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EXPLORING ANTI-INFLAMATORY POTENTIAL OF ETHNOMEDICINAL PLANTS: AN UPDATE

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ABSTRACT

"Herb" has been derived from a Latin word "herba" which means herb. At present, herb alludes to different natural origin parts of the plant like seed, bark, root, rhizomes, stem, bud, flower, leaf and non-woody plant. Medicinal plants have proved to be effective for their different purposes. Anti-inflammatory activity is shown by the plants that have the capability to synthesize variety of phytochemical compounds as secondary metabolites. By showing effects on body mechanics the herbs of natural origin reduce all types of inflammation. These herbs give relief from swelling, stiffness, joints pain and inflammation. Anti-inflammatory supplement as well as anti-inflammatory herbs decrease the level of prostaglandins which is chemical released by cells at sites of injury and also sensitize the nerve endings that cause pain. In different systems like Ayurveda, Siddha, and Unani, several medicinal plants were used for curing different human diseases. In this review an effort is being made to inquire anti-arthritic and anti-inflammatory activity of medicinal herbal drugs.

***Keywords*:** Anti-inflammatory; antarthritic activity: ethnomedicinalplants; joints pain: Ayurveda

Introduction

Inflammation refers to a response by living tissue in case of an injury. The primary symptoms of inflammation include redness or warmth, heat, pain, and swelling. In case of an injury in any body part, arterioles of the surrounded tissue widen. It leads to increased circulation of blood and redness in the affected area (Anonymous, 1992). Mostly the inflammation appears as either acute or chronic. Acute inflammation refers to primary response of the body to detrimental stimuli. While, chronic inflammation means prolonged inflammatory reaction that involves some progressive change in the type of cells present in the inflammation site, showing damage to the same. Arthritis is one of the most distressing and disabling syndromes encountered in medical practice (Asmawi *et al*., 1993). The common form of chronic inflammatory joint disease is represented rheumatoid arthritis (Nuki *et al*., 1993). Cyclooxygenase (COX) is the main enzyme in the process of synthesis of thromboxanes, prostaglandins and prostacyclinsthat cause inflammation, platelet aggregation as well as pain (Udupa *et al*., 1994). Generally, steroidal (SAIDs) and non-steroidal anti-inflammatory drugs (NASIDs) are the majorly used medicines in the treatment of different disorders related to inflammations. However, they show negative secondary effects on renal and gastric lesion etc (Rosa *et al*., 1995). COX-1 and COX-2 enzyme activity are blocked by these drugs. COX enzymes play an important role in the production of prostaglandin. Drugs such as NSAIDs and SAIDs are used till date. However, continuous use of these drugs shows undesirable side effects like renal failure, liver, cardiovascular, gastrointestinal damage (Perez 1996) and gastric lesions (Valsaraj *et al*., 1997).

Now, there is a requirement of a new effective, safe and less toxic anti-inflammatory drug. Plants have the capability to synthesize variety of species of phytochemicals containing crude drugs as secondary metabolites. Most of the parts of medicinal plants are used as crude drugs and they contain several phytochemical medicinal characteristics (Vogel *et al*., 1997). In different systems like Ayurveda, Siddha, and Unani, many medicinal herbal plants have been put to use for curing different diseases (Geetha *et al*., 1998; Sindhu and Arora, 2012). As per one of the reports by the World Health Organization (WHO), around 75% of the total world population relies on traditional ways of using herbs or medicines for treatment of all diseases. Chinese and Ayurveda medicinal systems are the most widely accepted systems that have required a lot of research on pharmaceutical chemistry, pharmacognosy, pharmacology etc. (Mengi *et al*., 1999, Liu *et al*., 2001)

Several medicinal plants have been a crucial part of traditional ayurvedic medicine for treatment as well as treating of distinct inflammatory disorders.

Types of Inflammation

Following are the two types of inflammation:

A. Acute inflammation

B. Chronic inflammation

A. Acute inflammation

Acute inflammation is the inflammation which starts quickly. It becomes severe in a short while. It can be an early reaction of the body to detrimental stimuli and then its rapid onset of action appears for a few days.

