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In Vitro Study of Vitellogenesis in the Blue Crab (Callinectes Sapidus): Site and Control of Vitellin Synthesis

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Abstract

The determine the site of vitellin (Vn) synthesis in the blue crab, Callinectes sapidus, tissues (ovary, hepatopancreas, and gill) from adult female crabs were incubated in vitro with [35S]methionine. Tissue extracts were separated by sodium dodecyl sulfate-polyacrylamide gel electrophoresis and radiolabeled proteins were visualized by autoradiography: Four radiolabeled ovarian proteins (188, 168, 109, and 86 kDa) comigrated with the subunits of Vn. A Western blot analysis confirmed that these ovarian proteins were the Vn subunits. Proteins in the hepatopancreas and gill were also radiolabeled but were not Vn-immunoreactive. In vitro incorporation of [35S] methionine into ovarian proteins was inhibited by an extract of eyestalks; the inhibition was dose-dependent and specific. Autoradiography of the electrophoretically separated ovarian proteins revealed that the eyestalk extract inhibited incorporation of [35S] methionine into numerous proteins, including the Vn subunits. These results suggest that the ovary is a site of Vn synthesis and that the eyestalks contain a factor or factors that directly inhibit the synthesis of Vn and other ovarian proteins. It is anticipated that the suppression of ovarian protein synthesis will be a useful bioassay for blue crab vitellogenesis-inhibiting hormone.