

**INTERNATIONAL JOURNAL OF UNIVERSAL
PHARMACY AND BIO SCIENCES**

IMPACT FACTOR 4.018***

ICV 6.16***

Pharmaceutical Sciences

Review Article.....!!!

ANTI-ARTHRITIC ACTIVITY WITH MEDICINAL PLANTS**Dr.S.Senthilkumar****Karur, Tamilnadu, India.****KEYWORDS:**

Arthritic activity, Medicinal plants, Traditional uses, Rheumatoid arthritis, Membrane stabilization.

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ABSTRACT

Rheumatoid arthritis (RA) is a disorder characterized by acute and chronic systemic inflammation that primarily involves the joints, but may also affect many tissues and organs, including blood vessels, heart, skin, lungs and muscles. RA initially presents with fatigue, musculoskeletal pain, and stiffness and only after week to months does it progress to involve joints. Generally the small joints are affected first, particularly the small bones of the hands. Later joints are affected, becoming swollen, warm, and painful. The use of medicinal plants play an important role in the development of potent therapeutic agents. The medicinal plants along with their chemical constituents and pharmacological profile which focus on the dose administered, bio active extract involved in anti-arthritis mechanism.

INTRODUCTION:

The plant provide foodstuff, attire, shelter and medicine. Most of the gerbil benefits seem to have been developed through observation of wild animals and by trial and error methods. As time goes on, people started to find and to utilize more herbs having medicinal power. They systematically brought together information on herbs and developed to well-defined herbal pharmacopoeias i.e. traditional medicinal system. Traditional use of medicine is identified as a way to learn about potential future medicines. Because of wide biological and medicinal values, high safety margins and lesser cost of herbal medicine, it has great demand and used as source of basic health care in both developed and developing countries WHO notes that around 200 pharmaceutical medicines are derived from the plant, in modern medicinal system around 74% of which are used in ways that can directly correlated to their ancient medicinal uses. Arthritis is one of the most common chronic inflammatory disorders, foremost cause of disability in world wide. There are more than 100 different types of arthritis and related conditions. Out of which rheumatoid arthritis and osteoarthritis are the major ones. Most of the diseases of joints affect synovial joints. Symptoms of one type arthritis are unlike other type. Some people may show mild but some are with strong symptoms. Some of the common symptoms are: Pain, Edema of Joints, Rigidity, Tenderness, Redness, Warmth, Loss of Flexibility, Limping, Bone Spurs, Discomfort when Standing or Walking, Fatigue (feeling tired).

Arthritis is an auto immune disorder characterized by pain, swelling and stiffness. Its prevalence depends upon age. It is an inflammation of synovial joint due to immunomediated response. Rheumatoid arthritis has 19th century roots and a 20th century pedigree. Although its name was introduced in the 1850s. rheumatoid arthritis is characterized by persistent synovitis, systemic inflammation and autoantibodies (particularly to rheumatoid factor and citrullinated peptide.)

Conventional treatments for RA, including Non-steroidal anti-inflammatory Drugs (NSAID's), disease modifying anti-rheumatoid drugs (DMARD's) and corticosteroids aim to reduce the patients pain and joint inflammation, minimize loss of function and decrease the progression of joint damage. However, such treatment are rarely totally effective and some pharmacological therapies have the potential to cause side effects. All anti inflammatory drugs are not anti-arthritis because it does not suppress T-cell and B-cell mediated response. Rheumatoid arthritis is associated with poor nutritional status in relation to various nutrients due to not only because of increased requirements and reduction in their absorption but also due to NSAID's, DMARD's and corticosteroids prescribed to alleviate symptoms of this disease.

EPIDEMIOLOGY:

RA affects about 1% of the world's population¹. No population is immune but a women are affected two to three times as often as men. The peak age of onset is between 30 and 55. Annually, the incidence of RA is 30 per 100,000 people. Due to the fact that women are affected more than men, the prevalence of RA in women over the age of 65 is around 5%⁵. Risk factors for the development of RA include smoking, obesity, concurrent infections, advancing age, female gender, and genetic inheritance, while oral contraceptives and some dietary constituents may be protective.

CAUSATIVE FACTORS:

RA is a common disorder that has plagued for centuries. Many possible causative agents have been identified, yet the etiology of disease is still unknown. Women are affected by RA predominately more often than men and a possible reason includes the effects of estrogen on the immune system via a T-suppressor cell pathway.

It is believed that a genetic component to RA may exist. Supporting evidence includes an increased in individuals carrying an epitope in the third hypervariable region of the HLA-DRB chains. Although there is still uncertainty in the etiology of RA,HLA genotyping may help predict relative risk, disease severity, and response to therapy.

Serum rheumatoid factor, an immunoglobulin with anti-IgG Fc specificity, is another genetic component that can be found in patients with RA. Rheumatoid factor is highly characteristic of RA, but is not specific, so clinicians do not rely solely on this finding for diagnosis. Twin studies have also shown that there is a hereditary component involved with RA as monozygotic twins have a higher incidence of RA than dizygotic twins. The relationship has held true for first degree relatives: they have a 1.5 increased risk of developing RA than individuals in the general population. Another significant correlation is the link between RA and other diseases believed to have an autoimmune pathogenesis. There is overlap between alleles of RA, lupus erythematosus, inflammatory bowel diseases, multiple sclerosis, and ankylosing spondylitis.

Environmental factors, such as smoking, have also been implicated in causation. Some studies have suggested that cigarette smoking enhances the development of RA. Cigarette smoking is also associated with more severe disease, where smokers with at least a 25 or more packyear history are more likely to be seropositive, have nodules, or have more radiographically apparent erosions.

Infection is yet another environmental factor and may offer further explanation as to the possible etiology of RA. One of the prime suspects for a microbial trigger to RA is the Epstein bar virus

(EBV). In 1975 an antibody in the sera of RA patients was shown to react with an Epstein barr nuclear antigen. Since that further findings have linked RA and EBV, one of which is that EBV is a polyclonal activator of B lymphocytes, including those that express rheumatoid factor. Other agents that have been suggested in the development of RA include mycoplasma. *Proteus mirabilis*, parvovirus, and retrovirus. Further studies may elucidate the exact role these microorganisms play in the etiology of RA.

PATHOGENESIS:

Although much about the etiology of RA seems uncertain, it is believed that RA is initiated by an arthritogenic microbial antigen acting on an immunogenetically susceptible host. The origin of the arthritogenic antigen is currently unknown, yet it is still able to cause disease by activating an immune response. Once the host is attacked, the first event to occur is the activation of CD4+ helper T-cells which then release local inflammatory mediators and cytokines. Soon thereafter, endothelial cells of synovial capillaries are triggered, with the expression of intercellular adhesion molecule-1 (ICAM-1). This in turn leads to the migration and attachment of other inflammatory cells to the affected joint. While CD4+ cells are being activated, B cells are also triggered, which results in antibody production in the affected joints. In 80% of patients with RA, autoantibodies to the Fc portion of autologous IgG, also known as rheumatoid factors are formed. However, these factors are not diagnostic for RA because they may not be identified in some patients but found in other disease states. The circulating immune complexes are mostly localized within the inflamed cartilage activating complement and enhance the synovial inflammatory reaction. The synovium in RA organizes into invasive tissue, that if left untreated, can degrade cartilage and bone and eventually lead to the destruction of the joint.

CLINICAL MANIFESTATIONS:

The clinical picture of RA varies with a majority of patients presenting initially with a slow and insidious disease. The symptoms that predominate during this preliminary phase are musculoskeletal pain, stiffness, and swelling of many joints. Sites of early arthritis are typically localized in the metacarpophalangeal and proximal interphalangeal joints of the fingers, interphalangeal joints of the thumbs, the wrists, and metacarpophalangeal joints of the toes. Other joints that also may be affected initially include joints of the upper and lower limb, such as the elbows, shoulders, ankles, and knees. Uncommonly the upper spine may be involved, but the lumbosacral region and hips are usually spared. As noted above, morning stiffness is typical. In about 10% of individuals with RA the onset of disease is acute and presents with severe

symptoms and polyarticular involvement developing within a few days. But the typical clinical picture presents with progressive joint involvement over a period of months to years, with initial minimal limitation of motion that in time becomes more severe. The course of RA may be fast or slow and fluctuates over a period of years, with the majority of the damage incurring in the first 4 or 5 years following disease onset. One-fifth of patients have periods when their symptoms partially or completely resolve!

