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GEOGRAPHICAL PATTERNS IN EUROPE OF LIFE HISTORY TRAITS OF THE INTRODUCED NORTH AMERICAN SUNFISH, PUMPKINSEED *Lepomis gibbosus*

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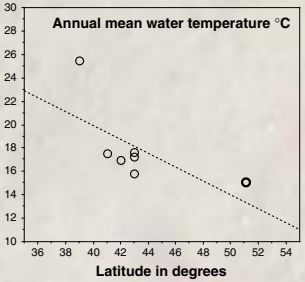
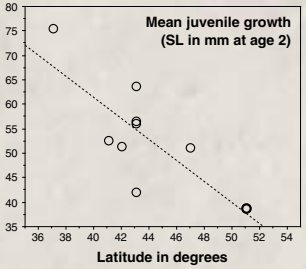
CEFAS The Centre for Environment, Fisheries & Aquaculture Science

Growth and temperature patterns

- Mean juvenile growth and annual mean water temperature increase with increasing latitude

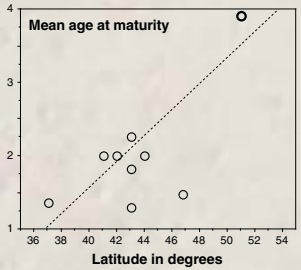




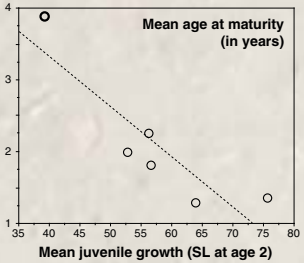
- Juvenile & age-specific growth of English population lowest in Europe
- Generalised condition (regression *b*) decreases with annual mean temperature but not latitude
- Age-specific condition (Fulton's) of English population lowest reported in Europe

Reproductive patterns

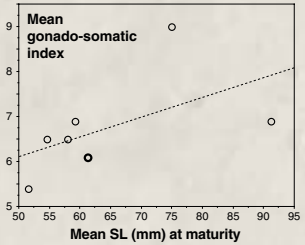
- Mean age at maturity correlates with latitude



- Mean age at maturity correlates with mean juvenile growth



- Mean GSI correlates with mean SL at maturity



Rationale

- Biogeographical patterns and life-history adaptations of non-native fishes are relevant to invasion and colonisation theory
- Pumpkinseed are good colonisers and demonstrate phenotypic plasticity in their native range
- Data on certain biological traits exist for European populations (mainly middle and southern latitudes), which can be compared with only studied UK population (thick circle in graphs)

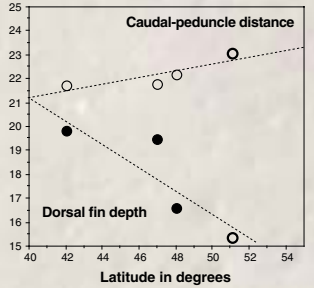
Photo source: FishBase

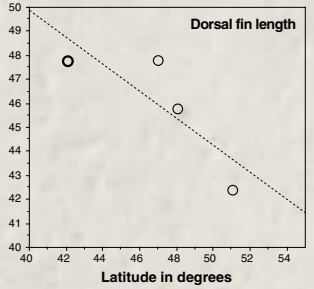
Summary of establishment patterns in Europe

- Invasiveness enhanced in southern locations by earlier maturity and faster juvenile growth
- Invasiveness may be reduced in northern locations by lower temperature, limited food and elevated cannibalism, which give late-maturing females an advantage
- Incremental growth rates in Europe highest in early summer, contrasting late summer peak in N.A. populations

Morphology patterns

- Some morphological characters correlate with latitude
- Some support for theory of differentiation (increasing caudal-peduncle length with increasing latitude)





Seminal references

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Full references in: Copp, G.H., Fox, M.G. & Kováč, V. 2002. Growth, morphology and life history traits of a coolwater European population of pumpkinseed *Lepomis gibbosus*. *Arch. Hydrobiol.* (in press)

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