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SWASAKUDORI CHOORANAM: SIDDHA MEDICINE INDICATED FOR IYA ERAIPPU NOI (BRONCHIAL ASTHMA) – A REVIEW

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ABSTRACT

Siddha system of medicine is one of the indigenous system of medicine practised in India. The exponents of this system are Siddhars.[1] Siddhars classified the diseases on the basis of three humours Vatha, Pitha, Kaba and signs and symptoms. The disease Iya eraippu noi is a kaba disease which can be correlated to Bronchial Asthma in Modern science. The prevalence of Asthma has increased since the 1970, and now affects an estimated 4 to 7% of the people world wide.[2] All the Siddha drugs are natural products obtained from herbs, metals, minerals and animal kingdom which are given by the Siddhar's spiritual knowledge to this society.[3] Siddha sastric preparation Swasakudori chooranam is a poly herbo mineral formulation and it is the safe and efficacious medicine used traditionally for the treatment of Respiratory illness. This review describes the chemical constituents, pharmacological and therapeutic uses of its ingredients.

KEYWORDS: Siddha, Iya Eraippu noi, Swasakudori chooranam, Bronchial Asthma.

INTRODUCTION

The prevalence of Bronchial Asthma, a major public health problem world wide. Bronchial Asthma is a common respiratory disorder affecting approximately 3-5 percent of the population. In siddha, Swasakudori Chooranam is specially indicated for Bronchial Asthma which comprises 9 ingredients such as *Alpinia officinarum Hance*(Chittarathai), *Piper longum Linn*(Thippili), *Piper nigrum Linn*(Milagu), *Zingiber officinale Rosc*(Sukku), *Valmilagu(*Piper Cubeba), *Modi or Thippili ver*(Chavica Roxburgii), *Akkarakaram*(Anacyclus pyrethrum), *Thalisapathiri*(Taxus buccata), *Purified Venkaram*(Sodium Biborate, Borax). Each ingredients were taken 17.5 grams(1/2 palam)

except Thalisapathiri. Thalisapathiri was taken 280 grams(8 palam). All drugs were purified and fried in a clay pan one by one except Venkaram. Then they were grinded very fine powder. Then the purified Venkaram was fried and added. Then they were mixed and grinded and filtered by a soft white cloth. Then it was kept in a container.[4]

This review mainly evaluates and documents the scientifical data of the ingredients of Swasakudori chooranam to prove the efficacy of the drug in managing Bronchial Asthma.

Alpinia officinarum Hance

Family: Zingiberaceae

Tamil name: Chittarathai

Part used: Rhizome

Chemical constituents

The rhizome was reported to contain tannins, phlobaphenes in the alcoholic extract while chloroform extract showed the presence of flavones such as kaempferide, galangin and alpinin.[5] Five diarylheptanoides were obtained and their structures were identified as 5-ethoxyl-7-(4-hydroxy-3-methoxy-phenyl)-1-phenyl-3-heptanone, 5-hydroxy-1,7-diphenyl-3-heptanone, 5-hydroxy-7-(4-hydroxyl-3-methoxyphenyl)—1-phenyl-3-heptanone, 5-methoxy-7-(4-hydroxy-3-methoxyphenyl)-1-phenyl-3-heptanone and (E)-7-(4-hydroxy-3-methoxyphenyl)-1-phenylhept-4-en-3-one.[6] GC-MS revealed that the major constituents of essential oil were eucalyptol 28.11%, terpineol 9.17%, murolene 7.88%, farnesene 5.73%, caryophyllene 4.6%, bergamotene 4.18% and gurjunene 3.63%.[7] The alcoholic extract of rhizome showed the presence of various flavanoid which include quercetin, kaemferol, quercetin-3-methyl ether, isorhamnetin, kaemferide, galangin and galangin -3-methyl ether.[8] Two flavanoides, i.e., rhamnocitrin and 7-hydroxy-3,5-dimethoxyflavone have also been isolated from the plant.Various compounds have also been reported to be present in the oil, which include, 1,8-cineole, α-pinene, β-pinene, methyl isovalerate, camphene, limonene, p-cymene, camphor trans-α-bergamotene, β-elemene, terpinen-4-ol.[9] Moreover, the roots of the plants have been noted to contain quercetin-3 methyl ether, galangin 3-methyl ether, kamfero 7-methyl ether and 7-OH-3,5-DIO-o methyl flavanone and pungent principle like 5-OH-7(4-OH-3-OMe-ph-1-ph-3-heptanone).[10]