B. Chronic inflammation

Chronic inflammation is the inflammation which is long-term and may appear for many months or years. It is caused by failure to remove something that was leading to an acute inflammation. However, without inflammation damaged tissue cannot be healed, chronic inflammation may later lead to various diseases and medical conditions that include different types of cancers, atherosclerosis and rheumatoid arthritis etc. Also, inflammation can cause stiffness and restricted mobility. pain, stiffness or discomfort and even agony may be felt by the person, depending on the severity of the inflammation. Chronic inflammation causes severe pain because swelling pushes against the sensitive nerve endings (Sosa *et al.*, 2001; Sindhu and Arora, 2013).

Symptoms

Symptoms of inflammations depend on if the response is acute or chronic.

A. The symptoms of acute inflammation are the following:

(i) Pain

(ii) Redness

(iii) Immobility

(iv) Swelling

B. The symptoms of chronic inflammation are the following:

(i) Abdominal pain

(ii) Fatigue

(iii) Rash

(iv) joint pain

(v) Fever

Rheumatoid arthritis (RA) is diagnosed by rheumatoid factor, which are abnormal antibodies (IgG) that are present in the blood. Such abnormal antibodies react with antigen and then form antigen-antibody complex which causes pain and inflammation of synovial membrane. The American College of Rheumatology suggests that atleast some of the following seven criteria confirms diagnoses

(i) At least one hour of stiffness in the morning around the joint.

(ii) At least six weeks of arthritis in three joints.

(iii) At least six weeks of joints arthritis in hand.

(iv) At least six weeks of arthritis on both sides of the body.

(v) Rheumatoid nodules which are present under the skin.

(vi) In blood testing rheumatoid factor are found.

(vii) In X-rays rheumatoid arthritis are visible. (Garrido *et al.*, 2001, Jordan *et al.*, 2001)

Anti-inflammatory medication

Non-steroidal anti-inflammatory drugs (NSAIDs) are taken to treat pain that inflammation has caused. They act against an enzyme that causes inflammation. This either reduces or prevents pain. Example- naproxen, ibuprofen and aspirin. However, acetaminophen such asparacetamol, reduces pain without affecting the inflammation. It is ideal for those wishing to treat only the pain while allowing the healing factor of the inflammation to run its course (Olajide and Alada 2001).

Examples of NSAIDs with potential side effects-

Name of drug	Potential side effects
• Diclofenac sodium • Ibuprofen • Celecoxib	• diarrhea and abdominal cramps, • Drowsiness • Heartburn, ulcer and bleeding, nausea or vomiting, • Heart attacks, increased risk of blood clots, stroke • Greater risk of cardiovascular disease

Rheumatoid Arthritis Drugs

Such class of steroid hormones that prevent a number of mechanisms involved in inflammation.

(i) Glucocorticoids

(ii) Corticosteroids

(iii) Mineralocorticoids

Examples of glucocorticoids:

Glucocorticoids are steroids. Other immune response has been blocked by strong anti-inflammatory drugs. These rheumatoid arthritis remedies assist to reduce symptoms and may slow and stop joint harm. Due to risk of side effects these RA are used only for a certain period (Adeyemi *et al.*, 2002).

Name	Potential Side effects
• Betamethasone • Prednisone • Budesonide • Cortisone • Dexamethasone • Hydrocortisone • Methylprednisolone • Prednisolone	• Osteoporosis • High blood pressure • Increased cholesterol • Indigestion or increased appetite • Nervousness or mood swings • Weakness of muscle • Cataracts • Atherosclerosis • Infections

Examples of Corticosteroids:

Corticosteroids are steroids. In rheumatoid arthritis patients it reduce inflammation and assist to regulate autoimmune activity. Corticosteroids has been used to treat symptoms. Many RA treatment therapies are used in combination with NSAIDs, they can assist protect joints and organs from injury (Huerta *et al.*, 2002).

Name	Potential Side Effects
• Prednisolone • Prednisone • Dexamethasone (Decadron) • Triamcinolone (Aristospan) • Methylprednisolone (Depo-Medrol, Medrol)	• Mild weakness in the arms muscles and legs muscles. • Slow healing of wounds and cuts • Both thinning and excessive growth of hair • Acne, Round face • Slowed growth in children • Blurred vision • Osteoporosis (loss of bone calcium)

Example of Mineralocorticosteroids:

The corticosteroid hormone is mineralocorticoid. The main mineralocorticoid is aldosterone which is increases sodium reabsorption by an action on the distal tubules of the kidney (Amos *et al*., 2002).

