

## A Literature Review of Sukku (*Zingiber officinale*) Related to Its Medicine in Traditional Medicine in Sri Lanka

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Country: Sri Lanka

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### ABSTRACT

The Sri Lankan traditional medicine is a combination of indigenous medicine of the country and Ayurveda received from India, siddha medicine from south India and Unani from middle east. Sukku (*Zingiber officinale*) is an herbal origin under the family of Zingiberaceae. It is a perennial herb with horizontal rhizome occurred in branched pieces. Its phytochemicals actions help to cure many diseases fever, GIT disorders, kerdpa vaayu and headache etc. Sukku is one of the ingredients in most of the prescribed drugs by doctors in Ayurveda, siddha government hospital in Sri Lanka. Therefore, we selected this herb to literature review related to its medicines in traditional medicine. 270 Sukku related prepared medicines are collected from 48 references. From the review 77% were internal medicines and 23% were external medicines. From the internal medicines kudineer has highest numbers (60), kalgam and melugu have least numbers (2). From the external medicines 72% were oils, 12% were maathirai, 2% anchanam, 8% were patru, 3% were pugai and poochu. From this review 115 were cured Gastro intestinal tract disorders, 56 were fever, 26 were vaatham, 23 respiratory diseases, 17 were pittam and 15 were eye diseases etc. This literature review provides useful documented evidences related its medicines. There is need further laboratory study about this herb in future.

**Keywords:** Indication, Prepared medicines, Sukku, Traditional medicine.

### Authors' contributions

This work was carried out in collaboration between both authors. Author JK and YD designed the study, performed the statistical analysis, wrote the first draft of the manuscript. Author NRM manage the literature searches and analysis of the study. Both authors read and approved the final manuscript.

### 1. Introduction

The traditional system itself comprises two distinct systems natural and super natural. The natural system includes the medical system that indigenous to Sri Lanka [9]. The Sri Lankan traditional medicine is a combination of indigenous medicine of the country and Ayurveda received from India. It drawn upon siddha medicine from South India and unani medicine from middle east [2]. The plants are used singly or as mixtures. The traditional system of medicine has a vast literature mainly in the form of manuscripts [5].

Dry ginger (Sukku) is herbal origin used in traditional medicine. Its scientific name is *Zingiber officinale* under the family of zingiberaceae [4]. Its plant is a flowering perennial herb with large solid horizontal rhizomes occurred in branched pieces [4,10]. It has underground rhizome with many delicate scale leaves at nodal region. It propagated through rhizomes by cutting them into moderate sized pieces of about 25-30 g. After cultivation, it takes around 15-20 days to germinate. It grows erect forming herbaceous stem about 30-90 cm in height. Ginger after growing for 6-8 months can be harvested any time [26]. Dry ginger has organoleptic characters, phytochemicals and pharmacological actions. Its prepared medicines are used to cure diseases like fever, GIT disorders, pain, cold [4].

### 2. Methodology

**Study design:** A literature review of Sukku (*Zingiber officinale*) related to its medicine in traditional medicine in Sri Lanka.

**Place and study period:** Library at Unit of Siddha Medicine, main library of University of Jaffna and public library of Jaffna from January to October 2020

**Research instrument:** Data entry form

**Data collection:** Data for literature review were collected from relevant books, peer review journals and websites with the help of data entry form which consists of taxonomy, morphology, phytochemicals, pharmacological actions, medicinal uses, prepared medicines and its uses of sukku.

**Statistical analysis:** Collected data were analyzed by simple statistical with the help of MS Office word 2016.

### 3. Results and discussion

#### 3.1. Taxonomic position of dry ginger plant

Plant taxonomy is the science that finds, identifies, describes, classifies, and names plants [13]. There are 8 distinct taxonomic categories. These are domain, Kingdom, Phylum, Sub phylum, Class, Order, Family, Genus and Species. Table 1 shows taxonomic position of dry ginger plant [23,16].

**Table 1:** Taxonomic position of dry ginger plant

Taxonomic	Dry ginger plant
Domain	Eukaryota
Kingdom	Plantae
Phylum	Spermatophyta
Subphylum	Angiosperms
Class	Monocotyledon
Order	Zingiberales
Family	Zingiberacea
Genus	Ginger
Species	Zingiber officinale

#### 3.2. Different names of dry ginger plants

Dry ginger plants have scientific names, tamil names, sinhala names, sanskrit names, hindi names, telungu names, karnardaka, malayala and arabs names [4,31,32,44,33,3]. Table 2 shows Different names of dried ginger plants.

**Table 2:** Different names of dried ginger plants

Different names	Dry ginger
Scientific name	<i>Zingiber officinale</i>
Tamil names	Sukku, Verk kompu, Arukkan, Athgam, Sowpannam, Sundisonidi, Sowvarnam, Navasuru, Vidamoodya amirtham,

	kadupathrum, Ooragam, Upakullam, Mahaouditham, Koodathagam
Sinhala names	Inguru, Siddhigura
Sanskrit names	Nagaram, Sharnga, Sunti, Anupama, Nagara
Hindi names	Sonth, Adrak
Telungu name	Sonti
Karnardaka name	Ona sunti
Malayala name	Chukku
Arabs names	Zingebilarataba

### 3.3. Morphology of dried ginger plant

The plant morphology is the study of the physical form and external structure of plants. Plant morphology is useful in the identification of plants [24]. Table 3 shows morphology of dried ginger plant [4,31,10].

**Table 3:** Shows morphology of dried ginger plant

Morpholgy	Features
Habitat	In tropical countries and a native of the Pacific islands. It is commonly grown in all vegetative gardens in Ceylon.
Habit	A perennial herb with horizontal rhizome
Leaves	Leafy stems to 2m. Leaves sessile 15* 1.5cm, Simple, alternate, lanceolate-linear, tapering at both ends, up to 30cm-2cm acuminate at apex, distichous, very short petiolate, smooth , bright green and prominent midrib beneath, glabrous margins, ligule up to 5mm long, bi-lobed and peduncle up to 25cm long erect clothed with long lanceolate sheaths.
Flowers	Flowers stems shorten than leafy ones 15-30cm high, erect, flowers are small, pale yellow pectate with purple edges, sessile surrounded by smooth thin placed in the axils of large, concave smooth, striate and greenish yellow obtuse bracts with margins.
Calyx tube	Calyx over 1cm long
Corolla tube	2.5cm long lobes dull yellow, dorsal lobe up to 2*1 cm narrowed at the apex. Tube exceeding the calyx.
Staminodes	Staminodes 6 in two rows, outer rows of 3 inserted the mouth of corolla,

