

Short Communication**Effects of Air Pollution on Hematology of Parrot-*Psittacula krameri manillensis* at Firozabad City, U.P****Pushendra Pathak and K.S. Rana**

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Email: pushpendrakumarpathak@gmail.com**ABSTRACT**

Air pollution induced changes in the hematological parameters of birds may lead to sensitive changes. The objective of the current study was to determine the effects of in laboratory condition. Birds were maintained in a wild net in the air pollution area, which is highly polluted area of Firozabad city due to the presence of glass industrial pollutants. Numbers of blood leucocytes were counted using a preparation of smear, staining and microscopic observation technique. The Differential leukocyte count values were measured with microhaematocrit centrifugation methods.

INTRODUCTION

Several biochemical responses occur when a bird exposed for 60 days in air pollution glass industrial area. The measurement of hematological parameters is suitable method generally used in air pollution and biomonitoring of birds. Physiological changes induced due to the presence of air pollution glass industry which are also apparent at the biochemical level. In cases whereas these alterations are adaptive they are referred to as stress responses, while they are considered effects when they have a negative cause on the physiological condition or even survival of the Birds. The intensity and duration of these responses affected by several factors, including the concentration of the contaminant, during the experimental protocol exposure for 1 to 60 days other researchers have confirmed this found, for examples, changes in haematocrit.

Physiological stress indicators such as hematological parameters could be useful to evaluate the effects of contaminants heavy metals on Birds. Blood indices are considered physiological parameters of the whole body and therefore are important in diagnosing the structure and functional status of Birds exposed to air pollution glass industrial area. Moreover, hematological indices provide quite frequently and routinely accepted methods in air pollution glass industrial area. Birds blood is sensitive to air pollution induced changes in the hematology of parrots.

Many experimental reports have confirmed that the presence of heavy metals in air pollution glass industry. Several studies on different condition of experiments have confirmed that the hematological system as a whole is affected by exposure to air pollution of glass industrial area. Though, the extent of hematological system is dependent on the type of pollutants, duration of exposure, species and even the strain of birds used, furthermore, many of these studies have tested exposed in air pollution glass industrial area.

MATERIALS AND METHODS

Birds parrot was exposed for 60 days in glass industrial area of Firozabad city. The birds were reared throughout the period of study in the well ventilated well adopted room. The birds were than randomly divided into six equal groups, consisting of 6 numbered as set A to F. Blood samples were collected from the jugular vein puncture. All samples were collected into bottles containing EDTA for hematological analysis. The Differential leukocyte count was determined using preparation of smear, staining and microscopic observation technique with the help of Leishman's stains. The hematological analysis were performed according to Fudge [1], and calculated mean values and standard deviation for each acquired values. The difference between control and pollutant effects was observed and statistically evaluated using standard statistical procedures student t-test. Birds were randomly divided into the six different groups containing six parrots in each group. Conditions within each experimental sites were monitored day to day at the local area of Firozabad. The Birds

were fed on different types of variety like seeds, berries, fruits, nuts, blossome, nector, pellets, cooked beans, rice, grains, millet(Bajra), green chilli and water, the experiments were done for 1 to 60 days air pollution exposure. The fecal remains and food residues were removed each and every day. The food supply was provided fresh and without pollutants sources. The haematological analysis was performed on 36 healthy Parrot-*Psittacula krameri manillensis* for experimentation. The given data showed the increasing values of Differential leukocyte count. The Differential leukocyte count was calculated after the 1, 7, 15, 30, 45 and 60 days. The control set was recorded in Table number 1, level of Differential leukocyte count (lymphocyte, neutrophil, eosinophil, monocyte and basophils), were estimated by the method given by Dacie and Lewis [2,3].

The analysis of Differential leukocyte count with the help of microhaematocrit capillary tube to determine significant differences and to evaluate the effects of air pollution on hematological parameters, to investigate associations between bioaccumulation and its effects, Pearson correlation coefficients(r) were used to determine the blood hematology. The difference between means analyzed at the 5% probability level (p value of less than 0.05 was considered as statistically significant). Data are reported as means±standard deviation (X±SD).

RESULTS

The results showed significant increment in differential leucocyte count of haematological analysis is presented in Table-1. All activities exhibited significant analysis of variance (P>0.05). Results showed a significant increment in differential leukocyte count with in higher considerable values than those of the control group, the present study revealed that the differential leukocyte count values were found significantly increased.

Table -1: Differential Leukocyte Count (%) in the blood of parrot -*Psittacula krameri manillensis* after exposure for 60 days at sites of Firozabad city at different time intervals

Hematological Parameters	Control Set	No. of Birds	Set A	Set B	Set C	Set D	Set E	Set F
			1 Day	7 Days	15 Days	30 Days	45 Days	60 Days
Lymphocyte (%)	22.0 ± 0.5	6x6	25.0 ± 0.6*	29.0 ± 0.7*	32.0 ± 0.5*	39.0 ± 0.8**	42.0 ± 0.5**	45.0 ± 0.6****
Neutrophil (%)	38.0 ± 0.7		39.0 ± 0.7*	41.0 ± 0.5**	44.0 ± 0.8**	50.0 ± 0.6***	52.0 ± 0.7***	59.0 ± 0.7****
Esoinophil (%)	2.0 ± 0.03		1.0 ± 0.01*	1.0 ± 0.04*	2.0 ± 0.02*	3.0 ± 0.04**	2.0 ± 0.05*	3.0 ± 0.01**
Monocyte (%)	4.0 ± 0.02		2.0 ± 0.03**	5.0 ± 0.04*	2.0 ± 0.08**	1.0 ± 0.05**	4.0 ± 0.06*	6.0 ± 0.04**
Basophil (%)	1.0 ± 0.01		0.0 ± 0.0*	1.0 ± 0.02*	1.0 ± 0.01*	2.0 ± 0.01**	2.0 ± 0.03**	1.0 ± 0.02*

Industrial state, Bhau Ka Nagla; S.Em- Standard error of mean

* Non Significant (P>0.05)

** Significant (P<0.05)

*** Highly significant (P<0.01)

**** Very Highly significant (P<0.001)

DISCUSSION

Air pollution toxicity changes quantitative and qualitative characteristics of blood cells to produce toxic symptoms. Haematotoxicity happen when some of these different blood components are present or structural anomalies occurring in blood components interfere with normal functioning.Hematological parameters can be considered indicators of toxicity in Birds studies. There is little research related to hematological responses in birds exposed in Air pollution glass industrial area. In this study the hematological parameters were examined in Parrot-*Psittacula krameri manillensis*, after exposed for 60 days air pollution area. During the experimental protocol the air pollution exposure significant increase in differential leukocyte count these results are similar to those found by Valkiunas [4], Fudge [1] and Pravda *et al* [5]. The given data showed the significant increasing values of differential leukocyte count. In conclusion the major findings of this study were that the exposure in air pollution causes several changes in the hematological parameters of the studied Birds, so estimation of these indices, could provide a useful indicator of air pollution studies.

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