Research Article

Effect of Earthworm Paste on Growth and Reproduction In Wistar Rats *(Rattus norvegicus)*

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ABSTRACT
Dietary supplementation with the earthworm paste to Wistar rats significantly increased the percentage of growth rate and number of litters delivered of when compared to the rat fed on standard rodent diet and given water *ad libitum* (normal control). The percentage of growth rate of experimental male and female rat fed on the earthworm paste showed a significant increase ($p<0.01$) when compared to the respective normal control groups. The results clearly indicate that earthworm paste is a good growth and reproductive stimulator.

Keywords: Earthworm paste, Wistar rats, *ad libitum* and rodent diet.

INTRODUCTION

The use of earthworms as therapeutic drugs is described in a book on ancient Chinese medicine Shen Nong's Herbal". According to traditional Chinese medicine, earthworms possess anti-pyretic, antispasmodic, diuretic and detoxic effects etc. In recent years, it has also been found that earthworms have strong antiasthmatic, antihypertensive and antiallergic effects (Mao *et al.,* 1964).The folk-legend in China revealed that the earthworm exhibits a contraceptive capacity greatly inspired us to study the spermatocidal effects of earthworms (Zhao, 2005). Hence the effect of earthworm paste on the reproductive potential of rat was evaluated.

MATERIAL AND METHODS

Preparation of "Earthworm Paste"

The *Eudrilus eugeniae* (Kinb) were washed with running tap water and then fed with wet blotting paper for 18-20h to clear their gut. The gut cleared worms were again washed with distilled water. The worms were kept in plastic troughs, covered tightly with polythene cover, and exposed to sunlight for 3 days to kill them. Mucus and coelomic fluid that oozed out digested the dead worms forming a brown coloured paste earthworm paste (EP*)* (Balamurugan, *et al.,* 2007).

Animals Used

Healthy and pure strain male and female Wistar rats (*Rattus norvegicus*), ranging from the body weight of 150-200g used for the experimental study. The animals were housed in polypropylene cages at 24° ± 2° C and were fed with standard pellets, chow,(Lipton, Mumbai) and water *ad libitum* throughout the experiment. The experiment got clearance from the institutional animal ethical committee (IAEC) approved the experimental protocol.

Treatment/Control Groups

Two groups (control and Experimental) comprising of six pairs each of male and female Wistar rats weighing in the range of 150-200g were selected.

Group 1

Normal control- Wistar rats receiving rodent pellets and water only. F_o generation rats of same age group were used for the studies.

Group 2

Experimental rats receiving rodent pellets and the crude earthworm paste 500mg/kg orally administered to each of six pairs of male and female Wistar rats daily in the morning for 14 weeks. The body weight, time required for giving birth to young ones, number of young ones delivered by each group and external abnormalities, if any in the young ones were recorded.

RESULTS AND DISCUSSION

The growth rate of male and female Wistar rats supplemented with the earthworm paste is given in fig 1 and 2 respectively .The percentage of growth rate of the male and female rat fed on earthworm paste showed a significant increase ($p<0.01$) when compared

to the control groups. The increase in the percentage of growth rate in the experimental group was consistent throughout the experimental period when compared to the control groups. A significant difference in the percentage growth rate was observed between male and female control rat ($P<0.0001$). Results on the effect of earthworm paste on the number of litter's production (11±1) were compared with the control groups (7±2) fed on standard rodent pellets. The control female rat conceived during the eighth week and gave birth to young ones during the eleventh week of the experiment. Interestingly, the experimental female rat supplemented with the earthworm paste feed conceived much earlier in the third week and also conceived for the second time during the tenth week of experiment when compared to the control groups. A sudden decline in the percentage growth rate during the eleventh week in the control female rat and the seventh and thirteenth week in the experimental rat was attributed to parturition.

