Review Article

www.ijrap.net

A REVIEW ON RASNA SAPTAK KWATH: AN AYURVEDIC POLYHERBAL FORMULATION FOR ARTHRITIS

Shruti Pandey [1]*, Anand Kumar Chaudhary [2]

[1]Ph.D Scholar, Department of Rasa Shastra, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India

[2]Professor & Head, Department of Rasa Shastra, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India

Received on: 18/12/16 Revised on: 03/01/17 Accepted on: 08/02/17

***Corresponding author**
E-mail: shruayu@gmail.com

DOI: 10.7897/2277-4343.08126

ABSTRACT

Rheumatoid arthritis (RA) is a most common immuno-inflammatory joint disorder seen in clinical practice mainly affecting synovial joints with synovial proliferation and destruction of articular cartilage. It is an autoimmune disease, whereby the body's immune system attacks its own tissues as if it were a foreign invader. The scientific community view that increased oxidative stress or defective antioxidant status contributes to the pathology of RA. In recent times, focus on Complementary and Alternative Medicine (CAM) has increased all over the world. Ayurveda, a traditional system of medicine, emphasized the use of medicinal plants in the form of various formulations for treatment of arthritis. Among them, Rasna Saptak Kwath (RSK) is a formulation, which contains eight medicinal plants viz. *Pluchea lanceolata, Tribulus terrestris, Tinospora cardifolia, Boerhavia diffusa, Ricinus communis, Cedrus deodara, Cassia fistula and Zingiber officinale*. These herbs have the potential to treat symptoms of RA like inflammation and pain other than that, it also treats arthritis at immune and free radical level. These herbs are known for their immunosuppressive action (e.g. *Pluchea lanceolata*), anti-inflammatory action (e.g. *Tribulus terrestris,*), analgesic action (ex. *Ricinus communis,*), and antioxidant (e.g. *Tinospora cardifolia*). This review paper emphasized on a comprehensive information for each herb of RSK because pharmacology, mechanism of actions based on various preclinical studies, safety precautions along with the current research potential of the herb. At the same time, the probable pharmacodynamic action of drugs is drawn to know the imperative for optimal and safe utilization of the herb, are discussed in this review paper.

Keywords: Ayurvedic medicinal plants, Rheumatoid arthritis, Rasna Saptak Kwath, Immunosuppressive, Antioxidant.

INTRODUCTION

Rheumatoid arthritis is a most common immuno-inflammatory joint disorder seen in clinical practice mainly affecting synovial joints with synovial proliferation and destruction of articular cartilage[1]. The scientific community views it as an autoimmune disease, whereby the body's immune system attacks its own tissues as if it were a foreign invader[2]. In recent times, focus on Complementary and Alternative Medicine CAM has increased all over the world. Ayurvedic system of medicine is a plant base, mineral base and animal base system of medicine system. The branch in Ayurveda which deals with the dosage form of Ayurvedic medicines known as *Bhaishjya kalpana* (Ayurvedic pharmaceutics). In Ayurvedic pharmaceutics the medicinal plants firstly converter into primary dosage form viz. Swarasa (self-expressed juice), Kalka (paste), Kwath (decoction), Hima (cold water infusion), Phanta (hot water infusion) and then these primary dosage form transformed into secondary dosage form viz. solid dosage forms (pills, powders), liquid dosage forms (Asavas, Aristhas-a hydroalcoholic formulation) and semisolid dosage forms (ghritas, avalehas - semisolid dosage form). These dosage forms either have single herbal ingredient, polyherbal or herbo-mineral ingredients [3].

Rasna Saptak Kwatha (RSK) is an Ayurvedic polyherbal decoction prescribed for arthritis. The formulation RSK contains medicinal plants (Table 1)[4] viz. *Pluchea lanceolata, Tribulus terrestris, Tinospora cardifolia, Boerhavia diffusa, Ricinus communis, Cedrus deodara, Cassia fistula and Zingiber officinale.* These herbs are known for their anti-inflammatory activity, analgesic, anti-arthritic activity. viz Rasna (*Pluchea lanceolata*), Gokshura (*Tribulus terrestris*), Eranda (*Ricinus communnis*). Some of them even known for their antioxidant activity like Aragvadha (*Cassia fistula*) and Immunomodulatory activity like Guduchi (*Tinospora cardifolia*) see Table 2.

The present review paper is an attempt made to provide comprehensive information for each herb present in the formulation of RSK on account of pharmacology, mechanism of actions on various preclinical studies, safety precautions. At the same time, the probable pharmacodynamic action of drugs is drawn to know the imperative for optimal and safe utilization of the herb, are discussed. The present review incorporated a detailed account of the plant, stressing its therapeutic uses, pharmacology, mechanisms of action based on preclinical safety issues along with the current research potential of the herb. A high quality and reliable medical information from the internet was retrieved only from the Health-on-Net (HON) conduct-certified and accredited websites like Entrez PubMed (Medline), CAM-PubMed, Allied and complementary medicine database, Natural Medicine Comprehensive Database, Embase and Cochrane library.

