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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 ± 9,4 mm, which were collected in the Puerto El Morro Mangrove (2° 42' 33'' S, 80° 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 × 10^6 viable zygotes. As results, fertilized eggs had 60 µm diameter; while first and second cell divisions were observed to 1 h post-fertilization, with individual average length of 65 ± 4 µm and polar body. Latter cell divisions, including gastrula stage, appeared at 9 h post-fertilization, with individual average length of 71 ± 4 µm; and trochophore stage at 16 h post-fertilization with individual average length of 75 ± 5 µm. In addition, veliger stage was registered at 20 h post-fertilization with individual average length of 81 ± 5 µm. Umboned larvae appeared at day 8 post-fertilization, with individual average length of 145 ± 6 µm. 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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