PRECLINICAL TOXICITY STUDY ON

“KARASOODA SATHU PARPAM”

(DISSertation Subject)

For the partial fulfillment of
Requirements to the Degree of
DOCTOR OF MEDICINE (SIDDHA)

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Chennai - 600 047.

AFFILIATED TO THE TAMILNADU Dr. M.G.R MEDICAL UNIVERSITY
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DEPARTMENT OF NANJU NOOLUM MARUTHUVA NEETHI NOOLUM
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1. INTRODUCTION

Siddha System of Medicine is ancient one among Indian system of medicine derived by Siddhar's. It has a holistic approach. Siddha Medicine stands unique in various aspects.

The word Siddhars derived from “Sidh”. Sidh means Wise. They are experts in all aspect including yoga, astronomy, astrology, philosophy, medicine, alchemy. The word Siddha is derived from “Siddhi” meaning an object to the attended perfection. Siddha System emphasizes that medicine treatment should be oriented not merely to disease but should also take into account the patient his environment, sex, age, habits, mental, frame, diet, physical constitution.

Concept of Siddhar's; a healthy soul can only be developed through a healthy body so the developed method and meditation are believed to straighten the physical body and there by the soul.
Basic principle of Siddha System.

a) The human power and the natural power are responsible for the functions of the universe, which are neither different nor variant in nature.

b) All the objects in this world either with a definite shape or without shape are composed of five elements.

c) The human body is a conglomeration of 3 humors. Their equilibrium is good health and any disarrange leads to disease.

d) In Siddha the major preventive approach for maintaining and improving the quality of life includes
- Daily regimen
- Season regimen
- Ethical consideration.

Siddhar’s spends their life in experiment to save the human life from diseases using plant products, animal products, metals and minerals which are the gift of nature. As a result of their experiment they formulated so many valuable method of preparation for medicine which proved to be more scientific and involve high order of chemistry.
“All substance are poisons there is none which is not poison and remedy”-Paracelsus

In Siddha System each and every mineral and metal are having well defined purification process before medicine preparation. The toxic substance and their antidotes are well documented in Siddha literature.

Any Medicine need to be evaluated for their safety before administration to human. This is not a mandatory requirement because the Siddha Medicine has been in traditional use for years with proven efficacy and safety in experienced. Toxicological studies need to be conducted in order to prove the safety of the medicine and scientific approach of our sages, the Siddhar’s thus paving the way to worldwide acceptance of Siddha drugs.

One of the Siddha medicine “Karasooda sathu parpam” is indicated for urethritis and urinary tract infections. Karasooda sathu parpam contain Vengaram (Borax) and Silasathu (Selenite). It is already a known fact that both have diuretic property. But the safety profile of Karasooda sathu parpam is not known. Hence I want to evaluate the toxicity of Karasooda sathu parpam in animal models as per WHO guidelines. WHO guidelines provide practical technical guidance for monitoring the safety of traditional medicines within pharmacovigilance systems.
2. AIM AND OBJECTIVE

AIM:

To study the safety profile of the drug “Karasooda Sathu Parpam”

OBJECTIVE:

- Procurement, quality assessment of the raw drugs used for the preparation of test drug.
- To evaluate the scientific rationale behind the purification of the ingredients and Prepare Karasooda sathu parpam as per Siddha literature.
- To analyze the physical and chemical properties of the test drug.
- To evaluate the toxicity profile, Acute and long-term toxicity studies of the drug “Karasooda Sathu Parpam” on animal model (Swiss albino mice and Wister albino rats).
3.1 விசாரிகள்

விசாரிகள் காலங்கள் 25 ம் ஆண்டு ஆகும்.

சீதை விசாரி:

"நற்சொற்று பார்க்கும் வெளியில் சென்று

கிலை வேலியில் செல்லும் வெளியில் சென்று

மஞ்சள் வேலியில் சென்று வெளியில் சென்று

அறக்கு மூ்மனி செல்லும் வெளியில் சென்று

காந்திய வேலியில் சென்று வெளியில் சென்று

காப்பு வேலியில் சென்று வெளியில் சென்று

துறுப்பில் புதிதும் வேலியில் வெளியில் சென்று

நண்புரிகளுக்கு வேலியில் வேலியில் சென்று

ஏழு காலங்கள் வேலியில் வேலியில் சென்று"
கொண்டானை:

★ தமிழ்கருவியாக இரு காற்றான்களையும் பிள்ளையாளர்களுக்கு விளக்கமாக உருண்டையாக.

★ துறை கால்பனை.

★ கருவிசெய்யும் காயப்படும்.

★ கருவியையால் செய்யும் சுருக்கிய புது காரணியை மிக சிறிய கண்டுபிடித்தல் புலரும்.

★ பாரியுற்று அகிலிணேயை மிக காட்சும் பாரியுற்று அதில் தினம் துணைக்குட்பு புரிந்து.

கொண்டானை கால்பனை விளக்கம்:

துளை பைக்கும் கொண்டானை விளக்கம் புது 1 பை, கொண்டானை 8 பை மறிக்கும் விளக்கம் துளைப்பினும், துளையில் நூறு 100 பை பைக்கும் புது 6 ¼ பை மறிக்கும் துளைப்பின் விளக்கத்தை துளைகுட்பிகளின் கம்ப காரணியை குறிப்பிட்டு. துளையில் முதல் வறுக்கு கட்டிய துளை பைக்கும் 1 பை, கருவியரின் துளை 1 பை, குறிப்பிட்டு விளக்க ½ பை குட்பிக்கும் 4 பைக்கும் துளைப்பினும் விளக்கத்தை கொண்டானை விளக்கமாக குறிப்பிட்டு.

சின்னம் குறுக்கை:

★ 64 காற்றான்களை குறுக்கை,

★ இப்பை 120 பை காற்றான்களை.

★ கருவிசெய்யும் குறுக்கை,

★ கருவியை, சின்னம் குறுக்கை, குறுக்கை குறுக்கை.

சங்கநாயகம்:

"சீனகையான் காரணியை காற்றான்களை விளக்கமும்; 
சின்னமும், போட்டுப்பாடு, அருகியும், குறுக்கை 
முன்பையில் குறுக்கை 

கொண்டானை காற்றான்களை விளக்கமாக குறுக்கை"
பார்வை காரணத்துண்டு குழுக்கூடானாக காண்போற்ற

புனித நேரடை குறுக்கு தனிப்பாட்டுப் பார்வையாக

அப்போது படிமத்துண்டு பார்வையாக நடை காண்போற்ற

அப்போது நெற்ற நெடுநிலம் பழுஷ.