RASNA (*Pluchea lanceolata)*

Rasna (Figure 1) has been traditionally used since ancient times by Ayurvedic practitioners, to treat various painful afflictions and swelling of the body joints[5]. Tribally, a poultice of leaves is applied to the inflamed areas of the body. It is a major ingredient

of the famous anti-inflammatory Ayurvedic decoction viz. "Maharasnadi Qwath"[6] and "Rasna Saptak Kwath"[7]

Active Constituents[8]
Moretenol, Moretenol Acetate, Neolupenol, Octacoanoic, Hexacosanoic And Tetracoanoic Acid, Tetrcosanol, Hexacoanol, Triacontanol, Stigmasterol And Beta-Sitosterol-D-Glucoside (leaves and stems)
Quercetin & Isorhamnetin (air dried leaves)

Mechanism of action on basis of preclinical studies
Anti-inflammatory activity[9]: The ethanolic extract of *Pluchea lanceolata* exhibited significant anti-inflammatory activity. An important clinical difference was that the plant extract suppressed the delayed periarticular changes more as compared to the acute inflammatory phase. Another study on the therapeutic aspect of *Pluchea lanceolata* was the comparison of the water-soluble fraction of the alcoholic extract with the non-saponifiable steroidal fraction, the test system being carrageenan-produced hind paw swelling in albino rats. While the former extract did not show significant activity, the latter steroidal fraction was significantly anti-inflammatory in action. It had, however, not much effect on the granuloma pouch. The anti-inflammatory potential of some Ayurvedic compositions containing *Pluchea lanceolata* extract was tested on experimental arthritis and granuloma pouch. They showed marked anti-inflammatory activity in both models. In experimental arthritis, a decoction of the plant has been reported to prevent the swelling of joints.

Immunosuppressive actions[10]: The immunosuppressive potential of 50% ethanolic extract of *Pluchea lanceolata* and its bioactive chloroform fraction (PLC) was investigated with basic models of immunomodulation, such as, the humoral antibody response (hemagglutination antibody titers), cell-mediated immune response (delayed-type hypersensitivity), skin allograft rejection test, in vitro and in vivo phagocytosis (carbon clearance test). The findings revealed that *Pluchea lanceolata* causes immunosuppression by inhibiting Th1 cytokines.

Anti-oxidant activity[11]: Flavonoids are reported as scavengers of free radicals and potent inhibitors of lipid peroxidation. Oral pre-treatment of the ethanolic extract significantly attenuated cadmium chloride, induced oxidative stress, and genotoxicity.

Anti-arthritic activity[12]: In albino rats, the water-soluble fraction of the 90% alcohol extract showed significant anti-inflammatory activity in induced formalin arthritis and granuloma pouch. The decoction of the plant has been used in arthritis. The leaves are aperients and used as a laxative, analgesic and antipyretic.

GOKHSURA (*Tribulus terrestris*)

This spiky fruit (Figure 2) looks like the cloven hoof of a cow and hence the name of a go-ksura (cow-hoof). 'Kshura' means "scratcher". It is a superb diuretic that clears excess fluids from the system. Its hormonal precursor compounds actively nourish the reproductive system. It is also very useful for itchy skin, especially on the hands and feet. The fruit aerial parts and root are used in Ayurveda. The aerial parts appear to have the widest spectrum of rejuvenative activity for the reproductive system. The fruits are best known for their lithotropic activity and for their action on the skin.

Active Constituents[13]
Phyto-Sterol and Saponins (Fruits): Protodioscin, Terrestrosins A-E, Stigmasterol, Gitonin, Beta – Sitosterol.
Steroidal Sapogenins (Flowers- based on diosgenin): Hecogenin And Ruscogenin.
Flavonoids: Kaempferol & Quercetin.
Alkaloids: Harmala Potassium Nitrate, Lignans, Tribulusamides A & B

Mechanism of action on basis of preclinical studies
Anti-arthritic activity[14,15]: Methanolic extract of *Tribulus terrestris* fruit was reviewed for anti-arthritic activity in rat. The anti-arthritic activity of *Tribulus terrestris* (200mg/kg and 300 mg/kg p.o.) was assessed using Frund's complete adjuvant (FCA) induced arthritis in rats. The herbal extracts at dose 200mg/kg and 300 mg/kg p.o was administered for 21 days after the injection of FCA in the rat's paws. It has an important mechanism of anti-arthritic activity, which is the membrane stability modulating effect. The activity is probable due to presence of flavonoids. These flavonoids are having the surface charge neutralizing effects. It was found that the administration of *Tribulus terrestris* (200 and 300 mg/kg bodyweight) leads to inhibition of leukocyte migration which may have beneficial effect for joint preservation. The activity may be due to presence of steroidal glycoside[16]. The researchers have shown that dry extract of *Tribulus terrestris* increases calcium level in the blood serum in broilers parent. Ethanol (95%) extract of the dried entire plant, administered intraperitoneally to mice showed skeletal muscle relaxant activity.

