TOXICOLOGICAL EVALUATION OF SOME FOOD ADDITIVES

By

Mohamed Yasin Ali Yasin

B.Sc. in Agric. (Food Sciences), Faculty of Agriculture,
Fayoum University, 2009

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science

In

Agricultural Science
(Biochemistry)

Department of Agricultural Biochemistry
Faculty of Agriculture
Fayoum University

2015

ABSTRACT

In the present study biochemical, hematological, histological examination, and genotoxicity of different combinations of sunset yellow and sodium benzoate were assessed *in vivo* against female rats (90-130 g). The effect of these combinations was also assessed *in vitro* against some bacterial species. Different combinations of sunset yellow-sodium benzoate were dissolved in drinking water and administered daily to rats for 12 weeks to six experimental groups of animals, while the first group received regular drinking water and served as control. The second group received 5 mg sunset yellow+10 mg sodium benzoate, the third group received 5 mg sunset yellow+100 mg sodium benzoate, the fourth group received 50 mg sunset yellow+100 mg sodium benzoate, the fifth group received 50 mg sunset yellow+10 mg sodium benzoate, the sixth group received 200 mg sunset yellow+750 mg sodium benzoate, and the seventh group received 20 mg sunset yellow+75 mg sodium benzoate. The Results revealed liver and renal dysfunction (an elevation in AST, ALT, alkaline phosphatase, triglyceride, cholesterol, creatinine, and urea and reduction in total proteins, and albumin), a decrease in RBCs count, haematocrit, WBCs, MCV, and Hb levels. The results also showed a reduction in blood glucose level and an elevation in MCH, MCHC, platelet count.

Genotoxicity studies (Chromosomal Aberration, Comet assay, and liver DNA profile) were carried out *in vivo* at the end of the experiment. The results showed damage to DNA in some experimental groups. Some combinations of the tested compounds showed antibacterial activity *in vitro* against some bacterial species.

Histopathological examinations were performed on liver and kidney of the tested rats after decapitation at the end of the experiment and fixed in 10% neutral buffered formalin for 24 hours. Liver and kidney tissues showed some lesions due to the administration of the tested compounds in comparison to the control animals.

Key words: Synthetic food additives, sunset yellow, sodium benzoate, hematological studies, liver function, renal function, genotoxicity, and histological examination.