Auramine O (4, 4'-dimethylaminobenzophenonimide) and its hydrochloride salt are used in the colouring of paper, textile and leather. It is also used as a non-permitted food colouring agent in industries. Auramine O appears to be a potent carcinogen and mutagen. Exposure of human beings particularly women to auramine O in the name of "cowdung powder" produces toxic side effects. The present study was undertaken to evaluate the toxicity of auramine O in experimental rats.

The oral LD$_{50}$ value of auramine O in female albino rats was found to be 0.8g/kg body weight. After determination of this, a 1/20$^{th}$ of LD$_{50}$ value was selected for sub-chronic study and the rats were exposed to auramine O through oral intubation (40 mg/kg body weight for 7, 15, 30 and 60 days).

The activities of marker enzymes like acid and alkaline phosphatases, alanine and aspartate transaminases and lactate dehydrogenase were increased on auramine O exposed rats.

The level of microsomal cytochrome P$_{450}$ and b$_{5}$ as well as the activities of NADPH-cytochrome c reductase and aminopyrine N-demethylase were also found to be decreased.

The activities of mitochondrial enzymes succinate dehydrogenase, isocitrate dehydrogenase, $\alpha$-ketoglutarate and malate dehydrogenase were found to be inhibited.
A time-dependent increase in lipid peroxidation was observed in auramine O treated rats. Elevation in the level of lipid peroxides was more pronounced during 30 and 60 days of auramine O exposure.

The levels of non-enzymatic antioxidants reduced glutathione, total thiols, ascorbic acid and vitamin E were depleted in auramine O exposed rats.

The activities of enzymatic antioxidants like superoxide dismutase, catalase, glutathione peroxidase, glutathione S-transferase and glutathione reductase were decreased in a duration-dependent manner.

The DNA, RNA and protein content were found to be significantly decreased on auramine O exposure.

Histological studies together with the biochemical analysis indicate a positive correlation for free radical-mediated cellular injury in liver, kidney and small intestine.

This subchronic toxicity study shows depletion of glutathione on auramine O treatment as a possible reason for the imbalance in antioxidant defense leading to lipid peroxidation. This might be the cause for extensive damage in tissues.