

Patterns of diet overlap between populations of non-indigenous and native fish species in shallow ponds

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Abstract

The diets of four non-indigenous fish species (brown bullhead *Ameiurus nebulosus*, topmouth gudgeon *Pseudorasbora parva*, pumpkinseed *Lepomis gibbosus* and Eastern mudminnow *Umbra pygmaea*) and two native fish species (gudgeon *Gobio gobio* and roach *Rutilus rutilus*) were studied in two small, shallow ponds (Belgium) during late summer. Diurnal foraging patterns and habitat and body size dependency of diets were simultaneously assessed for all populations.

No significant differences in diet composition were detected between ponds and habitats for any of the populations. Based on diet composition, groups of size classes within species "functional groups" were distinguished with cluster analysis. Diet overlaps for interspecific combinations of functional groups were calculated. For most functional group combinations of exotic fish species, diet overlap values were low. Although chironomid larvae formed the most important food source, differential consumption of chironomid larvae size classes allowed an important degree of niche differentiation between non-indigenous fish species. In contrast, high diet

overlap was found between the functional groups of indigenous gudgeon and of several non-indigenous fish species, indicating a high potential for interspecific exploitative competition.

The diet of roach consisted almost entirely of non-animal remains (detritus and plant material). The high proportion of such low-energy food in the diet of this species may be indicative for a competition induced niche shift to sub-optimal food sources.

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