

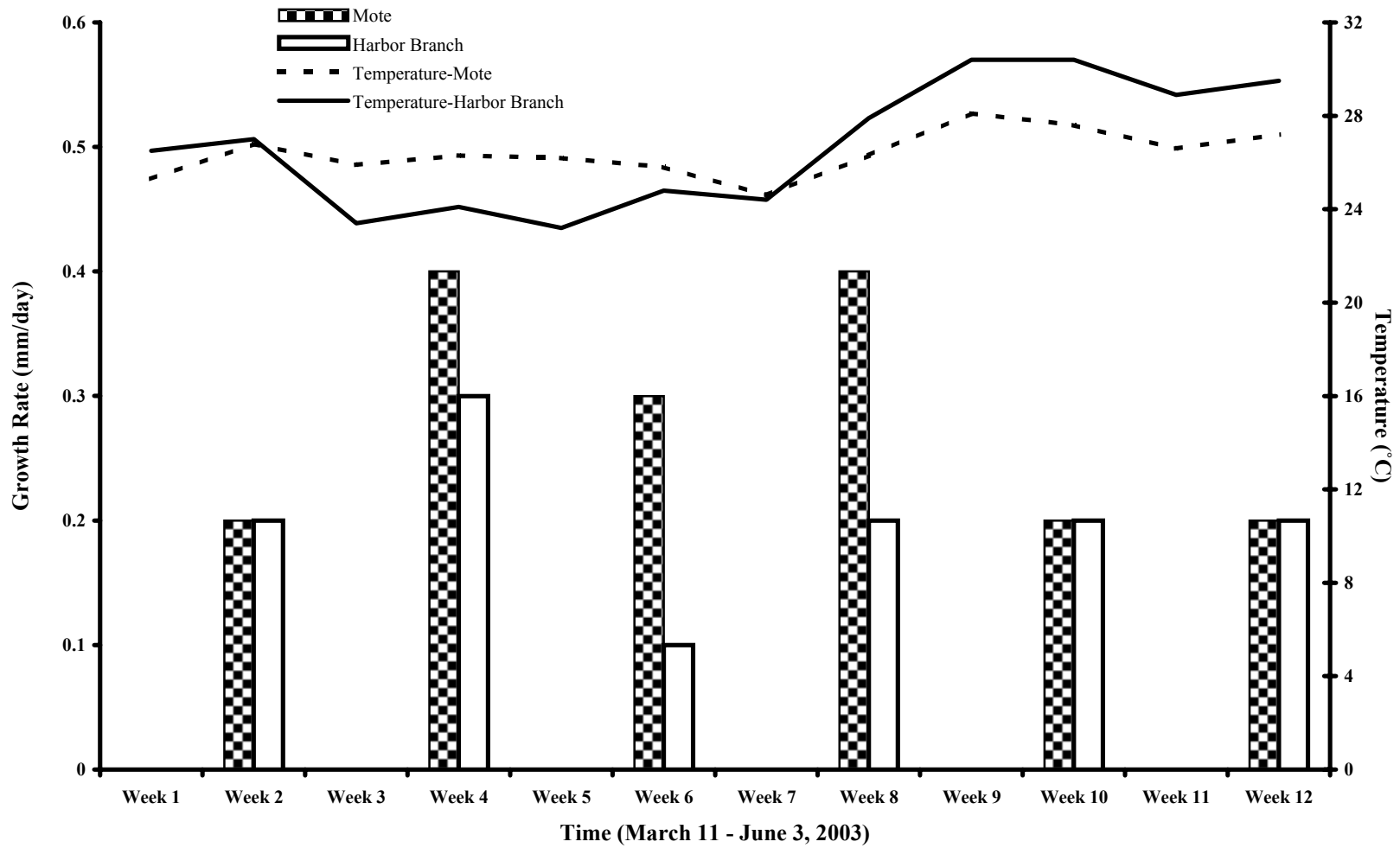
## Growth of Florida Fighting Conch, *Strombus alatus*, in Recirculating Systems