Analgesic activity[17,18]: The significant analgesic effects of different doses of *Tribulus terrestris* extract in formalin test. In the formalin test, the initial phase is a direct stimulation of nociceptors and the late phase is thought to be secondary to inflammatory reaction and therefore it seems that the analgesic effect of *Tribulus terrestris* extract may be mediated centrally and peripherally. The most effective dose of extract was 100 mg/kg. However, doses higher than this one did not increase the analgesic effect of extract. Doses higher than 400 mg/kg produced non-pharmacologic or toxic effects.

Herb- drug interactions[12:] Caution with antipsychotic drugs (especially MAO inhibitor medication) as its alkaloid content may speed up the breaking down of the medication in the digestive system thus reducing the effectiveness of the drug.

Safety profile[19]: The maximum tolerated dose of a 50% ethanolic extract of fruit was 100mg/kg in rats.

GUDUCHI *(Tinospora cardifolia)*

Guduchi (Figure 3) is described as "the one who protects the body" One of the synonym is "amrta" which means "divine nectar". This is a virile creeper that grows throughout the forest of India. Those growing up neem (*Azadirachta indica*) trees are said to be the best as the synergy between these two bitter plants enhances efficacy. Its therapeutic strength lies in its rejuvenating and strengthening properties while also detoxifying and cleansing the whole system, specifically via the liver. It is also known as cakralakshana meaning "marked with a circle as the transverse section of the vine system reveals a cartwheel pattern".

Active Constituents[20]
Glucoside: Giloin, Bitter Principles,
Alkaloids: Berberine, Protoberberine, Tinosporin,
Diterpenes: Columbin, Chasmanthin, Palmarin, Tinosporone, Tinosporic Acid, Syringin, Cordial.

Mechanism of action on basis of preclinical studies

Immunomodulatory activity[21]: Guduchi leads to stimulation of T and B lymphocytes and also exhibits TH-1 immune response which results in enhanced macrophage phagocytosis and increase production of nitric acid. In one of the study it was reported that, the extract of Guduchi, significantly increase the number of colony-forming units of the granulocyte-macrophage series (CFU-GM). This result showed that, extract of guduchi was responsible for activation of macrophages, leading to increase in leukocytes and enhanced neutrophil functions. The spontaneous mytogenic activity on splenocytes which potentiated non-specifically the responsiveness of splenoctes to mytogen, is responsible for immunomodulatory activity of Guduchi.

Anti-inflammatory activity[22]: The aqueous extract has significant anti-inflammatory activity. It significantly reduces the pain and morning stiffness in patients having rheumatoid arthritis. RA is considered as an immune disorder and guduchi have active principles which have anti-inflammatory and anti-arthritic activity. This effect is also considered to be due to the inhibition of C3 convertase and serine protease which indicates that inhibition of serine protease in general may be involved in anti-inflammatory activity. When C3 convertase is inhibited, pro inflammatory anaphylactic peptides are not released with the result that no inflammation is observed. In one of the study Guduchi Yoga had shown significant reduction in serum uric acid levels[23]

Antioxidant activity[24]: The extract of *Tinospora cardifolia* reported for reducing the toxicity which was caused by free radicals. It also inhibits the lipid peroxidation and generation of superoxide and hydroxyl radicals in vitro. The extracts also reduced the elevated lipid peroxides in serum and liver and alkaline phosphatase glutamine pyruvate transaminase

Safety Profile[25]: Excessive doses of berberine inhibit vitamin B assimilation and can cause nausea. The maximum tolerated doses are 250 and 500mg/kg in adult rats for the 50% ethanolic extract of the *Tinospora cardifolia.*

PUNARNAVA *(Boerhavia diffusa)*

Punarnava (Figure 4) literally means in Ayurveda one which "renews the old body". Its rejuvenative action works via its opening and cleansing activity, allowing effective nourishment to reach the tissues. It is a superb diuretic and it benefits the heart. This water – loving creeping, perennial flowers during the monsoon and grows all over India and Srilanka. It is the main ingredient in Punarnavadi guggulu an Ayurvedic formula for reducing water retention, congestive heart conditions and treating oedematous inflammatory joint diseases.

