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NOTE

Biochemical Effect of Some Newly Synthesized Nitrogen Containing Heterocyclic Compounds on Rats

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The present investigation is an endeavour to analyse the effects of some newly synthesized nitrogen containing heterocyclic compounds, *viz.*, 6,7-benzo-3,4-furano-5-oxo-azepine, 6,7-benzo-3,4-furano-5-oximino-azepine and 8-hydroxy-9-methoxy-11-oxo-morphanthridine on biochemical aspects of laboratory rats.

Key Words: Biochemical effect, Heterocyclic compounds, Rats.

Choudhary and Chakrabarti[1] reported a decrease in the serum and liver proteins in rats exposed to opps. Dose dependent increase in serum protein levels in rate administered with tri-n-butyl-phosphate is reported by Oishi *et al*[2]. Some investigators[3] have reported changes in spermatogenesis of rats after administration of lead in μg/kg body weight. Increased levels of hypothalamic dopamine is also reported 4 in rats in response to lead. Decreased protein synthesis was also observed in rat brain after lead intoxication[3–6].

Yamashita[6] observed a decrease in the blood protein in ulcer affected rock fish when compared with their normal value. Hiraoka[7] also observed a decrease in total protein content in rainbow trout exposed to different concentrations of CCl_4.

It has been shown by G.J. Mudler (1840) that the function of protein is not primarily to supply energy but to furnish certain essential components of the living tissue of the organism itself. Works were first directed towards the study of the protein components of the mammals but is now being extended to other classes of vertebrates.

Protein phenotype variations in laboratory populations of *Rattus norwegicus* are variant electrophoretic patterns were observed for proteins representing 5 of an established 21 gene loci in population samples of rats of 3 substrains. Glucose-6-phosphate dehydrogenase differed in Long Evans and Sprague-Dawley rats. Alkaline phosphatase exhibits three different phenotypes in rats of the long evans sublines. Sixteen esterases varied in tissue distribution and in substrate specificities; one was found only in females; a second was active in some and inactive in other individuals; a third, which was very active in cardiac muscle, exhibited three different phenotypes in the population sample.

As proteins are involved in metabolism growth, comparative measurement of activities of protein in control and seven-membered heterocyclic compounds

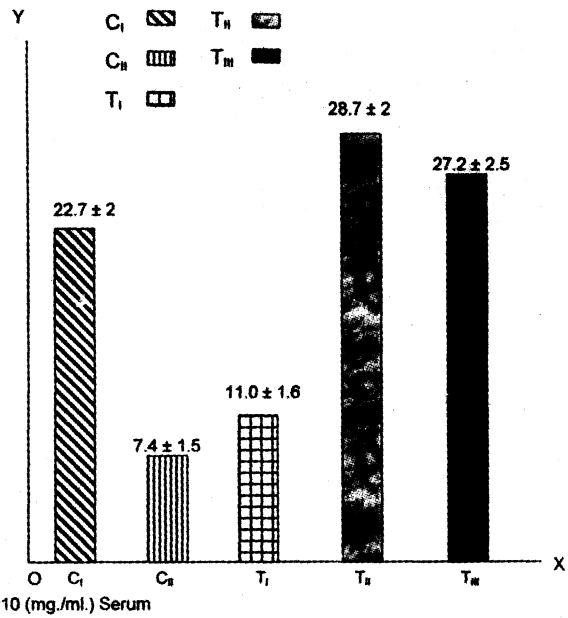
prepared exposed laboratory rats may help in understanding the physiological changes that arise from the chemical reactions. Keeping this in view, protein activity was measured in laboratory rats in control and treated with prepared heterocyclic compounds.

Quantitative estimation of blood proteins of control and treated rats was done by Lowry's method.

Protein concentration in serum of laboratory rats during control and treatment with synthesized heterocyclic compounds at 48 h (Graph I)

Treated Compounds		*Serum (mg/mL)*
Control	C_I	22.7 ± 2 S.D.
	C_{II}	7.4 ± 1.5 ***
	T_I	11.0 ± 1.6 ***
	T_{II}	28.7 ± 2 ***
	T_{III}	27.2 ± 2.5 ***

(Mean ± S.D.); S.D. = standard deviation,
C_I = Normal Rats
C_{II} = Rats treated with ethanol
T_I = 6,7-benzo-3,4-furano-5-oxo-azepine.
T_{II} = 8-hydroxy-9-methoxy-11-oxo-morphanthridine
T_{III} = Oxime derivative of 6,7-benzo-3,4--furano-5-oxo-azepine.
*** = P < 0.001 (significant)



Graph 1. Biochemical effect of some synthesized nitrogen containing heterocyclic compounds on laboratory rats

On the basis of the observations recorded above, it was concluded that the introduction of ethanol in the carrier molecule results in the decline of protein concentration in the blood serum of untreated (normal) rats.

Introduction of each of the three synthesized azepines led to activation of the protein synthesizing machinery and consequently increase in the concentration of serum potein in the treated rats.

6,7-Benzo-3,4-furano-5-oxo-azepine was, however, least active in this respect, whereas 8-hydroxy-9-methoxy-11-oxo-morphanthridine was most active in elevating serum protein concentration.

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