

# The multiplex response of co-introduced parasites to the range expansion of their globally invasive frog host

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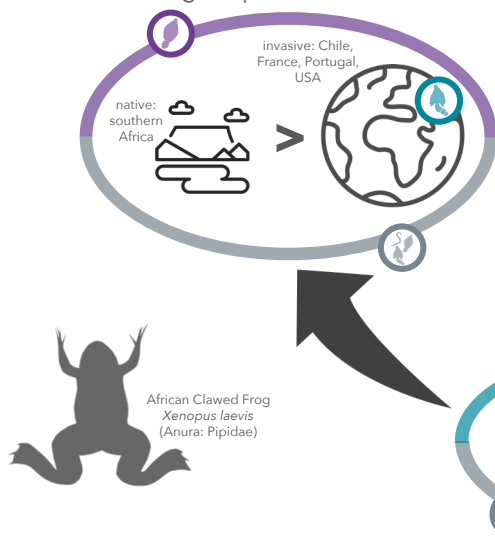
Where a frog lives and its size determines **how many parasites** it might have.  
Yet, parasite dynamics remain **unpredictable**.

## 1. Background

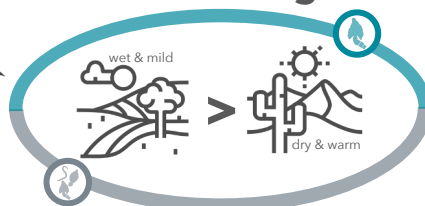
**Co-introduced parasites** make up a large fraction of all non-native species. However, the forces shaping **parasite dynamics during the range expansion** of their hosts are poorly understood. The globally invasive amphibian *Xenopus laevis* and its well-studied and diverse parasite assemblage pose an ideal model to **explore the spatial heterogeneity of parasitism**, both in its native range in southern Africa and its invasive range on four continents outside Africa. This host-parasite system was investigated on different ecological scales, from the level of individual host traits to a comparison between the native and invasive range to **identify the drivers of parasite abundance and diversity**.

Monogenean prevalence and overall parasite species richness decrease during large scale **range shifts**

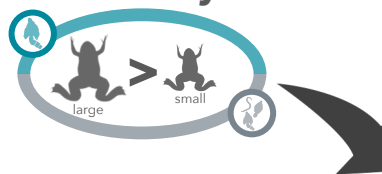
whilst cestode abundance decreases at smaller scales with further range expansion in the invasive range



Tapeworm abundance and community crowding is higher in milder and wetter **bioclimatic regions**



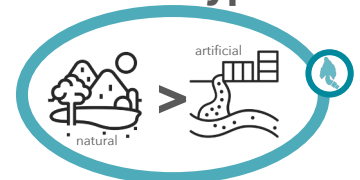
Tapeworm abundance and community crowding increases with **host body size**



## 2. Approach

Adult frogs were captured from South Africa (n=186) and France (n=114) and metazoan parasites were recovered & identified. The response of **tapeworm & monogenean** abundance and **infracommunity crowding** to predictors at **different ecological scales** was examined with the help of Bayesian GLMMs. Body condition and size of frogs were considered as fixed effects, along with habitat type and a combination of 19 bioclimatic variables. Locality was included as a random effect. Parasite abundance and richness were compared between the native and invasive ranges.

Tapeworm abundance is generally lower and more variable in highly disturbed artificial **habitat types**



## 3. In sum...

The parasite dynamics of *Xenopus laevis* depend upon the complex **interplay of many factors** that act at **different spatial scales**. We identify host body size, habitat disturbance, rainfall & temperature and host range expansion as important predictors of parasitism. Yet, the varying responses of the two dominant parasites species and the metazoan parasite community of this frog to variation in host, habitat and bioregional factors underscore the **unpredictable nature of parasite dynamics in a changing world**. Species-specific studies across various ecological scales with multiple geographic replicates are a step in the right direction.

## Acknowledgements

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## Let's chat!

This is an ongoing study - we would love to hear what you think! Have a look at [my website](#) for a [video](#) where I elaborate on the information on this poster. Alternatively, you send me an [email](#) or connect on [Twitter](#).

