



ISSN (E): 2320-3862
ISSN (P): 2394-0530
NAAS Rating: 3.53
JMPS 2018; 6(1): 34-35
© 2018 JMPS
Received: 09-11-2017
Accepted: 10-12-2017

Jessy Jacob
Department of Pharmaceutical
Sciences, Mahatma Gandhi
University, Kottayam, Kerala,
India

NA Aleykutty
Department of Pharmaceutical
Sciences, Mahatma Gandhi
University, Kottayam, Kerala,
India

Jyoti Harindran
Department of Pharmaceutical
Sciences, Mahatma Gandhi
University, Kottayam, Kerala,
India

Correspondence
Jessy Jacob
Department of Pharmaceutical
Sciences, Mahatma Gandhi
University, Kottayam, Kerala,
India

Evaluation of diuretic activity of dry ethanolic extract of leaves of *Blepharis maderaspatensis* (L.) B. Heyne ex Roth

Jessy Jacob, NA Aleykutty and Jyoti Harindran

Abstract

Blepharis maderaspatensis (L.) B. Heyne ex Roth is a creeping herb native to many parts in central and peninsular India. It has been reported to be used as a diuretic by tribals of Yavatmal district of Maharashtra, India. So in the current work the diuretic activity was evaluated using the lipschitz method. It was decided to test the efficacy of different extracts (petroleum ether (60-80 °C) extract, ethyl acetate extract and dry alcoholic extract) of *Blepharis maderaspatensis* (L.) B. Heyne ex Roth for the diuretic activity. The study was carried out at a dose of 200 mg/kg body weight with the different extracts and results obtained showed that only the alcoholic extract showed diuretic activity. Further studies were carried out using the dry alcoholic extract only. Different doses of the extract, i.e., 200, 400 and 600 mg/kg body weight were used for the diuretic evaluation study and results showed that the doses of 400 and 600 mg/kg body weight yielded results almost at par with loop diuretic (Frusemide). It was seen that the dry alcoholic extract showed promising results with a lipschitz value of 1.4 and 1.44 for the medium as well as high doses. The tests are a conclusive evidence for the ethnobotanical study reports. Thus opening avenue for use of this drug as a potent diuretic.

Keywords: *Blepharis maderaspatensis* (L.) Heyne ex Roth, Yavatmal (Maharashtra dist.), diuretic

1. Introduction

Blepharis maderaspatensis (L.) Heyne ex Roth is a common herb found in central as well as southern peninsular India. Ethnobotanical studies have revealed the use of this plant for many disease conditions such as wound healing, snake bites, dysuria, headache, asthma etc [1-4]. Folkloric tales have reported that this herb may have been present with the herbs (Sandhanakarini, restorer of skin) which Hanuman had brought from the Donagiri hills in Uttaranchal. V.R Mohan et al has prepared the pharmacognostical and phytochemical studies of the whole plant of *Blepharis maderaspatensis* to help in the preparation of a monograph [5]. In the current study it was thought to gather further evidences for popularizing this drug in herbal medicine.

2. Materials and Methods

2.1 Collection, identification and extraction of plant material

The leaves of *Blepharis maderaspatensis* (L.) B. Heyne ex Roth were collected from the medicinal herbal gardens of Anugraha Herbals, Kurupanthara, Kottayam. The plant was authenticated by Asst. Prof. Rojimon Thomas, CMS College kottayam, and the voucher specimen stored in the Pharmacognosy laboratory in Department of Pharmaceutical Sciences, Cheruvandoor Campus, MG University. The leaves were washed and dried in shade and powdered using a mechanical grinder to obtain the coarse powder of about one kilogram [6]. The drug was subjected to soxhlet extraction using the successive solvent extraction method by using different solvents like petroleum ether (60-80 °C), ethyl acetate and ethanol R.S. The extracts were filtered, dried by using rotary vacuum evaporator. The final extracts weighed 34, 81 and 85 grams respectively in the above order of the solvents used for extraction.

2.2 Evaluation of diuretic activity

The preliminary diuretic studies were carried out using lipschitz assay [7] at a dose of 200 mg/kg body weight with all the three extracts, but only the ethanolic extract showed appreciable diuretic activity. Phytochemical studies have revealed that this fraction mainly contains flavanoids and tannins.

Further studies were carried out to determine the optimum dose for the diuretic activity of the ethanolic extract.

Healthy adult wistar albino male rats (weighing about 100-200 grams) were purchased from Govt. Veterinary College, Munoothy and housed at the animal house of Department of Pharmaceutical Sciences, Puthuppally, Kottayam for two days before the experiment for acclimatization. The animals were kept in hygienic as well as controlled conditions of temperature (25 ± 3 °C) and humidity (50 ± 5 %) and a 10-12 hrs of light and dark cycles were observed. The animals were housed individually in polypropylene cages with saw dust bedding as approved by IAEC of Department of Pharmaceutical Sciences, Puthuppally till the end of the study. The animals were maintained on normal diet and water ad libitum^[8]. Food and water was withdrawn 18hrs before the start of the experiment.