Chemical Constituents[26]

Alkaloids: Punarnavine

Phytosterols: Beta-Sitosterol, Lignans: Liriodendrin, Syringaresinol Mono-B-D Glucoside, Rotenoids: Punarnavoside, Root Contain-Rotenoids Boeravinone A, B, C2, D And F, and Salts: Potassium Nitrate, Xanthones: The Benzene Extract Yielded Boerhavine.

Mechanism of action on basis of preclinical Studies

Anti- arthritic activity[27]: The aqueous extract significantly inhibited the increased serum amino transferase activity in arthritic animals similar to hydrocortisone. Liver ATP phosphohydrolase activity was also increased by the aqueous extract

Anti-inflammatory activity[28]: The aqueous and acetone extracts of the root, showed significant anti-inflammatory activity against carrageenan-induced edema and formaldehyde induced arthritis in albino rats. The water insoluble alcoholic extract of different parts of the plant was studied for anti-inflammatory activity against carrageenan induced paw swelling in rats. The root and leaves were found to be most active.

Antioxidant[29]: Ethanol and methanol extracts were prepared and screened for in-vitro antioxidant activities using Ferric reducing power and Hydrogen peroxide scavenging activity. The activity was compared to standard antioxidant like ascorbic acid. Both the extracts showed strong antioxidant activity in both the methods. Between these two extracts, ethanolic extract has shown better antioxidant activity as compared to methanolic extract in both the activities.

Herb- drug interactions[25]: No drug – herb interaction is known, but caution with sedative, anti-depressive and antiepileptic medication. There is potential for a positive potentiation of ACE inhibitors.

Safety profile[30]: Safe if used with appropriate clinical guidance, but may raise blood pressure and affect the heart. LD_{50} for a 50% ethanolic extract of the root and the whole plant was 1000mg/kg body weight in adult albino rats

ERANDA *(Ricinus communis*)

Castor oil is considered as the king of the medicines for treating arthritis. A native of Africa, it grows all over the India. Of the two varieties, red and white, the white is used medicinally. The leaf and the root are also highly prized medicines for arthritis (Figure 5).

Active Constituents[31]

Phytosterols: Brassicasterol, Campesterol, Beta-Sitosterol, Beta-Amyrin, Lupeol presents in aerial pats.

Flavonoids, Coumarins and Phenolic Acid; Kaempferol, Quercetin, Isoquercetin, Rutin (Aerial Parts), Gallic Acid, Ellagic Acid, Chlorogenic.

Alkaloid: Ricinine (Seed)

Fatty Acids: Ricinoleic Acid, Palmitic, Linoleic and Stearic Acids.

Proteins: Ricin- A, B, C, D (Seed)

Mechanism of action on basis of preclinical studies

Antioxidant effect [32]: Extract produced an inhibition of Aryl Hydrocarbon hydro-oxylase (AHH) activity and H_2O_2 production by lindane-induced mouse Hepatic microsomes, indicating the antioxidant activity of the plant.

Anti-inflammatory activity[33,34]: Petroleum ether extract of the root bark shows anti-inflammatory activity against formaldehyde induce arthritis. It significantly reduces the edema when administered up to 15 days. It is known to inhibit the primary and secondary phase of inflammation. The anti-inflammatory effect produced is potent as compared with betamethazone. As it inhibits the secondary phase of inflammation and it is known that only specific anti-inflammatory agent act on secondary phase, it is considered as specific anti-inflammatory agent.

Herb- drug interactions [35]: Hypokalaemia (resulting from long-term laxative abuse) potentiates the action of cardiac glycosides and interacts with anti-arrhythmic medicinal products. Concomitant use with diuretics, adrenal corticosteroids and liquorice root may enhance loss of

potassium. Concomitant use of antihistamines may reduce the laxative action of castor oil (WHO, 2009).

Safety Profile[36]: The seeds are highly toxic. If swallowed without chewing poisoning is less likely because the impermeable seed coat remains intact. The oil is used more commonly and as the protein ricin is denatured during processing, therapeutic dosages of castor oil are reasonably safe. Oil is contradicted in intestinal obstruction, abdominal pain pregnancy and lactation.

DEVDARU *(Cedrus deodar)*

This hardy tree (Figure 6) thrives in the high altitudes of the western Himalayas. It means wood of the gods. The inner wood is aromatic and is also distilled into essential oils. The outer bark is astringent and is used for diarrhea and Pain. The essential oil usually comes from the uprooted stumps of felled trees.