Radiographic hallmarks of RA are joint effusions and juxta-articular osteopenia with erosions and narrowing of the joint space with the loss of articular cartilage. With continued destruction of ligaments, tendons, and joint capsules, characteristic deformities are produced on imaging which include, radial deviation of the wrist, ulnar deviation of the fingers, and flexion-hyperextension abnormalities of the fingers. However, with time, extensive destruction occurs and the severity of erosions may reach a level beyond which further progression of the RA cannot be assessed radiographically.

DIAGNOSIS:

Laboratory tests to diagnose RA definitively do not exist, but genetic tests are available to test for susceptibility. These factors do not guarantee that patients will develop the disease, but the chances for the possibility of occurrence are much greater than in the general population. The majority of individuals who have RA are positive for both HLA-DR beta and rheumatoid factor. These genetic factors are clearly major determinants for RA, however clinicians cannot rely solely on these factors for diagnosis. Synovial fluid in the inflamed joint can also be analyzed for leukocytosis of neutrophils or lymphocytes, low glucose and complement levels, and protein levels approaching those in plasma. This test is nonspecific for RA, yet it may be used as a means to confirm the presence of inflammatory arthritis. Clinical features aid in the confirmatory diagnosis.

CURRENT AND NEW THERAPIES:

Appropriate treatment early in the course of RA is essential to maintain joint function. The longer active disease persists, the less likely the patient is to respond to therapy. Evidence has shown that early treatment can control synovitis and may slow, or even stop, radiographic progression of disease. The goals of treatment include controlling signs and symptoms of RA, restoring physical function to joints, and preventing joint damage. If joint damage already exists then the goals are to ameliorate or halt progressive disease. However, despite all the current therapies available it may not be possible to achieve complete remission

PHARMACOLOGIC THERAPY:

Drug therapy is a mainstay in treatment options. The goals of pharmacologic therapy are to induce remission and prevent further loss of joint tissues or function in daily activities. Physicians can manage their patients by manipulating the order in which they administer drugs, adjusting dosages, and offering different combinations. There are five main drug classes that are currently used for treatment and they include analgesics, nonsteroidal anti-inflammatory drugs (NSAIDs), glucocorticoids, disease-modifying antirheumatic drugs (DMARDs), and anticytokine therapies.

Analgesics provide pain relief from mild to moderate arthritis. Included in this class are acetaminophen, tramadol, capsaicin, and narcotics. Due to the fact these drugs do not exhibit any anti-inflammatory properties, they are usually combined with NSAIDs, glucocorticoids, DMARDs, and anticytokine therapies.

Nonsteroidal anti-inflammatory drugs have both analgesic and anti-inflammatory properties but do not change disease outcomes. The drugs in this class include ibuprofen, aspirin, naproxen, and indomethacin. They inhibit COX-1 and COX-2, which block prostaglandin synthesis. NSAIDs are useful for treating the symptoms of RA, but are unable to prevent the development of progressive disease. Although NSAIDs are essential to the treatment of RA, they can cause severe GI distress and ulcers. On the other hand, selective COX-2 inhibitors are also just as useful in the treatment of RA, but have a lower severity of these adverse GI side effects. These drugs include celecoxib and valdecoxib and are similar to the NSAIDs except that they do not have the same corrosive effects on the GI lining. However, when administering these drugs, the patients' medical history must be assessed to ascertain that cardiovascular disease is not significant. COX-2 inhibitors are associated with reduced PG12 production by vascular endothelium with little or no inhibition of potentially thrombotic platelet thromboxane A₂ production. This, in turn, predisposes to endothelial injury, which can increase ischemic cardiovascular events. Since there is still uncertainty about the safety of COX-2 inhibitors, administration of these drugs should be decided on a case by case basis.

The most commonly used glucocorticoids are prednisone or prednisolone. Glucocorticoids may be administered orally, intravenously, or by intraarticular injection. The actions of these drugs on joint pain are much greater than NSAIDs and analgesics but they come with many side effects including adrenal suppression, ulcers, and osteoporosis. When deciding on whether or not to initiate therapy with glucocorticoids, other medical conditions which may possibly increase the risk of glucocorticoid drug toxicity should be assessed. These conditions include established

hypertension or diabetes, preexisting cataracts or glaucoma, and significant risk factors for osteoporosis. Furthermore, the physician should explain potential side effects, the importance of limiting the duration and dosage of glucocorticoids, directed use, the difficulty in ceasing use of steroids, as well as the danger of long-term use and abrupt cessation. All patients receiving long-term glucocorticoid therapy should wear a medical alert bracelet. Finally, all patients should be counseled on smoking cessation and/or cholesterol reduction in order to curtail cardiovascular risk factors.

DMARDs are disease-modifying antirheumatic drugs that encompass a large group of drugs that reduce the progression of joint erosion. These drugs have slow onsets and no analgesic activity. DMARDs include gold compounds, penicillanmine, hydroxychloroquine, cyclophosphamide, and methotrexate. The actions of these drugs are probably related to reduction of phagocytosis and immune responses.

The last class of drugs available to treat RA is anticytokine therapies. The action of these drugs is still unknown, but it is thought that they act by decreasing the inflammatory response in affected joints. Examples of these drugs include anti-tumor necrosis factor alpha agents, etanercept, infliximab, and adalimumab and the interleukin-1 receptor antagonist, anakinra. There are, however, case reports stating that the anti-TNF-alpha agents may induce leukocytoclastic vasculitis and even neurologic manifestations, with resolution after the drugs are removed. These drugs are newer treatments and in the future additional biological therapies will probably become available.

All of these drug therapies are useful in the treatment of RA and when administered in combination have a greater ability for relief. When choosing a treatment regimen for a patient one should take into consideration the severity of the disease, possible adverse effects of treatment, convenience to the patient, and patient preferences.

TABLE-1. TRADITIONALLY USED ANTI-ARTHRITIC PLANTS

S.NO	BOTANICAL NAME	FAMILY
1.	<i>Abrus precatorius</i> Linn	<i>Papilionaceae</i>
2.	<i>Acica catechu</i> willd	<i>Fabaceae</i>
3.	<i>Acalypha indica</i> Linn	<i>Euphorbiaceae</i>
4.	<i>Acanthus illicifolius</i> Linn	<i>Acanthaceae</i>
5.	<i>Achillea millefolium</i> Linn	<i>Compositae</i>
6.	<i>Achyranthus aspera</i> Linn	<i>Amaranthaceae</i>
7.	<i>Acampe wightiana</i> Lindl	<i>Orchidaceae</i>
8.	<i>Aconitum ferox</i> Wall	<i>Ranunculaceae</i>

9.	<i>Aconitum napellus</i> Linn	<i>Ranunculaceae</i>
10.	<i>Aconitum palmatum</i> Don	<i>Ranunculaceae</i>
11.	<i>Acorus calamus</i> Linn	<i>Aroideae</i>
12.	<i>Actaea racemosa</i> Linn	<i>Ranunculaceae</i>
13.	<i>Actaea apicaria</i> Linn	<i>Ranunculaceae</i>
14.	<i>Adansonia digitata</i> Linn	<i>Malvaceae</i>
15.	<i>Adenthera pavonina</i> Linn	<i>Leguminosae</i>
16.	<i>Adaroda vasika</i> Nees	<i>Acanthaceae</i>
17.	<i>Aegel marmolosa</i> Corr	<i>Ruraceae</i>
18.	<i>Aesculus indica</i> Colebr	<i>Sapindaceae</i>
19.	<i>Agave ameridcana</i> Linn	<i>Amaryllidaceae</i>
20.	<i>Aghati gtandiflora</i> Desv	<i>Leguminosae</i>
21.	<i>Agropyron repens</i> Beauv	<i>Graminae</i>
22.	<i>Ailanthus excels</i> Roxb	<i>Simaroubaceae</i>
23.	<i>Alangium lamarckii</i> thwaites	<i>Cornaceae</i>
24.	<i>Allium cepa</i> Linn	<i>Liliaceae</i>
25.	<i>Allium sativum</i> Linn	<i>Liliaceae</i>
26.	<i>Alocasia indica</i> Schott	<i>Aroideae</i>
27.	<i>Alpinia galangal</i> Willd	<i>Scitaminaceae</i>
28.	<i>Alstonia scholaris</i> R.Br	<i>Apocynaceae</i>
29.	<i>Althaea rosea</i> Cav	<i>Malvaceae</i>
30.	<i>Ammannia baccifera</i> Linn	<i>Lythraceae</i>
31.	<i>Amorphophallus campanulatus</i> Roxb	<i>Aracea</i>
32.	<i>Anacylus pyrethrum</i> DC	<i>Compositae</i>
33.	<i>Andropogon citrates</i> DC	<i>Gramineae</i>
34.	<i>Androphogon iwarancusa</i> Roxb	<i>Gramineae</i>
35.	<i>Andropogon martini</i> DC	<i>Gramineae</i>
36.	<i>Andropogon nardus</i> Linn	<i>Gramineae</i>
37.	<i>Anemone obtusiloba</i> Don	<i>Ranunculaceae</i>
38.	<i>Anisomeles malabarica</i> Linn	<i>Labiatae</i>
39.	<i>Aphanamixis polystachya</i> Blatter	<i>Meliaceae</i>
40.	<i>Apium graveolens</i> Linn	<i>Umbellifeae</i>
41.	<i>Aquilaria agallocha</i> Roxb	<i>Thymelaeaceae</i>
42.	<i>Arctium lappa</i> Linn	<i>Compositae</i>
43.	<i>Argyreia speciosa</i> Sweet	<i>Convulvulaceae</i>
44.	<i>Aristolichia bracteata</i> Linn	<i>Aristolochiaceae</i>
45.	<i>Aristolichia serpentaria</i> Linn	<i>Aristolochiaceae</i>
46.	<i>Artanema sesamoides</i> Benth	<i>Scrophulainaeae</i>
47.	<i>Artemisa absinthium</i> Linn	<i>Compositae</i>

