International Journal of Reverse Pharmacology and Health Research (IJRPHR)

Review article

Therapeutic effectiveness of a Siddha formulation Karuppu Vishnu chakkara mathirai: A Review

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ABSTRACT

Siddha system is one among the ancient system of Indian medicine. Karuppu Vishnu chakkara mathirai (KVC) is the one of the Siddha Herbo mineral formulation documented in Clinical Siddha text Viramamunivar Vagada Thirattu.It consist of 24 ingredients 6 of them minerals others are herbals. It is used to treat Ellavidha janni(Delirium),Anda vatham(Paralysis),Thimirvatham (Palsy),Ilampillaivatham(Infantileparalysis) Parisavatham(Polio), Thanurvatham(Tetanus), peenisam(Sinusitis), Vallipugal (Convulsion). Suram(Fever), Irumal(Cough), Gunmam (Gastric ulcer), Erigunmam (Gastritis), Kuttam (a type of skin disorder comes under leprosy).These proves KVC is effective to treat above mentioned disease. Ingredients of the formulation and their pharmacological action of each ingredients in various research studies are discussed in this review. Most of the drug have Anti inflammatory ,Analgesic , Anti convulsant and Anticancer and Antioxidant property.

Keywords:

Karuppu Vishnu Chakkaram, Herbo mineral formulation, Siddha medicine, pharmacological action .

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CODEN : IJRPHR

To access this article online

Website : http://www.ijrphr.com/

DOI : 10.121/ijrphr/05.0301.543

Quick response code

INTRODUCTION

The Siddha System is traditional system genereated from tamilculture .The siddha system of medicines praticised mainly in South India which include drugs of herbal, mineral, metal and animal origins(1) Siddhars have an enormous amount of knowledge regarding chemicals, metals, minerals and plants, which were successfully used by them for various purposes in various conditions/ situations. Two majar division of siddha medicines are internal and external medicine. Mathirai is one among the 32 internal medicine in siddha[(1)] .siddha system of medicine is attracting people because of the efficacy in curative nature of drug.[(2)]. Karuppu Vishnu chakkara mathirai(kvc)[(3)] is one of the siddha formulatory drug. It is Herbomineral preparation, consists of 24 ingrediants six of them minerals other are herbals .It is used to treat Ellavidha janni(Delirium),Anda vatham(Paralysis),Thimirvatham(Palsy),Ilampillaivat ham (Infantile paralysis) Parisavatham (Polio), Thanur vatham (Tetanus), peenisam (Sinusitis),Vallipugal (Convulsion).Suram (Fever), Irumal (Cough), Gunmam (Gastric ulcer) ,Erigunmam (Gastritis), Kuttam(a type of skin disorder comes under leprosy). The review is aimed bringout scientific evidence of therapeutic evidence of kvc and focused on the pharmacological activity in ingergients of kvc and responsible for the curative nature of the drug

Ingredients of karuppu Vishnu chakkra mathirai [(3)]:

1. Purified Thalagam-Trisulphuretof arsenic

2.Purified rasam- Hydragyrum

3.Purified Gandhagam-Sulphur

4.Purified Lingam-mercuric sulphide

5.Purified kaantham –Magnetic oxide of iron

6.Purified ayapodi-Ferrum (iron)

7.Vasampukkari- Acorus calamus

8.Poondu-Allium sativam

9.Moosamparam- Dried juice of Aloe vera

10.Velampisin- gum of Acacia nilotica

11.Chukku- Dried Zingiberofficinale

12.Kodiveliver- Plumbago indica

13.Nannariver- Hemidesmusindicus

14.Santhanam –Santalum album

15.Eluppaivithai –Madhuca longifolia

16.Drakkshai-Vitis vinifera

17.Porithaperungayam-Ferrula asafoetida

18.Purified Naabi-Aconitum napellus

Juices of KVC

19.Thumbai leaf juice-Leucas aspera

20.Kalyan murungai juice-Erythrina variegate

21.Manjal Karisalai Juice-Eclipta prostrate

22.Nerunjil whole plant juice - Tripulus terrestris

23.Adathodai leaf juice-Adathoda vasica

24.Dried Veppampattai Kashayam-Azardiachta indica

PHARMACOLOGICAL ACTIVITY OF HERBAL INGRDIENTS OF KARUPPU VISHNU CHAKKARAM MATHIRAI.

1. Acrous calamus

Antiulcer activity:

Arasan, Elayaraja et al, studied Antiulcer activity of Ethanolic extract of Acrous Calamus Rhizome in ethanol, reserbin, cysteamine induced Gastro duodenal mucosa injurious in Rat . Maximal effect of ethanolic extracts showed at a dose of 200 mg/kg by reducing the ulcer score, ulcer index, gastric content. [(7).]

Anti convulsant activity :

Dr. Chandrashekar et al studied anti convulsant activity of etanalic extract of rhizome (EERA)of acrous calamus in(MES)maximal electric shock induced seizure in swiss albino mice. The Result shown EEACR when given in a dose of 250 mg/kg and 500mg/kg significantly reduced hind limb extension and

tonic flexion of forelimbs when compared to control ($p<0.001$). [8]

Anti hepatotoxic activity :

S.palani et al studied anti hepatotoxic activity of ethanoic extract of acorous calamus in acetoaminophen inducd hepato toxicity in rats at two dose level 250mg/kg & 500 mg/kg B/W . It observed that the ethanol extract of AC confers hepato productive activitiy by histopathological and biochemical observations . The activity of ethanol extract of AC (500 mg/kg B/W) is comparable to the standard drug silymarin . [9].