- அப்போதில் புனிதமான - 1200

மாதங்கள்:

கிருட்டங்குழி, அவளாம், கண்டியாம், பால், தல் சிலிய குழுக்கூடானாக நடை காண்போற்ற.

பிறிக்கும் வருடங்கள்:

"பார்வை காரணத்துண்டு பெருமையாலே கீழ்

பார்வை (பார்வைகள்) உள்ள நிகழ்ச்சிகளின்

குறிப்பிட்டு பிறிக்கும் வருடங்கள் வருடம் போற்ற

குகார் தோன்றல் வருடங்கள் வருடம் என்றாலே

சிலிய குழி உள்ளது என்றாலே

கீழே கீழ் பார்வைகள் தோன்றல் என்றாலே

- அப்போதில் புனிதமான - 1200

மாதங்கள்:

பார்வையாம், பாஷியாம், தீனாம் ராவாம் பிரிக்கும் நடைகளாக.
கோஷ்பாரணிகள் தொடர்பான குறிப்பிட்டுதல்:

குழு - குடும்பப், வீடு விழா குழு

நினைவு - மோபை

தமிழ்த்தக்கதிகாணை:

1. நாணயார்கள்:

சுற்று நாணயார்கள், சுற்று பீடார்கள், கட்டுக்கார்கள், பெருக்கார்கள்.

2. மதமல்கள்:

சுருக்கத்தார், மதமல்கள், அப்பாறகள், குடும்பப்.

பேர் குறிப்பிட்டு:

"தமிழ்த் தானியங்கள் தன்போற் என்ன நாணயார் பார்வை

புதிய நாணயார் குடும்ப விழா - நாணயார்கள்

காந்தராஜா பொருள்கள் சுப்பிரமணியர் குழு

பெருக்கார்கள் அதிகாரியார் விளை

தமிழ்த் தானியங்கள், பொருள்கள், குழுக்கள், விளைக்குறிகள், பொருள்கள், போராட்டங்களின்

குறிப்பிட்டு சுருக்கத்தார் மதமல்கள் முதலில் சுருக்கத்தார் மதமல்கள்.

கற்பினர் பற்றி:

1. தமிழ்த் தானியங்கள் பொருள்கள் முழுமத்து சுருக்கத்தார் மதமல்கள் குழுக்கள் 3

பொருள்கள் சுருக்கத்தார் முதலில் குழுக்கள் 2 காரணிகளுக்கும்.

- குழுக்கள் தான் தமி விளை

2. தமிழ்த் தானியங்கள் பொருள்கள் சுருக்கத்தார் முதலில் குழுக்கள் 2 காரணிகளுக்கும்.

- குழுக்கள் தான் தமி விளை
3. மொத்தகாலத்தில் வருமாறு விளக்கமும் நிதி குறிப்பிட்டுக.

- கல்லூரியல் நாள் தேர்ந்தெடுக்கும்

4. மொத்தகாலத்தில் வருமாறு விளக்கமும், கல்லூரியல் பயிற்சிகளை அறிவித்து இருந்து நிதி குறிப்பிட்டுக.

- கல்லூரியல் நாள் தேர்ந்தெடுக்கும்

5. மொத்தகாலத்தில் பயிற்சிகளை அறிவித்து நிதி குறிப்பிட்டு இருந்து குறிப்பிட்டுக.

- கல்லூரியல் நாள் தேர்ந்தெடுக்கும்

செயல்பாடு பிரிவுகள்:

1. மொத்தகாலத்தில்:

பிரித்து நாள் முன்னேற்றம், அறிக்கை செய்ய

2. மொத்தகாலத்தில் பயிற்சிகளும், தேதியை அவைகளின் குறிப்பிட்டு நாள் என்று முன்னேற்றம், மக்கள் தொடர்வு, குழுவின் தொடர்வு.

3. மொத்தகால நிதி:

காப்புள்ள, ஸ்பிட்டேக்சிப்புள்ள, அறிக்கை பெருந்தொடர்வுக்கும் முன்னேற்றம் முன்னேற்றம் பெருந்தொடர்வுக்கும்.

4. பயிற்சிகளை 2 கால்வரியாக 4 கால்வரியாக முன்னேற்றம் பயிற்சிகளின் குறிப்பிட்டு முன்னேற்றம்.

5. மொத்தகாலத்தில் ½ நாள் 2 ½ கால்வரியாக முன்னேற்றம் பயிற்சிகளின் குறிப்பிட்டு முன்னேற்றம்.

6. பயிற்சிகள் மொத்தகாலத்தில் 5 நாள் 10 கால்வரியாக முன்னேற்றம் பயிற்சிகளின் குறிப்பிட்டு முன்னேற்றம்.
7. செயல் குறிப்பிட்டுகள்:
   அடையாளம்: கத்து அதாிபீ குடை
   அறிவுக் குறிப்பிட்டு: கத்து அறிவுக் குறிப்பிட்டு
   நோய் நிலை: செயல்பெருக்கு குறிப்பிட்டு

8. திறன்கள் பாதுகாப்பு பட்டியல்:
   அடையாளம்: கருணை (130mg)
   அறிவுக் குறிப்பிட்டு: திருச்சி அருள், நேர்
   நோய் நிலை: மார், கருணை.

9. குழந்தைகள் பாதுகாப்பு பட்டியல்:
   அடையாளம்: பல்லை (488mg)
   நோய் நிலை: பல்லை, சுருக்கம், மார்.

10. குறிப்பிட்டுகள்:
   அடையாளம்: கருணை (130mg)
   நோய் நிலை: முதல் காலப்பகுதி, மார், கருணைகள்

11. செயல்வாய்ப்பு சோதனை:
   அடையாளம்: 1 to 2 நிலை
   அறிவுக் குறிப்பிட்டு: குறிப்பிட்டு
   நோய் நிலை: மறு கூறுகளாக விளங்குகின்றன.
12.காலி தொடர் திலகவம்:

அதாவது: 1 to 2 முடி
அதி மார்தி: கதாணரிக்கு
நெக்கர் திறன்: மரு திறனில்லாத நெக்கர்

13.செந்தோற்ற குரலங்கள்:

அதாவது: குறுகிநிதகர் அலட்ச
அதி மார்தி: நீண்ட
நெக்கர் திறன்: கடல், பால்கார் புறையறை, முனிவுரை, மூச்ச.

