

C101

Spermatogenesis and Chromosomes in *Helicoverpa assulta* (Lepidoptera:Noctuidae)

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The spermatogenesis and chromosomes were investigated in the pupal testis of *Helicoverpa assulta* by light microscopy. During the spermatogenesis, each bundle of $2^8(256)$ sperms developed by 6 mitotic and 2 meiotic spermatogonial divisions. From the early stage of spermatocyte, it was distinguishable between two kinds of sperm differentiation, eupyrene and apyrene spermatogenesis, which are characteristic in Lepidoptera, by the differences in nuclear shape and size and cell distribution in immature spermatocyst. Through the followed spermiogenesis, the spermatocysts were developed into one of two kinds of mature cyst, a streamline-shaped eupyrene cyst with nucleated sperms of thready head or a long spindle-shaped apyrene cyst with anucleated sperms of cylindrical head.

As the results of chromosomal analysis at metaphase of the spermatogonial mitosis and spermatocytic meiosis, the karyotype was $2n=62/n=31$, respectively, and no variation in chromosome number between individuals.

C102

Immunohistochemical Study on the immunosuppression of T lymphocytes and NK cells in Murine Lymph node by Cyclosporin A

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Cyclosporin A is a selective immunosuppressive agent that has been credited with improved survival of solid organ allografts. Lymph node of cyclosporin A administered ICR mouse were immunohistochemically observed to understand immunosuppressive effects of cyclosporin A on T lymphocytes and natural killer cells in lymph node as secondary lymphatic organ. Cyclosporin A was orally administered daily for 10 days at the dose of 45mg/kg/day. The lymph node were obtained at day 1, 3, 7, 14, and 21 after cyclosporin A administration and embedded with paraffin, and then stained by following ABC method that used monoclonal antibody including L3T4(CD4), Ly-2(CD8), IL-2R(CD25), and NK-1.1(CD56). There were little changes of reactive degree and number of helper T lymphocytes, cytotoxic T lymphocytes, IL-2 receptors, and natural killer cells at day 3, but they began to decrease at day 7. These decrease were greatest at day 21. Helper T lymphocytes, cytotoxic T lymphocytes, IL-2 receptors, and natural killer cells distributed in paracortex and medullary cord. These results indicated that the secretion of IL-2 began to decrease at day-7 after cyclosporin A administration and subsequently to suppress T lymphocytes and natural killer cells as components of cell-mediated immunity