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Kabhasura Kudineer and its ingredients against

COVID -19

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ABSTRACT

Siddha System of Medicine is one of the folklore medicines practised by people in South India since several years about 12000 yrs back. Ancient people were aware of knowledge in herbs and its uses. They were also handled several such pandemic conditions on that period itself by Notification, Isolation and used some concoction one such medicine is *Kabhasura Kudineer* (KSK). It is the Siddha formulation contain 15 ingredients mainly prescribed by Siddha Physicians against Viral Diseases like COVID-19 etc., Covid 19 disease is caused by the virus SARS-COVID virus which is come under CORONA Virus. It causes severe acute respiratory syndrome. This virus is highly contagious through nasal and oral secretions caused a pandemic of acute respiratory disease, which threatens human health and public safety. Several crores were affected and several deaths were recorded for the past 2 years. KSK prescribed for COVID-19 diseases in South India because of the ingredients contain Anti-inflammatory, Anti pyretic and Anti-viral activity. This article ensures the chemical constituents of the KSK ingredients and its actions. Furthermore, preclinical study required for confirmation of the action of the KSK.

Keywords: Siddha, Kabhasura Kudineer, SARS-COVID, Antiviral, Antiinflammatory, Antipyretic.

INTRODUCTION

Kabhasura Kudineer (KSK) is the Siddha formulation contain 15 ingredients mainly prescribed by Siddha Physicians against Viral Diseases like COVID – 19 etc., Viruses are an infectious one that can only reproduce within a host organism. Viruses can infect a variety of living organisms, including bacteria, plants, and animals. ^[1] Covid 19 disease is caused by the virus SARS –COVID virus which is come under CORONA Virus which is identified first in Wuhan city in china in the year of 2019 December ^[2]. It causes severe acute respiratory syndrome. This virus is highly contagious through nasal and oral secretions caused a pandemic of acute respiratory disease, which threatens human health and public safety. Several Crore were affected and several deaths were recorded for the past 2 years. KSK prescribed for COVID – 19 diseases in South India because of the ingredients contain Antiinflammatory, Anti pyretic and Anti-viral activity. One In- Silico computational study also derivates the 9 compounds of KSK had showed high binding affinity against SARS-CoV-2 spike protein (PDB ID: 6VSB) ^[3]. This review explained the ingredients and preparation of KSK and detailed the phyto chemicals present in that ingredient and its pharmacological action which helps against the COVID – 19 infections.

Kabhasura Kudineer (KSK)

Siddha System of Medicine is one of the folklore medicines practised by people in South India since several years about 12000 yrs back. Ancient world contains large land surface area which among one is *Kumari Kandam*. *Siddhars* were practised herbals, metals, minerals origins for treating and curing the diseases. People were lived in that place aware of knowledge in herbs and its uses. People also handled several such Pandemic conditions on that period itself by Notification, Isolation and used some concoction one such medicine is KSK.

In Siddha medicine contain 32 kinds of Internal and 32 kinds of External treatments. In Internal medicine Kudineer (Concoction) is one among them. KSK is prescribed for *Kabha suram* which symptoms like the acute respiratory ailment caused by Viruses including severe phlegm, cough and fever. KSK *Chooranam* powder was manufactured as per the (National Siddha Formulary of India, part I, 1st edition 1992).

Table 1: Ingredients of Kabhasura Kudineer (KSK)

S. No	Ingredients of KSK	Part used	Quantity	English Name	Botanical Name
1	Chukku	Rhizome	1 Part	Dry Ginger	<i>Zingiber officinale L</i>
2	Thippili	Fruit	1 Part	Long pepper	<i>Piper longum L.</i>
3	Lavangam	Flower	1 Part	Clove	<i>Syzygium aromaticum (L.) Merr. & L.M.Perry</i>
4	Kadukkai	Fruit	1 Part	Indian hog plum	<i>Terminalia chebula Retz.</i>
5	Cirukancori	Root	1 Part	Climbing nettle	<i>Tragia involucrata L.</i>
6	Akkarakaram	Root	1 Part	Pellitory	<i>Anacyclus pyrethrum (L.) Link</i>
7	Neer mulli	Root	1 Part	Marsh barbel	<i>Hygrophila auriculata Schumach</i>
8	Siruthekkku	Root	1 Part	Blue glory	<i>Clerodendron serratum (L.) Moon</i>
9	Kostam	Root	1 Part	Costus	<i>Costus speciosus (J.Koenig) Sm</i>
10	Korai kizhangu	Root	1 Part	Nut grass	<i>Cyperus rotundus L.</i>
11	Adathodai	Leaf	1 Part	Malabar nut	<i>Justicia adhatoda L.</i>
12	Karporavalli	Leaf	1 Part	Indian borage	<i>Coleus aromaticus Benth</i>
13	Vattathiruppi	Leaf	1 Part	Velvet leaf	<i>Cissampelos pareira L.</i>
14	Seenthil	Stem	1 Part	Heart leaved moonseed	<i>Tinospora cordifolia (Thunb.) Miers</i>
15	Nilavembu	Whole Plant	1 Part	Kriate	<i>Andrographis paniculata Burm.f.Nees</i>

