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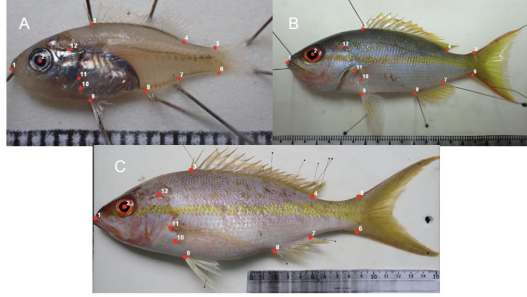
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# Morphological variability of *Ocyurus chrysurus* in coral reefs of Guadeloupe (Lesser Antilles)

MEHDI BOUDAULT<sup>2</sup>, LÉA VIGNAUD<sup>2</sup>, SÉBASTIEN CORDONNIER, BRUNO FRÉDÉRICH, CHARLOTTE R. DROMARD<sup>1,2</sup>, DAVID LECCHINI<sup>1</sup>

## Introduction

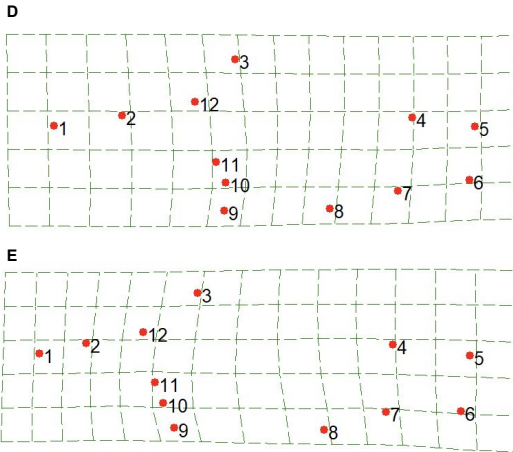
- The morphology of reef fish is mostly related to the way the species feeds.
- The tool used to quantify morphological variations during ontogeny : allometry by geometric morphometry (Bookstein, 1992).
- The objective of this study is to start a morphometric analysis project on reef fish species from Guadeloupe, and more particularly on the differences in shape observable between the ontogenetic post-larval, juvenile and adult stages of *Ocyurus chrysurus*.



*Ocyurus chrysurus* in the post-larval (A), juvenile (B) and adult (C) stages with landmarks on interest points.

## Material and method

- Several types of traps were used: the ridge net, the "CARE" trap (Collected by Artificial Reef Ecofriendly), the senne net and dip nets. Adult individuals were recovered from fishermen.
- Images were processed using the "TPS" suite of geometric morphometry software.
- A principal component analysis was applied on the shape variables, which allowed the realization of the deformation grids. The significance of shape differences between ontogenetic stages was tested using F-tests (TwoGroup8 software). This test also reports a Procrustes distance value, a value directly proportional to the existing shape difference between the average shape of two groups corresponding to stages.



Deformation grids with the average shape of post-larvae (D) and adults (E) of *Ocyurus chrysurus*, with the landmarks distributed previously.

<i>Ocyurus chrysurus</i>		F-score	p-value	Procrustes distance between means
Larvae	Juvenile	15,49	0,0004	<b>0,0593</b>
Larvae	Adult	19,61	0,0004	0,0784
Juvenile	Adult	25,21	0,0004	<b>0,0693</b>

Procrustes distances separating each group.

## Results and discussion

- The deformation grids allow to visualize the ontogenic trajectories taken by the body of *Ocyurus chrysurus*, during its growth: the insertion of the fins on the body changes and the body profiles hydrodynamically. Contrary to the global trend observed in reef fishes, in *Ocyurus chrysurus*, the body shape is significantly more different between the juvenile and adult stages than between the post-larval and juvenile stages.
- The juvenile life stage of this species is characterized by association with seagrass beds, similar to other representatives of the Lutjanidae, found in the western Atlantic (Garcia et al., 2003; Radford et al., 2011). As adults, yellowtail snappers definitely move closer to the reefs and become a large predator, feeding on shrimp, crabs, but also fish (Bortone and Williams, 1986). This radical variation in the diet of the species certainly requires great changes in its morphology, especially between the juvenile and adult stages as observed in this study.

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## Introduction :

The morphology of reef fish is mostly related to the way the species feeds. It influences swimming ability and foraging. The tool used to quantify these morphological variations during ontogeny is called allometry by geometric morphometry (Bookstein, 1992). This quantification allows first of all the identification of even slight morphological differences or similarities between individuals, and then to understand the ecology of the species when these laboratory observations are combined with naturalistic observations, which is then called ecomorphology. Studies of this kind have been carried out in large numbers on herbivorous and omnivorous fish species in the Pacific region, but few have been carried out in the Caribbean region and even fewer on carnivorous species in the Lesser Antilles. The objective of this study is to start a morphometric analysis project on reef fish species from Guadeloupe, and more particularly on the differences in shape observable between the ontogenetic post-larval, juvenile and adult stages of *Ocyurus chrysurus*.

## Material and method

Individuals were sampled in the Petit and Grand Cul de Sac Marin of Guadeloupe. Several types of traps were used: the ridge net, the "CARE" trap (Collected by Artificial Reef Ecofriendly), the senne net and dip nets. Adult individuals were recovered from fishermen. Individuals were euthanized with eugenol diluted in seawater following the sampling, then photographed in lateral view, the body fixed and the fins extended with entomologist's pins. Images were processed using the "TPS" suite of geometric morphometry software. A principal component analysis was applied on the shape variables, which allowed the realization of the deformation grids. The significance of shape differences between ontogenetic stages was tested using F-tests (TwoGroup8 software). This test also reports a Procrustean distance value, a value directly proportional to the existing shape difference between the average shape of two groups corresponding to stages.

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