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Impact of Novastar on the Haematological Profiles of the Rose-Ringed Parakeet

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Abstract: An experiment to assess the impact of novastar on the hematology of the rose-ringed parakeet, *Psittacula krameri*, in both sexes resulted 14.32±1.47, 10.12±0.68, 12.40±0.41 and 12.28±0.42 for males, whereas for the females, they were 12.08±0.55, 12.04±0.50, 11.34±0.18 and 10.80±0.28. It was evident that the initial doses resulted in an abrupt cessation of the feeding efficacy, followed by the reduction in the (%) hemoglobin values, past 12 h, the haemoglobin values were comparable owing to an enhanced immunological tolerance and restoration of the bone marrow tissue.

Key words: Novastar, haemotology, rose-ringed parakeet

INTRODUCTION

The rose-ringed parakeet, *Psittacula krameri*, occurs in large proportion in the light wooded areas throughout Indo-Pak subcontinent. Due to its wide feeding niche, it is regarded as a serious avian pest (Ali and Ripley, 1969; Roberts, 1991; Khan, 2002). Novastar is a mixture comprising abamectin and bifenthrin compounds. Abamectin, a mixture of avermectins B1a and avermectin B1b (Lankas and Gordon, 1989; Meister, 1992). Abamectin is a potential insecticide, but has also been administered against some mammalian pests, apart from producing the toxicity in birds. According to Bowermann *et al.* (2000) reference haematological values were comparable among different avian species. Bifenthrin, another insecticide, designated as 'restricted use', on account of severe toxicity, both to the aquatic and terrestrial organisms. It has been primarily used against insects like the worms, seed bugs and beetles in the croplands. Bifenthrin paralyses the central nervous system of insects and occasionally its impact against the small rodents, has also proved neurotoxic (Hayes and Laws, 1990). The present study was aimed at investigating the impact of novastar (containing abamectin and bifenthrin) on the haematology of the rose-ringed parakeets to determine the lethal toxicity following the administration of the lethal dose.

MATERIALS AND METHODS

Studies on the impact of novastar on the haematological profiles of the rose-ringed parakeet were extended in the Pharmacological laboratory, University of Agriculture, Faisalabad. Of the haematological parameters, total erythrocyte and leucocyte count were initially performed, following Natt and Herrik (1952). Blood was drawn into the erythrocyte diluting pipette to a desired

limit. A drop of Natt and Herrik solution was added to the medium in the counter chamber, following the placement of the coverglass on it. Approximately 2 min were given to the cells to settle down. Counting chamber was examined under a lowered power (X 10) microscope to locate a central square, whereas, examining under high powered vision, number of red blood cells present in five small squares were counted. Similarly, the number of white blood cells were also counted in the available 25 small squares. Haemoglobin estimation was made by using Sahili's apparatus. N/10 HCl was filled to the 2nd mark of a graduate tube and blood was drawn into the tube to a mark designated for the special hemoglobin pipette. The drawn blood was mixed with the HCl already present in the Sahili's tube. A time interval, approximately 3 min. was provided to facilitate the cells to collapse. The amount of acid hematin formed was estimated by comparing with the known standard, using some form of comparator.

RESULTS AND DISCUSSION

Table 1 provides information regarding the percentage of hemoglobin in both sexes of the rose-ringed parakeets, following their exposure to the novastar. It is evident that, under controlled conditions, the percentage of males was 14.32±1.47, whereas for the remaining time intervals, the percentage values for male parakeets were recorded to be 10.12±0.68, 12.40±0.41 and 12.28±0.42. For the female parakeets in the stipulated time duration, the hemoglobin percentage values recorded were 12.08±0.55, 12.04±0.50, 11.34±0.18 and 10.80±0.28, such that the overall means for both male and female parakeets were 11.92±0.28. According to the ANOVA analysis, both time (T) and interaction between gender and time (GT) were statistically significant, while the gender (G) remained non significant. According to the data of the present study, in

Table 1: Haematological values (g % SEM) of the rose-ringed parakeet following the exposure to the novastar (n = 10 each)

Obs. Time (hrs)	Male	Female	Overall mean
0.00	14.32±1.47	12.08±0.55	13.20±0.83
12.00	10.12±0.68	12.04±0.50	11.08±0.51
48.00	12.40±0.41	11.34±0.18	11.87±0.27
168.0	12.28±0.42	10.80±0.28	11.54±0.34
	12.28±0.52	11.56±0.22	11.92±0.28

the controlled conditions, the male parakeets exhibited more vigorous proportion of the blood which significantly declined after the administration of the novastar in the first 12 h time interval. It may be attributed to the abrupt changes in the blood chemistry of the parakeets which resulted in a decrease of the blood values. After 40 and 168 h, however, the haemoglobin values were comparable and similarly such results have been obtained by (Palomeque *et al.*, 1991). The wild turkey populations when treated with abamectin and bifenthrin, also expressed almost similar proportions in New Castle, England (Vigin, 1997). In the present study, the reduction seems to be sudden or the 12 h but later on possibly due to the immunological tolerance and activation by bone marrow tissue, the reduction slowed down and the parakeets resumed to feed normally.

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