Name	Potential Side effects
• Fludrocortisone (Florinef)	• Hypertension • Diabetes mellitus • Psychosis • Insominia • Hypokalemia • Hypernatremia

Plant with anti-inflammatory activity

***Aegle marmelos* (Rutaceae)**

Bilva is the common name of *Aegle marmelos* Roxb. that belongs to the family Rutaceae. The aqueous extract of root of *Aegle marmelos* is used for anti-inflammatory activity. The aqueous extract of the root bark of *A. marmelos* has been prepared. It is used for the anti-inflammatory activity in albino rats using carrageenan induced paw edema model. Indomethacin has been taken as standard drug. It has been concluded that *A. marmelos*is used for anti-inflammatory activity (Anwar *et al*., 2003)

***Bryophyllum pinnatum* (Crassulaceae)**

Pan-Futi, Life-Plant, Ghamari is the common name of *Bryophyllum pinnatum* that belongs to the family Crassulaceae. The study has been undertaken to examine anti-inflammatory. The aqueous leave plant extract of *B. pinnatum* has been prepared. It is used for anti-inflammatory activity in different investigational animal models. In this experiment paw oedema model is used for study anti-inflammatory activity. The standard drug Diclofenac (100 mg/kg) has been used. The results indicated that aqueous extract of *B. pinnatum* possesses anti-inflammatory activity by used different experimental animal study (Anonymous, 2003).

***Moringa oliefera* (Moringaceae)**

Drumstick tree is the common name of *Moringa oliefera* that belongs to the family Moringaceae. The ethanolic or aqueous extract of stem bark of *M. oliefera* is used for anti-inflammatory activity. The ethanolic and aqueous extracts of stem bark of *M. oliefera* shows anti-inflammatory activity in paw edema at the dose (300 mg/kg body weight). Diclofenac sodium has been taken as standard drug (Jain and Basal 2003).

***Cassia fistula* (Caesalpiniaceae)**

Indian laburnum is the common name of *Cassia fistula* that belongs to family Caesalpiniaceae. The bark part is used for anti-inflammatory activity. The aqueous bark extract of *C. fistula* indicated that acute or chronic anti-inflammatory activity in rats. The study displays that this drug is used for anti-inflammatory activity (Shivkar and Kuma2004).

***Zingiber officinale* (Zingiberaceae)**

Adrak or zinziber is the common name of *Zingiber officinale* that belongs to family Zingiberaceae. Ethanolic extract of *Z. officinale* has been estimated for anti-inflammatory activity using acute inflammation or chronic inflammation models (Arya and Kumar2005).

***Hibiscus rosa sinensis* (Malvaceae)**

Hibiscus rosa sinensis is the common name of *H.r. sinensis* that belongs to family Malvaceae. Methanolic extract of *Hibiscus rosa sinensis* leave is used for anti-inflammatory activity. Carrageenin and dextran have been used in anti-inflammatory model to induce rat paw-edema. The standard drug Indomethacine is used that show major anti-inflammatory activity. The plant extract has been used at the dose (250 and 500 mg/kg body weight orally). The experimental results show anti-inflammatory activities (Ilavarasan *et al*., 2005).

***Sida cordifolia* (Malvaceae)**

Ilima, heart-leaf sida is common name of *Sida cordifolia* Linn. that belonging to family Malvaceae. The aqueous extract of *S. cordifolia* has been assessed in animal models shows the anti-inflammatory acute toxicity. The prepared extract utilizes leave composed prior the flowering period. Aqueous extract shows major prevention of carrageenin-induced rat paw-edema at a dose400 mg/kg orally. The aqueous extract of *S. cordifolia* shows less acute toxicity in mice (Burke *et al*., 2005).

***Emblica officinalis* (Euphorbiaceae)**

Amla is the common name of *Emblica officinalis* that belongs to the family Euphorbiaceae, is tree rising in tropical or subtropical parts of China, India, etc. The methanolic extract of plant leaf is used for anti-inflammatory activity. Carrageenan, serotonin and histamine induced subplantar injection have been used for acute inflammation in rats. The result indicates that aqueous and alcoholic extract of *E. officinalis* possess potent anti-inflammatory activity. The result reveals that *E. officinalis* protect acute and chronic inflammatory conditions (Rindfleisch and Muller, 2005).

