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Research Article.....!!!

**ANTI ARTHRITIC ACTIVITY OF ETHANOLIC LEAF EXTRACT OF
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ABSTRACT

Boerhaavia diffusa, a perennial creeping weed found in tropics and sub-tropics is a well known ethno-medicinal plant. The whole plant as well as its different parts(leaves, roots and stems) and plant extracts have been widely used in various traditional and folklore systems of medicine for treatment of various ailments. Several researchers have confirmed biological, pharmacological and clinical activities of the plant and its phyto constituents. Some of the promising effects of this plant include diuretic, hepatoprotective, anti-inflammatory, anti-fibrinolytic, anti cancer, anti-diabetic, immune-modulatory immune-suppressive, anti-lympho proliferative, analgesic properties and used in treatment of pulmonary tuberculosis. The whole plant *Boerhaavia diffusa* fresh or dried is the source of the drug punnarava which is official in Indian pharmacopoeia as a diuretic.

KEYWORDS:

Ethanol, Anti arthritic activity, *Boerhaavia diffusa*, Freund's complete adjuvant, Paw volume.

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INTRODUCTION:

It is been recorded in history that medicinal herbs have been used as of therapy for the relief of pain. The exploration of the chemical constituents from plants, pharmacological and phytochemical screening would provide the basis for developing the new leas molecules in strategic furor of natural product drug discovery. The aim and subject of many researchers is the discovery and development of isolating a new efficient, active and less toxic molecule for systemic activities (1). The biologically active agents from natural sources have always been of great interest to working on various diseases (2). Tribal communities are using their traditional knowledge system to cure different diseases. They use plant as a source of drug through trial and error method and the process is experienced over hundreds of years. Which says that the medicinal plants have been in the focus as life saving drugs right from the beginning of human civilization (3,4). The medicinal plants have been the object of research in both systematic and advanced areas of plant sciences (5,6).

MATERIALS AND METHODS:**COLLECTION OF PLANT MATERIAL:**

The leaves of *Boerhaavia diffusa*. were collected from paramathi near karur District in Tamilnadu.

PREPARATION OF PLANT EXTRACT:

The leaves of *Boerhaavia diffusa* were shade dried at room temperature. The dried material was then homogenized to obtain coarse powder and stored in air-tight bottles for further analysis. The shade, dried, powdered leaves were extracted with ethanol by hot extraction using soxhlet apparatus, collected and stored in a vial for further analysis.

PROCEDURE:

Wister albino male rats (150-200g) were divided into T groups of six animals each (n=6). Group I served as control. Arthritis was induced in raty by injecting 01.ml of 0.1% freund's complete adjuvant (FCA), (Sigma Aldrich USA) into the sub planter region in the right hint paw of group II-IV rats on the first day of the experiment . Group III was administrated with indomethacin (10mg Kg⁻¹ day⁻¹ P.O) daily for 15 days which served as the standard reference. Group IV and V was administrated with 200mg kg⁻¹ day⁻¹ P.O and 400 mg kg⁻¹day⁻¹ P.O of ethanolic leaf extract of *Boerhaavia diffusa* daily for 15 days (4).

EXPERIMENTAL DESIGN:

The plant extract treatments were administrated as follows for 5 days

Group-I : Served as control

Group-II : Freund's complete adjuvant (FCA) in to the sub planter region in the right hind paw.

Group-III: Administrated with Indomethacin ($10\text{mg kg}^{-1} \text{ day}^{-1}$ P.O) daily.

Group-IV: $200\text{mg kg}^{-1} \text{ day}^{-1}$ P.O of *Boerhaavia diffusa*.

Group- V: $400\text{mg kg}^{-1} \text{ day}^{-1}$ P.O of *Boerhaavia diffusa*

The increase in joint diameter was measured daily starting from day 1, by using verniar caliber.

Percentage protection rendered by the plant extract is calculated using the formulae

$$\text{Difference in paw volume of Induced-difference in paw volume of standard / or treated} \times 100$$

Percentage Protection = -----

Difference in paw volume of Induced

STATISTICAL ANALYSIS:

The data presented here are means \pm SD of 6 rats in each group. The results were analysed using one-way analysis of variance (ANOVA) and the group means were compared by Dunecan's multiple range test (DMRT) using statistical program for social sciences (SPSS Version 16.0) soft ware for windows. The findings were considered statistically significant at $P < 0.05$ (5).