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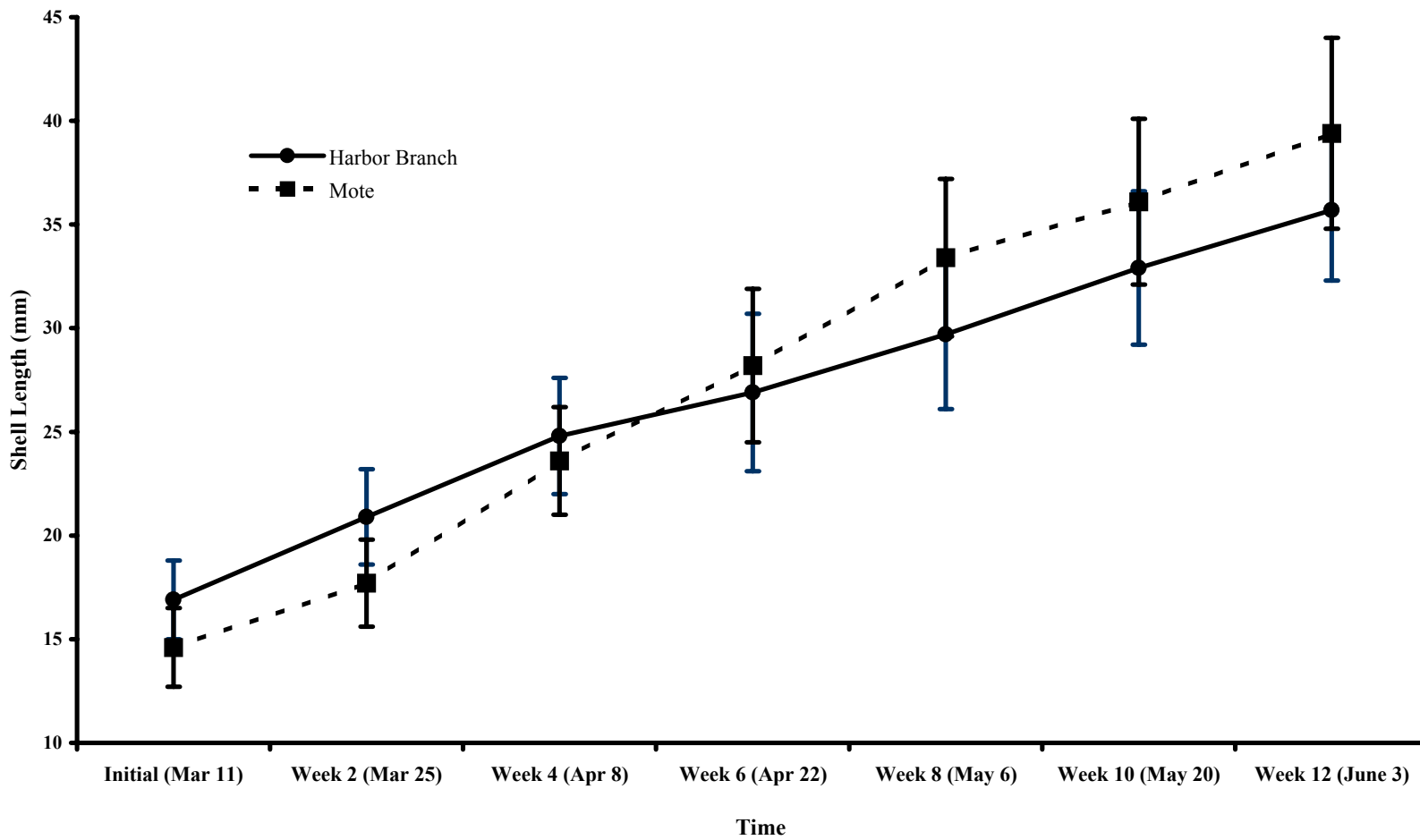
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With the increased interest in water conservation and the need to reduce the discharge of effluent from aquaculture production systems, there has been a shift from open, flow-through systems to recirculating aquaculture production systems. In 2001, Harbor Branch Oceanographic Institution developed the first recirculating conch aquaculture program. One of the most important aspects of conch aquaculture is determining the stocking density and water quality parameters in growout systems that yield the fastest growth rate and the highest survival. This experiment was conducted from March 11 – June 3, 2003 at two locations: Harbor Branch Oceanographic Institution (Harbor Branch) in Ft. Pierce, FL and Mote Marine Laboratory (Mote) in Sarasota, FL. The purpose of this study was to compare survival and growth rates of juvenile conch in two different locations. A recirculating growout system with an elevated sand substrate bottom was designed at both locations. There were three replicate raceway troughs at each location that were stocked with juvenile Florida fighting conch, *Strombus alatus*. The initial stocking density at both sites was 75 conch per m<sup>2</sup> (109 and 140 conch per replicate at Harbor Branch and Mote, respectively). In 12 weeks, the conch grew 17 mm or 0.20 mm/day at Harbor Branch and 20 mm or 0.24 mm/day at Mote. There was a significantly faster growth rate at Mote, however this appeared to be due to a lower stocking density throughout the experiment. Temperature, salinity, and pH averaged 26.7°C, 31.6 ppt, and 7.9, respectively at Harbor Branch, and 26.4°C, 34.9 ppt, and 8.2, respectively at Mote. The ammonia (mg/L) at both locations remained at zero. The feed conversion ratio was 1.3 at Harbor Branch and 2.2 at Mote. There was an 83% and 70% overall survival rate at Harbor Branch and Mote, respectively. The recirculating aquaculture systems utilized at each site had optimal stocking densities and water quality for growing juvenile conch.



