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An overview of a *Siddha* poly herbal formulation *Vayu Keelaga Ilagam*

Gohila M[1], Nalini sofia H[2*] and Mohan.S[3]

[1]P.G Scholar, Department of Maruthuvam, National Institute of Siddha, Chennai

[2*]Lecturer, Department of Maruthuvam, National Institute of Siddha, Chennai.

dr.h.nalinisofia@gmail.com

[3] Professor&HOD, Department of Maruthuvam, National Institute of Siddha, Chennai

ABSTRACT

Siddha medicines include 32 types of internal medicines and 32 types of external applications. Herbal drugs are given in the forms like *choornam* (powder), *ilagam*, *Mathirai* (tablets), *thylam* (oil) and mineral preparations in the form of *parpam* (white calcinated powder), *chendooram* (red in color) etc. The *siddha* formulation ***'Vayu keelaga ilagam'*** is a polyherbal formulation consists of nine herbal ingredients. According to siddha literature, the ingredients in this formulation have therapeutic effects on *vatha* diseases and this formulation itself indicated for *vatha* diseases especially *Uthira Vatha Suronitham.* The signs and symptoms said in *Uthira Vatha Suronitham* can be correlated with Rheumatoid arthritis in modern medical science. Analyzing various research articles, the ingredients of this formulation possesses Anti-inflammatory, Analgesic, Anti-oxidant, Anti-arthritic, Immuno Modulatory, Anti-Rheumatoid arthritis anti-osteoporotic activity which will improve the symptoms of illness as well as prevent the complications of disease. This review explainsthe phytoconstituents and pharmacologyof each ingredient of *Vayu keelaga ilagam* that has been mentioned in *Prana Rakshamirtha Sindhu*a classical *siddha* literatue.

Key words

Vayu keelaga ilagam, *Uthira Vatha Suronitham* ,Rheumatoid arthritis, *Siddha*, *ilagam*

INTRODUCTION

India also boasts of traditional system of medicine like *Ayurveda, Siddha, Unani* etc., The siddha system has been practiced mostly in South India, especially in Tamilnadu. The term Siddha is derived from *'Siddhi',* which means accomplished, achievement and attainment of perfection. This Siddha medicine had works were bestowed by the greatest *Siddhars*, after attaining spiritual knowledge through physical perfection and spiritual salvation.As per the Siddha literature *Vali, Azhal* and *Iyam* (i.e.*Vatham ,Pitham* and *Kapham*) are the three humours ,which are the life constitution of the body. i.e., *vali* for creation, *Azhal* for protection and *Iyam* for destruction of our body. The essential of Siddha medicine based on the five elements (Earth, Water, Fire, Air and Space) and three constitutions (*Vali, Azhal* and *Iyam*). Siddha drug classified into 2 types –Internal and external medicine, each type consist of 32 forms. Siddha drugs belong to herbal, mineral, metal or herbo-mineral and animal origin. *Ilagam* is one of herbal based internal medicine. Shelf life of *Ilagam* is 6 months. Siddha system of medicine has better answer for many of the refractory diseases, i.e. Diabetes mellitus, Cancer, Rheumatoid arthritis etc., while western medicine hardly cures. In the western system of medicine certain diseases can neither be prevented nor cured. Some of the traditional Siddha drugs may also have high effectiveness in certain ailments.

Yugi the *Siddhar* describes Vali azhal keel vayu as, it is a chronic disorder of the joints with palpable systemic involvement characterized by pain and swelling of the ankle, knee and smaller joints of the hand. Pain and tenderness present in minor joints, fever and loss of appetite. The signs and symptoms said in *Uthira Vatha Suronitham* can be correlated with Rheumatoid arthritis in modern medical science. Rheumatoid arthritis is a chronic, systemic inflammatory disorder that may affect many tissues and organs, but initially attacks the synovial joints. Although the cause of rheumatoid arthritis is unknown, autoimmunity plays a major role in chronicity and prognosis of the disease and it is considered a systemic autoimmune disease. It can be a disabling and painful condition, which leads to substantial loss of functioning and mobility if not adequately treated. In modern medical science the treatment for Rheumatoid arthritis includes Disease – modifying antirheumatic drugs (DMARDs), anti – inflammatory agents and analgesics.

