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A Systematic Review on Medicinal Plants Having Anti- Arthritic Activity

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ABSTRACT: - Arthritis is an chronic, inflammatory, systemic autoimmune disease that may be affects many tissues and organs but specifically it attacks on the flexible (synovial) joints. Swelling of the synovial cells. Rheumatoid arthritis affecting people 20-50 years ages with unpredictable course. the aim of this review is to collect data on experiments reporting the anti-arthritic effect of herbal plants with the total of 18 plant species have been identified as active sources of arthritic properties. Here introduce some plants of the anti-arthritic activity as *Curcuma longa*, *Zingiber officinale*, *Rosmarinus officinalis*, *Borago officinalis*, evening primrose and Devil's claw in this review. Since the treatment of arthritis is not a one-dimensional remedy, this review tries to reach a multidimensional therapeutic approach to arthritis with the help of herbal medicine and modification in lifestyle.

I. INTRODUCTION

Arthritis is an auto immune disorder characterized by pain, swelling and stiffness. The word arthritis means inflammation of joints. ["Artho" means joints and "itis" means inflammation] Rheumatoid Arthritis is a chronic and systemic inflammatory disease of unknown etiology. It is marked by synovial hyperplasia with local invasion of bone and cartilage leading to joint destruction [1,2]. it involves internal organs such as nerves, eyes, lungs or heart. The symptoms of Rheumatoid Arthritis can be non-specific, it includes feeling unwell or tired soreness in or around joints, low grade fever and weight loss/ poor appetite [3-5].

Various drugs are used to control Rheumatoid Arthritis there are numerous reports regarding the side effects of the drugs. A range of newer drugs called TNF blockers have been linked to condition called Lekocytoclastic vasculitis [LCV or TNF blockers]. Humira and Remicade reported increase the risk of cancer and infections. That's why to avoid this problem we use the herbal plants to treat the R.A has no side effects.

The knowledge about herbal medicines is valuable in searching new medicines for human welfare at home and abroad. As they are believed to be comparatively less toxic than the synthetics. [4- 5].

List of the herbal plants used for Rheumatoid Arthritis plants used for Rheumatoid Arthritis

Sr. No	Botanical Name	Common Name
1	<i>Borago officinalis</i>	Borage
2	<i>Boswellia serrata</i>	Indian Olibanum
3	<i>Curcuma longa</i>	Turmeric
4	<i>Camellia sinensis</i>	Green Tea
5	<i>Cinnamomum zeylanicum</i>	Cinnamon
6	<i>Glycyrrhiza glabra</i> and <i>Boswellia serrata</i>	Liquorice and Indian olibanum
7	<i>Hibiscus platiniifolius</i>	Maple-leaved mallow
8	<i>Justicia gendarussa</i>	Gardarusa
9	<i>Tripterygium wilfordii hook</i>	Thunder God Vine

10	Polygonum viviparum	Alpine Bistort
11	Rosmarinus officinalis	Rosemary
12	Rosa Cannina	Dog rose
13	Strychnous potatorium	Katakam
14	Urtica Pilulifera	Stinging Nettle
15	Urtica dioica	Common Nettle
16	Urgenia indica	Indian squill
17	Wedelia chinensis Merrill	Bhringraj
18	Zingiber officinalis	Ginger

