



AT9900232

W3 07

Genetic ecotoxicology: natural selection in contaminated environmentsL.R. SHUGART¹, J. BICKHAM² AND C. THEODORAKIS²¹ LR Shugart & Associates Inc., , Oak Ridge, TN, USA; ² Dept. Wildlife & Fisheries Sci., Texas A&M Univ., College Station, USA

Environmental pollution is a complex issue because of the diversity of anthropogenic agents, both chemical and physical, that have been detected and catalogued. The consequences to biota from exposure to genotoxic agents present an additional problem because of the potential for these agents to produce adverse change at the cellular and organismal levels (*Comp. Physiol. Biochem.*, **113**:273-276, 1996). Organismal responses at the genetic level to exposure to environmental genotoxicants have been well documented. Past studies in genetic toxicology at the Oak Ridge National Laboratory have focused on structural damage to the DNA of environmental species that may occur after exposure to genotoxic agents and the use of this information to document exposure and to monitor remediation (*Environ. Health Perspec.*, **102**:13-17, 1994). Current studies in genetic ecotoxicology are attempting to characterize the biological mechanisms at the gene level that regulate and limit the response of an individual organism to genotoxic factors in their environment (*Ecotoxicology*, **6**:205-218, 1998 and **6**:335-354, 1998). An elucidation of the molecular mechanisms involved with these responses, as well as an assessment of the changes that may occur to the genetic material, will provide an understanding to the potential for deleterious consequences at higher levels of biological organization. Moreover, modern procedures of molecular biology offer the hope that alterations and changes to genetic material can be readily detected.