ABSTRACT

The Effect of Insecticide Carbofuran on Developmental Abnormalities of Brain, Somite and Sex Differentiation in Chick Embryo

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The aim of this research was to identify the influence of carbofuran exposure that decreased choline esterase (ChE) activity that caused abnormality development of brain vesicle. Inhibition in brain vesicle formation that following the decrease of glucose concentration may also cause abnormality in the development of other organs, such the formation of somite and sex differentiation.

This research used Randomized Complete design with 3 treatments and repetition with 10 fertile eggs each. The teratogenic dose at broiler was determined based on LD_{50} to chicken 25 mg/Kg BW and dose degradation was carried out carefully to prevent killing the chick embryo. The control eggs, was injected 0.1 ml NaCl physiologic 0.09% to each egg. All of eggs were stored into incubator in 38°C and 60 – 80 % humidity. Observation to somite development, brain vesicle and sex differentiation were carried out in 24, 72 hr using whole mounts technique and 18 d after incubation using dissecting microscope. In 72 hr after incubation, the measurement of ChE and glucose concentration were carried out by grinding the brain vesicle and adding 0.2 ml sterile NaCl physiologic 0.09% solution.

The exposure of carbofuran in degraded of 1/10 and 1/12 of LD_{50} (Furadan 3G of 0.4241 and 0.3534 mg/egg as equal to 0.0159 and 0.0127 mg/egg) resulted in the increase ChE, 1/10 LD_{50} which was significantly difference from that of 1/12 LD_{50} and control. The latter showed no significant difference in ChE level. Reducing of glucose level was not found in the brain of chick embryo and there were also no significant differences in the formation of brain vesicle, somite count and testicular length in those groups.

Key words : *Developmental abnormality, brain, somite, sex differentiation, chick embryo, insecticide carbofuran*