Preparation of KSK

All the ingredients mentioned in Table 1 confirmed and authenticate by the botanist. Then all the them should be purified as per the Siddha Text like Suththi Muraigal and Siktcha Rathina Deepam. All the purified raw drugs should powder separately, roughly and mixed well.

Dose of KSK

Take 5gm of the course powder mixed with 320 ml of water boiled until comes in to 60 ml concoction for adult BD under physician advice.

RESULTS AND DISCUSSION

Phyto chemical constituents of KSK ingredients and its Pharmacological action against COVID 19 has explained in Table 2

All the ingredients of KSK have antimicrobial activity against Staphylococcus aureus. 93.33% plants revealed against Escherichia coli, 80% plants revealed against Bacilus subtilis, 73.33% plants revealed against Pseudomonus aeruginosa, 66.66% plants revealed against Klebsiella pneumonia and 60% plants revealed against Salmonella typhimurium. The ethanolic and methanolic extracts of the plants have shown the anti-microbial properties against Staphylococcus aureus. Escherichia coli, Bacilus subtilis,

Pseudomonus aeruginosa, Klebsiella pneumonia and Salmonella typhimurium. [59]

As this review revealed the most of the KSK ingredients have Anti – inflammatory property because of contains naturally occurring chemical constituents like alkaloids, flavanoids, phenolic compounds, steroid etc., Anti–inflammatory action of ginger processed through suppression of Prostaglandin synthetase and pro inflammatory cytokines such as IL-1, IL-8, TNF –alpha. KSK ingredient reduces the inflammation due to SARS COVID virus. Chukku, Thippili, Lavangam, Neermulli, Korai kizhangu has the Antipyretic action. Chukku, Thippili, Lavangam, Kadukkai, Akkaragaram, Neermulli, Korai kizhangu, Karpooravalli has Analgesic activity. Lavangam, Kadukkai, Karpooravalli has Anti- Viral Property. Siruthekkku, Adathodai has strong bronchodilator. Chukku, Thippili, Lavangam, Kadukkai, Ciruthekkku, Akkarakaram, Neermulli, Kostam, Korai Kizhangu, Seenthil, Vattathiruppi has Anti-oxidant activity. So, this review stated that the ingredient of KSK which is the compound formulation relieves the symptoms of SARS- COVID by the presence of natural chemical constituents and it is a very good anti-oxidant activity to rejuvenate the body to prevent the development of diseases. But evidence is needed to prove the global acceptance of the KSK for treating the viral diseases with this decoction. Even though KSK used by south people long run need to prove by pre-clinical and clinical studies for development of new drug intervention against COVID – 19.

Table 2: Phyto chemicals and pharmacological actions of KSK ingredients against COVID 19

S. No	Ingredients of KSK	Phyto chemicals	Pharmacological activities
	<i>Zingiber officinale L</i>	[6]- gingerols, [8]- gingerols, [10]-gingerols, 1,7-bis-(40-Hydroxy-30-methoxyphenyl)-3,5-heptadione, adenine, 1- Dehydro-3-dihydro-[10]-gingerdione, Acetoxy-6-dihydroparadol, [4]- Isogingerol, 5-Methoxy-[6]-gingerol, Methyl diacetoxy-[4]-gingerdiol, Methyl diacetoxy-[10]-gingerdiol, 1-Dehydro-[3]-gingerdione, Acetoxy-[4]- gingerol, [4]-Shogaol, [6]-Shogaol, [8]-Shogaol, [10]-Shogaol, [12]-Shogaol, [6]-Paradol, [7]-Paradol, [8]-Paradol, [9]-Paradol, [10]-Paradol, [11]-Paradol, [13]-Paradol, 1-(40-Hydroxy-30-methoxyphenyl)- 7-octen-3-one, 1-(40- Hydroxy-30-methoxyphenyl)-7-decen-3-one, 1-(40-Hydroxy-30-methoxyphenyl)-7-dodecen-3-one, beta-sitosterol palmitate, isovanillin, glycol	Anti – inflammatory, Anti – Cancer, Anti – Oxidant, Anti pyretic, Anti – microbial activity.[4]

