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Review Article

**ARTHRITIS – A REMEDIAL APPROACH WITH COMPLIMENTARY  
AND ALTERNATE MEDICINE WITH A SPECIAL REFERENCE TO  
NYCANTHUS ARBOR-TRISTIS LINN (NAT) - A REVIEW**Sujatha, M<sup>1\*</sup>, Praveena, B<sup>1\*</sup>, and Shreyas, N<sup>2</sup><sup>\*1</sup>Department of Chemistry, M.E.S. College of Arts, Commerce and Science,  
Bengaluru, Karnataka, India<sup>2</sup>KVG Medical College, Sullia, Dakshina Kannada, Karnataka, India**Article Received:** January 2020    **Accepted:** February 2020    **Published:** March 2020**Abstract:**

Arthritis is an auto immune disorder with swelling and tenderness in one or more joints. Allopathic medications are prescribed symptomatically to decrease the pain, which results in side effects like gastrointestinal bleeding, bone loss and poor nutritional status. Ayurveda provides complimentary and alternate treatment for Arthritis. Herbal medicines have gained popularity as potential therapeutic agents to prevent and treat various illness because of their high efficacy and least side effects. This review introduces drug derived from curative plants with proven anti-inflammatory, anti-oxidant, anti-viral, anti-fibrotic properties to treat Arthritis. Use of herbal medicines regularly along with Ayurvedic procedures such as panchakarma, emesis, enema, detoxification methods help to decrease the arthritic problem and associated pain. Harsingar or Parijataha commonly known as Night flowering Jasmine of India, is a wonderful plant with enormous medicinal values can be used to treat arthritis. Every part of this plants such as leaves, bark, seeds are used as anti-bacterial, anti-inflammatory, anti-pyretic, anti-helminthic agents. This paper helps the researchers to explore more about the plant for the benefit of the affected society.

**Keywords:** Arthritis, Anti-inflammatory, Analgesic, Harsingar or Parijata (*Nycanthus arbor-tristis* Linn.)**Corresponding author:****Sujatha, M,**Department of Chemistry, M.E.S. College of Arts,  
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**INTRODUCTION:**

Arthritis, auto immune complication characterized by pain, swelling and stiffness in one or more joints leading to decreased range of motion over a period. It is associated with inflammation of synovial joint due to immunomediated response [1]. Arthritis is not a single disease; it is an amalgamation of over a 100 different types and severities making it the leading cause of disability. However, there are two main types of arthritis.

**Rheumatoid Arthritis (RA)** – It's a chronic inflammatory disorder in major and minor joints.

**Osteoarthritis (OA)** – It's a degenerative disorder affecting flexible joints' cartilage.

**Gout** is another type of inflammatory disease caused by pathogenic deposition of uric acid crystals in joints and tissue [2].

Rheumatoid arthritis (RA) is a chronic, inflammatory systemic autoimmune disease characterized by both local and systemic inflammation with elevated plasma concentration of pro-inflammatory cytokines, such as interleukins, tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) and acute phase proteins [3].

Osteoarthritis (OA) is the most common form of chronic disorder of synovial joints. It is characterized by degeneration of cartilage and its underlying bone within a joint as well as bony outer growth. It is also known as degenerative joint disease. The breakdown of these tissues eventually leads to pain and joint stiffness. Joints appear larger, stiff and painful, the swelling and the pain worsens by the end of the day. The tissue that lines the joint can become inflamed, the ligaments can loosen and the muscles around the joint can weaken. It can occur in any joint especially weight bearing joints like knees and ankles .