V*ayu keelaga ilagam* is apoly herbal siddha formulation said in the siddha text "*Prana Rakshamirtha Sindhu*" especially in the treatment of *Uthira Vatha Suronitham* (Rheumatoid arthritis). The ingredient of this formulation includes*Parangipattai* (Smilax china.Linn), *VenKodivelivearpattai* (Plumbago zeylanica.Linn), *Sanganvearpattai* (Azematetrantha. Linn), *Seemaiamukkarakizhangu* (Withania somnifera .Linn), *Chukku* (Zingiber officinale .Linn) *Milagu* (Pippernigram .Linn), *Thippili* (Piper longam .Linn), *Elakkai* (Elettaria cardamomum .Linn),

Seeragam(Cuminumcyminum .Linn). These ingredients have therapeutic effect on *vali noigal* said in *Yugi vaidhya chinthamani.* Analyzing various research articles, the ingredients of this formulation possesses Anti-inflammatory, Analgesic, Anti-oxidant, Anti-arthritic, Immuno Modulatory, Anti-Rheumatoid arthritis anti-osteoporotic activity which will improve the symptoms of illness as well as prevent the complications of disease. This review paper deals with the herbs used as ingredients in this formulation with scientific data.

Table 1.Description of phytopharmacology of *VAYU KEELAGA ILAKAM*

S. NO	PLANTS NAME	BOTANICAL NAME &FAMILY	PART USED	PHYTOCHEMICALS	ACTIVITIES
1.	*Parangi pattai* (China root)	Smilax china.Linn Liliaceae	Rhizome	Prosapogenin-A of Diosin,Dioscin,Gracillin, Me-protogracellin, Me-protodioscin and 22 hydroxy –analog, Beta sitosterol glucoside, Smilaxin,Two Forustan and one spirostane glycosides Tannins,Carbohydrates and gums[1].	• Anti-inflammatory[2,3] • Analgesic[3] • Anti-oxidant[4,5] • Anti-cancer[6] • Hepatoprotective[7] • Anti-diabetic[8] • Anti-obesity[9] • Anti-hyperuricaemic[10] • Nephro protective [10] • Alternative[11] • Anti-syphilitic[11] • Aphrodisiac[11] • Depurative[11]
2.	*Kodivelivear Pattai* (Lead wort Ceylon lead wort)	Plumbago zeylanica.Linn Plumbaginaceae	Root bark	Plumbagin, 3-Chloroplumbagin, 2,3 biplumbagin, 6,6biplumbagin, Zeylinone,Isizeylinone, Chitranone, Droserone, Plumbagic acid,	• Anti-Inflammatory[14] • Analgesic[15] • Anti-arthritic[16] • Anti –oxidant[17] • Immuno modulatory[18,19,20] • Hyperlipididemic[21] • Anti-viral[22]

				Plumbazeylanone, Glucose, Fructose, Enzymes as Protease and Invertase[12, 13].	• Wound healing[23] • Anti-malarial[24] • Anti-carcinogenic[25] • Hepatoprotective[26] • Anti-periodic[11] • Diaphore[11]
3.	*Sanganvear* (Beesting bush)	Azema tetracantha.Lam Salvadoraceae	Root	Azimine Ascarpaine Carpaine Indoleglucosinolate Alkalpides Flavonoides Tannins Glycosides,Lupeol, Glutinol and β sitisterol,Friedelin,Amino acid[27]	• Anti-inflammatory[28,29] • Analgesic[29] • Anti -arthritic[28] • Anti-pyretic[29] • Anti-oxidant and free radical scavenging activity[30] • Anti-nephrotoxic[31] • Diuretic[11] • Stimulant[11] • Astringent[11] • Tonic[11] • Anti-periotic[11] • Expectorant[11]
4.	*Amukkara Kizhangu (Seemai)* (Winter cherry)	*Withania somnifera*.Dunal Solanaceae	Rhizome	Alkaloids(Isopellitarine and Anferine,Ashwagandhine, Cuscohygrine,Anahygrine, Trophineetc..,), Saponine(Sitoindoside VII and VIII),Steroidal lactone (Withanolides A Y,WithaferineA,WithasomniferineA,Withasomniferols A-C,	• Anti-inflammatory[34] • Analgesic [35] • Anti-arthritic[36,37] • Anti-oxidant[38,39] • Immuno modulatory[40,41,42,43] • Anti-cancer [44,45] • Anti-stress[46,47,48] • Cardio protective[49,50] • Musculotrophic activity[51,52] • Aphrodisiac [53]

