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PHYTOCHEMICAL AND PHARMACOLOGICAL ACTIVITIES PLANT *BAUHINIA BLAKEANA DUNN*

Neha Khare*[1], Mrunal K. Shirsat[1], Manish Dubey[1]

[1*]Department of Pharmacy, Madhav University, Abu Road, Rajasthan, India.

ABSTRACT

In this study plants gathered from extraordinary areas of India were screened to pick out any chemotherapeutic agents present in them. Different solvent like Pet.ether, Chloroform, Methanol and distilled water extracts of antipyretics and antitumor activity the use of Induction of yeast-induced pyrexia, potato disc assay, and phytotoxicity interest the use of radish seed bioassay. Phytochemical tests confirmed the whole plants presence of alkaloids, saponines, anthraquinones, terpenoids, flavonoids, flavones, tannins, phlobatannins, and cardiac glycosides in distinctive concentrations in these extracts. The present review is therefore, an effort to give a detailed survey of the literature on its Pharmacognosy, Phytochemistry, pharmacological and traditional uses.

KEYWORDS

Plant extracts, Plant growth, Phytochemical and Antipyretics.

Author for Correspondence:

Neha Khare,

Department of Pharmacy,

Madhav University,

Abu Road, Rajasthan, India.

Email: nehakhare567@gmail.com

INTRODUCTION

The traditional medicinal methods, in particular using medicinal plant, still play a vital position to cover the basic health needs in growing nations. Moreover, the usage of herbal treatments has risen in the evolved international locations inside the final many years. In this connection, plant life remains a wealthy supply of healing sellers having antitumor pastime in animals as well as in plant life (crown gall tumors). The active ideas of many capsules are found in flora or are produced as secondary metabolites[1]. The first rate contribution of plants to the drug industry has been viable, because of the large range of Phytochemical research all over the global. Plants were the foremost supply of capsules in Indian gadget of

medicine and other historical structures inside the global. The Indian subculture has an ancient history of conventional remedy. Indian traditional drug treatments based on numerous structures including Ayurvedic, Siddha, Unani and Homeopathy[2].

It is a common annual herb, located basically in the backyards of houses and waste locations throughout the plains of India. The plant has extensive uses within the traditional medicines of numerous nations and reportedly possesses diuretic, purgative and Antihelmintic homes, besides being extensively utilized for bronchitis, bronchial asthma, pneumonia, scabies and different cutaneous sicknesses[3].

MATERIAL AND METHODS

All chemicals used in the present study were analytical grade and purchased from Merck specialties Pvt. Ltd. (Mumbai, India). Paracetamol (reference drug) from Dr. Reddy's laboratories (Hyderabad, India)[4].

Plant Material

The whole plants *Bauhinia blakeana Dunn*. Were collected from local areas of Vadodara, Gujarat and authenticated by Dr. P. G. Diwakar, Joint Director, at Botanical Survey of India (BSI), Govt. of India, Ministry of Environment and Forests, Pune, India.

Phytochemical Screening

The freshly prepared crude Pet.ether, Chloroform, Methanol and distilled water extract of *Bauhinia blakeana Dunn*. Whole plant was qualitatively tested for the presence of major Phytochemical constituents. This was carried out by the method described by J. B. Harborne.

Animals

Wistar rats (180-200g) and male albino mice (20-25g) were obtained from the animal Centre, Vadodara (Babaria Institute of Pharmacy, Varnama, Vadodara) and kept in standard environmental conditions. They were fed with standard pellet diet and water *ad libitum*. Experiments were carried out in accordance with CPCSEA guidelines and the study was approved by Institutional animal ethical committee.

Acute Toxicity Study

Five groups (n=6) of male albino mice were used in the acute toxicity study of *Bauhinia blakeana Dunn,* Pet, ether, extract. Animals from all groups were fasted overnight and administered (p.o) with single dose (200, 300, 1000 and 2000mg kg-1) of the extract. A group of animals which received equal volume of 1% CMC served as control. Acute toxicity study was performing as per 423 guidelines (OECD). Changes in the behaviour of animals were observed for 24 h after extract administration. For any signs of toxicity and mortality, animals were observed for 14 days.

Qualitative Analysis of Phytochemical

The Following screening checks have been carried for the different solvent extract to discover the presence of Phytochemical.

Detection of Saponines

About 0.5mL of extract changed into dissolved in 5mL of distilled water in a test tube. Persistent frothing on warming shows the presence of saponines. The capability of saponines to produce frothing in aqueous answer became used as a screening test for the sample[5].