Rheumatoid arthritis is associated with poor nutritional status and reduction in their absorption. Modern science treats RA with Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), Disease Modifying Anti-Rheumatoid Drugs (DMARDs) and Corticosteroids, to reduce the patient's pain, joint inflammation, minimize loss of function and decrease the progression of joint damage [TABLE 1]. However, such treatments are rarely totally effective and such therapies have the potential to cause severe side effects [3,5]

**Table 1: Anti- arthritis drugs and their side effects [2,3]**

Sl. no	Name of the drug	Side effects
1	Non-steroidal anti-inflammatory drugs (NSAIDs) and simple analgesics like Ibuprofen, naproxen, salsalate, piroxicam, ketorolac	Gastro-duodenal ulceration, Dermatologic abnormalities, Renal abnormalities.
2	Oral Gold Salts	Diarrhea
3	Injectable Gold Salts	Stomatitis, Myelosuppression.
4	Oral Gluco Corticoids [6]	Trigger Diabetes, lower absorption of calcium leading to osteoporosis, increase cholesterol and triglyceride levels, suppress immune system .
5	Disease modifying anti rheumatic drugs (DMARDs) like Methotrexate, Sulfasalazine, Hydroxy Chloroquine, D-penicillamine	Gastro Intestinal Upset, Oral Ulceration, Liver functional abnormalities, drug induced pneumonitis.
6	Biologics:- Like TNF- $\alpha$ neutralizing agents- Infliximab, Etanercept, Adalimumab, Golimumab ,Tocilizumab, Certolizumab ,Abatacept, ,Leflunomide, Rituximab <sup>7</sup> ;	Infections such as tuberculosis, lymphoma and other malignancies.
7	Immune suppressive and cyto toxic drugs: Like Leflunomide, cyclosporine, azathioprine and cyclophosphamide	Liver function enzymes

### Need for treatment of Arthritis by alternate therapy using Natural sources:

Modern medicine is lacking satisfactory treatment to such severe cases of arthritic diseases. To a larger extent these diseases are treated symptomatically and the drugs used in the treatment have varying levels of the toxic side effects. Whereas, in traditional medicines including in Ayurveda, Siddha, Unani, Homeopathy, several herbal drugs are used to treat these diseases [2].

#### Ayurveda:

Thousands of years before modern medicine provided scientific evidence for the mind-body connection, the sages of India developed Ayurveda, which continues to be one among the world's most sophisticated and powerful mind-body health systems.

Ayurveda, an old medicinal system is in use primarily within the Indian subcontinent. In Sanskrit, the word "Ayurveda" may be a tatpurusha compound of the word ĀYUS meaning "LIFE" or "life principle" and therefore the word VEDA refers to system of "KNOWLEDGE", and would translate as the "SCIENCE OF LIFE OR KNOWLEDGE OF LIFE". According to Indian sage Charaka, "life" itself is defined as "combination of the body, sensory organs, mind and soul, the factor liable for preventing decay and death, which sustains the body over time, and guides the processes of rebirth."

Ayurveda deals with the measures of healthy living. Ayurveda is one of the few traditional systems deals with Kayachikitsa (General medicine), Shalya Tantra (Surgery), Shalakya Tantra (ENT & Ophthalmology), Stri Roga Prasuti Tantra (Gynecology & Obstetrics) and Kaumarabhritya (Pediatrics). Ayurveda is an age old medicinal system has a reference to Atharva Veda, the last one among four vedas. It is based on the idea of balance in bodily systems and uses diet, herbal treatment and yogic breathing. Ayurveda has originated in India about 5000 years ago. Ayurveda focuses on various treatments such as Panchakarma (five actions), yoga, massage, acupuncture and herbal medicine, to improve health and wellbeing of patients.

Ayurveda was first described by Agnivesha, in his book Agnivesh tantra. The book was later revised by Charaka, and renamed to Charaka Samhitā. Another early text of Ayurveda is Sushruta Samhitā. These three are served as textual material in ancient Universities of Takshashila and Nalanda.

Ayurveda adopts holistic approach. The two main guiding principles of Ayurveda:

1. The mind and the body are inter-connected
2. Mind has more power to heal and transform the body.

Ayurveda advocates every person is made of five basic elements as found in the universe namely Space, Air, Fire, Water and Earth. These combine within the physical body to make three life forces or energies, called "doshas". These doshas control how body works. They are *Vata dosha* (space and air); *Pitta dosha* (fire and water); and *Kapha dosha* (water and earth). Everyone inherits a singular mixture of the three doshas. However, one is usually stronger than the others. Each one controls a different body function. It's believed that your chances of getting sick and the health issues you develop are linked to the balance of your doshas.