14.சமையல்வைக் குரலங்கள்:

அதாவது: குறுகிநிதகர் அலட்ச
அதி மார்தி: புலூம், பசுமை, நீண்ட
நெக்கர் திறன்: காசரம், பீன்பா, கான்காரம், பாகரம்,
சாம்பல்புறையறை.

15.சாறு கலாசார் பாரம்பரியான:

அதாவது: பீட்வை அதாவ 2 தொட்டி
அதி மார்தி: திருத்தி காசு புறையறை
நெக்கர் திறன்: காசரம், காசு, ரோஸ்டெட்.
16. கிருட்பத்தின் குட்டி வகுப்பு:

அலகு : மருந்துக்கலன்கள் (488ல்) 2 இலைகள்

சிறுமி விளைப்படி : கிருட்பத்தின், தாய்ச்சுத்தின் மகன்.

17. கிருட்பத்தின் வெளிபெற்றுறை:

அலகு : ¼ - 1 மில்லியன் அலகு

வெளிபெற்றுறை : பால் வைல்னின்

சிறுமி விளைப்படி : கரும்புரத்தின், புரோட்டன், பெரூ, பச்சைந்துருந்து

8. புது வாய்ப்புகள்

1. மருந்துக்கலன், காய்கலன், மருந்துக்கலன். தன்மையான மருந்துக்கலன் காய்கலனுடன், கிருட்பத்தின் மட்டுமே.

2. மருந்துக்கலன், 1 மருந்து, காய்கலன் கொண்டு வெளிபெற்றுறை பொருள்களுக்கு பால் மருந்து, வெளிபெற்றுறையை பெற்றெடுத்து.

3. பதில்

மருந்துக்கலன் 2 மருந்து, 1 ½ மருந்துக்கலன் காய்கலன் பொருள், மருந்துக்கலன் காய்கலனுடன் மருந்துக்கலன் பொருள்களுக்குப் பெற்றெடுத்து.

9. பானைகள்:

1. மருந்துக்கலன் காய்கலன் பால் மருந்துக்கலன் பொருள் காய்கலனுடன் பால் மருந்துக்கலன் மின்னவர்.

2. பால் மருந்துக்கலன் காய்கலனுடன் பால் மருந்துக்கலன் பொருள் பால் மருந்துக்கலன்.
3.2.சிறந்து வழிசெல்லும் வழி: 

120 மீட்டர் வரை, சிறந்து வழிசெல்லும் வழி பிள்ளையார் செல்வதனால் செதுக்க உதவும் வழி வழிசெல்லும் வழி.

சிறந்து வழி & தொகுதி:

"பல்லுயன்செல்வது பள்ளிக்கல்வு வழி பிள்ளையார் செல்வதனால் முக்கியமான வழி

பள்ளிக்கல்வு பிள்ளையார் பள்ளிக்கல்வு மற்றும் மற்றும் வழி

பள்ளிக்கல்வு பிள்ளையார் பள்ளிக்கல்வு புறங்கிருந்து முதல் செல்வது

பிழைத்து பிள்ளையார் பள்ளிக்கல்வு 7000 - 3ம் வரை

- பல்லுயன்செல்வது பள்ளிக்கல்வு வழி

சிறந்து வழி வழிசெல்பாள்: 

"பல்லுயன்செல்வது பள்ளிக்கல்வு வழி

பிள்ளையார் பிள்ளையார் பள்ளிக்கல்வு புறங்கு

அதையும் பிள்ளையார் பள்ளிக்கல்வு புறங்கு

அதையும் பிள்ளையார் பள்ளிக்கல்வு புறங்கு

மாற்றும் பிள்ளையார் பள்ளிக்கல்வு புறங்கு

மாற்றும் பிள்ளையார் பள்ளிக்கல்வு புறங்கு

மாற்றும் பிள்ளையார் பள்ளிக்கல்வு புறங்கு

- பிழைத்து பிள்ளையார் 1200.
பொருள், பணத்தூண்டு, கால்சைடு, சிரைந்தை, அணும் பேண்டு, வேலைக்கட்டு, புதிய கட்டு. 

கலம், கலந்து & பிரிவு:

கலம்  -  திருப்பு
கலந்து  -  கலந்து
பிரிவு   -  திருப்பு

சிறப்பு & நிதிகள் சாகத்தில்:

சிறப்பு  -  சிறப்பு, கால்சைடு, சிரைந்தை, திருப்பு

பிரிவின் தினசரி:

பிரிவின் தினசரி: காலத்து

மக்கள்:

"சிறுநட்சத்திர் கூட்டணி சில சேவைகள்

புநராம்பிழங்கள் குழு கூட்டணி சேவை

சிறுநட்சத்திர் கூட்டணி சில சேவைகள்

சேவைகள் இருவரும் இருண்டு சேவைகள்

2.சிறுநட்சத்திர் கூட்டணி சேவைகள்

2.சிறுநட்சத்திர் கூட்டணி சேவைகள்

சிறுநட்சத்திர் கூட்டணி வல்லு குழுக்கள்

சிறுநட்சத்திர் கூட்டணி வல்லு குழுக்கள்

மென்பொருள் போர்க்கல் குழு கூட்டணி சில சேவைகள்

- முறையிடுதல் 1000 – 3ம் காலந்து
* கால்வரை கீழேட்டு

* பதில் கீழேட்டு.

சோதனை விளக்கம்:

1. சோதனையில் மூன்று கோடிக்குறிய புதுக்காரன் இருக்கும் செயற்பாடு.
2. அவற்றை விளக்கும் பொருள் செயற்பாடு.
3. கீழேட்டுகள் பிறப்பட்ட கூறுகளுக்கு அல்லது பிறப்பட்ட பிறமுடைய செயற்பாடு.

செயல்வாயில் பராசாரிசி

செயல்வாயில்:

2. கோடி கீழேட்டு

கோடி:

பராசாரிசியின் புதுக்காரன் பிறக்கும் படித்து.