		monopalmitate, hexacosanoic acid 2,3-dihydroxypropyl ester, maleimide-5- oxime, p-hydroxybenzaldehyde and 1-(omega-ferulyloxygeranyl) glycerols, Gingerol, Paradol, Shogoal, Zingerone, Zerumbone, 1-Dehydro-(10) gingerdione, Terpenoids, Ginger flavonoids. ^[4]	
	<i>Piper longum L.</i>	Retrofractamide C, piperolein B, pipernonaline, dehydropipernonaline, (2E,4Z,8E)/N/[9/(3,4/methylenedioxyphenyl)/2,4,8/nonatrienoyl] piperidine, Piperine, Piperidine, (2E,4E)/N/isobutyl/eicosa/2,4/dienamide, (2E, 4E, 14Z)/N/isobutyl/eicosa/2, 4, 14/trienamide, (2E, 4E, 12Z)/N/isobutyl/ocatadeca/2, 4, 12/trienamide, Piperlongumine, Methylpiperate, Piperocetadecalinide, 3',4',5'-trimethoxycinnamate, Piperanine, Pellitorine, Piperonal, 1,2-dihydroxybisabola-3,10-diene, Guineesine, Pipericide, Dihydropiperlongumine, piperchabamide B. ^[5]	Anti-Cancer, Anti-Oxidant, Hepatoprotective, Anti-inflammatory, Immuno modulatory, Coronary Vasodilation, Antimicrobial, Anti – pyretic, Bioavailability –enhancing, Antiplatelet, Antifertility, Anti hyper lipidemic, Anti-obesity, Analgesic, Larvicidal, Adulticidal, Radioprotective. ^[5]
	<i>Syzygium aromaticum (L.) Merr. & L.M.Perry</i>	Flavonoids, hydroxybenzoic acids, hydroxycinnamic acids, and hydroxyphenyl propenes. Phenolic compounds - gallic acid, ferulic, elagic, caffeic and salicylic acids. Kaempferol and quercetin are some flavonoids. Tannins, sterols, triterpenes, Volatile Oil contains Essential oil, Eugenol, Eugenol acetate, Caryophyllene. ^[6]	Analgesic, Anti-Viral, Anti –microbial, Anti-oxidant, Anti Stress, Anti-pyretic, Hepato protective, Anti-inflammatory, Antinoceptive activity. ⁷
	<i>Terminalia chebula Retz.</i>	Tannin - chebulic acid, chebulagic acid, corilagin and gallic acid. Tannins are of pyrogallol (hydrolyzable) type. ^[8] 14 components of hydrolyzable tannins (gallic acid, chebulic acid, punicalagin, chebulanin, corilagin, neochebulinic acid, ellagic acid, chebulegic acid, chebulinic acid, 1,2,3,4,6- penta-O-galloyl-β-D-glucose, 1,6-di-O-galloyl-D-glucose, casuarinin, 3,4,6-tri-O-galloyl-D- glucose, terchebulin) from fruit. ^[9] Besides, fructose, amino acids, succinic acid, betasitosterol, anthroquinone and sennoside. ^[10] Flavonol glycosides, triterpenoids, coumarin conjugated with gallic acids called chebulin. ^[11]	Anti-viral, Anti-fungal, Anti-Bacterial, Antioxidant, Hepato protective, Neuro protective, Cytotoxic, Anti diabetic, Anti-inflammatory activities, Cardio protective etc., ^[12]
	<i>Tragia involucrata L.</i>	Alkaloids, carbohydrates, protein, tannins, flavonoids, sterols, saponins vinyl hexylether, shellsol, 2,4-dimethyl hexane, 2-methylnanone, and 2,6-dimethyl heptane. In addition, five other different compounds, namely; TIR-01, TIR-02, TIR-03, TIR-04 and TIR-05 has been identified in the ethyl acetate extract. ^[13]	Anti bacterial /microbial activity, anti-diabetic, antioxidant activity, and anti-inflammatory activity. It cures haemorrhoids. ^[14]
	<i>Anacyclus pyrethrum (L.) Link</i>	Pellitorine, Sesamine, Anacylin, 2-phenyl ethyl amine, inulin, polyacetylenic amides I-IV, sesamin, spathulenol, β-biotol and salvial -4 (14) -en-1-one, Eudesma -4 (15),7-diene-1- ol and β – himachalo. It also contains tannins, gum and essential oil traces. ^[15] various secondary metabolites such as alkaloids, reducing compounds, tannins, flavonoids and coumarins. Three fatty acids, a sterol and ten unsaturated amides. ^[16]	Anti-inflammatory, Analgesic, antidiabetic, immune stimulating effect, inhibitory effects, antidepressant activity and anticonvulsant activity memory-enhancing activity, aphrodisiacs, antimicrobial activity, antioxidant, local anaesthetic effect, insecticidal effect, action on COX and LOX, interactions with testosterone, interaction with libido, and it interaction with testicles. ^[17]