The test compound was administered orally at doses of 100 (low), 200 (medium), 400 (high) mg/kg in 5mL of water/kg body weight. Groups of three animals were placed in each metabolic cage, two cages were selected for each dose (a &

b). There were six groups of animals in total. The control group I (a & b) received normal saline water only. In Group II (a & b) each animal received 1g/kg body weight of urea (standard dose I). Additionally 5mL of 0.9%w/v solution of sodium chloride was given per 100gram body weight to each animal by oral gavage for all the groups. group III (a & b) received 100mg/kg body weight of ethanolic extract, group IV (a & b) received 200mg/kg of ethanolic extract and group V (a & b) received 400mg/kg body weight group VI (a & b) received frusemide (Standard dose II) 20mg/kg body weight, Urine excretion was determined after 5 hours and 24 hours. Urine volume per 100g/body weight was calculated for each group. The results are expressed as the Lipschitz value (T/U) where T is the urine volume of the test drug and U is the urine volume of the urea treatment. The sodium and potassium contents in urine were measured by using the microprocessor flame photometer 1385 model (Electronics India). All the statistical calculations have been done using SPSS 16.0 software.

Table 1: Summary of parameters of diuretic activities of different doses of the ethanolic extract of *Blepharis maderaspatensis* (L.) Heyne ex Roth using the Lipschitz assay.

Groups	Urine output ml/100g/5hr (mean±SD)	Lipschitz value	Na ⁺ ion Concentration (mean±SD)	K ⁺ ion Concentration (mean±SD)
Control group (Normal Saline Only)	3.18±0.10	-	103.77±2.26	57.29±2.32
Urea 1g/kg body weight	11.70±2.63	-	119.32±1.50	66.40±1.18
Low dose of Extract (100mg/kg body weight)	11.88±2.88	1.02	124.45±1.322	69.77±0.87
Medium dose of Extract (200mg/kg body weight)	16.62±5.55	1.42	127.79±0.59	72.72±0.78
High dose of Extract (400mg/kg body weight)	16.80±5.28	1.44	129.33±1.38	82.85±0.70
Frusemide 20mg/kg body weight	19.00±0.926	1.63	137.60±1.13	89.52±1.05

3. Results and Discussion

The Preliminary studies revealed that only the ethanolic extract possessed remarkable diuretic activity. Further studies were done to determine the optimum dose for diuretic activity and the ethanolic extract at a dose of 200 as well as 400mg/kg body weight gave lipschitz value very near to that of frusemide. The extract is natriuretic. There was an increase in the excretion of the content of Pottassium excretionbut not severe enough to cause acute hypokalemia.

4. Concussion

The evidences support the ethanobotanical repots of using the alcoholic extract of leaves of *Blepharis maderaspatensis* (L.) B. Heyne ex Roth as a potent diuretic. The study also revealed that a medium dose of 200mg/kg body weight was sufficient to produce a comparable result almost at par with standard loop diuretic (Frusemide). Thus this plant can be hence forth popularized in ayurvedic medicines.

5. Acknowledgment

The first author, Mrs. Jessy Jacob would like to thank Mr. K.J. Kurian, proprietor, Anugraha Herbals for supplying all the raw material of plant drug free of cost during the whole period of study in the interest of promoting and popularizing the plant drug.

6. References

1. Avinash Kumar Reddy G, Priyanka B, Saisaranya Ch, Ashok Kumar CK. wound healing potential of Indian medicinal plants. International journal of Pharmacy Review and research. 2012; 2(2):75-87.
2. Dhawale PG, Ghyare BP. Ethnomedicinal survey of Yavatmal district, (MS), Asian Journal of Pharmaceutical Science and Technology. 2015; 5(3):188-193.

3. Ignatchimuthu S, Ayyanar M, Sankara Shivaraman K. Ethanobotanical investigations among tribes of Madurai district of Tamil Nadu (India). Journal of Ethanobiology and Ethanobiology. 2006; 2:25.
4. Prabu M, Kumuthakalavalli R. Folk remedies of medicinal plants for snake bites, scorpion stings and dog bites in the eastern ghats of Kolli hills, Tamil Nadu, India. International Journal of Ayurveda and Pharmacy, 2012; 3(5):696-700.
5. Mohan VR, Abragam Amish D, Kalidass C, A Maruthupandian, Pharmacognostical and Phytochemical investigation of whole plant of *Blepharis maderaspatensis* (L.) Heyne ex Roth. 2010; 2(14):1-10.
6. Jessy Jacob N, Aleykutty A, Jyoti Harindran. In Vitro evaluation pf Indigenious Formulation of *Blepharis maderaspatensis* (L.) B.Heyne ex Roth in the treatment of acute conjunctivitis. The Pharma Innovation journal. 2017; 6(10):220-242.
7. Lipschitz WL, Hadidian Z, Kerpcsar A. Bioassay of diuretics. Journal of Pharmacological and Experimental Therapeutics. 1943; 79:97-110.
8. Jessy Jacob, Aleykutty NA, Jyoti Harindran. Evaluation of wound healing activity in streptozotocin induced diabetic rats by ethanolic extract of *Blepharis maderaspatensis* (L.) B. Heyne ex Roth, International Journal of Herbal Medicine. 2017; 5(6):45-47.