Metal ingredients of KVC :

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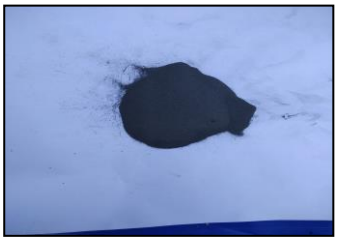

Herbal ingredients :

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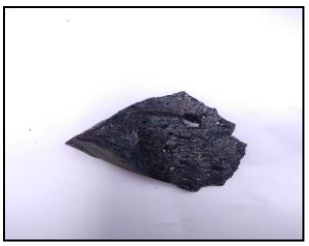

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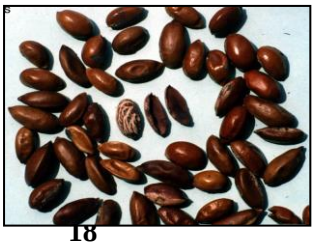

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Juices of KVC

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Information about herbal ingredients of karuppu Vishnu chakkara mathirai :(4)

Botanical name	Family	Parts used	Taste/poteny	Division	Action	Therapeutic action
Acrous calamus	Aroidae	Dried rhizome	Pungent/hot	Pungent	Exepectront Carminative Emetic Aromatic Antispasmodic Nauseant Nerve sedative	Paralysis Kasam (4)
Allium sataivam	Liliaceae	Bulb and oil	Pungent /hot	Pungent	Stimulant Carminatives Emmenagogue Antirheumatic Anthelmintic Alternative	Swasakasam Kushtam Paralysis Tremor Chronic ulcer internal ulcers of the lungs.
Zingiber offiicinale	Scitaminaceae	Scraped and dried rhizome	Pungent /hot	Pungent	Aromatic Carminative Stimulant Stomachic Sialagogue	Agnimantham Amavatham Strengthens memory Nervous disease Incontinence
Plumbago indica	Plumbaginaceae	Root	Pungent/hot	Pungent	Astringent Febrifuge Stimulant	Piles Acisites Ulcer Sobai Vatha disease
Hemidesmus indicus	Asclipidaceae	Root Root bark Juice	Sweet/cool	Sweet	Alternative Tonic Demulcent Diaphoretic Diuretic	Kustam Premeham Daham Arochakam Sexual debility ,shyphilis Diaphoretic.
Vitis vinifera	Vitaceae	Fruits,ripe ,unripe and partly dried ones ,leaves	Sweet/collent	Sweet	Demulcent Laxative Refrigerant Stomachic Diuretic Cooling expectorant	Anaemia Wasting disease Dyspepsia Haemorrhage Chronic bronchitis Heart disease Gout Convulsions Jaundice Cough
Ferrula asafoetida	Umbelliferae	Aromatic gum resin	Bitter/hot	Pungent	Stimulant Carminative Antispasmodic Expectorant Laxative	Flatulence Diarrhoea Burning in urine Disease of brain Improve vision

					Nervine andpulmonary stimulant	paralysis Chorea Epilepsy Convulsion of child Flatulence.
Aloe vera	Lilaceae	Expressed and dried juice of leaves and pulp	Bitter /coolent	Sweet	Stomachic Tonic Purgative	Worms Catarrhal and purulent ophthalmia Piles ,pneumonia infants Chronic ulcers.
Acacia Arabica	Mimosaceae	Expreesed and dried juice of leaveas and pulp	Bitter /coolent	Sweet	Astringent Demulcent Aphrodisiac Nutritive Expectorant Tonic	Cough gonorrhoea Leucorrhoea Dysentery diarrhoea Piles Pulmonary and cattarhal infection
Aconitum napellus	Ranunculaceae	The dried root	Bitter /hot	Pungent	Sedative Anodyine Antipyretic	Neuralgia Tetanus Acute and chronic rhematisam, gout erysipelas and fever Parasthesia Trigeminal neuralgia .
Leucas aspara	Labiatae	Flower and leaf	Sweet and pungent /hot	Pungent	Stimulant Expecrorant Diaphoretic Emmenagogue Insecticide	Nasal –laryngeal cough,cold, intestinal catarrh,amenorrhoea, headache snake bite ,scabies.
Ertthrina variegate	Fabaceae	Barkjuice ,leaves	Bitter /hot	Pungent	Expectorant Febrifuge Anthelminintic ,vermifuge Cathartic ,diuretic Laxative	Act on central nervous system to diminish and abolish the function ,dysentry , ear –ache ,Rhematic fever liver trouble ,snake bite, Syphilis dysmenorrhoea .
Eclipta prostrate	Compositae	Rizhome	Bitter/hot	Pungent	Emetic Laxative Aphrodisiac	Improves vision fever ,tonic,jaundice ,pruritis,scabies ,brain tonic ,colicky pain,enlarged liver,spleen,dropsy.
Adathoda vasica	Acanthaceae	Leaves ,roots ,flowers ,bark	Bitter /hot	Pungent	Expectorant Diuretic Antispasmodic ,alternative.	Swasa kasam Jwaram kustam ,megam,raktha pitham.

