

Molecular identification, life cycle characterization, and hatchery seed production of dwarf oysters from the Ebro Delta (Spain)



Dwarf oysters in the Ebro Delta are only observed growing on local pen shells, *Pinna nobilis* L., currently under extinction risk. The species identification of these populations is uncertain, given recent genetic classifications of dwarf oysters of *Ostrea stentina* species complex. Hence, the first objective of this study was to confirm the identity of dwarf oysters associated to *P. nobilis* in the Ebro Delta. Then, we aimed to assess the viability of hatchery and nursery production of *O. stentina* for potential conservation programs using diets based on a mix of live microalgae species or the commercial Shellfish Diet 1800®. Our results showed that COI sequences obtained were specific to *O. stentina*. Significant differences in the growth and survival of larvae between diet treatments were observed in 3 days. For the live diet, the larval period lasted from 15 to 22 days ($299.2 \pm 4 \mu\text{m}$) whereas it took up to 36 days using the Shellfish Diet 1800® ($280 \pm 7.2 \mu\text{m}$), with an overall mortality of 72.3 vs. 99.3%, respectively for each diet. Besides, no seed survival was observed for the commercial diet after a 10-day-fixation attempt. In contrast, ca. 16% of the individuals on

the live diet that were allowed to settle reached the juvenile stage and could be released to the environment. Histological examination of obtained seed did not present any sign of disease and showed gonadal development for both sexes at ca. 6 months of age (16.1–19.1 mm). The growth curve obtained was fitted to a Schnute-Richards growth model which returned ages of up to 10 years for maximum local sizes of 45 mm. We conclude that although the Shellfish Diet 1800® is not an adequate diet for *O. stentina*, its hatchery production is feasible and might provide support to future conservation actions.

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Obtenir le document : EDP Sciences

Mots clés : *Ostrea stentina*, DNA barcoding, Shellfish Diet 1800, microalgae diets, Schnute-Richards growth equation, age at first maturity

Thème (issu du Text Mining) : MILIEU NATUREL, FAUNE

Date : 2022-05-20

Format : text/xml

Source : <https://doi.org/10.1051/alr/2022005>

Langue : Anglais

Télécharger les documents : <https://www.alr-journal.org/10.1051/alr/2022005/pdf>

Permalien : <https://www.documentation.eauetbiodiversite.fr/notice/molecular-identification-life-cycle-characterization-and-hatchery-seed-production-of-dwarf-oysters-f0>

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