***Albizia lebbeck* (Mimosaceae)**

Lebbek tree, flea tree is common name of *Albizia lebbeck* Benth that belongs to the family Mimosaceae. The ethyl-acetate and methanolic extract of *A. lebbeck* is used for anti-inflammatory activity in rat by carrageenan induced paw-edema model. The plant extract has been used as 200-400 mg/kg dose level (Ojewole, 2005).

***Cassia occidentalis* (Caesalpiniaceae)**

Coffee senna is common name of *Cassia occidentalis* that belongs to the family Caesalpiniaceae. The whole plant of *C. occidentalis* is assessed for anti-inflammatory activity. Ethanolic extract of *C. occidentalis* for study of anti-inflammatory activity uses potential dose250 mg per kg in carrageenan induced paw-edema model. The outcome shows which significantly reduced carrageenan induced inflammation in mice at dose as 250 mg/kg) (Ilavarasan *et al*., 2005).

***Cynodon dactylon* (Poaceae)**

Scutch, dhoob is the common name of *Cynodon dactylon* that belongs to the family Poaceae. The aqueous extract of *C. dactylon* have been examined foranti-inflammatory activity of *C. dactylon* at many doses at 200, 400 and 600 mg/kg administered orally using, carrageenan, serotonin, dextran and histamine induced rat paw-edema and cotton pellet method. These both extracts has been found to decrease anti-inflammatory activity (Silva, 2006).

***Aloe vera* (Liliaceae)**

Aloe vera is the common name of *Aloe barbadensis* Linn. belonging to family Liliaceae. The fresh juice from the leaves are used for acute inflammation.Aqueous or chloroform extracts of the juice have been stated to prevent carrageenan-induced inflammation (Shih and Chang, 2007).

The anti-inflammatory activity has been obtained from fresh leaves juice of the *A. vera* which prevent carrageenan induced rat paw-edema. Standard drug Ibuprofen is used that shows major anti-inflammatory activity. However, the fresh juice has been effective in acute inflammation but shows no effect in chronic inflammation (Amresh *et al*., 2007).

***Calotropis procera* (Asclepiadaceae)**

Rubber bush, rubber tree is the common name of *Calotropis procera* (Ait) R Br that belongs to family Asclepiadaceae. It is natural rising tropical plant. It shows various medicinal properties. The wide range shows anti-inflammatory effects of ethanolic extract of different parts of the plant have been report to shows anti-inflammatory activity (Mahesh and Sathish2008, Saha and Ahmed 2009). The aqueous and acetone extracts of the dry latex prevent carrageenan, formalin induced paw-edema in rats. As compared to standard anti-inflammatory drugs phenyl butazone, dry latex of *C. procera* has been more effective against carrageenin-induced edema (Jurenka, 2009).

***Cissus trifoliata* (Vitaceae)**

Marine ivy or possum grape, bolontibi are common name of *Cissus trifoliate* Rott that belongs to the family Vitaceae. It prevents rheumatic arthritis. The ethanolic root extract shows anti-inflammatory activity in carrageenan induced edema in mice, adjuvant-induced arthritis and formaldehyde in rats (Mukherjeeand Houghton, 2009). Phenylbutazone is taken as standard drug in acute inflammation and chronic inflammation.

***Ambrosia artemisiaefolia* (Compositae)**

Tamaris is common name of *Ambrosia artemisiaefolia* Linn. belonging to the family Compositae. The leaves are used in topical anti-inflammatory therapy. The juice of leaves is used to prevent arthritis (Kiranjot and Kunwarjeet, 2010). The ethanolic leaf extract has been reported to prevent croton oil-induced inflammation and carrageenan-induced inflammation in rats.

***Curcuma longa* (Zingiberaceae)**

Turmeric or haldi is the common name of *Curcuma longa*belonging to the family Zingiberaceae. The dried rhizome of *C. longa* has been found to inhibit carrageenan-induced paw edema or formaldehyde in rats (Chandrashekar, 2010). The methanolic and aqueous extracts of *C. longa* have major inhibitors of inflammation which shows anti-inflammatory activity. There are two models of inflammation used i.e. cotton pellet and granuloma pouch and both of them are used to test their inhibitory action on the development of inflammation paw edema in rat. The effectiveness of *C. longa* is about equivalent to phenyl butazone in the carrageenin induced edema test. It has been experimental studied that drug is less toxic than the standard drug.