	posterior 2 small and anterior petaloid shorter than corolla lobes.
Anther	Dark purple 5-8 mm long epigynous glands 5mm linear free from each other and oblong linear.
Ovary	Inferior 3 locular with numerous ovules, style passing up behind between the anther cells and extending beyond them stigma tufted.
Root	Numerous, cylindrical, fleshy, thick, up to 2cm, irregularly branched but normally only in the vertical plane, covered with deciduous, thin scales which leave ring like scars, semitransparent yellow, irregularly wrinkled in the dried rhizome, aromatic, on dried rhizomes scars of leafy stems visible as shallow cup like holes.
Rhizome	Large solid horizontal rhizome consists roundish joints, pale yellow covered with pale silvery brown skin ringed with leaf scars.
Ovary	Inferior, 3*2 mm glabrous, 3 locular with numerous ovules

### 3.4. Cultivation of ginger plant

- Perennial plant (But grown as an annual plant for harvesting as a spice) [38].
- Successfully grown places: -
  - Altitude- up to 1500m (From mean sea level) [40,38]
  - Climate- It requires a warm and humid climate with heavy rainfall
  - Rainfall- 1500mm or more (~150cm-300cm) / year [40,38]

If rain fall is low crop should be grown under irrigation.

  - pH: - should be 5.5 -6.5 [40,41]
  - Sunlight-It does not grow in only direct sun light [41]

Best grown in partial shade [38]

(Site that provide plenty of light including 2-5hours of direct sun light) [39]

So, it can be incorporated as an intercrop in orange, coconut, coffee, pigeon pea, cluster bean, bananas plants. [41,38]

  - Most suitable soil type – Sandy or clay loam soil with good drainage and humid content [38]- Planting- During April/May [38]
- In dry zones –September/October [40]
- Harvesting period – 8-10 month (however collecting for vegetable purpose starts after 6 months) [40,41]
- Harvest –Digging out of the rhizomes (when the tops have died downs) [39,38]

### **3.5. Making dried ginger**

Dried ginger is available in a number of different forms – the rhizomes can be left whole or they may be split or sliced in to smaller pieces to accelerate drying.

The process for dried ginger

- The fresh rhizome is harvested at between 8-9 months of age.
- The roots and leaves are removed and the rhizome is washed.
- The rhizomes have to be killed or inactivated. This is done by peeling, rough scraping or chopping the rhizome in to slices. The skin should be peeled off using a wooden scraper made from bamboo to prevent staining the rhizome. Whole unpeeled rhizomes can be killed by boiling in water for 10 minutes.
- After peeling and washing, the rhizomes are soaked for 2-3 hours in clean water then soaked in a solution of 1.5-2.0 % lime (calcium oxide) for 6 hours. This produces a lighter colored (bleached) rhizome. After soaking, the rhizomes are drained.
- The rhizomes are dried. The traditional method is to lay the pieces on clean bamboo mats or on a concrete floor and sundry until a final moisture content of 10%. Drying may take anything from 7-14 days depending upon the weather conditions. During drying, the rhizomes lose between 60- 70 % in weight.
- In rainy conditions, a mechanical drier such as a tray drier should be used to accelerate the drying process. Sliced ginger pieces take only 5-6 hours to dry when a hot air drier is used. Whole peeled ginger rhizomes take about 16-18 hours to dry in a mechanical drier. The drying temperature should not exceed 60 degree Celsius as this causes the rhizome flesh to darken.
- After drying, the rhizomes are cleaned to remove any dirt, pieces of dried peel and insects. An air separator can be used for large quantities, but at the small scale it is probably not cost effective.
- The dried rhizomes should be packaged into air tight, moisture proof packaging for storage or export [26].

### **3.6. Phytochemicals in dried ginger**

Phytochemicals are naturally occurred in medicinal plants leaves, vegetables, rhizomes and roots that have defense mechanism [17]. The medicinal plants are useful for healing as well as for curing of human diseases because of presence of phytochemical constituent [8]. Phytochemicals in dry ginger were given below [4].

- ❖ Gingerol
- ❖ Shogol
- ❖ Zingerone
- ❖ Gingerine
- ❖ Gingeberol
- ❖ Essential oil - Camphene, phellandrene, cineol, zingiberene and borneol
- ❖ Resin and starch

Dried ginger has been a traditional herbal remedy for thousands of years in Asian, Indian, Arabic medicine because it contains a higher concentration of two active compounds Shagoal and Gingerol about three times more than in fresh ginger. Shagoal is the pungent ingredient of ginger and has a very strong anti-cough effect.

Gingerol the other active ingredients of ginger give it its unique types of spiciness [19]. It helps to increase immune cells in the blood vessels to protect the body from bacteria and other toxic elements [20]. Both these ingredients help to reduce blood pressure, gastric concentration and the risk of a variety of cancers and tumors [19].

### ***3.7. Organoleptic characters of dried ginger***

Organoleptic characters of medicinal plants are *svvai*, *veeriyam* and *pirvu*. *Svvai* has hot significant place in Siddha. Our tongue experiences these tastes when a drug is administered orally. The dynamics of siddha preparation are based on taste parameters. Six tastes are known as sweet, sour, salt, pungent, bitter and astringent. *Pirvu* is post absorptive taste.

*Veeriyum* is described as active constituents of the drug responsible for pharmacological actions of the medicinal plants and other drugs [7]. Organoleptic characters of dried ginger are shown below [3].

*Svvai*: Pungent

*Veeriyum* (*Thanmai*): Hot potency

*Pirvu*: Pungent

### ***3.8. Pharmacological actions of dried ginger***

The pharmacology action of dried ginger is carminative, stomachic, circulatory stimulant, diaphoretic, digestive, antispasmodic, anti-emetic, expectorant, rubefacient and sialagogue [3,4,25,47].

### ***3.9. Uses of dried ginger***

Dried ginger more effective than fresh ginger. It cures many diseases such as to cure throat complaints, headache, fever, cough, asthma, pain, flatulence, dyspepsia, colic, vomit, cholera, indigestion, stomachache, *vaayu kunmam*, colic, spasms, fainting, gout, and chronic rheumatism [1, 4, 35].

