Traits of Invasive Herps

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Background

Previously Hypothesized Traits:
● Generalists vs Specialists
● Fecundity
● Enemy Release
● Environmental tolerance
● Growth rates
● Human relationships: Disturbance tolerance, introductions by humans
● Many more!
Example Herp Species

*Chelydra serpentina*: Common Snapping Turtle
- Intro Events: 14
- Phylogenetic Distance: 1.43
- Age in Months at Maturity: 54
- Clutch Size: 30
- Reproductive Events per Year: 1

*VS.*

*Cordylus cordlyus*: Cape Girdled Lizard
- Intro Events: 1
- Phylogenetic Distance: 1.19
- Age in Months at Maturity: 30
- Clutch Size: 2
- Reproductive Events per Year: 2

Established (in California and/or Florida)

Non-established (in California and/or Florida)
Hypothesis

More likely to become established in if…

- Higher # of Introduction Events
- Lower ages of sexual maturity
- Larger clutch sizes
- Greater phylogenetic distance
- Greater reproductive events per year
Methods (Our Data)

- 159 Herp Species
- 0 = Non-establishment in California and/or Florida; 1 = Established
- Looked at: Introduction events, Average Phylogenetic Distance, Age at Maturity, Clutch Size and Reproductive Events per Year
- Created histograms for each category comparing Established and Non-Established Herps
# of Introduction Events for Herp Species
Average Phylogenetic Distance in Established vs Non-Established Species

Distance (Smaller Values means closer related (genetically) to native species)
Age of Sexual Maturity of Herp Species (Months)

Frequency

Age of Sexual Maturity (Months)
Results (Summary)

Established populations are/have…

● Smaller clutch sizes
● More phylogenetic distance
● Younger age of sexual maturity
● More reproductive events per year
● More introduction events
Smart Moves: Relative Brain Size on Establishment Success of Invasive Amphibians and Reptiles (Amiel et. al)

Figure 1. Mean (± SE) residual brain mass of amphibian and reptile species that were successful (open circles) and unsuccessful (dark squares) in establishing populations outside of their native geographic ranges in seven different biogeographic realms. AA = Australasia, AT = Afrotropics, NT = Neotropics, NA = Neartic, PA = Paleartic, OC = Oceania, and IM = Indomalaysia. Lack of standard errors in the AT and IM realms reflect low numbers of unsuccessful introductions.

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Figure 2. Invasion potential of amphibian and reptile families versus mean residual brain mass of each family. See Methods for calculation of invasion potential.

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Conclusions/Discussion

- Fecundity and reproduction is an important factor in a species “invasiveness”
- Although it was completely different from the traits we researched, according to our paper relative brain size correlates to level of invasiveness
Questions??
Sources

- Data sheet from Bethany Bradley
- Smart Moves: Relative Brain Size on Establishment Success of Invasive Amphibians and Reptiles (Amiel et. al)
- Global Invasive Species Database
- NAS- Nonindigenous Aquatic Species
- Reptile Database