Active Constituents[37]
Essential Oil: Heartwood yields about 2.1% of essential oil, consisting mainly of the Sesquiterpenes Hydrocarbons Alpha-Himachalene, Beta- Himachalene, P-Methyl Acetophenone, Atlantone And Himachalol.
Hydrocarbon: The Petroleum Ether Extract of the bark oil yields saturated straight chain and branched chain hydrocarbons (C_{14}-C_{20}).
Flavonoids: Stem bark contains Deodarin, Taxifolin and Quercetin.

Mechanism of action on basis of preclinical studies
The anti-inflammatory, Anti-arthritic activity and Analgesic activity [38,39]
An aqueous extract of the air-dried stem bark showed anti-inflammatory and anti-arthritic activity against acute and chronic inflammation in carrageenan-induced paw swelling, cotton pellets, granuloma pouch and formalin and adjuvant arthritis in albino rats. The volatile oil from wood exhibited anti-inflammatory activity against exudative proliferative and chronic phases of inflammation in adjuvant arthritis in rat. The oil also showed analgesic activity against acetic acid- induced writhing and hot plate reaction in mice.

Safety profile [40]: A formulation having 15% mixture of oil in castor oil was tested for acute toxicity and it was found that, the formulation was non-irritant to the skin of rabbit and sheep and did not alter blood urea nitrogen and blood glucose levels. The LD_{50} was 500 mg /kg in adult albino mice.

ARAGVADHA *(Cassia fistula)*

This medium sized tree (Figure 7) grows all over the world. Aragvadha literally means "remover of disease".

Active Constituents [41]
Glycosides, Sterols
Anthraquinones: Fistulic Acid and Sennosides,
Sugar: Saccharose

Mechanism of action on basis of preclinical studies
Anti-inflammatory activity[42]: The methanol extract of leaves exhibited anti-inflammatory activity against carrageenan, histamine and dextran-induced paw swelling in rats.

Antioxidant activity[43]: Anti-inflammatory and Antioxidant activities of the aqueous (CFA) and methanolic extracts (CFM) of the *Cassia fistula Linn*. bark was assayed in wistar albino rats. The extracts were found to have significant anti-inflammatory effect in both acute and chronic models. *Cassia fistula* bark extracts showed significant radical scavenging by inhibiting lipid peroxidation initiated by CCl_4 and $FeSO_4$ in rat liver and kidney homogenates. Both extracts exhibited significant antioxidant activity in DPPH, Nitric oxide and Hydroxyl radical induced in vitro assay methods. Both extracts showed Dose-Dependent protective effect against lipid peroxidation and free radical generation in liver and kidney homogenates

Immunomodulatory activity[44]: .In one of the study it was reported that Aragvadha significantly stimulate the cell mediated immunity in immune responses with the antigenic challenge by sheep RBCs. In this study, there was increases in neutrophil adhesion and delayed type hypersensitivity response and no effects on the humoral immunity. This immunomodulatory activity was performed by the administered doses of 100 and 200 mg kg-1 orally in rats.

Safety profile[45]: Aqueous and methanol extract of *Cassia fistula* bark were studied for acute oral toxicity in Albino wistar rats up to the doses of 2000 mg kg^{-1} and it was found that it is not the lethal dose.

SUNTHI *(Zingiber officinale*)

Ginger (Figure 8) is a perennial that thrives all over India and Sri lanka, especially in hot and damp environments. As it increases digestion of nutrients it may also increase assimilation of pharmaceutical drugs.

Active Constituents [46]
Phenolic compounds: The pungent components are series of Gingerols, Gingerdiols and Gingerdiones and their dehydration products, the Shogaols.
Essential Oils - 1-2% volatile oil Zingiberine, Zingerone, Camphene, Borneol, Phellendrene, Citral.

Mechanism of action on basis of pre-clinical studies
Anti-inflammatory activity[47]: It blocks inflammatory prostaglandins and thromboxane. The volatile and essential oils, beta-phellendrene and zingiberine decompose on drying. The warming gingerol principle transforms into shogaols on drying making it more centrally heating. Fresh ginger is more peripherally active while dry ginger is more centrally stimulating and warming it is considered as effective as acetyl-salicyclic acid in reducing carrageenan induced paw swelling in rats. It is thought that these anti-inflammatory actions are the result of inhibition of prostaglandin release and hence ginger may act in a similar manner as NSAID, which interfere with prostaglandin biosynthesis. It is found that 6-gingerol and 6-shagol have analgesic and antipyretic activities.

Analgesic activity[48]: The rhizome extract of *Zingiber officinale* was investigated for anti-inflammatory and analgesic properties in albino rats and Swiss mice respectively. The extract (50 and 100 mg/kg b.w) produced significantly ($P<0.05$) inhibition of the carrageenan – induced rat paw swelling and a reduction in the number of writhing induced by acetic acid in mice. The results showed that rhizome extract of *Zingiber officinale* possesses anti-inflammatory and analgesic agent(s)

Antioxidant activity[49]: The pungent principles including gingerol and zingerone, demonstrated in vitro effects in scavenging the superoxide and hydroxyl-radicals and inhibiting lipid peroxidation.