*Sukku* has warming effect and is beneficial in all conditions related to poor circulation, chilblains, cramps, weak digestion, and cold extremities, whether taken internally or used in hand and foot baths. It also relieves colic, flatulence, and indigestion, morning and travel sickness. It has diaphoretic properties when taken hot and is useful for feverish conditions, colds and flu. As a gargle it relieves sore throats.

It also has an expectorant action dispelling mucus and cough. Externally it can be used as a compressor liniment for strains and sprains, fibrositis, and aching muscles [42,47].

### ***3.10. Sukku related prepared medicines***

270 prepared medicines are collected from 48 references. Their types of medicine and its uses are shown in table 4. Their references were shown as abbreviations their meaning was given below in annex part.

**Table 4:** Formulations of dried ginger (Sukku)

S.No.	Prepared medicines	Cured diseases	Internal (I)/ External (E)	References
1.	Annak kudineer	Suram (Fever), Dryness of mouth	I	SOAI
2.	Iyavedpuk kudineer	Kapha suram	I	SOAI
3.	Karukkuk kudineer	Maantham, Kalichchal	I	SMM
4.	Ketpani muraipuraththuk kudineer	Suram	I	SOAI
5.	Ketpanisurak kudineer	Suram, Headache	I	SOAI
6.	Nilavempuk kudineer	Suram	I	SOAI, SMM
7.	Pittavedpuk kudineer	Pittasuram	I	SOAI
8.	Sadankapaanik kudineer	Athisaara suram	I	SMM
9.	Senkamaarik kudineer	Senkamaari (Jaundice)	I	SOAI
10.	Sukkuk kudineer	Suram, Vayitru vali(Stomachache)	I	KMM
11.	Thiripalaathy kudineer	Pitta suram	I	AG
12.	Thoyvuk kudineer	Iraipu (Asthma) , Eelai	I	SMM
13.	Thumbaikaruku kudineer	Vomit	I	SMP
14.	Vidaachsurak kudineer	Vidaasuram	I	SOAI
15.	Vaathavedpuk kudineer	Vaathasuram	I	SOAI
16.	Viraivaathathirdku kudineer	Viraivaatham	I	SVMV
17.	Vellaiyakkarak kudineer	Akkaram	I	KM
18.	Ullakkarak kudineer	Akkaram	I	KM
19.	Akkarasurak kudineer	Akkaram suram	I	KM

20.	Aamasurak kudineer	Aamasuram	I	KM
21.	Verkompuk kudineer	Viddachsuram	I	KM
22.	Palasurak kudineer	Vaath pitta kapha suram	I	KM
23.	Ilavangapaddaik kudineer	Moolam (Piles)	I	SVMS
24.	Athimadhurak kudineer	Iraththa moolam	I	SVMS
25.	Paalaiththandu kudineer	Kulir suram	I	SMP
26.	Thippiliyathyk kudineer	Perunk kalichchal	I	SMP
27.	Arithakee kasaayam	Moolavaayu	I	SVMS
28.	Barskiyaathy kasaayam	Soapai (Odema)	I	AG
29.	Ellathy kasaayam	Suram	I	AG
30.	Illadmichchai kasaayam	Seethalangal	I	AG
31.	Iluppaipoovaathy kasaayam	Pitta suram	I	AG
32.	Indilai kasaayam	Cough	I	AG
33.	Kaayvellaiyaathy kasaayam	Suram	I	AG
34.	Kadugayaathy kasaayam	Suram	I	AG
35.	Karpa paandu kasaayam	Anemia, Soapai,	I	SVMK
36.	Karpiniku jvara veedgam kandaal kasaayam	Veadgam (odema)	I	SVMV
37.	Koththamalliyaathy kasaayam	Kulir suram	I	AG
38.	Kudalvaathathirku kasaayam	Kudal vaatham	I	SVMV
39.	Maathulam pinchaathy kasaayam	Suram	I	AG

40.	Munnaiyaathy kasaayam	Suram	I	AG
41.	Munnaiyilai kasaayam	Vaanthy	I	SVMS
42.	Musthathy kasaayam	Suram	I	AG
43.	Nannari veer kasaayam	Pitta suram	I	AG
44.	Nilakumil kasaayam	Stomachache	I	AG
45.	Nimpaathy kasaayam	Pitta suram	I	AG
46.	Peraamatri kasaayam	Suram	I	AG
47.	Perungaya kasaayam	Anda vaatham	I	AG
48.	Sirukaanchoorik kasaayam	Suram	I	AG
49.	Sithramoolathy kasaayam	Sanni	I	AK
50.	Sitramati kasaayam	Vaatha suram	I	AG
51.	Sukkkathy kasaayam	Sanni paatha suram	I	AG
52.	Surraithandu kasaayam	Sanni	I	AG
53.	Thaadmaathy kasaayam	Iraththa pittam	I	SVMS
54.	Thasamoolathy kasaayam	Suram	I	AG
55.	Thirikadugaathy paluthayam	Pasi thoondum(Appetizer)	I	SVMS
56.	Thiripalaathy kasaayam	Pitta suram	I	AG
57.	Thoothuvalaiyathy kasaayam	Kapha suram	I	AG
58.	Vaasaathy kasaayam	Kulir suram	I	AG
59.	Verkompu kasaayam	Maantham	I	AG
60.	Villvaathy kasaayam	Vaanthy suram	I	AG
61.	Vilvaathy seethak	Pittam	I	SVMS

	kasaayam			
62.	Abipathra chooranam	Soolai, pitta nooigal	I	SVMS
63.	Adda chooranam	Kunmam, Stomachache	I	SMM
64.	Amukiraaay chooranam	Enpuruki nooi, vaatham	I	SMM
65.	Araththai chooranam	Productive cough	I	MSK
66.	Bhaskaralavana chooranam	Ajeeranam, kunmam	I	SMM
67.	Ellathy chooranam	Vaayu, Perunmpaadu, kunmam, vomit	I	SMM, SVMS
68.	Gandaga chooranam	Skin diseases	I	SVMS
69.	Hareethagi chooranam	Yonisoolai, Kunmam	I	SVMS
70.	Kaantha chooranam	Suram	I	SOAL
71.	Karanai chooranam	Pitta vaayu	I	SVMS
72.	Karpooraathy chooranam	Asthma, cough	I	MSK
73.	Kerpini athisaarathirku chooranam	Kalichchal	I	SVMK
74.	Maanthakasathirdku marunthu	Maantha kaasam	I	SVMK
75.	Mariththapillai vilamarunthu	Irantha kulanthai piradgum	I	SVMK
76.	Muddaku chooranam	Vaatham	I	SOAL
77.	Nilavaadhai chooranam	Constipation, skin diseases	I	SMM
78.	Panchathhedpadkini chooranam	Pittavaayu, indigestion, gas flatulence	I	SOAL
79.	Paranki kilandgu chooranam	Vaatham	I	SOAL
80.	Parankipaddai chooranam	Skin diseases, soolai	I	SVMS