48.	<i>Asparagus filicinus</i> Ham	<i>Liliaceae</i>
49.	<i>Asparagus officinalis</i> Linn	<i>Liliaceae</i>
50.	<i>Asparagus racemosus</i> Willd	<i>Liliaceae</i>
51.	<i>Asystasia coromandeliana</i> Nees	<i>Acanthaceae</i>
52.	<i>Asystasia gangertca</i> T. Anders	<i>Acanthaceae</i>
53.	<i>Atalantia monophylla</i> DC	<i>Rutaceae</i>
54.	<i>Atropa belladonna</i> Linn	<i>Solanaceae</i>
55.	<i>Atyosia barbata</i> Baker	<i>Leguminosae</i>
56.	<i>Azadirachta indica</i> A. Juss	<i>Meliaceae</i>
57.	<i>Azima tetracentha</i> Lam	<i>Salvadoraceae</i>
58.	<i>Bacopa monnieri</i> Penell	<i>Plantaginaceae</i>
59.	<i>Balsamodendron mukul</i> Hook	<i>Burseraceae</i>
60.	<i>Balsamodendron playfairii</i> Hook	<i>Burseraceae</i>
61.	<i>Barleria courtallica</i> Nees	<i>Acanthaceae</i>
62.	<i>Barleria cristata</i> Linn	<i>Acanthaceae</i>
63.	<i>Baliospermum montanum</i> Muell	<i>Euphorbiaceae</i>
64.	<i>Bassia butyracea</i> Roxb	<i>Sapotaceae</i>
65.	<i>Bassia latifolia</i> Roxb	<i>Sapotaceae</i>
66.	<i>Bassia longifolia</i> Linn	<i>Sapotaceae</i>
67.	<i>Bassia malabarica</i> Bedd	<i>Sapotaceae</i>
68.	<i>Barosma crenulata</i> Hook	<i>Rutaceae</i>
69.	<i>Bauhinia tomentosa</i> Linn	<i>Fabaceae</i>
70.	<i>Bauhinia tomentosa</i> Linn	<i>Fabaceae</i>
71.	<i>Berberis asiatica</i> Roxb	<i>Berberidaceae</i>
72.	<i>Berberis petiolaris</i> Wall	<i>Berberidaceae</i>
73.	<i>Berberis vulgaris</i> Linn	<i>Berberidaceae</i>
74.	<i>Bidens pilosa</i> Linn	<i>Compositae</i>
75.	<i>Blumea balsamifera</i> DC	<i>Compositae</i>
76.	<i>Blumea ripens</i> DC	<i>Asteraceae</i>
77.	<i>Bula alba</i> Linn	<i>Cupliferae</i>
78.	<i>Boerhaavia diffusa</i> Linn	<i>Nyctagineae</i>
79.	<i>Boucerosia aucheriana</i> Dcne	<i>Asclepiadaceae</i>
80.	<i>Borassus flabellifer</i> Linn	<i>Arecaceae</i>
81.	<i>Boswellia glabra</i> Roxb	<i>Burseraceae</i>
82.	<i>Boswellia serrata</i> Triana	<i>Burseraceae</i>
83.	<i>Brassica campestris</i> Linn	<i>Cruciferae</i>
84.	<i>Brassica integrifolia</i> West	<i>Cruciferae</i>
85.	<i>Brassica juncea</i> Coss	<i>Cruciferae</i>
86.	<i>Brassica nepus</i> Linn	<i>Cruciferae</i>

87.	<i>Brassica nigra</i> Linn & Koch	Cruciferae
88.	<i>Brassica oleracea</i> Linn	Cruciferae
89.	<i>Bridelia retusa</i> Spreng	Euphorbiaceae
90.	<i>Bryonia epigoea</i> Rottl	Cucurbitaceae
91.	<i>Buxus sempervirens</i> Linn	Euphorbiaceae
92.	<i>Caccinia glauca</i> Savi	Boragineae
93.	<i>Cadaba indica</i> Lamk	Capparidaceae
94.	<i>Caesalpinia bonduc</i> Roxb	Caesalpinaceae
95.	<i>Callicarpa macrophylla</i> Vahl	Verbenaceae
96.	<i>Calophyllum apeltatum</i> Wild	Guttiferae
97.	<i>Calophyllum inophyllum</i> Linn	Guttiferae
98.	<i>Calotropis gigantea</i> R. Br	Asclepiadaceae
99.	<i>Calotropis procera</i> R. Br	Asclepiadaceae
100.	<i>Camphora officinarum</i> Bauh	Lauraceae
101.	<i>Canarium odoratum</i> Baill	Annonaceae
102.	<i>Canarium bengalense</i> Roxb	Burseraceae
103.	<i>Canarium commune</i> Linn	Burseraceae
104.	<i>Canarium strictum</i> Roxb	Burseraceae
105.	<i>Cannabis sativa</i> Linn	Urticaceae
106.	<i>Canella alba</i> Murry	Canellaceae
107.	<i>Capparis aphylla</i> Roth	Capparideae
108.	<i>Capparis deciduas</i> Edgew	Capparideae
109.	<i>Capparis heyneana</i> Wall	Capparideae
110.	<i>Capparis spinosa</i> Linn	Capparideae
111.	<i>Capsicum annum</i> Linn	Solanaceae
112.	<i>Cardiospermum halicacabum</i> Linn	Sapindaceae
113.	<i>Carissa carandas</i> Linn	Apocynaceae
114.	<i>Carissa spinarum</i> Linn	Apocynaceae
115.	<i>Carthamus tinctorius</i> Linn	Compositae
116.	<i>Cassia fistula</i> Linn	Caesalpiniceae
117.	<i>Cassia sophera</i> Linn	Caesalpiniceae
118.	<i>Cassia tora</i> Linn	Fabaceae
119.	<i>Cadrea toona</i> Roxb	Meliaceae
120.	<i>Cedrus deodaara</i> Lou Don	Coniderae
121.	<i>Cedrus libani</i> Barrel	Coniderae
122.	<i>Celastrus paniculata</i> Willd	Calastraceae
123.	<i>Celosia argentia</i> Linn	Amaranthaceae
124.	<i>Centella asiatica</i> Urban	Mackinlayaceae
125.	<i>Cephaelis ipecacuanha</i> A. Rich	Rubiaceae