Ficus platyphylla (Moraceae)

Gamji is the common name of *F. platyphylla* Del-Hollthat belongs to the family Moraceae. Aqueous extract of root and bark is used in the cure of inflammation acetyl salicylic acid is used as standard drug. Experimental investigation shows that the methanolic bark extract and aqueous extract of plant prevent egg albumin-induce rat paw edema (Shimoda *et al*., 2010).

***Entada abyssinica* (Mimosaceae)**

Splinter bean is the common name of *E. abyssinica* Steud. ExA. Rich. that belongs to family Mimosaceae. Plants has been use for the cure of arthritic pains. The methanolic extract of leaf of *E. abyssinica*indicate anti-inflammatory activity model. The outcomes indicate which methanolic extract of *E. abyssindica* prevents inflammation in paw edema induced by Carrageenan (Tomar *et al*., 2010).

***Butea frondosa*(Papilionaceae)**

Palash is the common name of *Butea frondosa* Koen. Ex Roxb. belonging to the family papilionaceae. The leaves are used in inflammatory conditions (40). The aqueous leaf extract shows anti-inflammatory activity of *B. frondosa* in carrageenan induced rat paw-edema. Experimental study reveals that anti-inflammatory activities have been significant orcomparable to that of ibuprofen (Sreejith *et al*., 2010).

***Calligonum comosum* (Polygonaceae)**

Fire bush is the common name of *Calligonum comosum* L. Hert. belonging to the family Polygonaceae. The experimental study shows that the ethanolic extract of the different parts of *C. comosum*reduce, increase in hind paw edema induced by carrageenan (Viji and Helen, 2010).

***Achillea millefolium* (Asteraceae)**

Yarrow or gandrain is the common name of *Achillea millefolium* Linn. that belongs to family Asteraceae. This is a perennial natural herb. Alcoholic or aqueous extracts of *A. millefolium* is used for the treatment ofanti-inflammatory activities (Pilotto *et al*., 2010). Petroleum ether, aqueous and ethanolic extract has been evaluated in inhibition of acute inflammation or chronic inflammation. An acute inflammation has evaluated by xylene-induced in carrageenan induced paw edema or mice ear edema. The

chronic inflammation has tested in adjuvant induced arthritis in wistar rat model (Ayannar and Ignacimuthu, 2011).

***Aconitum heterophyllum* (Valeraneaceae)**

Ativisha or Patisis common name of *A. heterophyllum* that belongs to family Valeraneaceae. *A. heterophyllum* is used for the treatment of rheumatoid arthritis. The ethanolic root extract of *A. heterophyllum* root shows effective anti-inflammatory effect through inhibition of prostaglandin pathways. Transudative or proliferative components of chronic inflammation have been widely used to assess cotton pellet-induced granuloma. As compared with Diclofenac sodium the inhibitory of *A. heterophyllum* is very close to it. *A. heterophyllum* shows that ethanolic root extracts to inhibit sub-acute inflammation (Benni *et al*., 2011).

***Bacopa monnieri* (Scrophulariaceae)**

Brahmi is the common name of *Bacopa monnieriis* Linn. belonging to the family Scrophulariaceae. The plant shows that anti-inflammatory activity in carrageenan-induced rat paw edema. In comparison with indomethacin it shows edema prevention. 24. In traditional medicines *B. monnieri* possesses relevant anti-inflammatory conditions (Garg and Paliwal, 2011).

***Cassia fistula* (Caesalpiniaceae)**

Indian laburnum,purging cassia is the common name of *Cassia fistula* that belongs to family Caesalpiniaceae. The entire plants possess medicinal properties valuable in the cure of inflammatory diseases as arthritis. The methanolic or aqueous extracts of *Cassia fistula* of bark have major anti-inflammatory effect in acute or chronic anti-inflammatory models of inflammation in wistar albino rats. Paw oedema has been Carrageenan induced by injecting in physiological saline into the sub-plantar tissues in wistar albino rats at dose (170 –200 g). Diclofenac sodium (5 mg / kg orally) has been used as standard (Altschul *et al*., 2012).

