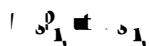
 : Biochemistry; Bitumen; Environment; Hematology; Histology; Rat



Toxic/harmful substances may be introduced deliberately or accidentally into the environment, impairing its quality and making it unsuitable for life forms. When the concentration of toxicants exceeds the homeostasis of the organisms, it can lead to death or organ damage [1,2]. Few of the well-known pollutants are herbicides, pesticides, industrial compounds/wastes, etc. [3]. Persistent organic pollutants (POPs) have been widely reported to induce environmental stress due to their inefficient biochemical and transport properties [4,5]. This makes them to be retained within the body of organisms where they biomagnify in food webs especially found in top dwellers. Such induced stress could be the precursor of various health defects, such as neuro-endocrine disruption, immune suppression and tissue/organ disruption in animals [4-8].

Blood plasma clinical-chemical parameters (BCCPs) are known to be qualitative biochemical indicators of health disorders such as organ dysfunctions, bone diseases, metabolic/hormonal imbalances, etc. [9]. Series of factors are known to influence BCCPs including infectious diseases, genetic aberrations, starvation, dehydration and pollution [10-12] and they are therefore being used as biomarkers for pollution studies involving different animal models [10-14]. It has equally been

Bitumen stock used was obtained from the bitumen observatory well in Agbabu, Ondo State, Nigeria where the bitumen flows out continuously thereby polluting the environment.

W. P. ...

Adult male and female *Rattus norvegicus* ~~as~~ *albinus* weighing 200-250 g with specific pathogen-free certified status were procured from the animal center, Physiology Department (Faculty of Basic

Table 1: Statistical summary of 14 blood plasma clinical–biochemical parameters of *Rattus norvegicus* exposed to bitumen leachate.

Parameter	Control	20%	40%	60%	80%	100%
PCV (%)	75 ± 5.22	74 ± 4.20*	63 ± 3.02*	58 ± 2.12*	49 ± 2.04*	46 ± 2.02*
WBC (mm ³ of blood)	5000 ± 10.02	7800 ± 9.21*	13600 ± 10.22*	11000 ± 12.02*	17600 ± 10.01*	24000 ± 13.22*
RBC (millions/ml)	6550000 ± 15.20	6200000 ± 20.12*	5050000 ± 19.02*	5300000 ± 31.02*	4950000 ± 17.40*	4500000 ± 23.02*
Hb (g/dl)	23 ± 0.02	23 ± 1.03*	22.6 ± 1.01*	17.7 ± 1.20*	16.1 ± 1.22*	14.8 ± 1.20*
Neutrophils (%)	08 ± 1.01	16 ± 1.02*	18 ± 1.02*	28 ± 1.01*	42 ± 3.02*	41 ± 2.03*
Lymphocytes (%)	54 ± 2.12	58 ± 3.32*	63 ± 2.02*	84 ± 3.02*	77 ± 4.02*	82 ± 4.02*
Eosinophils (%)	01 ± 0.01	01 ± 0.01	02 ± 0.01*	04 ± 0.02*	03 ± 0.02*	03 ± 0.02*