Pharmacological studies

Antimicrobial activity

The ethyl alcohol extract of the rhizome revealed anti microbial activity against Staphylococcus aureus, Bacilus subtilis, Escherichia coli, Candida albicans.[11,12] Antibacterial activity of galangin was investigated against 17 strains of 4-quinolone resistant Staphylococcus aureus using an agar dilution assay. The strain which possessed an aminoacid alteration in the Gr1B subunit of topoisomerase IV had increased susceptibility to galangin. The topoisomerase IV enzyme may therefore be implicated in the antibacterial mechanism of action of galangin. Antimicrobial activity of galangin against 16 camphylobacter jejuni clinical isolates and several Gram-positive and Gram-negative human pathogens were investigated. Galangin showed highest percentage of sensitivity among camphylobacter jejuni strains. Aggregatory effect of galangin on bacterial cell was investigated. In preparatory time-kill assays, galangin was found to reduce colony counts of Staphylococcus aureus. Light microscopy study showed significant increases in the number of large clusters of bacterial cells in populations treated with the flavanol. The bioactivity of the flavanoids galangin 3-methyl ether was investigated in vitro against amastigote stages of Leishmanis amazonensis and found to have significant activity. A number of mechanisms are involved in the antimicrobial effects of herbs, including inhibition of beta-lactamase, which was found in the herbal phytoconstituents galangin.[13]

Antioxidant activity

In vitro and *in vivo* antioxidant activity indicate that galangin has anti-oxidative and free radical scavenging activity and is capable of modulating enzyme activity and suppressing the genotoxicity of chemicals. Liposomes containing flavanoids (galangenin) was evaluated for their antioxidant activity and found to have significant antioxidant activity and is dependent on concentration and chemical structure of active compound.Antioidant activity of galangin was measured and found to showed significant DPPH radical scavenging activity.[14]

A comparision of alizarin red and fluorescein as target molecules in oxygen radical absorbence capacity-like methods is reported and showed that galangin decreased alizarin red initial consumption rate.Galangin was found to have significant antioxidant potential. Antioxidant activity of various components of propolis was investigated and found that galangin possessed significant antioxidant activity. Mitochondria are important intracellular sources and targets of ROS. Antioxidant activity of galangin on Fe2+/citrate –mediated

membrane lipid peroxidation in isolated rat liver mitochondria was investigated. Results suggest that 2,3-double bond in conjugation with the 4-oxo function in the flavanoid structure are major determinants of the antioxidant activity of flavanoids in mitochondria. The modulatory effect of galangin on rabbit PMN oxidative metabolism, specifically stimulated via Fc gamma R, CR or both classes of receptors, was evaluated by luminal-and lucigenin-dependent chemiluminescence assay.[13]

Anti-inflammatory activity

Topical anti-inflammatory activity of selected flavanoids commonly found in propolis was investigated. The reduction in croton oil-induced oedema in a mouse model, after topical application of galangin for 3h, was more than 50%, while after 6h of treatment the reduction was less than 50%. Various fractions obtained from parthenium hysterophorus showed anti-inflammatory activity and contain ganglin as active constituent.[13]

Piper nigrum Linn.

Family: Piperaceae

Tamil name: Milagu

Part used: Fruits

Chemical constituents

Volatile oil: The dried fruits contain 1.2-2.6% of volatile oil mainly composed of sabinene (15-25%), Caryophyllene, α-pinene, β-pinene, β-ocimene**,** **delta**-cadinol, guaiacol,1-phellandrene, 1,8 cineole, p-cymene, carvone,citronellol, α-thujene, α-terpinene, bisabolene, dl-limonene, dihydrocarveol, camphene and piperonal.[15] Alkaloids and amides: These are the main pungent principles and incude piperine, piperylin, piperolein A and B, Cumaperine, piperanine, piperamides, pipericide, guineensine and sarmentine. Other alkaloids include Chavicine, piperidine and piperettine, methyl caffeic acid, piperidide, β-methyl pyrroline, and a series of vinyl homologues of piperine and their stereoisomers.[16]

