

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Radiation Fields, Effects and Risks in Human Space Missions (4)

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EFFECTS OF RADIATION ON CANDIDA ALBICANS FUNGUS

Abstract

Ionizing Radiation (IR) is energy in the form of waves or particles that have enough force to remove electrons from atoms and cause cell damage, DNA damage, mutation and other changes in living cells. The goal of this study is to understand the effect of Gamma Radiation on *Candida albicans* cell growth and morphology. *Candida albicans* fungi are commensal or opportunistic pathogens that are found naturally in many different environments, such as, the mouth, vagina and gastrointestinal tracts of humans. It coexists with other organisms in natural environments, but can become pathogenic following a shift in the equilibrium of the host. *Candida albicans* is of interest because it was isolated during previous human exploration missions. *C. albicans* cells were grown on Sabouraud Dextrose Broth (SDB) inside Erlenmeyer flasks by adding concentration of 10^3 cells per ml of inoculum. Samples were harvested and examined at different time intervals up to 96 hours after inoculation. Morphological changes, optical density, and biomass tests were performed. A viability test using trypan blue was performed to determine viable cells versus non-viable cells. A viability test and cell separation using flow cytometry was also conducted and cells were re-plated after separation. 18 hours after inoculation, the percentage of non-viable cells were 3.5% in the control compared to 7.5% in cells exposed to gamma radiation. After 24 hours the percentage of non-viable cells increased from 9% in control to 31% in gamma radiation. Formation of pseudo hyphae as well as budding and clumping were also observed. 18th hour control showed 0.6% formation of pseudo hyphae in control versus 1.1% in gamma radiation. In the 24th hour, the pseudo hyphae increased to 1.3% in control versus 2.5% in gamma radiation. A notable change in cell size was not observed.