



Seasonal Changes in the Reproductive Biology of a Tampa Bay (FL) Population of the Dwarf Seahorse, *Hippocampus zosterae*

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Abstract: Syngnathid fish are well known for their diverse mating systems and coastal distribution from temperate zones through the tropics. In the present study, we investigate factors associated with the reproductive ecology of the dwarf seahorse, *Hippocampus zosterae*. Fish were collected using push nets across three sites located roughly 100 meters apart in a Tampa Bay (FL, USA) seagrass bed. Upon collection, fish were marked and photographed for analysis of size, sex, and reproductive state. Sampling was conducted with 33 collections from each site during 2005-2007 and 25 from each site from 2008-2009. Analysis of body size, density, sex ratio, and gravid to non-gravid ratios across site and season was conducted to work to understand the population dynamics of *H. zosterae*. No significant difference was detected in body size between males and females, indicating no sexual dimorphism in this species. Animal density did not vary significantly with site and season, indicating there is little evidence of seasonal migration in this species, unlike that found for other species of syngnathids. *Hippocampus zosterae* density in Tampa Bay between 2005 and 2017 was shown to be stable with a mean seahorse density of 0.085114 (animals/m²) using a linear fit model ($r^2 = 0$). As expected, increased population densities were associated with a higher frequency of gravid males in the population. The ratio of gravid to non-gravid males was found to shift by season, but not by site, with breeding detected year-round in this population. Peak breeding (68% gravid males) observed in the summer in one of the three sites. Sex ratio shifted by site and with season, and overall a significantly female biased sex ratio was detected. The combination of female biased sex ratio with significantly more non-gravid males by season is unique to this species as many syngnathids are male biased in their populations and have substantially higher pregnancy rates. This interesting reversal of patterns requires more research to understand this species as well as providing a more thorough basis upon which to build management programs around the Gulf of Mexico.

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