

**A REVIEW ON MEDICINAL PLANTS WITH ANTI-INFLAMMATORY AND ANTI-ARTHRITIC ACTIVITY****P. Anjali, *R. Vimalavathini and S. Kavimani**

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ABSTRACT

Inflammation is a complex response of body's tissue in response to noxious stimuli. Rheumatoid arthritis (RA) is a chronic inflammatory autoimmune disorder affecting joints throughout the body. Currently available drugs such as non steroidal anti-inflammatory drugs (NSAIDS), disease modifying anti-rheumatoid drugs and biological agents provides only symptomatic relief and severe adverse effects. Herbs produce anti-arthritis action with fewer risks and improve the quality of life in patients with RA.

KEYWORDS: Inflammation, rheumatoid arthritis, herbs.**INTRODUCTION**

Inflammation is an exaggerated tissue response to noxious stimuli and is of 2 types such as acute and chronic inflammation. Acute inflammation is primarily associated with the migration of leukocytes to the affected region and involved in tissue repair, whereas chronic inflammation is mediated by the involvement of mononuclear cells that leads to the tissue damage. Rheumatoid arthritis (RA) is a chronic inflammatory autoimmune disorder affecting joints throughout the body. Currently drugs used in the treatment of RA such as NSAIDS, disease modifying anti-rheumatoid drugs (DMARDS) and biological agents suppress immune system, reduces inflammation and joint destruction and thus producing symptomatic relief only. Also these agents are associated with severe adverse effects such as gastrointestinal ulcers, cardiovascular complications, hematologic toxicity, nephrotoxicity, pulmonary toxicity, myelosuppression, hepatic fibrosis, and cirrhosis.^[1] Herbs provide long term therapeutic effects with fewer side effects and also improve the quality of life in patients with RA. This review discusses a list of plants (table 1) that has been pharmacologically proved to exhibit anti-inflammatory and anti-arthritis activity.

Table 1: List Of Plants With Anti-Inflammatory And Anti- Arthritic Activity.

SL NO	BIOLOGICAL NAME OF THE PLANT	FAMILY	PART USED	CHEMICAL CONSTITUENT	PHARMACOLOGICAL ACTIVITY	METHOD USED
1	<i>Tridax procumbens</i>	Asteraceae	Whole plant	Alkaloids, tannins, flavonoids, saponins	Anti-arthritic activity	Freund's complete adjuvant induced arthritis in female Sprague Dawley rats. ^[2]
2	<i>Ficus benghalensis</i>	Moraceae	Roots	Tannins, flavonoid	Anti-arthritic activity	Freund's complete adjuvant induced arthritis in either sex of Wistar albino rats. ^[3]
3	<i>Berberis orthobotrys</i>	Berberidaceae	Roots	Quercetin, gallic acid, caffeic acid, p- and m-coumaric acid, ferulic acid, cinnamic acid, sinapic acid	Anti-arthritic activity	Inhibition of protein denaturation using bovine serum albumin, HRBC membrane stabilization, turpentine oil induced joint edema in rats, formaldehyde induced arthritis in rats, freund's complete adjuvant induced arthritis in rats either sex of Sprague Dawley rats. ^[4]
4	<i>Nigella sativa</i>	Ranunculaceae	Seeds	Tocopherols	Anti-inflammatory, anti-arthritic activity	Freund's complete adjuvant induced arthritis in female Wistar albino rats. ^[5]
5	<i>Plumeria rubra</i>	Dogbane	Bark	Alkaloids, carbohydrates, flavonoids, glycosides, steroids, proteins, saponins, tannins, phenolic compounds	Anti-inflammatory, anti-arthritic activity	Freund's complete adjuvant induced arthritis in male Wistar albino rats. ^[6]
6	<i>Periploca forrestii</i>	Asclepiadaceae	Stem	Cardenolide, caffeoylquinic acid	Anti-arthritic activity	Invitro anti-arthritic effect on synovial cell line MH7A, collagen induced arthritis in male Sprague Dawley rats. ^[7]
7	<i>Sesamum indicum</i>	Pedaliaceae	Seeds	Sesamin, sesamol, sesamol, oleic acid, tocopherols, palmitic acid, stearic acid, linoleic acid, linolenic acid	Anti-inflammatory, anti-arthritic activity	Freund's complete adjuvant induced arthritis in male Wistar albino rats. ^[8]
8	<i>Xanthium strumarium</i>	Asteraceae	Ripened fruits	Caffeoylquinic acid, chlorogenic acid	Anti-arthritic activity	Freund's complete adjuvant induced arthritis in male Wistar albino rats. ^[9]
9	<i>Moringa oleifera</i>	Moringaceae	Leaves	Alkaloids, Tannins, Flavonoids, Isothiocyanates,	Anti-inflammatory, anti-arthritic activity	Freund's complete adjuvant induced arthritis in male Sprague

