

Spawning Induction and Early Larval Development of the Penshell *Atrina maura* (Sowerby, 1835) under Controlled Conditions in Ecuador

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Abstract : Ecuador is one of the countries with the greatest aquatic biodiversity worldwide. In particular, there are at least a dozen native marine species with great aquaculture potential locally. This research concerns one of those species. It has proposed to implement experimental protocols in order to induce spawning and to generate the early larval development of the penshell *Atrina maura* under controlled conditions. Bioassays were carried out with one adult batch ($n=26$) with an average valvar length of $307,6 \pm 9,4$ mm, which were collected in the Puerto El Morro Mangrove ($2^{\circ} 42' 33''$ S, $80^{\circ} 14' 28''$ W), Guayas Province. During a short acclimation stage, five adults of penshell *A. maura* were sacrificed in order to determine their sexual maturity degree and to estimate their sex ratio. Dissection showed that three were ripe females (60%) and two were ripe males (40%). Later, three groups ($n=7$ by each) were tested with two treatments in order to induce the broodstock spawning: thermal stress, osmotic shock, and one control. Spawning induction was achieved by the immersion in water to 0 g L^{-1} per 1 h and immersion in sea water to 34 g L^{-1} per 1 h. After the delivery of gametes, it was achieved $1,35 \times 10^6$ viable zygotes. As results, fertilized eggs had $60 \mu\text{m}$ diameter; while first and second cell divisions were observed to 1 h post-fertilization, with individual average length of $65 \pm 4 \mu\text{m}$ and polar body. Latter cell divisions, including gastrula stage, appeared at 9 h post-fertilization, with individual average length of $71 \pm 4 \mu\text{m}$; and trochophore stage at 16 h post-fertilization with individual average length of $75 \pm 5 \mu\text{m}$. In addition, veliger stage was registered at 20 h post-fertilization with individual average length of $81 \pm 5 \mu\text{m}$. Umboned larvae appeared at day 8 post-fertilization, with individual average length of $145 \pm 6 \mu\text{m}$. These pioneering results in Ecuador can strengthen the local conservation process of the overexploited *A. maura* and to encourage its production for commercial purposes.

Keywords : *Atrina maura*, Ecuador, larval development, spawning induction

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