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Anti Arthritic Indigenous Herbal Drugs: Phyto-chemistry and Possible Mechanism

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Abstract

Arthritis is a most troublesome problem in oriental countries like India. It has an ancient presence in the subcontinent's medical traditions. The disorders typically involve with of pain, stiffness, and blockage, including joint, bone, and muscle problems followed by paralysis. Present-day terms for arthritis, rheumatism, and joint disorders reflect the contemporary mix of humoral and biomedical influence in the region. Use of indigenous herbal drugs for the treatment of arthritis is of prime important and is traditionally claimed from ancient folk-lore. The present review focuses on the use of several herbal drugs for the treatment and management of arthritis along with their possible.

Key-words: Arthritis, Indigenous Herbal Drugs, Mechanism

Introduction

RA is a chronic, systemic inflammatory disease predominantly affecting the joints and periarticular tissue. RA still remains a formidable disease, being capable of producing severe crippling deformities and functional disabilities and cartilage destruction and commonly leads to significant disability, caused by no. of pro inflammatory molecules released by macrophages including reactive oxygen species and ecosanoids such as prostaglandins, leukotrines and cytokines. The regulation of these mediators secreted by macrophages and other immune cells[1] and modulation of arachidonic acid metabolism by inhibiting enzymes like Cox and LOX are the potential target for chronic inflammatory conditions. RA is a complex process, involving synovial cell proliferation and fibrosis, degeneration of cartilage and bone erosion. This process is mediated by an interdependent network of cytokines, prostanoids and proteolytic enzymes.[1-3]

Need of exploring herbal drugs

Plants are a rich source of various metabolites and they contain two categories of metabolites namely primary and secondary metabolites. Primary metabolites include those substances which contribute a major role in plant structure as well as energy metabolism of the plants. These basically include the primary metabolites like carbohydrates, proteins and fats. Secondary metabolites are the group of chemicals not required by the plant for its structure or function and are comparatively found in less quantity as compared to the primary metabolites. These are a group of non-nutritive dietary components, some of which are utilized by plants in defense system.

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The compounds which fall under the category of secondary metabolites are broadly categorized as "phytochemicals". Phytochemicals are the defense molecules present in the plant to protect from various microbes, insects etc. They also act as growth regulators in the plant system. Secondary plant metabolites or phytochemicals possess pharmacological properties. Since then various scientific studies are being carried out to study the therapeutic potential of various plants and their products. Till date many plants have been shown to possess significant anti arthritic role thus proving to be a potential tool in drug discovery and drug development process. The plant, as one of the important sources, still maintains its original place in the treatment of various diseases, including arthritis, with minimum side effects. Considerable studies have been carried out on ethno medicinal plants; however, only few indigenous medicinal plants have attracted the interest of scientists, to investigate them as a remedy for arthritis.[4-5]

Indigenous Herbal drugs used in arthritic with possible mechanism[4-38]

Table 1: List of herbal sources of anti-arthritic activity

S/No.	Botanical name	Family	Parts and Extract used	Chemical constituent	Model used
1.	*Abrus precatorius*	Leguminosae	Red and White Seeds Ethanol	Flavones luteolin, abrectorin, orientin, isoorientin and desmethoxycentaureidin 7-0-rutinoside	FCA
2.	*Asystasia dalzelliana*	Acanthaceae	Leaves Ethanolic	Steroids, flavanoid, alkaloids, tannins	FCA
3.	*Aristolochia bracteata*	Aristolochiaceae	Whole plant Petroleum ether, chloroform and methanol	Aristrolochic acid, alkaloids, flavanoids.	FCA
4.	*Butea monosperma*.	Fabaceae	Whole plant, Petroleum ether	Gallic acid, pyrocatechin	FCA
5.	*Bauhinia variegate*	Caesalpiniaceae	Stem Ethanol	Flavanoid, alkaloids	CFA
6.	*Borassus flabellifer*	Arecaceae	Male flowers (inflorescences) Ethanolic	Steroids, saponins, borassosides.	FCA
7.	*Capparis spinosa*	Capparidaceae	Fruit Ethanol:Water	Flazin, Guanosine, Capparine,	AIA
8.	*Capparis erythrocarpos*	Capparaceae	Roots Ethanolic	Proteins, poly phenols	FCA
9.	*Cassia uniflora Mill*	Caesalpiniaceae	Leaves Petroleum ether, ethyl acetate, methanolic	Proteins, poly phenols, alpha galactosidase	CFA
10.	*Cissampelos pareira*	Menispermaceae	Roots Aqueous ethanolic	Alkaloids, flavanoids	CFA
11.	*Cleome gynandra*	Capparidaceae	Leaves Ethanolic	Alkaloids, carotinoids, flavanoids, phytates, saponins,tannins	AIA
12.	*Cocculus hirsutus*	Menispermaceae	Leaves Ethanolic	Alkaloids, carotinoids, flavanoids, phytates, saponins,tannins	FCA, FIA
13.	*Costus speciosus*	Costaceae	Aerial part Methanolic	Diosgenin, succinic acid	FCA
14.	*Elaeocarpus sphaericus*	Elaeocarpaceae	Fruit Ethanolic	Alkaloids, carbohydrates, glycosides	FCA
15.	*Ficus bengalensis*	Moraceae	Stem bark Methanolic	Alkaloids, glycosides	FCA, FIA, AIA
16.	*Glycosmis pentaphylla*	Rutaceae	Stem bark Ethanolic	Alkaloids, flavanoids	FCA

