

Gulf and Caribbean Research

Volume 24 | Issue 1

2012

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DOI: 10.18785/gcr.2401.09

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Recommended Citation

Stein, W. III, N. J. Brown-Peterson, J. S. Franks and M. T. O'Connell. 2012. Evidence of Spawning Capable Tarpon (*Megalops atlanticus*) Off the Louisiana Coast. *Gulf and Caribbean Research* 24 (1): 73-74.
Retrieved from <https://aquila.usm.edu/gcr/vol24/iss1/9>

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SHORT COMMUNICATION

EVIDENCE OF SPAWNING CAPABLE TARPON (*MEGALOPS ATLANTICUS*) OFF THE LOUISIANA COAST

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KEY WORDS: *Megalops atlanticus*, Northern Gulf of Mexico, Spawning

INTRODUCTION

Despite the fact that the tarpon (*Megalops atlanticus*) is a popular sport fish in the Gulf of Mexico (GOM; Ault et al. 2008), little is known of its spawning behavior. Spawning *M. atlanticus* have never been documented and fertilized eggs have not been observed *in situ* (Ault et al. 2008). While it has been suggested that adult *M. atlanticus* move to deep water off the southwest coast of Florida and into the Yucatan Channel to spawn, the actual locations of spawning grounds remain unknown (Smith 1980, Crabtree et al. 1995, Crabtree et al. 1997). Distribution patterns of larvae (leptocephali) have served as the basis for most of what has been inferred about the spawning areas (Smith 1980, Crabtree et al. 1997). For example, leptocephali were collected from the southwestern GOM, the Yucatan Channel, and along the west coast of Florida, and based on their size, it was assumed that *M. atlanticus* spawned in nearby areas (Smith 1980).

Histological examination of gonads has also been used to estimate the location of *M. atlanticus* spawning habitat. Females collected from the Florida Keys and Boca Grande Pass off the west coast of Florida and contained ovaries with post ovulatory follicles (POF) and advanced vitellogenic oocytes, suggesting *M. atlanticus* spawn in this region from April through July (Crabtree et al. 1997). Examination of gonads from *M. atlanticus* caught off the coast of equatorial Ceara State, Brazil suggested that spawning occurs there from October through January (de Menezes and Paiva 1966). We report here the first evidence of spawning capable *M. atlanticus* off the coast of Louisiana in the northern GOM based on histological examination of gonads.

MATERIALS AND METHODS

Two large, sexually mature *M. atlanticus* (one female, one male) were collected by anglers about 30 km south of Venice, Louisiana on 2 July 2011. A second male was captured by anglers on 28 July 2011 from the same area. Fish were weighed (kg) and measured (mm fork length, FL) and gonadal tissue from each specimen was removed, weighed, and

fixed whole in 10% neutral buffered formalin within 12 h of capture. Gonadal tissue was processed following standard histological techniques, embedded in paraffin, sectioned at 4 μ m and stained with hematoxylin and eosin. Reproductive phases and gamete stages were determined following Brown-Peterson et al. (2011).

RESULTS AND DISCUSSION

The female *M. atlanticus* weighed 56.8 kg and was 1778 mm FL. The first male weighed 55.5 kg and was 1676 mm FL; the second male weighed 56.6 kg and was 1698 mm FL. These fish were within the same size ranges as reported for spawning *M. atlanticus* from Brazil and Florida (de Menezes and Paiva 1966, Crabtree et al. 1997).

The female was classified as spawning capable based on the presence of both late vitellogenic oocytes and 24 h POF in the ovaries at the time of collection (Figure 1A). The warm water at the time of specimen collection in combination with less than optimal fixation resulted in rapid degradation of the POF observed. However, these POFs appear similar to 24 h POF from other species collected at similar water temperatures (Brown-Peterson et al. 2011) and provide evidence that this female spawned 24 h or less prior to capture. While the ovary was dominated by tertiary vitellogenic oocytes (Vtg3), there was evidence of asynchronous oocyte development because secondary vitellogenic (Vtg2) were also present (Figure 1A). The two males were also both classified as spawning capable. Testes were full of spermatozoa but there was no active spermatogenesis occurring (Figure 1B), suggesting the males were at the end of the reproductive season but still capable of releasing spermatozoa. These specimens were collected near the end of the reported spawning season for *M. atlanticus* in Florida (Crabtree et al. 1997).

