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Chemical and Biological study on some natural and synthetic food colorants and their effects on experimental rats

By

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ABSTRACT

Food colorants are used all over the world in great amount. It is an integral part of our culture and is also indispensable to the modern day consumer. During the past several decades, the technology of food processing has changed dramatically and the growth in the use of food colors has increased enormously. However, their use in food or drink is still controversial.

The present study was carried out to compare between the possible toxic effect of some natural (annatto E١٦٠ - caramel E١٥٠ - chlorophyll E١٤٠) and synthetic (sunset yellow E١١٠-chocolate brown E١٥٥- fast green E١٤٣), food colorants on lipid profile, liver and kidney function and glutathione enzyme of sixty five male albino rats. Natural and synthetic food colors were administered orally in two doses, one low and other high dose for ٨ weeks in drink water.

The results of this study revealed that the mean food intake and body weight gain % of rats groups treated with either natural and synthetic colors have been increased when compared with control group, serum cholesterol, HDL-c and (LDL-c in high dose only). Also organs weight (kidneys, heart, brain and spleen) recorded a significant increase when compared with control. On the other hand the triglycerides were decreased in all investigated colors. The results indicated that a noticeable decrease in AST and glutathione. While ALT recorded an increase in natural food colors groups except fast green and sunset yellow at low doses. Low and high doses of natural and synthetic food colors could impair activities of serum creatinine as compared to the control group.

Analysis of microscopic Histopathology data of liver, kidney, testis and brain sections showed minor histopathological changes in rats fed on experimental diets treated by both natural and synthetic food colorants in drinking water.

Therefore, large quantities and /or long periods of colorants administration should not be used as additive in human's diet. Hence, these colorants should restrict be used in nutritional food and drugs. And more caring must be done to avoid using them as much as possible by children in foods for long time.

Key words: Natural Food Color; Synthetic Food Color; Albino rats; Lipid Profile; Liver enzymes; Kidney functions; Glutathione Enzyme; Histopathology.