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Effect of Novel Heterocyclic Compound on Protein and Lipid Metabolisms in Different Tissues of Male Albino Rats

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ABSTRACT

The present study was carried out on the effect of novel heterocyclic compound on total proteins, free amino acids and total lipids contents in different tissues to understand the protein and lipid metabolisms and their role in male rats. The treatment with Ethyl 1-(2-oxoindolin-3-ylideneamino)-1,2,3,6-tetrahydro-4-methyl-2-oxo-6-phenyl pyrimidine-5-carboxylate compound at dose level of 50mg/kg body weight for 21 days did cause mild changes in proteins and lipid metabolism in reproductive and somatic tissues of treated rats. In order to assess the physiological changes in testis, brain, heart, kidney and liver of rats, estimation of total proteins, free amino acids and total lipids has been under taken. The result showed a mild decrease in total protein levels, but in contrast to the same treatment caused a mild increase in free amino acid and total lipid levels.

Key words : Novel heterocyclic compound, Proteins and lipid metabolisms, Physiological changes, Reproductive tissue, Somatic tissues

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The chemistry of heterocyclic lies at the heart of drug discovery (Tempest 2005). Many known active compounds contain heterocyclic cores which are indispensable elements for bio activity (Houghteen *et al.*, 2000). The development of new drug from heterocyclic compounds is an attractive proposition because heterocyclics are widely utilized compounds in both pharmaceutical and agricultural fields (Lang and Lin-I, 1984). Consequently, the development of methodologies useful for the assembly of molecules containing heterocyclic templates continues to attract the attention of both the academic and industrial communities (Rajanarendar *et al*., 2008).

The present study is an attempt to evaluate the effect of Ethyl 1-(2-oxoindolin-3-ylideneamino)-1,2,3,6-tetrahydro-4-methyl-2-oxo-6-phenyl pyrimidine-5-carboxylate compound on protein and lipid metabolisms. In our previous work this novel heterocyclic compound has resulted reduction in sperm count (Anil Kumar, 2009). Further same compound was also tried to asess whether it has any adverse effect on metabolic activities like proteins and lipid metabolism in somatic and reproductive tissues of rats such as testis, brain, heart, kidney and liver. Even though, literature is available, the metabolic activities of some heterocyclic compounds especially indole derivatives are to be proved. Keeping in view the references cited nature of heterocyclic compound was tested for its effects on protein and lipid metabolism in male albino rats.

The new heterocyclic compound developed in the Medicinal Chemistry Laboratories, University College of Pharmaceutical Sciences, Kakatiya University, Warangal had been selected for this study. This compound was prepared adopting the appropriate methods available in literature and is characterized by spectral data. The new compound possessing pyrimidine moiety because of structural similarities with nucleic acid bases exhibits various biological activities. Literature reveals that indole derivative exhibits aldose reductase inhibition activity along with other biological activities keeping in view of biological significance of indole moiety and pyrimidine moiety present in the new compound, it was planed to study the effect of this new compound on protein and lipid metabolism adopting standard protocols available in literature.

MATERIALS AND METHODS

Animals:

Wistar stain male albino rats weighing about 180-230 g were housed in polypropylene cages under controlled conditions (25°± 2°C