126.	<i>Chenopodium album</i> Linn	<i>Chenopodiaceae</i>
127.	<i>Chloroxylon swietenia</i> DC	<i>Meliaceae</i>
128.	<i>Cicuta virosa</i> Linn	<i>Apiaceae</i>
129.	<i>Cimicifuga racemosa</i> Ellicot	<i>Ranunculaceae</i>
130.	<i>Cinchona calisaya</i> Hook	<i>Rubiaceae</i>
131.	<i>Cinnamomum camphora</i> Nees	<i>Lauraceae</i>
132.	<i>Cinnamomum cassia</i> Blume	<i>Lauraceae</i>
133.	<i>Cinnamomum tamala</i> Fr. Nees	<i>Lauraceae</i>
134.	<i>Cinnamomum macrocarpum</i> Hook	<i>Lauraceae</i>
135.	<i>Cinnamomum parhenoxylon</i> DC	<i>Lauraceae</i>
136.	<i>Cissus quadrangularis</i> Linn	<i>Vitaceae</i>
137.	<i>Cistus creticus</i> Linn	<i>Cistaceae</i>
138.	<i>Citrullus colocynthis</i> Schrad	<i>Cucurbitaceae</i>
139.	<i>Citrus aurantium</i> Linn	<i>Rutaceae</i>
140.	<i>Citrus bergamia</i> Ris	<i>Rutaceae</i>
141.	<i>Citrus limonum</i> Sp. Risso	<i>Rutaceae</i>
142.	<i>Cleome brachycarpa</i> Linn	<i>Capparidaceae</i>
143.	<i>Cleome gynandra</i> Linn	<i>Capparaceae</i>
144.	<i>Cleome rutidosperma</i> DC	<i>Cleomaceae</i>
145.	<i>Clerodendron colebrookianum</i> Walp	<i>Lamiaceae</i>
146.	<i>Clerodendron inerme</i> Gaertn	<i>Verbenaceae</i>
147.	<i>Clerodendron phlomides</i> L.F	<i>Verbenaceae</i>
148.	<i>Clerodendron serratum</i> Spreng	<i>Verbenaceae</i>
149.	<i>Clerodendron siphonanthus</i> R.Br	<i>Verbenaceae</i>
150.	<i>Clitoria ternatea</i> Linn	<i>Verbenaceae</i>
151.	<i>Cocculus cordifolius</i> Miers	<i>Menispermaceae</i>
152.	<i>Cocculus hirsutus</i> Diels	<i>Menispermaceae</i>
153.	<i>Cocculus villousus</i> DC	<i>Menispermaceae</i>
154.	<i>Cochlearia armoracia</i> Linn	<i>Cruciferae</i>
155.	<i>Colchicum autumnale</i> Linn	<i>Melanthaceae</i>
156.	<i>Colchicum luteum</i> Basker	<i>Liliaceae</i>
157.	<i>Coldenia procumbens</i> Linn	<i>Boragineae</i>
158.	<i>Coptis teeta</i> Wall	<i>Ranunculaceae</i>
159.	<i>Corallocarpus epigeous</i> Rottl & Willd	<i>Cucurbitaceae</i>
160.	<i>Coriandrum sativum</i> Linn	<i>Umbelliferae</i>
161.	<i>Costus speciosus</i> Sm	<i>Scitaminaceae</i>
162.	<i>Cotula anthemoides</i> Linn	<i>Compositae</i>
163.	<i>Crataeva nurvala</i> Linn	<i>Capparidaceae</i>
164.	<i>Crataeva religiosa</i> Hook & Forst	<i>Capparidaceae</i>

165.	<i>Crinum asiaticum</i> Linn	<i>Amaryllidaceae</i>
166.	<i>Crinum latifolium</i> Linn	<i>Amaryllidaceae</i>
167.	<i>Crocus sativus</i> Linn	<i>Irideae</i>
168.	<i>Crotalaria prostrate</i> Rottler	<i>Fabaceae</i>
169.	<i>Croton oblongifolus</i> Rox	<i>Euphorbiaceae</i>
170.	<i>Croton tiglium</i> Linn	<i>Euphorbiaceae</i>
171.	<i>Curcuma longa</i> Linn	<i>Scitaminaceae</i>
172.	<i>Cymbopogon citrates</i> Stapl	<i>Graminae</i>
173.	<i>Cymbopogon jwarancusa</i> Schult	<i>Graminae</i>
174.	<i>Cymbopogon schoenanthus</i> Spreng	<i>Graminae</i>
175.	<i>Cynodon dactylon</i> Pers	<i>Graminae</i>
176.	<i>Daemia extensa</i> R. Br	<i>Asclepiadeae</i>
177.	<i>Dalbergia lanceolaria</i> Linn	<i>Fabaceae</i>
178.	<i>Daphne mezereum</i> Linn	<i>Thymelaceae</i>
179.	<i>Datisca cannabina</i> Linn	<i>Datisceae</i>
180.	<i>Datura alba</i> Nees	<i>Solanaceae</i>
181.	<i>Datura metel</i> Linn	<i>Solanaceae</i>
182.	<i>Datura stramonium</i> Linn	<i>Solanaceae</i>
183.	<i>Delonix elata</i> Gamble	<i>Fabaceae</i>
184.	<i>Delphinium consolida</i> Linn	<i>Ranunculaceae</i>
185.	<i>Delphinium consolida</i> Linn	<i>Ranunculaceae</i>
186.	<i>Delphinium staphisagri</i> Linn	<i>Ranunculaceae</i>
187.	<i>Derris uliginosa</i> Benth	<i>Papilionaceae</i>
188.	<i>Dichrostachys cinera</i> W. & A	<i>Fabaceae</i>
189.	<i>Diospyros candollena</i> Wight	<i>Ebanaceae</i>
190.	<i>Diospyros paniculata</i> Dalz	<i>Ebanaceae</i>
191.	<i>Dipterocarpus alatus</i> Roxb	<i>Dipterocarpaceae</i>
192.	<i>Dipterocarpus indicus</i> Bedd	<i>Dipterocarpaceae</i>
193.	<i>Dononaea viscosa</i> Linn	<i>Sapindaceae</i>
194.	<i>Dolichos falcatus</i> Klein	<i>Papilionaceae</i>
195.	<i>Dysoxylum malabaricum</i> Bedd	<i>Meliaceae</i>
196.	<i>Eclipta prostrate</i> Linn	<i>Asteraceae</i>
197.	<i>Elaeocarpus oblongus</i> Gaertn	<i>Tiliaceae</i>
198.	<i>Elaeocarpus serratus</i> Linn	<i>Tiliaceae</i>
199.	<i>Elaeis guineensis</i> Jacq	<i>Palmae</i>
200.	<i>Elaeocarpus tuberculatus</i> Roxb	<i>Tiliaceae</i>
201.	<i>Elephantopus scaber</i> Linn	<i>Asteraceae</i>
202.	<i>Emblica officinalis</i> Gaertn	<i>Euphorbiaceae</i>
203.	<i>Ephedra gerardiana</i> Wall	<i>Gnetaceae</i>

204.	<i>Ephedra vulgaris</i> Rich	<i>Ephedraceae</i>
205.	<i>Erythrina stricta</i> Roxb	<i>Papilionaceae</i>
206.	<i>Eucalyptus globulus</i> Labill	<i>Myrtaceae</i>
207.	<i>Eugenia operculata</i> Roxb	<i>Myrtaceae</i>
208.	<i>Eupatorium perfoliatum</i> Linn	<i>Asteraceae</i>
209.	<i>Euphorbia antiquorum</i> Linn	<i>Euphorbiaceae</i>
210.	<i>Euphorbia helioscopia</i> Linn	<i>Euphorbiaceae</i>
211.	<i>Euphorbia berifolia</i> Linn	<i>Euphorbiaceae</i>
212.	<i>Euphorbia nukulia</i> Ham	<i>Euphorbiaceae</i>
213.	<i>Euphorbia tirucalli</i> Linn	<i>Euphorbiaceae</i>
214.	<i>Euryale ferox</i> Salisb&Roxb	<i>Fabaceae</i>
215.	<i>Erythrina stricta</i> Roxb	<i>Fabaceae</i>
216.	<i>Excoecaria acerifolia</i> Didrichs	<i>Euphorbiaceae</i>
217.	<i>Fagopyrum eacuentum</i> moench	<i>Polygonaceae</i>
218.	<i>Farsetia aegyptiaca</i> Turr	<i>Cruciferae</i>
219.	<i>Farsetia hamiltonii</i> Royle	<i>Cruciferae</i>
220.	<i>Farseaia jacquemontii</i> Hk.F. & T	<i>Cruciferae</i>
221.	<i>Feaula asafetida</i> Linn	<i>Umbelliferae</i>
222.	<i>Ferula galbanifulua</i> Bioss	<i>Umbelliferae</i>
223.	<i>Ferula narthex</i> Boiss	<i>Umbelliferae</i>
224.	<i>Ficus bengalensis</i> Linn	<i>Urticaceae</i>
225.	<i>Ficus religiosa</i> Linn	<i>Urticaceae</i>
226.	<i>Ficus retusa</i> Linn	<i>Urticaceae</i>
227.	<i>Flacourtia sepiara</i> Roxb	<i>Cyperzceae</i>
228.	<i>Fraxinus exvelsior</i> Linn	<i>Oleaceae</i>
229.	<i>Garcinia pictorial</i> Roxb	<i>Guttiferae</i>
230.	<i>Gaultheria fragrantissima</i> Wall	<i>Eriaceae</i>
231.	<i>Gelsemium nitidum</i> Michaux	<i>Loganiaceae</i>
232.	<i>Gendarussa vulgaris</i> Nees	<i>Acanthaceae</i>
233.	<i>Gentian lutea</i> Linn	<i>Gentianaceae</i>
234.	<i>Geodorum densiflorum</i> Lam	<i>Orchidaceae</i>
235.	<i>Geranium maculatum</i> Linn	<i>Geraniaceae</i>
236.	<i>Gmelina asiatica</i> Linn	<i>Verbenaceae</i>
237.	<i>Gossypium arboretum</i> Linn	<i>Malvaceae</i>
238.	<i>Gossypium barbadense</i> Linn	<i>Malvaceae</i>
239.	<i>Gossypium haceum</i> Linn	<i>Malvaceae</i>
240.	<i>Gosstpium indicam</i> Linn	<i>Malcaceae</i>
241.	<i>Grangia maderaspatana</i> Poir	<i>Compositae</i>
242.	<i>Grewia asiatica</i> Linn	<i>Tiliaceae</i>

