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Skeletal muscle relaxant effect of *Bacopa monnieri* (L.) natural and micropropagated plant extracts

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Abstract

This research work was carrying out to evaluate the natural and micropropagated *Bacopa monnieri* plant extract for skeletal muscle relaxant activity. The skeletal muscle relaxant activity of the extracts was evaluated using Rota rod test. The skeletal muscle relaxant activity of control and treated mice were recorded and statistically correlated among the control, standard and the test drugs. For muscle relaxant property total fall off time for standard and control group was recorded.

Keywords: *Bacopa monnieri*, natural plant, micropropagated plants, skeletal muscle relaxant activity, rotarod test

Introduction

Bacopa monnieri is also known as Brahmi, belongs to family Scrophulariaceae. In the traditional system of medicine the plant is used for number of activities like laxative, carminative, digestive, anti-inflammatory, anti-convulsant, bronchodilator, febrifuge, and nervine tonic [1-6]. The drug mainly contain bacosides which is triterpenoid saponins. Hersaponin, one of its active principle, is reported to have a sedative effect.[7-9] The plant shows cardioprotective and hepatoprotective effects. The plant is an aphrodisiac, effective in treating scabies and syphilis, and purifies the blood, having proven useful for diarrheas and pyresis [10-11].

The plant tissue culture techniques are used for the investigations of the secondary metabolites. Already 2000 plants have been reported to be regenerated through the plant tissue culture. It has also been shown that many of such plants can produce secondary metabolites in culture. Tissue culture (often called micropropagation) is a special type of asexual propagation where a very small part of tissue (shoot apex, leaf section, or even an individual cell) is excised (cut-out) and placed in aseptic culture in a test tube, petri-dish or tissue culture container containing a special culture medium. Tissue culture technology has been known as an effective tool to propagate valuable medicinal plants. Therefore now plant tissue culture has been included as an important tool under biotechnology [12-17].

This research work was carried out to conduct skeletal muscle relaxant of natural and micropropagated plant of *Bacopa monnieri*

Material and Methods

Collection and authentication of plant

Bacopa monnieri was collected from field of Jawaharlal Nehru Ayurvedic Medicinal Plant Garden and Herbarium Kothrud, Pune in the month of February, 1998 and authenticate the plant from same institute. After collection plant material was washed thoroughly with water and kept for drying in the sunlight for 4-5 days. After drying, the plant material was broken into very small pieces and then passed through crusher mill, to obtain coarse powder. The powder was passed though sieve no.12.

Micropropagated tissue culture plant

Shoot tips and nodel segments of B. monnieri L were cultured on Murashige and Skoogs (M. S.) basal medium supplemented with different concentration of BAP and IAA. [12].

Materials

Chemicals and Pharmaceuticals: Chlorpromazine, Tween 80 Instrument and equipment: Rotarod, Animals: Swiss albino mice Others: Syringe, injection needles, weighing balance.

Preparation of drug solution

Ethanolic extract of *B. monnieri* natural (BMN) plant, Ethanolic extract of *B. monnieri* micropropagated (BMM) plant and Ethanolic extract of *B. Monnieri* Standard (BMS) were prepared by dissolving required amount of BMN ethanolic extract in distilled water. A drop of tween 80 was used to prepare uniform suspension. Chlorpromazine (2 mg/kg, ip): It was prepared by dissolving 0.2 mg of chlorpromazine in 1 ml of distilled water.

Pharmacological Screening

Rotarod Test (Muscle relaxant activity)

This test was used in particular to screen myorelaxant activity of the drug. Motor weakness is detected by failure of mice to cling to the rotating rod. In this test only those mice were selected which were capable of remaining on the rotating rod normally for more than 2 minutes. The rod was maintained at the speed of 12 rpm and the mice were kept on the rod facing its back towards the side of observer. Fall time has been used to assess the ability of control and treated mice, individually in each group at the interval of 30 minutes for the period of two and a half-hours. In this experiment, the mice were divided in to 5 groups each groups carrying 6 mice. The first group was served as control and was treated with vehicle

(tween 80, 0.5% v/v, ip). The second BMN plant ethanolic extract, third BMM plant ethanolic extract and Fourth group BMS ethanolic extract (100 mg/kg ip) of each respectively and last group receiving chlorpromazine (2 mg/kg, ip).[18]

Result

Rotarod Test (Muscle relaxant activity)

Table 1: Effects of ethanol extracts of *B. Monnieri* natural, micropropagated and standard on muscle grip in albino mice by Rotarod test

Treatment (Dose and route)	Rotarod Test (Muscle relaxant activity) in min.					
	30	60	90	120	180	240
Control (tween 80, 0.5%, ip.)	0	0	0	0	0	0
BMN extract (100mg/kg, ip)	0	0	0	0	0	0
BMM extract (100 mg/kg, ip)	0	0	0	0	0	0
BMS extract (100 mg/kg, ip)	0	0	0	0	0	0
Chlorpromazine (2 mg/kg, ip)	3	5	5	4	1	0

Control: tween 80, 0.5% v/v, ip
BMN: *Bacopa Monnieri* Natural plant extract, 100 mg/kg, ip.
BMM: *Bacopa Monnieri* Micropropagated plant extract, 100 mg/kg, ip.
BMS: *Bacopa Monnieri* Standard extract, 100 mg/kg, ip &
CPZ: Chlorpromazine 2 mg/kg ip.

Discussion

The ethanolic extract of BMN, BMM and BMS were evaluated for muscle relaxant activity in mice using rotarod test. The extract failed to show muscle relaxant activity (Table 1).Present pharmacological study with ethanolic extract of BMN, BMM and BMS showed muscle relaxant activity. Such study with natural plan of *B. monnieri* have been confirmed by many worker but the similar study on the micropropagated plants needs to be evaluated**.**

Conclusion

The pharmacological profile indicates that the extract failed to show muscle relaxant activity.

Conflict of interest

The authors declare no conflict of interest.

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