81.	Santhragandtha chooranam	Kedpavaayu, Kedpasoolai	I	SOAL
82.	Seenthil powder	Diabetics		SMP
83.	Seeragaathy chooranam	Aroosadgam	I	SVMS
84.	Sundayaathy chooranam	Moola nooi	I	SVMS
85.	Sukku chooranam	Headache, kunmam (ulcer), indigestion	I	KMM, MOA
86.	Sundi chooranam	Pittta diseases	I	SVMS
87.	Thalisaathy chooranam	Cough, Asthma	I	SMM
88.	Thalisapaththri chooranam	Cough, Asthma	I	SOAL
89.	Thasamoola chooranam	21 Medgankal	I	SOAL
90.	Thayirsundi chooranam	Seariyaak kalichchal	I	MSK
91.	Thiraasaadhi chooranam	Pitta diseases	I	SVMS
92.	Thirikadauku chooranam	Vaatha pitta kapha nooigal	I	MSK
93.	Thirikadugathy chooranam	Pitttam, soolai	I	SVMS
94.	Veegari chooranam	Paandu (Anemia)	I	KM
95.	Yogaraja kudkulu chooranam	Viranagal, Athisaaram	I	SVMS
96.	Akkara sanjeeva maathrai	Akaram	I	TYV, SOAL
97.	Arunothaya maathrai	Vaatham, kunmam	I	SOAL
98.	Asda bhairava maathrai	Suram	I	SOAL
99.	Balasanjeevi maathrai	Suram	I	SMM
100.	Gankayan kuligai	Moola nooi	I	SVMS

101.	Godasoori kuligai	Soolai, suram	I	SOAL
102.	Indguvaathy urndai	Soolai	I	SVMS
103.	Iradnaathy maathrai	96 eye diseases	E	SVMN
104.	Irasa kuligai	Pitta nooigal	I	SVMS
105.	Irasaa mirunkangusa matthrai	Kaphala sanni	I	PSR
106.	Irumal maathrai	Cough	I	SMM
107.	Jalathosathirdku maathirai	Jalathossam	I	EPA
108.	Kaadganavan maathrai	Maantham	I	SMM
109.	Kasthuri maathrai	Pitta suram, Vathapidipu	I	TYV
110.	Kodasaalai maathrai	Vaatham	I	TYV
111.	Maantha kuligai	Maantham	I	SVMK
112.	Maanthagana maathrai	Ganam	I	SVMK
113.	Maanthasanni kuligai	Maantha sanni	I	KM
114.	Maanthathirdku urundaai	Maantham	I	SVMK
115.	Maha ellathy maathrai	Kunmam, nadukka suram	I	SOAL
116.	Medganaatha maathrai	Paandu, soapai, constipation	I	MSK
117.	Mirutha sanjeevi maathrai	Suravalipu, perumpaadu	I	SOAL
118.	Mullaipaal kuligai	Gas flatulence, maantham	I	SOAL
119.	Murrukan vittu maathrai	Pethy , kudarpulu	I	MSK
120.	Nayanarodgathirku maathrai	Eye diseases	E	SVMN
121.	Nayanaviyaathy poovuku urundai	Kankalil poo	E	SVMN
122.	Neerkovai maathrai	Headache	I	SMM

123.	Nervaala maathrai	Pethy	I	TYV
124.	Paalar kirumi naasa maathrai	Kudarpulu theerum	I	SOAL
125.	Palavaayu kuligai	Vaayvu, stomachache	I	SMM
126.	Pasaana maathrai	Vaatham	I	TYV
127.	Periyamoochu kuligai	Vaatha sanni , vaayvu	I	SOAL
128.	Periyasivapu kuligai	Vaayvu, suvaatham	I	SOAL
129.	Piramaanantha bhairavam	Sanni suram	I	SOAL
130.	Pirana sanjeevi mathirai	Vayitru kadupu	I	VS
131.	Poduthalai Kuligai	Maanthavalipu	I	TYV
132.	Poorana santhraathy maathrai	Cough, Pitta suram , neerkadupu	I	SOAL
133.	Saamalaadevi maathrai	Uooli nooidgal	I	SMP
134.	Saathlinga maathrai	Suram	I	SOAL
135.	Sandroythaya urundai	Nightblindness	E	SVMN
136.	Sanjeevi maathrai	Soolai vali, kasam	I	SOAL
137.	Sarvasura kuligai	Suram	I	SV
138.	Sina punnai vear kuligai	Vaayvu, pitta iyam	I	SOAL
139.	Sitraamaddi kuligai	Maantha sanni	I	KM
140.	Sura poopathy maathrai	Suram, cold	I	SOAL
141.	Thambiraathy maathrai	Eye thimiram, padalam	E	SVMN
142.	Thimiraathy maathrai	Eye thimiram	E	SVMN
143.	Vaatharadchathan maathrai	Vaatham	I	SOAL
144.	Vellaivengaya kuligai	Ajeeranam, hypertension , GIT disorders	I	SMM
145.	Vilvaathy urndai	Eye diseases	E	SVMN

