

**EVALUATION OF ANTI ARTHRITIC ACTIVITY OF ETHANOLIC
LEAF EXTRACT OF *CASSIA AURICULATA*****DR.S. SENTHILKUMAR**

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KEYWORDS:

Ethanol, *Cassia auriculata*, Paw volume, Freund's complete adjuvant, Antiarthritic activity.

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ABSTRACT

Rheumatoid arthritis is a systemic autoimmune disease characterized by articular inflammation that eventually leads to that destruction of joints. Rheumatoid arthritis (RA) is an autoimmune disease that affects approximately 1% of the population. Prevalence of RA increase with age, approaching 5% women over the age of 55. The incidence and prevalence of RA is 2-3 times greater in women than in men. Effective treatment of RA has been impeded by a paucity of accurate diagnostic prognostic test, owing in part to the heterogeneity of the diseases. India is known as the "Emporium of medicinal plants" due to availability of several thousands of medicinal plants in the different bio climatic zones anti-inflammatory diseases including rheumatoid arthritis are still one of the main health problems of the world's population.

INTRODUCTION:

Plants are the only economic source of a number of well established and important drugs. In addition, they are also the source of chemical intermediates needed for the production of some drugs (1). Herbal medicines is the root of various traditional medicine systems around the world. Ayurvedic medicine in India has a proven track record of 5000 years and forms part of the national health service, offered alongside conventional medicine. The ayurvedic national formulary lists some 8000 well proven ayurvedic formulations described in Dravyaguna.

Remedies are made from single or multiple herbs and minerals for various medical conditions like asthma, flu, diabetes, arthritis, heart disease, digestive problems, mental health and skin problems. Herbal medicines yielding about 25% of currently used crude drugs with another 25% derived from chemically altered natural products in the treatment of arthritis, however only a little number of plants have been evaluated scientifically (2). Herbal products are often perceived as safe because they are "natural". In recent years, there is increased research on traditional ayurvedic herbal medicines on the basis of their known effectiveness in the treatment of ailments for which they have been traditionally applied (3).

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

The leaves of *Cassia auriculata* L. were collected from Paramathi near Karur District in Tamilnadu.

PREPARATION OF PLANT EXTRACT:

The leaves of *Cassia auriculata* 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:

Wistar albino male rats (150-200g) were divided into 5 groups of six animals each (n=6). Group I served as control. Arthritis was induced in rats by injecting 0.1 ml of 0.1% Freund's complete adjuvant (FCA), (Sigma Aldrich USA) into the sub-planter region in the right hind paw of group II-IV rats on the first day of the experiment. Group III was administered with indomethacin (10 mg kg⁻¹ day⁻¹ P.O) daily for 15 days which served as the standard reference. Group IV and V was administered with 200 mg kg⁻¹ day⁻¹ P.O and 400 mg kg⁻¹ day⁻¹ P.O of ethanolic leaf extract of *Cassia auriculata* daily for 15 days (4).

EXPERIMENTAL DESIGN:

The plant extract treatments were administered 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: Adminstrated with Indomethacin (10mg kg⁻¹ day⁻¹ P.O) daily.

Group-IV: 200mg kg⁻¹ day⁻¹ P.O of *Cassia auriculata*.

Group- V: 400mg kg⁻¹ day⁻¹ P.O of *Cassia auriculata*.

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

$$\text{Percentage Protection} = \frac{\text{Difference in paw volume of Induced} - \text{Difference in paw volume of standard / or treated} \times 100}{\text{Difference in paw volume of Induced}}$$

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. Antirthritis activity of ethanolic leaf extract of *Cassia auriculata*

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	3.21 \pm 0.13	3.23 \pm 0.11
1.	3.28 \pm 0.16	6.96 \pm 0.24	6.60 \pm 0.21	7.36 \pm 0.53	7.54 \pm 0.72
2.	3.28 \pm 0.16	7.45 \pm 0.23	7.27 \pm 0.14	7.54 \pm 0.54	7.27 \pm 0.71
3.	3.28 \pm 0.16	7.95 \pm 0.02	7.83 \pm 0.09	7.84 \pm 0.53	6.88 \pm 0.78
4.	3.28 \pm 0.16	8.60 \pm 0.09	8.38 \pm 0.09	7.84 \pm 0.53	6.88 \pm 0.78
5.	3.28 \pm 0.16	9.32 \pm 0.05	8.16 \pm 0.04	7.64 \pm 0.52	6.58 \pm 0.69
6.	3.38 \pm 0.16	9.92 \pm 0.04	7.89 \pm 0.05	7.46 \pm 0.52	6.36 \pm 0.64
7.	3.28 \pm 0.16	10.25 \pm 0.09	7.73 \pm 0.11	7.24 \pm 0.53	6.10 \pm 0.60
8.	3.28 \pm 0.16	10.77 \pm 0.04	7.23 \pm 0.06	7.05 \pm 0.56	5.86 \pm 0.59
9.	3.28 \pm 0.16	11.44 \pm 0.08	6.89 \pm 0.10	6.86 \pm 0.56	5.67 \pm 0.53
10.	3.28 \pm 0.16	11.85 \pm 0.06	6.52 \pm 0.12	6.68 \pm 0.55	5.55 \pm 0.49
11.	3.28 \pm 0.16	11.23 \pm 0.07	6.15 \pm 0.05	6.46 \pm 0.57	5.42 \pm 0.45
12.	3.28 \pm 0.16	10.73 \pm 0.06	5.73 \pm 0.06	6.27 \pm 0.56	5.32 \pm 0.46
13.	3.28 \pm 0.16	10.11 \pm 0.04	5.43 \pm 0.06	6.08 \pm 0.61	5.23 \pm 0.42
14.	3.28 \pm 0.16	9.85 \pm 0.08	5.25 \pm 0.08	5.88 \pm 0.64	5.17 \pm 0.37
15.	3.28 \pm 0.16	9.31 \pm 0.08	5.11 \pm 0.04	5.64 \pm 0.51	5.13 \pm 0.36

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

Table-2 Percentage protection of *Cassia auriculata* against FCA induced arthritis

Groups	Initial paw volume (mm)	Final paw volume (mm)	Difference (mm)	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	3.21 ± 0.13	5.64 ± 0.51	2.43 ± 0.38	60.55
High dose	3.23 ± 0.11	5.13 ± 0.36	1.90 ± 0.30	69.03

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

RESULTS AND DISCUSSION:

Rheumatoid arthritis (RA) is a chronic inflammatory disease which leads to the destruction of synorrial membranes, cartilage and bone. Although etiology and pathogenesis of RA is poorly understood. Pro-inflammatory cylokines are considered to be one of the most important mediators involved in the pathogenesis of RA (6). (FA- induced experimental model for arthritis is considered closed to simulating human rheumatioid arthritis and therefore it is the most widely used chronic test model in which the associated clinical and Histopathologicla changes are comparable to those seen in human form (7,8).

Arthritis is classified as an autoimmune, inflammatory arthritis, the disease comprises three basic interrelated process-inflammation, synovial proliferation and joint damage in RA. (Table 1,2). Thus result cartilage and bone destruction and to the fibrosis (9,10,11).

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