***Daphne pontica* (Thymelaeaceae)**

Twin-flowered or Pontic daphne is common name of *Daphne pontica* Linn. belonging to the family Thymelaeaceae. Numerous *Daphne* species have been used in opposition to inflammatory disorder. *D. pontica* has been used for the treatment of inflammatory disorder or rheumatoid arthritis. Ethyl acetate extract of *D. pontica* is used in mice by formalin test or ethyl acetate extracts 10.0 mg/kg. The results indicated that the extract 10.0 mg/kg has potential anti-inflammatory activities which support its medicinal use (Mohamed *et al*., 2013).

***Mangifera indica* (Anacardiaceae)**

Mango, Aam is the common name of *Mangifera indica* Linn. belonging to the family *Mangifera indica*. It rises in the tropical region and subtropical region. *M. indica* parts are commonly used in traditional medicine for different diseases. *M. indica* has been reported for treatment of anti-inflammatory activity. The ethyl acetate or ethanolic extracts of the roots of *M. indica* has been reported to contain significant anti-inflammatory activity. Standard drug Diclofenac sodium is compared with different extract activity (Witaicenis *et al*., 2014).

***Phyllanthus polyphyllus* (Euphorbiaceae)**

Sirunelli is common name of *Phyllanthus polyphyllus* Linn. that belongs to the family Euphorbiaceae. It is a tiny shrub used in anti-inflammatory activity. The *P. polyphyllus* is used for acute and chronic inflammatory activity in traditional medicine. Acute inflammation has been produced by sub-plantar injection of 1% suspension of carrageenan with gum acacia (two percent) in normal saline in the right hind paw of the rats. Aqueous and ethanolic extracts have been administered orally at dose (150 and 300 mg/kg). Phenylbutazone at dose (80 mg/kg)orally has been used as the standard for anti-inflammatory activity.

***Ricinus communis* (Euphorbiaceae)**

Castor bean or castor oil plant is the common name of *Ricinus communis* Linn. that belongs to the family Euphorbiaceae. *R. communis*is cultivated everywhere in the tropical regions and subtropical regions of the world. The methanolic extract reveals that it prevents anti-inflammatory activity in cotton-pellet granuloma model and carrageenan induced hind paw-edema model in wistar albino rats (Carvalho, 2019). The study shows which methanolic extract of *R. communis* have majoranti-inflammatory activities in acute or chronic inflammatory modelsin wistar rats.

***Sesbania sesban* (Leguminosae)**

Jayanti, riverhemp is the common name of *Sesbania sesban* Linn. belonging to the family Leguminosae. Methanolic and aqueous extract of *S. sesban* leaves part are used for anti-inflammatory activity. Inhibition of carrageenan oedema model proves this. In starting phase the extract is able to control enhancement in paw edema and later related to inhibition of prostaglandins release (Carvalho, 2019).

***Dodonaea viscosa* (Sapindaceae)**

Sanatta or vilayti mehndi is the common name of *Dodonaea viscose* belonging to the family Sapindaceae. The leaves part is used for anti-inflammatory activity. Hydro-alcoholic extract of the leaves of *D. viscosa*, given orally at dose (300 mg/kg) much inhibits the paw-edema induced by carrageenin model. The extract shows less toxicity. This result shows that *D. viscosa* leaves have anti-inflammatory activity.

***Ruta graveolens* (Rutaceae)**

Rue is common name of *Ruta graveolens* that belongs to the family Rutaceae. The ethanolic and methanolic extracts of *R. graveolens* has been tested by carrageenan induced rat paw-edema method is shows anti-inflammatory activity. The result significantly is increase anti-inflammatory activity of methanolic extract at dose (20 mg/kg body weight) and ethanolic extract (50 mg/kg body wt) of *Ruta graveolens* can be due to inhibition of the mediators of inflammation viz, histamine prostaglandin and serotonin. The results show an effectiveness of methanolic extract at dose (20 mg/kg body wt) and ethanolic extract at dose (50 mg/kg body wt) of *R. graveolens* as capable therapeutic agent in acute anti-inflammatory conditions (Szollosi, 2020).

Conclusion

These plants are of utmost importance for the cure of anti-inflammatory or antiarthritic activity from their chemical constituents. This review will be helpful for the recent medicinal plants with curative anti-inflammatory properties.

These medicinal plants have proven evidence of their use in the cure of inflammatory disorders. In these plants, inherent anti-inflammatory activity is inferred from other identified pharmacological activities related to modulation of the complex inflammatory response. In this review article, we collected a comprehensive literature survey on the scientific evidences for anti-inflammatory activity of many herbs.

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