				Withasomnidienone, Withanoneetc) Root also contain rich Iron andWithaniol,Acylsterylglucosides,Starch,Reducingsugar,Ducitol,Amino acids.[32,33]	
5.	*Chukku* Dried ginger	*Zingiber officinale*.Linn Zingiberaceae	Rhizome	Non –volatile pungent; Zngerols, Shogaols, Paradols, Zingerone. Essential oils, Flavonoids, Glycoside, Saponins, Steroids, Terpenoids, Tannin, Carbohydrates, Protein, Alkaloids, Olieresin, Proteolytic enzymes and Waxes[54].	• Anti-inflammatory[55,56] • Analgesic[57,58] • Anti-oxidant[59,60,61] • Immuno modulatory[64,65] • Anti-arthritic[62,63] • Anti-cancer[66] • Anti-diabetic[67] • Anti-microbial[68,69] • Anti-noceceptive[71] • Anti-platelet aggregation Activity[72] • Stimulant [11] • Stomachic[11] • Carminative [11]
6.	*Milagu* Black pepper	*Piper nigram*.Linn Piperaceae	Dried unripe berries	Piperine Isopiperin Chavicine Isochavicine Pipene Piperamide Piperamine Amides,steroids, Ligans,Noeligans,terpenes and chalcones [72]	• Immuno modulatory[75] • Anti-oxidant[74] • Anti-inflammatory[73] • Analgesic [73] • Anti-arthritis [73] • Anti-diarrhoeal[76] • Hepatoprotective [77] • Anti-depressant [78] • Anti-cancer[79]

					• Anti-septic[11] • Rubefacient[11] • Stimulant[11] • Resolvent[11] • Anti –vatha[11] • Anti –dote[11]
7.	*Thippili* Indian long Pepper	*Piper longum*.Linn Piperaceae	Dried fruits	Piperine,Piper longumine,Piper longuminine,Methyl-3,4 ,5 trimethoxycinnamate, piplatin,PiperlactumA &B, Piporadione,Starch,Protein,Alkaloids,Saponin, Amygdalin and volatile Oil[80, 81].	• Anti-inflammatory[82,83] • Anti-Rheumatoid arthritic [85,86] • Anti –Arthritic[84] • Immunomodulatory[87] • Anti-oxidant[88,89] • Protective myocardial Activity[90] • Hepatopretective[91] • Anti-asthmatic[92] • Anti –Diabetic[93] • Anti-hyperlipidemic[93] • Anti -Tumor [94] • Stimulant[11] • Carminative [11]
8.	*Elakkaai* Lessor cardamomum	*Elettaria cardamomum*. Linn zingiberaceae	Seeds	Terpineol,Terpinene Cineol,Limonene Sabinene,Bornneol Camphene,Geraneol D-limonene,Linalool Menthone,Citral Citronellal,Farnesol Myrcene,Heptane Alkaloids.Flavonoides, Saponins, Sterols and Tannins.[95, 96.	• Anti-inflammatory[97,98,99] • Analgesic[100] • Anti –spasmodic[100] • Anti –oxidant[101] • Immuno modulatory [102,103] • Insecticidal and Anthelmentic[104] • Laxative[105] • Diuretic Stimulant[106] • Carminative[11]

					• Stomachic[11]
9.	*Seeragam* White Cumin	*Cuminum cyminum*.Linn Apiaceae	Seeds	Cuminaldehyde,Limonene Eugenol, α, β pipene,1,8 Cineole α and β Cymene β and δ Terpinene Linalool,Protein Volatile oil Carbohydrates[107]	• Anti-inflammatory[108,109] • Analgesic[108,109,110] • Anti-oxidant[111,112,113] • Immunomodulatory[114] • Anti-estrogenic[115] • Anti-diabetic[110,116] • Anti-cancer[117] • Anti-diabetic[118] • Anti-Cancer[119]

1.SMILAX CHINA

Anti-inflammatory activity and analgesic activity

Raghu et al (2010)Ethyl acetate and methanolic extract of S.china had the significantdose dependent Anti- inflammatory and analgesic activity at higher concentration in acute carrageenan induced rat paw oedema model and Eddy's hot plate method respectively. ***Inamullah et al (2008)***studiedthe lypoxygenase inhibition (IC50:38µM) was due to the presence of Seiboldogenin in S.china.In this study significant inhibition ($P<0.05$) of carrageenan induced hind paw oedema was observed at the dose of 10 and 50 mg /kg.

Anti-oxidant activity

Chang et al (2013),the highest Anti-oxidant property was obtained from the ethyl acetate fraction of S.china correlated with high phenolic levels, especially catechin and Epicatechin.

