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ANTI-ANAEMIC ACTIVITY OF LEAF EXTRACT OF EHRETIA LAEVIS ON ALBINO RAT

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ABSTRACT

The present work deals with the evaluation of haematinic effect of *Ehretia laevis* aqueous extract in phenyl hydrazine treated albino rats. Anaemia was induced in rats by intraperitonial administration of phenyl hydrazine daily for 2 days. Anaemic rats were treated with 150 mg/kg/day and 200 mg/kg/day body weight of plant extract. Haematological investigation revealed that *Ehretia laevis* has positive effect on haemopoetic system of rats.

KEYWORD: Albino rats, Phenyl hydrazine, haemopoetic, *Ehretia laevis.*

INTRODUCTION

Anaemia is a decrease in the total amount of red blood cells (RBCs) or haemoglobin in the blood, or a lowered ability of the blood to carry oxygen. When anaemia comes on slowly, the symptoms are often vague and may include tiredness, weakness, and shortness of breath or a poor ability to exercise. Anaemia that comes on quickly often has severe symptoms, which may include confusion, feeling like one is going to pass out, loss of consciousness, or increased thirst. Anaemia must be significant before a person becomes noticeably pale. Additional symptoms may occur depending on the underlying cause (Rodak, 2007; Johnson and Rubenstein, 2013).

Medicinal plants have been discovered and used in traditional medicine practices since prehistoric times. Variety of medicinal plants also show the potential to treat the anaemia.

Among these different plant, *Ehretia laevis* is a local medicinal flora of Amravati district, Maharashtra. *Ehretia laevis* belongs to family Boraginaceae. It is a perennial deciduous tree

of moderate sized smooth with grey bark. The leaves are of 7-14 cm long, elliptic, obtuse or acuminate, entire, membranous when young, hard when mature. Flowers white, small, in terminal or axillary, slender, usually one-sided cymes. The calyx with 5-cleft, corolla-tube is of 2.5 cm long, petals 5, spreading. Stamens 5; fruit a 0.5 cm across drupe, globose, depressed and red. (Torane *et al*., 2011). In the present work an effort was made to study the antianemic activity of the leaves of *Ehretia laevis* on albino rat model.

2.0 MATERIAL AND METHODS

2.1 Laboratory animals

Wistar albino rats (180-220 gm) used for the experiment, were purchased from the animal house of Sudhakarrao Naik Institute of Pharmacy, Pusad (Maharashtra) and maintained in animal house of Government Vidarbha Institute of Science and Humanities, Zoology Department, Amravati (Maharashtra). All the rats were kept in standard plastic rat cages with stainless steel coverlids and wheat straw was used as bedding material. The protocol was approved by the Institutional Animal Ethics Committee with registration no.1060/ac/07/CPCSEA/03/feb- 2015.

2.2 Plant material

The plant material (plant leaf) was collected from different regions of Amravati district in January 2017 and identified and authenticated by Botanical survey of India Pune Maharashtra. The voucher specimen of the same was deposited.

2.3 Preparation of extracts T

he material was dried at room temperature and powdered and sieved through various meshes. The powdered plant material was extracted with water in Soxhlet apparatus. The filtrate was then concentrated on a steam bath to give the extract [black slurry].

2.4 Induction of anaemia

Anaemia was induced in rats by interperitoneal administration of phenylhydrazine (1ml/kg body weight) daily for 2 days. Confirmatory test using 3 rats was carried out in a trial experiment after which the plasma haemoglobin level was determined to verify that rats were anaemic.

2.5 Experimental animal groups

Group	Description
I	Normal control received 10 ml/kg of distilled water
II	Anemic control received 1 ml/kg Phenylhydrazine
III	Positive control rat treated with $AlCl_3$
IV	Anemic rat treated with *Ehretia laevis* extract of 150 mg/ kg/ day
V	Anemic rat treated with *Ehretia laevis* extract of 200 mg/ kg/ day

2.6 Collection of blood Sample and Laboratory analysis

After 14 days of treatment, whole blood sample was collected from retro-orbital plexus under anaesthesia. For haematological analysis, samples were added to a tube containing EDTA. Estimation was done by Automated analyser. The results were expressed as Mean ± SD of triplicate (Khan and Khanum, 2008).

