

ANTIDIARRHEAL ACTIVITY OF AQUEOUS EXTRACT OF LEAVES OF FIMBRISTYLIS BISUMBELLATA

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Article Received on
18 June 2018,

Revised on 09 July 2018,
Accepted on 30 July 2018,

DOI: 10.20959/wjpr201815-13084

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ABSTRACT

Fimbristylis bisumbellata is a plant belonging to the family Cyperaceae. Antidiarrheal effect of aqueous leaves extract of Fimbristylis bisumbellata was evaluated in female wistar rats. A preliminary phytochemical screening of aqueous extract of leaves of Fimbristylis bisumbellata gave positive tests for tannins. Studies were carried out on in-vivo gastrointestinal motility, on castor oil induced diarrhea in rats. 200mg/kg and 400mg/kg doses were used against castor oil induced diarrhea in rats against loperamide as a standard. The extract showed decrease in number of stools within 12 hours and increase in diarrhea free period. Results obtained showed that the aqueous extract of leaves has significant Antidiarrheal activity. Present research aspects is an honest presentation of the determination of

activities possessed by chemical constituents in the leaves of plant Fimbristylis bisumbellata. Significantly it shows Antidiarrheal against experimentally induced Castor oil diarrhea.

KEYWORDS: Fimbristylis bisumbellata.

INTRODUCTION

Diarrhea is defined as the passage of three or more abnormally loose or watery stools per 24 hours. However, recent change in consistency and character of the stools is more important rather than the number of stools. During the initial 2–3 months of life, infants, particularly those who are being breastfed, may normally pass as many as 8–10 semi-formed stools daily that do not constitute diarrhea. Again, a recent change in character of stools should be given

adequate attention in recognition of diarrhea. Various Preventive measures are taken for overcoming the diarrheal condition which includes antimicrobial drugs, antimotility, Antidiarrheal agents and Antiamoebic agents. Plant extracts are also useful for Antidiarrhoeal action.^{[1][2]}

Present plant *Fimbristylis bisumbellata* (Forssk.) Bubani, Lavara ghaas (Hindi) is an herbaceous annual plant belonging to family Cyperaceae which reach up to the height of 5-20 cm. Stem acutely angular, leaves ligulate, sheaths pubescent, ferruginous, blades linear 1-2 mm wide, basal shorter than stem. Inflorescence compound with several too many spikelets. (Photo-1) Commonly available at the edges of drying pools, in wet flushes, springs, along streams and rivers on Sandy River bars. It is also a common weed of rice fields. It is usually seen associated with *Cyperus difformis*, *Fimbristylis miliacea* and *Echinochloa colona*. It is variable in height and common near water sources. This plant was novel to research field till date, hence aqueous extract was selected for determination of activities possessed by chemical constituents.^[3,4]



Photo 1: *Fimbristylis bisumbellata* (Forssk.).

EXPERIMENTAL

The leaves of *Fimbristylis bisumbellata* were collected and dried under the shade; the leaves of plant were slippery in nature that it couldn't be grinded in the mixer grinder. Therefore the leaves of *Fimbristylis bisumbellata* were cut into small pieces with the help of scissors and cutter. Then the leaves (200gm) were taken in a beaker (1000 ml) with warm water and macerated for 24 hours. Extract of leaves so obtained was air dried and dried extract was used for determination of its Antidiarrheal activity.

Wistar albino rats (female) weighing (200-250gms) were used for determination of Anti-diarrheal activity by using castor oil induced diarrhea animal model.

Antidiarrheal activity: Castor oil induced diarrhea model

Procedure

Procedure- Female *Wistar* rats weighing 200-250 grams will be used after overnight fasting. For the experiment, the rats will be housed in individual cages with access to drinking water in 04 different groups of 05 animals each. The aqueous extract of leaves *Fimbristylis bisumbellata* (AELFB) will be administered orally in group 3 and 4 dose 200mg/kg & 400mg/kg.^[7] Loperamide is used as a standard drug for the experiment. Control (Toxic) group animals will receive distilled water only. Each dose of standard and AELFB is given to group 2, 3 and 4, one hour after dosage; 1 ml of castor oil is administered orally to all the groups. Stools will be counted on non-wetting paper sheets up to 12 h after administration of the castor oil.^[6]

1. Control Group Toxic (Distilled water + Castor Oil 1ml)
2. Standard Group (Loperamide 4mg/kg + Castor Oil 1ml)
3. Test Group I (AELFB 200mg/kg + Castor Oil 1ml)
4. Test Group II (AELFB 400mg/kg + Castor Oil 1ml)

Diarrhea Free Period: The diarrhea-free period is defined as the time in minutes between castor oil administration and the occurrence of the first diarrheal output. The acute diarrheal phase is the time between the first and the last diarrheal output of the 8-hr observation period. Stools occurring between 8 and 24 hours after castor oil administration are called late diarrheal excretion.^[6]



Figure 1: Toxic Control Group (Distilled water +1 ml of Castor oil).



