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Review Article

The herbal remedies and their bioactive compounds mechanism for treatment of arthritis: an overview

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ABSTRACT

Arthritis problems most common found in older person due to inflammation and autoimmune disease. The symptoms of this disease are swelling, stiffness and pain. Many synthetic drugs are available for the treatment of arthritis, but after long-term use of the drug, some side effects. These drugs are the cure for health disorders, therefore peoples of now days, especially those with chronic disease go towards the ayurvedic treatment. In the Ayurvedic treatment, it has been found that many herbal drugs can cure this disease and reduce the inflammation and reduce the pain. In this article, we covered all the factors and discussed the potential herbs that have the ability to cure these health disorders.

Keywords: Anti-Arthritic, Inflammatory, Rheumatoid Arthritis, Herbal Remedies.

INTRODUCTION

Rheumatoid arthritis is also known as one of the chronic inflammatory problems of joints and the 'King of Human Miseries. It is a type of autoimmune chronic inflammatory disease. The symptoms of this disease are swelling, stiffness, pain in joints; reduce the quantity of synovial joint fluid, destruction of bones and auto-antibodies [1-4]. It has been found that about 1% of the person of the world suffering this problem. Some researchers have reported that these joint problems are mostly seen in people who are becoming old, overweight, have irregular eating habits, hormonal disorders, alcoholic and irregular lifestyle [5].

Many synthetic drugs are available for the treatment of arthritis, but long-term use of these drugs produces some side effects. These drugs are the cure for health disorders, therefore peoples of now days, especially those with chronic disease go towards the ayurvedic treatment. In the ayurvedic treatment, it has been found that many herbal drugs can cure this disease and reduce the inflammation of and reduce the pain. In this article, we covered all the factors and discussed the potential herbs that have the ability to cure these health disorders. Some names of herbal plants are traditionally used for the treatment and management of Rheumatoid arthritis, as discussed in below in tabulated form [6, 7].

Anti-arthritis activity mechanism of plants and their bioactive compounds

The anti-inflammatory mechanism of Brassica oleracea L. seeds

Rheumatoid arthritis is a progressive autoimmune disorder that worsens over time. The present study demonstrated that Brassica oleracea L. seed extract contains twelve phenolic compounds with significant anti-arthritic potential. Both the extract and IL-1RA showed protective effects by reducing inflammation, oxidative stress, and joint damage. These findings highlight the extract as a potential nutraceutical and suggest IL-1RA as a novel therapeutic option for RA, warranting further clinical investigation.

Table 1: List of anti-arthritic plants

Botanical Name	Family	Parts Used	Solvents Used
Abrus precatorius	Leguminosae	Seed	Ethanol
Acalypha alopecuroides (jacq.),	Euphorbiaceae	Aerial parts	Chloroform, methanol and water
Ajuga bracteosa	Labiateae	Whole plant	Ethanol
Ammania baccifera linn	Lythraceae	Whole plant	Ethanol and water
Anisomeles malabarica	Lamiaceae Labiatae	Leaves	Methanol
Aristrolochia bracteata	Aristrolochiaceae	Whole plant	Methanol
Asystatica dalzelliana	Acanthaceae	Leaves	Methanol
Bacopa monniera	Scrophulariaceae	Fresh whole plant	Methanol
Barringtonia racemosa	Lecythidaceae	Fruits	Methanol
Borassus flabellifer	Areaceae	Male flowers	Ethanol
Boswelia serrata	Burseraceae	Gum resin	N-hexane
Capparis erythrocarpos	Capparaceae	Roots	Ethanol
Capparis spinosa	Capparaceae	Fruits	Ethanol water
Cassia uniflora	Cesalpinaceae	Leaves	Methanol, petroleum ether, ethyl acetate
Centenella asiatica	Apiaceae	Fresh whole plant	Methanol
Chlorophytum borivilianum	Liliaceae	Roots	Alcohol, water
Cissampelos pareira	Menispermaceae	Roots	Aqueous ethanol
Cleodendron inerme	Verbenaceae	Leaves	Petroleum ether, ethanol
Cleome rutido rutidosperma	Capparidaceae	Whole plant	Ethanol (90%)
Cocculus hirsutus	Menispermaceae	Leaves	Ethanol
Coldenia procumbens	Boraginaceae	Leaves	Methanol
Cyperus esculantus	Cyperaceae	Essential oil	Ethyl acetate
Cyperus rotundus	Cyperaceae	Essential oil	Ethyl acetate
Delonix elata	Caesalpiniaceae	Barks	Pet.Ether, chloroform and hydroalcohol
Euphorbia antiquorum	Euphorbiaceae	Whole plant	Water and ethanol
Euphorbia tirucalli	Euphorbiaceae	Stem, bark, leaves	Methanol
Glycerriza glabra	Leguminosae	Rhizome	Methanol
Gymnema sylvestre	Asclepiadaceae	Leaves	Petroleum ether, ethyl acetate and alcohol, chloroform water
Hybanthus enneaspermus	Violaceae	Plant	Ethanol
Jatropha gossypifolia	Euphorbiaceae	Leaves	Ethanol
Justicia gendarussa burm	Acanthaceae	Leaves	Ethanol
Lawsonia inermis	Lythraceae	Leaves	Aqueous ethanol
Manilkara zapota	Sapotaceae	Leaves	Ethanol
Merremia tridentate	Convolvulaceae	Root and aerial parts	Ethanol
Naravalia zeylanica	Ranunculaceae	Aerial parts	Petroleum ether, chloroform and ethanol
Newbouldia laevis	Bignoniaceae	Bark	Ethanol
Portulaca oleracea	Portulacaceae	Leaves	Petroleum-ether
Premna serratiflora	Verbenaceae	Wood (without bark)	Ethanol
Rubia cordifolia	Rubiaceae	Roots	Ethanol
Sesbania grandiflora	Leguminosae	Dried bark	Chloroform, petroleum ether, methanol
Sesbania sesban	Leguminosae	Dried bark	Chloroform, methanol, petroleum ether
Strobilanthus callosus nees	Acanthaceae	Stem	Pet ether, chloroform and Methanol
Strobilanthus ixiocephala benth	Acanthaceae	Stem	Chloroform and Methanol
Strychnous potatorum	Loganiaceae	Whole seeds	Water
Tinospora cordiflora	Menispermaceae	Dry bark	Water
Urginea indica	Lilliaceae	Whole plant	Ethanol
Urtica pilulifera	Urticeacae	Leaves	Methanol
Vernonia anthelmintica	Asteraceae	Seeds	Ethanol, acetonitrile
Vitex negundo	Verbenaceae	Leaves	Ethanol
Wedelia calendulacea	Asteraceae	Fresh leaves	Methanol

