

## ROLE OF LIFE STYLE PATTERN ON THE DEVELOPMENT OF BLOOD PRESSURE AMONG BHAGALPUR URBAN PEOPLE

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### ABSTRACT

Profenofos pesticides commonly used in agriculture have profound effect on mammalian system. As a organophosphate pesticide profenofos is vigorously used in different agricultural crops to get rid of multiple pests. Field Rats depend upon cultivated seeds and fruits and in turn heavily infested with profenofos. It has deleterious effect on endocrine and can cause severe damage to certain tissues and biomolecules. Curcuma longa is a well known ayurvedic and household medicine and have strong remedial property for thyroid and diabetes through the well known active compound curcumin. Swiss albino mice were exposed with profenofos (50mg/kg b.w) daily for 30 days orally after that curcumin treatment (120mg/kg b.w) upto 30 days and it was noticed that due to profenofos TSH 0.65 $\mu$ IU/ml, T3 64ng/dl and T4 3.6 $\mu$ g/dl and Glucose 51.23 mg/dl. After the treatment with curcumin these parameters get changed to TSH 0.2  $\mu$ IU/ml, T3 146 ng/dl, T4 5.7 $\mu$ g/dl and Glucose 103.9 mg/dl. On the basis of this observation it was observed that hypoglycaemia and hypothyroid is recovered by the treatment of curcumin.

**Key words:** Profenofos, Curcumin, Thyroid stimulating hormones (TSH) and Body weight (bw)

### INTRODUCTION:

Pesticides of various categories are frequently used against a number of pests in the field to increase crop production. Profenofos (0- 4 bromo -2-chloro phenyl o-ethyl s-propyl phosphothiorate) is an organophosphorous pesticides and widely used to control various insects pest of agriculture/horticulture crops in developing countries (Chirions, 1996 and Geraud, et al., 1997). It is non biodegradable and known for its residual effect on food and drinking water (E. L. Nabarwy, et al., 1993). It has been declared as moderately hazardous (toxicity class 2) pesticide by WHO and it has a

moderate order of acute toxicity following oral and dermal administration (WHO, Geneva 1990, 2001). Analysis of residual quantity of profenofos in agriculture crops and in processed food community is in for front to derive strategic measures for public health safety ( Fawzy, et al., 2007) and (Gomes et al., 1991) have observed the hepatocellular injuries in liver and tubular degradation of kidney respectively under the exposure to profenofos. It has also been reported that profenofos exposed animal's shows decrease in the level of blood cells and hemoglobin in comparison to normal range (Shehata, 2006). It is also reported that some plant extract i.e., Calotropis gigantean have anti inflammatory activity (Jagtap et al., 2010) and abutilon dicum and ponax gigesang (Gomes J.; et al., 1999).

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Generations of free radicals and reactive oxygen species /stress (ROS) are considered as diagnostic index in profenofos poisoning (Roshan, *et al.*, 2000). The toxicity of organophosphorous insecticide results in negative effect on many organs and system such as liver kidney and nervous system (R. Aly, *et al.*, 2000). Earlier studies have shown that acute and sub chronic exposure to dimethoate alters the antioxidant status and the histology of liver and brain in rats (R. Sharma, *et al.*, 2005). The thyroid hormones tri-iodothyronine (T3) and thyronine (T4) are tyrosine based hormones produced by thyroid glands that are primarily responsible for regulation of metabolism. It is composed of iodine and its decreased level leads to decrease in T3 and T4 (causes goitre) (Roshan S., *et al.*, 2000). It is reported that curcumin (1, 7 bis (4-hydroxy -3 methoxy phenyl) 1, 6 heptadiene 3-5 dione) have scavenging potential to free radicals and reactive oxygen stress (Shehata E.M. Shal.; *et al.*, 2006). The use of turmeric includes antiseptic analgesic, anti-inflammatory, anti oxidant and other activities associated to turmeric (C. Niederau 1999, A.Tawatsin 2001, G. Bouvier; *et al.*, 1993). Therefore, it is not too surprising that turmeric displays activities against a variety of disease because it exhibits potent antioxidant activity. In view of such changes in hormones and other brain parameters, the present investigation has been designed to improve the hormone and glucose level in mammalian model organism, Swiss Albino Mice (*Mus musculus*) by the treatment of curcumin (herbal product) to profenofos exposed mice.

## **MATERIAL AND METHODS:**

### **ANIMALS:**

9 pairs of male Swiss albino mice with average body weight ranging from 22-30gm were obtained from animal house of University Department Zoology, T. M. Bhagalpur University,

Bhagalpur, Bihar. Food and water to mice were provided ad libitum (prepared mixed formulated feed by the laboratory itself). Animals were housed in colony room with 12 hrs light /dark cycle during the period of experimentation.

### **TREATMENT PROTOCOL:**

Animals were placed in 3 groups and each group containing six animals having body weight 25-30gms. Following protocol were adopted to treat each group of animals.

**Group 1:-** Normal control; given normal feed for thirty days

**Group 2:-** Profenofos treated; Animals were exposed to profenofos 25 mg /kg body weight for 30 days (profenofos was dissolved in sterilized distilled water to make stock solution out of which required volume was orally administered to animals to maintain the dose as prescribed.

**Group 3:-** Curcumin treated; after 30 days of profenofos exposure, curcumin (120 mg/kg body weight) was orally administered daily for further 30 days. Curcumin was dissolved in ethanol (1mg /1ml) and the required volume of it was orally administered to maintain the dose prescribed.

### **Blood Collection:**

2ml of blood sample was collected through retro orbital vein puncture from different groups of animals for the taken parameter study. Blood glucose level test were performed and hormonal studies i.e., TSH, T3 and T4 test were performed according to chemo-luminescent immune assay.

### **RESULTS:**

The findings depicted in Table-1 shows that there was a significant decrease in thyroid hormone T3, T4 and glucose level and increase in TSH level in profenofos exposed mice. The treatment of curcumin (120 mg/kg body wt.) was given to profenofos exposed mice and it was noticed that in curcumin treated mice hormone and glucose

levels were noticed to approach to normal range. Results of each group of animals were presented in Table-1.

**Table 1; shown values of different parameters**

No of group	TSH (0.17-0.3 $\mu$ IU/ml)	T3 (65-200 ng/dl)	T4 (5.5 $\pm$ 0.7 $\mu$ g/dl)	Glucose level (80-120 mg/dl.)
Normal control	0.25 $\mu$ IU/ml	70 ng/dl	5.6 $\mu$ g/dl	110 mg/dl
Profenofos exposed	0.65 $\mu$ IU/ml	64 ng/dl	3.6 $\mu$ g/dl	51.23 mg/dl
Curcumin treated	0.2 $\mu$ IU/ml	146 ng/dl	5.7 $\mu$ g/dl	103.9 mg/dl

### DISCUSSION:

Present result and previous studies shows that profenofos caused harmful effect on animals, human and environment. It is widely used in developing countries for pest control and crop production. Our results provide good effect of curcumin (120 mg/kg body wt.) on hypothyroid and hypogalaceamia caused due to profenofos exposure. The present finding revealed that the decrease in thyroid hormone and glucose level is due to the effect of profenofos on the pituitary gland which secretes TSH which promotes the secretion of thyroid hormones (T3, T4). Turmeric extract may soothe irritation in blood vessel; skin and the brain. Researchers believe that due to its antioxidant potential it supports thyroid health. In order to control the profenofos exposure on hormone level and glucose level, the present finding suggests that curcumin has the ability to efficiently reduce the profenofos exposed effects in Swiss albino mice.

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