				B-Sitosterol, Chlorogenic Acid		Dawley rats. ^[10]
10	<i>Ciccus quadrangularis</i>	Vitaceae	Stem	Calcium, phosphorus	Anti-arthritis activity	Carrageenan induced paw edema in rats, Freund's complete adjuvant induced arthritis in either sex of Wistar albino rats. ^[11]
11	<i>Momordica charantia</i>	Cucurbitaceae	Roots	Amino acid, alkaloid, flavonoids, tannin.	Anti-arthritis activity	Freund's complete adjuvant induced arthritis in male Sprague Dawley rats. ^[12]
12	<i>Asparagus racemosus</i>	Liliaceae	Roots	Steroidal saponins, Isoflavones, asparagine, racemosol, polysaccharides, mucilage, vitamins.	Anti-inflammatory and anti-arthritis activity	Carrageenan induced paw edema, Freund complete adjuvant induced arthritis in either sex of Wistar albino rats. ^[13]
13	<i>Cyathocline purpurea</i>	Asteraceae	Whole plant	Eudesmanolide, guaianolide, sesquiterpene lactones, isoivangustin, guaianolide, 6-hydroxy-4(14), 10(15)-guainadien-8-, 12-olide	Anti-arthritis activity	Freund's complete adjuvant induced arthritis in female Wistar albino rats. ^[14]
14	<i>Sophora flavescens</i>	Fabaceae	Roots	Flavones	Anti-arthritis activity	Freund's complete adjuvant induced arthritis in female Wistar albino rats. ^[15]
15	<i>Costus speciosus</i>	Costaceae	Rhizomes	Flavonoids, saponins, glycoside, carbohydrates	Anti-arthritis activity	Inhibition of protein denaturation using bovine serum albumin, HRBC membrane stabilization, proteinase inhibitory action, Freund's complete adjuvant induced arthritis in Wistar albino rats. ^[16]
16	<i>Terminalia chebula</i>	Combretaceae	Dried immatured fruits	D-galloyl glucose, chebulagic acid, chebulinic acid, ellagic acid, syringic acid, gallic acid, chebulic acid	Anti-arthritis activity	Formaldehyde-induced arthritis, Freund's complete adjuvant-induced arthritis in male Wistar albino rats. ^[17]
17	<i>Nyctanthes arbor-tristis</i>	Oleaceae	Mature leaves	Alkaloids, carbohydrates, flavonoids, glycosides, tannins, terpenoids, acids, coumarins, carotenoids, phenols	Anti-inflammatory, anti-arthritis activity	Freund's complete adjuvant induced arthritis in either sex of Sprague Dawley rats. ^[18]
18	<i>Alstonia boonei</i>	Apocynaceae	Stem bark	Calcium, phosphorus, iron, sodium,	Anti-inflammatory, anti-arthritis activity	Carrageenan-induced paw oedema, cotton pellet granuloma ,