	<i>Hygrophila auriculata Schumach</i>	Alkaloids, steroids, tannins, proteins, flavonoids, carbohydrates, fats, and oils were isolated from the roots. The high-performance thin layer chromatography analysis revealed the presence of phytosterols, namely, β-sitosterol and lupeol. Maximum content of lupeol was found in the roots. Lupeol, Betulin, Luteolin, Apigenin 7-O-glucoside, Apigenin 7-O-glucuronide and Stigmasteryl, 25-Oxo-hentriacontyl acetate, Methyl 8-n-hexyltetracosanoate. ^[18]	antitumor, hypoglycemic, aphrodisiac, free radical scavenging and lipid peroxidation, haematopoietic activity, analgesic, antimicrobial, hepatoprotective, diuretics, Anti-oxidant, anthelmintic, anti-inflammatory, antipyretic, anabolic and androgenic properties etc. ^[19]
	<i>Clerodendron serratum (L.) Moon</i>	Saponins, D - mannitol, Stigmasterol, oleanolic acid, Queretaroic acid, Serratagenic acid, Sitosterol, Clerosterol identified as 5, 25- stimastadien-3β o, Clerodone as 3β-hydroxyl- lupan 12- one, B- sitosterol, Lupeol, A steroidal glycoside, Phytosterols, Ferulic acid, Arabinose, Scutellarcin, Baicalein , Serratatin and Ursolic acid. ^[20]	Antiasthmatic, bronchodilator, anti-cancerous, hepatoprotective, anti-allergic, anti-inflammatory, vaso-relaxant and wound healing property. icosahydriconic acid and ursolic acid of this plant has anti-allergic and hepatoprotective activity. ^[21]
	<i>Costus speciosus (J.Koenig) Sm</i>	phenolics, steroids, alkaloids, saponins, terpenoids and tannins to be present in different parts of the plant. Bioactive compounds like diosgenin, dioscin, prosapogenins A and B of dioscin, gracillin, eremanthin, costunolide, β-sitosetrol, β-D- glucoside, β- carotene, α- tocopherol quinone, dihydrophytyl plastoquinone, 5 α-stigmast- 9(11) en 3β-ol, tetracosanyl octadecanoate, methyl hexadecanoate, metyloctadecanoate, cycloartenol, cycloartenol and cycloaludenol are specifically found in this plant. ^[22]	anti-oxidant, anti-cancer, antidiabetic activities and has insecticidal, anti-fungal, anti-bacterial and anthelmintic properties. ^[23]
	<i>Cyperus rotundus L.</i>	alkaloids, flavonoids, tannins, starch, glycosides, furochromones, monoterpenes, sesquiterpenes, sitosterol, fatty oil containing a neutral waxy substance, glycerol, linolenic, myristic and stearic acids, essential oil, Alpha-cyperone, Alpha-rotunol, Beta-cyperone, Beta-pinene, Beta-rotunol, Beta-selinene, Calcium, Camphene, Copaene, Cyperene, Cyperenone, Cyperol, Cyperolone Cyperotundone Dcopadiene, D-epoxyguaiene, D-fructose, D-glucose, Flavonoids, Gamma-cymene, Isocyperol, Isokobusone, Kobusone, Limonene, Linoleic-acid, Linolenic-acid, Magnesium, Manganese, C. rotunduskone, Myristic-acid, Oleanolic-acid, Oleanolic-acid-3-oneohesperidoside, Oleic-acid, P-cymol, Patchoulone, Pectin, Polyphenols, Rotundene, Rotundenol, Rotundone, Selinatriene, Sitosterol, Stearic-acid, Sugeonol, Sugetriol. ^[24]	anti-Candida, anti-inflammatory, anti-diabetic, anti-diarrhoeal, cyto protective, anti-mutagenic, antimicrobial, antibacterial, antioxidant, cyto toxic and apoptotic, anti-pyretic and analgesic activities. ^[25]
	<i>Justicia adhatoda L.</i>	Essential oils, fats, resins, sugar, gum, amino acids, proteins and vitamins 'C' etc., ^[26] Phenols, tannins, alkaloids, anthraquinone, saponins, flavonoids and reducing sugars were found in the leaves of J. adhatoda. But the pharmacologically most studied	anti diabetic, anti-bacterial, anti-inflammatory, anti-malarial, anti-oxidant, anti-mutagenic, respiratory stimulant, broncho dilator, cardio-