RESULTS AND DISCUSSION

Table 1 shows the initial body weight and final body weight of control, anaemic, AlCl3 and extract treated rats. It was observed that the anemic group and the AlCl3 treated group of rats shows a decrease in weight on the 15th day as compared to control and there was almost no change in weight in extract treated groups.

Table 1: Changes in body weight of rats.

	Weight of Rats on 1st day	Weight of Rats on 15th day
Control Group	190	195
Anaemic Group	200	180
Positive Control ($AlCl_3$)	230	210
Anaemic+ Extract Treated group I	210	210
Anaemic+ Extract Treated group II	200	205

Haematological parameters such as the haemoglobin, RBC, WBC, Lymphocytes, Granulocyte, PLT, MCV and MCH of the five experimental groups are shown in table II and Fig. 1. A slight increase in MCV in AlCl3 treated group and extract treated group is observed as compared to control There is a decrease in neutrophil count in anaemic control group (Negative control) and increase in AlCl3 treated group as well as extract treated group as compared to control. Similarly it is observed that there is a decrease in Hb level in anaemic group (Negative control) where as an increase Hb level in the positive control (AlCl3 treated group) as well as extract treated group. It was observed that that there was an increase in R.B.C., W.B.C. as well as platelets in the extract treated groups as compared to negative control group.[fig II.Table2]

Table no. 2: Effect of alcoholic extract of *ehretia laevis* leaves on phenylhydraxine -induced anaemia in rats.

	WBC	Lymp	RBC	Hb	Neutrophil	PLT	MCV	MCH
Control	13.73±0.3	9.55±0.9	9.86±0.2	11.33±0.6	3.35±3.5	653±.3.5	51.8±0.3	18.7±0.13
Anaemic	10.71±0.2***	7.11±0.2	7.88±0.3**	9.11±0.11**	2.37±0.09	520±2.0	55.3±1.0*	20.08±0.21**
Al Cl3	17.08±0.54*	10.13±0.2***	8.06±0.0	10.13±0.21	2.76±0.2**	606.6±11.4*	70.25±0.2	19.03±0.1**
Ext. 1 150Mg/Kg	14.1+0.2**	11.1±0.3**	9.4±0.18**	13.7±0.2***	2.73±0.1	613±13.3**	67.36±0.5	21.5±0.13***
Ext. 2 200Mg/Kg	17.18±0.29***	12.33±0.2*	10.55±0.1	15.02±0.3***	3.10±2.0*	630±0.06	7.23±0.8**	23.42±0.1*

Value in mean ± S.E (Standard Error), n=6,*P<0.05, **P<0.01, ***P<0.001, when compared between group.

