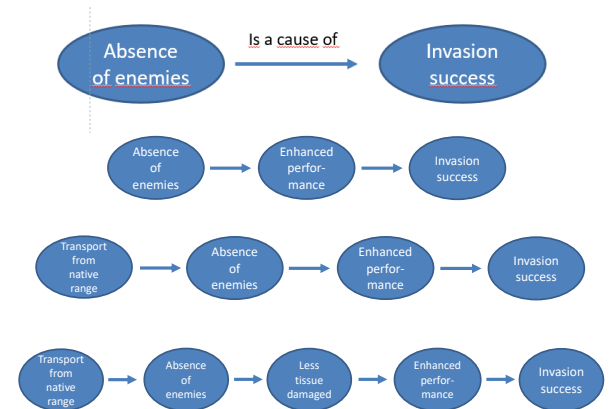


Fig. 2: Refining the enemy release hypothesis...

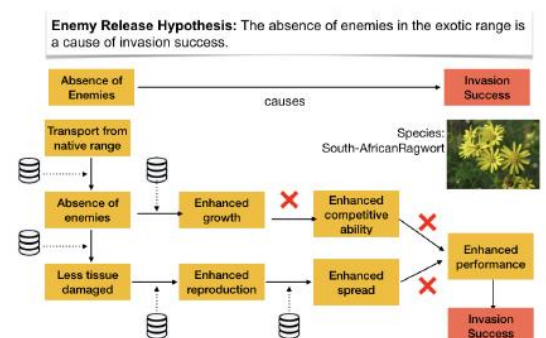


Fig. 3:... to show which aspects have been tested yet, and which haven't