RESEARCH ARTICLE

Evaluation of Antidiabetic Activity of Various Extract of *Peristrophe bicalyculata* (R.) Nees.

Sumeet Dwivedi[1*], Udita Singh[2], Prakash C. Patel[3], Rahul S. Bijwar[4], Supriya Shidhaye[5] Arun Patidar[6]

[1]*Acropolis Institute of Pharmaceutical Education and Research, Indore, Madhya Pradesh, India*
[2]*Centre for Biotechnology, APS University, Rewa, Madhya Pradesh, India*
[3]*Department of Botany, Govt. S.K. College, Mauganj, Rewa, Madhya Pradesh, India*
[4]*Jagadambha Institute of Pharmacy & Research, Kalamb, Yavatmal, Madhya Pradesh, India*
[5]*Shimati Kishoritai Bhoyar College of Pharmacy, Kamptee, Nagpur, Maharashtra, India*
[6]*Chameli Devi Institute of Pharmacy, Indore, Madhya Pradesh, India*

Received: 13th December, 2022; Revised: 11th April, 2023; Accepted: 14th August, 2023; Available Online: 25th September, 2023

ABSTRACT

In the conventional medical system, India's population depends on ancient medicine systems like *Ayurveda*, Homeopathy, Siddha and Unani for the treatment of disease. With such a large population relying on herbal remedies, scientific support for the efficacy of herbal products that have been used for a long time is essential. Diabetes is predicted to become more common worldwide. According to WHO, developing nations will bear the majority of the burden. *Peristrophe bicalyculata* (R) Nees. belongs to the Acanthaceae family. It is native to Afghanistan, Africa and India. The plant's flowers are used medicinally to treat various diseases and disorders. The present paper shows the antidiabetic activity of hydro-alcoholic extracts of *P. bicalyculata* (R) Nees flowers was investigated using an animal model.

Keywords: Antidiabetic, Diabetes, Indigenous.

International Journal of Pharmaceutical Quality Assurance (2023); DOI: 10.25258/ijpqa.14.3.16

How to cite this article: Dwivedi S, Singh U, Patel PC, Bijwar RS, Shidhaye S, Patidar A. Evaluation of Antidiabetic Activity of Various Extract of *Peristrophe bicalyculata* (R.) Nees. International Journal of Pharmaceutical Quality Assurance. 2023;14(3):559-560.

Source of support: Nil.

Conflict of interest: None

INTRODUCTION

For many years, traditional methods have had to adapt to the needs of the surrounding areas. Since the Vedic era and the beginning of human civilization, the traditional medical system has been practiced in India. Despite various changes throughout its lengthy history, it continues to be the primary source of medical relief for a sizeable portion of the country's population.[1] Diabetes prevalence among urban dwellers is not only high, but also rapidly increasing, as data received from during last ten years. It is estimated to affect 33 million people in India. By 2025, this figure will rise to 57.2 million.[2] The majority of doctors in the Indian medical system write and administer their own prescriptions. The World Health Organisation catalogs 21,000 medicinal plants in the world. 150 of the 2,500 species identified in India are employed extensively for commercial purposes. India is the leading manufacturer of these medicinal plants.[3]

Peristrophe bicalyculata (Acanthaceae) can grow to a height of 60–180 cm and is virtually ubiquitous in India, Afghanistan, and Africa. In Hindi, it is frequently referred to as *kali aghedi*, and in Sanskrit, as *kakajangha*. The herb is utilized for ear and eye therapies as well as its antibacterial (tuberculostatic) and anti-snake poisoning properties. The dried aerial components' chemical make-up included 35-hydroxynonatriacontanal and 14-methyl-tritriacont-14-en-15-ol. Traditionally, plant parts, especially the roots, leaves and flowers, are used for various diseases of human. Flower heads are also used against skin, burns, ringworm and some skin diseases.[4,5]

MATERIALS AND METHODS

Methodology

The dried plant material was authenticated by the Botanist and Voucher No. PBF-0111 was assigned.