		chemical component in <i>J. adhatoda</i> is a bitter quinazoline alkaloid, vasicine which is present in the leaves, roots and flowers. Besides vasicine, the leaves contain several alkaloids (Vasicinone, Vasicinol, Adhatodine, Adhatonine, Adhvasinone, Anisotine and Hydroxypeganine), betaine, steroids and alkanes Vasicine is metabolized to vasicinone. 1, 2, 3, 9-tetrahydro-5-methoxypyrrol [2, 1-b] quinazolin-3-ol. [27]	protective, anti-ulcer, insecticidal, allopathic, hepato protective and anti-cholinesterase potentials. [28]
	<i>Coleus aromaticus Benth</i>	Carvacrol, thymol, α -humulene, undecanal, γ -terpinene, p-cymene, caryophyllene oxide, α -terpineol, β -selinene, eugenol, terpinolene, α -pinene, β -pinene and β -phellandrene. [29]	analgesic, Lactogenic, Anti-Inflammatory, Anti tumorigenic, Anti-epileptic, Antiviral, Antifungal, Antimicrobial. [30]
	<i>Cissampelos pareira L.</i>	Acids, betacyanin, quinones, coumarins, carbohydrates, alkaloids, amino acids, fixed oils and fats, flavonoids, steroids, tannins, resins, terpenoids, phenols, cardiac glycosides, volatile oils and starch were present in different extracts of leaf triterpene, flavonoids, glycosides, alkaloids, and carbohydrates. [31]	Anti-diabetic activity, Hepato protective activity, Anti-ulcer activity, Anti-inflammatory activity, Anti-cancer activity, Anti-asthmatic activity, Anti-fertility activity, Antioxidant activity, Anti-nociceptive and anti-arthritic activities, Anti-anxiety activity, Anti-leukemic activity. [32]
	<i>Tinospora cordifolia (Thumb.) Miers</i>	Alkaloids, glycosides, steroids, sesquiterpenoid, aliphatic compound, essential oils, mixture of fatty acids and polysaccharides. [33] The alkaloids include berberine, bitter gilonin, non-glycoside gilonin, gilosterol. Glycosyl composition of a polysaccharide shown terminal-glucose, 4-xylose, 4-glucose, 4, 6- glucose and 2, 3, 4, 6-glucose. Cyanidin 3-O-sambubiosyl 5-O-glucoside, Hesperetin 7- Rhamnoglucoside, quercetin 3-O- β -xylopyranosyl-(1 \rightarrow 2)-O- β -galactopyranoside, Blumenol C malonylglycosyl galacturonide [M+H] ⁺ , Verbascoside, Quercetin-3-glucuronide, and Catechin/ Epicatechin-(epi) gallo catechin dimer. [34]	Antioxidant activity, antimicrobial activity, antibacterial activity, antifungal activity, anti-diabetic activity, antistress activity, hypolipidaemic effect, hepatic disorder, anticancer, anti-HIV potential, anti-osteoporotic effects, antitoxic effects, wound healing, immune modulating activity, systemic infection and Parkinson's disease. [35]
	<i>Andrographis paniculata Burm.f.Nees</i>	Diterpenoids, flavonoids and polyphenols. Andrographolide, deoxyandrographolide, neoandrographolide, 14-deoxy11,12-didehydroandrographide and isoandrographolide. 5-hydroxy-7,8-dimethoxy flavone, 5-hydroxy-7,8,2',3'-tetramethoxyflavone, 5-hydroxy-7,8,2'- trimethoxyflavone, 7-O-methylwogonin and 2'-methyl ether, dihydroneobaicalein, andrographidine A, andrographidine B, andrographidine C -D glucopyranoside; three diterpenoids - andrograpanin, β and 5,2'-dihydroxy-7,8-dimethoxyflavone 2'-O- neoandrographolide and andrographolide; two phenylpropanoids: trans-cinnamic acid and 4-hydroxy-2-methoxycinnamaldehyde; and oleanolic acid, β -sitosterol and β -daucosterol. [36]	Anti-diabetic, anti-retroviral, cardioprotective, anti-inflammatory, anti-proliferative proapoptotic, anti-angiogenic, anti-thrombotic, anti-urolithelial, anti-leishmaniasis. [36]