2.PLUMBAGO ZEYLANICA

Anti-oxidant activity

Nile et al (2010), isolated new flavonoid 2-(2,4-Dihydroxyl phenyl)-3,6,8-trihydroxy chroman -4 one from the root of the P.zeylanica has Anti-oxidant activity in free radical scavenging and super oxide scavenging methods. ***Zahin et al. (2009),*** evaluated in vitro Anti-oxidant activity methanolic extracts of P.zeylanica (root), A.calamus (rhizome), H.indicus(stem) and

H.antidysenterica (bark). According to FTC assay, the order of Anti-oxidant potential was found to be highest in P.zeylanica.

Immunomodulatory activity

Tsai et al (2008), detected the immune modulatory effects of seselinfrom P.zeylanica which significantly reduced the IL-2, IFN gene expression on phytohen agglutinin (PHA) stimulated cell proliferation in human Peripheral Blood Mononuclear Cells (PBMC). ***Checker et al (2009)***, T-cells proliferation was inhibited by Plumbagin in response to polyclonal mitogen concanavalin A (Con A) by blocking the cell cycle progression. The immuno suppressive action of Plumbagin on cytokine levels were also studied in *vivo.* In this Plumbagin was completely inhibited Con A induced I KB alpha degradation and NF-KB activation. It also prevented graft versus host disease- induced mortality in mice.

Anti-inflammatory activity

Sheeja et al (2010) and ***dang et al (2011***) analyzed two models of acute inflammation in Phyllanthus emblica, Plumbago zeylanica and cyperus rotundus. The results showed that P.zeylanica reduced the carrangeenan induced rat paw oedema, as well as it suppressed the activation of NF-Kappa B and tumour cells. Two groups of animals treated with P.zelanica inhibited the acute inflammation 31.03% and 60.3% respectively at a dose of 300 and 500 mg/kg body weight.

Anti-arthritic activity

Poosarla and athota (2007) Ethyl acetate fraction of the root extract of P.zeylanica in its Anti-suppressed collagen type II induced arthritis in DBA/I mice in a dose dependent manner. In addition the treatment with P.zeylanica stimulated con-A induced T-cell proliferation to normal level in arthritic mice.

3. **AZEMA TETRACANTHA**

Anti-arthritic activity

Sredharan et al (2008), the ethanolic extract of A.tetracantha possessed anti-arthritic activity in freunds complete adjuvant (FCA) induced arthritis method. The Rheumatoid factor and C - reactive protein levels were decreased.

Anti-inflammatory, analgesic and antipyretic effect

Paulrayer et al (2911),in acute phase inflammation the maximum inhibition effect of Friedelin was found in carrageenan induced hind paw oedema and Croton oil induced ear oedema.

Friedelin also reduced the formation of granuloma tissues significantly. Significant analgesic effect was found acetic acid induced abdominal constriction response and formalin induced paw licking response. Significant anti-pyretic effect was found in yeast induced hyperthermia in rats.

4. WITHANIA SOMNIFERA

Anti-inflammatory activity

Gupta et al (2014), the root powder of W.somnifera (600mg/kg) significantly reduced the severity of the arthritis and improved the functional recovery of the motor activity and the radiological score in arthritic rats. Withaferin A and 3-b-hydroxy-2,3dihydrowithanolide F isolated from W.somnifera showed significant Anti-bacterial, Anti-inflammatory and immune modulatory activity.

Anti-arthritic activity

Paval et al (2009),the compound withaferin A was found to exhibit fairly potent Anti-arthritic &Anti-inflammatory activity.It was found to suppress the adjuvant-induced arthritic changes in rats without any toxic effects.

Anti –oxidant activity

Bhatayala et al (1997), administration of active principles of Sitoindosides VII-X and Withaferin A increased Superoxide dimulate (SOD), Catalase(CAT) and Glutathione peroxidase (GPX) activity in rat brain frontal cortex and straiatum. The another active principle of Glyco-withanolides possess Anti – oxidant effect, Anti- inflammatory, Immunomodulatory, anti –ageing and cognition facilitated the effects produced by them in animals.

Immunomodulatory activity

Battacharya et al (1992),Withferrin A and Withnolide E exhibited specific immuno suppressive effect on human B and T Lymphocytes and in mice thrombocytes. Withanolide E had specific effects on T –Lymphocytes, whereas Withferin A affected both B and T Lymphocytes.