The collection of both male and female *M. atlanticus* in the spawning capable phase suggests that *M. atlanticus* may be spawning off Louisiana and represents the first evidence that this species appears to be reproducing in the northern

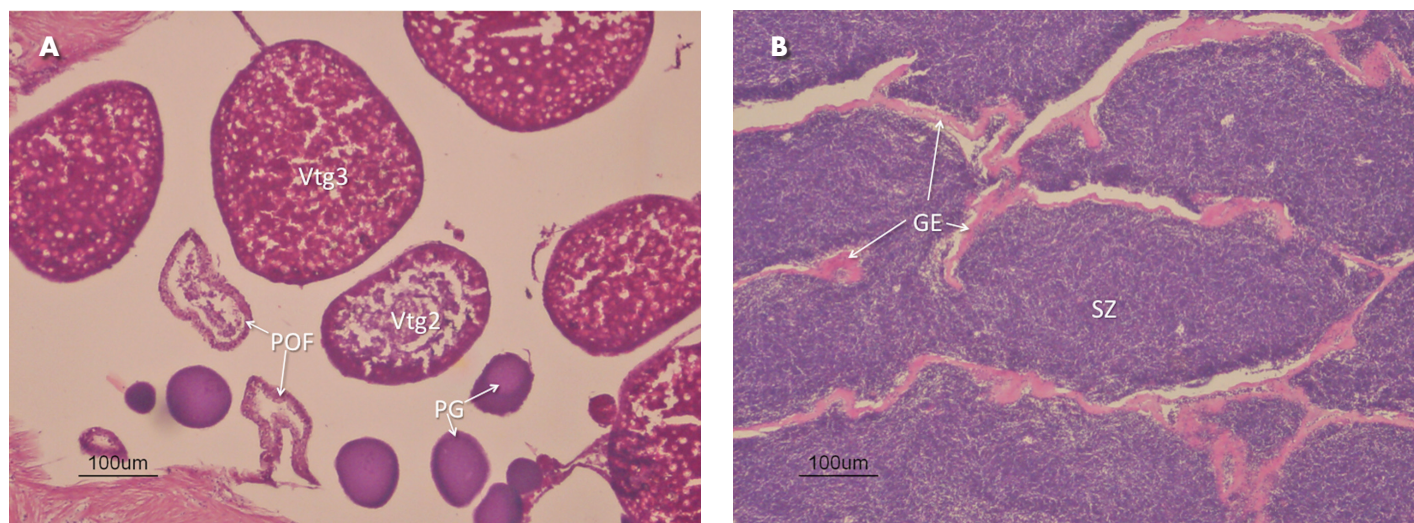


Figure 1. Histological images of gonadal tissue in the spawning capable phase from *M. atlanticus* collected off the coast of Louisiana on 2 July 2011. **A.** Female. **B.** Male. Key: PG—primary growth oocyte; POF—24 h postovulatory follicle; Vtg2—secondary vitellogenic oocyte; Vtg3—tertiary vitellogenic oocyte; GE—germinal epithelium; SZ—spermatozoa.

GOM. Juvenile *M. atlanticus* have been reported from Mississippi coastal locations by Franks (1970), Overstreet (1974) and Schofield et al. (2007). Various suggestions have been made to account for the presence of juvenile *M. atlanticus* on the coasts of Louisiana¹ and Mississippi² (Franks 1970, Overstreet 1974,

Schofield et al. 2007). It is possible that these juveniles are the product of local spawning activity based on evidence provided here. Additional collections of adult *M. atlanticus* during the spring and summer from the northern GOM would help elucidate reproductive activity of this species.

ACKNOWLEDGEMENTS

We thank M. Mullen, USM, for histological preparations. We are grateful to members of the Louisiana Tarpon Club, Louisiana Council of Underwater Dive Clubs, and Hell Divers Dive Club for providing specimens and to J. Pituch, Louisiana Department of Wildlife and Fisheries Biologist, for assistance with gonad sample collection.

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