A review on Pharmacological activity of *Kabasura* decoction

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Abstract- *Kabasura* decoction is a poly herbal medicine used in the treatment of *Kabasuram* in Siddha Medicine. *Zingiber officinale, Piper longum, Syzygium aromaticum, Tragia involucrate, Anacyclus pyrethrum, Hygrophila auriculata, Terminalia chebula, Adatoda vasica, Coleus amboinicus, Saussurea lappa, Tinospora cordifolia, Clerodendrum serratum, Andrographis paniculata, Sida acuta* and *Cyperus rotundus* are the ingredients of *Kabasura* decoction. The clinical features of COVID-19 can be correlated with Kabasuram in Siddha Medicine. The aim of this study was to review the pharmacological activity of *Kabasura* decoction and its individual plants. The data were collected about *Kabasura* decoction and its ingredients from Siddha text books and research publications through the PubMed, Research gate and Google Scholar. The literatures and review research articles reveal this decoction have anti-inflammatory, hepato protective, antipyretic, analgesic, expectorant and cardio protective actions. All plants have anti-microbial activity and inhibit both gram positive as well as gram negative bacteria and fungi. In *in vitro* study, 60% of plants have revealed antiviral activity against influenza virus and Human respiratory syncytial virus. From this review, *Kabasura* decoction could be prescribed for the infective pandemic crisis of COVID-19 and also be act as a prophylactic measure from the complications.

Index Terms- COVID-19, *Kabasuram, Kabasura* decoction, Pharmacological activities

I. Introduction

Infectious diseases are becoming the fastest cause of death globally. Coronavirus disease (COVID-19) is an infectious disease caused by a new virus. Worldwide more than 2257000 people are suffered from this disease, 155000 were died due to this disease. In all over India more than 15000 people are affected. This disease causes respiratory illness with the symptoms like flu, cough, difficulty in breathing, sore throat, runny nose, headache, body pain and diarrhoea. This virus spreads through contact with an infected person when they cough or sneeze and touches the surface or object that has the virus on it. There is no vaccination found to this disease yet.

Fever is a sign in Allopathic medicine, but in Siddha medicine *Suram* (Fever) is known as a disease. There are 64 types of Fever mentioned in Siddha text books.[23,47,48] Fever, Sore throat, cough, dyspnea, rapid breathing, chest pain, excessive sweating, loss of appetite, tasteless, paleness of face, hands and legs, tiredness and diarrhoea are the symptoms of *Siletpana suram*. Fever, Sore throat, dry cough, dyspnea, running nose, body pain, tiredness, nausea, vomiting, cold and clammy skin, paleness of face, hearing inability, hiccough and confusion are the symptoms of *Vatha siletpana suram*.[4,5,23] According to Siddha literacy COVID-19 can be compared by the sign and symptoms with *Kabasuram* or *Siletpana suram* and *Vatha siletpana suram*. In many Siddha text books, *Kabasura* decoction is prescribed for *Kabasuram* and has used currently in routine clinical practice in Sri Lanka and India.[23]

As a result of the side effects in the antibiotics usage, ongoing efforts have embraced the use of herbal medicine in treating infectious ailments. Plenty of in vitro, in vivo and preclinical studies have established antimicrobial effects in numerous medicinal plants. Based upon the classical texts and published research works, the present study has been driven to analyze the pharmacological activity of individual plants of *Kabasura* decoction.

II. Methodology

The data regarding *Kabasura* decoction and its ingredients were obtained from *Siddha Vaidhya Thiraddu* and research publications regarding the pharmacological properties of individual plants available from PubMed, Research gate and Google Scholar were analysed.

III. Results and Discussion

3.1 Ingredients of *Kabasura* decoction

No	Name of the plant	Percentage (%)

1.	*Zingiber officinale*	6.66
2.	*Piper longum*	6.66
3.	*Syzygium aromaticum*	6.66
4.	*Tragia involucrata*	6.66
5.	*Anacyclus pyrethrum*	6.66
6.	*Hygrophila auriculata*	6.66
7.	*Terminalia chebula*	6.66
8.	*Adatoda vasica*	6.66
9.	*Coleus amboinicus*	6.66
10.	*Saussurea lappa*	6.66
11.	*Tinospora cordifolia*	6.66
12.	*Clerodendrum serratum*	6.66
13.	*Andrographis paniculata*	6.66
14.	*Sida acuta*	6.66
15.	*Cyperus rotundus*	6.66

(Table no. 01)
According to *Siddha Vaidhya Thiraddu* 15 herbs are mentioned in *Kabasura* decoction. Each herbs are taken equal quantity (6.66g) and make 100g decoction powder. Take 5g of powder mix with 300ml of water and boiled it until 30ml reach.[23]

