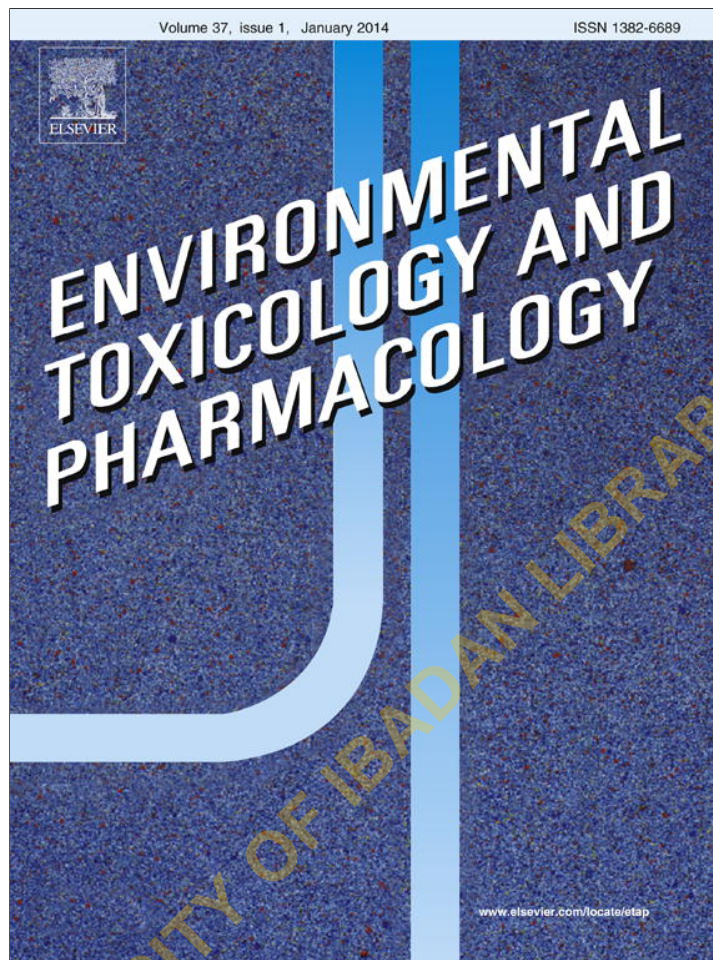


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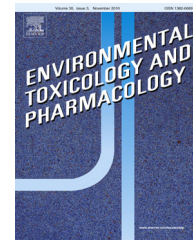
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Sperm functional parameters and erythrocytes oxidant–antioxidant imbalance during municipal landfill leachate treatment withdrawal in rats

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ABSTRACT

Adequate information on how leachates affect hematological and reproductive functions is necessary to help in linking causality with predictable response. The present study investigated the effects of Olushosun municipal landfill leachate (OMLL) exposure and withdrawal on sperm characteristics and erythrocytes oxidant–antioxidant balance in rats. Adult male Wistar rats were exposed to 0%, 12.5% and 25% OMLL in drinking water for 28 days. One-half of the rats in each group were sacrificed on day 29 while the remaining one-half stayed an additional 28 days without treatment. OMLL exposure significantly decreased sperm functional parameters, disrupted antioxidant systems with concomitant elevation in hydrogen peroxide and malondialdehyde levels in erythrocytes and sperm. Following withdrawal of treatment, OMLL-mediated decrease in sperm count and daily sperm production were reversed to near control. However, erythrocytes and sperm oxidative damage, increased sperm abnormalities, decreased epididymis weight, sperm progressive motility and testicular sperm number persisted and were consistent with results obtained from rats sacrificed immediately after OMLL treatment. Collectively, OMLL-induced irreversible oxidative damage to erythrocytes and sperm in rats within the time course of investigation. These findings highlight potential adverse effects of OMLL on individuals unduly exposed to leachates contaminated substances.

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1. Introduction

Waste could be classified as industrial, biomedical and municipal solid waste (Bhargav et al., 2008). The disposal of waste to landfill remains the most common method of waste management worldwide (Siddique et al., 2009). Leachates are liquid effluents produced by the decomposition of wastes or by interaction of wastes with rain water. Leachates from landfills

which are not adequately managed may pose a severe environmental impact. Hazardous wastes are those that hold a considerable potential threat to human health or environment when improperly treated, stored, transported, disposed off or otherwise managed (Farombi et al., 2012). In Nigeria, there is growing community concern about the general health and environmental risk likely to be posed by the rapid increase in the annual waste volume on landfills which are generally not controlled and managed in accordance to international

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