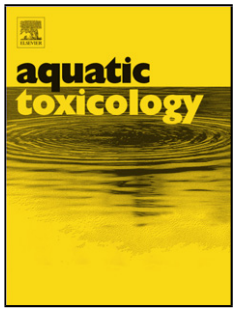

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Sex-specific immunomodulatory action of the environmental estrogen 17α-ethynylestradiol alongside with reproductive impairment in fish

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Highlights

- EE2 exposure of adult *O. melastigma* revealed distinct sex differences in the EE2-mediated biological responses.
- Female fish responded with immune enhancement and restored reproduction at low and persistent reproductive impairment at high EE2 concentrations.
- Direct EE2 exposure impaired male reproduction and immune competence dose-dependent with recovery upon EE2 abatement.
- Downregulation of hepatic *tlr3* and *c3* (in female) and *tlr3*, *tlr5* and *c3* (in male) may be indicative of impaired fish immune competence.
- Adult EE2 exposure may affect F0 population survival through reduced immune competence and F1 output through impaired reproduction.