முறையில்:

குறிப்பிட்டு கீழேட்டு

புதுக்கார் கீழேட்டு

சோதனை கீழேட்டு

அமர் கீழேட்டு
பார்வை கோவம்:

"நேரமுள்ள கீழ் சிற்றுறுப்பு தேர்வு

புவர்சொல் எசேலையின் பட்டை வெளியே - நூற்றாண்டு

நூற்றாண்டு பட்டையை எசேலையின் உடை

தேர்வுக்கு பல கோஸ்தயங்கள்”

இன்றைய உணவு மனிதக் குறிப்பிட்டன, புகழ்போக்காரர் நரே, புகழ்போக்காரர் புண்டா, புகழ்போக்காரர் கை, புகழ்போக்காரர் கோஸ்தய நூற்றாண்டு.

இந்த 40 அக்டோபர் கல்லறை நல்லை நூற்றாண்டு. இந்த 40 நல்லை நூற்றாண்டு.

கொஞ்சு சிற்றுறுப்பு

சொல்ல வல்லை:

"நேரமுள்ள புளோ கீழ் சிற்றுறுப்பு தேர்வு

கோஸ்தயாக மனிதக் குறிப்பிட்டன

நூற்றாண்டு புகழ்போக்காரர் உடை

புகழ்போக்காரர் வருகிறார் நூற்றாண்டு

புகழ்போக்காரர் மனிதக் குறிப்பிட்டன

புகழ்போக்காரர் வருகிறார் நூற்றாண்டு

புகழ்போக்காரர் வருகிறார் நூற்றாண்டு

புகழ்போக்காரர் வருகிறார் நூற்றாண்டு

- புருஷார்க்க 1200

கோஸ்தயாக கோஸ்தயாக கோஸ்தயாக, கோஸ்தயாக கோஸ்தயாக கோஸ்தயாக, கோஸ்தயாக கோஸ்தயாக

தேர்வுக்கு பல கோஸ்தயங்கள்

முண்டம், பும்பு கோஸ்தை கோஸ்தை கோஸ்தை கோஸ்தை கோஸ்தை

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குறிப்பிட்டு: 

குறும்புதல்: பாசசு, பசுலைய நிலவு பகுதிகள் முடிகின்றன.

பார்வதி குறிப்பிட்டு:

"குறும்புதல் பாசசுக்கு முதலாக விளக்கும்

சாலூடாக்கள் இயற்றல் விளக்கமுளர் - விளக்கங்களைத்

சீனாசுத் சிறுகொலம் பெருகி விளக்கம்

குறும்புதல் சிறுகொலம் முடிகின்றது".

குறும்புதல், சிறுகொலம், அதிகாரபூர்வகிளித்தியின், சுற்றுக்குமுள்ளவரும், விளக்கமுளர்

விளக்கம்.

குறிப்பிட்டு வலுச்சிகள்:

1. குறும்புதல் சிறுகொலம் பாசசு கழுத்தி வரும் குறிப்பிட்டு

   - விளக்கம்

2. குறும்புதல் சிறுகொலம் தடுக்கின்றிருக்கும் குறும்புதல் பாசசு

   - விளக்கம்

3. குறும்புதல் சிறுகொலம் தடுக்கும் குறும்புதல் பாசசு

   - விளக்கம்

4. குறும்புதல் சிறுகொலம் குறும்புதல் பாசசு

   - விளக்கம்

5. குறும்புதல் பாசசு முடியும் குறும்புதல் பாசசு

   - விளக்கம்
6. புயல்வாய்ப்புகள் கருவிகள் உருவாக்கும் பொழுது பல்லிகள் பின்புள்ள வருவாயியின் புல்லிகள் ஆம்
காரணிக்குறிப்பிட்டு கருவிகள் வருவாய்வு காரணிப்படும்।

- குளைப்பல் உடல் தோற்றம்

சுருக்கம் பின் முன்னெடுக்கவும்:

a. குண்டு பயன்பாடுகள்

1. காலை விளையாட்டு பேருி:

   அளவு : 10 புத்தகம் 30 மணிக்கணக்குள் (650 mg to 1.9gms)

   அடைப்பால் : புல்லிகள்

   இறைய விளக்கம் : பூட்டு விளச்சி, பிளாக் புல்லி, நீர்ப்பட்டியை.

2. வேளாண்டு விளையாட்டு:

   அளவு : 2 புத்தகம் 4 மணி (70gm to 140gm)

   இறைய விளக்கம் : புல்லிகள், புல்லி, காரு

3. போளும் விளையாட்டு பேருி:

   அளவு : 1 காரணிய (35mg) 2 மணி

   அடைப்பால் : காலை, புல்லிகளைக்

   இறைய விளக்கம் : மூட்டுகள், பல்லி, பல்லி, பொருள்கள்.
4. வெள்ளையான பொழுதை விளையாட்டு:

அடை : பொதுகோ பாதுகாப்பு

சூழன் சின்னம் : பெருமையுடன், மரணத்திறன், மருமதந்தம்.

5. தட்டுத்தண்டு சிறந்தச் சுத்தம்:

அடை : 1 குழு (35மி) 2 சமையல்

அடைப்பிட்டம் : பிரிசு, தட்டுத்தண்டு

சூழன் சின்னம் : பாலம், பல்லாரணம்.

6. திருமணம் பாறைகள்:

அடை : பிள்ளையான பாறைகள் 1-2 பாறைகள்

அடைப்பிட்டம் : பல, பால்

சூழன் சின்னம் : பாலம், ஆழ்வாரம் பல்லாரணம்

7. பாப்பான் பிள்ளை விளையாட்டு:

அடை : பிள்ளையான அடை

சூழன் சின்னம் : பலம், பல்லாரணம்
8. கிளைச்சை பருப்பத்திலிருந்து:

<table>
<thead>
<tr>
<th>அளவு</th>
<th>1 (கதரி(35mg)</th>
</tr>
</thead>
</table>

9. கருளிப்பிக் பருப்பத்திலிருந்து:

<table>
<thead>
<tr>
<th>அளவு</th>
<th>2 பருப்பத்தில்</th>
</tr>
</thead>
</table>
| அதிராணாமா | மாருபு குழுநிலப்பனு |}

10. பட்டி மாசு பொருள்களிலிருந்து:

<table>
<thead>
<tr>
<th>அளவு</th>
<th>(கதரி(35mg)</th>
</tr>
</thead>
</table>
| அதிராணாமா | செரு |}

11. கருளிப்பிக் பொருள்களிலிருந்து:

<table>
<thead>
<tr>
<th>அளவு</th>
<th>(கதரி(35mg) 2 பொருளை</th>
</tr>
</thead>
</table>
| அதிராணாமா | செரு, செருவூத்திரம்
| வேறு விளையாட்டுகள் | பச்சை, மஞ்சளை, குழு வைத்திருந்து |
b. புது மன்னர்கள்

1. சமையல் கைவல்லிடல்:

   கைவல்லிடல் : கூடை விளையாட்டு, பொழுது விளையாட்டு, கொடுது விளையாட்டு.

2. கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் .

3. கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் கைவல்லிடல் .
3.3 ஆங்கிலத்

நூறு பாகம்:

"ஆங்கிலத் கலைகளாக பிறந்து வருக

மாணவர் சான்று மற்றும் புத்துணர்வு

கலைகளின் போது புத்துணர்வு

கலை முனி பிரார்த்தனை வசானை

கலைகளின் முனி மற்றும் அடையாணத்

மாணவர் சான்று

கலைகளின் போது

கலைகளின் போது

கலைகளின் போது

கலைகளின் போது

கலைகளின் போது

கலைகளின் போது

நூற்றோர் - 1200

சான்று, மற்றும் புத்துணர்வு, மற்றும் புத்துணர்வு, மற்றும் புத்துணர்வு, சான்று, சான்று.

மண்டலம் பிள்ளை:

பாதுகாப்பு நிறுவனமான தலைமை பிரார்த்தனை மண்டலத்திடம் மண்டலம்.

மண்டல் பிள்ளை:

❖ பாடல் 8 பிறகு 10 அடுத்த மண்டலம்

❖ மாணவர் புத்துணர்வு மண்டலத்திடம்

❖ மாணவர் மண்டலமான காத்ரி ஆண்டு மண்டலம்

❖ சான்று புத்துணர் மண்டலத்திடம்.
முடிக்கள்:

❖ நேர்முறை வழிபாடு
❖ கருப்பு வழிபாடு
❖ முதல் வழிபாடு
❖ தொடர்நிலை வழிபாடு
❖ கட்டுமானம் வழிபாடு
❖ முன்னேற்றப் பாதுகாப்பு
❖ காலமுறை வழிபாடு
❖ கல்லறை வழிபாடு
❖ இயற்கை வழிபாடு
❖ விளையாட்டு வழிபாடு
❖ வருடந்தம் வழிபாடு
❖ பிள்ளைவாண வழிபாடு
❖ குடியிருப்பு வழிபாடு

- குறிப்பிட்டுக்கொள்ளும்: பிள்ளைவாண வழிபாடு

வழிபாடுகள் பயன்படுத்தும் கலம், குழுவம், முழுமம் பிலிப்பு:

கலம் - பொருள்
குழுவம் - வீரமூர்த்தி
பிலிப்பு - கருப்பு

சீரமைப்பு:

❖ குறிப்பிட்டுக்கொள்ளும்: குழுவக் குழுவம்
❖ அறுவ தகவல்காரியில்
மாரிய தன்னால்:

"மாரியால் போட்டியில் போட்டியில் போட்டியில்
நோய்க்கிறது போட்டியில் போட்டியில் - பத்மக்கா
கம்பியா போட்டியில் போட்டியில் போட்டியில் போட்டியில்
சம்பாதனை முற்புடையது என்”

- பத்மக்கா சுவாமிக்க

சுருக்கிய புரிந்து சக்திக்குறைக்கும் காரணங்கள் கற்றிருந்து கையிலேயே புரிந்து சக்திக்குறைவு காரணங்களுக்கு முன்னர் அதையை போட்டியில் முற்புடைவது.

சுருக்கிய காரணங்கள்:

"சுருக்கிய காரணங்கள் கையிலேயே காரணங்கள்
சுருக்கிய காரணங்கள் காரணங்கள் - சுருக்கிய
சம்பாதனை முற்புடையது சம்பாதனை
சம்பாதனை முற்புடையது என்”

- சுருக்கிய புரிந்து சக்திக்குறை

பின்னர் காரணங்களில் கெட்டும்போட்டில் - அல்லது காரண, முன்னேற்குறை, புதுக்காப்பு, போட்டியில் போட்டியில், போட்டியில் போட்டியில் போட்டியில் போட்டியில், ஆக்கிரமம், தொண்டா கெட்டும்போட்டில் 6 நாட்கள் 2 மணி விளையாட்டு.

முன்னேற்ற பட்டியல்:

1. சுருக்கிய புரிந்து சக்தியுடையது
2. காரணங்கள் அமல்படுத்தும் முறைக்குறை, போட்டியில் போட்டியில் போட்டியில்
3. காரணங்கள் சுருக்கிய புரிந்து சக்தியுடைய முறைக்குறை போட்டியில் போட்டியில் போட்டியில் போட்டியில் காரணங்கள் முறைக்குறை போட்டியில் போட்டியில்.
4. பழையார் இரு அமையச் சின்னம் ஒன்று, 2 செக்கல் 3 செக்கல் நீலம் கிளைகள் பைக் கைகளின் வலமும் கோடுபா உருளம் துக்க வெயில் குழும.

5. மற்றுமொன்றிலும் மற்றும் கீழ்லக்குடும்பம் பழையார் போக்குறுத்தவியல் மலர் குழும நீலக்குறுத்தவியல்.

சொற்றொருண்டுகள்:

a.கோண பார்வைகள்:

★ அம் வரம்புக்கீழ

★ அம் புலம்புக்கீழ

b.வட பார்வைகள்:

1.சுருக்காரச் சுருக்கம்:

அடுத்து : கோட்டக்கதை அடுத்து கோட்டக்கதை கல்லு
மின்ம சுருக்கம் : வரம்பு.

2.வெளிந்த மரம் பார்வைகள்:

அடுத்து : பழ அடுத்து
அடுத்தக்கதை : வரம்பு கல்லு
மின்ம சுருக்கம் : கோட்டக்கதை, வரம்பு கல்லு.

3.மின்மதா வகை பார்வைகள்:

அடுத்து : கூறுதல் ஆடுகள் (65mg)
அடுத்தக்கதை : கூறுதல்
மின்ம சுருக்கம் : கோட்டக்கதை, வரம்பு கல்லு.

4.சுருக்க குறிப்பிட்டும் பார்வைகள்:

அடுத்து : பிளேசுதல்
அடுத்தக்கதை : கூறுதல்
5. விளக்காசியர் பாதுகாப்பு:

அலை: 2 - 3 கத்திரி (260mg to 390mg)

செய்வு கருப்பு: துளையான, பச்சைகற்கை, காலைகற்கை.