5.ZINGIBER OFFICINALE

Anti-oxidant activity

Eleasu et.al (2012), studied the anti-oxidant potential in six varieties of Ginger. All the six varieties had strong anti-oxidant activities and possessed high quantities of Phenols, that could

produce the Anti-oxidant effect. ***Masuda et al. (2004)*** the compounds Gingerol, Shagoals, Gingerdiols, Gingerdiones and Dehydrogingerdiones isolated from the Dichloromethane extract of the Ginger rhizomes showed Anti-oxidant activity. In Vitro Ginger has been shown to exhibit Anti-oxidant effect. Gingerol produce HL-60cells from oxidative stress.

Immunomodulatory activity

Dugenci SK et al (2003)Nonspecific immunity was increased in rainbow trout eating a diet containing 1% of dried aqueous ginger extract for three weeks. ***Pauri et al (2010),***Mice fed with 50% ethanolic ginger extract (25 mg/kg) for seven days had higher haemagglutination antibody titer and plaque forming cell counts, consistent with improved humoral immunity. ***Iqbal et al (2001),*** inan in Vitro study Ginger suppressed lymphocyte proliferation and it was mediated by decreased IL-2 and IL-10 production.

Analgesic activity

Suekawa et al (1987)the active principle of (6) Shogaol has inhibited acetic acid induced writhing in mice and to elevate the nociceptive threshold of the yeast inflamed paw. ***Onogi et al (1992)*** observed that (6) Shogaol inhibited the release of substance P by stimulating the primary afferents from their central terminal and hence shared this site of action with Capsaicin.

Anti-inflammatory activity

Junk et al (2009), the anti - inflammatory action was evaluated in Hexane fraction of dried ginger methanolic extract which suppressed the pro-inflammatory gene expression in LPS activated BV2 microglial cells. Gingerol and Shogaol exert inhibitory effect on biosynthesis of Prostaglandins and Leukotrienes by suppressing prostaglandin synthase or 5 lipoxygenase.

Anti-arthritic activity

Kattiyar et al (2016), Alcoholic and aqueous extract of Z.officinale possessed a significant anti-arthritic action against formaldehyde induced arthritis in a dose dependent manner i.e., at a dose of 100,200 and 400 mg/kg b.w respectively.

6. PIPER NIGRAM

Anti-inflammatory, anti-arthritic and analgesic activity

Bang et al (2012),the anti-inflammatory, analgesic, and anti-arthritic activities were found in piperine. The in vitro anti-inflammatory effect was evaluated on interleukin 1β stimulated fibroblast-like synoviocytes obtained from rheumatoid arthritis and anti-arthritic including analgesic activities

were evaluated on carrageenan induced acute paw model of pain and arthritis in rats. Piperine treated groups significantly inhibited the synthesis of prostaglandin E2 at the concentrations of 10-100 μg/ml. Piperine treated groups significantly reduced the pain and arthritic symptoms in rats.

Anti-oxidant activity

Akbar et al (2014), the ethanolic extract of P.longum and P.nigram fruits exhibited good Anti-oxidant effect which might have prevent or reduce the process of different oxidative stress related diseases.

Immuno-modulatory activity

Sharma et al (2014), In vitro immune modulatory assay Piperine treated mouse splenocytes exhibited an increased secretion of Th-1 cytokines (IFN-γ and IL-2), increased macrophage activation and proliferation of T and B cell. Protective effect of piperine and rifampicin (1 mg/kg) combination against Mycobacterium tuberculosis was reported due to the immuno-modulatory effect of piperine.

7.PIPER LONGUM

Anti –inflammatory activity

Mamta et al (2012),Decoction of P.longam fruit showed a marked anti- inflammatory effect on carrangenan induced rat oedema. The anti – inflammatory effect was due to the inhibitory effect of the piper extract and the phyto-component of piperine which inhibited prostaglandin and Leucotrienes COX-1. ***Stoha et al (2001),*** The Chloroform extract of P. longum revealed larger amount of Phenol and had significant Anti – Inflammatory effect when compared to the extracts obtained from Hexane, Ethyl acetate and Ethanol, Hydro ethanol and aqueous extract.

Anti-arthritic activity

Sharma et al (1980), Aqueous extract of p.longum showed anti- arthritic effect on Complete Freuds Adjuvant (CFA) induced arthritis in rat. Aqueous extract of P.longum fruit at a dose of 400mg/kg and 200 mg/kg body weight significantly reduced the paw edema in rats.

Anti – oxidant activity

Stoha et al (2001), The Ethanolic extract of P.longum showed a good Anti- oxidant effect compared to aqueous extract in a dose dependent manner.

