

**Short Communication****Comparative Study of some Hematological Parameters in Parrot- *Psittacula krameri manillensis* inhalation of Glass Industrial Pollutants at Firozabad city, U.P.****Pushendra Pathak, K.S. Rana and Surendra Singh\***

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**ABSTRACT**

The exposure of glass industrial air pollutants and comparative effects of suspended particulate matter, smog and particulate matter on some hematological Parameters of Parrot-*Psittacula krameri manillensis* were analyzed. A total thirty-six Parrot were taken in this experiment. The Birds were divided into six different groups containing six parrot in each group. The result showed that packed cell volume (PCV), mean corpuscular volume (MCV), hemoglobin concentration (Hb.conc.) were significant decreased due to the presence of glass industrial Pollutants these values were statistically different from the control group values and secondary, total leukocyte count (TLC), and mean corpuscular Hemoglobin concentration (MCHC) were significant increased in the presence of glass industrial pollutants these values were statistically different from the control group values. It is, therefore concluded that glass industrial and particulate matter are highly toxic and are potential damaging agents to the hematopoietic system and could causes serious disease.

**INTRODUCTION**

Contamination of the environment by various forms like glass industrial pollutants which are widely spread and frequent, Similarly air pollution and particulate matter are produced by various forms like Buses, Truck, coal fired etc., thousands of tones hazardous waste are produced at present time, we have examined the ring neck parakeets were allocated in experimental area of Firozabad city, which is highly polluted zone U.P. state, air pollutants India. Mainly hazardous waste is produced and enters in the blood of birds through lungs. It is well known that clinical, hematological and chemistry data can be useful aids for diagnosis of diseases in birds. Moreover, managing abnormalities in birds requires and under-standing of how disease change the blood and biochemical function of the bodies, because the clinical signs of illness in birds are frequently subtle, haemograms and clinical, chemistry are necessary to evaluate cellular changes according [1, 2]. In this study we aimed to investigate the variation in haematological values.

It therefore becomes necessary to investigate alteration in blood biochemistry for the evaluation of normal and abnormal physiological state of the Parrot after exposure in glass industrial pollutants zone.

**MATERIALS AND METHODS****Experimental Birds:**

Parrot-*Psittacula krameri manillensis*, Purchased from with the help of local animal catcher, of Firozabad city, The Birds were acclimated in wild net and were divided into six different groups containing six parrots in each group.

**Experimental Design and Maintanances :**

Birds parrot was exposed for 1 to 60 days in glass industrial pollutants at Firozabad city. The birds were reared throughout entire period of study in well ventilated well adopted room during the period of experimental protocol. The birds were divided into six different groups containing six parrot in each group. Blood samples were collected on weekend with the help of plastic syringes fitted with 20 SWG needle directly from the jugular venipuncture of Parrot- *Psittacula krameri manillensis* and mix the blood into bottles containing ethylene diamine tetra acetic acid (EDTA) for hematological analysis.

The birds were fed on different types of variety of seeds, berries, fruits, nuts, blossom, nector, pellets, cooked beans, rice, grains, millet (Bajra), green chilli and water, the experiments were done in glass industrial air pollutants zone, exposure for 1 to 60 days, fecal remains and food residues were removed each and every day. The food supply was provided fresh and without pollutants sources.

#### **Determination of hematological parameters:-**

The hematological analysis was performed 36 healthy Parrot-*Psittacula kramiri manillensis* for research experimentation. The given data showed the increasing values of TLC and MCHC and decreasing values of PCV, MCV and Hb. conc. were calculated after 1,7,15,30,45 and 60 days. The control set was recorded in accordance with Table no. 1, were estimated by the method [3] with standard Neubauer haemocytometer, Hemoglobin concentration were estimated by the method given by cyanmethaemoglobin method [3], MCHC, PCV and MCV were estimated by the method given by wintrobe's method.

#### **Statistical analysis:**

Data were subjected to statistical evaluation using mean standard deviation (X+SD), with student t-test [4].

