Scholars Academic Journal of Biosciences (SAJB) **ISSN 2321-6883 (Online)**
Sch. Acad. J. Biosci., 2016; 4(8):681-683 **ISSN 2347-9515 (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI : 10.36347/sajb.2016.v04i08.015

Original Research Article

Anti-Anemic Activity of Ethanolic Leaf Extract of *Kedrostis foetidissima* in Phenylhydrazine Induced Anemic Rats

Baskaran K[1*], Suruthi B[2]
[1]Chengalpattu Medical College, G.S.T. Road, Chengalpattu, Kancheepuram – 603001, Tamilnadu, India
[2]Madras Medical College, E.V.R. Periyar Salai, Park Town, Chennai – 600003, Tamilnadu, India

***Corresponding author**
Dr. K. Baskaran
Email: basky235@gmail.com

Abstract: The aim of the present study is to evaluate the anti-anemic activity of ethanolic leaf extract of *Kedrostis foetidissima* against phenylhydrazine induced hemolytic anemia in rats. Phenylhydrazine (60mg/kg) was administered intraperitoneally for 2 days to induce anemia in rats. The animals were divided in to four groups of 6 animals each. Group I served as normal control, group II as anemic control, group III as reference control administered with Vitamin B_{12} and group IV animals were treated with 200mg/kg, of ethanolic leaf extract of *Kedrostis foetidissima*. All the test drugs were administered once daily for 28 days through oral route. On 29th day blood was withdrawn, through sinus puncture under phenobarbitone anesthesia and subjected to the estimation of RBC, Hb and percentage Hematocrit. Both the ethanolic leaf extract of *Kedrostis foetidissima* and Vitamin B_{12} significantly increased the RBC, Hb and Hematocrit levels which conclude that, *Kedrostis foetidissima* leaf extract exhibits anti-anemic activity.
Keywords: Anemia, Anti-anemic activity, *Kedrostis foetidissima* and Vitamin B_{12}.

INTRODUCTION

Anemia is a condition that develops when blood lacks enough healthy red blood cells or hemoglobin. Anemia affects the lives of more than 2 billion people globally, accounting for over 30% of the world's population which is the most common public health problem particularly in developing countries occurring at all stages of the life cycle [1]. Iron deficiency is the most common nutritional disorder in the world. Worldwide, Iron-deficiency anemia is a significant problem and especially in developing countries it is widespread yet the most neglected micronutrient deficiency disorder among children, adolescence girls, and pregnant women [2].

Anemia occurs when the body's iron stores become depleted and a restricted supply of iron to various tissues becomes apparent. This may result in depletion of Hemoglobin and iron-dependent intra-cellular enzymes participating in many metabolic pathways [3]. Therefore, there is the need for proper management of micronutrient deficiencies most especially irons deficiency. Over the years, medicinal plants have been recognized to be of great importance to the health of individuals and communities. In many developing countries, herbal medicines are assuming greater importance in primary health care.

Kedrostis foetidissima (Family: Curcubitaceae) is a herbaceous perennial plant producing annual stems up to 3 meters long from a tuberous, perennial rootstock. The stems scramble over the ground and climb into the surrounding vegetation, attaching themselves by means of tendrils. The leaves are a favored food of some native peoples, where they are commonly harvested from the wild for local use. *Kedrostis foetidissima*, traditional medicinal plant, locally named as Appakovai, in Tamil, the juice of leaves used to treat common cold and diarrhoea in children [4,5]. The roots crushed, mixed in cold water is taken once a day for the treatment of Measles (6). *Kedrostis foetidissima* which is very effective in the treatment of asthma, chest pain and urinary tract infection, diarrhoea, HIV, small pox, skin diseases, snake bite [7]. *Kedrostis foetidissima* have higher iron, vitamin, niacin and more starch content [8]. Based on the rich iron content in *Kedrostis foetidissima*, the current study is planned to evaluate the anti- anemic activity of *Kedrostis foetidissima* against phenylhydrazine induced hemolytic anemia in rats.

MATERIALS & METHODS

Plant Material

The leaves of *Kedrostis foetidissima* was collected from Kolli hills. It was identified and authenticated as *Kedrostis foetidissima* by Scientist 'F' Botanical survey

of India, Southern Regional Centre, Tamilnadu Agriculture University, Coimbatore. The voucher specimen (BSI/SRC/5/56/15-16/Tech - 321) has been deposited in department for further references.

Preparation of Extract

The collected leaves were, shade dried and then ground into coarse powder. The powder was then subjected to exhaustive extraction by a maceration process using 90% ethanol as a solvent at room temperature for 7 days. The ethanolic extract was concentrated by vacuum distillation to dry. The collected extract was stored in desiccators and used for further pharmacological study.

Animals

Healthy adult albino rats of Wistar strain of both sex, weighing about 150-200 g were obtained from the animal house of Chengalpattu Medical College, Chengalpattu. The rats of either sex were isolated and housed in separate cages during the course of experimental period and kept them at room temperature (24± 2°C) with a 12 : 12 h light/dark cycle. The animals were fed with standard pellet diet and provided water *ad libitum.* All the procedures and protocols were reviewed and approved by the Institutional Animal Ethics Committee of Chengalpattu Medical College, Chengalpattu.