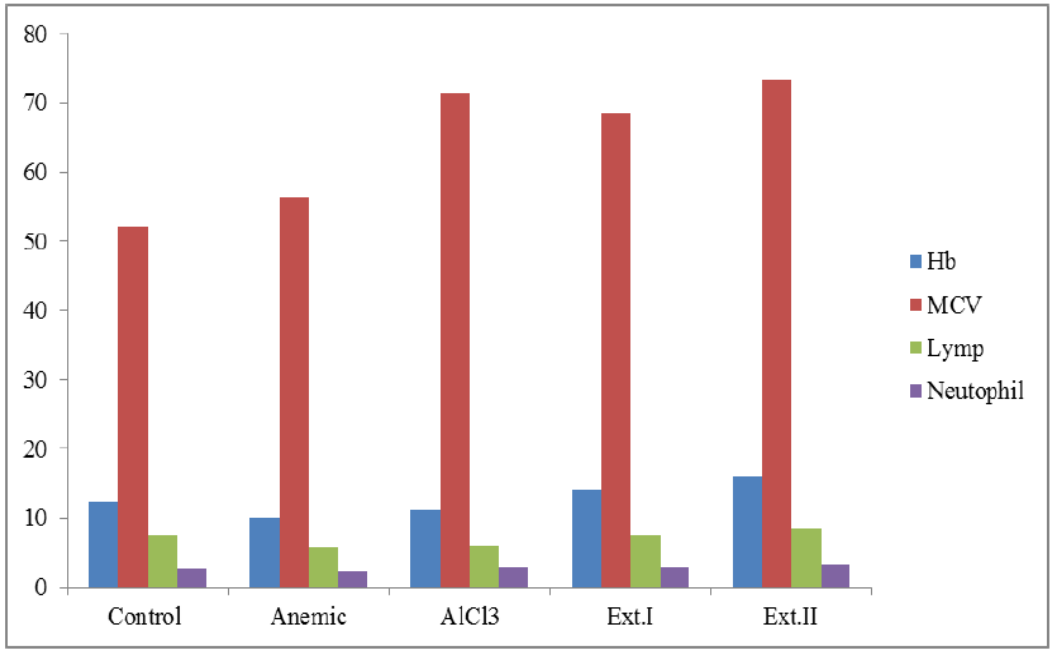

Fig. 1: Graph showing effect of alcoholic extract on Hb-Haemoglobin, MCV-Mean cell volume, Lymph-Lymphocytes, Neutrophil.

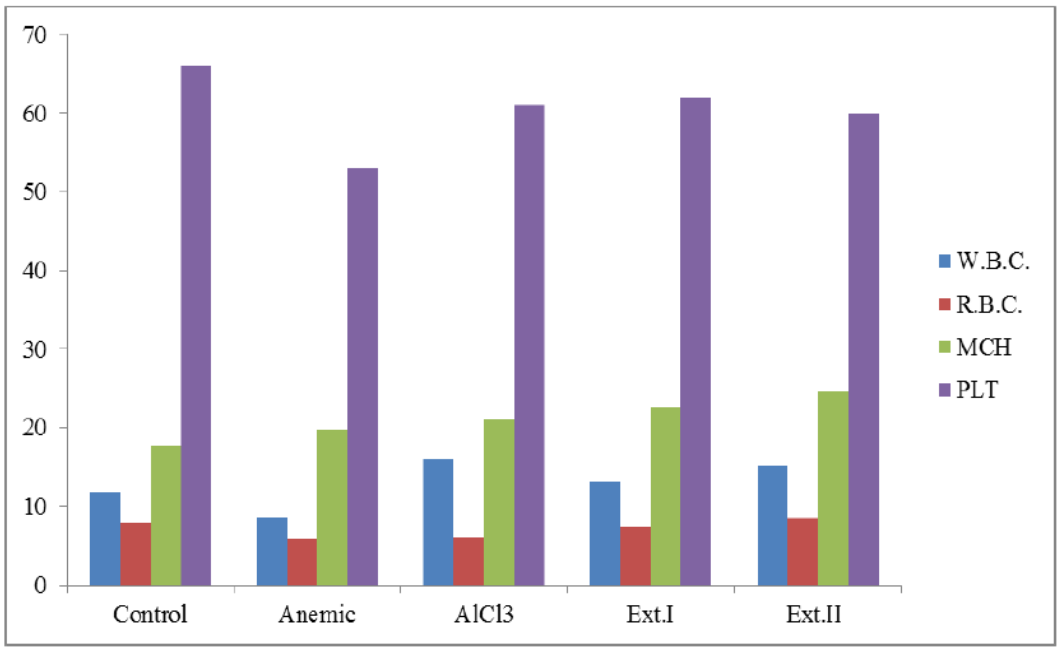

Fig. 2: Graph showing Effect of alcoholic extract on WBC- White blood cells, R.B.C.- Red blood cells, PLT-platelets, MCH-Mean cell haemoglobin.

DISCUSSION

The leaf extract of *Ehretia laevis* had positive effect on the haemopoietic system of experimental rats. It was observed that administration of aqueous extract of *Ehretia laevis* orally for a period of 15 days in test rats resulted in augmentation of RBC, MCV, WBC, and platelet count compared to control rats.

The rise in production of RBC (erythropoiesis) shows that aqueous extract of *Ehretia laevis* may provoke erythropoietin release from kidney, which acts as human oral regulator for RBC production as earlier reported in case of Mangiferaindica and in Anethumgraveolens. (Nwinuka- Nwibani, M. *et. al.*, 2008).This observation is in agreement with previous report of, Keenwe and Bekalo (1996), Sainak (2009), Nayak and Thirunavoukkarasu (2016), Gopalasathees kumar *et al.* (2019), Mishra, (1980); Chandan *et. al.*, (1991); Rawat *et.al.*, (1997).

CONCLUSION

The present study showed that haematological parameters increase in experimental animals, indicating the boosting effects of plant extract (*Ehretia laevis*) on the synthesis of haemoglobin and for formation of red blood cells and might have a promising role in treatment and prevention of anaemia.

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