ÉCOLE DOCTORALE
Sciences du végétal : du gène à l'écosystème (SEVE)

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Important characteristics determining the success of non-native freshwater fish

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Context

- The rise of the global trade has led to **more and more introductions** of species beyond their natural geographic ranges. These species can become **invasive** if they **establish** and have **impacts**[1].
- **551 freshwater fish species** are recorded as established all around the world [2]

Aim

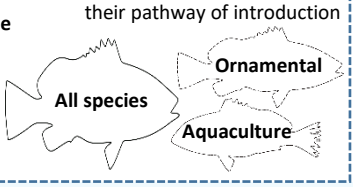
Determine the characteristics associated with freshwater fishes that were successfully **introduced,** successfully **established,** have **ecological impacts** in a **high number of countries**.

Material

307 freshwater fish species **worldwide**
14 characteristics :

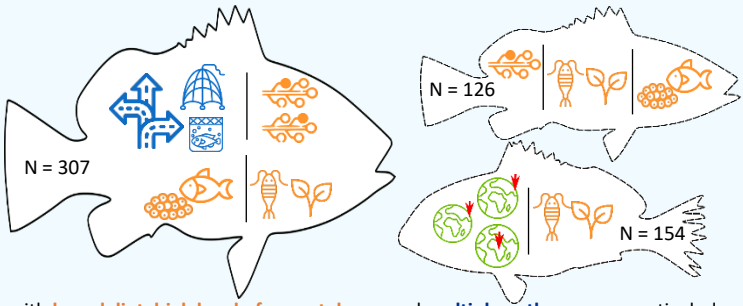
- Ecological[2]
- Socio-economic[3]
- Species[3,4]

3 species groups considering their pathway of introduction



Introduction

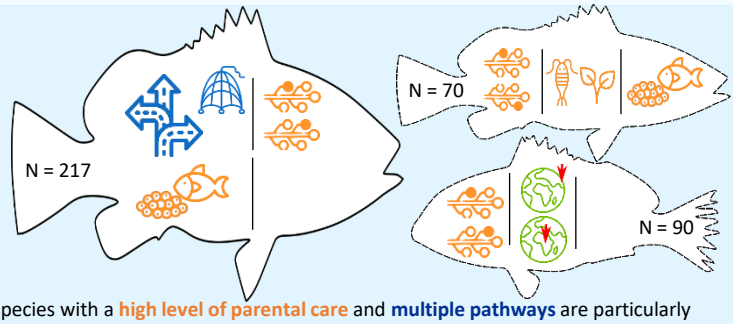
Response variable :
Number of countries



Overall, species with **broad diet**, **high level of parental care** and **multiple pathways** are particularly successfully introduced. The **main native region** is also important for ornamental species.

Establishment

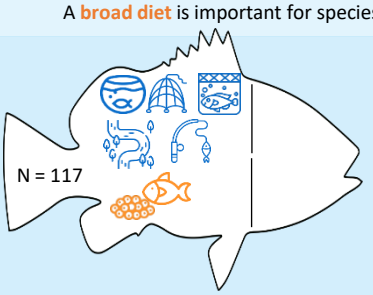
Response variable :
Number of countries



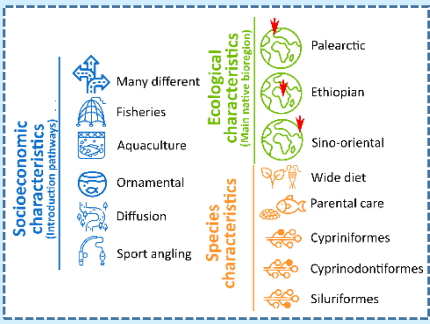
Overall, species with a **high level of parental care** and **multiple pathways** are particularly successfully **introduced**. The **main native region** is also important for **ornamental species**. A **broad diet** is important for species introduced through **aquaculture**.

Impact

Response variable :
Number of countries



Socio-economic characteristics are the characteristics that best explain the impact



Implications

- Highlight the importance to **consider different invasion steps separately** to account for the wide variety of factors involved in invasion models and disentangle the effects of introduction pathways.
- Useful to improve screening tools

[1]Seebens, H., Blackburn, T.M., Dyer, E.E., Genovesi, P., Hulme, P.E., Jeschke, J.M., *et al.* 2017. No saturation in the accumulation of alien species worldwide. *Nat Commun*, **8**: 14435.
[2] Tedesco PA, Beauchard O, Bigorne R, Blanchet S, Buisson L, et al. 2017. A global database on freshwater fish species occurrence in drainage basins. *Sci Data*. 4(1):170141
[3] Froese R, and Pauly D. Editors. 2022.FishBase. World Wide Web electronic publication. www.fishbase.org, (02/20)
[4] Brosse S, Charpin N, Su G, Toussaint A, Herrera-R GA, et al. 2021. FISHMORPH: A global database on morphological traits of freshwater fishes. *Global Ecology and Biogeography*. 30(12):2330–36