146.	Virechana poopathy	Constipation	I	SMM
147.	Visnusarkkara kuligai	Suram	I	SOAL
148.	Perungaya kalgam	Vikkal	I	SVMS
149.	Thipili kalgam	Arosagam	I	SVMS
150.	Ammukura ledhiyum	Nervine tonic, paandu	I	SMM
151.	Aswakendaathy ledhiyum	Pitta nooigal	I	SVMS
152.	Devathaaru ledhiyum	Pittam, suvasakaasam	I	SVMS
153.	Ellathy ledhiyum	Pitta rodgam	I	SVMS
154.	Inchi ledhiyum	Kunmam, soolai, arosagam	I	SOAL
155.	Jalathossathuku ledhiyum	Jalathossam	I	EPA
156.	Kakkuwan ledhiyum	Kakkuwan cough, kasam	I	SOAL
157.	Karisaalai ledhiyum	Pitta, paandu, vomit	I	SOAL
158.	Lasunapisdi ledhiyum	Suram, Headache	I	SVMS
159.	Maha vilvaathy ledhiyum	Arosagam, kiraany, paandu	I	SOAL
160.	Mathanakamesura ledhiyum	Veeriya viruthy	I	VS
161.	Mathanasinthhamani ledhiyum	Thaathupusdi, Veeriya viruthy	I	VS
162.	Marisaathy ledhiyum	Arosagam	I	SVMS
163.	Nellikay ledhiyum	Enpu nooi, cough, asthma	I	SMM
164.	Pittasamana ledhiyum	Pitta nooigal, thedga erivu	I	SMM
165.	Thetrakkoddai ledhiyum	Moolanoi, aththy suram	I	SOAL
166.	Thiripalathy ledhiyum	Kapha,vaatha,pitta nooigal	I	SVMS
167.	Vaalai ledhiyum	Nerve weakness, thedga soodu	I	SMM
168.	Vaasaathy ledhiyum	Vaatharogam	I	SVMS

169.	Vaasakandakaari ledhiyum	Kaasam, cough	I	SVMS
170.	Vellaivengaya ledhiyum	Pittarodgam, kamaalai, moothra kirisaraam	I	SOAL,SMM
171.	Vilvaathy ledhiyum	Pitta rodgam	I	SVMS
172.	Perungaya lediyum	Vaayu kolaarudgal	I	EPV
173.	Thiri gadugu ledhiyum	Vaayu kolaarudgal	I	EPV
174.	Nayana viyaathikku kulampu	Eye diseases	I	SVMN
175.	Palavilai kulampu	Suram	I	KM
176.	Thidi thosa piraaniku kulampu	Ajeeranam	I	SVMK
177.	Ulli kulampu	Kaphala vaayu	I	PSR
178.	Irasakanthy melugu	Vaathasoolai, skin diseases	I	SOAL,SMM
179.	Kunmakudoory melugu	Kunmam, mantham	I	SOAL, SMM
180.	Aayil ennai	Amutha vaatham	E	PSR
181.	Aeranda thailam	Kapala venkarappan	E	PSR
182.	Akkiniseevini thailam	Surasanni	E	SV
183.	Amrutha lavanka thailam	96 type Kan noikal	E	SVMN
184.	Arithaki thailam	Amutha setpanam	E	PSR
185.	Aasana vilvaathi thailam	Kapala vaayu	E	PSR
186.	Birunkaamila thailam	Neththira noi,udal erivu	E	SVMN
187.	Elaathi ennai	Amutha soolai	E	PSR
188.	Ianthennay thailam	Iranguvaatham	E	SV
189.	Iyankam ennai	kapala senkarappan	E	PSR
190.	Kaathu noi thailam	Kaathu noikal	E	SOAL

191.	kadu milaku thantri ennai	Amutha setpana piththam	E	PSR
192.	Kadukaamalath thailam	Amutha vaatha piththam	E	PSR
193.	Kaiyanthakarai ennai	kapala senkarappan	E	PSR
194.	Ganaththirku ennai	Gana soodu	I	SVMK
195.	Karunkaali thailam	Kapala vali	E	PSR
196.	Kiraanikalukku ennai	Kiraani	I	SVMK
197.	Kothiyennai	Maantham	E	KM
198.	Lasuna pishdi thailam	Vaatham,kunmam,ulmoolam	I	SVMV
199.	Lasunaathi eranda thailam	Paarisa soolai,gunmam	I	SVMS
200.	Maavilankam ver thailam	Neer kanappu	E	PSR
201.	Maha narayana thailam	Vaatham,nasiyam,thalai muluhal	E	SVMV
202.	Maha nirkundi thailam	kan niokal,peenisam	E	SVMN
203.	Marakathanchanam thailam	Thalai nadukku,siraththampanam	I	SVMV
204.	Masha thailam	Vaatham Nasiyam,thalai mulukal	E	SVMV
205.	Mayiladikkurunthu ennai	Amutha setpana vaatham	E	PSR
206.	Milaku thailam	Kapala setpana	E	PSR
207.	Mulaippaal ennai	Amutha varadchi	E	PSR
208.	Nayana viyaathikku thailam	Paarvai mantham	E	SVMN
209.	Nirkundi thailam	kan niokal, peenisam	E	SVMN
210.	Paalar kiranthi kothiyennai	Kiranthi,constipation	E	SMM
211.	Pancha raththina	Kapala sanni	E	PSR

