Vol. 10/2 (2010) 105 - 108

JOURNAL OF NATURAL REMEDIES

Evaluation of Anti-histaminic Activity of *Beta vulgaris* L Root

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Abstract

Clonidine, a a_2 adrenoreceptor agonist induces dose dependent catalepsy in mice, which was inhibited by histamine H_1 receptor antagonists but not by H_2 receptor antagonist. Clonidine releases histamine from mast cells which is responsible for different asthmatic conditions. Roots of *Beta vulgaris* are sweet, expectorant and tonic, and are useful in psychopathy, cough, asthma and inflammation. In present investigation methanol extract of *Beta vulgaris* at doses 100 and 150 mg/kg, i.p. were evaluated for antihistaminic activity using clonidine induced catalepsy as catalepsy produced by clonidine is mediated by histamine via H_1 receptors. Result of present investigation showed that both extract significantly ($P<0.001$) inhibit clonidine induced catalepsy. Phytochemical study found that presence of carbohydrate, glycosides, flavonoids and tannin.

Keyworrds: *Beta vulgaris,* Clonidine, Histamine, Clorpheniramine maleate

1. Introduction

Beta valgaris Linn (Chenopodiaceae) is annual or biennial, 30-50 cm. high. The beets owe their medicinal uses to and active principle Betin. The root contains about a tenth portion of pure sugar. The swollen roots are sweet, expectorant and tonic, and are useful in psychopathy, cough, asthma, inflammation and general debility. The leaves are sweet acrid, cooling, diuretic, ant-inflammatory, purgative, anodyne and tonic[1, 2]. The red beet is valuable in uterine disease. It possesses antioxidant, antiacetylcholinesterase and hepatoprotective activity [3, 4]. Objective of present study was to evaluate antihistaminic activity of methanol extract of roots of *Beta valgaris* using clonidine induced catalepsy in mice.

2. Material and Methods

2.1. Plant material

Roots of *Beta valgaris* were collected from Baramati localities, Pune district (Maharastra).

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Roots were cut into small pieces and dried in the shade at room temperature. Dried seeds were coarsely powdered in grinder and powder material was kept in air tight container for further study. The plant was identified and authenticated by Dr. Neelam Patil Reader and Head Dept. of Botany, T.C. College, Baramati; a sample specimen has been deposited.

2.2. Extraction

Dried and coarsely powder of *Beta valgaris* roots were macerated for 48 hrs using methanol evaporated to dryness in water bath to produce methanol extract.

2.3. Animals

Swiss albino mice of either sex weighing 25-28 g were housed under standard laboratory conditions, in groups of five. The animals had free access to food and water. The animal ethical committee of the institute approved all the protocols of the study.

2.4. Drugs and Chemicals

Clonidine (Unichem, Ltd.); Chlorpheniramine maleate (Alkem, Mumbai).

2.5. Statistical Analysis

The results were reported as mean±SEM and analyzed for statistical significance using One way ANOVA followed by student - Newman Keuls test $P < 0.05$ was considered significant

2.6. Clonidine-induced catalepsy in mice

Bar test was used to determine the indirect Antihistaminic activity of the extracts by using Clonidine induced catalepsy in mice. Mice were divided into four groups, five animals in each group. Animals belonging to group I served as control and were administered vehicle the (5 ml/kg, i.p.) Animals belonging to groups II & III received ethanol extract at dose of 100 and 150 mg/kg i.p respectively. Standard drug Chlorpheniramine maleate (CPM) 10 mg/kg i.p., was given to group IV. The forepaws of mice were placed on a horizontal bar (1 cm in diameter, 3 cm above the table) and the time required to remove the paws from bar was noted for each animal. All the groups received Clonidine (1 mg/kg s.c.), 30 minutes after the drug administration and the duration of catalepsy was measured at 30, 60, 90, 120 & 150 minutes interval [5, 6].

2.7. Phytochemical investigation

Extracts were screened for preliminary phytochemicals test using standard procedure [7-9].

Table 1. Effect of *Beta vulgaris* root extract on clonidine induced catalepsy in mice

Treatment	Dose	Time of Catalepsy (sec)				
		30min	60min	90min	120min	150min
Control (Saline)	5 ml/kg	19.056 ± 2.200	45.336 ± 5.267	83.036 ± 9.110	73.67 ± 2.610	17.266 ± 2.033
Methanol Extract of *B. vulgaris*	100 (mg/kg)	34.618 ± 5.705	42.65 ± 2.507	44.16 *** ± 6.563	37.198 *** ± 0.691	2O.43 ± 4.076
	150 (mg/kg)	19.472 ± 4.891	29.194 ± 7.111	29.754 *** ± 7.667	21.76 ***± 4.524	13.028 ± 1.383
CPM	10 (mg/kg)	33.37 ± 7.009	42.592 ± 5.121	50.14 *** ± 3.036	52.3 ** ± 5.506	23.59 ± 1.258

One way ANOVA followed by student- Newman Keuls test *** $P < 0.001$, ** $P < 0.01$, as compaired to control group.

3. Results

3.1. Clonidine-induced catalepsy in mice

Clonidine releases histamine from mast cells which is responsible for different asthmatic conditions. Catalepsy produced by clonidine is mediated by histamine via H_1 receptors. The maximum catalepsy is developed after 90 minute of clonidine administration (1 mg/kg, i.p.) in vehicle treated (control) group. Prior treatment with methanol at dose 100 and 150 mg/kg, i.p. showed significant ($P<0.001$) inhibition of clonidine induced catalepsy as shown in (table 1).

3.2. Phytochemical investigation

Phytochemical study found that presence of carbohydrate, glycosides, flavonoids and tannin.

4. Discussion

Clonidine, a a_2 adrenoreceptor agonist induces dose dependent catalepsy in mice, which was inhibited by histamine H_1 receptor antagonists but not by H_2 receptor antagonist [10]. Clonidine releases histamine from mast cells which is responsible for different asthmatic conditions [11]. Catalepsy produced by clonidine is mediated by histamine via H_1 receptors. Dhanalakshmi *et al*., (2004) showed that extracts having antihistaminic or mast cell stabilizing effect inhibit clonidine-induced catalepsy [12]. Methanols extract of *Beta vulgaris* at dose 100 and 150 mg/kg, i.p. inhibit catalepsy induced by clonidine, which is may be due to antihistaminic property of extract. Some plants were investigated for antihistaminic activity using clonidine induced catalepsy in mice *Allium sativum* and *Terminalia belerica* [13], *Clerodendrum serratum* [14], *Tamarindus Indica* [15], *Clitoria ternatea* [16], etc.

In conclusion methanol extract of *Beta vulgaris* roots showed antihistaminic activity in clonidine induced catalepsy in mice it is may be due to presence of flavonoids.

5. Acknowledgement

The authors are thankful to the Management S.V.P.M's College of Pharmacy, Malegaon (Bk), Baramati for providing necessary facilities and also to the Dr. Neelam Patil Reader and Head Dept. of Botany, T.C. College, Baramati for the authentication of the plant.

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