Herb- drug interactions[45]: Ginger may increase the absorption of allopathic medication. Theoretical interaction with anti-

coagulant medication is not proven by human clinical trials. Used at less than 3gm per day it is safe in patients susceptible to hemorrhage or taking warafrin or aspirin. It may reduce the effect of antacids, as it increases gastric secretions. Not recommended in patients with gallstones due to its cholagogue effect.

Safety Profile[50]: It is generally considered as safe. It has been demonstrated to be helpful in allaying nausea of pregnancy. Sometimes it is contraindicated in pregnancy as it could potentially induce uterine contractions

Table 1: Ingredients present in Rasna saptak kwath

S.no	Plant Name	Scientific Name	Part Used
1	Rasna	*Pluchea lanceolata*	Leaf
2	Gokshura	*Tribulus terristris*	Fruit
3	Guduchi	*Tinospora cardifolia*	Stem
4	Punarnava	*Boerhavia diffusa*	Root
5	Eranda	*Ricinus communis*	Root
6	Devdaru	*Cedrus deodara*	heartwood
7	Aragvadha	*Cassia fistula*	Fruit
8	Sunthi	*Zingiber officinale*	Rhizome(dry)

Table 2: Pharmacological properties of each herbs present in formulation

S.no	Ingredient	Modern Pharmacology
1	Rasna	Anti-Inflammatory, Anti-Arthritic Activity, Anti-Oxidant Activity
2	Gokhsura	Anti-Inflammatory, Analgesic Anti-Arthritic Activity
3	Guduchi	Anti-Inflammatory, Immunomodulatory Effect
4	Punarnava	Rejuvenator, Anti-Inflammatory
5	Eranda	Anti-Inflammatory, Analgesic Activity
6	Devdaru	Anti-Inflammatory, Analgesic
7	Aragvadha	Anti-Inflammatory, Antioxidant
8	Sunthi	Anti-Inflammatory, Analgesic

A - fresh Herb

B - Dried stem

Figure 1: ***Pluchea lanceolata***

A - Fresh Herb

B - Dried fruit

Figure 2: ***Tribulus Terristeris***

A - Fresh herb

B - Dried stem

Figure 3: ***Tinospora Cardifolia***

A - Fresh herb

B - Dried root

Figure 4: ***Boerhavia diffusa***

A - Fresh herb

B - Dried root

Figure 5: ***Ricinus communis***

A - Adult Plant

B - Dried heartwood

Figure 6: ***Cedrus deodara***

A - Adult plant

B – Fruit

Figure 7: ***Cassia fistula***

A - Fresh plant

B - Dried rhizome

Figure 8: ***Zingiber officinale***

CONCLUSION

Ayurveda is gaining an overwhelming response all over the world, especially in treating chronic or lifestyle disorders. Improper life style, irregular food habits, stress and workaholic attitude is now gripping the younger generation by altering the physio biological phenomenon of their body thus hampering their standards of life style causing an imbalance at cellulo molecular level and inculcating one of the chronic disease viz. arthritis.

Ayurveda paves a holistic approach regarding treatment of chronic and a life style disorder with a plentiful formulation quoted in numerous Ayurvedic classics and plays an eminent role in establishing the quality of life. RSK is one of the renowned formulation among them adapted by the Ayurvedic practitioners in their regular clinical practice for the treatment of arthritic symptoms. Various researches states that the enlisted herbs of RSK, a significant formulation which respond positively to the cardinal symptoms of arthritis like inflammation, pain, stiffness etc. as these herbs cumulatively works as an immunosuppressive and antioxidants for management of the arthritic symptoms by countering at cellulo–mechano-bio molecular level.

Ancient Ayurvedic practitioners designed an Ayurvedic formulation with synergism of these medicinal herbs, to treat all the factors related to arthritis and till date this formulation holds its quality's efficacy and proves its effectiveness at par to the contemporary parameters.