243.	<i>Grewia tenax</i> Fiori	<i>Tiliaceae</i>
244.	<i>Guaiacum officinale</i> Linn	<i>Zygophyllaceae</i>
245.	<i>Guizjia abyssynica</i> Cass	<i>Compositae</i>
246.	<i>Gynandropsis gyuandra</i> Marill	<i>Capparidaceae</i>
247.	<i>Gynocardia odorata</i> R.Br	<i>Flacourtiaceae</i>
248.	<i>Hedeoma pulegioides</i> Persoon	<i>Labiatae</i>
249.	<i>Heliotropium indicum</i> Linn	<i>Boraginaceae</i>
250.	<i>Hemidesmus indicus</i> R.Br	<i>Asclepiadaxae</i>
251.	<i>Herpestis monniera</i> H.B.K	<i>Scrophularineae</i>
252.	<i>Hibiscus tillaceus</i> Linn	<i>Malvaceae</i>
253.	<i>Hiptage benghalensis</i> Linn	<i>Malpighiaceae</i>
254.	<i>Hptage madabiota</i> Gaertn	<i>Malpighiaceae</i>
255.	<i>Holarrhena antidysenterica</i> Wall	<i>Apocynaceae</i>
256.	<i>Hedera helix</i> Linn	<i>Araliaceae</i>
257.	<i>Holoptelea integrifolia</i> Planch	<i>Urticaceae</i>
258.	<i>Humulus lupulus</i> Linn	<i>Cannanineae</i>
259.	<i>Hydnocapus wightiana</i> Blume	<i>Flacourtiaceae</i>
260.	<i>Hydrocotyle asiatica</i> Linn	<i>Umbelliferae</i>
262.	<i>Hyssopus officinalis</i> Linn	<i>Labiatae</i>
263.	<i>Illicium verum</i> Hook	<i>Magnoliaceae</i>
264.	<i>Indigofera oblongifolia</i> Forsk	<i>Papilionaceae</i>
265.	<i>Indigofera paucifolia</i> Delile	<i>Papilionaceae</i>
266.	<i>Indigofera trifoliata</i> Linn	<i>Papilionaceae</i>
267.	<i>Inula helenium</i> Hook	<i>Compositae</i>
268.	<i>Ipomoea eriocarpa</i> Br	<i>Convolvulaceae</i>
269.	<i>Ipomoea hispida</i> Roem & Schult	<i>Convolvulaceae</i>
270.	<i>Ipomoea pescaprae</i> Purga	<i>Convolvulaceae</i>
271.	<i>Ipomoea reniformis</i> Choisy	<i>Convolvulaceae</i>
272.	<i>Ipomoea turpethum</i> Br	<i>Convolvulaceae</i>
273.	<i>Jasmiunm grandiflorum</i> Linn	<i>Oleaceae</i>
274.	<i>Jatropha curcas</i> Linn	<i>Euphorbiaceae</i>
275.	<i>Jatropha glandulifera</i> Roxb	<i>Euphorbiaceae</i>
276.	<i>Juglans regia</i> Linn	<i>Juglandaceae</i>
277.	<i>Juniperus communis</i> Linn	<i>Coniferae</i>
278.	<i>Justica ecnolium</i> Linn	<i>Acanthaceae</i>
279.	<i>Justica gendaruusa</i> Burm	<i>Acanthaceae</i>
280.	<i>Justica procumbens</i> Linn	<i>Acanthaceae</i>
281.	<i>Koelpinia linearis</i> Pallas	<i>Asteraceae</i>
282.	<i>Lantana aculeata</i> Linn	<i>Verbenaceae</i>

283.	<i>Launaea pinnatifida</i> Cass	Compositae
284.	<i>Lavandula stoechas</i> Linn	Labiatae
285.	<i>Lawsonia alba</i> Linn	Lythraceae
286.	<i>Leea indicum</i> Merr	Vitaceae
287.	<i>Leonotis nepetaefolia</i> R.Br	Labiatae
288.	<i>Leucas aspera</i> Spreng	Labiatae
289.	<i>Lipidium crassifolium</i> Hung	Cruciferae
290.	<i>Lipidium sativum</i> Linn	Cruciferae
291.	<i>Leucas linifolia</i> Spreng	Labiatae
292.	<i>Lium usitatissimum</i> Linn	Linaceae
293.	<i>Litsea chinensis</i> Lam	Lauraceae
294.	<i>Litsea sebifera</i> Pers	Lauraceae
295.	<i>Lolium temulentum</i> Linn	Graminae
296.	<i>Lycopodium clavatum</i> Linn	Lycopodiaceae
297.	<i>Lygodium flexuosum</i> Linn	Polypodiaceae
298.	<i>Machilis macrantha</i> Ness	Lauraceae
299.	<i>Marrubium vulgare</i> Linn	Labiatae
300.	<i>Matricaria chamomilla</i> Linn	Compositae
301.	<i>Melaleuca leucadendron</i> Linn	Myrtaceae
302.	<i>Melaleuca minor</i> Smith	Myrtaceae
303.	<i>Melia azadirachra</i> Linn	Meliaceae
304.	<i>Melia azedaracha</i> Linn	Meliaceae
305.	<i>Menthe piperita</i> Linn	Labiatae
306.	<i>Menyanthes trifoliata</i> Linn	Gentianaceae
307.	<i>Merremia tridentata</i> Hallier	Convulvulaceae
308.	<i>Mwsua ferrea</i> Linn	Guttiferae
309.	<i>Michella champaca</i> Linn	Magnoliaceae
310.	<i>Mimosa pudica</i> Linn	Fabaceae
311.	<i>Mollugo cerviana</i> Ser	Ficoidaceae
312.	<i>Momordica chirantia</i> Linn	Cucurbitaceae
313.	<i>Momordica cochinchinensis</i> Spreng	Cucurnitaceae
314.	<i>Moniera cuneifolia</i> Michx	Scrophulariaceae
315.	<i>Monarda punctuate</i> Linn	Labiatae
316.	<i>Morinda cirtifolia</i> Linn	Rubiaceae
317.	<i>Mringa oleifera</i> Lam	Moringaceae
318.	<i>Mucuna gigantean</i> DC	Papilionaceae
319.	<i>Mukia maderaspatana</i> Linn	Cucurbitaceae
320.	<i>Murraya exotica</i> Linn	Rutaceae
321.	<i>Murraya koenigii</i> Linn	Rutaceae

