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RESEARCH PAPER

In vivo acute and sub acute toxicity study of antimycobacterial compounds from marine micro algal extracts in albino miceas animal model

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ABSTRACT

Acute and sub acute toxicity study were performed in albino rats by active antimycobacterial principles extracted from the marine microalgae, *Isocrysis galbana* (MG2), *Tetraselmis gracilis* (MG6), and *Chromulina friebergensis* (MG10). The acute toxicity studies were carried on 20 - 25gms albino mice with all three samples (MG2, MG6, MG10). Seven groups of albino mice of either sex were selected, each group containing 10 mice. The algal extract was administrated by oral route at the dose level of 500mg/kg, 1000mg/kg, 1500mg/kg, 2000mg/kg, 2500mg/kg, 3000mg/kg, and 3500mg/kg body weight. These mice were observed for mortality. For the algal extract MG2 at the dosage level of 2500mg/kg, 2 animals were found dead, at 3000mg/kg, 5 animals were dead and 3500mg/kg, 6 animals were dead. Thus, the LD_{50} value for sample MG2 was 2000mg/kg. For the algal extract of MG6 and MG10 the LD_{50} value was above 3500mg/kg. The animals were continuously monitor and findings were recorded for 28 days of their weekly body weight, mortality, clinical sign, food consumption, relative organ weight, gross pathology and microscopic examination. The toxicity studies carried for the sample MG2, MG6, MG10 showed early toxic effects on heart, liver, spleen and kidney. No significant effects and changes were observed in the biochemical and hematological parameters.

Key words : Antimycobacterial compounds, Albino miceas

Discovering new therapeutic molecules is becoming increasingly important as more and more bacteria become resistant to the usual antibiotics. The recent increase in the number of MDR tuberculosis, clinical isolates have created an urgent need for the discovery and development of new antituberculosis leads. Natural products form one avenue in the search for new antituberculosis agents. Nature has continuously provided human kind with a broad and structurally diverse arsenal of pharmacologically active compounds. These are utilized as highly effective drugs to combat a multitude of deadly diseases or as lead structures for the development of novel synthetically derived drugs that mirror their models from nature. Traditionally, higher plants and, since the discovery of the penicillin, terrestrial microorganisms have proven to be the richest source of natural drugs that are indispensable especially for the treatment of fatal diseases such as cancer. The oceans are the source of a large group of structurally unique natural products. Several of these compounds show pronounced pharmacological activities and are interesting candidates for new drugs. Numerous natural products from marine source show structurally similarities to known metabolites of microbial origin, suggesting that microorganisms (bacteria, microalgae) are at least involved in their biosynthesis are in fact, the true sources of these respective metabolites (Proksch, 2002). From 1969 - 1999 approximately 300 patents on bioactive marine natural products were issued. From the humble beginnings, the number of compounds isolated from various marine organisms have virtually soared and now exceed 10,000 (Marin Lit., 20001), with hundred of new compounds still being discovered every year (Faulkner, 2000; Faulkner, 2002).

Traditionally used in Asiatic medicines, algae, since the second half of the 20th century, are screened for their biological activities. Thus, anti bacterial effects have been noticed in all the algal classes and notably marine phytoplankton (Burkkholder *et al.*, 1960; Reichelt and Borowitska, 1984; Pesando, 1990). Recently, microalgae have become targets for screening programmers in search of novel compounds of potential medicinal value. Numerous compounds have been isolated from prokaryotic and eukaryotic micro algae, and may have been tested for different types of bioactivity with positive effects. Microalgae are significant resource for bioactive metabolites, particularly cytotoxic agents with applications in cancer chemotherapy (Moreau *et al.*, 1988). From the marine micro algae (such as from the blooms of *Phaeocystic* sp.), antibiotic substance are reported