

Reliable Milk Conch Captive Breeding Population Helps to Pave the Way to Establish a Queen Conch Captive Breeding Population

Población de caracol de leche de gran rendimiento reproductivo en cautiverio abre camino para establecer una población de reproductores de caracol rosado en cautividad

Une population reproductrice fiable de lambis en captivité contribue à ouvrir la voie à l'établissement d'une population reproductrice en captivité de lambis

AMANDA MATTHEWS¹, NICHOLAS BESWICK-SEIDL², MEGAN DAVIS¹, ROBINSON BAZURTO¹
¹Florida Atlantic University Harbor Branch Oceanographic Institute, 5600 US 1 North, Fort Pierce, Florida, USA,
amatthews2015@fau.edu;

²Willamette University, 900 State Street, Salem, Oregon, USA,
ncbeswickseidl@willamette.edu

EXTENDED ABSTRACT

In 2024 a breakthrough that occurred at FAU Harbor Branch offers promising advancements in conch aquaculture by potentially eliminating the need for wild-sourced egg masses to supply hatcheries. Sixteen milk conch (*Macrostrombus costatus*) broodstock, consisting of nine females and seven males, were provided with a sand substrate, flow-through seawater, and a diet predominantly consisting of diatom-rich algal turf scrubbers (Fig. 1). These scrubbers were cultured using nutrient-rich wastewater from FAU Harbor Branch's onshore Integrated Multi-Trophic Aquaculture system. This diet has been one of the contributing factors that resulted in reliable and prolific spawning, compared to previous studies that used formulated feeds (Shawl and Davis 2004).

Between April to November 2024 (32 weeks) this population produced an average of 7 egg masses per week, totaling 225 egg masses, of which 76% had viable offspring. Along with the nutrient rich primary diet of algal turf scrubbers, egg mass production appeared to be related to water temperature, with the highest number of weekly egg masses occurring between 27.0-29.5 °C. Eventually egg mass production declined during week 20-22 of the study when water temperatures remained between 29.0-29.5 °C. At week 23 of the study, a chiller was added to the captive breeding colony's water system and set to 28°C. Egg mass production then increased briefly before decreasing as the temperature of the flow through well water seawater fell below 28°C during week 32, in November.

The listing by NOAA Fisheries of the queen conch, *Aliger gigas* as threatened on the Endangered Species Act has un-



Figure 1. a-c (a) Captive milk conch using its proboscis to graze on the algal turf scrubber screen. (b) Milk conch from the captive breeding colony engaged in copulation with the female (right) grazing on filamentous algae. (c) Milk conch egg mass produced by the captive breeding colony.

derscored the need for a recovery plan for this ecologically and economically important species. As a close relative of *A. gigas*, the milk conch (*M. costatus*) serves a similar ecological role and is harvested in certain Caribbean regions.

This proximity allows milk conch to be used as a surrogate species to test the viability of establishing a captive queen conch breeding population, thereby reducing the dependence on wild egg mass collection for restoration hatcheries. This

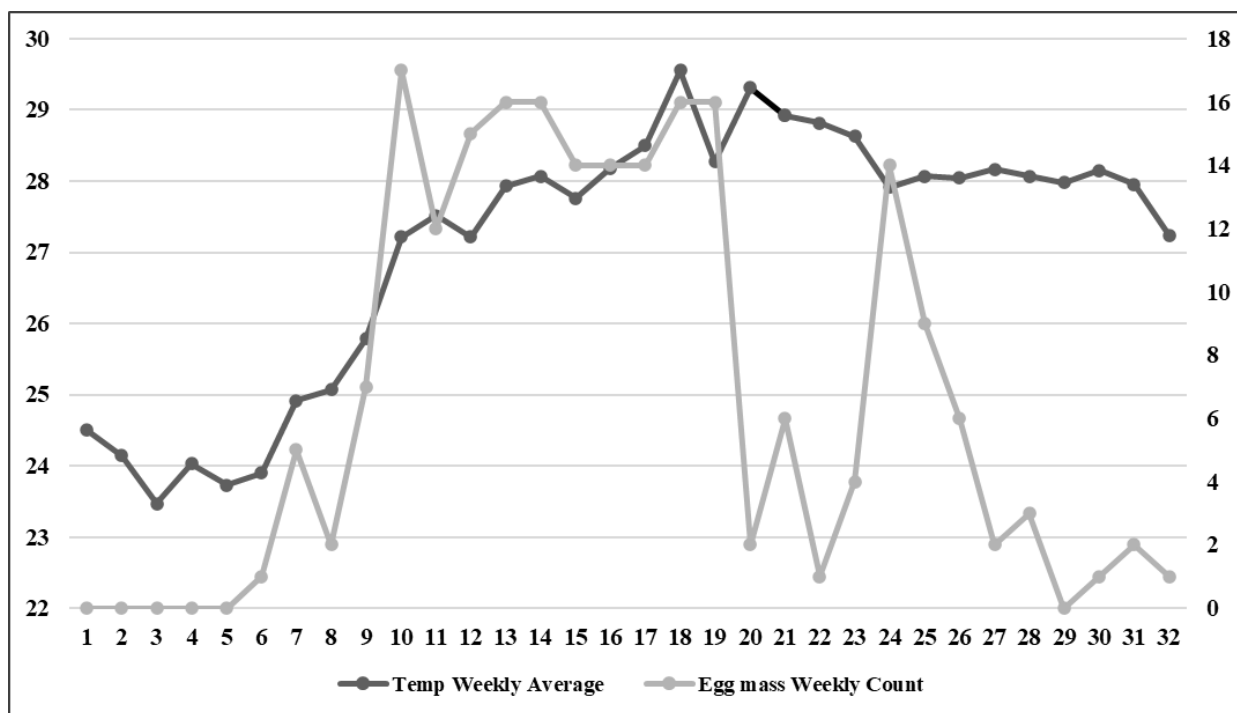


Figure 2. Weekly egg mass production from the milk conch captive breeding colony in 2024 and average weekly temperature in degrees Celsius. Week one was 24.5 and week 32 was 27.2.

study has shown that a key to a reliable captive conch breeding program is the use of algal turf scrubbers as the primary nutritional component. Future studies with queen conch adults should use this food source to encourage egg laying in captivity for use in restoration aquaculture.

LITERATURE CITED

Shawl, A. L., & Davis, M. (2004). Captive breeding behavior of four *Strombidae* conch. *Journal of Shellfish Research*, 23(1), 157-164.

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