322.	<i>Myristica fragrans</i> Houtt	<i>Myristaceae</i>
323.	<i>Myrisica malabarica</i> Lamk	<i>Myristaceae</i>
324.	<i>Myropyrum similacifolium</i> Blume	<i>Oleaceae</i>
325.	<i>Myrtus caryophyllus</i> Linn	<i>Myrtaceae</i>
326.	<i>Myrtus communis</i> Linn	<i>Myrtaceae</i>
327.	<i>Naregamia alata</i> W.&A	<i>Meliaceae</i>
328.	<i>Nicotiana tabacum</i> Linn	<i>Solanaceae</i>
329.	<i>Nychanthis arbor-tristis</i> Linn	<i>Oleaceae</i>
330.	<i>Ocimum gratissimum</i> Linn	<i>Labiatae</i>
331.	<i>Ocimum sanctum</i> Linn	<i>Lam.iaceae</i>
332.	<i>Odina wodier</i> Roxb	<i>Anacardiaceae</i>
333.	<i>Oldenlandia heynei</i> Hk	<i>Rubiaceae</i>
334.	<i>Okea cuspidare</i> Wall	<i>Oleaceae</i>
335.	<i>Onosoma bracteatum</i> Wall	<i>Boraginaceae</i>
336.	<i>Onosoma echoides</i> Linn	<i>Boraginaceae</i>
337.	<i>Origanum majorana</i> Linn	<i>Labiatea</i>
338.	<i>Origanum vulgare</i> Linn	<i>Labiatea</i>
339.	<i>Oroxylum indicum</i> Vent	<i>Bignoniaceae</i>
340.	<i>Osmunda regalis</i> Linn	<i>Osmundaceae</i>
341.	<i>Paederia feotida</i> Linn	<i>Rubiaceae</i>
342.	<i>Pandanus odoratissimus</i> Willd	<i>Pandanaceae</i>
343.	<i>Pandanus tectorius</i> Soland	<i>Pandanaceae</i>
344.	<i>Panicum italicum</i> Linn	<i>Gramineae</i>
345.	<i>Papaver dubium</i> Linn	<i>Papaveraceae</i>
346.	<i>Papaver somniferum</i> Linn	<i>Papaveraceae</i>
347.	<i>Pavetta indica</i> Linn	<i>Rubiaceae</i>
348.	<i>Pavonia odorata</i> Willd	<i>Malvaceae</i>
349.	<i>Pedaliium murex</i> Linn	<i>Pedaliaceae</i>
350.	<i>Peganum harmala</i> Linn	<i>Rutaceae</i>
351.	<i>Peucedanum graveolens</i> Benth	<i>Umbelliferae</i>
352.	<i>Pergularis daemia</i> Linn	<i>Apocynaceae</i>
353.	<i>Pergularis extensa</i> N.E	<i>Asclepiadaceae</i>
354.	<i>Phaseolus</i> Roxb. <i>Urghii</i> Linn	<i>Papilionaceae</i>
355.	<i>Physalis alkekenji</i> Linn	<i>Solanaceae</i>
356.	<i>Pinus australis</i> Michaux	<i>Coniferae</i>
357.	<i>Pinus balsamea</i> Linn	<i>Coniferae</i>
358.	<i>Pinus gerardiana</i> Wall	<i>Coniferae</i>
359.	<i>Pinus picea</i> Du Roi	<i>Coniferae</i>
360.	<i>Piper longum</i> Linn	<i>Piperaceae</i>

361.	<i>Pisonia aculeate</i> Linn	<i>Nictaaginaceae</i>
362.	<i>Pittosporum floribundum</i> W.& A	<i>Pittosporaceae</i>
363.	<i>Pittosporum napaulense</i> Rehdre	<i>Pittosporaceae</i>
364.	<i>Plantago ispagula</i> Forsk	<i>Plantaginaceae</i>
365.	<i>Plantago major</i> Linn	<i>Plantaginaceae</i>
366.	<i>Plantago ovate</i> Forsk	<i>Plantaginaceae</i>
367.	<i>Plumbago rosea</i> Linn	<i>Lumbaginaceae</i>
368.	<i>Plumbago zeylanica</i> Linn	<i>Plumbaginaceae</i>
369.	<i>Plumieria acuminata</i> Poir	<i>Apocynaceae</i>
370.	<i>Plumieria acutifolia</i> Poir	<i>Apocynaceae</i>
371.	<i>Podphyllum peltatum</i> Linn	<i>Berberidae</i>
372.	<i>Poinciana elata</i> Linn	<i>Papilionaceae</i>
373.	<i>Pongamia glabra</i> Vent	<i>Papilionaceae</i>
374.	<i>Polygala snega</i> Linn	<i>Polyganaceae</i>
375.	<i>Portulaca oleracea</i> Linn	<i>Portulacaceae</i>
376.	<i>Premna Hacea</i> Roxb	<i>Verbenaceae</i>
377.	<i>Premna integrifolia</i> Linn	<i>Verbenaceae</i>
378.	<i>Prinsepia utilis</i> Royle	<i>Rosaceae</i>
379.	<i>Prosopis spicigera</i> Linn	<i>Fabaceae</i>
380.	<i>Prunus persica sstokes bot</i>	<i>Rosaceae</i>
381.	<i>Prunus triflora</i> Roxb	<i>Rosaceae</i>
382.	<i>Pseudarthria viscid</i> W. &A	<i>Papilionaceae</i>
383.	<i>Psidium guyava</i> Linn	<i>Myrtaceae</i>
384.	<i>Psoralea corylifolia</i> Linn	<i>Papilionaceae</i>
385.	<i>Ptychotis ajowan</i> DC	<i>Umbelliferae</i>
386.	<i>Pyrethrum indicum</i> DC	<i>Fabaceae</i>
387.	<i>Pyrethrum indicym</i> DC	<i>Compositae</i>
388.	<i>Pyrus malus</i> Linn	<i>Rosaceae</i>
389.	<i>Randia dumetorum</i> Lamk	<i>Rubiaceae</i>
390.	<i>Ranunculus avensis</i> Linn	<i>Ranunculaceae</i>
391.	<i>Ranunculus muricatus</i> Linn	<i>Ranunculaceae</i>
392.	<i>Ranunculus trichophyllus</i> Linn	<i>Ranunculaceae</i>
393.	<i>Rhamnus catharticus</i> Linn	<i>Rhamnaceae</i>
394.	<i>Rhazya stricta</i> Dcne	<i>Apocynaceae</i>
395.	<i>Rhodendron campanulatum</i> D.Don	<i>Eriaceae</i>
396.	<i>Rhodendron javanicum</i> Benn	<i>Eriaceae</i>
397.	<i>Ribes nigrum</i> Linn	<i>Saxifragaceae</i>
398.	<i>Richinus Communis</i> Linn	<i>Ephorbiaceae</i>
399.	<i>Ruta graveolens</i> Linn	<i>Ruraceae</i>

400.	<i>Rubia cordifolia</i> Linn	<i>Rubiaceae</i>
401.	<i>Rourea santaloides</i> W. & A	<i>Conoraceae</i>
402.	<i>Rosa alba</i> Linn	<i>Rosaceae</i>
403.	<i>Saccolabium pappulosum</i> Lindl	<i>Orchidaceae</i>
404.	<i>Salacia oblonga</i> Wall	<i>Celastraceae</i>
405.	<i>Salacia reticulate</i> Wight	<i>Celastraceae</i>
406.	<i>Salacia reticulate</i> Wight	<i>Celastraceae</i>
407.	<i>Salix alba</i> Linn	<i>Salicaceae</i>
408.	<i>Salvadora oleoides</i> Dcne	<i>Salvaoraceae</i>
409.	<i>Salvadora persica</i> Linn	<i>Salvadoraceae</i>
410.	<i>Samadera indica</i> Gaertn	<i>Simaroubaceae</i>
411.	<i>Sambucus Canadensis</i> Linn	<i>Adoxaceae</i>
412.	<i>Sambucus nigra</i> Linn	<i>Adoxaceae</i>
413.	<i>Sansevieria urghiana</i> Roxb and Schult	<i>Hemodoraceae</i>
414.	<i>Santalum rubrum</i> Linn	<i>Sapindaceae</i>
415.	<i>Sarcocephalus missionis</i> Wall	<i>Rubiaceae</i>
416.	<i>Sassafras officinale</i> Nees	<i>Laurineae</i>
417.	<i>Ssussurea lappa</i> Clarke	<i>Compositae</i>
418.	<i>Schleichera trijuga</i> Willd	<i>Sapindaceae</i>
419.	<i>Schoenocaulon officinale</i> A. Gray	<i>Melanthaceae</i>
420.	<i>Scindapsus officinalis</i> Schitt	<i>Araceae</i>
421.	<i>Semecarpus anacardium</i> Linn	<i>Anacardiaceae</i>
422.	<i>Sesamum indicum</i> Linn	<i>Pepilionaceae</i>
423.	<i>Sesbania aegyptiaca</i> Pers	<i>Papilionaceae</i>
424.	<i>Sesbania grandiflora</i> Pers	<i>Papilionaceae</i>
425.	<i>Setaria italic</i> Beauv	<i>Graminae</i>
426.	<i>Shorea robusta</i> Gaertn	<i>Dipterocarpaceae</i>
427.	<i>Sida acuta</i> Burm	<i>Malvaceae</i>
428.	<i>Sida cordifolia</i> Linn	<i>Malvaceae</i>
429.	<i>Sida rhombifolia</i> Linn	<i>Malvaceae</i>
430.	<i>Siegesbeckia orientalis</i> Linn	<i>Compositae</i>
431.	<i>Skimmia laureola</i> Sieb	<i>Rutaceae</i>
432.	<i>Smilax china</i> Linn	<i>Liliaceae</i>
433.	<i>Smilax lanceafolia</i> Roxb	<i>Liliaceae</i>
434.	<i>Smilax officinalis</i> Kunth	<i>Smilaceae</i>
435.	<i>Smilax zeylaciae</i> Linn	<i>Liliaceae</i>
436.	<i>Smithia conferta</i> Sm	<i>Papilionaceae</i>
437.	<i>Solanum dulcamara</i> Linn	<i>Solanaceae</i>
438.	<i>Solanum nigrum</i> Linn	<i>Solanaceae</i>