Sargentodoxa cuneata

Sargentodoxa cuneata, a traditional Chinese medicinal plant, exhibits diverse pharmacological properties including anti-inflammatory, antioxidant, antimicrobial, antitumor, and anti-sepsis activities. It has been found that 110 bioactive compounds are reported; these compounds have potential anti-arthritis activity, but still need to undergo more clinical research for confirmation and check the compounds for therapeutic efficacy and safety after the confirmation. These compounds give an idea for the development of novel drug concepts.

Daphnetin

It coumarin derivative having potential anti-arthritis activity, but we need to do more scientific research work for confirmation and check the compounds for therapeutic efficacy and safety. After the confirmation, these compounds give an idea for the development of a novel drug concept.

p-Coumaric acid and its derivatives

It is another coumarin derivative, have been found to possess multiple actions and is found to be effective in the treatment and management of arthritis. Some other therapeutic activities of this compound are antibacterial, anti-inflammatory, anticancer, antioxidant, and metabolic disease-modifying properties.

Achyranthes

It is a very common plant and found throughout the year in the tropical and subtropical regions of India. It is traditionally used for the treatment of wounds, childbirth, skin infections, arthritis and dental diseases, etc. These activities behind of this plant are the presence of many

bioactive compounds are Ketosteroids, polysaccharides, polypeptides, and saponins.

Madecassoside

It is famous for the treatment of memory enhancement, but this plant is also traditionally used in arthritis treatment. It enhances the immune action and anti-inflammatory activity. Therefore, this plant is effective in the treatment of arthritis. Some other names of anti-arthritis plants and their applications is discussed in Table 2.

Modern research and future prospects

In modern days, research has become more advanced and is taking research work with the help of advanced artificial technologies. These technologies provide scientific results and correlate disease causes, validate the problems and resolve the diseases by the exact causes. Many critical diseases like arthritis, asthma, skin diseases, diabetes, and hypertension are resolving the problems by the help of personalised medicine therapy. The arthritis one of the more problematic health disorders, where taking the herbal medicines by the peoples and manages these problems, but the exact mechanism and bioactive compounds need to be found out in future.

Table 2: Names of anti-arthritis plants, bioactive compounds and their applications

Name of plants	Bioactive compounds	Applications
Angelica biserrata	Coumarins, volatile oils	Neuroprotective, anti-inflammatory, anti-arthritic
Boldine Peumus boldus	Aporphine alkaloid	Antioxidant, hepatoprotective, anti-inflammatory, neuroprotective, anticancer, nootropic
Morin hydrate Moraceae family	Flavonoid	Antioxidant, anti-inflammatory, anticancer, antimicrobial, antidiabetic, organ-protective
Dehydrozingerone (DHZ)	Phenolic ketone	Anti-arthritic, antioxidant, anti-inflammatory
Euphorbia Factor L2 (EFL2) Euphorbia seeds	Diterpenoid	Anti-inflammatory, anti-arthritic
Costus afer leaves (CAHLF)	Hexane fraction phytoconstituents	Anti-arthritic, immunomodulatory, hypolipidemic

CONCLUSION

Arthritis is related to joint disorders; it is found all over the world, especially in old age, heavy weighted alcoholic and persons with irregular lifestyles. Therefore, need to maintain our weight, regular diet, maintain our life style do some physical activity. Some herbs are traditionally used to manage these health issues, but more research is needed to present scientific data behind the role of plants. So that novel drug able comes in market at a lower price in future.

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