**Author for Correspondence: herbal0914@rediffmail.com*

Table 1: Serum glucose level in groups

Category	*Serum glucose (mg/dL)*			
	Zero day	*Seventh day*	*Fourteenth day*	*Twenty one day*
C	83.02 ± 32	85.30 ± 11	83.43 ± 21	84.29 ± 09
DC	295.32 ± 04	360.19 ± 23$^{\#\#}$	419.11 ± 38$^{\#\#\#}$	418.29 ± 12$^{\#\#\#}$
S 10 mg/kg	288.28 ± 02	211.11 ± 12***	169.29 ± 23***	117.41 ± 1.19***
HAEPBF (200 mg)	294.11 ± 0.12	231.21 ± 0.01***	207.29 ± 1.01***	159.29 ± 1.11***
HAEPBF (400 mg)	292.22 ± 0.24	228.29 ± 1.11***	173.02 ± 1.19***	131.29 ± 1.14***

Reading are Mean ± SEM; n=6; statistically significant ***p<0.001

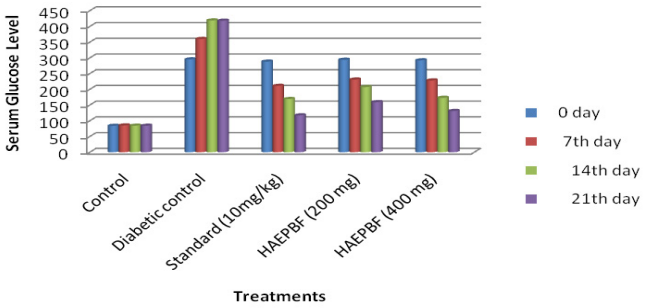

Figure 1: Antidiabetic activity

Preparation of Extract

The shade-dried flowers of a selected plant (250 gm) were loded in a soxhlet apparatus with ethanol:water (90:10). The extraction took 72 hours to complete. After the extraction was completed, the extract was dried and stored for future use.[6]

Acute Toxicity Studies

The mice were employed in a study of acute toxicity. The toxicity was calculated in accordance with OECD rules 423.[7]

Antidiabetic Activity

The antidiabetic activity was performed using alloxan alloxan-induced diabetic model. In the present investigation, animals were divided in different groups containing 6 animals of each. The Institutional Committee approved all the experimental protocols. Alloxan monohydrate was given in water at the dose of 150 mg/kg body weight and after 4 days of administration, blood glucose level was measured and accordingly, groups were made.[8]

Group I control and only saline was given, group II is diabetic control received alloxan 150 mg/kg be, group III is Diabetic+glibenclamide and received 10 mg/kgbw, group IV is Diabetic+HAEPBF received 200 mg/kgbw and group V is Diabetic+HAEPBF received 400 mg/kg bw.

Statistical Analysis

All the data obtained were compared with control using ANOVA (n=6)

RESULTS AND DISCUSSION

The OECD guideline no. 423 was used to screen the HAEPBF for acute toxicity and determine the LD_{50}. The findings demonstrated that there was no mortality at the level of 2000 mg/kg bw. As a result, the 200 and 400 mg dosages were chosen for the current experiment. The estimated serum glucose level shows a considerable reduction in sugar in the hydro-alcoholic extract at doses of 200 and 400 mg/kg bw. Table 1 and Figure 1 displays the extract's antidiabetic effect on the fasting blood sugar levels of diabetic rats. The blood glucose levels are equivalent to those caused by glibenclamide at a dose of 10 mg/kg.

CONCLUSION

HAE at a dose of 400 mg/kg bw is more effective than standard medication at decreasing serum glucose level.

REFERENCES

1. Dwivedi SN, Shrivastava S, Dwivedi S, Dwivedi A, Dwivedi S, Kaul S. Relevance of medicinal herbs used in traditional system of medicinal, Farmavita.Net. 2007;1-14.
2. Ramachandran A, Snehalatha C, Viswanathan V. Burden of type 2 diabetes and its complications- the Indian scenario. Curr. Sci. 2002; 83:1471–1476.
3. Grover JK, Yadav S, Vats V. Medicinal plants of India with antidiabetic potential. J. Ethnopharmacol. 2002; 81:81–100.
4. Dwivedi S. Status survey of medicinal plants wealth of Malwa region of Madhya Pradesh with special reference to conservation of vulnerable and endangered species, J. Econ. Taxon. Bot., 2009; 33(2): 443-452.
5. Seth SD, Sharma B. Medicinal plants of India. Indian J. Med. Res. 2004; 120:9–11
6. Harborne JB .Phytochemical methods, Chapman and Hall, London. Ist Edition, 1984; 24-51.
7. OECD. Guidelines for the testing of chemicals revised draft guideline 423: Acute oral toxicity. France: Organization for Economic Cooperation and Development, 2000; 156.
8. Islam MH, Mostafa MN, Rahmatullah M. Antihyperglycemic activity of methanolic extracts of corms of *Colocasia esculenta* var *esculenta*. Eur J Pharm Med Res. 2018; 5:129-132.