				potassium, magnesium, Alkaloids, tannins, saponins, flavonoids, cardiac glycosides, ascorbic acid.		freund's complete adjuvant-induced arthritis in male Wistar rats. ^[19]
19	<i>Phyllanthus amarus</i>	Euphorbiaceae	Standardized extract	Phyllanthin, Hypophyllanthin	Anti-arthritis activity	Freund's complete adjuvant induced arthritis in female Wistar albino rats. ^[20]
20	<i>Merremia emarginata</i>	Convolvulaceae	Whole plant	Resin, glycosides, reducing sugars, starch, fats, fixed oil	Anti-arthritis activity	Freund's complete adjuvant arthritis in either sex of Wistar albino rats. ^[21]
21	<i>Piper longum</i>	Piperaceae	Seeds	Piperine	Anti-arthritis activity	Freund's complete adjuvant arthritis in male Wistar albino rats. ^[22]
22	<i>Trigonella foenum graecum</i>	Fabaceae	Seeds	Flavonoids, polysaccharides, saponins, fixed oils and alkaloids like trigonelline, choline	Anti-arthritis activity	Freund's complete adjuvant induced arthritis in female Sprague Dawley rats. ^[23]
23	<i>Hibiscus hispidissimus</i>	Malvaceae	Aerial parts	Saponins, alkaloids, tannins, flavonoids, glycosides, reducing sugars, triterpenoids, steroids	Anti-arthritis activity	Inhibition of protein denaturation using egg albumin and bovine serum albumin, HRBC membrane stabilization, proteinase inhibitory action. ^[24]
24	<i>Rhizophora mucronata</i>	Mangroves	Leaves	Saponins, flavonoids, tannins, anthracene, phenols, amino acids, sugars	Anti-inflammatory, anti-arthritis activity	Inhibition of protein denaturation using egg albumin and bovine serum albumin, HRBC membrane stabilization. ^[25]
25	<i>Bacopa monniera</i>	Scrophulariaceae	Whole plant	Flavonoids, bacosides, triterpenoids	Anti-arthritis activity	Inhibition of protein denaturation using bovine serum albumin, HRBC membrane stabilization. ^[26]
26	<i>Acacia auriculiformis</i>	Mimosaceae	Stem bark	Carbohydrates, phenols, tannins, saponins, flavonoids	Anti-arthritis activity	Inhibition of protein denaturation using bovine serum albumin. ^[27]
27	<i>Cocculus hirsutus</i>	Menispermaceae	Leaves and stem	Phenols, flavonoids, triterpenoids, steroids, alkaloids	Anti-inflammatory, anti-arthritis activity	Inhibition of protein denaturation using bovine serum albumin, HRBC membrane stabilization. ^[28]

28	<i>Myxopyrum serratulum</i>	Oleaceae	Aerial parts	Flavonoids, terpenoids, glycosides, tannins, saponin, iridod glycosides	Anti-inflammatory, anti-arthritis activity	Inhibition of protein denaturation using bovine serum albumin, HRBC membrane stabilization. ^[29]
29	<i>Callicarpa macrophylla</i>	Verbenaceae	Flowers	Glycosides, saponins, flavonoids, tannins, steroids, carbohydrates	Anti-inflammatory, anti-arthritis activity	Inhibition of protein denaturation using egg albumin, HRBC membrane stabilization. ^[30]
30	<i>Oryza sativa</i>	Grasses	Rice	Proteins, terpenoids, phenolic compounds, flavonoids, carbohydrates, volatile oils	Anti-inflammatory, anti-arthritis activity	Inhibition of protein denaturation using egg albumin, bovine serum albumin. ^[31]
31	<i>Enicostemma axillare</i>	Gentianaceae	Whole plant	Alkaloids, flavonoids, tannins, steroids, phenols	Anti-inflammatory activity	Inhibition of protein denaturation using bovine serum albumin, proteinase inhibitory action, HRBC membrane stabilization, Anti-lipoxygenase activity. ^[32]
32	<i>Syzygium zeylanicum</i>	Myrtaceae	Leaves	Alkaloids, glycosides, phenolics, flavonoids, steroids, terpenoids, saponins	Anti-inflammatory activity	Inhibition of protein denaturation using bovine serum albumin, assay of cyclooxygenase and 5-lipoxygenase. ^[33]
33	<i>Centella asiatica</i>	Umbelliferaceae	Whole plant	Alkaloids, flavonoids, glycosides, triterpenoids, saponins	Anti-inflammatory activity	HRBC membrane stabilization. ^[34]
34	<i>Swertia alata</i>	Gentianaceae	Aerial parts	Phenols, iridoids, tannins, carbohydrates, steroidal terpenes	Anti-inflammatory activity	Inhibition of protein denaturation using bovine serum albumin, proteinase inhibitory action, HRBC membrane stabilization. ^[35]

CONCLUSION

The above plants exhibit significant anti-inflammatory and anti-arthritic activity. Herbal plants provide better effects with minimal adverse effects. However further studies are in need in order to substantiate the preclinical studies and to be used commercially by all worldwide.

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