REFERENCES

1. Stephen J,Mxine A. Current Medical Diagnosis and Treatment,47th ed. New York: Mc Graw Hill Publishers;2008, p. 721
2. Murray M, Pizzorno J. Encyclopedia of Natural Medicine.2nd ed. Germany: Prima Publishing; 1998.p.770-1.
3. Sharangdhara Acharya, Sharangdhar Samhita, by Adhamalla and Gudharth Dipika by Kasiram, Edited by Pandit parasuram shastri, Varanasi, Chaukhamba Orientalia Publishers, 5th ed, 2002 Madhyam Khand,2nd chapter,,p 133
4. Anonymous, The Ayurvedic Formulary of India, 2nd ed. Part-1, Indian System of Medicine and Homeopathy, Govt. of India,2003.
5. Agnivesh, Charak Samhita, English commentary by Sharma P.V., Reprint, Varanasi: Chaukhambha Orientalia Publishers, Reprint 2011, Sutra Sthana 3/21,p 89
6. Thabrew MI, Dharmasiri MG, Senaratne L. Anti-inflammatory and analgesic activity in the polyherbal formulation Maharasnadhi Quathar. Journal of ethnopharmacology.2003;85(2):261-7.
7. G.Dash. Bhaisajya R ratnavali.1st ed. Varanasi: Chaukhamba Sanskrit Bhawan Publishers;.2006, p 289
8. Goyal PK. A Review on Phytochemical and Biological Investigation of Plant Genus Pluchea. Indo American Journal of Pharm Research.2013;3(4):3000-7
9. Srivastava V, Varma N, Tandon JS, Srimal RC. Anti-inflammatory activity of Pluchea lanceolata: isolation of an active principle. International Journal of Crude Drug Research. 1990;28(2):135-7.
10. P. K. Goyal et.al. A Review on Phytochemical and Biological Investigation of Plant Genus Pluchea. Indo American Journal of Pharm Research.2013;3(4):3000-7
11. Sharma SK, Goyal N. In Vitro Antioxidant Activity of Root Extracts of Pluchea lanceolata. Journal of Pharmaceutical and Biomedical Sciences. 2011;10(10):141-45
12. Feroz H, Khare AK, Srivastava MC. Experimental evaluation of anti-arthritic activity of Rasna in rats & rabbits.Indian drugs. 1982.
13. Pole S. Ayurvedic medicine: The Principles of Traditional Practice. 1st ed.London: Churchill Livingstone Publishers;2006.p.185
14. Mukund S. Chemistry and Pharmacology of Ayurvedic Medicinal Plants.1st ed. Varanasi: Chaukhamba AmaraBharati Prakshan;2006.p.345
15. Mishra NK, Biswal GS, Chowdary KA, Mishra G. Anti-arthritic activity of Tribulus terrestris studied in Freund's Adjuvant induced arthritic rats. Journal of Pharmaceutical Education and Research. 2013; 4(1):41-44.
16. Philips OA, Mathew K, Oriowo MA. Antihypertensive and vasodilator effects of methanolic and aqueous extracts of Tribulus terrestris in rats. J Ethnopharmacol, 006;104(3):51–5.
17. Heidari MR, et.al. The analgesic effect of Tribulus terrestris extract and comparison of gastric ulcerogenicity of the extract with indomethacine in animal experiments. Annals of the New York Academy of Sciences. 2007; 1095(1):418-27.
18. Nagarkar BH, et.al. Comparative evaluation of anti-inflammatory potential of medicinally important plants. Int J Pharm Pharm Sci. 2013; 5(3):239-43.
19. Elizabeth M Williamson.Major herbs of ayurveda.1st ed. London: Churchill Livingstone Publishers; 2002. p. 311
20. Pole S. Ayurvedic medicine: The Principles of Traditional Practice. 1st ed.London: Churchill Livingstone Publishers;2006. P.189
21. Upadhyaya R, Pandey RP, Sharma V, Verma Anita K. Assessment of the multifaceted immunomodulatory potential of the aqueous extract of Tinospora cordifolia. Research Journal of Chemical Sciences. 2011; 1(6):71-9.

