Introduction

Populations experience a variable landscape of selective pressures which act on phenotypic variation, resulting in geographic variation in phenotypes. Selective pressures applied by fishing activities accelerate the pace of evolution and can affect geographic variation in morphology. In the Philippines, 91% of locally-caught fishes are consumed locally, and an estimated 56% of protein consumption comes from fishes. In this region, Siganus fuscescens is a staple food item that is eaten fresh, dried, or in the case of juveniles, turned into a delicacy fish paste and whose fishery is showing signs of collapse. To better understand the effects of overfishing on the evolution S. fuscencens, here we test for differences in body shape among four locations in Negros Oriental, Philippines, each experiencing different fishing regimes.

Methods

i. Specimens collected (n=166) from 4 fish markets along the eastern coast of Negros Oriental (Fig. 1)
ii. All individuals photographed on left side
iii. 24 landmarks identified for each fish and stored in TPS format
iv. A PCA of several indices of fishing pressure (pop size, # fishers, available habitat, and distance from pop center was used to isolate PC1 for comparison with shape data
v. Geometric morphometrics using geomorph (Adams and Otárola-Castillo 2013) R package: a) Procrustes superimposition, b) MANOVA correction for allometry and sex, c) MANOVA test for effect of location and PCA to visualize, d) multivariate regression model for effect of fishing pressure

Results

• Shape differed significantly among locations
  - PC2 separates sites by size of operculum, position of anal fin (DU-AY vs BA-AM)
  - PC1 separates BA-AM by body depth
• 73% of variation in fishing pressure indices explained by PC1
• Shape related to PC1 of fishing pressure indices
  - Most fishermen in BA: deeper body, smaller operculum
  - Most people in DU: shallower, elongate body

Discussion

• Significant differences in fish shape strongly indicate spatial variation selective pressures.
• Population size and fisherman inversely related perhaps due to more people = more subsistence; fewer people = more commercial
• Phenotypes in area of highest commercial fishing pressure may reduce chances of capture via net -deeper body, smaller operculum

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