



ANTI-INFLAMMATORY AND HYPOGLYCEMIC EFFECTS OF *HELIOTROPIMUM KERALENSE* IN ALBINO RATS

MANOJ SINGH* and J. P. SINGH

S. G. R. (P.G.) College, Dobhi, JAUNPUR (U.P.) INDIA

ABSTRACT

Heliotropium keralense is an important medicinal plant & rarely is distributed. Its essential active compounds are flavonoid and terpenoid play an important role in change biological activity of human physiology. Benzene eluents minimize the glucose level in blood, which enhanced by gluco flavonoid and alkaloids. Experimental study shows that 1% carraginine solution induced inflammation in hind paw of albino rats significantly affected by *Heliotropium keralense* as well as its active principle. Hypoglycemic study shows the preventive as well as curative effect of *Heliotropium keralense*. Alcoholic extract of *Heliotropium keralense* is capable to block the adrenaline at different site of circulatory system such as heart, capillaries and hormonal level.

Key words: *Heliotropium keralense*, Anti-inflammatory, Hypoglycemic.

INTRODUCTION

Heliotropium keralense is an important endemic medicinal plant of eastern U.P.^{1,2} The plant belongs to IUCN globally endangered red list category^{3,4}. The plant is useful in the treatment of worms, skin diseases, scorpion and snake poisoning, asthma, cough, anemia, insanity and epilepsy^{2,5}. Efficient micropropagation protocol of important red listed plants is an essential requirement for their conservation and mass production⁶. The present paper describes a protocol, which can be used for rapid multiplication and genetic manipulation of *Heliotropium keralense*. Obesity is a serious health problem, among the multiple factors contributing to its etiology, the sedentary life styles. White collar jobs and lack of exercise, psychological factors and the consumption of energy rich diets are the major causes. Due to obscure etiology, the treatment of obesity is difficult and challenging. Further, the cause of concern is the non availability of drugs for its treatment and the short term efficacy and the limiting side effects of available drugs.⁷ *Heliotropium keralense* of bark is useful wash in

* Author for correspondence; E-mail: singhmanojh@yahoo.com

ulcers and skin diseases and a remedy is obesity and diarrhoea. Dried buds are useful in diarrhoea, worms, piles, dysentery.⁸ The claim for the utility of this plant in treatment of obesity has not been scientifically evaluated. Hence this study is emphasized to explore the effect of root on energy balance disorders like, obesity, hyperphagia, hyperglycaemia and hyperlipidemia. Therefore, the present investigation was carried out to investigate the constituents and anti obesity activity of the ethanolic extract of *Heliotropium keralense* is being reported here.

EXPERIMENTAL

Materials and methods

Phytochemical study

Plant material

The plant *Heliotropium keralense* root was procured from eastern U.P. The plant material was identified and authenticated taxonomically by a number of workers⁹. Extraction of *Heliotropium keralense* air dried powder of root was extracted by soxhlet apparatus with different solvent. The extract was concentrated and fractionated to solid residue, where petroleum ether extract (40 : 60) yield 1.7% of dry wt. and ethanol yield (11.6%) dry wt. The identification of active compounds present in petroleum ether and alcoholic extract was identified by T.L.C. (R_f Value) and separated by column chromatography (Benzene : Et. 0 Ac-2 : 2.6) with help of column chromatography different flavonoids, terpenoids are present in alcoholic extract are isolated and recrystallised in pure form. Structure of active compound was confirmed by elucidated structure.

Biological study

For this purpose two parameters were selected as under –

- (i) Effect of *Heliotropium keralense* on adrenaline induced hypoglycemia in albino rats.
- (ii) Effect of *Heliotropium keralense* on adrenaline counteracted carragenin induced hind paw inflammation¹⁰.

Test animals

Charles foster (1 : 1) albino rats (110-10 g) of either's sex were obtained from the animal house from reputed supplier Ram Nagar, Varanasi. They were kept in laboratory

animal house at 25 + 2 °C and relative humidity 4.5-51.5% light and dark cycle of 10 and 14 hrs, respectively for one week before and during the experiments. The animals were provided with standard rodent pellet diet on water was allowed ad libitum. Rearing up of animals in the experimental period and they were kept during the entire experimental span confirmed to ethical guidelines laid down by Institutional Animal Ethical Committee (IAEC of BHU Varanasi India).

RESULTS AND DISCUSSION

Hypoglycemic effect - Adrenaline induced hypoglycemia

For hypoglycemic study of *Heliotropium keralense* experiment was designed control group adrenaline group, extract + adrenaline group saline, adrenalin & adrenaline with extract injected intravenously and plasma glucose was measured at different time intervals. In the experimental groups previous experiments was repeated on the albino rats, pretreated with (60 mg, 100 g bw) alcoholic extract of drug. This drug was intra-peritonally injected to rats¹⁰. In this experiment with control group adrenaline was injected intravenously and plasma glucose was measured at different time intervals. In the experimental group previous experiment was repeated on the albino rats, pretreated with (60 mg/100 g b.w.) alcoholic extract of drug. The drug was intraperitonally injected to rats.

Table 1

S. No.	Group	Blood glucose 1 (Mean + S.E.)
1.	Control	91.8 ± 1.35
2.	II	166 ± 3.61
3.	III	122 ± 2.44

Control – Normal Saline
 II- Adrenaline 20 mg/100 g.b.w.
 III-Adrenaline + Ext. 60 mg/100 g.b.w.

The results indicated the lesser rise of plasma glucose in the experimental groups as compared to control.

For inflammation study in albino rat's carragenin (1% soln.) was injected subcutaneously to produce the inflammation in the hind paw. This experiment was

counteracted by injecting adrenaline intramuscular (20 mg/100 gm b.w.). This experiment was checked on albino rats pretreated with (60 mg/100 gm b.w.) *Heliotropium keralense* alcoholic extract for 3, 5 & 7 days group.

- (i) Control – Carragenin (1% soln.) 0.1 ml/paw
- (ii) Exp. Group – Carragenin + Adr. 10 mg/100 g.b.w.
- (iii) Exp. Group - Carragenin + Adr. + Extract 60 mg/100 g.b.w.

It is expected on behalf of previous works that counteracting effect of adrenaline on the carragenin inflammation was blocked by *Heliotropium keralense*.

In albino rat carragenin (1% soln.) was given subcutaneously to produce the inflammation in the hind paws. This effect was counteracted by injecting adrenaline intramuscularly (20 mg/100 gm b.w.). This experiment was performed on albino rats pretreated with (60 mg/100 g.b.w.) *Heliotropium keralense* extract.

Table 2

S. No.	Group	Blood glucose (Mean + S.E.)
1.	Control	932 ± 1.08
2.	II	3.73 ± 0.65
3.	III	7.65 ± 0.27

Control – Carrageenan (1% soln.) 1 mL/paw
 I-Carrageenan + Adr. 10 µg/100 g.b.w.
 II-Carrageenan + Adr. + Extract 60 mg/100 g.b.w.

Thus counteracting effect of adrenaline on the carragenin in inflammation was locked by *Heliotropium keralense*.

The experimental design will also provide by injecting alkaloid and petroleum extracted from *Heliotropium keralense* in albino rats in dose 0.1 mg, 100 g b.w. The beta blocker activity of *Heliotropium keralense* will be some flood faster in comparison to alcoholic or petroleum ether extract of *Heliotropium keralense*.

So from the above observation, it is evident that *Heliotropium keralense* is capable to block the effect of adrenaline at different levels such as heart, cappillaries and at

hormonal level. Thus the anti adrenergic effect of *Heliotropium keralense* is established, which may be due to Beta-blocker activity.

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