6. விளக்காசியர் பாதுகாப்பு:

அலை: கத்திரி (130mg) 2 விளக்காசியம்

அறுமரங்கள்: பல்லவுஞ்சயம், பெருமை

செய்வு கருப்பு: பல்லவுஞ்சயம், பெருமை, பிரோத்தாக்கம்.

c.புதுப்பிக்கை:

★ நிலைக்குரியச் சத்தம் - மருத்துவ நிதியா (அலை பிளிமேரம்)

★ உணவுப்புக்குரியச் சத்தம் - குடைகைக் குடும்ப உணவுக்கு மருத்துவப் பிளிமேரம், பெருமை, பல்லவுஞ்சயம் அதுவப்பக்க கீழ்வேலை.
3.4 BORAX

It is an important boron compound. It is usually a white powder consisting of soft colorless crystals that dissolve easily in water.

The word borax from the Arabic bauraq, meaning “white”.

SYNONYM:

- Sodium borate.
- Sodium tetra borate.
- Disodium tetra borate.

VERNACULAR NAME:

- Hindi-Tinkal, Tincal
- Sanskrit -Tankana
- Malayalam -Pijar
- Telugu- Velligaram
- Tamil - Vengaram

SOURCES:

Borax is directly deposited in arid regions from the evaporation of water in intermittent lakes called playas. The playas form only during rainy seasons due to runoff from adjacent mountains. The runoff is rich in the element boron and is highly concentrated by evaporation in the arid climate. Eventually the concentration is so great that crystals of borax and other boron minerals form.

OCCURRENCE:

The most commercially important deposits are found in Turkey, Searle’s Lake and California. Also, it has been found at many other locations in the Southwestern United States, the Atacama Desert in Chile, and in Tibet and Romania. Borax can also be produced synthetically from other boron compounds. It is obtained from the mineral colemanite by boiling it with a solution of Na2CO3.
Ca$_2$B$_6$O$_{11}$ + 2Na$_2$CO$_3$ $\rightarrow$ Na$_2$B$_4$O$_7$ + 2CaCO$_3$ + 2NaBO$_2$

Colemanite $\rightarrow$ Borax

VARIOUS FORMS OF BORAX:

The term Borax is often used for a number of closely related minerals or chemical compounds that differ in their crystal water content, they are

- Anhydrous borax (Na$_2$B$_4$O$_7$).
- Borax pentahydrate (Na$_2$B$_4$O$_7$ · 5H$_2$O.)
- Borax decahydrate (Na$_2$B$_4$O$_7$ · 10H$_2$O).

ACTION:

- Diuretic.
- Astringent.
- Antacid.
- Antiseptic.

GENERAL PROPERTIES:

- The chemical formula for borax is Na$_2$-B$_4$-O$_7$.
- Borax is a solid.
- Odorless.
- Molecular weight: 201.22 g/mole
- Melts at 741 ºC.
- Borax is stable and non-corrosive in the presence of glass. It is incompatible with alkaloid salts, mercuric chloride, zinc sulphate and other metallic salts.
• Boiling point: 320°C
• The pH is alkaline.

PHYSICAL PROPERTIES:

• Color : Blue, Colourless, Green, Grey, Grey white.
• Habit : Massive - Uniformly indistinguishable crystals forming large Masses. Prismatic –Crystal Shaped like Slender Prisms (e.g.tourmaline).Tabular - Form dimensions are thin in one direction
• Density : 1.7 - 1.72, Average = 1.71
• Diaphaneity : Translucent to opaque
• Fracture : Brittle Conchoidal Very brittle fracture producing small conchoidal fragments
• Hardness :2-2.5 - Gypsum-FingerNail
• Luminescence :Non-fluorescent.
• Luster : Greasy (Oily)
• Streak : White
• Specific Gravity : 1.7 (very light)
CHEMICAL PROPERTIES:

Borax is also easily converted to boric acid and other borates, which have many applications. Its reaction with hydrochloric acid to form boric acid is:

\[
\text{Na}_2\text{B}_4\text{O}_7\cdot10\text{H}_2\text{O} + 2 \text{HCl} \rightarrow 4 \text{B(OH)}_3 \ [\text{or } \text{H}_3\text{BO}_3] + 2 \text{NaCl} + 5 \text{H}_2\text{O}
\]

CHEMICAL COMPOSITION

<table>
<thead>
<tr>
<th>Element</th>
<th>Symbol</th>
<th>Atomic Mass</th>
<th># of Atoms</th>
<th>Mass Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>Na</td>
<td>22.989770</td>
<td>2</td>
<td>12.056%</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>H</td>
<td>1.00794</td>
<td>20</td>
<td>5.286%</td>
</tr>
<tr>
<td>Boron</td>
<td>B</td>
<td>10.811</td>
<td>4</td>
<td>11.339%</td>
</tr>
<tr>
<td>Oxygen</td>
<td>O</td>
<td>15.9994</td>
<td>17</td>
<td>71.319%</td>
</tr>
</tbody>
</table>

USES:

Borax has a wide variety of use,

- It is a component of many detergents, cosmetics, and enamel glaze.

- It is also used to make buffer solutions in biochemistry, as a fire retardant, as an anti-fungal compound for fiberglass, as an insecticide, as a flux in metallurgy, a texturing agent in cooking, and as a precursor for other boron compounds.

- When borax is added to a flame, it produces a yellow green color. This property has been tried in amateur fireworks, but borax in this use is not popular because its waters of hydration inhibit combustion of compositions and make it an inferior source of the boron that is responsible for most of the green color, and that is overwhelmed by the yellow contributed to the flame by sodium.

- However, commercially available borax can be mixed with flammables such as methanol to give the characteristic green flame of boron when ignited, which then slowly gives way to the characteristic yellow- orange flame of the sodium.
MEDICAL USES:

- Borax is given internally 10 to 30 grains for menorrhagia, dysmenorrhea and it promotes uterine pains during labour.

- Borax and reduced conch shell are taken equal parts and mixed well. The mixture is soaked in fresh ginger juice over three times and made into 2 grains pills. It is given with honey for bronchitis, pneumonia.

- 5 grains of Borax eaten with betel leaves has been found to be effective in impotence.

- 10 grains borax and 10 grains cinnamon with betel juice is given for loss of appetite, cough, asthma and diarrhea.

- Externally borax is used in lotion for acne, freckles and urticaria.

