

MORPHOGENESIS OF CRICKET EMBRYO AND ITS SPECIFIC INHIBITORS II

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It was reported in the former meeting that the stage-specific effects were observed when cricket, Gryllus bimaculatus (Insecta: Orthoptera), embryos were immersed in physiological saline solution containing various inhibitors during development. However, the immersion into the saline solution alone, without inhibitors, also delayed the development. Consequently, this phenomenon and effects of inhibitors (cycloheximide, colchicine and cytochalasin B) were furthermore examined accurately.

The treatment with the saline solution delayed the development depending on the length of immersion period. when embryos were treated for 8 hr at different stages of development, the delay was appeared from 24 hr after oviposition, and it was highest at 32 hr. If those delayed embryos were cultured in air, after the immersion, their development were recovered from the delay. Since the cause of the delay was thought to be shortage of oxygen in the saline solution embryos were immersed in the saline solution containing different concentrations of oxygen. These solutions were prepared by mixing of both N₂ gas-saturated and O₂ gas-saturated solution in different proportions. Embryos immersed in N₂-saturated solution were delayed in the development, as well as embryos immersed in the normal saline solution when they were treated for 8 hr from 24 hr after oviposition. However, development of embryos immersed in O₂-saturated solution did not delay at all. Since the delay was decreased, when the O₂ concentration was increased, it was suggested that embryonic development had to delay significantly under the O₂ concentration in the non-treated saline solution. From these results, the delay of development

in cricket embryos immersed in the saline solution must be possibly caused by the suppression of energy metabolism based on shortage of dissolved O_2 . When embryos were treated for 4 hr at different developmental stages with the saline solution containing inhibitors, cycloheximide, colchicine and cytochalasin B, respectively, affected on the embryonic development more markedly by the treatment before 12 hr than thereafter.

In order to examine change in the permeability of inhibitors into embryos during development, the effect of inhibitors must be tested by two kinds of procedures; effects of microinjected inhibitors and effects on various enzyme activators in the cell-free system. These studies are now in progress.