Table 3: Article conclude and proves the action of KSK ingredients against COVID 19.

S. No	Ingredients of KSK	Article conclude and proves the action of KSK ingredients against COVID 19
	<i>Zingiber officinale L</i>	Anti-inflammatory action of ginger processed through suppression of Prostaglandin synthetase and pro inflammatory cytokines such as IL-1, IL-8, TNF - α . [37] In some studies reveals 6 shagaol can down regulate iNOS and COX -2 inflammatory gene expression and it also reduce the elevated expression of NF κ B and TNF- α which is linked with several inflammatory diseases like MI, Cancer, Asthma etc.. [38] It promotes digestion and is very useful to treat asthma and chronic respiratory ailments. [39] The ethanol extract of ginger has a good anti-inflammatory activity that may suppressing paw edema of rat in both early and later stage of inflammation. Ginger has (6)-shogaol which to inhibit cyclooxygenase enzyme. [40] Ginger inhibiting PGE2 biosynthesis and reduce the elevated body temperature. Ginger also has analgesic effect. [41]
	<i>Piper longum L.</i>	It is used to treat indigestion, asthma and respiratory ailments. [42] Its extract and piperine possess inhibitory activities on prostaglandin and leukotrienes COX-1 inhibitory effect and thus exhibit anti-inflammatory activity. Alcoholic extract of <i>Thippili</i> is useful in exert protective activity in case of myocardial ischemia animals. It also act as CNS depressant, antipyretic, analgesic, anti-inflammatory, antioxidant. [43] It has potential immune stimulating activity, a much needed attribute in these pandemic. It can also rejuvenate the cells and tissues in infected people and rapidly enhance their immunity. [44]
	<i>Syzygium aromaticum (L.) Merr. & L.M.Perry</i>	Eugenol which presents in <i>Syzygium</i> is potent analgesic agent which suppress prostaglandins and other inflammatory mediators such as leukotriene. It has power to kill bacteria and promotes liver health. It is an expectorant for treating many upper-respiratory conditions including colds, bronchitis, sinus, cough and asthma. Clove has been used in traditional public medicine to relieve nasal obstruction and musculoskeletal pain which implies its anti-inflammatory activity and the activity is due to COX-2 inhibition. Eugenol (200 and 400 mg/kg) was also found to reduce the volume of pleural exudates without changing the total blood leukocyte count indicating its anti-inflammatory potential. [45]
	<i>Terminalia chebula Retz.</i>	Anti-inflammatory activity for the aqueous extracts of fruits of <i>T. chebula</i> and could inhibit cyclooxygenase-1 (COX-1), COX-2, 5-lipoxygenase (5-LOX), tumour necrosis factor-alpha (TNF- α), and down-regulation of nuclear factor-kappa B. [46] It extracts significant increase reaction time to heat stimuli which may be linked partly to cyclooxygenase and/or lipoxygenase inhibition. It has analgesic activity to inhibit prostaglandin synthetase. [47]
	<i>Tragia involucrata L.</i>	<i>Tragia involucrata</i> extract exhibited potent antioedema effect against carrageenin-induced rat paw oedema might be due to inhibition of lipoxygenase and or cyclooxygenase pathway of arachidonic acid metabolism. [48]
	<i>Anacyclus pyrethrum (L.) Link</i>	Aqueous and Methanolic extract of <i>Anacyclus pyrethrum</i> exhibit higher activity in acute inflammation in a Xylene- induced ear edema model than that of indomethacin. [49]
	<i>Hygrophila auriculata</i>	In HPTLC analysis of <i>Hygrophila auriculata</i> revealed the presence of phytosterols, namely, β -sitosterol and lupeol. Maximum content of lupeol was found in the roots which exhibits the most of Pharmacological activity. [50]