Aminoacids: The dried fruits are rich in β-alanine, arginine, serine, threonine, histidine, lysine, cystine, asparagines and glutamic acid in combination with γ-aminobutyric acid and pipecolic acid.[17]

Miscellaneous compounds: Eugenol, methyl eugenol, myristicin, safrole, benzaldehyde, trans-anethole, piperonal, m-methyl aceto-phenone, p- methyl acetophenone, n-

butyrophenone, benzoic acid, phenyl acetic acid, cinnamic acid and piperonic acid are some of the aromatic compounds characterized in pepper oil. Methyl heptanoate, methyl octanoate, 2-undecanone, n-nonane, n-tridecane, n-nonadecane and piperidine are the other compounds identified.[18]

Antioxidant activity

Studied the antioxidant efficacy of black pepper and piperine in rats with high –fat diet-induced oxidative stress. Thirty male rats (95-115g) were divided into five groups. They were fed standard pellet diet, high-fat diet (20% coconut oil, 2% cholestrol and 0.125% bile salts), high-fat diet plus black pepper (0.25 g or 0.5g/kg body weight) or high fat diet plus piperine (0.02g/kg body weight) for a period of 10 weeks. Significantly elevated levels of thio-barbituric acid reactive substances (TBARS), conjugated dienes (CD) and significantly lowered activities of superoxide dismutase (SOD), Catalase(CAT), Glutathione peroxidase (GPx), glutathione-s-transferase (GST) in the liver, heart, kidney, intestine and aorta were observed in rats fed the high-fat diet as compared with the control rats. Simultaneous supplementation with black pepper or piperine lowered TBARS and CD levels and maintained SOD, CAT, GPx, GST and GSH levels to near those of the control rats. The data indicate that supplementation with black pepper or the active principle of black pepper, piperine, can reduce high-fat-diet-induced oxidative stress.[19] Pepper is rich in phenolicamides and possess antioxidant effects that are more potent than α-tocopherol and equivalent to the synthetic antioxidants butylated hydroyanisole(BHA) and butylated hydroxytoluene(BHT).[20]

Anti-inflammatory activity

Piperine exhibited activity by depressing both the acute inflammatory process and chronic granulative changes using carrageenan-induced rat paw oedema, cotton pellet and croton oil-induced granuloma pouch models.It was through the stimulation of the pituitary adrenal axis.[21]

Antimicrobial activity

Black pepper extracts inhibited aflatoxin production, via the β-glucuronidase rreporter gene under the control of the aflatoxin biosynthesis gene promoter in the fungus Aspergillus parasiticus.[22] Using the agar diffusion method, both the ethanol and aqueous extracts of the dried fruits were found to have significant activity against a penicillin G-resistant strain of Staphylococcus aureus.[23] An extract was toxic to the culture of Escherichia coli,

Staphylococcus faecalis, Staph. aureus, Staph.albus, Corynebacterium diptheriae, Salmonella dysenteriae and S.sonnei.[24]

The volatile oil also exhibited a high degree of antimicrobial activity against various types of organisms including animal pathogens, organisms involed in food poisioning and other spoilage bacteria and fungi.[25] Piperine showed mild to moderate antibacterial activity against selected Gram positive and Gram negative bacteria.[26]

Bio-enchancing ability

The efeect of piperine on the bioavailability and pharmacokinetics of propranolol and theophylline has been examined clinically.[27]

Piper longum Linn.