Anti-Anemic Activity

Induction of Anemia

Anemia was induced in rats by intraperitoneal administration of phenylhydrazine (60mg/kg) daily for 2 days [9]. Rats that developed anemia with Hemoglobin concentration lower than 13 g/dl were recruited for the study.

Treatment of the animals

The anemic rats were randomly divided into 4 groups six animals each. Group I was non anemic animals (normal control) received 1ml/kg of 0.1% Carboxy methyl cellulose solution. Group II was served as anemic control and group III served as reference control, received Vitamin B_{12} syrup (1 ml/rat) and group IV animals received 200mg/kg of *Kedrostis foetidissima* extract through oral administration, by suspending in CMC solution. All the test drug were administered orally, once daily for 28 days.

On 29th day, blood was collected in EDTA coated tubes, by sinus puncture under phenobarbitone (45mg/kg, ip) anaesthesia. The following parameters like, Red Blood Cell count (RBC), Hemoglobin (Hb) and Hematocrit percentage (HCT) were evaluated in blood [10].

Statistical Analysis

Data's were expressed as mean ± SEM. The data were analyzed by using one way analysis of variance (ANOVA) followed by Dunnet's 't' test. P values < 0.05 were considered as significant.

RESULTS

Anti-anemic activity of *Kedrostis foetidissima* leaf extract on Phenylhydrazine induced hemolytic anemia in rats was studied and the results were shown on table 1. The anti-anemic activity of *Kedrostis foetidissima* leaf extract was assessed by determining the red blood cell count, hemoglobin and hematocrit percentage. Phenylhydrazine decreased the RBC, Hb and % HCT as compared normal control. There was significant (P<0.001) increase in RBC and Hb with both Vitamin B_{12} and *Kedrostis foetidissima* leaf extract against phenylhyrazine challange. Also there was significant (P<0.01) increase in % HCT with both Vitamin B_{12} and *Kedrostis foetidissima* leaf extract. This shows that *Kedrostis foetidissima* effective anti-anemic activity against phenyhydrazine induced hemolytic anemia in rats and it has comparable effect as that of the standard drug Vitamin $B_{12.}$

Table 1: Effect of *Kedrostis foetidissima* leaf extract on Phenylhydrazine induced hemolytic anemia in rats

S.No	Drug Treatment	RBC (10^6 μL^{-1})	Hb (g dL^{-1})	HCT %
1	Normal Control (0.1% CMC)	8.91±0.61	13.52±0.55	47.88
2	Anemic Control Phenylhydrazine (60mg/kg)	4.81±0.14	6.22±0.23	28.42
3	Reference Control Vit B_{12} (1ml/rat)	8.35±0.42***	13.13±0.73***	45.29**
4	Test Control *Kedrostis foetidissima* (200mg/kg)	8.04±0.54***	13.05±0.74***	43.61**

Data were expressed as Mean ± SEM (n=6)

*P<0.05, ** P<0.01 and *** P<0.001 Vs Anemic Control

CONCLUSION

The ethanolic leaf extract of *Kedrostis foetidissima* exhibits anti-anemic activity against phenyhydrazine induced anemia in rats. The anti-anemic effect produced by the *Kedrostis foetidissima* leaf may be due to its high content of iron which is present in the plant.

REFERENCES

1. Ramesh C, Lopamudra P; Prevalence of Iron-Deficiency Anemia in India: Results from a Large Nationwide Survey. Journal of Population and Social Studies, 2010; 19(1): 59-80.
2. World Health Organization, Micronutrient Deficiencies: Prevention and Control Guidelines, World Health Organization, Geneva, Switzerland, 2015.
3. Eftekhari, MH, Connor JR, Beard JL, Malecki EA, Epstein DK, Allen RP; Abnormalities in cerebrospinal fluid concentrations of ferritin and transferring in RLS. Neurology, 2003; 54: 1698–1700.
4. Karuppusamy S; Medicinal plants used by Paliyan tribes of Sirumalai hills of Southern India. Natural Products Radiance, 2007; 6(5): 436 - 442.
5. Kamatenesi MM, Acipa A, Oryem-Origa H; Medicinal plants of Otwal and Ngai Sub Countries in Oyam District, Northern Uganda. Journal of Ethnobiology and Ethnomedicine, 2011; 7:7.
6. Ragupathy S; Malasars medicinal utility of the flora in the Velliangiri hills. Journal of Ethnobiology and Ethnomedicine, 2008; 4- 8.
7. Vasantha K, Priyavardhini S, Tresina Soris P, Mohan VR; Phytochemical analysis and antibacterial activity of *Kedrostis foetidissima.* Bioscience Discovery, 2012; 3(1): 06-16.
8. Veerabahu Ramasamy Mohan, Chinnamadasamy Kalidass; Nutritional And Antinutritional Evaluation of Some Unconventional Wild Edible Plants. Tropical and Subtropical Agro ecosystems, 2010;12: 495- 506.
9. Roque M, D'Anna C, Gatti C, Veuthey T; Haematological and Morphological analysis of erythropoietic regenerative responses in Phenylhydrazine induced haemolytic anaemia in mice. Scandinavian Journal of Laboratory Animal Science, 2008; 35: 181 – 190.
10. Ghai CL; A text book of practical physiology. Jaypee Brothers, India, 1995.