Azardirachta indica [5]	Meliaceae	Every part of the plant bark ,root bark ,young fruit or seed flowers ,leaves ,gum,today or sap.	Biter/hot	Pungent	Stimulant Anthelmintic Discutient	Kustam Premeham Chronic fever Blood purifier Gunmam ,arochagam Ulcer in urinary passage ,bronchitis ,leprosy
Tribulus territris	Zygophyllaceae	Whole plant	Astringent ,sweet /coolent	Sweet	Diuretic Tonic Demulcent Aphodisac Astringent	Kalladaippu neeradaippu
Santalum album	Santalaceae	Whole tree	Bitter /coolent	Sweet	Coolent adtringent Diuretic Stimulant Alternative	Leuucorrhoiea
Eluppai vithai Madhuca longifolia	Sapotasceae	Leaf ,flower ,fruit ,seed ,ghee.	Atstringent/coolent	Bitter	Demulcent Tinic Stimulant Demulcent	Neer vedkai

Information about metal ingrediants of kvc [6]

Common name		**Taste/potency**	**Action**	**Therapeutic uses**
Purified Thalagam	Trisulphurete of arsenic	-	Emmenagogue Antiperiodic Alternative Tonic Convalescent Expectorant	Fever Skin disease Asthma Paraplegia Hemiplegia Monoplegia Facial paralysis Cough Epilepsy Dropsy
Purified rasam	Hydrahygrum	Six tastes dominated by sweet /hot and cold	Vitalizer Tonic Laxative Diuretic Silagogue Anti inflammatory	Neutrilizing pitha Veneral diseases.

Lingam	Red sulphide of mercury	No taste and smel /hot	Tonic	Diarrhoea Pyrexia Delirium Utricaria Dieresis Tuberculosis Scabis Syphilis Leprosy Exzema Skin disease
Kantham	Magnetic oxide of iron	Astringent Mild sour Bitter taste	Tonic Haemopoietic Appetite stimulant	Ulcer Jaundice Veneral diseases Diseases of three humours Leucorrhoea Dyspepsia Anasarca Gonorrhoea Splenomegaly
Ayapodi	Ferrum	Astringent Mild sour Bitter taste	Tonic Haemopoietic Appetite stimulant	Anaemia Jaundice Leucoderma Obesity Dropsy Anorexia Peptic ulcer Spermatoohoea Diarrhoea

Anti inflammatory activity :

Deepak Kumar Jain et al studied anti-inflammatory activity of the 80% ethanolic extract of acrous calamus in experimental animal models using the carrageenan-induced paw oedema and cotton pellet granuloma tests in rats. Indomethacin is used as a standard. Result shows the exudate formation inhibited by 200 mg/kg of the extract in the cotton pellet granuloma test was comparatively significant. In this study possesses also reduce the early phases of inflammatory mediators. [(10)]

Anti oxidant activity :

pulok kumar et al studied in invitro antioxidant study of ethyl acetate extract of acrous calamus in DPPH scavenging assay at three different concentrations (0.2, 0.1, and 0.01 g/mL) showed a maximum activity of 86.43% at 0.2 g/mL[(11).]

2.Ferulla asafoetida

Anti inflammatory and Anti-nociceptive effect:

Bahgeri et al studied anti inflammatory and antinociceptive effect of ferulla asafoetida in hot plate method . in this method asafoetida exhibited a significant antinociceptive effect at all administered doses and the most effective dose was 10 mg/kg .The highest maximum potent effect was observed 15 minuets after asafoetida administration .paw weight was significantly reduced only in treated animals with 2.5 mg /kg asafoetida results clearly indicate that the asafoetida could be potential source of anti inflammatory and analgesic agent .[(12)]

Memory enhancing activity :

Bagheri sm et al studied memory enchancing activity in D galatose and NAN02 induced dementia in mice . Animals which divided into four groups .Normal control (NC) dementia control(DC) dementia prophylactic(DP) and dementia treated (DT) theses groups dp, nc, dt, were appricaibly shown superior memory retension capability than the dc group asafoetida could prevent and treat amnesia which may be explained by the presence of bioactive compounds containing sulphur and sesquiterpene coumarins.[13]

Anti ulcer activity :

Alaqasoum s. et al studied anti ulcer activity of aqueous extract of ferulla asafoetida by pyloric ligation assay in rats . Indomethacin is used as a standard , after administration of ferulla asafoetida there was a significant gastric lesion protection in all models .[14]

3.Aloe vera

Anti tumour activity :

Naveena et al studied anti tumour activity of ethonic extract of aloe vera in ehrlich asicits carcinoma (EAC) in mice. The Aloe vera showed decrease in abdominal circumference and body weight of EAC tumor bearing mice. [15]

Anti ulcer activity :.

