

FEEDBACK REGULATION OF METHYL FARNESOATE SYNTHESIS BY MANDIBULAR ORGANS OF THE CRAYFISH

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ABSTRACT

The effect of different concentrations of methyl farnesoate (MF), a compound with juvenile hormone activity found in crustacea, was investigated on the regulation of MF synthesis by the crayfish mandibular organ (MO) *in vitro*. Nonvitellogenic animals have small ovaries with 0.12 gonad somatic index (GSI), MF in the blood is low at 0.30ng/ml and MF synthesis by MOs was low at 8.5ng/hr. Vitellogenic animals have 10 times larger ovaries, 3 times more MF in the blood and 2 times more MF synthesis by MOs than nonvitellogenic animals. In controls the right and left paired glands (MOs) have the same MF synthesis rates. A 1ng/ml of MF added to the media increased MF synthesis by 70% over controls in MOs from nonvitellogenic animals. This concentration did not alter MF synthesis in MOs from vitellogenic animals. A 20ng/ml concentration of MF added to the media of MOs from vitellogenic animals significantly decreased MF synthesis by 21%. A 20ng/ml MF in the media did not alter the MF synthesis by MOs from nonvitellogenic animals. These results indicate that in nonvitellogenic animals, MF synthesis by MOs is increased by low levels of MF while in MOs from vitellogenic animals at higher MF concentrations MF synthesis is decreased *in vitro*. These data suggest that MF levels in the hemolymph may play in regulating MF synthesis *in vitro* both in a positive direction in early vitellogenic and a negative direction in later vitellogenic stages, possibly by feedback. Such feedback control may also function *in vivo*.

KEYWORDS: Crayfish, Methyl Farnesoate, *In Vivo* Feedback, Mandibular Organ