Family: Piperaceae

Tamil name: Arisi thippili

Part used: Fruit

Chemical constituents

Alkaloids and amides: The fruit contains a large number of alkaloids and related compounds, the most abundant of which is piperine, together with methyl piperine, pipernonaline, piperettine, asarinine, pellitorine, piperundecalidine, piperlongumine, piperlonguminine, retrofractamide A, pergumidiene, brachystamide-B, a dimer of desmethoxypiplartine, N- isobutyl-decadienamide, brachyamide-A, brachystine, pipercide, piperderidine, longamide, dehydropipernonaline piperidine and tetrahydropiperine.[28] Methyl-3, 4,5 trimethoxycinnamate.[29]

Lignans: Sesamin, pulviatilol, fargesin and others have been isolated from the fruits.[30]

Esters: The fruits contain tridecyl-dihydro-p-coumerate, eicosanyl-(E)-P-coumerate and Z-12-octadecenoic-glycerol-monoester.[31] Volatile oil: The essential oil of the fruit is a complex mixture, the three major components of which are (excluding the volatile piperine) carryophyllene and pentadecane (both about 17.8%) and bisaboline (11%). Others include thujine, terpinoline, zingiberine, p-cymene, p-methoxyacetophenone and dihydrocarveol.[32]

Essential oil consisting of n-hexadecane, n-heptadecane, n-octadecane, n-nonadecane, n-sicosane, n-hencosane. L tyrosine, L cysteine hydrochloride DL serine, L-aspartic acid are

free amino acids in fruits. Seeds contain sylvatine, dieudesmin, palmitic, hexadecenoic, stearic, linoleic, oleic, linolenic higher saturated acids.[33]

Pharmacological activity

Immunomodulatory activity

Tests such as haemagglutination titre (HA), macrophage migration index(MMI) and phagocytic index (PI) in mice have demonstrated the immunomodulatory action of Piper longum fruits to be both specific and non specific. The effect was more prominent at lower doses (225 mg/kg) and was marginally reduced when the dose was increased.[34] In another study, it was found to offer protection against externally induced stress.[35] Extract of Piper longum and piperine was found to increase the circulating antibody titre and antibody forming cells indicating its stimulatory effect on humoral arm of immune system. Administration of this drug could also significantly inhibit the growth of solid tumour induced by Dalton's lymphoma ascites cells and Ehrlich ascites carcinoma cells. Immunomodulatory activity of P.longum and piperine may be due to the combined action of humoral and cell-mediated immune responses. Immunomodulation by piperine may be clearly attributed to its multi faceted activities such as anti-oxidative, anti-apoptotic and restorative ability against cell proliferative mitogenic response, splenic B- and T-cell population and cytokine release. Immunoregulatory potential of P.longum and piperinic acid, one of its active constituent, in Balb/C mice(in vivo) and human PBMCs(in vitro) models was also observed. Piperinic acid moderated the proinflammatory mediators and cytokines. At doses of 10,20,40 and 80 mg/kg p.o.PL showed a dose dependent decrease of lymphocytes (CD4 + and CD8+T-cells) and cytokine levels in sensitized Balb/C mice with a marked inhibition at 40 mg/kg. At an in vitro doses of 20 µg/ml of PL and 5µg/ml of piperinic acid, there was asignificant inhibition of mitogen induced human PBMC proliferation, Mrna transcripts of IL-2 (Con A) and TNFα, IL-1β and Inos(LPS) respectively under stimulated conditions in time dependent (6 h,12h and 24h respectively) expression studies. In parallel, induced nitric oxide production was also reduced by stimulated macrophages.[17]

Antiasthmatic activity

Studies have been carried out to validate the traditional claims of Ayurveda for antiasthmatic activity of Piper longum. An extract of the fruits in milk reduced passive cutaneous anaphylaxis in rats and protected guinea pigs against antigen-induced bronchospasm.[36]

Anti-inflammatory activity

A marked antiinflammtory activity of a decoction of P.longum fruits has been reported using carrageenan-induced rat oedema.[37]

Antibacterial activity

The essential oil of P.longum showed antibacterial action against a number of bacterial strains.[37,38] *Piper longuminine* was found to have potent activity against *Bacillus subtilis* while piperine was more effective against *Staphylococcus aureus*.[39]

Bioavailability enchancement

Piperine has been shown to enchance the bio-availability of structurally and therapeutically diverse drugs, possibly by modulating membrane dynamics, due to its easy partitioning and increasing permeability.[40] The effect of Trikatu a compound Ayurvedic preparation containing Piper longum as one of the major ingredients, was tested in combination with other drugs. The study reported that Trikatu increased their bio-availability either by promoting rapid absorption from the gastrointestinal tract or by protecting the drug from being metabolized during its first passage through the liver after being absorbed, or by combination of both mechanisms.[41]

The fruits proved to be very effective in childhood Asthma, the total dose for a child under five years being 9.35 g and for a child over five years being 15.75 g over a period of five years.[42]

Chavica Roxburgii

Family: Piperaceae

Tamil name: *Modi or Thippili ver*

Part used: Stems(roots)

Chemical constituents

Resin, volatile oil, starch, gum, fatty oil, inorganic matter and alkaloid piperine.