According to Ayurveda, Vata dosha is most powerful among three doshas. Vata dosha controls very basic body functions like cell division, mind, breathing, blood flow, heart function, and skill to urge obviate waste through intestines. If vata dosha is main vital force in any person, he is thought to be more likely to develop conditions like anxiety, asthma, heart condition, skin problems, and arthritis. This traditional system of medicine was in use to treat and integrate body, mind, and spirit using a very comprehensive, preventive and healing therapies along with various purification and rejuvenation methods.

#### Treatment for Arthritis in Ayurveda:

According to Ayurveda, pain is caused by the aggravation of the vata dosha. Arthritis is a condition caused by accumulation of "ama" and aggravation of "vata". "Ama" is a toxic product of improper digestion. The ama circulates in the body and its deposits are collected at the sites which are weaker. When it deposits in the joints, there will be aggravation of "vata". According to Ayurveda, over eating of foods that are too salty, sour, alkaline, fatty, improperly cooked, meat of the animals or birds of marshy and desert regions which have been soaked in water, excessive drinking of sugar cane juice, exposure to cold winds, sleeping in the daytime and not in the night, travelling long distances at a stretch could causes Arthritis.

For digestion of toxic materials various combination of herbs viz. Hinguvadichoornam, Vaishwanarachoornam, Amrithotharam, Kashayam are used. Medicated oils like Dhanwantharam, Mahanarayanam, Sahacharadi and Pindatailam are used for external application. Internal medication with ghee and oil medium are also administered. This is followed by cleansing the body from accumulated

toxic materials (Panchakarma). The cleaning methods described in Ayurveda are therapeutic vomiting or emesis (vamana), purgation (virechana), enema (basti), elimination of toxins through the nose (nasya) and detoxification of blood (raktamokshana). After cleansing the body, Shamana therapy (rectification of imbalance in the body) is carried-out and followed by Rasayana therapy (Rejuvenation therapy) using various preparations [2]. Numerous herbal Kashayams are used to treat Rheumatic diseases and Osteoarthritis.

Medicinal plants like Harsingar or Parijata are used as potent therapeutic agents. It has phytoconstituents such as flavonoids, tannins, terpenes, quinones, catechins, glycosides phenolics alkaloids, anthocyanins and anthoxanthines, they are known to possess anti-inflammatory effects [8]. They act by suppressing the various types of inflammatory mediators involved in inflammation process. There are many medicinal plants which exert anti-arthritis activity at a particular dose.

Ayurveda world's most ancient healing heritage uses the Plantae since its inception for both diet and medicine. Among many plants and their different species, Harsingar or Parijata (*Nyctanthes arbor-tristis* Linn.) has therapeutic importance in many disease [9] having very high medicinal value.—Harsingar or Parijata is referred as in Sanskrit and night flowering jasmine in English is widely distributed in sub Himalayan regions and southwards to Godavari and is predominately native to Southern Asia [10]. The geographical distribution of the plant extends from northern Pakistan and southern Nepal through northern India and southeast to Thailand and also in other parts of the world [11].

#### Names and symbolism:

The Parijata tree is sometimes called the "tree of sorrow", because the flowers lose their brightness during daytime; the scientific name arbor-tristis also means "sad tree". The flowers are often used as a source of yellow dye for clothing. The flower is named Gangaseuli and Jharaa sephali in Odisha, India. The flower is the official flower of the state of West Bengal, India, which is also known as Parijata and Siuli in local West Bengal region in India, and for Kanchanaburi Province, Thailand [5] Har-Shringar in Mithilanchal Bihar (SKJ). It is called as Xewālee (hewālee) in Assamese, sepalika in Sri Lanka.

Parijata is also called as hara-singhara (Lord Hari is decorated by Parijata flower), Sephali (plenty of honey bees reside on this tree), Raga-pushpi (its flowers have very beautiful and attractive colours), Kahrapatrak (its leaves are rough in texture),

pushpaka, Nala-kumkuma (corolla tube is orange in color), Prajakta, Rakta kesara (Red colour corolla).