**Figure 1.** Bi-weekly growth rate shown in comparison to water temperature for the duration of the experiment (March 11- June 3, 2003).



**Figure 2.** Juvenile Florida fighting conch shell growth from March 11 - June 3, 2003 (mean  $\pm$  sd).

**Table 1.** Water quality parameters during the experimental period, March 11 - June 3, 2003, (n = sample size).

|  | <b>Harbor Branch</b> | <b>Mote</b>     |
|--|----------------------|-----------------|
| Temp (°C)  | 26.7 ± 2.7 (85)      | 26.4 ± 1.0 (85) |
| Salinity (ppt)   | 31.6 ± 1.3 (39)      | 34.9 ± 2.0 (85) |
| pH   | 7.9 ± 0.1 (39)       | 8.2 ± 0.1 (85)  |
| Dissolved Oxygen (mg/L)  | 6.73 ± 0.41 (29)     | 6.2 ± 0.6 (85)  |
| Ammonia (mg/L)   | 0 (6)                | 0 (6)           |
| Nitrite (mg/L)   | 0 (6)                | 1.4 ± 1.5 (5)   |
| Nitrate (mg/L)   | 2.2 ± 1.9 (6)        | 0.6 ± 1.3 (5)   |
| Ca <sup>+</sup> ion Concentration (mg/L as CaCO <sub>3</sub> ) | 784 ± 325.6 (3)      | 482 (1)         |

**Table 2.** Weight gain and feed conversion ratio for juvenile Florida fighting conch during the experimental period, March 11 - June 3, 2003, (n = sample size).

|                                 | <b>Harbor Branch</b> | <b>Mote</b>     |
|---------------------------------|----------------------|-----------------|
| Initial wet weight (g)          | 0.4 ± 0.1 (327)      | 0.4 ± 0.0 (420) |
| Final wet weight (g)            | 5.2 ± 0.1 (327)      | 7.2 ± 0.8 (306) |
| Total wet weight gained (g)     | 4.8                  | 6.8             |
| Rate of wet weight gain (g/day) | 0.06                 | 0.08            |
| Initial no. of conch            | 327                  | 420             |
| Final no. of conch              | 327                  | 306             |
| Total amount of food (g)        | 2043                 | 4434            |
| Feed conversion ratio           | 1.3                  | 2.2             |