Figure 2: Effect of Loperamide (Std. Group) against Castor oil induced diarrhea in rats.



Figure 3: Effect of Aqueous Extract Leaves of *Fimbristylis bisumbellata* (200 mg/kg) against castor oil induced diarrhea.



Figure 4: Effect of Aqueous Extract Leaves of *Fimbristylis bisumbellata* (400 mg/kg) against castor oil induced diarrhea.

Table 1: Effect of Leaves extract of *Fimbristylis bisumbellata* against Castor oil induced diarrhea in rats.

Sr no.	Group (mg/kg per oral)	Number of Stools
1	Toxic Control Group (Distilled water + CO 1ml)	23.4±0.6782
2	Standard Group (Loperamide 4mg/kg+ CO 1ml)	2±0.00**
3	Test Group I (AELFB 200mg/kg+ CO 1ml)	16±0.4472*
4	Test Group II (AELFB 400mg/kg+ CO 1ml)	11.8±0.2000*

Result are expressed as Mean ± SEM, (n=5) Data was analyzed by one way ANOVA followed by Dunnet's test Comparisons were made with Control toxic group vs. all treated groups. *Represents Statistical significance at $P < 0.05$. ** Represents $P < 0.001$

CO- castor oil, AELFB- Aqueous extract of leaves of *Fimbristylis bisumbellata*

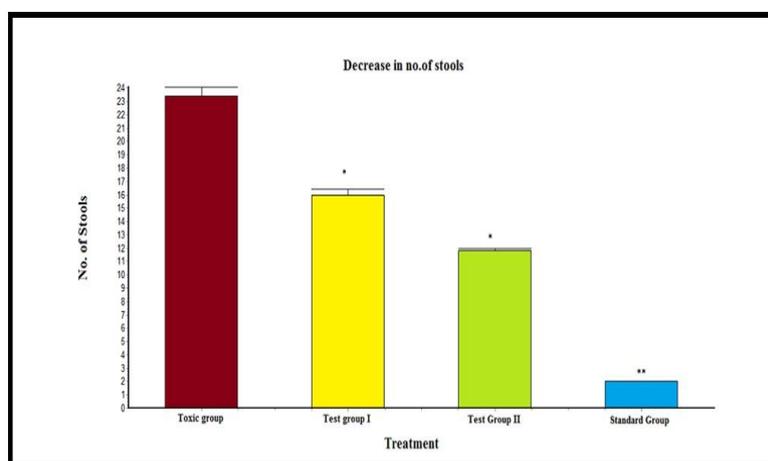


Figure 5: Effect of Leaves extract of *Fimbristylis bisumbellata* against Castor oil induced diarrhea in rats. (Decrease in number of Stools).

*Represents Statistical significance at $P < 0.05$. ** Represents $P < 0.001$

RESULTS AND DISCUSSION

The extract showed decrease in number of stools within 12 hours and increase in diarrhea free period. Results obtained showed that the extract of leaves has significant Antidiarrheal activity. The aqueous leaves extract of plant *Fimbristylis bisumbellata* shows significantly Antidiarrheal activity against experimentally Castor oil induced diarrhea.

CONCLUSION

On the basis of current findings, we conclude that the leaves of *Fimbristylis bisumbellata* possess the Antidiarrheal activity against experimentally Castor oil induced diarrhea. The Antidiarrheal effect is due to presence of Tannins in the aqueous extract.

Results obtained showed significant response in Anti diarrheal activity. The leaves extract showed decrease in stool number and increase in diarrhea free period.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge partial support of this work by Principal and department of Pharmacology, Y.B. Chavan College of Pharmacy, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra, INDIA. Also thankful to Principal, Maulana Azad College, Dr. Rafiq Zakaria Campus, Rauza bagh, Aurangabad, M.S. India. 431001.

Authors express their deep sense of gratitude to Dr. M. A. Wadood Khan, Ex Head of Botany Department, Majalgaon Arts, Science and Commerce College, Majalgaon, Dist. Beed (M.S.) for his great cooperation in collection and identification of the plant material.

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