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Alterations in chromatin DNA and protein absorbance ratio in the liver of albino rats (*Rattus norvegicus*) treated with bonny light crude oil

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Abstract

Objective: To determine whether or not Bonny Light Crude Oil (BLCO), when administered to albino rats for six consecutive days at 48 hours interval would result in a dose-related alteration in chromatin structure as obtained in its absorbance ratio, and subsequent impairment of its function such as DNA synthesis.

Methodology and results: Twelve albino rats (*Rattus norvegicus*) were divided into four groups with group one serving as control, and group two to group four were administered with 2.5, 5.0 and 10.0 ml/kg bw of Bonny Light Crude Oil (BLCO) by intra peritoneal injection for six consecutive days. All the rats were sacrificed on the eighth day and their liver excised. The livers were all homogenized, and through differential and fractional centrifugation, the nuclei containing the chromatin were obtained. The chromatin DNA and protein absorbance ratio was determined at 260nm and 280nm by UV spectrophotometry. The results show that the chromatin ratio for control (untreated) rats was 0.95 while there were moderate increases in the ratio for treated rats. Significantly the 260nm/280nm absorbance ratio increases occurred at 260nm and not 280nm, showing that chromatin DNA was more altered than chromatin protein.

Conclusion and application of findings: Bonny light crude oil probably induced DNA polymerization by unscheduled DNA synthesis in chromatin, which suggests genotoxicity especially carcinogenicity. This demonstrates probable adverse impact to human health on exposure to crude oil spillage and pollution in air, land and water bodies.

Biography

Ibiba F. Oruambo obtained his Ph.D from New York University and completed his doctoral research thesis in the laboratory of organic chemistry and carcinogenesis in Nelson's Institute of Environmental Medicine of New York University. He is currently a senior lecturer in Biochemistry and Environmental Toxicology in the Department of Chemistry, Rivers State University of Science and Technology, Nigeria. His research focuses on the biochemistry of chemical carcinogenesis and environmental toxicology as these relate to the effect on eukaryotic DNA and proteins. He is CEO of ENVIR-health Consultants, a consulting firm on environmental health issues. He has published over 24 papers in reputable international and Nigerian journals.