Sai Krishna borra et al studied anti ulcer activity of aloe vera in indomethacin induced ulcer in rats. Omeprazole is used as a standard . A. vera showed statistically significant anti-ulcer activity comparable to standard drug omeprazole, based on ulcer index and histopathological studies . The mean ulcer indexes of two drugs were statistically significant (P value is < 0.001). [16]

Hypoglycemic activity :

Anupama gupta et al studied hypoglycaemic activity of leaf extract of Aloevera in rat. The result has been shown to a significant **hypoglycemic activity**. It decreases the fasting serum blood glucose level and HbA1C in alloxan induced diabetic rabbit.

The present study was carried out **arthrogenic effect** of leaf extract of Aloevera in alloxan induced rabbit models.The result shows significant decrease in serum level of Triglycerides and increased highdensity lipoprotein[17]

4.Acacia nilotia

Anti mutagenic activity :

Arora s.kaur .k et al stuied antimutagenic activity in acetone extract of acacia nilotia in ames salmonella histidine reversion assay by using different strains of salmonella typhimurium Acacia nilotica exhibited antimutagenic activity against direct acting mutagens of NPD, sodium azide, and the S9-dependent mutagen 2-aminofluorene (2AF). [18] .

Antioxidant activity :

Sultana et al studied anti oxident activity in methanolic extract of bark of acacia nilotica in DPPH radical scavenging assay . Acacia nilotica exhibited inhibition of oxidation of linoleic acid 44–90% ranged from 49% to 87% [19]

Anti bactreial activity :

B. Mahesh et al (2008) has observed antibacterial activity of methanolic extracts of Acacia nilotica, showed highest antibacterial activity against B. Subtilis, and Staphylococcus aureus with inhibition zone 15±0.66mm and leaf extract showed highest activity against Bacillus subtilis with inhibition zone 20±1.20mm [20].

Galactgogue activity :

Eline mb et al studied galactgogue activity in aqueous extract of acacia nilotica in rat . the result shows milk production is improved by 59% in first hour in rat [21].

Anti hepato carcinogenic activity :

Singh b.n et al studied antihepatocarcinigenic activity in bark extract of acacia nilotica in nitro sodiumethylamine treated rat .It prevented hepatic malondialdehyde (MDA) formation and reduced glutathione (GSH) . It also reduced liver injury and restored liver cancer markers .[22]

5.Zingiber officinale

Anti anorectic activity :

Kulkarani vs et al stuied antianorectic activity in hydrocholoric extract of the ginger in rat .Anorexia induced by intraperitonial administration of ecoli

lippopolysaccraide and fluroxetine in rats . The effect of same doses of the extract was also tested in freely feeding rats .200/400 mg ginger reversed the anoretic effect while gingerol 5 mg require for the effect. The ginger is able to attenuate anorexia induced by proinflammatory cytokines mediators [(23)]

Neuro protective activity :

Waggas et al studied neuroprotective activity in zinger root extract of the of zingiber officinale in albino rat .Monosodium glutamate induced toxicity in different brain areas in male albino rats. The nueroprotective effects partly attributable to an antagonisite activity of ginger rat extract in monosodium glutamate effect.Ginger extract was neuroprotective role against monosodium glutamate toxic effect. [(24)]

Nephrotoxicity effect :

Ajith ta et al studied nephrotoxicity effect of aqueous ethanol extract of gingiber officinale and Doxorubicin induced acute renal damage in rat. Ginger in mediated by preventing doxorubicin induced decline of renal antioxidant status and also by increasing the activity of glutathonine transferase .[(25)]

Effect on blood cloting:

Thomson et al studied blood cloting effect of zingiber officinale in rat . 500 mg /kg ginger is orally administrated in rats .After admistration TXB2 levels were significantly lower in rat.[(26)]

Gastroprotective activity :

Yamahara j et al studied gastro protective activity of zingiber officinale in rat. Zinger and its constituent show a vital role in ulcer prevention via increasing mucin secretion [(27).]

Anti Atherosclerotic activity:

Verma sk et al studied anti atherosclerotic activity of air dried ginger power of zingiber officinale in atherosclerotic induced rabits.In this study ginger treatment did not cause any significant lowering of serum lipids ,but lipid peroxidation was decreased and fibrinolytic activity increased .[(28)]

Anti inflammatory activity :

Anti inflammatory activity studied in intraperitonial administration of alcoholic ginger extract in the carrogeenan compound 48/80 or serotonin induced rat paw edema,ginger extract was also effective in inhibiting 48/80 induced rat skin edema at doses of 0.6 and 1.8 mg/site. The results demonstrated that z.officinale was able to reduce rat paw and skin edema.[(29)]

Antioxidant activity:

siva mosovska et al studied anti oxidant activity in ginger extract of zingiber officinale .The activity was determined using ABTS radical cation decolourization assay the activity of ginger extract was expressed by IC50 value .[(30)]

6. Kodiveli ver (plumbago indica)

Anti carcinogenic effect

Nguyen A et al studied anticancer effect of plumbago zeylancia in male f344 rats. Administered with plumbagin at 200 ppm in the diet for two weeks beginning one week before azoxymethane (AOM) injection had a lower incidence and multiplicity of tumors in the small intestine than those administered AOM alone. This suggests that plumbagin could be a promising neoplasia.[(31)]

Anti viral activity :