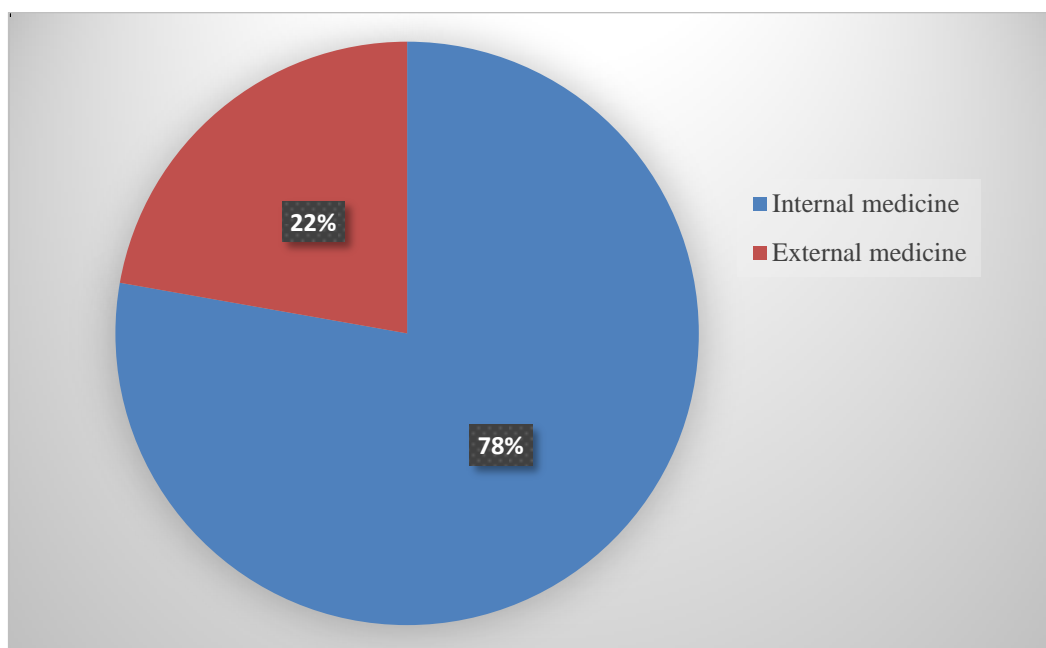
	sinthaamani thailam			
212.	Pancharkga thailam	Vaatham	E	SVMV
213.	Peenisa thailam	Peenisam	E	SMM
214.	Periya manjal ennai	Kapala kuddam	E	PSR
215.	Poothika thailam	Vaatham	E	SVMV, SOAL
216.	Poar maanthathitku ennai	Poarr maantham	I	SVMK
217.	Saaradai thailam	Kan noikal	E	SVMN
218.	Santhanathi thailam	Kapala varadsi	E	PSR
219.	Sannivaatha surathilenney	Sanni vaatham	E	SV
220.	Sathurvagai saatru ennai	Vaatham	E	SOAL
221.	Sukku thailam	Nasiyam,peeniam,sevi noi, thalai idi ,vaai koppalikka(mouth wash)	E	SMM
222.	Thalu thalai ennai	Amutha sedpana vaatham	E	PSR
223.	Thasamoola masha thailam	Vaatham	E	SVMV
224.	Thirikaduku ennai	Kapala karunkarappan	E	PSR
225.	Ulli aamanakku ennai	vayittuppisam,vayittu noikal	I	SVMS
226.	Vaatha kesari thailam	Vaatha noikal	E	SMM
227.	Vathapitta suraththilennay	Vatha pitta suram	E	SV
228.	Veddaikku ennai	Mehappun,kiranthi	E	TYV
229.	Vellai ennai	Pethi,sori,constipation	I	SMM
230.	Venkai thailam	Thalai rogam,thalai muluha	E	SVMN
231.	Aadathodai kirutham	Paithyam sedmam	I	PSR
232.	Aswagantha nei	Kaphala karappan	I	PSR

233.	Erulli nei	Ganai	I	KM
234.	Karpamaga nei	Karpamtharika	I	SVMK
235.	Mudakottraan nei	Nithamba soolai	I	SVMS
236.	Naagara kirutham	Mahothram	I	SM
237.	Naayuruvi nei	Seelmoolam	I	SVMS
238.	Nerunjil nei	Moothirarodgam	I	SVMS
239.	Nilakumil nei	Kasarodgam	I	SV
240.	Pirami nei	Valipu, soothga sanni	I	SOAL
241.	Ponnankaani nei	Kaphala pittam	I	PSR
242.	Pungam nei	Soonitha vaatham	I	SVMS
243.	Santhanaathy kirutham	Pitta noidgal	I	SVMS
244.	Sathaavaari kirutham	Pitta noigal	I	SVMS
245.	Seenthil nei	Amutha pittam	I	PSR
246.	Seeradga nei	Kasarodgam	I	SV
247.	Sundyaathy kirutham	Vilaavali, kunmam	I	SM
248.	Thirikadu nei	Moola noi	I	SVMS
249.	Thoothuvalai nei	Akkaram	I	KM
250.	Valai poo nei	Maantham	I	KM
251.	Vallarai nei	Asthma, maantham	I	SOAL
252.	Ayajampeera vadagam	Paandu, pittam	I	SVMS
253.	Karunai kilangu vadagam	Moola noidgal	I	SVMS
254.	Kaadukarunai vadagam	Moola noidgal	I	SVMS
255.	Sinchara vadagam	Soolai, moothraadipu	I	SVMS
256.	Thalisaathy vadagam	Indigestion, maantham	I	MSK
257.	Karungoli paspam	Moolaviyaathy	I	SV
258.	Periya paspam	Indigestion, kamaalai, kiranthy	I	SOAL

259.	Vellarugu paspam	Soolai, kunmam,vaatham	I	SOAL
260.	Manchal parpam	Amenorrohea	I	SMM
261.	Kavigal patru	Veedgam, nerikaddal	E	SMM
262.	Nethravaayuvuku patru	Nethra vaayu	E	SVMN
263.	Sukku patru	Headache	E	MM
264.	Vellulli patru	Vaatha pain, tendonitis	E	SMM
265.	Vidasanniku patru	Sanni	E	SMP
266.	Kapalakuttru anchanam	Kaphalakuththu	E	PSR
267.	Nenjuvaatha poochu	Nenjuvaatham	E	SV
268.	Sukkathy poochu	Moolamulaidgu poosal	E	SVMS
269.	Arithagi pugai	Headache, nasal obstruction	E	SVMS
270.	Kuddathidrgu pugai	Kuddam	E	SV

