DEEPEND
DEEP PELAGIC NEKTON DYNAMICS OF THE GULF OF MEXICO

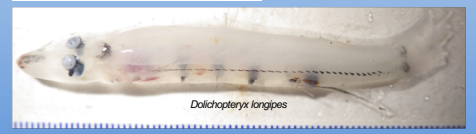
Ecology of the Barreleyes (Opisthoproctidae) in the Gulf of Mexico

Austin Boutilier[1], Tracey Sutton[2], April Cook[2], and Jon Moore[1]

1. Florida Atlantic University, 2. Nova Southeastern University

HARRIET L. WILKES HONORS COLLEGE
FLORIDA ATLANTIC UNIVERSITY

NSU NOVA SOUTHEASTERN UNIVERSITY
Halmos College of Natural Sciences and Oceanography



Introduction

- "Barreleyes" are a family (Opisthoproctidae) of deep-pelagic fishes
- Nineteen species are recognized within the family, all sharing the feature of tubular-shaped eyes directed dorsally[1]
- Previously 3 species were known from the Gulf of Mexico: *Dolichopteroides binocularis*, *Dolichopteryx longipes*, and *Monacoa grimaldii*[2]

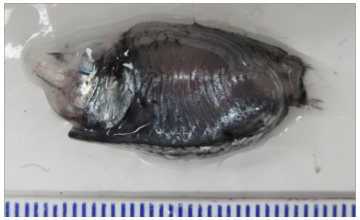


Fig 1. *Monacoa grimaldii*, 29 mm SL

Methods

- 3 Meg Skansi cruises (2011), 3 seasons
- 4 Pisces cruises (2010 - 2011), 4 seasons
- 4 DEEPEND cruises (2015 – 2017) conducted seasonally (2 week intervals, 1 – 2 cruises/year)
- High speed rope trawl used aboard Pisces
- Multiple Opening and Closing Net and Environmental Sensing System (MOCNESS, see Fig. 2) on Meg Skansi and DEEPEND
- All vessels sampled stations on SEAMAP grid (Fig 3)
- MOCNESS sampled 5 discrete depths between 0 and 1500 meters with standardized sampling on 2 vessels (Fig. 4)
- Trawls conducted twice daily centered on solar noon and solar midnight with cruise transects spread across oceanographic features
- Volumetric flow readers on each net
- Species identified by meristics & morphometrics[3]

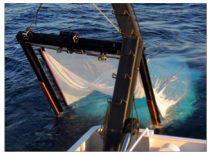
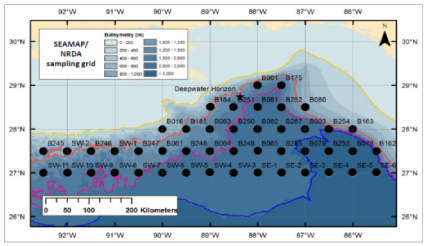


Fig 2. MOCNESS cod-ends (left) MOCNESS being deployed (right)



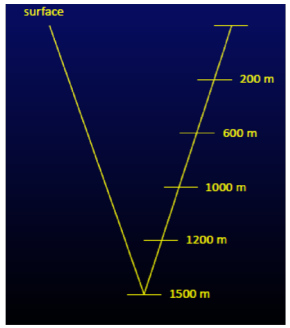


Fig. 3. (above) Study area and sampling stations in the northern Gulf of Mexico. Each station was sampled at least once and at most 3 times within a year

Fig. 4. (left) Discrete depth strata sampled by the MOCNESS. Strata were chosen by association with known oceanographic features

