

Purification, characterization and immunoassay of striped bass (*Morone saxatilis*) vitellogenin

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Abstract

The egg yolk precursor, vitellogenin (VTG), was purified from blood plasma of striped bass by chromatography on hydroxylapatite or DEAE-agarose. The fish were first implanted with estradiol-17 β (E₂), which induced vitellogenesis. A rabbit antiserum (a-FSPP) raised against plasma from mature female striped bass, and then adsorbed with mature male plasma, was used to detect female-specific plasma protein (FSPP) in the chromatography fractions. Striped bass VTG (s-VTG) was collected from the peak fraction that was induced by E₂, reacted with a-FSPP, and contained all detectable phosphoprotein. It appeared as a single band (M_r \approx 170,000) in SDS-PAGE or Western blots using a-FSPP, and as a pair of closely-spaced phospholipoprotein bands in native gradient-PAGE, suggesting that there is more than one circulating form of s-VTG. The relationship of s-VTG to the yolk proteins was verified using a-FSPP. The antiserum reacted with the main peak from gel filtration of saline ovary extracts, and it specifically immunostained the two main bands in Western blots of the extracts and the yolk granules of mature oocytes. The amino acid composition of s-VTG was similar to that of VTG from other fish and *Xenopus*. A radial immunodiffusion assay for s-VTG was developed using a-FSPP and purified s-VTG as standard. The s-VTG was not detected in blood plasma of males, immature females, or regressed adult females, but plasma s-VTG levels were highly correlated with plasma E₂ and testosterone levels, and oocyte growth, in maturing females. The results indicate that the maturational status of female striped bass can be identified by s-VTG immunoassay.