Histological, Ultrastructural and Physiological Studies on the Effect of Different Kinds Of Energy Drinks on the Liver Of Wistar Albino Rat

Latifa khayyat
Biology Department
Faculty of Applied Sciences
Umm Al-Qura University
Makkah, Saudi Arabia
likhayyat@uqu.edu.sa

Amina Essawy
Biology Department
Faculty of Applied Sciences
Umm Al-Qura University
Makkah, Saudi Arabia
amina_essawy@yahoo.com

Jehan Sorour
Biology Department
Faculty of Applied Sciences
Umm Al-Qura University
Makkah, Saudi Arabia
Jehansorour@hotmail.com

Maisaa Al Rawi
Biology Department
Faculty of Applied Sciences
Umm Al-Qura University
Makkah, Saudi Arabia
mmalrawi@uqu.edu.sa

***Abstract*— Three kinds of energy drinks (Power horse, Red bull and Code red) were used to study their histological, ultrastructural and physiological effects on Wistar albino rat liver. Forty male Wistar albino rats were divided into four groups. Group 1 was the control, while Groups 2, 3 and 4 were each orally administered with a type of the energy drinks daily for 4 weeks. After two and four weeks of treatment, five animals from each group were killed and dissected. The liver was removed, cut and fixed quickly to carry out light and electron microscopic preparations. Blood samples were collected from each rat via Cardiac puncture method for enzyme determination. The histopathological and ultrastructural results indicated mild hepatotoxicity of Power horse, Red bull and Code red. The alterations in liver ultrastructure were almost similar to each other; however the necrotic areas and the pyknotic nuclei were more obvious in Power horse and Red bull than that of Code red. Moreover, the present study showed that the energy drinks induced an elevation of liver enzymes AST, ALT and ALP after two and four weeks of treatment. The data illustrated that power horse was more effective in its action on liver enzymes, followed by red bull and to less extend code red. The different action of the energy drinks on liver function could be attributed to the different mixture of their ingredients.**

Keywords: **energy drinks, rat, liver, histopathology, ultrastructure, liver enzymes**