Actions

Stimulant, carminative and alterative tonic more powerful than black pepper.

Aphrodisiac, diuretic, vermifuge and emmenagoguge.

Medicinal uses

Old long pepper is more efficacious in medicine than fresh article. Powdered long pepper administered with honey will relieve cough, cold, Asthma, hoarseness and hiccup. A compound powder consisting of long pepper, ginger, black pepper, cinnamon and caraway in equal part is a good expectorant and infusion made of 10 peppers with honey makes a good expectorant.[43]

Piper Cubeba L.F

Family: Piperaceae

Tamil name: Valmilagu

Part used: Dried mature Fruits

Chemical constituents

The oxygenated cyclohexanes, piperenol A and B together with cyclohexanes,(+)-crotepoxide and (+)-zeylenol have been isolated from the petroleum extract of the fruit; it also contains (-)-cubebin, (-)-hinokin, (-)-clusin, (-)-cubebinin, (-)-dihydrocubebin,(-)-dihydroclusin, (-)-yatein, (-)-cubebininolide(cor-digerin), (-)-2-(3’’4”-methylenedioxybenzyl)-3-(3’,4’-dimethoxybenzyl) butyrolactone, (-)-isoyatein, (-)-cubebinone and (-)-di-O-methylthuja plicatin methyl ether. Isolation of heterotropan, magnosalin, 2,4,5-trimethoxybenzaldehyde, α-O-ethylcubebin, β-O-ethyl cubebin, 5’’-methoxyhinokinin, and monoacetate of dihydrocubebin(hemiariensin) is also reported from the fruits. Polyhydroxy cyclohexanes possess anti tumour, antileukaemic and antibiotic activities.[44]

Antioxidative activity

The results of antioxidant activity indicate higher free radical scavenging activity in ethanolic extracts of Piper cubeba in comparison to Piper nigrum due to presence of phytochemical constituents especially polyphenols. This experiment supports that these fruits can be used in pharmaceutical industries as natural antioxidants.[45]

Anti-inflammatory activitiy

The essential oil of P. cubeba possesses significant antioxidant and anti-inflammatory activities. These findings confirm the traditional anti-inflammatory indications of P. cubeba and provide persuasive evidence and support its use in Arab traditional medicine for the adjunct treatment of inflammatory disorders.[46]

Zingiber officinale Rosc

Family: Zingiberaceae

Tamil name: Sukku

Part used: Rhizome

Chemical constituents

Phenolic compounds

The pungent components are a series of gingerols, gingerdiols and gingerdiones and their dehydration products, the shogaols.[47]

Essential oil

Major constituents of the essential oil are the monoterpenes β-phellandrene, perillaldehyde, neral and geranial and the sesquiterpenes α-Zingiberine, β-Santalol, β-bisaboline, α-Curcumene, Zingiberol, nerolidol, β-eudesmol, farnesol, elemol and Zingerone.[48]

Antiinflammatory activity

An ethanolic extract of the rhizome reduced carrageenan-induced paw swelling and yeast-induced fever in rats, but was ineffective in suppressing the writhing induced by acetic acid. The essencial oil inhibited chronic adjuvant arthritis in rats.[49]

Antioxidant activity

The pungent principles, including gingerol and zingerone, demonstrated invitro effects in scavenging the superoxide and hydroxyl radicals and inhibiting lipid peroxidation.[50]

Immunomodulatory activity

Humoral immunity was enhanced, as shown by humoral antibody titre and cell-mediated response was also stimulated in leucocyte migration inhibition tests.[51]

