

Early Life History of Yellowfin Grouper (*Mycteroperca venenosa*) in Little Cayman, Cayman Islands



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Objectives

Provide a description of early life
history stages of Yellowfin Grouper

Background

- Yellowfin Grouper (YF) are
- Large reef predator widely distributed throughout the western Atlantic Ocean
- 2. Important culturally, ecologically and economically
- Early life history stages have not yet been described for this species
- It is important to gain a basic understanding of the early life history of YF as temperature and other environmental variables are expected to change over time.
- Early life history stages of fish have been shown to be sensitive to environmental changes.
- During annual Grouper Moon Project in 2020, a large (approx. 300) spawning aggregation of YF was first documented adjacent to a much larger Nassau Grouper aggregation.

Methods

- Divers sampled at spawning aggregation site on Little Cayman, Cayman Islands (Fig. 2)
- Reared collected larvae at 25°C
- Subsampled at 12 hours post fertilization (hpf), 24 hpf, 36 hpf, 48 hpf, 72 hpf, 96 hpf, 108 hpf, and 114 hpf
- Removed dead eggs and then dead larva daily
- Preserved samples in formalin and later transfer to 70% ethanol
- Photographed samples with AmScope
- Took measurements using ImageJ
- Statistically analyzed difference between means (ANOVA and Tukey-Kramer)

Results



Results continued



Members of the Grouper Moon team collected larval YF during spawning events in 2020





Figure 1: Adult Yellowfin Grouper

Figure 3: Early Life History Measurements





Figure 4: Early life history stages of YF (a) 12 hpf, (b) 24 hpf – hatched, (c) 36 hpf – eye formation, (d) 48 hpf, (e) 72 hpf – oil globule completely absorbed and eye pigmentation, (f) 96 hpf – body pigmentation and functioning jaws, (g) 108 hpf, (h) 114 hpf

Significance

These data will set a baseline for future studies regarding the impacts of environmental change on early life history stages of tropical marine fishes of the Epinephelinae subfamily (i.e., YF, Nassau, and Tiger Grouper) which is crucial.

Figure 5: Mean of (a) average of 2 diameters for egg, (b), average of yolk depth and length, (c), average of 2 diameters of oil globule, (d) length of BDV, (e) length of MDV, (f) length of BL, (g) average of 2 diameters for eye, (h) SL and (i) TL of early life history stages of Yellowfin Grouper over time ± standard error. The asterisk symbol (*) represents a statistically significant difference in means between that hpf bar and the previous hpf according to Tukey-Kramer post hoc test.



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