Table-1 Antiarthritis activity of Ethanolic leaf extract of *Boerhaavia diffusa*

Paw volume (mm)					
Days	Control	Induced	Standard	Low dose	High dose
0	3.28 \pm 0.16	3.15 \pm 0.12	3.40 \pm 0.08	3.24 \pm 0.18	3.16 \pm 0.05
1	3.28 \pm 0.16	6.96 \pm 0.24	6.60 \pm 0.21	7.20 \pm 0.33	7.23 \pm 0.39
2	3.28 \pm 0.16	7.45 \pm 0.23	7.27 \pm 0.14	7.75 \pm 0.24	7.45 \pm 0.37
3	3.28 \pm 0.16	7.95 \pm 0.02	7.83 \pm 0.06	8.04 \pm 0.24	7.37 \pm 0.37
4	3.28 \pm 0.16	8.60 \pm 0.09	8.38 \pm 0.09	8.31 \pm 0.20	7.18 \pm 0.37
5	3.28 \pm 0.16	9.32 \pm 0.05	8.16 \pm 0.04	8.22 \pm 0.20	7.08 \pm 0.34
6	3.28 \pm 0.16	9.92 \pm 0.04	7.89 \pm 0.05	8.04 \pm 0.16	6.89 \pm 0.34
7	3.28 \pm 0.16	10.25 \pm 0.04	7.73 \pm 0.11	7.88 \pm 0.20	6.80 \pm 0.34
8	3.28 \pm 0.16	10.77 \pm 0.04	7.23 \pm 0.06	7.67 \pm 0.19	6.69 \pm 0.35
9	3.28 \pm 0.16	11.44 \pm 0.08	6.89 \pm 0.10	7.46 \pm 0.19	6.49 \pm 0.35
10	3.28 \pm 0.16	11.85 \pm 0.06	6.52 \pm 0.12	7.30 \pm 0.17	6.29 \pm 0.33
11	3.28 \pm 0.16	11.23 \pm 0.07	6.15 \pm 0.05	7.11 \pm 0.17	6.08 \pm 0.34
12	3.28 \pm 0.16	10.73 \pm 0.06	5.73 \pm 0.06	6.92 \pm 0.17	5.88 \pm 0.34
13	3.28 \pm 0.16	10.11 \pm 0.04	5.43 \pm 0.06	6.72 \pm 0.22	5.67 \pm 0.34
14	3.28 \pm 0.16	9.85 \pm 0.08	5.25 \pm 0.08	6.62 \pm 0.19	5.50 \pm 0.14
15	3.28 \pm 0.16	9.31 \pm 0.08	5.11 \pm 0.04	6.49 \pm 0.35	5.40 \pm 0.12

Values are expressed as mean \pm SD (n=6).

Table -2. Percentage protection of *Boerhaavia diffusa* against FCA induced arthritis

Groups	Initial paw volume volume(mm)	Final paw volume volume (mm)	Difference	Percentage protection (%)
Control	3.28 ± 0.16	3.28 ± 0.16	-----	-----
Induced	3.15 ± 0.12	9.30 ± 0.08	6.15 ± 0.19	-----
Standard	3.40 ± 0.08	5.11 ± 0.05	1.71 ± 0.09	72.20
Low dose	3.24 ± 0.18	6.49 ± 0.35	3.26 ± 0.35	48.09
High dose	3.16 ± 0.05	5.40 ± 0.12	2.24 ± 0.12	63.56

Values are expressed as mean ± SD (n=6).

RESULTS AND DISCUSSION:

Adjuvant-induced arthritis in rats is a well established experimental model that has features similar to the human rheumatoid arthritis. In addition, it is a good chronic inflammatory model for development of potential analgesic and /or inflammatory drugs useful for the treatment of arthritis (9,10). An injection of CFA into the rat paw induces inflammation as primary lesion with a maximum after 3 to 5 days. Secondary lesions occur after a delay of approximately 11 to 12 days which are characterized by inflammation of non-injected sites (hind-leg, fore paws, ears, nose, and tail) decrease in body weight and cell-mediated immunity. The suppression of these effects suggests immunosuppressive activity. (Table 1,2).

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