

## ABSTRACT

European eel (*Anguilla anguilla*, L., 1758) is suffering a strong population decrease and at the same time it is a very appreciated species and by now it has not been possible closing its cycle life. In fact, this species does not mature in captivity unless hormonally induced. So all the production is up to the natural population. All these factors together make urgent achieving the closing of the productive cycle and for this aim it is important to understand the reproductive physiology and the reasons of this development blockage.

The present thesis wants to be a new contribution to the knowledge of reproductive physiology in female European eel submitted at hormonal treatment. To achieve this goal, expression of genes not previously studied in this species (*cyp19a1*, *ara*, *arb*, *gnrhr1a*, *gnrhr1b*, *gnrhr2*, *zpb* and *zpc*) was analyzed in eels reared under a constant thermal regime, accordingly to the usual rearing conditions. Also, the effect of rearing temperature on gene expression and steroid profile (T, 11-KT and E2) was studied. In fact, eels migrate to Sargasso Sea to reproduce and during the travel experiment temperature changes, while traditionally they are reared at a constant high temperature which could affect vitellogenesis progression and final oocyte quality.

For the study it was necessary cloning and characterizing some genes which have not still been sequenced in European eel. Gene expression was studied by qPCR after designing primer and optimizing the qPCR race. Steroid profiles were analyzed by immunoassays and the gonadal development stages were established by histology.

The first result obtained at the end of the study were six new genes characterized in European eel.

The analysis of gene expression allowed to understand the involvement of specific genes during vitellogenesis (*arb*, *gnrhr1b* and *gnrhr2*) in different brain regions.

The temperature was conformed as a crucial environmental factor affecting vitellogenesis. On one hand, eels matured at lower starting temperatures showed better reproductive parameters which could have an influence in the final oocyte quality. On the other hand higher temperatures are necessary to achieve further vitellogenetic stages