1. **Boarago officinalis:** - common name is borage. Rich source is gamma linoleic acid, which contains 25% of GLA. Borage oil can clarify the anti-inflammatory effect in rheumatoid arthritis [6]. Antirheumatoid arthritis potential of borage seed oil was assessed in 2 RCT as in first study with 1.4g/day of borage oil compared with placebo in RA patient 36.8% amelioration occurred at end of 6 months therapy. In second study 2.8g/day of borage seed oil taken by RA patient during 6 month the 64% amelioration noticed [7].
2. **Boswellia serrata:** - common name is Indian olibanum. In arthritis Efficacy of Boswellia serrata extract has been substantiated; dramatic alleviation in frequency of joint pain, swelling and augmentation in joints flexibility have been observed at the end of treatment [8].
3. **Curcuma Longa:** - common name turmeric. Is an Indian indigenous plant. Main component is curcumin. Many clinical trials have been done for proving the anti-inflammatory effect of curcumin. The results suggest that that curcumin can be effective in improving inflammation of Rheumatoid Arthritis and reducing clinical manifestation of RA, such as joint swelling and morning stiffness in comparison with phenylbutazone which is used as positive control [9].
4. **Camellia Sinensis:** - common name is green tea. The potential disease-modifying effect of green tea on arthritis came to light when it was shown that collagen type II-induced arthritis in mice, an animal model of inflammatory polyarthritis, was ameliorated by prophylactic administration of green tea polyphenols in drinking water [10]. with the global availability of green tea, its low cost and proven lack of toxicity, green tea catechins or compounds derived from them could one day be useful as a conventional medicine or as effective adjunct therapies for the treatment of both Rheumatoid arthritis and osteoarthritis.
5. **Cinnamomum zeylanicum:** - in a study the potential of TAPP extracted from cinnamon (Cinnamomum zeylanicum) bark in animal models of inflammation and rheumatoid arthritis in rats was evaluated. Type-A procyanidine polyphenols (TAPP) are reported to have immunomodulatory and anti-inflammatory potential in vitro. As a conclusion, TAPP showed disease-modifying potential in animal models of inflammation and arthritis in rats [11].
6. **Glycyrrhiza glabra and Boswellia serrata:** - in the study investigation was undertaken to assess the anti-arthritic activity of Glycyrrhiza glabra and Boswellia serrata. Extract was combined to study the synergistic property for potent anti-arthritic activity. The combined formulation of Glycyrrhiza glabra and Boswellia are in proportion (1:1) showed significant synergistic action [12].
7. **Hibiscus platinifolius:** - in a study the anti-arthritic activity of leaves of Hibiscus platinifolius Linn have been investigated on male Wister rats and estimation of paw edema, body weight measurement and measurement of activity marker enzyme like alanine trans aminases and serum glutamate oxalo acetate transferase in serum by using aqueous extract of Hibiscus platinifolius. The study involves induction of arthritis using FCA and turpentine oil induced in IP route [13-17].

8. ***Justicia gendarussa***: - the plant is known for its medicinal properties in Indian traditional system of medicine. Leaves are used in the treatment of fever, hemiplegia, rheumatoid arthritis, muscle pain, lumbago, headache and earache [18]. traditionally a decoction prepared by boiling *Justicia gendarussa* roots in milk used in treatment of chronic rheumatic disorders, dysuria, fever, carbuncles and diarrhea. *Justicia* contains lignans, naturally occurring phenolic dimers and triterpenoids. Lignans have been used as lead compounds for the development of anti-rheumatic agents [19].
9. ***Tripterygium wifordii hook F***: - it is a perennial vine like plant that grows in southern China and Taiwan it also known as 'Thunder God Vine' medicinal extract is derived from the root and used for the treatment of various Autoimmune and inflammatory diseases including rheumatoid arthritis, systemic erythematosus, nephritis, psoriasis and asthma for several centuries [20]. an ethyl acetate extract of the plant showed therapeutic benefit in patients with treatment refractory rheumatoid arthritis [21]. Common side effects of this plant are vomiting, hair loss, dryness, abdominal pain and vaginal spotting also lead to development of amenorrhea [20].
10. ***Polygonum Viviparum***: - in folk medicine it is used for treatments of Wounds, Fever from pneumonia, and small large intestine diseases. It is also Relieves cough and promotes Expectoration [22]. in a study of *polygonum viviparum*, methanol extract of Rhizome was investigated on acute and chronic inflammation. As methods carrageenan and dextran induced paw edema assays used whereas chronic inflammation was assessed by mycobacterium induced arthritis and formaldehyde arthritis. From results of this study a significant reduction of paw inflammation both in acute and chronic inflammatory models up to 50mg/kg. In acute inflammation inhibition was 18-34% whereas the reduction of chronic inflammation was ranging up to 44%. Also inhibited the elevated levels of biochemical and Hematological parameters such as SGPT, ESR, and TLC in Arthritic animals. [23].
11. ***Rosmarinus Officinalis***: - common name rosemary. In an open label trial, the effects of rosemary extract have been assessed in patients with Osteoarthritis, Rheumatoid arthritis, and fibromyalgia during 4 weeks; hs- CRP (an index for inflammation presence) was decreased in patients who had demonstrated augmentations in this index. Reduction in inflammation related to pain score was observed during the treatment but remission has not occurred in fibromyalgia score [24]. there is evidence that confirms Anti-inflammatory potential of *Rosmarinus officinalis* in molecular scope; Rosmarinic acid could disturb complement system activation easily by inhibiting C3B attachment; the dose required for making this effect is very low 34 mm [25].
12. ***Rosa Cannina***: - common name is dog rose. The effectiveness of rosehip has been assessed in osteoarthritis and Rheumatoid arthritis patients. After treatment of this plant Alleviation in pain, rescue medication consumption, stiffness and a significant Reduction in CRP have been observed [26-27]. Rosehip powder has reduced ESR and improved quality of life in Rheumatoid Arthritis patients; might be used as a supplement besides the standard treatment of Rheumatoid Arthritis [28]. the ethanol extract of Rosehip was Fractioned by solvents with different polarity; ethyl acetate and butanol fraction had Anti-inflammatory effects [29].
13. ***Strychnos potatorum***: - commonly known as Katakam in Ayurvedic system of medicine. According to Ayurveda, its seeds are acrid, alexipharmic, lithotriptic and cure strangury, urinary discharges and head diseases. In unani system of medicine seeds are used in liver and kidney complaints, Gonorrhea and for colic. The ripe seeds are used for clearing muddy water [30]. for the arthritis seeds are carried out on Freund's Adjuvant induced arthritic Rats by using aqueous extract and whole seed powder of *strychnos potatorum*. [31].
14. ***Urtica Pilulifera***: - it is used as an expectorant, purgative, diuretic, hemostatic, vermifuge and for treatment of eczema, to alleviate inflammation, rheumatism, hemorrhoids, hyperthyroidism, bronchitis and cancer [32]. for Anti-arthritic effect methanolic leaf extract and ibuprofen is use in a complete Freund's Adjuvant induced arthritis model. By giving two extract doses (1.33mg/kg and 2mg/kg) and ibuprofen (53mg/kg) up to 30 days. The effect of extract on joint deformity, ankle swelling and inflammatory markers was evaluated. [33].
15. ***Urtica dioica***: - common name is Stinging nettle. Nettle leaf has been investigated to prove its anti-inflammatory effect in a pilot study. For acute arthritis patient 50mg diclofenac per day together with 50mg infusion of *Urtica dioica* orally. *Urtica dioica* when combined with NSAIDs have an outstanding synergistic effect [34]. topical effectiveness of Nettle leaf has been assessed in osteoarthritis of thumb through RCT; significant alleviation in pain, stiffness, and anti- inflammatory and analgesic requirements have been observed [35].