**3.10.1. Types of medicine related to sukku from prepared medicines**

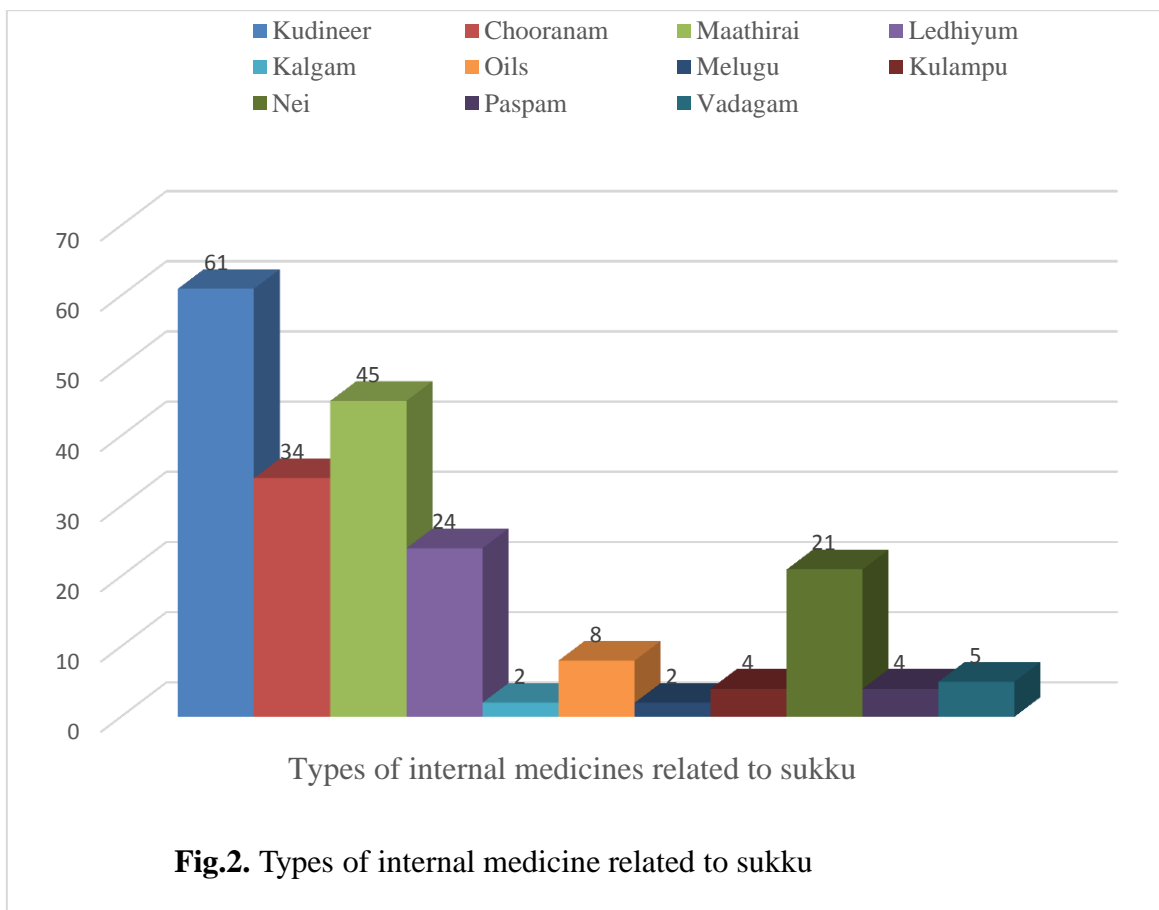
According to the mode of application the siddha medicine could be categorized in to two classes, internal medicine and external medicine [46]. Figure 1 shows types of medicine related to sukku from above prepared medicines. From 270 prepared medicines , 78% (110) were internal medicines and 22%(60)were external medicines [3,6,11,12,14,15,18,21,22,27,28,29,30,34,36,43,48].



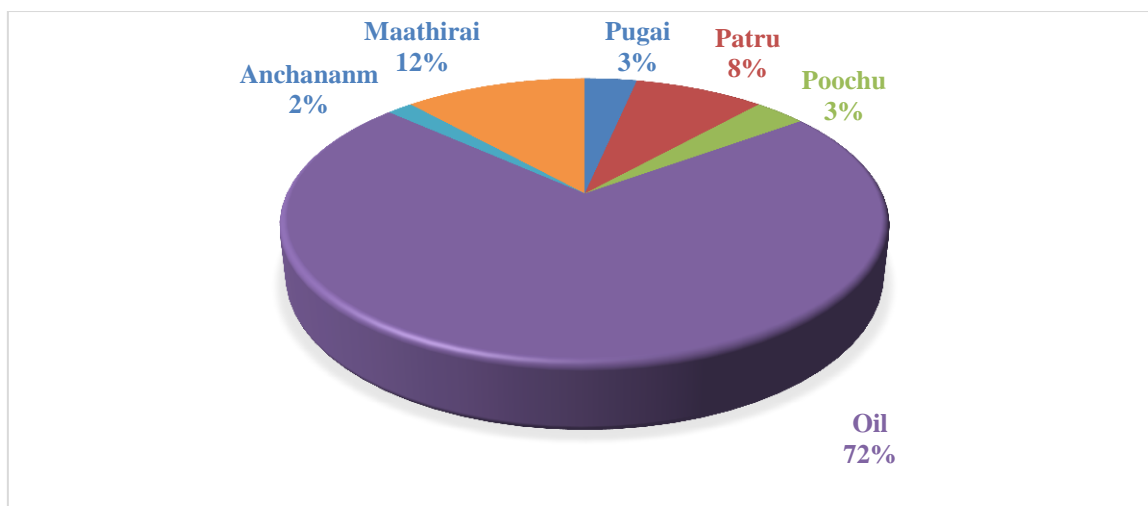
**Fig.1.** Types of medicine related to sukku

**3.10.2. Types of internal medicine related to sukku from this prepared medicines**

The internal medicine was used through the oral route and further classified into categories based on their form, methods of preparation and shelf life etc [46]. Figure 2 shows types of internal medicine related to sukku from the 270 prepared medicines. Kudineer was highest numbers (61) and kalgam and melugu were least numbers (2). From this 45 were maathirai, 34 were chooranam, 24 were ledhiyum, 8 were oils, 4 were kulampu, 21 were nei, 4 were paspam and 5 were vadagam [3,6,11,12,14,15,18,21,22,27,28,29,30,34,36,43,48].