Results

- 8 species of opisthoproctids were identified from the Gulf of Mexico: ***Bathylychnops brachyrhycus, Dolichopteroides binocularis, Dolochopteryx longipes, Dolichopteryx rostrata, Monacoa grimaldii, Opisthoproctus soleatus, Rhynchohyalus natalensis,*** **and** ***Winteria telescopa***
- First records for the Gulf of Mexico for *Bathylychnops brachyrhycus* (Fig 5), *Dolichopteryx rostrata, Opisthoproctus soleatus* (Fig 6), *Rhynchohyalus natalensis* (Fig 7), and *Winteria telescope* (Fig. 8)
- Several species known from only one specimen, so far (*Winteria telescopa, Dolichopteryx rostrata, Opisthoproctus soleatus*)
- Surprising abundance of *Bathylychnops brachyrhynchus* specimens
- Largest specimens of *Bathylychnops brachyrhycus* ever recorded (up to 31.6 cm)

Fig. 5. *Bathylychnops brachyrhynchus*, 191 mm SL

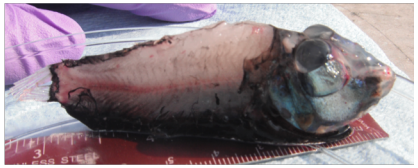


Fig. 6. *Opisthoproctus soleatus*, 75 mm SL

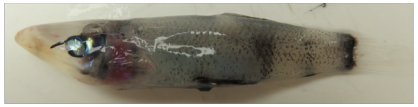


Fig. 7. *Rhynchohyalus natalensis*, 55 mm SL

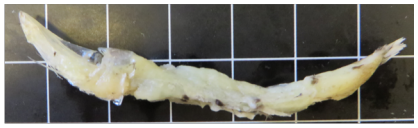
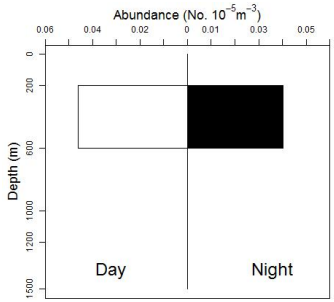


Fig. 8. *Winteria telescopa*, 76 mm SL



Monacoa grimaldii

Fig 9. Vertical distribution. Standardized abundance by volume by depth strata sampled using MOCNESS gear for *Monacoa grimaldii*

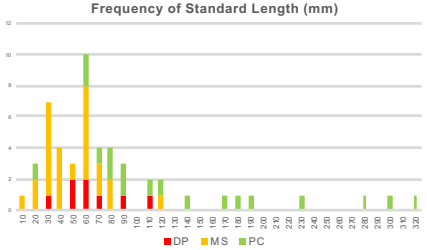


Fig 10. Size by gear. Total frequency of all intact opisthoproctids by SL (mm) caught over all cruises; HSRT = green; MOCNESS = red and yellow

Discussion and Goals

- **Vertical distributions indicate no evidence of participation in diel vertical migration (Fig. 9).**
- **Net evasion is likely among these fishes (see Figure 10), indicating possible under-representation in research-grade trawls**
- **This work will help to establish a baseline of relative abundances, species richness, and the natural history of this obscure group in the Gulf of Mexico, potentially contributing to future ecosystem-based management of that basin**
- **Further work on these taxa is needed. These data will be published as forthcoming tools for managers, including dietary information and distributional descriptions**

Acknowledgements

Special thanks to Danté Fenolio, and Nina Pruzinsky. This research was made possible by a grant from the Gulf of Mexico Research Initiative

Works Cited

1. Nelson, J. et al. 2017. Fishes of the World, 5th ed. John Wiley & Son.
2. McEachran, J.D. 2009. Fishes, Vertebrata, Pisces of the Gulf of Mexico. In: Gulf of Mexico Origins, Waters, and Biota. Biodiversity. DL Felder and DK Camp (eds.) College Station, TX: Texas A&M, pp. 1223-1316; McEachran, J.D. and Fechhelm JD. 1998. Fishes of the Gulf of Mexico, volume 1: Myxiniformes to Gasterosteiformes. University of Texas Press, pp. 377-380.
3. Strauss, R.E. & Bond, C.E. 1990. Taxonomic methods: morphology. In: Schreck, C.B. & Moyle, P.B. (eds.) Methods for Fish Biology. American Fisheries Society, Maryland, pp 109–140.