439.	<i>Solanum xanthocarpum</i> Schrad&Wendll	<i>Solanaceae</i>
440.	<i>Spilanthes acmella</i> Murr	<i>Compositae</i>
441.	<i>Spondis pinnate</i> Kurz	<i>Anacardiaceae</i>
442.	<i>Stachytarpheta indica</i> Vahl	<i>Verbenaceae</i>
443.	<i>Strychnos bourdilloni</i> Trees	<i>Loganiaceae</i>
444.	<i>Strychnos cinnamomofolia</i> Thw.Enum	<i>Loganiaceae</i>
445.	<i>Strychnos nux-vomica</i> Linn	<i>Loganiaceae</i>
446.	<i>Strychnos potatorum</i> Linn	<i>Loganiaceae</i>
447.	<i>Teucrium polium</i> Linn	<i>Labiatae</i>
448.	<i>Teramus labialis</i> Spreng	<i>Combretaceae</i>
449.	<i>Teramus belerica</i> Roxb	<i>Combretaceae</i>
450.	<i>Terminalia chebula</i> Retz	<i>Combretaceae</i>
451.	<i>Tinospora cordifolia</i> Miers	<i>Menispermaceae</i>
452.	<i>Tinospora malabarica</i> Miers	<i>Menispermaceae</i>
453.	<i>Thevetia nerifolia</i> Juss	<i>Apocynaceae</i>
454.	<i>Thymus vulgaris</i> Linn	<i>Labiatae</i>
455.	<i>Toddalia aculeate</i> Lamk	<i>Rutaceae</i>
456.	<i>Toddalia asiatica</i> Lam	<i>Rutaceae</i>
457.	<i>Toddalia bilocularis</i> W.&A	<i>Rutaceae</i>
458.	<i>Toluijera pereirae</i> Bail	<i>Fabaceae</i>
459.	<i>Trewia nudiflora</i> Linn	<i>Eiphorbiaceae</i>
460.	<i>Tribulus terrestris</i> Linn	<i>Zygophyllaceae</i>
461.	<i>Trichosanthes palmate</i> Roxb	<i>Cucurbitaceae</i>
462.	<i>Trigonella foenum-gaeceum</i> Linn	<i>Papilionaceae</i>
463.	<i>Tylophora asthmatica</i> W.&A	<i>Acslepiadaceae</i>
464.	<i>Unona narum</i> Dun	<i>Anonaceae</i>
465.	<i>Uraria lagopoides</i> DC	<i>Papilionaceae</i>
466.	<i>Urena lobata</i> Linn	<i>Malvaceae</i>
467.	<i>Urgenia indica</i> Kunth	<i>Liliaceae</i>
468.	<i>Urtica dioica</i> Linn	<i>Urticaceae</i>
469.	<i>Vanda roxburghii</i> Br	<i>Orchidaceae</i>
470.	<i>Vanda tessellate</i> Hook	<i>Orchidaceae</i>
471.	<i>Valeriana officinlais</i> Linn	<i>Valerianaceae</i>
472.	<i>Vateria indica</i> Linn	<i>Dipterocarpaceae</i>
473.	<i>Vepris bilocularis</i> Engler	<i>Rutaceae</i>
474.	<i>Veratrum viride</i> Solander	<i>Melanthaceae</i>
475.	<i>Verbascum Thapsus</i> Linn	<i>Scrohulariaceae</i>
476.	<i>Verbena officinalis</i> Linn	<i>Verbenaceae</i>
477.	<i>Vernonia anthelmitica</i> Willd	<i>Compositae</i>

478.	<i>Viola tricolor</i> Linn	<i>Violaceae</i>
479.	<i>Vitex negundo</i> Linn	<i>Verbenaceae</i>
480.	<i>Vitex trifolia</i> Linn	<i>Verbenaceae</i>
481.	<i>Vitis pallid</i> W.&.A	<i>Vitaceae</i>
482.	<i>Vitis vinifera</i> Linn	<i>Vitaceae</i>
483.	<i>Withania somnifera</i> Dunal	<i>Solanaceae</i>
484.	<i>Xylia dolabriformis</i> Benth	<i>Papilionaceae</i>
485.	<i>Zingiber officinale</i> Roscoe	<i>Taminaceae</i>
486.	<i>Zizyphus jujube</i> Mill	<i>Rhambaceae</i>

TABLE-2. ANTI-ARTHRITIC MEDICINAL PLANTS

S.NO	BOTANICAL NAME	FAMILY
1.	<i>Acyranthus aspera</i> Linn	<i>Amaranthaceae</i>
2.	<i>Achyranthea aspera</i> Linn	<i>Amaranthaceae</i>
3.	<i>Aconitum vilmorinianum</i> Kom	<i>Ranunculaceae</i>
4.	<i>Ajuga bracteosa</i> Wall	<i>Labiatae</i>
5.	<i>Ajuga decumbens</i> Thunberg	<i>Lamiaceae</i>
6.	<i>Alsonic noonei</i> DE Wild	<i>Apocynaceae</i>
7.	<i>Alstonia scholaris</i> Linn R.Br	<i>Apocynaceae</i>
8.	<i>Ammania bracifera</i> Linn	<i>Lythraceae</i>
9.	<i>Aristolochia bracteata</i> Lam	<i>Aristolochiaceae</i>
10.	<i>Argyreia speciosa</i> Sweet	<i>Convulvulaceae</i>
11.	<i>Arisaema rhizomatum</i> Fischer	<i>Aroideae</i>
12.	<i>Arnebia euchroma</i> Johnst	<i>Boraginaceae</i>
13.	<i>Artocarpus tonkinensis</i> A	<i>Moraceae</i>
14.	<i>Asystasia dalzelliana</i> Santapau	<i>Acanthaceae</i>
15.	<i>Baccharis genistelloides</i> Linn	<i>Asteraceae</i>
16.	<i>Bacopa monniera</i> Penell	<i>Scrophulariaceae</i>
17.	<i>Barleria monniera</i> Lindl	<i>Acanthaceae</i>
18.	<i>Barleria lupulina</i> Lindl	<i>Acanthaceae</i>
19.	<i>Bauhinia variegata</i> Linn	<i>Caesalpinaceae</i>
20.	<i>Bergenia stracheyi</i> Linn	<i>Saxifragaceae</i>
21.	<i>Boerhaavia diffusa</i> Linn	<i>Nyctaginaceae</i>
22.	<i>Boswellia carterii</i> , Birdw	<i>Burseraceae</i>
23.	<i>Boswellia serrata</i> Triana	<i>Burseraceae</i>
24.	<i>Butea monosperma</i> Linn	<i>Facaceae</i>
25.	<i>Caesalpinia sappan</i> Linn	<i>Leguminosae</i>
26.	<i>Caesalpinia sappan</i> Linn	<i>Leguminosae</i>
27.	<i>Calotropis gigantean</i> R.Br	<i>Asclepiadaceae</i>
28.	<i>Calatropis procera</i>	<i>Apocynaceae</i>