Marian et al. examined the antiviral activities of the 80% methanolic extracts of Plumbago zeylanica against Coxsackie Virus B3 (CVB3), influenza A virus and herpes simplex virus type 1 kupka (HSV-1) using cytopathic effect (CPE) inhibitory assays in HeLa, MDCK and GMK cells respectively. The antiviral activity of the most active compound was confirmed with plaque reduction assays. They also found that CVB3 was inhibited by the extract of Plumbago zeylanica .[(32)]

7. Hemidesmus indicus

Antimicrobial activity :

M .Gayathri_et al studied antimicrobial activity of Aqueous extract of Hemidesmus indicus . Antimicrobial activity were evaluated by zone of inhibition method at the range of 0.04 mg to 0.1 mg against the bacteria tested. The susceptibility of bacterial pathogens was in the order *of* S. aureus, K. pneumoniae *and* P. aeruginosa. [(33)]

Antioxidant activity :

Anita Murali et al studied Antioxident activity of methanol extract of H.indicus in CCl4 induced hepatotoxicity in albino Wistar rats the results shows

increase in the levels of SOD, peroxidase and a significant decrease in lipid peroxidation; reduced glutathione and catalase levels were significantly increased only with 600mg/kg dose of the extract.[34]

Analgesic activity:

Farook SM et al studied analgesic activity of hydro-alcoholic extract of Hemidesmus

Indicus in Swiss albino mice. Analgesic activity was evaluated by using Eddy's hot plate method .The results shows a maximal effect was observed at 300 mg/kg.[35])

Anti-inflammatory activity:

Dutta MK et al studied Anti inflammatory activity of The ethylacetate extract of roots of Hemisdesmus indicus used mehods of dextran induced inflammation in rats, the results shows significantly prevented increase in volume of paw edema and formation of granulation tissue in dose dependent manner and maximal effect was observed at 300 mg/kg b.w which was comparable to phenylbutazone 100 mg/kg b.w., i.p.[36]

Antioxidant activity:

1.Sultana S et al studied antioxidant activity of the aqueous extract of whole plant of Hemidesmus indicus in various invitro methods. The results shows inhibition of 1, 1-diphenyl-2-picryl hydrazyl (DPPH) radical, superoxide radicals and moderate nitric oxide scavenging activity due to the presence of polar components.[37]

2.Mahalingam G et al studied antioxidant activity of aqueous extract of hemidesmus indicus roots in streptozotocin induced diabetic rats, the results shows decreased lipid peroxidation index which is attributed to its antioxidant action.[38]

Hepatoprotective activity:

Mookan P et al studied hepatoprotective activtity of Ethanolic extract of Hemidesmus indicus roots in Rifampicin and Isoniazid (INH) induced liver toxicity in rats .The results shows Extract (100mg/kg b.w./day, for 15 days) prevented alteration in activities of isocitrate dehydrogenase, α-ketoglutarate dehydrogenase, succinate dehydrogenase,malate dehydrogenase, cytochrome C oxidase and NADH dehydrogenase. These effects probably might be due to the presence of coumarinolignoids viz.hemidesmin-I and hemidesmin-II which has free radicalscavenging activity[39]

Antimicrobial activity:

Ratha M et al studied Antimicrobial activity of Methanolic and ethanolic root extract of Hemidesmusindicus in agar well diffusion test the results shows maximum zone of inhibition against Escherichia coli and Vibrio cholera[40]

Wound healing activity:

Moideen MM et al studied Wound healing activity of the alcoholic extract of Hemidesmus indicus leaves (5% and 10% ointment) in rat. The results shows increased rate of wound contraction and period of epithelisation.[41]

Anticonvulsant activity:

Malathi M et al studied Anticonvulsant activity Ethanolic extract of Hemidesmusindicus roots at different concentration (100mg/kg and 200mg/kg) in Electro Shock method and pentylenetetrazol method in albino rats by using the standard drug as phenobarbitone the results shows significantly reduced the duration of tonic extensor phase and postictaldepression and the duration of clonus.([42])

Antiulcer activity:

Sony D et al studied Antiulcer activity of the combined ethanolic extracts of Hemidesmusindicus and Ficusreligiosaat the doses of 100, 200, 400, 800 mg/kg body weight orally in albino rats. The results such as good anti ulcer activity in the pylorus ligation model but in aspirin induced ulcer model, the combined extract have shown less significant activity[43]

8. Santalum album

Anti ulcer activity :

Ahmed n et al studied anti ulcer activity of hydroalcoholic extract of santalum album in rat.It inhibit physically (stress) and chemically (both irritant and dry NSAID) induced gastric ulceration in rats.[44]

Cardio protective activity:

Khan ms et al studied cardio protective activity of aqueous extract of sandal wood oil in rat model.It inhibit significantly in cardiac tissue damage by reducing lipid peroxidation on doxorubicin induced cardio toxicity in rat model. [45]

Anti hyperglycemic and anti hyperlipidemic effect:

Kulkarni et al studied antihyperglycemic and anti hyperilpidemic effect of petroleum either fraction of sandal wood oil in streptozotocin induced diabetic rats.Rats were treated with santalum album pet ether fraction orally at a dose of 10 m g/kg body weight twice daily for 60 days . Metformin was used as a positive control,lipid profile and glycated hemodlibin were estimated.Results shows santalum album pet ether fraction has potential anti hyperlipidemic activity that can help in over coming insulin resistance.[46]