Protective myocadial activity

Mishra et al (2010), one of the main active components of Piperaldehyde in Piper longum had significant DPPH scavenging activity and exert protective effect in the myocardial narcotic rats.

Immunomodulatory activity

Manavalan et al (1979), Test such as Haemagglutinationtiter (HA), Macrophage Migration Index (MMI) and Phagocytic Index (PI) in mice have demonstrated the immune stimulatory action on P.longum fruits to be specific and non -specific .The immune-modulatory effect was higher at a lower dose of 225 mg/kg (lower dose) and it was marginally reduced when the dose was increased.

Anti- rheumatoid activity

Yende et al (2010),aqueous extract of P.longum with a dose of 200 & 400 mg/kg administered orally in Freunds Adjuvant induced arthritis rat. The swelling was reduced in the Diclofenac sodium (13.5 mg/kg) treated group (55% inhibition) and followed by P.longum 400 mg/kg (46.32% inhibition) treated group and finally P.longum 200 mg/kg (15.04%) treated group.

8.ELETTARIA CARDAMOMUM

Anti-inflammatory activity

Sermugapandian et al (2019), E.cardamom oil 0.175 mg/kg administered orally significantly reduced the paw edema in rats. It also reduced the pro-inflammatory cytokines level such as Tumour Necrosis Factor Î±,Interleukin (IL) 1 and IL 6 level in serum. In histopathological evaluation resulted that there is a marked reduction of congested blood vessels with no marked impression for inflammation.

Analgesic and anti-spasmodic activity

Pawar et al (2010),233 µL/kg of the oil extracted from E.cardamom seeds produced 50% protection against the writhing (Stretching syndrome) induced by intraperitoneal administration of a 0.02% solution benzoquinine in mice.***Al Zuhair et al, (1996),***reported that the oil extracted from E.cardamom seeds had anti-spasmodic effect through muscarine receptor blockage.

Anti-oxidant activity

Beddows et al (2000), E.cardamomumpossesses anti-oxidant components of phenolic and flavonoids.

Immunomodulatory activity

Amin et al, (2010), Aqueous extract of E.cardamomum and black pepper enhanced the splenocyte proliferation significantly in a dose dependent synergetic fashion. Enzyme linked immune sorbent assay revealed that E.cardamomum and black pepper significantly enhanced and suppressed T –helper (Th) 1 cytokine and Th2 cytokine released by splenocytes.

***9.*CUMINUM CYMINUM**

Analgesic and anti- inflammatory activity

Intra peritoneal injection of Cumin oil (0.1 ml/kg) in rats inhibited the carrageenan induced paw oedema compared with that of the standard drug Diclofenac sodium. ***Sangeetha et al (2014),*** Aqueous and ethanolic extract of cuminum cyminum (200mg/kg and 500mgkg) had significant effect of analgesic activity and anti-inflammatory activity than control group.

Analgesic activity

Purnima et al (2015), the analgesic activity was found in the methanolic extract of cumin seeds individually or with the combination of Coriandrum sativam seeds.

Anti-oxidant activity

Saini N Singh et al (2014), the aqueous extract of Cumin seeds indicated that less amount of Cumin was needed for scavenging and superoxide radicals'.

Immunomodolatory effect

Chauhan et al (2010), immuno modulatory effect was found in C.cyminum in normal and Cyclosporin –A-induced Immune suppressed animals.It significantly increased the T –cells (CD4&CD8) and Th I predominant immune response in a dose dependent manner. Modulation of T lymphocyte expression enhances the immune modulatory activity of C.cyminum. In stress induced immune-suppressed animals, the active compound of C.cyminum countered the depleted T lymphocytes and decreased the increased level of corticosterone.

Estrogenic /anti-osteoporotic activity

Shirke et al (2008), in their study, the phytoestrogen present in Cumin has an osteoporotic effect. The methanolic extract of cumin reduce the excretion of calcium in urine and augmentation of calcium content the animals receiving methanolic extract of cumin, significant reduction in urinary calcium excretion and augmentation of calcium content and also the mechanical strength of bones.

The bone and ash densities increased in animals and the microarchitecture also improved, without adverse effects such as body weight gain and the weight of atrophic uterus.

Conclusion

The herbal ingredients of this formulation has significant analgesic, anti-inflammatory, anti-arthritic, anti-pyretic actions as well as a good immune modulatory effects while searching experimental studies carried out by various researches. Furthermore this formulation should be subjected to preclinical evaluations to understand the safety and better effectiveness of the herbal medicine before prescribing to the patients.

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