POSTER 14

IS AROMATASE NECESSARY FOR OVARIAN DIFFERENTIATION IN TAMBAQUI (*Colossoma macropomum*)?

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Introduction

Cytochrome P450 aromatase, encoded by the *Cyp19* gene, is a critical steroidogenic enzyme for the aromatization of androgens into oestrogen. In most teleosts, there are two isoforms of the gene, *Cyp19a* and *Cyp19b*, which encode two structurally different proteins, P450aromA and P450aromB, respectively, with similar catalytic activities. The *Cyp19a* is predominantly expressed in the gonads, while the *Cyp19b* is mainly expressed in the brain, while lower levels of both isoforms are found in both sites and in some other tissues. Here we report for the first time the identification, characterization and expression of *Cyp19a* and *Cyp19b* in tambaqui (*Colossoma macropomum*) during sex differentiation.

Methods

The *de novo* individual transcriptome libraries generated from six headless juvenile tambaqui (3 putative males and 3 putative females) during sex differentiation (from 20 to 33 mm total length) and ovary and testes of immature juveniles (25 and 28 cm standard length, respectively) were assembled using the Trinity pipeline. The Cytochrome P450 aromatases were analyzed and phylogenetically characterized by full gene identification on the *C. macropomum* genome and the Coding Sequence (CDS) was used to deduce the protein.

Results and Discussion

We detected the expression of *Cyp19a* and *Cyp19b* in ovary and testis of immature fish. However, only the *Cyp19b* was expressed in headless juveniles during sex differentiation, with no difference between the putative males and females. The absence of *Cyp19a* transcripts as well as the non-dimorphic (and low) expression of *Cyp19b* seems to be a physiological feature of this phase in tambaqui. Altogether, these data suggest that oestradiol does not have a relevant function at these early stages of sex differentiation. Therefore, these novel findings indicate that the differentiation of ovaries in tambaqui might have another pathway, different from the well-known role of oestrogen in the female differentiation of lower vertebrates.

Conclusion

Taken together, our results indicate that both aromatase isoforms are expressed in tambaqui, but in a life-cycle-specific pattern. During sex differentiation, the equal (and low) expression of *Cyp19b*, in addition to the complete absence of the *Cy19a* in headless juveniles, suggests a lack of oestradiol synthesis in this phase. Further studies are required to discover what is the main force driving the ovary formation in the tambaqui.