Detection of Tannins

About 0.5mL of extract was dissolved in 5mL of distilled water. To it, a few of neutral ferric chloride answer become added. Formation of blue precipitate suggests the presence of tannins.

Detection of Phenols

About 0.5mL of extract becomes dissolved in 5mL of distilled water. To it, some drops of neutral 5% ferric chloride became delivered. A dark inexperienced coloration indicates the presence of phenols.

Detection of Flavonoids

About 0.5mL of extract was treated with 5mL of 10% ammonium hydroxide solution. A yellow fluorescence indicated the presence of flavonoids[6].

Detection of Phytosteroids

About 50µL of extract changed into treated with 2mL of acetic anhydride. To it, 1-2 drops of conc. Sulphuric acid became introduced along aspects of the take a look at tube. An array of colour showed presence of Phytosteroids[7].

RESULTS

Phytochemical analysis

Phytochemical analysis showed the presence of different.

Anti-pyretic activity

Pyrexia or fever is caused as a secondary impact of infection, tissue damage, inflammation, graft rejection, malignancy or other diseased states. It is the body's natural defense to create an environment where infectious agent or damaged tissue cannot survive. Normally the infected or damaged tissue initiates the enhanced formation of pro-inflammatory mediator's (cytokines like interleukin 1β, α, β and TNF-α), which increase the synthesis of prostaglandin E2 (PGE2) near pre-optic hypothalamus area and thereby triggering the hypothalamus to elevate the body temperature[8]. As the temperature regulatory system is governed by a nervous feedback mechanism, so when body temperature becomes very high, it dilates the blood vessels and increases sweating to reduce the temperature; but when the body temperature becomes very low hypothalamus protects the internal temperature by vasoconstriction. Most of the antipyretic drugs inhibit COX-2 expression to reduce the elevated body temperature by inhibiting PGE2 biosynthesis. Moreover, these synthetic agents irreversibly inhibit COX-2 with high selectivity but are toxic to the hepatic cells, glomeruli, cortex of brain and heart muscles, whereas natural COX-2 inhibitors have lower selectivity with fever side effects[9]. A natural antipyretic agent with reduced or no toxicity is therefore, essential. Moreover search for herbal remedies with potent antipyretic activity has received momentum recently as the available antipyretics, such as paracetamol, nimusulide etc. have toxic effect to the various organs of the body[10]. A number of plant extracts modulate enzymes of cyclooxygenase pathway, as reported with the rosmarinic acid of *Rosmarinus officinalis* that inhibit leukotriene and prostaglandins synthesis, while COX-1 and COX-2 was inhibited by cirsilineol, cirsimaritin, apigenin, rosmarinic acid and eugenol of *Ocimum sanctum* similar to ibuprofen, naproxen, and aspirin[11]. Antipyretic activity was therefore carried out to ascertain the traditional claims and was performed according to the previously reported methods[12].

Protocol for antipyretic activity

Study on normal body temperature

Rats of either sex were divided into groups, comprising six in each group. The body temperature of each rat was measured rectally at predetermined intervals before and for 5 hour after administration of either 2% aqueous Tween 80 solution (control) or plant extract at doses of 200mg/kg body weight orally.

Induction of yeast-induced pyrexia

Rats were divided into five groups of six rats each. The normal body temperature of each rat was measured rectally at predetermined intervals and recorded[13]. The rats were acclimatized to remain quiet in a restraint cage. A thermister probe was inserted 3-4cm deep into the rectum and fastened to the tail by adhesive tape. The temperature was measured on a thermometer. After measuring the basal rectal temperature, animals were given a subcutaneous injection of 10-ml/kg body weight of 15% (w/v) yeast suspended in 0.5% (w/v) methylcellulose solution. Rats were then returned to their housing cages. After 19 h of yeast injection, the animals were again restrained in individual cages for the recording of their rectal temperatures as described previously.

Drug administration

Nineteen hour after yeast injection the drug extract of was administered orally at doses of 200mg/kg body weight, to different groups, respectively. A similar volume of (5ml/kg) 2% aqueous Tween 80 solution was administered orally to the control group. Another group of rat received the standard anti-pyretic drug paracetamol at a dose of 25mg/kg orally. Rats were restrained for recording the rectal temperatures at the 18th hour immediately before the administration of the extract, 2% Tween 80 solution or paracetamol, and again at 1 h intervals up to 4 hours after yeast injection.

Pharmacological Activity

Acute toxicity study -In LD_{50} studies, it was found that the animals were safe up to a maximum dose of 2000mg/kg body weight. There were changes in normal behavior pattern and signs and symptoms of toxicity and mortality were observed.