Table 2: Statistical summary of 7 haematological parameters of

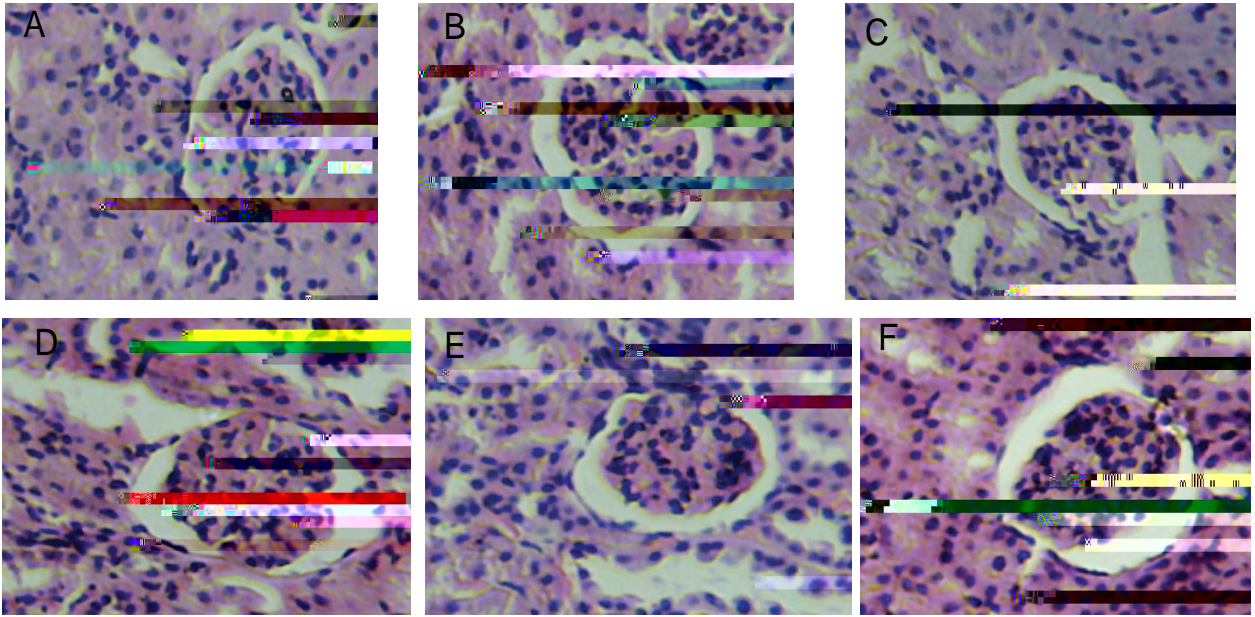


Figure 3a: A

- b:
- c:
- d:
- e:
- f:

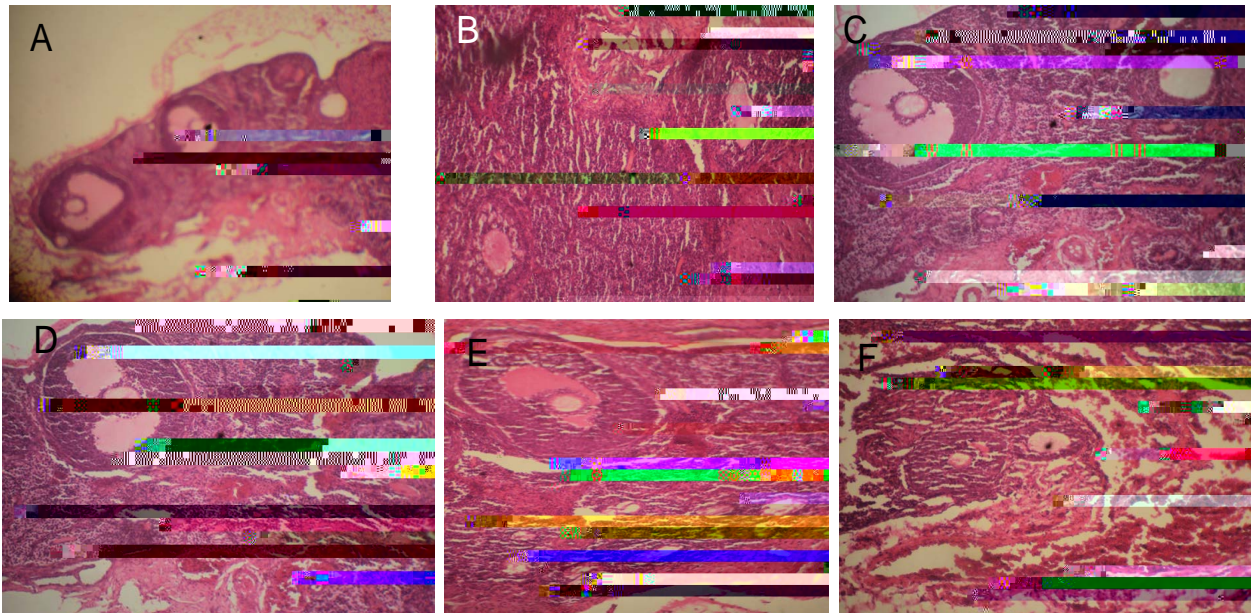


Figure 4a:

- b:
- c:
- d:
- e:

In this study, the decreased level of RBC, hemoglobin and PCV counts in rats treated with bitumen leachate might have resulted from hemolysis caused by this toxicant. Previous studies, [47,48] have reported similar observations in experimental animals exposed to different toxicants while other reported a decrease in the same parameters on exposure to other toxicants [49]. The observed increase in WBC during treatment may be due to stimulated lymphopoiesis and/or enhanced release of lymphocytes from lymphomyeloid tissue as a defense mechanism of the rats to withstand the toxic effect of the bitumen leachate and this agrees with the submission of Kavitha et al. [20]. The increase in leucocyte count indicates the stimulatory effect of the toxicant on immune system and also depends on the toxicant stress and this is confirmatory to the findings of Ates et al. [50].

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