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Modulations in Haematological Aspects of Wistar Rats Exposed to Sublethal Doses of Fipronil under Subchronic Duration

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ABSTRACT

Fipronil (FPN) a phenylpyrazole insecticide is one of the preferred agricultural chemical known for controlling insect pests. Assessment of its safe and toxic levels has become a matter of serious concern as it is occupationally exposed to the farming community. The current investigation was thus aimed to elucidate the changes in haematological indices of Wistar rats on exposure to FPN. Healthy and mature male Wistar rats were distributed into four groups, namely C, E1, E2 and E3 and received 0.0, 6.46, 12.12 and 32.33mg/kg body weight of FPN respectively for a duration of 90 days. The results obtained indicated significant ($*p < 0.05$) changes in RBC, WBC, Hb, PCV, MCH and MCHC values unlike MCV as compared to control. The decline noticed in RBC suggested anaemic conditions of rats. Significant ($*p < 0.05$) elevation in WBC at E1 and subsequent decline at E2 and E3 was also witnessed under current study. As the modulatory outcome of FPN is evident on haematological aspects, it is thereby suggested that FPN under selected doses should be avoided for application into agricultural fields unless precautionary measures are taken to avoid exposure of toxicant as it threatens the health of the mammalian class resulting in compromised haematological condition.

Keyword: Fipronil; haematotoxicity; immune system; red blood corpuscles; Wistar rats

INTRODUCTION

The widespread use of pesticides in agriculture can lead to soil, water and air contamination resulting in adverse effects on inhabiting non-target organisms [1]. A number of pesticides are presented mainly into the agricultural landscapes as racemates even though their activity usually results from a preferential reactivity of only one enantiomer [2]. The pesticides currently in use include a wide variety of chemicals with great differences in their mode of action, uptake by the body, metabolism and elimination from the body, and causes the

adverse health conditions to the non-target organisms including humans [3]. In the present era a large diverse group of insecticides are utilized against the insect pests thereby enhancing agriculture yield, but they eventually are found to reach the aquatic ecosystem through agriculture runoff ultimately entering the food chain in more adequate amounts [4]. After organochlorines [5], carbamates [6], synthetic pyrethroids [7] and organophosphates [8]; new class insecticides are being explored for their ability to selectively kill insect pests with lesser or no damage to non-target organisms.

PRINCIPAL

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