Mutation preventive and antigenotoxic potential of methanol extracts of two natural lichen species, *Rhizoplaca chrysoleuca* and *Rhizoplaca melanophthalma* on corn (*Zea mays* seeds)

Medine Gulluce$^1$, Guleray Agar$^1$, Ali Aslan$^2$, Sedat Bozari$^1$, Mehmet Karadayi$^1$, Furkan Orhan$^1$

$^1$Department of Biology, Faculty of Science, Ataturk University 25240 Erzurum, Turkey (mgulluce@hotmail.com)

$^2$Department of Biology, Kazim Karabekir Education Faculty, Ataturk University 25240 Erzurum, Turkey

Summary

Lichens, which grow on rocky coasts, soil and plant cover exist from an association with a heterotrophic mycobiont as a fungus and an autotrophic photobiont as an alga or a cyanobacterium. These mutualistic symbionts have variously characteristic properties different from their basic component. These properties enable lichens to be used in various areas. For example, some of them are used in the perfume and dye industry and they are also used for the removal of toxic metals from different substances like water, air etc. We aimed to determine the mutagenic, antimutagenic and antigenotoxic effects of *Rhizoplaca chrysoleuca* and *Rhizoplaca melanophthalma*'s methanol extracts on the known mutagens against two different organisms using mitotic index (MI) and Ames-Salmonella assay systems. For the MI assay the genotoxic dose of NaN$_3$ was defined on *Zea mays* seeds and different dose of the lichen extract used as anti-mutagen (5, 10, 20, 40 mu g/plate). Observed data showed that methanol extracts prevent the cytotoxic effect of NaN$_3$ partially. In addition, the antimutagenic activities of the methanol extracts were investigated against 9-AA in TA1537 and NaN$_3$ in TA1535 strains of *Salmonella typhimurium*. Extracts show antimutagenic effect against 9-AA-induced mutation in TA1537 strain at all tested concentrations. The inhibition rates ranged from 70.73 to 85.71% (*R. chrysoleuca*, 0.5 mu g/plate - 5 mu g/plate). The results show that these natural compounds have an ability to reduce or prevent the effects of these mutagenic substances.

Key words: lichen, *zea mays*, seed treatment, antimutagenic