Antiviral activity

β-Sesquiphellandrene exhibited significant antirhinoviral activity against rhinovirus B in vitro.[52] We hypothesized that ginger and its active components induce bronchodilation by modulating intracellular calcium ([Ca2+]i) in airway smooth muscle (ASM). In isolated human ASM, ginger caused significant and rapid relaxation. Four purified constituents of ginger were subsequently tested for ASM relaxant properties in both guinea pig and human tracheas: [6]-gingerol, [8]-gingerol, and [6]-shogaol induced rapid relaxation of precontracted ASM (100–300 μM), whereas [10]-gingerol failed to induce relaxation. In human ASM cells,

exposure to [6]-gingerol, [8]-gingerol, and [6]-shogaol, but not [10]-gingerol (100 μM), blunted subsequent Ca2+ responses to bradykinin (10 μM) and S-(−)-Bay K 8644 (10 μM). In A/J mice, the nebulization of [8]-gingerol (100 μM), 15 minutes before methacholine challenge, significantly attenuated airway resistance, compared with vehicle. Taken together, these novel data show that ginger and its isolated active components, [6]-gingerol, [8]-gingerol and [6]-shogaol, relax ASM, and [8]-gingerol attenuates airway hyperresponsiveness, in part by altering [Ca2+]i regulation. These purified compounds may provide a therapeutic option alone or in combination with accepted therapeutics, including β2-agonists, in airway diseases such as asthma.[53]

In this study, the anti-inflammatory activity of Zingiber officinale alone and in combination with indomethacin was studied using carrageenan-induced rat paw oedema. Aqueous extract of Zingiber officinale (200 mg/kg or 400 mg/kg) was administered alone and in combination with indomethacin (25 mg/kg) to separate group of rats and paw volume was measured by a plethysmometer and compared with the control group. Results: Indomethacin, ginger 200 mg/kg and ginger 400 mg/kg displayed values of 95%, 89.5% and 92.6% inhibition of paw oedema respectively. The combinations of indomethacin with ginger 200 mg/kg and indomethacin with ginger 400 mg/kg displayed values of 95% and 97.5% inhibition of paw oedema respectively. These results indicate a similarity in the anti-inflammatory profile of ginger and indomethacin, and furthermore an enhanced anti-inflammatory profile when both are combined. Conclusion: As ginger root showed significant anti-inflammatory activity in the model studied, it can be investigated further as a promising anti-inflammatory agent.[54]

Anacyclus pyrethrum (L.)

Immuno stimulating effect

Hot water polysaccharide extracts of Anacyclus pyrethrum (L.) Link. (FamilyCompositae) Citrullus colocynthis (L) Schrad. (Family: Cucurbitaceae) and Alpinia galanga(L.) Willd. (Family Zingiberaceae) were tested for their immune stimulating activity in mice. The fractions from Anacyclus pyrethrum and Alpinia galanga showed a marked stimulating effect on the reticulo-endothelial system (RES) and increased the number of peritoneal exudate cells (PEC), and spleen cells of mice. In this case, the optimum doses were 50 and 25mg/kg for the 2 fractions, respectively. On the other hand, the polysaccharide extracts of both Anacyclus pyrethrum and Alpinia galangal markedly enhanced the proliferation of the murine spleen cells in vitro using two tests (in vitro and in vivo effect). The results of the in vivo effect at a

doses of 50 and 25 mg/kg, showed a stimulation index better than obtained with the in vitro effect at 50 and 25mg/ml for Anacyclus pyrethrum and Alpinia galanga, respectively. While the extract of Citrullus colocynthis showed much weaker and variable immuno stimulating activity.[55]

Chemical constituents

The plant has been reported to contain daidzein, genistein, coumestrol, formononetin and biochanin A.[56] Anacycline, pellitorine, enetriyne alcohol, hyrdocarolin, inulin (c 50%), traces of volatile oil and (+) – sesamin,amides (I, II, III, IV) are also presents in the plant.[57]

The cortical portion of the root contains 5per cent of pyrethrin. In a recent investigation it has been found that the crystalline sialagogue isolated from this material, and named pellitorine (melting point 72°C), is in fact a mixture of isobutyl amides of the general type.

Antimicrobial activity

The plant shows the presence of many phytochemical constituents which are responsible for antimicrobial property. The A.pyrethrum have potential for development of antimicrobial agents against for some human pathogens.