#### Significance in Hinduism and Mythological origin of Parijata [9]:

Parijata (*Nyctanthes arbor-tristis*), appears in several Hindu religious stories and is usually associated with the Kalpavriksha. According to, Bhagavata Purana, the Mahabharata and the Vishnu Purana, Parijata appeared as the result of the Samudra manthan (Churning of the Milky Ocean) and Lord Krishna battled with Indra to win Parijata. Further on, Krishna's wife Satyabhama demanded the tree to be planted in the backyard of her palace. It so happened that in spite of getting the tree in her backyard, the flowers were falling in the adjacent backyard of the opposite queen Rukmini, who was favourite of Lord Krishna, all due to her superior devotion and humility. *Kalpavriksha*, also referred to as Kalpataru, Kalpadruma or Kalpapādapa, is a wish-fulfilling divine tree in Hinduism, Jainism and Buddhism.

#### Habit and Habitat [12] :

*Nyctanthes arbor-tristis* (NAT), the night-flowering jasmine or Parijata or hengra bubar is a species of *Nyctanthes* native to South Asia and Southeast Asia. Significant Classification of NAT includes

*Kingdom: Plantae; Clade: Tracheophytes; Clade: Angiosperms; Clade: Eudicots; Clade: Asterids; Order: Lamiales; Family: Oleaceae; Genus: Nyctanthes; Species: Narbor-tristis.*

*Nyctanthes arbor-tristis* is a shrub or a little tree growing to 10 m tall, with flaky grey bark. The leaves are opposite, simple 6–12 cm long and 2–6.5 cm broad, with a complete margin. The flowers are fragrant, with a five-to-eight-lobed white corolla with an orange-red centre, they're produced in clusters of two to seven together, with individual flowers opening at dusk and finishing at dawn. The fruit is a bilobed, flat brown heart-shaped to round capsule 2 cm diameter, each lobe containing one seed. It is more found in southern part of India, and in south east Asian countries such as Thailand, Malaysia and Indonesia. It is often planted near Hindu temples in India and Sri Lanka, as well as in Malaysia and Indonesia.

Leaf, root, flower and seed of Parijata are used in different dosage form like juice, powder, decoction etc to treat numerous diseases. It is specifically used to pacify the diseases occurring due to vitiation of vatha and kapha.

**Chemical constituents [13]:**

- **Plant:** Contains 2,3,6 tri-O-methyl-D-glucose, 2,3,4,6-tetra-O-methyl-D-glucose, 2,3,6-tri-O-methyl-D-mannose, 2,3-di-O-methyl-D-mannose, arbortriosides A,B and C and iridoid glycosides
- **Stem:** Contain the glycoside naringenin-4'-O- $\beta$ -glucopyranosyl- $\alpha$ -xylopyranoside and  $\beta$ -sitosterol
- **Bark:** Contains glycosides and alkaloids
- **Leaves:** Contains  $\beta$ -sitosterol, D-mannitol, flavanol glycosides, nicotiflorin, oleanolic acid, astragalol, nyctanthic acid, tannic acid, methyl salicylate, ascorbic acid, an amorphous glycoside, an amorphous resin, trace of volatile oil, friedeline, carotene, mannitol, lupeol, glucose, fructose, iridoid glycosides, and benzoic acid.
- **Flowers:** Contain essential oils, nyctanthin, D-mannitol, tannins, glucose, carotenoids, glycosides including  $\beta$ -monogentiobioside- $\beta$ -D monoglucoside ester of  $\alpha$ -crocetin,  $\beta$ -monogentiobioside ester of  $\alpha$ -crocetin (or crocin-3) and  $\beta$ -digentiobioside ester of  $\alpha$ -crocetin (or crocin-1).
- **Seeds:** Contain arbortriosides A and B, glycerides of linoleic, lignoceric, oleic, stearic, palmitic and myristic acids, nyctanthic acid, 3,4-secotriterpene acid and a water-soluble polysaccharide composed of D-glucose and D-mannose.
- **Flower Oil:** Contains 1-hexanol, methylheptanone, phenyl acetaldehyde,  $\alpha$ -pinene, p-cymene, 1-decenol and anisaldehyde.