9. Madhuca longifolia

Analgesic activity :

neha shekhowat et al studied analgesic effect of methanolic ecxtract of madhuca longifolia in either rat or mice in tail flick and hot plate methods. In this methods carried out either acetic acid induced abdominal pain in rat or mice . The methonolic extracts (50-200 mg kg /ip)were significantly reduced acetic acid induced abdominal contraction and strecting of hand limbs in a dose depenedent manner.madhuca longifolia possesses analgesic activity and it was evaluated using acetic acid –induced nociception response.[47]

Anti oxidant activity:

s.palani ,s raja et al studied antioxidant activity of ethanolic extract of madhuca longifolia in acataaminophen induced toxicity in rats .70% ethonic extract of bark of madhuca longifolia were studied for antioxidant activity. The ethonolic extract was tested by using reducing power and free radicals scavenging model. Studies assessed by determining the tissue GSH and lipid peroxidation level. The ethonolic extract of the leaves of m.longifolia at two dose levels of 500 mg/kg and 750 mg /kg body weight shows anti oxident activity .[48]

Invivo model anti oxidant activity :

Srirangam prashanth et al studied anti oxident of ethanolic extract of madhuca longifolia . anti oxident activity was evaluated by free radical seavenging activity using in 1,2 diphenyl 1,2 phenyl hydrazil BPPH reducing assay and superoxide scavenging activity the result of the assay was then comparing with a natural antioxidant ascorbic acid.[49]

Anti inflammatory activity :

Neha shekhowat et al studied anti inflammatory activity of saponin mixture of seeds of madhuca longifolia in rats. The anti inflammatory activity was evaluated using acute (carrageenin induced inflammation) subacute (formaldehyde induced inflammation) chronic (cotton pellot granuloma i)n rats ,both the extracts had more effective response than the reference drug diclofenac sodium in sub acute inflammation model [50]

Antiulcer activity:

Seshagiri.M et al studied anti ulcer activity of the alkaloid extract and ethonolic extract of seeds of Madhuka indica. The ethnolic extract was significantly effective in protecting pylorus ligation induced gastric ulcer .100 mg/kg showed significantly reduced in the ulcer index compared to vehicle.[51]

10.Vitis vinifera

Antioxidant activity :

g.k jaya prakasha et al studied antioxidant activity of grape seed proanthocyanidine extract (gspe)of vitis vinifera. In this extract provide protection against free radical scavenging assay and its effects was better than vitamins c and E.(GSPE 100 MG/KG) Compared to other antioxidents provided significant protection against 12-0 tetrodecanoylphorbol 1-3 acetate (tpa) induced oxidative damage.[52]

CNS effect :

n.s.s.a valli kanagarba et al stuided cns effect of seed extract of vitis vinifera , grape seed extract showed neuroproductive effects on neuronal injury induced by tranisient forebrain ischemia in gerbil achieved by inhibiting DNA damage in the gerbil hippocampus. Futher more the extract could inhibit the accumulation of aggrelated oxidative DNA damage in the spinal card and in various brain regions.[53]

Cardio protective effect :

N.s.s.a valli kanagarba et al studied cardio protective effect in oral consumption of standardized grape extract of vitis vinifera . Grape extract 100 and

200 mg /kg provide significant cardioproduction by improving post –ischemic ventricular recovery and reducing the amount of myocardial infraction in rats.[54]

11. Poondu (Allium sativum)

Anti tumour effect :

Pendbhaje et al studied anti tumour effect of allium sativum. Garlic extracts used as inhibition of cancer development in the presence of known tumor promoters and Sulphurous components present in garlic are believed to be liable to evade the developing of cancerous cells in stomach, liver, and other organs of human body.[55]

Anti cancer effects:

Tsubura A, et al studied anti cancer effects in oil soluble compounds derived from garlic such as diallyl disulfide (DADS)), are more effective than water-soluble compounds in suppressing breast cancer. Mechanisms of action include the activation of metabolizing enzymes that detoxify carcinogens, the suppression of DNA adduct formation, the inhibition of the production of reactive oxygen species, the regulation of cell-cycle arrest and the induction of apoptosis . Moreover, garlic extract reduces the side effects caused by anti-cancer agents. [56]

Anti diabetic activity :

Eidi a et al studied anti diabetic activity of allium sativum in streptozotocin-induced as well as alloxan-induced diabetes mellitus in rats and mice.in this study evaluated oral administration of garlic extract for 14 days on the level of serum glucose, total cholesterol, triglycerides, urea, uric acid, creatinine, in normal and streptozotocin-induced diabetic rats. Administrations of the garlic extract significantly decreased serum glucose, total cholesterol, triglycerides, urea, uric acid, creatinine, aspartate amino transferase and alanine amino transferase levels, while increased serum insulin in diabetic rats but not in normal rats , a comparison was made between the action of garlic extract and glibenclamide, a well-known antidiabetic drug. The antidiabetic effect of the garlic was more effective than that observed with glibenclamide .[57]

12. Aconitum Napellus

Anti inflammatory activity:

Mukesh K-Singh etal studied Anti inflammatory activity of ethanolic extract of Aconitum hetrophyllum in cotton pellet induced granuloma in rats. The extract has reduced inflammation as evidenced by decreased weight of cotton pellet.[58]

Antiepilepetiform effects:

Ameri A etal studied Antiepilepetiform effect in several diterpene alkaloids of Aconitum Napellus in rat kippocmpal slices. The Antiepilepetiform activity of diterpene alkaloids is in line with the blockage of the Na+ channels, because the Na+ channels are now to be involved in the genesis of abnormal activity in epilepsy. Na+ channels blocking compounds ex (Lappaconitine) inhibit experimentally induced epleptiform activity frequency dependently by sparing the normal neuronal activity.[59])

13. Leucas Aspara:

Antioxidant activity:

Emran TB etal studied antioxidant activity of ethanalic extract of Leucas Aspara in 1,diphenyl-2-picrylhydroyl(DPPH) Assay. Ascorbic acid is used positive control. Ascorbic acid solutions and different concentration of extract solutions where mixed with DPPH solutions. The mixture were kept in dark for 30 min to measure the absorbance at 517nm using a UV-visible Spectrophotometer. The low absorbance of the reaction mixture indicates higher free radical scavenging activity.[60]

Anticancer activity:

Krishnaraju etal studied Anticancer activity in hydro alcoholic extract of areal part of Leucas Aspara in brine shrimd lethality assay. Whole plant of Leucas Aspara exhibited cytotoxicity and this activity was more in root extract(LC50=52.8 ug/mL). In brine shrimd lethality assay, the Leucas Aspara ethanalic extract showed the LC50 value as (181.68+-2.15 ug/mL) which was statistically significant($p<0.0.1$) compared to positive control vincristine sulfate (lc 50 =(0.76 +_0.004)[61]

Anti inflammatory activity :

n.patil et al studied anti inflammatory activity of ethanolic extract of leucas aspara leaves, different doses 100mg/kg 200 mg/kg 400 mg /kg. Leaves extract showed sighnificant anti inflammatory activity in both acute as well as chronic inflammation in albino rats. The dose of 400 mg /kg produced a percentage

inhibition of 60.64 %. Which was comparabale to standard drug diclofenac (60-70 %) in carrageenan model ,whereas in cotton pellet method for diclofenac was (60.2) and for different dose of test 100,200.400 mg /kg was 50.85 % 57.63% 58 .42% respectively.[62]

Central nervous system activity :

Ragman m.s et al studied central nervous activity of ethnolic extract of leucas aspara in pentabarbitone induced sleeping time test , open field test and hole cross test in swis albino mice . leucas aspara root showed significant peripheral antinociceptive activity at the dose of 400 mg/kg.[63]

14 . Erythrina varigaeta

Anti rheumatoid arthiritis assay:

Nadkarani et al studied anti rheumatoid arthiritis assay of aqueous and ethonlic extracts of leaves of erythrina variegate,both the extracts of the two different concentration (256 ,500 kg body weight) administration of oral route once a day for 21 days .the extract has reduced swelling of the paw and bodyweight during secondary lesions .[64]

Anti convulsant activity :

Chinchawade et al studied anti convulsant activity of chloroform extract of the root and bark of erythrina variaegata in pentyleneterazole and maximal electric shock models in rat and mice. .Here chloroform extracts shows the onset of seizures compared with the control group in mice .finally it indicates the chloroform root and bark extract of erythina varegata may be beneficial in both absence and tonic clonic seizures.[65]

Anti inflammatory activity :

V.r Krishna et al stiided anti inflammatory activity of ethanolic extract of erythrina varigaata . Anti inflammatory activity was evaluated using acute inflammatory model like carrageenan induced paw edema and chronic inflammatory model like cotton pellet induced granuloma , the ethnolic extract in different doses 200,400 mg exhibited dose dependent and significant anti inflammatory activity in acute and chronic model inflammation.[66]

Analgesic activity :

Y bhagyasri et al studied analgesic activity of methanolic extract from the leaves of the varigata in acetic acid induced writhing model. Leaf of erythina variegata at a dose of 500 mg /kg showed significant antinociceptive activity with 49.03 % inhibition of writhing response .the results were statistically significant ($p<0.01$) in compared to control.[67])

15. Eclipta prostrata :

Anti inflammatory activity :

amritpal singh et al studied anti-inflammatory of methanolic extract of eclipta prostrate in wistar albino rats. Methanolic extract was administered orally to investigate anti inflammatory activity. 100 and 200 mg /kg showed significant anti inflammatory activity in carrageenan and egg white induced hind paw oedema in rats , which was comparable with indomethacin 10 /mg /kg and cyproheptadine 8 mg/kg.[68]

16.Nerunjil (Tripulus terrestriss)

Hepatoprotective activity:

kavitha p .et al studied hepato toxic activity of TT extract (250 mg/kg) of tripulus terrestries in acetaminophen induced hepatotoxicity in oreochromis mossambicus fish. . The elevated biochemical parameters and decreased level of reduced glutathione enzymes were normalized by treatment with TT extract (250 mg/kg) for acetaminophen-induced toxicity in fresh water fish. [69]

Anti inflammatory activity:

Oh JS ,baik sh et al studied anti inflammatory activity of ethanolic extract of TT in lipopolysaccharide-stimulated RAW264.7 cells .It inhibited the expression of cyclooxygenase-2 (COX-2) and inducible nitric oxide synthase (iNOS) in lipopolysaccharide-stimulated RAW264.7 cells. It also suppressed the expression of proinflammatory cytokines such as tumor necrosis factor-alpha (TNF-α) and interleukin (IL)-4 in macrophage cell line. Thus, the ethanolic extract of TT inhibits the expression of mediators related to inflammation and expression of inflammatory cytokines, which has a beneficial effect on various inflammatory conditions.[70]

Analgesic activity:

Heidari MR et al studied Analgesic activities of TT in male mice using formalin and tail flick test. The study indicated that the methanolic extract of TT at a dose of 100 mg/kg produced analgesic effect. This analgesic effect of the TT extract may be mediated

centrally and or peripherally. Effect of the extract was lower than morphine and higher than acetylsalicylic acid (aspirin) in both tests. [71]

Skeletal muscle relaxant activity:

Evan wc studied skeletel muscle relaxant activity of Ethanol (95%) extract of the dried entire plant.of tribulus terrirtus in mice administered intraperitoneally to mice showed skeletal muscle relaxant activity.[72]

17. Adathoda vasica

Effect in diabetic encephalopathy:

Atul kumar et al studied diabetic encephalopathy of ethanalic extract of adathoda vasica leaves in Streptozotocin (STZ)-induced diabetic Wistar rats. At the end of the study biochemical parameters like acetylcholinesterase (AchE) activity, nitrite tumor necrosis factor-alpha (TNF-α) and oxidative stress was measured from cerebral cortex and hippocampus regions of brain. AchE activity was found increased by 70% in the cerebral cortex of diabetic rat brain. Lipid peroxidation (LPO) levels were increased by 100% and 94% in cerebral cortex and hippocampus of diabetic rats, respectively. Nonprotein thiol levels, enzymatic activities of superoxide dismutase and catalase were found decreased in cerebral cortex and hippocampal regions of diabetic rat brain. Nitrite levels in both regions of diabetic brain were increased by 170% and 137% respectively. TNF-α, a pro-inflammatory cytokine, was found significantly increased in diabetic rats.The results suggest a protective role of Adhatoda vasica against diabetic encephalopathy, .[73]

Anti ulcer activity:

Shrivastava N studied antiulcer activity of leaf of adathoda vacica in rat. ulcer was induced by ethanol, pylorus, and aspirin. Adhatoda leaf powder showed a considerable degree of anti-ulcer activity in experimental rats when compared with controls. The highest degree of activity was observed in the ethanol-induced ulceration model.[74]

Bhargava MK, Stuided anti ulcer activity of chloroform extract of adathoda vasica in buffalo calves.wounds were created along the Medicine vertebral columns of buffalo calves, and alcoholic and chloroform extracts of Adhatoda in a powdered form were applied. As compared to control animals, the calves treated with Adhatoda vasica showed significantly improved healing. Vasica improved breaking strength, tensile strength, absorption and extensibility in the wound repair tissue. In addition, the levels of elastin, collagen, hydroxyproline, hexosamine and zinc were greatly increased in the animals treated with Adhatoda. The alcoholic extract of the herb was found to be the most effective.[75]

18. Azardirachta indica :

Anti inflammatory activity :

R. R. Chattopadhyay et al studied anti inflammatory activity of azardirachta indica in rats . A. indica leaves at a dose of 200 mg/kg, p.o., showed significant anti-inflammatory activity in cotton pellet granuloma assay in rats[76]

Hepato protective effect :

N. S. Baligar studied hepatocellur effect of azadirachtin-A in carbon tetrachloride (CCl4) induced hepatotoxicity in rats .The results confirmed that pretreatment with azadirachtin-A dose dependently reduced hepatocellular necrosis.[77]

Another study was carried out to evaluate the protective effect of active constituent of neem such as nimbolide against carbon tetrachloride (CCl4) induced liver toxicity in rats and results suggest that nimbolide possesses hepatoprotective effect against CCl4 induced liver damage with efficiency similar to that of silymarin standard [78].

Anti diabetic activity :

A study was undertaken to evaluate the 70% alcoholic neem root bark extract (NRE) in diabetes and results showed that neem root bark extract showed statistically significant results in 800 mg/kg dose [79]

S. K. Dholi, performed to examine the pharmacological hypoglycemic action of Azadirachta indica in diabetic rats and results showed that in a glucose tolerance test with neem extract 250 mg/kg demonstrated glucose levels were significantly less as compared to the control group and Azadirachta indica significantly reduce glucose levels at 15th day in diabetic rats.[80]

CONCLUSION

From this literature review it is evident that the most of ingredients of karuppu Vishnu chakkara mathrai has pharmacological activity like Anti convulsant , Analgesic , Anti-inflammatory , Anti oxidant ,Anti ulcer ,Anti tumour ,Anti bacterial ,Anti viral ,Anti microbial,Hepato protective ,and Neuro

protective activity which are responsible for its therapeutic activity claimed in siddha literature.

CONFLICT OF INTEREST

None Declared

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