

Biomonitoring of genotoxic contamination in two selected water bodies using erythrocytic nuclear abnormalities in feral Nile tilapia

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Inland water bodies are getting contaminated with wide variety of pollutants which may include genotoxic substances. The exposure of fish populations to genotoxic substances in the aquatic environments could induce mutations and diseases due to genetic aberrations. Erythrocytic nuclear abnormalities (ENA) which indicate mutagenic damage as a consequence of both spindle abnormalities and chromosomal breakage are sensitive and promising nonspecific biomarkers for exposure of fish populations to genotoxic substances in the natural environment. The present study was carried out to monitor genotoxic contamination in two selected water bodies in Sri Lanka with different degrees of pollution viz. Weras Ganga and Bathalagoda reservoir using ENA in a food fish, Nile tilapia inhabiting the two water bodies. Fish were collected from the study sites bimonthly during the period January 2008 to March 2009 and frequency of nuclear abnormalities were assessed using standard procedures. The nuclear abnormalities observed in the erythrocytes were micronuclei, notched nuclei, blebbed nuclei, nuclear buds and binuclei. The results showed that the frequencies of occurrence of micronuclei and other nuclear abnormalities in the erythrocytes were significantly higher in the fish collected from a polluted urban water canal, Weras Ganga compared to those in fish from a less polluted non-urban water body, Bathalagoda reservoir. Frequency of occurrence of ENA in fish from Bathalagoda reservoir was comparable to that in laboratory reared controls in most sampling periods. The results indicate that Weras Ganga is contaminated with genotoxic substances which could induce mutations in biota especially in feral fish populations.