Due to the presence of lot of chemicals and phytochemicals, Parijata possess many pharmacological actions like analgesic, Anti-inflammatory, Anti-spasmodic, Anti-viral, Anti- allergic, Anti-fungal, Anti-Bacterial, Anti-pyretic, Immunomodulator, insecticidal, Respiratory stimulant, Anti-Malarial properties. Its anti-viral, anti-inflammatory, hepato protective, immune modulator actually helps to treat (manage) Arthritis. Daily consumption of its leaves decoction in small doses helps to manage arthritis with no other side effects.

Use of specific dosage form of Parijata in different disease condition are mentioned (listed) [13]

- Patra swarasa (leaf juice) with madhu (honey) is used in chronic fever.
- Leaf extract with loha bhasma is used to treat anemia and hepato biliary diseases.
- A decoction of the leaves is used and recommended for obstinate sciatica.
- Panchanga kwatha of this drug is used to treat udaka meha.

- Patra swarasa (leaf juice) and sugar are used to treat worm infestations.
- Churna prepared out of bark along with betel leaves 3 to 4 times a day is used to treat cough and breathlessness /bronchitis.
- Paste prepared from its seeds is applied over the affected area in case of hair loss.
- Leaf extract is used to treat fever, fungal infections, its leaf extract is given to children for the expulsion of roundworms and thread worms.
- Leaf juice is used to treat rheumatism and fever, as an antidote for reptile venoms and snake bite.
- The bark of this tree is used in eye diseases, ulcers and as expectorant. Bark decoction is used for bleeding gums.
- The seeds, leaves, flowers of Parijata possess hepato-protective immune-stimulant, antiviral and antifungal activities.
- The leaves have powerful antioxidant properties that can be effectively used to get rid of harmful effects of free radicals in our body.
- The leaves can be used to inhibit early signs of aging and development of cancer.

**CONCLUSION:**

Arthritis is an autoimmune disorder characterized by pain, swelling and stiffness. Conventional drugs such as NSAIDS, DMARDS, CORTICOSTEROIDS, BIOLOGICS are not only costly but are also associated with very serious adverse side effects. Ayurveda emphasizes preventive and healing therapies along with various methods of purification and rejuvenation. Ayurveda treatment for Arthritis includes Panchakarma, cleansing methods such as therapeutic vomiting or emesis, purgation, enema, elimination of toxins through nose, detoxification, Shamana therapy, rejuvenation therapy. Ayurveda demands break between therapies, hence periodic treatment and regular usage of herbal formulations either as single drug or polyherbal drugs helps in reducing (managing) arthritis.

As traditional medicine in India, numerous plants are used as single herb or polyherbal formulations to treat arthritis and other inflammatory diseases. Parijata has been used for different medical as well as domestic purposes since ancient times. On chemical and phytochemical analysis, it is found that plant contains many active compounds such as sitosterol, nyctanthic acid, tannic acid, linoleic acid, D-mannitol and oleic acid. These constituents are responsible for its high therapeutic efficacy.

The leaves are antibacterial, anti-inflammatory and anthelmintic. Further, a dye extracted from the corolla tube is used to lend colour to Tussore Silk.

The flowers are bitter astringent, ophthalmic, stomachic and carminative.

It is an expectorant, bitter and tonic, febrifuge, and mild purgative. It is used in bilious and obstinate remittent fever, sciatica, and rheumatism. It is also very useful in constipation of children. The leaves are bitter and acrid. It is being used to treat fever, fungal skin infection and also dry cough. It is used in treatment of bronchitis and also as an antidote to snakebite. Multi active ingredients present in different parts of the plant may be the cause of its broad spectrum therapeutic use.

In addition to Ayurvedic therapies, cold laser therapy, acupressure treatment, chiropractic therapy, balanced diet and regular physical activities help arthritic patients to lead a pain free life without harmful side effects. Over all *Parijata* is a very important herbal medicine.

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