

The Effects of Radiation on Aquatic Invertebrates: Combining Field Studies in Lakes of Varying Contamination at Chernobyl with Laboratory Studies

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Rationale/Background

- **Lack of studies** in the natural environment regarding biological effects of long-term chronic exposure in aquatic invertebrate populations
- Assessment of biological effects across **multiple species** is necessary for remediation of past and future radioactive releases
- Combined laboratory and field studies are required to assess **applicability of lab data to natural populations**
- **Controversy regarding the doses** at which significant impacts occur to natural populations

Project Aims

- To elucidate the biological effects of ionizing radiation on aquatic invertebrate species using a number of **phenotypic and genetic endpoints** and establish the level at which these effects occur in the field
- To **compare the radiosensitivities** of freshwater and marine aquatic invertebrate species
- To assess the **applicability of laboratory exposures** to field populations

Research Outline - Laboratory Exposures



Gammarus pulex – Freshwater
Amphipod Species



Echinogammarus marinus –
Marine Amphipod Species

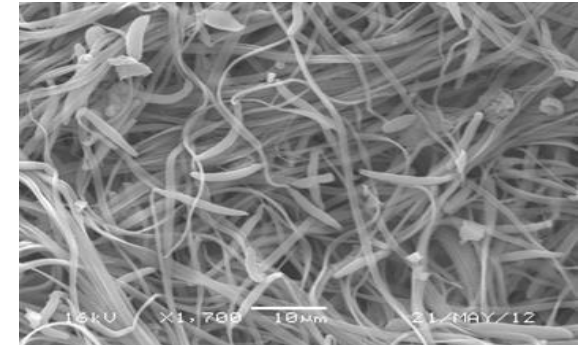


Control Population

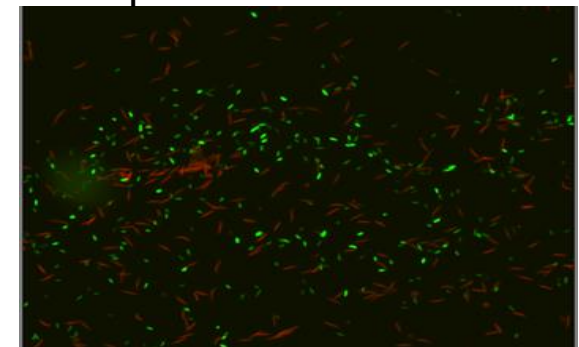
0.1 mGy/d⁻¹

1 mGy/d⁻¹

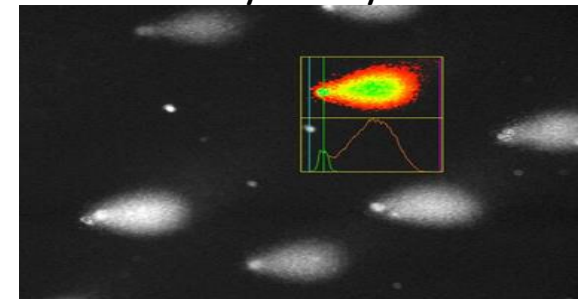
10 mGy/d⁻¹



Sperm Counts



Viability Assays

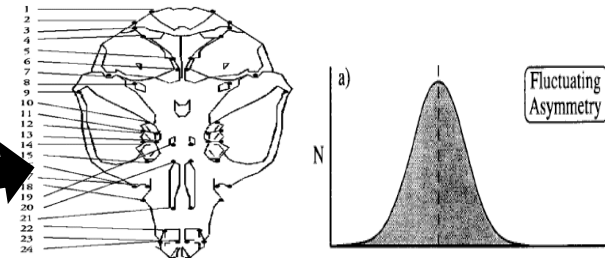


Comet Assay

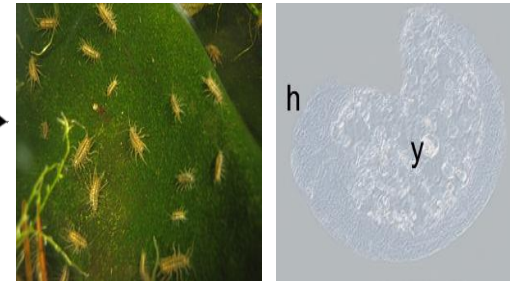
Research Outline – Field Studies: Chernobyl & Belarus



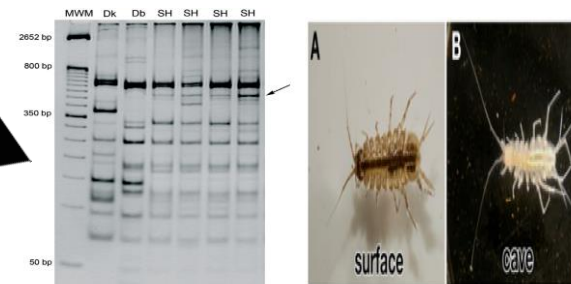
Asellus aquaticus – Freshwater
Isopod Species



Fluctuating Asymmetry



Population Parameters



Genetic Diversity - AFLP