

Totoaba, a species with great potential for mexican mariculture

Totoaba, una especie con gran potencial para la maricultura mexicana

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The Totoaba (*Totoaba macdonaldi*) is a member of the Sciaenidae family, which includes croakers. It is the largest species in this family and is currently classified as endangered species. Fishing for it has been permanently banned in Mexico since 1975 due to illegal fishing driven by the value of its swim bladder on the Asian market. This situation requires an honest evaluation by the relevant authorities.

The species inhabits the Gulf of California, where it is endemic to the region. It can reach a length of two meters and weigh up to 130 kg. This fish has been traditionally caught since the early 20th century, when the first fishermen settled in the area that would become Puerto Peñasco and the Golfo de Santa Clara. Since then, this fishery has been conducted without any oversight. While some official regulations were implemented in the 1940s, it was not until the 1980s that the fishing authorities finally addressed the issue.

Currently, various studies are being conducted on the biology and potential forms of production through aquaculture, including genetic studies. The aim is to conserve the species under controlled conditions. To this end, it is necessary to validate aquaculture production techniques and models that contribute to the recovery of wild populations while promoting productive activities for this valuable species.

Aquaculture research is essential not only for developing productive activities that promote aquaculture diversification and regional development and contribute to mitigating economic and social problems in marginalized rural areas, but also for solving problems associated with traditional fishing, such as overexploitation of species, by reducing pressure on natural populations. Research into marine fish aquaculture, particularly for endangered species, is essential for their conservation and covers aspects of their biology, including genomic diversity. Its scope of application includes repopulating areas where these species are native.

Therefore, it is vital to consolidate biotechnologies for the maturation of broodstock and the generation of offspring, as well as for aquaculture management in laboratories and in the field, for *Totoaba macdonaldi* and other species, with the purposes of conservation,

restocking, and sustainable use. To this end, the following objectives should be established for successful mariculture development:

1. In the short term, collecting a batch of broodstock involves collecting and conditioning wild specimens for maturation and controlled reproduction to obtain offspring.
2. Evaluate diets for managing broodstock in confinement.
3. Generation of protocols and manuals for the processes of induction to maturation, reproduction, spawning, fry rearing, breeding, and development.
4. Evaluation of growth in marine culture systems.
5. Systematic production of offspring in the laboratory for subsequent technological research stages.
6. Transfer of biotechnology for the sustainable management of aquaculture and the release of offspring into the natural environment under a restocking program, in strict coordination with environmental authorities.