The methanolic extract exhibited the best antimicrobial activity against three gram-positive bacterium(Listeria monocytogenes: 100%, Bacillus. cereus: 69% and Staphylococcus aureus: 66%), as well as against Candida albicans (81%). Finally, a relationship was observed between the biological activities potential and total phenolic and flavonoid levels of the extract. The results of this study provided an alternative of utilizing Anacyclus pyrethrum aerial parts as readily accessible source of natural antioxidant in food cosmetic and pharmaceutical industry.[58]

Anacyclus Pyrethrum extract produced little antibacterial effect against Staphylococcus aureus and Streptococcus sanguis. The plant did not have any antibacterial effect against Streptococcus mutans and Pseudomonas aeruginosa.[59]

Anti-inflammatory effects

In the present study, the evaluation of the activity of MEAPR (Methanol Extract of Anacyclus pyrethrum Roots), AEAPR(Aqueous Extract of Anacyclus pyrethrum Roots) revealed that both extracts possessed potent anti-inflammatory effects in both acute and chronic models of inflammation. Indeed, we have shown that that AEAPR and MEAPR

exhibited higher activity to counter the acute inflammation in a xylene-induced-ear-edema model (65 and 62%; respectively) than that of indomethacin (49%).[60]

Bronchodilating activity

Treatment with AET (200 and 400 mg/kg, p.o., for 7 days) showed significant protection against histamine and acetylcholine aerosol induced bronchospasm in guinea pigs. Significant decrease in the total leukocyte and differential leukocyte count in the BALF of the egg albumin sensitized guinea pigs was observed by administration of AET (200 and 400 mg/kg, p.o., for 15 days). AET dose dependently protected the mast cell disruption induced by compound 48/80. These results suggest that AET not only has bronchodilating activity but also decreases bronchial hyperreactivity by decreasing the infiltration of inflammatory cells in the airway and inhibiting the release of histamine like mediators from the mast cell by stabilizing it. In conclusion, our data suggest that the alcoholic extract of the leaves of T. baccata possesses significant anti-asthmatic activity and has beneficial effect in asthma by causing bronchorelaxation and decreasing bronchial hyperreactivity.[61]

The antioxidant activity

T. baccata can be considered a rich natural source of polyphenolic compounds with very good an-ticancer properties and strong antioxidant activ-ity. The antioxidant and anticancer activities of extracts from T. baccata depend on the plant part and solvent used for extraction, as well as on the chemical properties of the active substances pres-ent in the extracts. Our data show that the metha-nolic extract of leaves produces a better cytotoxic effect than the methanolic extract of seed cones, and that the HCT-116 cell line is more sensitive. Treatment with the methanolic extracts of leaves a nd seed cones induced apoptosis in both HCT-116 and MDA-MB-231 cell lines.

The total phenolic content ranged between 8.23 and 210.01 mg Ga/g, with the IC50 values for antioxidant activity between 25.24 and 533.66 mu g/ml. The MTT test showed that the methanolic extract of leaves had better activity on HCT-116 cells than the extract of seed cones, with IC50 values of 14.3 for 24 h and 4.59 for 72 h. The MDA-MB-231 cell line displayed significantly lower sensitivity to both extracts as compared to the HCT-116 cell line. Microscopic examination indicated that the extracts induced apoptosis in both cell lines. These results suggest that T. baccata leaves and seed cones are a potential source of phenolic compounds, especially flavonoids, as natural antioxidant, cytotoxic and strong proapoptotic substances of high value.[62]

Antimicrobial activity

The present study was aimed to investigate antimicrobial activity of various extracts from the Taxus baccata Linn. leaves (TBL). Various extracts viz. n-hexane (HX), dichloromethane (DCM), ethyl acetate (EA), ethanol (ET) and water (WT) prepared from TBL were tested on Gram-negative (9 species) and Gram-positive (4species) bacteria. The agar disc diffusion test was used to determine the sensitivityof the tested samples while the well micro-dilution was used to determine the minimum inhibitory concentration (MIC). The result of the disc diffusion assay showed that ET prevents the growth of all the 13 tested microbial species while other extracts showed selective activity. The inhibitory activity of the most active extracts viz. EA and WT was noted on 12(92.3%) and 11(84.6%) respectively. The lowest MIC value of 39.06µg/ml was observed with ET on five and WT only one microorganism, which appeared as both these extracts are the most active extracts.This lowest MIC (39.06µg/ml) is about 16-fold greater than that of reference antibiotic indicating very powerful antimicrobial potential.[63]