22. Patgiri B, Umretia BL, Vaishnav PU, Prajapati PK, Shukla VJ, Ravishankar B. Anti-inflammatory activity of Guduchi Ghana (aqueous extract of Tinospora Cordifolia Miers.). Ayu. 2014 Jan;35(1):108.
23. Shivaprasad Huded, Sonia V Gummadi, Kuber Sankh, Asha H.N. Ashwini H.S, Lingadore K. Evaluation of guduchi Yoga in the management of vatarakta (gouty arthritis): A Clinical study. Int. J. Res. Ayurveda Pharm. 2013;4(5):688-692
24. Vd.Mukund Sabnis. Chemistry and Pharmacology of Ayurvedic Medicinal Plants. Ist ed. Varanasi: Chaukhamba AmaraBharati Prakshan, 2002, p. 340
25. Elizabeth M Williamson.Major herbs of ayurveda.1st ed. London: Churchill Livingstone Publishers; 2002.p.302
26. Pole S. Ayurvedic medicine: The Principles of Traditional Practice. 1st ed.London: Churchill Livingstone Publishers;2006. P. 246
27. Annonymus,Indian Medicinal Plant. Vol.4, Medicinal Plants unit: Indian Council of Medical research,New Delhi, 2008. P. 617-30
28. Oladele GM, Ode OJ, Ogunbodede MA. Evaluation of anti-inflammatory and membrane stabilizing effects of aqueous root extract of *Boerhavia diffusa* Linn in rats. International Journal of Aplied Biology and Pharmaceutical Technology. 2011; 2(3):84-8
29. Rajpoot K, Mishra RN. *Boerhavia diffusa* Roots (Punarnava mool)–Review as rasayan (rejuvenator/antiaging). International Journal of Pharmaceutical and Biomedical Research. 2011 Oct;2(4):1451-60.
30. Elizabeth M Williamson.Major herbs of ayurveda.1st ed, London:Churchill Livingstone Publishers; 2002. P. 76
31. Pole S. Ayurvedic medicine: The Principles of Traditional Practice. 1st ed.London: Churchill Livingstone Publishers;2006. P. 153
32. Elizabeth M Williamson.Major herbs of ayurveda.1st ed. London:Churchill Livingstone Publishers; 2002.p.452
33. Kr BK, Parimi S, Ayaz A. Antinflammatory activity of eranda paka against carrageenan induced paw oedema in albino rats. Int.Ayurvedic Med. J.2014;2(3):337-341
34. Vd.Mukund Sabnis. Chemistry and Pharmacology of Ayurvedic Medicinal Plants. 1st ed. Varanasi: Chaukhamba Amara Bharati Prakshan.2006.p. 451
35. Vd.Mukund Sabnis. Chemistry and Pharmacology of Ayurvedic Medicinal Plants. 1st ed. Varanasi: Chaukhamba Amara Bharati Prakshan.2006.p. 450
36. Elizabeth M Williamson. Major herbs of ayurveda.1st ed, London:Churchill Livingstone Publishers; 2002. P. 251
37. Pole S. Ayurvedic medicine: The Principles of Traditional Practice. 1st ed. London: Churchill Livingstone Publishers;2006. P. 171
38. Annonymus, Indian Medicinal Plant. Vol.5, Medicinal Plants unit: Indian Council of Medical research, New Delhi, 2008.p.617-30
39. Singh P, Tripathi K, Yadav RB, Yadav KN. Devadaru (Cedrus deodara (Roxb.) Loud.): a critical review on the medicinal plant. International Journal of Ayurveda and Pharma Research. 2015 Dec 17;2(1).
40. Elizabeth M Williamson.Major herbs of ayurveda.1st ed, London:Churchill Livingstone Publishers; 2002. P. 99
41. Pole S. Ayurvedic medicine: The Principles of Traditional Practice. 1st ed. London: Churchill Livingstone Publishers;2006.p. 129
42. Annonymus, Indian Medicinal Plant. Vol.5, Medicinal Plants unit: Indian Council of Medical research, New Delhi, 2008.p.884-90
43. Ilavarasan R, Mallika M, Venkataraman S. Anti-inflammatory and antioxidant activities of Cassia fistula Linn bark extracts. Afr. J. Trad. CAM.2005: 2 (1): 70 - 85
44. Annonymus, Indian Medicinal Plant. Vol.5, Medicinal Plants unit: Indian Council of Medical research,New Delhi, 2008.p.889-95
45. Annonymus, Indian Medicinal Plant. Vol.5, Medicinal Plants unit: Indian Council of Medical research,New Delhi, 2008. p. 617
46. Pole S. Ayurvedic medicine: The Principles of Traditional Practice. 1st ed.London: Churchill Livingstone Publishers;2006.p. 183
47. Vd. Mukund Sabnis. Chemistry and Pharmacology of Ayurvedic Medicinal Plants.1st ed.Varanasi: Chaukhamba Amara Bharati Prakshan.2006.p 394
48. Raji Y, Udoh US, Oluwadara OO, Akinsomisoye OS, Awobajo O, Adeshoga K. Anti-inflammatory and analgesic properties of the rhizome extract of Zingiber officinale. African Journal of Biomedical Research. 2002;5(3):121-124
49. Vd. Mukund Sabnis. Chemistry and Pharmacology of Ayurvedic Medicinal Plants.1st ed. Varanasi: Chaukhamba AmaraBharati Prakshan.2006.p 392
50. Elizabeth M Williamson. Major herbs of Ayurveda.1st ed. London: Churchill Livingstone Publishers; 2002. P.329

Cite this article as:

Shruti Pandey, Anand Kumar Chaudhary. A review on Rasna saptak kwath: An Ayurvedic polyherbal formulation for arthritis. Int. J. Res. Ayurveda Pharm. 2017;8(Suppl 1):4-11 http://dx.doi.org/10.7897/2277-4343.08126

Source of support: Nil, Conflict of interest: None Declared