

Potential Modulator Role of *Chlorella Vulgaris* and *Spirulina Platensis* On Monosodium Glutamate Oxidative Stress, Genotoxicity, Apoptotic Gene Expression and Histopathological Alterations

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Abstract : *Chlorella vulgaris* (CH) and *Spirulina platensis* (SP) are microalgae being touted as functional foods with a number of health benefits. CH and SP have potent antioxidant activity and provoke a free radical scavenging enzyme system. The present study was sought to assess the potential protective activities of CH and SP aqueous extracts against MSG toxicity in male mice. Mice were orally gavages with MSG at dose of (1200 mg/kg b.w) alone or with either CH or SP (500mg/kg b.w) daily for 28 days. Algae total phenolic and flavonoids content were measured, it was noticed that Sp have the higher total phenolic content while CH have the high flavonoids content. Bone marrow and liver were collected for genetical, biochemical, histological and histochemical analysis. The results appeared that MSG increased lipid peroxidation, apoptosis, DNA fragmentation, while, decreased hepatic glutathione concentration and total antioxidant activities. In addition, it is up regulating mRNA Bax and caspase-3genes, down-regulating Bcl-2 genes expression. Moreover, MSG showed liver histopathological alterations and increased the liver DNA content. In contrast, co-treatment of MSG plus either CH or SP succeeded to normalize the biochemical parameters levels, reduced the cytotoxicity, genotoxicity and ameliorated the hepatic histopathological and histochemical alterations. Therefore, CH and SP aqueous extracts have protective efficiency due to their content of bioactive compounds and could be considered as available resource of natural antioxidants.

Keywords: *Spirulina platensis*, *Chlorella vulgaris*, MSG, biochemical parameters, genotoxicity, apoptosis, gene expressions, histopathological and histochemical.