17.	*Glycyrrhiza glabra*	Leguminosae	Rhizomes Methanolic	Alkaloids, glycosides	CFA
18.	*Harpagophytum procumbens*	Pedaliaceae	Roots Ethanol	Alkaloids, glycosides	FCA
19.	*Hybanthus enneaspermus*	Violaceae	Whole plant Alcoholic and aqueous	Alkaloids, carbohydrates, glycosides,	FCA
20.	*Justicia gendarussa Burm*	Acanthaceae	Leaves Ethanolic	Alkaloids, glycosides	FCA, CIA
21.	*Lawsonia innermis*	Lythraceae	Leaves Hydroalcoholic	Alkaloids, carbohydrates, glycosides, phytosterols, Saponins, tannins, proteins, flavanoids	FCA, FIA
22.	*Merremia emarginata Burm*	Convolvulaceae	Whole plant Ethanolic	Alkaloids, carbohydrates, glycosides,	FCA
23.	*Machilus macrantha*	Lauraceae	Bark Petroleum ether, alkaloidal fraction, acetone extracts	Alkaloids, carbohydrates, glycosides,	FCA
24.	*Merremia tridentata*	Convolvulaceae	Whole plant Ethanol	Ergosie alkaloids, pyrrolidine alkaloids	CFA
25.	*Piper longum*	Piperaceae	Fruit Aqueous	Alkaloids, steroids, tannins,	FCA
26.	*Pongamia pinnata*	Fabaceae	Leaves Methanolic	Alkaloids, steroids, tannins, flavanoids and glycosides	FCA
27.	*Phyllanthus amarus*	Euphorbiaceae	Aqueous	Alkaloids, glycosides, flavanoids,	FCA
28.	*Punica granatum*	Punicaceae	Seeds Ethanolic	Flavanoids, phenolic compounds	FCA
29.	*Pistia stratiotes*	Araceae	Leaves Aqueous and ethanolic	Alkaloids, glycosides, steroids, polysaccarides	AIA
30.	*Premna serratifolia*	Verbenaceae	Wood Ethanol	Alkaloids, steroids, tannins, flavanoids and glycosides	AIA
31.	*Randia dumetorum*	Rubiaceae	Fruit Methanolic	alkaloids, glycosides, flavanoids,	FCA
32.	*Ricinus communis*	Euphorbiaceae	Leaves Hydroalcoholic	Alkaloids, glycosides, steroids	FCA
33.	*Syzygium cumini*	Myrtaceae	Seeds Methanolic	Alkaloids, glycosides, steroids, polysaccarides	FCA
34.	*Strychnos potatorum*	Loganiaceae	Seeds Aqueous	Saponin glycosides, Bsitosterol, carbohydrates	FCA
35.	*Sida rhombifolia*	Malvaceae	Aerial part Ethanol and aqueous	Alkaloids, glycosides, steroids	AIA
36.	*Tamarindus indica*	Ceasalpiniaceae	Seeds Alcoholic and aqueous	Alkaloids, glycosides, flavanoids, phenolic compounds	FCA
37.	*Tinospora cordifolia*	Menispermaceae	Leaves Ethanol	Alkaloids, glycosides, steroids, polysaccarides	FCA

38.	*Vernonia anthelmintica*	Asteraceae	Seeds Ethanolic	Sterols, sequiterpene lactones, flavones	FCA
39.	*Vitex negundo*	Verbenaceae	Leaves Ethanolic	Carbohydrates, sterols, alkaloids, glycosides, flavanoids, phenolic compounds	FCA
40.	*Wedelia calendulacea*	Asteraceae	Leaves Methanol	Flavanoids, phenolic compounds	CFA

Note: FCA- Freund's Complete Adjuvant induced arthritis, AIA- Adjuvant induced arthritis, CIA- Collagen induced arthritis, FIA- Formalin induced arthritis, AIA- Agar induced arthritis, CFA- Complete Freund's Adjuvant induced arthritis

Conclusion

RA is a very common disorder now-a-days. The present review focuses on the phytochemistry and possible mechanism of 40 herbal drugs.

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