- Borax glycerine is useful as an antiseptic lotion in purulent ophthalmia and diphtheria.
3.5 GYPSUM - SELENITE

Gypsum is a common sedimentary mineral and the most common of all the sulphates - and is usually found in massive beds of tabular or block crystal form. Gypsum is often found in caves, in evaporated lakes or seabed’s, or salt flats

Selenite, satin spar, desert rose, and gypsum flower are four varieties of the mineral gypsum; all four varieties show obvious crystalline structure. The four "crystalline" varieties of gypsum are sometimes grouped together and called selenite.

All varieties of gypsum are composed of calcium sulphate dihydrate and the chemical formula \( \text{CaSO}_4.2\text{H}_2\text{O} \).

IDENTIFICATION OF CRYSTALS AS GYPSUM:

All varieties of gypsum are very soft minerals. This is the most important identifying characteristic of gypsum, as any variety of gypsum can be easily scratched with a fingernail. Also, because gypsum has natural thermal insulating properties, all varieties feel warm to the touch.

General identifying descriptions of the related crystalline varieties are:

SELENITE:

- It is most often transparent and colorless.
- Selenite crystals show translucency, opacity, and colour, it is caused by the presence of other minerals including druse. (a coating of small crystal points).

SATIN SPAR:

- Satin spar is almost always prismatic and fibrous in a parallel crystal habit. Satin spar often occurs in seams, some of them quite long, and is often attached to a matrix or base rock.
DESERT ROSES:

- Desert roses are most often bladed, exhibiting the familiar shape of a rose. Desert roses are almost always unattached to a matrix or base rock.

GYPSUM FLOWERS:

- Gypsum flowers are most often acicular, scaly. Gypsum flowers most often exhibit simple twinning, where parallel, long, needle-like crystals, sometimes having severe curves and bends.

SELENITE

BROAD CLASSIFICATION: Hydrous calcium sulphate

SYNONYM:

- Satinspar
- Selenite
- Alabaster
- Gypsum

VERNACULAR NAMES:

- English - Gypsum, alabaster, Calcium sulphate
- Tamil - Karpoora Silasathu
- Hindi - Sufed pathar
- Marathi - Godanti
- Bengal - Silajath
- Sanskrit - Silajit
- Geological - Selenite
HISTORY AND ETYMOLOGY:

The ancients had a belief that certain transparent crystals waxed and waned with the moon. From the 15th century, "selenite" has referred specifically to the variety of gypsum that occurs in transparent crystals or crystalline masses.

The word Selenite comes from the Greek “Selenites”. Meaning of Selenite “moon stone” or “moon rock”. The “Selene” meaning “Moon”, and for good reason. Selene is also the name of the Greek Goddess of the Moon.

The mineral Selenite is the near transparent and colourless crystal form of Gypsum. It is very much resemble the moon.

ORIGIN AND OCCURRENCE:

Selenite occurs as evaporates; extensive sedimentary deposits interbedded with limestone, red shales and clay stones etc.

In India, significant occurrences of selenite are at Nellore, Prakasam and Guntur in AndhraPradesh and Bikaner, Barmer, Jaisalmer, Nagaur, Ganganagar and Pali in Rajasthan. Major production of selenite come from these two states only. There are some other occurrences also reported in the states of Gujarat, Jammu and Kashmir, Himachal Pradesh, Uttarakhand and Tamil Nadu.

PHYSICAL PROPERTIES:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature</td>
<td>Crystalline showing elongated tabular crystals</td>
</tr>
<tr>
<td>Colour</td>
<td>Greyish white</td>
</tr>
<tr>
<td>Streak</td>
<td>White</td>
</tr>
<tr>
<td>Cleavage</td>
<td>Perfect</td>
</tr>
<tr>
<td>Fracture</td>
<td>Even</td>
</tr>
<tr>
<td>Lustre</td>
<td>Silky</td>
</tr>
</tbody>
</table>
Tenacity : Sectile
Transparency : Translucent
Hardness : 2
Sp. Gr. : 2 to 2.5
Molecular weight : 172.17 gm

CHEMICAL COMPOSITION:

Calcium : 23.28%
Hydrogen : 2.3%
Sulfur : 18.62%
Oxygen : 58.76%
Total : 100%.

MEDICAL USES OF SELENITE:

- Powered selenite is sprinkled over excoriations and ichorous ulcer.

- It is also employed native vaidyans .in case of wrinar disease, syphilis, blood pressure, whooping cough, diarrhea ect..

- Calcined power prepared by vaidyan is prescribed for cough, swelling in cases of dropsy and other disease involving unnatural accumulation of water in any cavity of the body.

- It is used to retain broken bones in a fixed position, in fracture of limb and ribs and the disease of spine it is useful.

- Internally it is an astringent and antacid and is useful in menorrhagia and acidic of the stomach and given in fever.
3.6 LEMON

BOTONICAL CLASSIFICATION:

- Kingdom : Plantae
- Class : Magnoliophyta
- Sub class : Rosidas
- Order : Sapindales
- Family : Rutaceae
- Genus : Citrus
- Species : lemon

BINOMINAL NAME:

Citrus Limon

SYNONYMS:

- English : Lime tree, Lemon
- Sanskrit : Nimbuka, Jambira, Jambaka
- Hindi : Jamir nimbu, Nimbu
- Malayalam : Cherunarakam, Cherunaranga
- Telugu : Pedda Nimma, Jambira, Nimmu

HABITAT:

- The true lemon tree reaches 10 to 20 ft (3-6 m) in height and usually has sharp thorns on the twigs.
- The alternate leaves, reddish when young, become dark-green above, light-green below; are oblong, elliptic or long-ovate, the leaf is 2 1/2 to 4 1/2 in (6.25-11.25 cm) long, finely toothed, with slender wings on the petioles.
- The mildly fragrant flowers may be solitary or there may be 2 or more clustered in the leaf axils.
- Buds are reddish; the opened flowers have 4 or 5 petals 3/4 in (2 cm) long, white on the upper surface (inside), purplish beneath (outside), and 20-40 more or less united stamens with yellow anthers.
- The fruit is oval with a nipple-like protuberance at the apex; the fruit is 2 3/4 to 4 3/4 in (7 -12 cm) long.
- The peel is usually light-yellow though some lemons are variegated with longitudinal stripes of green and yellow or white.
- It is aromatic, dotted with oil glands; 1/4 to 3/8 in (6-10 mm) thick; pulp is pale-yellow, 8 to 10 segments.

