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CNS depressant activity of *Hibiscus mutabilis* Linn. (Malvaceae) bark

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ABSTRACT

Present study reports CNS depressant activity of petroleum ether, ethyl acetate and methanol extracts of *Hibiscus mutabilis* bark. Extracts were screened for CNS depressant activity by pentobarbitone-induced sleeping time and locomotor activity testing. Results indicate that petroleum ether extract showed best CNS depressant activity.

KEYWORDS

Hibiscus mutabilis;
CNS depressant activity;
Pentobarbitone;
Photoactometer;
Diazepam.

INTRODUCTION

Hibiscus mutabilis (Malvaceae) is a large bushy shrub or small tree, about 8 ft in height. It is cultivated in Indians gardens as an ornamental plant for its beautiful flowers, which may be single or double. Leaves are 10-23cm in length, hairy, cordate, long petioled, suborbicular, 5-7 lobed or angled, irregularly crenate-dentate, often entire near the base, more or less softy pubescent or tomentose, stipules linear lanceolate. Flowers are 7-12cm in diameter, white or pink in the morning turning red by night. The Plant material is used in traditional medicines for their emollient in pectoral and pulmonary complaints. It is prescribed as a stimulant and leaves are applied to the swellings[1,2]. A flavonone glycoside naringenin, eriodictyol, ilicyanin and chrysanthemin have been isolated from the plant[3,4,5,6].

The bark of *H.mutabilis* was collected from Ahmednagar district of Maharashtra in August 2005 and authenticated by Botanical Survey of India, Pune (Voucher specimen No. PBG1). The bark was shade dried, reduced to coarse powder and subjected to successive solvent extraction using solvents as petroleum ether (60-80), ethyl acetate and methanol in Soxhlet extractor. Extracts were vacuum dried.

MATERIALS AND METHODS

Plant material

The bark of *H.mutabilis* was collected from Ahmednagar district of Maharashtra in August 2005 and authenticated by Botanical Survey of India, Pune (Voucher specimen No. PBG1).

Preparation of extracts

The bark was shade dried, reduced to coarse powder and subjected to successive solvent extraction using solvents as petroleum ether(60-80), ethyl acetate and methanol in Soxhlet extractor. Extracts were vacuum dried.

Animals

Healthy wistar albino mice of either sex and of approximately the same age, weighing about 20-25gm were used for study. They were housed in polypropylene cages maintained under standard condition (12h

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light/12 h dark cycle; 30^{0}C, 36-60 humidity).

The experimental protocol was subjected to the scrutiny of the Institutional Animal Ethical Committee and was cleared by the same before starting.

CNS depressant activity

1. Pentobarbitone-induced sleeping time[6]

Male mice were divided into four groups (n=6). First group received vehicle only, second to fourth groups received petroleum ether extract, ethyl acetate extract and methanol extract (30mg/kg, i.p., each) 30 min before administration of pentobarbitone sodium (40mg/kg, i.p.) and duration of sleep was measured. The sleeping time was measured as the duration for which the righting reflex was lost.

2. Locomotor activity testing[7]

Male mice were divided into five groups (n=6). First group received vehicle only, second group received diazepam (2mg/kg, i.p.). Third to fifth groups received petroleum ether extract, ethyl acetate extract and methanol extract (50mg/kg, i.p., each). Mice were placed individually in photoactometer. Basal reaction time was noted before and 30 min after the administration of treatment. A count is recorded when the beam of light falling on the photocell of photoactometer is cut off by mice.

RESULTS AND DISCUSSION

Results in TABLE 1 indicate that the sleeping time induced by pentobarbitone sodium was more prolonged after administration of petroleum ether extract followed by methanol extract, while ethyl acetate extract does not prolonged sleeping time significantly. Results in TABLE 2 revealed that the locomotor activity count in petroleum ether extract treated group was significantly reduced compared to vehicle group.

TABLE 1: Effect of various extracts of *H.mutabilis* bark on pentobarbitone-induced sleep in mice

Treatment (Dose: mg/kg, i.p.)	Duration of sleep (min)	% increase in sleeping time
Vehicle	46± 1.854	100
PEE (30)	84±0.867	182.6
EAE (30)	68± 0.913	147.82
ME (30)	72± 0.879	156.52

Observations were expressed as mean±SEM; n=6, *p<0.05 significant compared to vehicle. Where PEE- petroleum ether extract, EAE- ethyl acetate extract and ME- methanol extract.

TABLE 2: Effect of various extracts of *H.mutabilis* bark on locomotor activity of mice

Treatment (Dose: mg/kg, i.p.)	Number of movements (for 2 min)	
	Before administration of drug	After 30min of administration of treatment
Vehicle	112.11±0.769	118.15±0.765
Diazepam (2)	96±0.849	93.25±0.870
PEE (50)	98±0.844	68.56±1.145
EAE (50)	101±0.785	72.6±0.881
ME (50)	97.3±0.858	70.5±0.982

All values are expressed as mean±SEM; n=6, *p<0.05 significant compared to vehicle; Where PEE-petroleum ether extract, EAE-ethyl acetate extract and ME-methanol extract.

Prolongation of sleeping time in pentobarbitone-induced sleeping time test is may be because of enhancement in brain GABA as it is known to have depression action in brain[8,9]. In locomotor activity testing, decrease in rearing along with locomotor activity is observed, that reveals depressive effect on CNS[10].

Overall we can say that petroleum ether extract is having good CNS depressant activity.

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