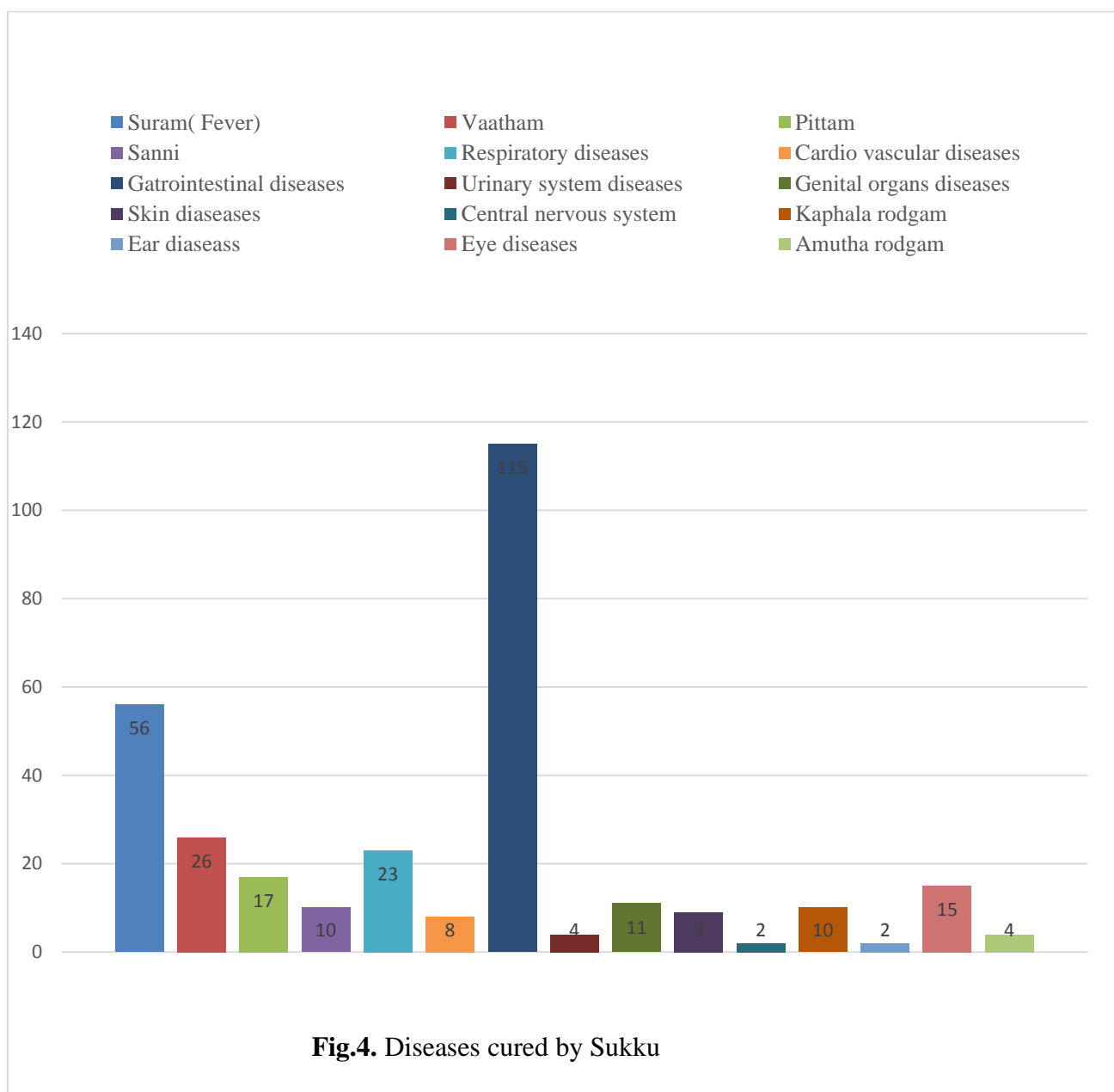
**3.10.3. Types of external medicine related to sukku from this prepared medicine**



External medicines includes certain forms of drugs and certain applications like nasal, eye and ear drops and leech application [45]. Figure 3 shows types of external medicine related to sukku from 270 prepared medicines. Oil was highest percentage 72%. From this 270, 12% were maathirai, 2% were anchanam, 8% were patru, 3% were pugai and poochu [3,6,11,12,14,15,18,21,22,27,28,29,30,34,36,43,48].

**3.10.4. Diseases cured by Sukku from above prepared medicines**

There are three humours in siddha medicine such as vatha, pitta and kapha. Their inharmonious interactions produce various pathological states. All diseases are caused by discordant mixture of those humours. Their proportions in the body govern a person’s physical and mental disposition [47, 37].



**Fig.4.** Diseases cured by Sukku

Sukku cure many diseases. Gastro Intestinal Tract diseases were highest numbers 115 such as kunmam, indigestion, maantham, constipation, piles, kalichchal, vomit, kammalai, dryness of mouth, stomachache, vayitru kadupu, akkaram, appetite, soolai, vaayu, diabetics and mouth wash etc. Fevers were 56 in numbers, Vaatha

diseases were 26 in numbers, Pitta diseases were 17 in numbers, Sanni were 10 in numbers. Cardiovascular diseases were 8 in numbers such as anemia and hypertension.

Respiratory system diseases were 23 in numbers such as cough, kasam and asthma. Urinary system diseases were 4 in numbers such as neer kadupu and moothira kirisaram. Genital organs diseases were 11 in numbers such as kerdpa vaayu, veeriya viruthy, peumpaadu, amenorrhea and delivery pain. Skin diseases were 9 in numbers such as karappan and kiranthy. Central nervous system was 2 in numbers such as nerve weakness. Kaphala rodgam were 10 in numbers such as kaphala karappan, kaphala serdpanam, kaphala kuddam, kaphala pittam, kaphala kuttru, kaphala vali and kaphala varadchi. Ear diseases were 2 in numbers such as earache. Eye diseases were 15 in numbers such as 96 eye diseases, thimiram, padalam and Nethra vaayu. Amutha rodgam were 4 in numbers such as amutha pittam, amutha serdpana, amutha soolai and varadchi [3,6,11,12,14,15,18,21,22,27,28,29,30,34,36,43,48]. Figure 4 shows types of diseases cured by dried ginger from above prepared medicines.

#### 4. Conclusion

This literature review provides useful documented evidences of sukku related it's medicines in traditional medicine.

#### 5. Suggestions

There is need further laboratory study about this herb in future.

#### Declarations

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##### *Competing Interests Statement*

The authors declare no competing financial, professional and personal interests.

##### *Consent for publication*

We declare that we consented for the publication of this research work.

#### Annexure

- o SOAI- Siddha Oudatha Ayurvedha Iladga*
- o SMM- Siddha Marunthu Muraiyiyal*
- o MSK- Marunthu Seyiyalum Kalaiyum*
- o PSR- Parajasegaram 1st part Sira Rodga nithaanam*
- o SVMN- Sarapenthra Vaidhiya Murai Nayanarodgam*
- o SVMV- Sarapenthra Vaidhiya Murai Vaatham*
- o SVMS- Sarapenthra Vaidhiya Murai Soolai,moola,kudda,pitta rodgangal*
- o SVMK- Sarapenthra Vaidhiya Murai Kerdpinipalarodga nithanaam*

- o AG- AGasthiya 2000*
- o TYV- Theraiyar Yagama Vendpa*
- o KMM- Kunapadam Siddha matria medica by Murugesu Muthaliyar*
- o SMP- Siddha Maruthuva Pothu*
- o KM-Kulanthia Maruththuvam*
- o MOA- Mooligai Oar Arimugam*
- o MM-Mooligai Maruthuvam*
- o SV-Segarasasekara Vaidhyam*
- o EPA- Eliyamurayil Pini Agatra seeradgam, sukku,miladgu,thipili maruthuvam*
- o VS- Visavaidhiya Sinthamani*

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