### **RESULTS AND DISCUSSION**

The following clinical symptoms and blood biochemical changes due to the presence of glass industrial air pollutants in parrot were recorded as compared to control groups. The results showed that the mean values of TLC in ( $10^3/\text{mm}^3$ ) were different during the experimental Protocol exposure for 1 to 60 days according to set A to set F as compared to control group. The control set was recorded  $9.5 \pm 0.1 \times 10^3/\text{mm}^3$ . The TLC values were significantly increased in glass industrial air pollutants group as compared to the control group. The mean values of MCHC in (%) were different during the experimental protocol exposure for 1 to 60 days according to set A to set F as compared to control set, the control set was recorded  $24.2 \pm 0.6$ .

The MCHC values were significantly increased in glass industrial air pollutants groups as compared to the control group. These values were significantly ( $P > 0.05$ ) increase than control group and significantly ( $P > 0.01$ ) higher in glass industrial air pollutants group than the control group. The mean values of PCV in (%) were different during the experimental protocol exposure for 1 to 60 days according to set A to set F as compared to control Set. The control set was recorded  $45.0 \pm 0.6$  %, the PCV values were significantly decreased in glass industrial air pollutants groups as compared to the control group.

The mean values of MCV in (%) were different during the experimental protocol exposure for 1 to 60 days according to the set A to set B as compared to control set, the control group was recorded  $52.1 \pm 0.8$  in control group. The MCV values were significantly decreased in glass industrial air pollutants group as compared to the control group.

The mean values of Hemoglobin concentration in (gm/dl) were different during the experimental protocol exposure for 1 to 60 days according to the set A to set F as compared to control group. The control group was recorded  $15.2 \pm 0.1$ , the Hb. conc. values were significantly decreased in glass industrial air pollutants groups as compared to the control group. These values were significantly ( $P < 0.05$ ) decreased than control group and significantly ( $P < 0.01$ ) lower in glass industrial air pollutants than the control group.

Changes in some hematological parameters were recorded on parrot after the exposure for 1 to 60 days in glass industrial air pollutants zone. There in little research related to hematological responses in birds. Glass industrial air pollutants can changes quantitative and qualitative characteristics of blood cells to produces toxic effects when pollutants present in blood of parrot, hematological parameters can be considered indicators of toxicity in birds studies. In this study the hematological parameters were examined during the glass industrial air pollutants zone exposure for 1 to 60 days at Firozabad U.P. India, during the experimental protocol in air Pollution Zone. In the present study these values were showed significant increment in TLC and MCHC and significant decrement in PCV, MCV and Hb. conc. these results are similar to those found by many scientists [5-9].

**Table 1:** TLC ( $10^3/\text{mm}^3$ ), MCHC (%), PCV (%), MCV (%) and hemoglobin Concentration (%) in the blood of Parrot (*Psittacula krameri manillensis*) after exposure for 1 to 60 days at site 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
TLC ( $10^3/\text{mm}^3$ )	9.5±0.1	6×6	9.9±0.05*	10.1±0.3*	10.4±0.5*	10.6±0.7**	11.5±0.3**	12.8±0.5**
MCHC (%)	24.2±0.6		26.3±0.5*	29.8±0.4*	32.5±0.6*	36.8±0.4**	40.0±0.5**	44.4±0.8***
PCV (%)	45.0±0.6		42.5±0.8*	40.0±0.7*	35.4±0.8**	30.7±0.8**	28.5±0.6***	25.0±0.4****
MCV (%)	52.1±0.8		50.0±0.7*	48.5±0.6*	42.1±0.8**	36.0±0.4**	31.4±0.8**	28.0±0.6***
Hb. Conc. (g/dl)	15.2±0.1		14.0±0.6*	13.5±0.4*	13.2±0.5*	13.0±0.8**	12.6±0.3**	12.0±0.4**

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 ( $P<0.001$ )

It can be concluded that many of the haematological parameters differed significantly in accordance different locations. The results of clinical chemistry of Parrot-*Psittacula krameri manillensis* obtained in this study can be considered as representative values for parrot and other birds species.

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