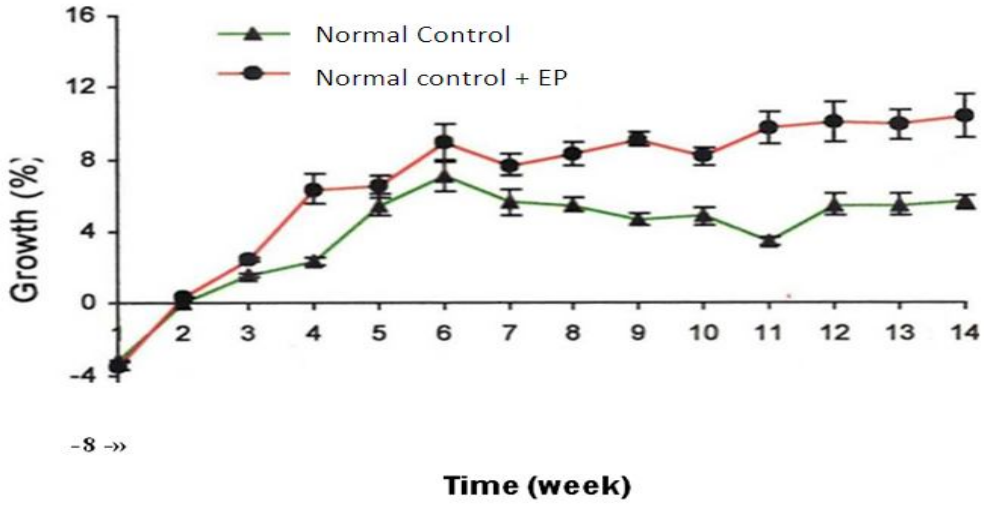

Fig. 1: Effect of the earthworm paste supplemented food on percentage growth (±SE) in male Wistar rats *Rattus norvegicus*

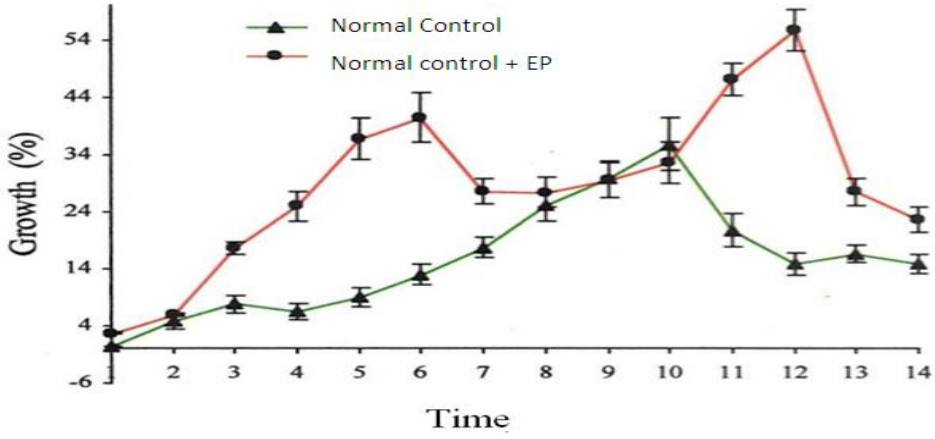

Fig. 2: Effect of the earthworm paste supplemented food on percentage growth (±SE) in female Wistar rats *Rattus norvegicus*

Dietary supplementation with the earthworm paste to Wistar rats significantly increased the percentage of growth rate and number of litters delivered of when compared to the rat fed on standard rodent diet and given water *ad libitum* (normal control). The percentage of growth rate of experimental male and female rat fed on the earthworm paste showed a significant increase ($p<0.01$) when compared to the respective normal control groups. Results on the effect of the earthworm paste on litter production revealed a 22% increase in the experimental groups when compared to the normal control groups fed on standard diet. The results clearly indicate that earthworm paste is a good growth and reproductive stimulator. This is quite contrary to the Chinese folk medicine.

REFERENCES

1. Balamurugan M, Parthasarathi K, Cooper E and Ranganathan LS. Earthworm paste (Lampito mauritii, Kinberg) alters inflammatory, oxidative, haematological and serum biochemical indices of inflamed rat. European Review for Medical and Pharmacological Sciences. 2007; 11:77-90
2. Mao WH and IMiao ZX. A preliminary observation of Perichaeta Bl for primary- hypertension. Journal of Traditional Chinese Medicine. 1964;21-26.
3. Zhao J, Qi SP, Wu J, Li L and He RQ. Bioactive natural products (Part K): earthworm fibrinolytic enzyme. Stud. Nat. Prod. Chem. 2005;30:825–847.