3.2 Medicinal uses of individual plants of *Kabasura* decoction

Name of the plant	Fever	Cough	Common cold	Sore throat	Breathlessness	Bronchial asthma	Tuberculosis	Runny nose	Throat infection	Respiratory infection	Nausea	Vomiting	Body ache	Headache	Diarrhoea
Zingiber officinale	*	*	*	*		*	*		*	*	*	*	*		
Piper longum	*	*		*	*	*	*	*		*			*	*	*
Syzygium aromaticum	*	*		*								*	*	*	*
Tragia involucrata	*	*				*								*	
Anacyclus pyrethrum	*		*	*		*						*			*
Hygrophila auriculata		*				*							*	*	*
Terminalia chebula	*	*		*	*	*	*					*	*		*
Adatoda vasica	*	*				*	*			*		*			*
Coleus amboinicus	*	*		*			*	*		*		*	*		*
Saussurea lappa	*					*									
Tinospora cordifolia	*	*				*						*			*
Clerodendrum serratum	*	*			*	*	*						*	*	
Andrographis paniculata	*		*	*						*			*		*
Sida acuta	*	*	*		*	*	*	*		*			*	*	*
Cyperus rotundus	*	*	*	*	*					*	*	*	*		*

Percentage (%)	93	80	33	53	33	73	47	20	7	47	13	53	67	40	73

(Table no. 02)

According to Siddha literatures and reviews of research articles 93.33% plants have prescribed for fever, 80% plants have prescribed for cough, 73.33% plants have prescribed for bronchial asthma and diarrhea and 66.66% plants have prescribed for reduce the body pain.[4,5,23,25,47,48]

3.3 Literary description of pharmacological properties of individual plants of *Kabasura* decoction

Name of the plant	Antipyretic	Anti-periodic	Expectorant	Anti-spasmodic	Diaphoretic	Carminative	Alterative	Stimulant	Tonic	Diuretic	Refrigerant	Demulcent
Zingiber officinale						*		*				
Piper longum						*		*				
Syzygium aromaticum				*		*		*				
Tragia involucrata					*							
Anacyclus pyrethrum								*				
Hygrophila auriculata									*	*	*	*
Terminalia chebula							*		*			
Adatoda vasica			*	*						*		
Coleus amboinicus			*		*			*				
Saussurea lappa			*		*			*	*			
Tinospora cordifolia		*					*	*	*	*		*
Clerodendrum serratum								*				
Andrographis paniculata	*	*					*					
Sida acuta			*			*				*		
Cyperus rotundus					*			*	*	*		*
Percentage (%)	7	13	27	13	27	27	20	60	33	33	7	20

(Table no. 03)

The review of Siddha literature revealed that out of 15 plants, 9 plants have stimulant action, 5 plants have tonic and diuretic actions and 4 plants have expectorant, diaphoretic and carminative actions. [25]

3.4 Pharmacological activity of individual plants of *Kabasura* decoction (in review of research articles)

Name of the plant	Antipyretic	Expectorant	Bronchodilator	Antispasmodic	Anti-asthmatic	Diaphoretic	Antiemetic	Anti-diarrhoeal	Antimicrobial	Antiviral	Immunomodullatory	Analgesic	Anti- inflammatory	Hepato protective	Cardio protective	Reno protective
Zingiber officinale[14,16,34,43]	*	*					*		*	*	*	*	*	*	*	
Piper longum[9,26,32,46]		*			*				*	*	*		*	*	*	
Syzygium aromaticum[19,49]		*						*	*				*			
Tragia involucrata[35]									*			*	*			
Anacyclus pyrethrum[1]	*					*			*		*	*				*
Hygrophila auriculata[3,11,40]	*								*			*	*	*		*
Terminalia chebula[7]		*							*	*	*	*	*	*	*	
Adatoda vasica[6,15,22,33]	*	*	*	*	*	*			*	*			*	*		
Coleus amboinicus[30]									*			*	*			
Saussurea lappa[24,36]	*			*					*	*			*	*		
Tinospora cordifolia[13,41]	*			*	*			*	*	*	*		*	*	*	
Clerodendrum serratum[17,28]		*	*	*	*			*	*			*	*	*		
Andrographis paniculata[8,10,43,45]	*							*	*	*	*		*	*	*	
Sida acuta[2,18]	*								*	*		*	*	*	*	
Cyperus rotundus[21,43,44]	*			*		*		*	*	*		*		*		
Percentage (%)	60	40	13	33	27	20	7	33	100	33	40	60	87	73	40	13

(Table no. 04)

According to the *in-vitro* and / or *in-vivo* analysis of published research works, all the ingredients of *Kabasura* decoction have shown antimicrobial action. Out of 15, 86.66% of plants have shown anti-inflammatory action, 73.33% have shown hepato protective action, 60% of plants have shown antipyretic and analgesic actions and 40% have exhibited expectorant and cardio protective actions. In *in vitro* study, 60% of plants have revealed antiviral activity against influenza virus and Human respiratory syncytial virus.

