From California to Belgium - How can one species change across two populations?

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Invasive species pose an increasing threat to biodiversity. They are defined as species that occur outside their native range, complete their life cycle in the non-native ecosystem, and become locally dominant there. Among the 1,400 extant species of sea spiders (i.e., pycnogonids), ubiquitous yet understudied marine chelicerates, none had previously fallen under the definition of invasive species. That changed when a population of *Ammothea hilgendorfi* (Böhm, 1879) was discovered a few years ago in Belgium. Native to the North Pacific Ocean (i.e., Japan and the USA), *A. hilgendorfi* was introduced in the late 1970s to Italy and the UK, then extended its range to several other European countries. Recent research highlighted that, in Belgium, it could be considered as invasive.

While many studies compare an invasive species with a native counterparts within the same ecosystem, very few explore the differences between invasive and native populations of the same species. This comprehensive study aims at filling this gap by investigating how a species may adapt to different environments, using *A. hilgendorfi* as a model. The two candidate populations examined are an invasive one in Knokke, Belgium, and a native one in San Francisco, California, USA. Specimens were compared in terms of population structure, stress resistance, and genetics. The results not only reveal significant differences in the way *A. hilgendorfi* interacts with its environment, but also suggest that the species might not actually be native to California.

Keywords
Invasive; Arthropod; Population; Stress; Genetics