16. ***Urgenia indica***: - common name is Indian squill. the bulb has used as anti-fungal [36-37], antiangiogenic and proapoptotic activity [38], asthma [39], emmenagogue, anti-helminthic, purgative, alexiteric and also useful in paralysis, bronchitis, dropsy, rheumatism, renal calculi, leprosy, skin diseases, headache, disease of nose, internal pains, scabies [40]. The anti-arthritis activity test by cotton pellet Method. [41].

17. ***Wedelia chinensis Merrill***: - common name is Bhringraj. *Wedelia chinensis* is a reputed herbal medicine in Ayurvedic, Siddha, and Unani system of medicine. [42]. its leaves can be used in the treatment of dermatological disorders, cough, headache, hair loss, lice, strengthening the nervous system, lack of blood, digestive system disorders. The leaves are also used in dyeing grey hair and in promoting growth of hair. Also used as tonic, coughs, cephalalgia, skin diseases, and alopecia. In decoction, the plant is used in uterine hemorrhage and menorrhagia. *Wedelia chinensis* using home remedy osteochondritis Dissecans, Multiple Sclerosis, Juvenile Arthritis, Gouty arthritis, Rheumatic fever, etc. [43].

18. ***Zingiber officinalis***: - common name is Ginger. Ginger has antioxidant, anti-inflammatory, antiseptic and carminative properties [44]. In Ayurvedic and Traditional Sino-Japanese medicine systems, ginger has been used for to treat inflammatory Rheumatic diseases. [45]. The use of CAM therapies for the treatment of arthritis like Exercise, Yoga, Acupuncture, massage, Magnetic therapy, Meditation, Nutrition and Dietary supplements. Here CAM therapy means Complementary and Alternative Medicine. [46].

III. DISCUSSION

Since Neanderthal times, the plants had been used for prevention and cure of various ailments such as Rheumatoid Arthritis and other inflammatory diseases. Natural sources as plants have been considered as the safest and valuable treatment for the disease. In the Review Article includes 18 different plants species that are used for the prevention and cure Rheumatoid Arthritis. From Review, noticed that majority of researches were carried on Rheumatoid Arthritis. in this review, mainly deal with safety profile, mechanism of action, plant extracts and alternate therapy for the treatment of arthritis. The most potent anti-arthritic plants such as *Borago officinalis*, *Boswellia serrata*, *Curcuma longa*, *Camellia sinensis*, etc. have been elaborated in the review article. Among these listed plants, certain plants have been used in acute and chronic rheumatism.

IV. CONCLUSION

Herbal medicines are popular as remedies for diseases by vast majority of world's population. And are a great Economical value. In this Review, I have selected some medicinal plants that highlight some of the main advances achieved in the identification of plants with anti-arthritic activity. Plants have been a prime source of highly effective conventional drugs for the treatment of many forms of arthritis. This review makes an attempt to give scientific account of use of valuable medicinal plants extracts in arthritis.

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