3.5 Summary of antimicrobial activity of individual plants of *Kabasura* decoction against the human pathogens

Name of the plant	*Staphylococcus aureus*	*Bacilus subtilis*	*Bacilus cereus*	*Escherichia coli*	*Mycobacterium tuberculosis*	*Mycobacterium avium*	*Helicobacter pylori*	*Acinetobacter baumannii*	*Penicillium spp*	*Klebsiella pneumonia*	*Proteus vulgaris*	*Pseudomonus aeroginosa*	*Salmonella typhimurium*	*Vibrio cholera*	*Streptococcus spp*	*Candida albicans*	*Aspergilus niger*
Zingiber officinale[14,43]	*	*	*	*	*	*	*	*	*							*	*
Piper longum[9]	*	*		*						*	*	*	*	*	*		
Syzygium aromaticum[49]	*	*		*					*	*	*		*		*		*
Tragia involucrata[38]	*	*							*	*		*	*	*			
Anacyclus pyrethrum[20]	*	*		*						*		*	*		*	*	
Hygrophila auriculata[11,40]	*	*	*	*						*		*	*			*	*
Terminalia chebula[29]	*	*	*	*			*					*	*				
Adatoda vasica[22]	*	*		*						*		*			*		
Coleus amboinicus[30]	*	*		*						*	*					*	
Saussurea lappa[36]	*		*	*						*	*	*			*	*	*
Tinospora cordifolia[39,41]	*			*						*	*	*			*	*	*
Clerodendrum serratum[28]	*	*		*						*	*	*	*				
Andrographis paniculata[8,43]	*	*		*								*	*		*		
Sida acuta[18]	*	*		*								*				*	*
Cyperus rotundus[21,43]	*			*									*			*	*
Percentage (%)	100	80	27	93	7	7	13	7	20	67	40	73	60	13	47	53	47

(Table no. 05)

Based upon the analysis of published research works all the ingredients 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 aeroginosa*, 66.66% plants revealed against *Klebsiella pneumonia* and 60% plants revealed against *Salmonella typhimurium.*

5.6 Phytochemical analysis of individual plants of *Kabasura* decoction (in review of research articles)

Name of the plant	Alkaloid	Flavonoid	Saponin	Tannin	Steroid	Terpenoid	Phenol	Glycoside	Starch	Amino acid	Fatty acid	Vitamin C	Essential oil	Volatile oil	Resin	Sterol	Anthroquinone
Zingiber officinale[14,43]	*	*	*	*	*	*		*	*	*		*	*		*	*	
Piper longum[27,46]	*	*			*		*			*		*		*			
Syzygium aromaticum[19]	*	*	*	*	*	*		*	*			*	*				
Tragia involucrata[35,38]	*	*	*	*		*		*	*							*	*
Anacyclus pyrethrum[1]	*	*	*	*					*	*			*				*
Hygrophila auriculata[3,37]	*	*	*	*	*	*	*	*	*	*	*	*				*	
Terminalia chebula[29]	*	*	*	*		*	*	*	*			*	*			*	
Adatoda vasica[22]	*	*	*	*			*		*	*	*	*				*	
Coleus amboinicus[31]		*		*		*	*					*		*			
Saussurea lappa[12,24,36]	*	*		*	*	*	*	*					*	*	*		*
Tinospora cordifolia[13]	*			*	*	*		*	*		*		*				
Clerodendrum serratum[17,28]	*		*		*	*	*	*	*			*					*
Andrographis paniculata[10,42,43,44]	*	*	*	*	*	*	*					*					*
Sida acuta[18]	*	*	*	*	*	*	*	*									
Cyperus rotundus[21,43,44]	*	*		*		*		*	*								
Percentage (%)	93	87	67	87	60	80	60	67	67	33	20	60	40	20	13	33	33

(Table no. 06)

Review upon the phytochemical properties of the individual plants 93.33% plants have alkaloids, 86.66% plants have flavonoids and tannins, 80% plants have terpenoids and 66.66% plants have saponins, glycosides and starch.

IV. Conclusion

Kabasura decoction is a poly herbal preparation in Siddha Medicine now widely prescribed for COVID-19. In the present review, the *Kabasura* decoction has antimicrobial, anti-inflammatory, hepato protective, anti-pyretic, analgesic, expectorant, immunomodulatory and cardio protective activities. Apart from the above properties few plants possess additional properties such as antiviral, anti-spasmodic and anti diarrhoeal. The ethanolic and methanolic extracts of the plants have shown the anti-microbial properties against *Staphylococcus aureus. Escherichia coli, Bacilus subtilis, Pseudomonus aeroginosa, Klebsiella pneumonia* and *Salmonella typhimurium.* Based upon the *in vitro* study, most of the plants have revealed antiviral activity against influenza virus and Human respiratory syncytial virus. The decoction may be attributed to elimination of toxins of body through diuretic and diaphoretic properties, reduces the elevated body temperature through perspiration and support the immune system through their immunomodulatory action.

Medicinal plants are now being embraced as the alternative options for battling various simple or life-threatening ailments and causing setbacks to their living and/or survival. From this review, the ingredients of *Kabasura* decoction can be subsided all the clinical

profile of the COVID-19. Not only for that, the complications of COVID-19 also be prevented due to its hepato protective, cardio protective and reno protective activities.

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