29.	<i>Caltha palustris</i> Linn	<i>Ranunculaceae</i>
30.	<i>Cannabis sativum</i> Linn	<i>Cannabaceae</i>
31.	<i>Capparis erythrocarpus</i> Isert	<i>Capparaceae</i>
32.	<i>Capparis spinosa</i> Linn	<i>Capparaceae</i>
33.	<i>Cardiospermum halicacabum</i> Linn	<i>Spindaceae</i>
34.	<i>Cassia uniflora</i> Mill	<i>Caesalpiaceae</i>
35.	<i>Cayaponia tayuya</i> Cogn	<i>Cucurbitaceae</i>
36.	<i>Celastrus aculeatus</i> Merr	<i>Celastraceae</i>
37.	<i>Centella asiatica</i> Urban	<i>Mackinlayaceae</i>
38.	<i>Cinnammomum zeylcanium</i> Breyn	<i>Lauraceae</i>
39.	<i>Cissampelos pareira</i> Linn	<i>Menispermaceae</i>
40.	<i>Chelidonium majus</i> Linn	<i>Papaveraceae</i>
41.	<i>Clematic chinensis</i> Osbeck	<i>Ranunculaceae</i>
42.	<i>Cleome gyandra</i> L	<i>Cleomaceae</i>
43.	<i>Coriandrum sativum</i> Linn	<i>Apiaceae</i>
44.	<i>Costus speciosus</i> Sm	<i>Zingieraceae</i>
45.	<i>Curcuma longa</i> Linn	<i>Zingiberaceae</i>
46.	<i>Curcuma zeodaria</i> Rose	<i>Zingiberaceae</i>
47.	<i>Delonix elata</i> , Gambles	<i>Ceasalpinoideae</i>
48.	<i>Dipsacus asperoides</i> Linn	<i>Dipsacaceae</i>
49.	<i>Drynaria queercifolia</i> L	<i>Polypodiaceae</i>
50.	<i>Elaeocarpus sphaericus</i> L.f	<i>Elaeocarpaceae</i>
51.	<i>Ephedra sinica</i> Staph	<i>Ephedrceae</i>
52.	<i>Euphobia antiquorum</i> Linn	<i>Euphorbiaceae</i>
53.	<i>Ficus bengalensis</i> Linn	<i>Moraceae</i>
54.	<i>Ginko bloba</i> Linn	<i>Ginkgoaceae</i>
55.	<i>Glycosmis pentaphylls</i> Linn	<i>Rutaceae</i>
56.	<i>Glycyrrhiza glabra</i> Linn	<i>Fabaceae</i>
57.	<i>Hedera helix</i> Linn	<i>Araliaceae</i>
58.	<i>Hemidesmus indicus</i> R.Br	<i>Asclepdiaceae</i>
59.	<i>Hippocratea excels</i> H.B.K	<i>Hipocreataeaceae</i>
60.	<i>Hybanthus enneaspermus</i> Muell	<i>Violaceae</i>
61.	<i>Jatropha isabellei</i> Mull	<i>Euphorbiaceae</i>
62.	<i>Justica gendarussa</i> Linn	<i>Acanthaceae</i>
63.	<i>Lantana camara</i> Linn	<i>Verbinaceae</i>
64.	<i>Laportea bulbifera</i> Weddell	<i>Urticaceae</i>
65.	<i>Lawsonia inermis</i> Linn	<i>Lythraceae</i>
66.	<i>Leucas aspera</i> Willd	<i>Lamiaceae</i>
67.	<i>Linum usitatissimum</i> Linn	<i>Linaceae</i>

68.	<i>Lonicera japonica</i> Thumb	Caprifoliaceae
69.	<i>Mallotus oppositifolium</i> Mull	Euphorbiaceae
70.	<i>Merremia emarginata</i> Burm	Convolvulaceae
71.	<i>Merremia tridentata</i> Hall	Convolvulaceae
72.	<i>Operculina trupethum</i> Linn	Convolvulaceae
73.	<i>Panax ginseng</i> C.A. Meyer	Araliaceae
74.	<i>Phyllanthus amarus</i> Schum.and Thomm	Euphorbiaceae
75.	<i>Physalis angulate</i> Linn	Solanaceae
76.	<i>Pinus maritime</i> Roxb	Pinaceae
77.	<i>Piper betle</i> Linn	Piperaceae
78.	<i>Piper longum</i> Linn	Piperaceae
79.	<i>Pisonia grandis</i> R.Br	Nyctaginaceae
80.	<i>Pistia stratiotes</i> Linn	Araceae
81.	<i>Pleurotus sajorcaju</i> Singer	Pleurotaceae
82.	<i>Premna serratifolia</i> Linn	Verbenaceae
83.	<i>Pseudocdreia kotschy</i> Schweinf	Meliaceae
84.	<i>Punica granatum</i> Linn	Lythraceae
85.	<i>Rhus verniciflua</i> Stokes	Anacardeaceae
86.	<i>Ruta graveolens</i> Linn	Rutaceae
87.	<i>Salacia reticulate</i> Wight	Celastraceae
88.	<i>Salix nigra</i> Linn	Saliaceae
89.	<i>Saraca asoca</i> Roxb	Rubeacea
90.	<i>Saussurea lappa</i> Clarke	Compositae
91.	<i>Semecarpus anacardium</i> Linn	Anacardiaceae
92.	<i>Sida rhombifolia</i> Linn	Malvaceae
93.	<i>Sinomenium acutum</i> Rehd	Menispermaceae
94.	<i>Smithia sensitive</i> Smith	Fabaceae
95.	<i>Sophora flavescens</i> Aoton	Fabaceae
96.	<i>Strobilanthus callosus</i> Nees	Acanthaceae
97.	<i>Strychus potatorum</i> Linn	Loganaceae
98.	<i>Torilis japonica</i> Houtt	Apiaceae
99.	<i>Toxicodendron pubescens</i> P.Mill	Anacardiaceae
100.	<i>Trewia polucarpa</i> Benth	Euphorbiaceae
101.	<i>Tridax procumbens</i> Linn	Asteraceae
102.	<i>Trigonella foenum raecum</i> Linn	Fabeceae
103.	<i>Urtica pilulifera</i> Linn	Urticaceae
104.	<i>Vernonia cinerea</i> Less	Asteraceae
105.	<i>Vitex negundo</i> Linn	Verbenaceae
106.	<i>Withania somnifera</i> Dunal	Solanaceae

107.	<i>Xanthium strumarium</i> Linn	<i>Compositae</i>
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MEDICINAL PLANTS FOR THE TREATMENT OF ARTHRITIS:

Herbal medicines are used for the treatment of various ailments from ancient times and it is not an exaggeration to say that the use of the herbal drugs is as old as mankind. Herbal medicines are synthesized from the therapeutic experience of generation of practicing physicians of ancient system of medicine for more than hundreds of years. Nowadays, researcher shows a great interest in those medicinal agents that are derived from plants because the currently available drugs are either have certain side effects or are highly expensive. Nature has blessed us with enormous wealth of herbal plants which are widely distributed all over the world as a source of therapeutic agents for the prevention and cure of various diseases. According to WHO, world's 80% population uses herbal medicines for their primary health care needs. Herbal medicines will act as parcels of human society to combat disease from the dawn of civilization. The medicinally important parts of these herbal plants are chemical constituents that produce a desired physiological action on the body.

Since ancient time India uses herbal medicines in the officially alternative systems of health such as Ayurveda, Unani, Sidha, Homeopathy, and Naturopathy. In India, there are more than 2500 plants species which are currently used as herbal medicaments. For than 3000 years, the herbal medicines are used either directly as folk medication or indirectly in the preparation of recent pharmaceuticals. Thus, from the knowledge of traditional plants, one might be able to discover new effective and cheaper drugs.

CONCLUSION:

Traditional medicines used for the treatment of arthritis are used in various tribal and rural cultures world wide. The plant extracts would be served as an alternate therapy for the treatment of arthritis with lessor side effects. Plant have been a prime source of highly effective conventional drugs for the treatment of many forms of arthritis. There are many medicinal plants which exert anti-arthritic activity at a particular dose. This article makes an attempt to give scientific account of use of valuable medicinal plants extracts in arthritis.

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