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Determination of some blood hydrocarbons contents, oxidative stress markers and haematological indices of rats orally exposed to bonny light crude oil

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This study assessed the concentrations of blood benzene, toluene, ethylmethylene, xylene, and total polycyclic aromatic hydrocarbons (PAH), some oxidative stress markers (MDA, SOD and CAT) and haematological indices in male albino Wistar rats orally exposed to bonny light crude oil (BLCO). Eighteen rats, weighing 150–180 g, and distributed into three groups of six rats each, were used in this study. Rats in groups one and two, which served as the control groups, were respectively administered distilled water and vegetable oil only; while rats in group three (test group) were orally administered 60 mg/kg bwt of BLCO daily for 30 days. At the end of the exposure period, the animals were sacrificed and the blood samples collected for the analysis of some haematological indices, blood oxidative stress markers and hydrocarbon concentrations. All the analyses were carried out using standard laboratory methods. The results showed that blood benzene, toluene, ethylmethylene, xylene, and total polycyclic aromatic hydrocarbons (PAH) recorded for rats exposed to BLCO (0.066 ± 0.004 , 0.641 ± 0.032 , 0.470 ± 0.030 , 0.112 ± 0.009 , and 12.540 ± 0.720 ug/dl, respectively) were significantly ($p<0.05$) higher compared with the concentrations recorded for rats in group one (0.020 ± 0.001 , 0.015 ± 0.001 , 0.010 ± 0.000 , 0.031 ± 0.001 , and 2.270 ± 0.120 µg/dl, respectively) and two (0.021 ± 0.001 , 0.016 ± 0.001 , 0.010 ± 0.001 , 0.031 ± 0.001 , and 2.271 ± 0.011 µg/dl, respectively). It was also observed from the results of this study that exposure to BLCO produced a significant ($p<0.05$) oxidative stress condition (decreased blood CAT and SOD activities and increased MDA concentration), and haematotoxicity (decreased RBC, Hb, PCV, and increased WBC and some differential cells) in male rats, compared with the control rats. It may therefore be concluded that benzene, toluene, ethylmethylene, xylene, and polycyclic aromatic hydrocarbons (PAH) are likely implicated in crude oil induced oxidative stress and haematotoxicity recorded in this study for male rats.

Biography

Saviour U Ufot completed his BSc in Biochemistry and MSc in Pharmacology from University of Calabar and Ibadan respectively. He completed his PhD in Biochemistry (Biochemical and Environmental Toxicology) from University of Calabar in 2014. He was a Lecturer in the Department of Pharmacology, University of Ilorin, Nigeria from 1993 to 1998. He is presently working with Total Exploration and Production Nigeria Limited as a Health, Safety and Environment specialist. He has published over 14 papers in reputable journals and has attended many scientific seminars and conferences.

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