	<i>Schumach</i>	
	<i>Clerodendron serratum (L.) Moon</i>	<i>Clerodendron serratum</i> roots possess the anti-inflammatory and anti-cancer activity with the presence of Saponins (terpenoids and steroids), flavonoids and phenolics isolated from roots. Isolated bio-actives from roots like icosahydropicenic acid and ursolic acid have been claimed to offer anti-allergic and hepatoprotective activity. ^[51]
	<i>Costus speciosus (J.Koenig) Sm</i>	<i>Costus speciosus</i> has significant anti-inflammatory effect was found against carrageenan induced edema formation in rats at a dose of 800 mg/kg and against cotton pellet granuloma formation in rats at doses of 400 mg/kg and 800 mg/kg. ^[52]
	<i>Cyperus rotundus L.</i>	<i>Cyperus rotundus</i> processes lupeol showed potent IL-1 β activity inhibition in THP-1 monocytic cells, and displayed significant ($p < 0.0025$) <i>in vivo</i> anti-inflammatory activity in carrageenan induced rat paw edema. ^[53]
	<i>Justicia adhatoda L.</i>	<i>Justicia adhatoda L.</i> extracts have strong anti-influenza virus activity that can inhibit viral attachment and viral replication, and may be used as viral prophylaxis. ^[54]
	<i>Coleus aromaticus Benth</i>	<i>Coleus aromaticus</i> leaf extracts from different solvents have revealed significant antiviral activity against <i>Bombyx mori Nuclear Polyhedrosis Virus</i> (BmNPV: affects a wide range of silkworm breeds); <i>Herpes Simplex Virus-1</i> (HSV1); <i>Vesicular Stomatitis</i> viruses (VSV) and <i>Herpes Simplex Virus-2</i> (HSV2). Similarly, leaf juice from <i>C. aromaticus</i> exhibited anti-HIV inhibition activity. Ethanolic extract of <i>C. aromaticus</i> revealed to have antiviral activity on Vero cell lines when tested against <i>Herpes Simplex Virus-1</i> (HSV1) and <i>Vesicular Stomatitis</i> (VSV) viruses. ^[55]
	<i>Cissampelos pareira L.</i>	<i>Cissampelos pareira</i> extract which manifests potent antiviral activity against all four prevalent DENV serotypes. In addition, this extract also manifested dose-dependent protective efficacy in an <i>in vivo</i> model. ^[56]
	<i>Tinospora cordifolia (Thunb.) Miers</i>	<i>Tinospora cordifolia</i> has Lectins and Polypeptides which blocks viral fusion or adsorption, forms disulfide bridges and coumarin which interacts with eukaryotic DNA, exhibit the Antiviral property. ^[57]
	<i>Andrographis paniculata Burm.f.Nees</i>	<i>Andrographis paniculata</i> Burm.f.Nees has Terpenoid lactones and flavonoids are the major bioactive classes of compounds which are responsible for pharmacological activities such as anticancer and antioxidant activities, respectively. Andrographolide is a major biological active principle and responsible for most of the pharmacological activities. ^[58] Its 14-Deoxyandrographolide has immunomodulatory, anti-atherosclerotic, vaso relaxation and apoptotic, antimicrobial activities.

CONCLUSION

From the above review, it is concluded that ingredient of KSK possess significant anti-inflammatory and anti-pyretic and anti – viral activity. The ethanolic and methanolic extracts of the plants have shown the anti-microbial properties against *Staphylococcus aureus*, *Escherichia coli*, *Bacillus subtilis*, *Pseudomonas aeruginosa*, *Klebsiella pneumonia* and *Salmonella typhimurium*. Recent clinical studies on KSK revealed that the drug had good action on Covid Patients to relive symptoms like fever, cough and cold. Thus, the traditional Siddha drug KSK is safe to use and can be prescribed as a drug of choice for treating Covid patients in this pandemic situation. Even though it is a need of hour to prove the drug development side for global acceptance. So, need more research of KSK on Instrumental, Preclinical, Cell line and Gene expression studies.

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Conflict of Interest

None declared.

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