Chemical constituents of Taxus baccata

Preliminary qualitative phytochemical screening of AET showed the presence of lignans, flavonoids, glycosides, sugars, amino acids and triterpenoids. Lignans are known to possess various biological activities including antibacterial, antioxidant, anticancer, spasmolytic and anti-inflammatory effects.[64,65] Flavonoids are known to possess various biological activities including antibacterial, antifungal, spasmolytic, antiviral, anticancer, and anti-inflammatory effects.[66] Anti-asthmatic activity of T. baccata may be due to the presence of the above cons tituents.[67-69] Earlier investigation on Taxus baccata revealed that this plant is the best source forvariety of molecules such as, steroids, benzenoids, phenyl propanoid, etc., Recently an important compound with anti-cancer property was reported i.e., paclitaxol.

The leaves are reported to contain taxin A (1.3%; C35H49O10N; m.p. 204 °C and taxin B (30%; C33H45O8N; m.p. 113°C), hydrocyanic acid, reducing sugars, resins, tannins, ephedrine, a glucoside taxicatin (C14H20O8; m.p. 170 – 170.5°C), taxiphyllin(C14H13O7N; m.p. 168°C), ferredoxin, ecdysterone (also present in wood) and β –sitosterol, β-ecdysone (0.2%), a benzenoid, 4-(4'-hydroxy-phenyl butan-2(r)-ol 232(0.0024%) and 4-(3'-4'-dihydroxy-phenyl butan-2(r)-ol (0.0013%).

Amentoflavone (0.005%) and 4'-7"-di-o-methyl amentoflavone (0.001%), an alkene, 2-(3-4-methylenedioxy-benzyl)-3-(3-4-ethylenedioxy- benzylidene)- butane-1-4-diol, (0.0003%) are

isolated from the leaves and twigs, A phenyl propanoid, p-coumaric acid (0.00238%), ferulic acid (0.00035%); benzenoid, gallic acid (0.0003%) and gentisitic acid (0.0023%) are isolated from the leaves. taxane, 1-β-hydroxy baccatin isolated from the needles of this plant. diterpene, 10 deacetyl baccatin III (0.0095%), a flavone, bravifoliol (0.0074%), a simple phenolic compounds, 4-hydroxy benzaldehyde, caffeic acid (0.00035%), α-conidendrin (0.0003%), a benzenoid, 4-(4'-hydroxy phenyl trans- but -3-en-2-one (0.0032%) are isolated from the leaves.

VENKARAM (BORAX-SODIUM BIBORATE)

Actions Demulcent, diuretic, emmenogogue, sedative, tonic, alterative, antiseptic, astringent, parturifaceient and lithodialysis.

General properties

Toad skin, gastric ulcer, haemorrhoids, hemiplegia, urinary tract infection, poison due to snake, infectivediseases, cough, rhinitis, amenorrhoea, menorrhagia, stomatitis, carbuncle, itching, venereal ulcer with pus, dental diseases, kapha, delirium, abdominal diseases, indigestion, delayed labour, dysmenorrhea, sinusitis, anaemia due to menorrhagia, diarrhea in labour, epilepsy and ulcer on the nipple.

Medicinal uses

Borax (325 mg) and pepper powder(Piper nigrum) (195 mg) are taken together with 4ml of honey thrice a day for controlling Asthma and cough. It is also useful for indigestion and loss of appetite.[70]

CONCLUSION

All the ingredients of Swasakudori chooranam are simple, effective and easily available herbs. This review distinctly exposes that all ingredients of Swasakudori chooranam have anti inflammatory, antihistaminic, antiasthmatic, antispasmodic, antimicrobial, expectorant, bronchodilator, immunomodulator and antioxidant activities. These properties play a major role in the treatment of Bronchial Asthma. Hence, it could be concluded that the Swasakudori chooranam is one of the best drug of choice for Asthmatic patients since it is scientifically validated.

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