Selection of dose of the extract

Acute toxicity study was carried out according to OEDC (Organization of Economic Co-operation and Development) guidelines in albino mice.

The acute toxicity study of various extracts of *Bauhinia blakeana Dunn* was showed signs of toxicity like tremor, convulsion and deep breathing at 2000mg/kg body weight $1/10^{th}$ of the same dose for all these extract were taken as therapeutic dose i.e. 200mg/kg. Body weight. The ethical clearance was obtained by the institutional Animal Ethics Committee (Registration number 652/02/a/CPCSEA) before the experiment.

Table No.1: Phytochemical analysis

S.No	Solvent	Saponins	Tannins	Phenols	Flavonoids	Phytosteroids
1	Methanol	+	+	-	+	+
2	Ethanol	-	-	+	-	+
3	Ethyl acetate	-	+	-	-	+
4	Chloroform	-	+	-	-	+
5	Hexane	-	-	+	-	+
6	Water	-	+	_	+	+
7	Acetone	-	-	+	+	+

(+)-Present (-)-Absent

Anti-pyretic activity of *Bauhinia blakeana Dunn*

Table No.2: Study on normal *Bauhinia blakeana dunn* body temperature

S.No	Treatment	Dose	Average temperature after treatment with extract (°C)					
			0 h	1 h	2 h	3 h	4 h	5 h
1	Control	5ml/ kg	37.7 ± 0.2	37.8 ± 0.2	37.6 ± 0.2	37.6 ± 0.2	37.7 ± 0.3	37.7 ± 0.3
2	*Bauhinia blakeana dunn*	A-200mg/kg	37.9 ± 0.2	37.6 ± 0.2	37.5 ± 0.7	37.6 ± 0.2	37.8 ± 0.1	37.9 ± 0.1
		B-200mg/kg	37.5 ± 0.2	36.9 ± 0.2	36.6 ± 0.1	36.6 ± 0.2	36.8 ± 0.1	37.0 ± 0.2
		C- 200mg/kg	37.2 ± 0.3	36.9 ± 0.2	36.7± 0.2	36.6 ± 0.3	36.7 ± 0.2	36.9 ± 0.2
		D-200mg/kg	37.5 ± 0.2	36.7 ± 0.1	36.5 ± 0.2	36.4 ± 0.2	36.7 ± 0.3	36.7 ± 0.3

Values are mean ± S.E, n=6; * P< 0.01 Vs Control by students't' test.

A-Petroleum ether extract, B-Chloroform Extract, C-Ethanol extract, D-Distilled water extract

Table No.3: Effect on Brewer's yeast induced Pyrexia in Rats *Bauhinia blakeana Dunn*

S.No	Treatment	Dose	Normal Temp (°C) 0 h	Temp. 19hrs after yeast induced pyrexia	Average temperature after treatment with extract (°C)			
					20 h	21 h	22 h	23 h
1	Control	5ml/ kg	37.5 ± 0.1	39.1 ± 0.2	39.1 ± 0.2	39.0 ± 0.2	38.9 ± 0.2	38.9 ± 0.3
2	*Bauhinia blakeana dunn*	A-200mg/kg	37.3 ± 0.1	39.7± 0.2	39.0 ± 0.1	38.7 ± 0.7	38.1* ± 0. 3	37.8* ± 0.2
		B-200mg/kg	37.1 ± 0.3	39.8 ± 0.2	38.3 ± 0.2	37.8 ± 0.3	37.4* ± 0.7	37.2* ± 0.8
		C-200mg/kg	37.2 ± 0.2	39.9 ± 0.3	39.0 ± 0.5	38.4 ± 0.4	38.0* ± 0.4	37.7* ± 0.7
		D-200mg/kg	37.8 ± 0.1	39.8 ± 0.2	38.4 ± 0.7	38.1* ± 0.2	37.7* ± 0.4	37.5* ± 0.5
3	Paracetamol	150mg/kg	37.2 ± 0.2	39.7 ± 0.2	38.0 ± 0.1	37.5* ± 0.1	37.1* ± 0.1	36.8* ± 0.1

Values are mean ± S.E, n=6; * P< 0.01 Vs Control by students't' test.

A-Petroleum ether extract, B-Chloroform Extract, C- Ethanol extract, D-Distilled water extract.

CONCLUSION

The findings of our study show that the plants extract has antipyretics activity and present of different type of phytoconstituent present in different extract The Phytochemical and pharmacological assessment of the plant extracts gives different pharmacological activities

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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