Data from: Influence of intra- and interspecific variation in predator-prey body size ratios on trophic interaction strengths

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Abstract

1. Predation is a pervasive force that structures food webs and directly influences ecosystem functioning. The relative body sizes of predators and prey may be an important determinant of

interaction strengths. However, studies quantifying the combined influence of intra- and interspecific variation in predator-prey body size ratios are lacking.

2. We use a comparative functional response approach to examine interaction strengths between three size classes of invasive bluegill and largemouth bass towards three scaled size classes of their tilapia prey. We then quantify the influence of intra- and interspecific predator-prey body mass ratios on the scaling of attack rates and handling times.

3. Type II functional responses were displayed by both predators across all predator and prey size classes. Largemouth bass consumed more than bluegill at small and intermediate predator size classes, whilst large predators of both species were more similar. Small prey were most vulnerable overall, however differential attack rates among prey were emergent across predator sizes. For both bluegill and largemouth bass, small predators exhibited higher attack rates towards small and intermediate prey sizes, whilst larger predators exhibited greater attack rates towards large prey. Conversely, handling times increased with prey size, with small bluegill exhibiting particularly low feeding rates towards medium-large prey types. Attack rates for both predators peaked unimodally at intermediate predator-prey body mass ratios, whilst handling times generally shortened across increasing body mass ratios.

4. We thus demonstrate effects of body size ratios on predator-prey interaction strengths between key fish species, with attack rates and handling times dependent on the relative sizes of predator-prey participants.

5. Considerations for intra- and interspecific body size ratio effects are critical for predicting the strengths of interactions within ecosystems and may drive differential ecological impacts among invasive species as size ratios shift.

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References

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predator-prey interaction, size ratios, bluegill, largemouth bass, tilapia

Files

1 files for this dataset

data.csv	6.45 kB	application/vnd.ms-excel

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