**HISTORY OF ORIGIN:**

Lemons first grew in Southern India, northern Burma, and China. Lemons entered Europe (near southern Italy) no later than the 1st century CE, during the time of Ancient Rome. However, they were not widely cultivated. It was later introduced to Persia and then to Iraq and Egypt around CE 700. The lemon was first recorded in literature in a 10th century Arabic treatise on farming, and was also used as an ornamental plant in early Islamic gardens. It was distributed widely throughout the Arab world.

**MEDICO HISTORICAL REVIEW OF LEMON:**

- The first clear descriptions of the usage of lemon for therapeutic purposes date back to the works of Theophrastus, Aristotle's pupil.
- In China, India and in the Mesopotamian civilizations used for its antiseptic, anti-rheumatic and refreshing properties and considered sacred in Muslim countries.
- It was mainly used as an antidote against poisons, as an astringent against dysenteric and hemorrhagic symptoms.
- Hellenics were used to growing lemon trees near olive trees to preserve them from parasitic attacks.
The ancient Romans believed so strongly in the healing power of lemon juice that they used it as a cure for various types of poisons.

In the 16th century, it was recognized that drinking lemon juice daily may prevent scurvy among sailors who spend most of the time on the sea.

In Italy, the sweetened juice is given to relieve gingivitis, stomatitis, and inflammation of the tongue.

**ACTIONS:**

- Anti-bilious
- Anti-scorbutic
- Aromatic
- Carminative
- Hepatoprotective
- Refrigerant
- Stimulant
- Stomachic.

**CHEMICAL CONSTITUENTS:**

- Volatile oil
- Coumarins
- Bio Flavanoids
- Vitamins A,B1,B2,B3,C
- Mucilage
- Phenylpropanoid Glycosides

**Volatile components:**

- Limonene
- 2-β-Pinene
- α-Terpinene
**Coumarins:**
- 8-Geranyloxypsolaren
- 5-Geranyloxypsolaren
- 5-Geranyloxy-7-methoxycoumarin
- Citropten

**Flavanoids:**
- Apigenin
- Luteolin
- Hesperidin

**Phenylpropanoid Glycosides**
- Citrusins
- Coniferin

**MEDICINAL USES:**

- Lemon juice is widely known as a diuretic, antiscorbutic, astringent, and febrifuge.
- Lemon juice in hot water has been widely advocated as a daily laxative and preventive of the common cold.
- Lemon juice and honey, or lemon juice with salt or ginger, is taken when needed as a cold remedy.
- It was the juice of the Mediterranean sweet lemon, not the lime, which was carried aboard British sailing ships of the 18th Century to prevent scurvy, though the sailors became known as "limeys".
- Oil expressed from lemon seeds is employed medicinally.
- The root decoction is taken as a treatment for fever in Cuba; for gonorrhea in West Africa. An infusion of the bark or of the peel of the fruit is given to relieve colic in abdomen.
- Lemon is acidic to the taste, it leaves off alkaline residues in the body. This is why it is useful in all symptoms of acidosis.
- Lemon-juice is a powerful antibacterial. It has been proved by experiments that the bacteria of malaria, cholera, diphtheria, typhoid and other deadly diseases are destroyed in lemon-juice.
OTHER USES:

Lemon juice:

Lemon juice is valued in the home as a stain remover, and a slice of lemon dipped in salt can be used to clean copper-bottomed cooking pots. Lemon juice has been used for bleaching freckles and is incorporated into some facial cleansing creams.

Lemon peel oil:

Lemon peel oil is much used in furniture polishes, detergents, soaps and shampoos. It is important in perfume blending and especially in colognes.

Petit grain oil:

Petit grain oil (up to 50% citral), is distilled from the leaves, twigs and immature fruits of the lemon tree in West Africa, North Africa and Italy. With terpenes removed, it is greatly prized in colognes and floral perfumes.

Lemon peel:

Lemon peel is marketed as cattle feed.

Wood:

The wood is fine-grained, compact, and easy to work. In Mexico, it is carved into chessmen, toys, small spoons, and other articles.
3.7 வையங்காலம் தொடுக்க விளைவுகள்

தொடுக்க விளைவுகள்:

- குறிப்பிட்டு, 
- இரு பல்கரமாக, 
- குறிப்பிட்டு கனவனை. 

பதிப்புகள்:

1. குழுவையும் வருடம் 80 வ.கி.களையும் வருடம் தொடுக்க விளைவின் வட்டம் விளக்கத்தை வையங்காலத்தில். 

2. குழுவையும் வருடம் 80.வ.கி.களையும் 2 வருடங்கள் தொடுக்க விளைவின் வட்டம் விளக்கத்தை வையங்காலத்தில். 

3.8 காம்பு விளக்கியில் இருக்கும் பதிலங்கள்

பதில் காட்டுதல்

• வாழ்க்கை
• பிரிவெம்
• அதிகங்கள் பதிலும்
• மேல் பதிலும்

குறிப்பிட்டுப் பகுதி:

• தமிழ்மாது பாரை- கரையும், மாடல் விளக்கியின் தொடக்கத்தில். முதலில் கரையும் விளக்குக்கு முன்னோடியாக விளக்கியின் தொடக்கத்தில் கையுருங்கு தொடர்வதை வருகிறது.

காம்பு விளக்கியில் இருக்கும் பதிலினைக்

அருகில் விளக்கியின் தொடக்கத்தில் வருகிறது.

குறிப்பிட்டுப் பகுதி:

செய்து விளக்கியின் தொடக்கத்தில்.
3.9 செய்வான விளக்கானது நாசாமக்கன்கூடா என்னும் விளக்கம்:

தனது விளக்கம்:

- செய்வான விளக்கானது நாசாமக்க நாசாமக்க அனைத்து செய்வான பரட்டு.

- செய்வான விளக்கானது விளக்கானது யாது செய்வான விளக்கானது நாசாமக்க நாசாமக்க நாசாமக்க நாசாமக்க.

தனது பாதுகாப்புமிக்கு குழுவாக்கத்தின் பாதுகாப்பு:

- யாது செய்வான விளக்கானது விளக்கானது யாது செய்வான விளக்கானது யாது செய்வான விளக்கானது.

- விளக்கானது விளக்கானது விளக்கானது யாது செய்வான விளக்கானது யாது செய்வான விளக்கானது.
3.10 TOXICOLOGICAL ASPECT OF BORAX

BORAX POISONING:

- Acute borax poisoning typically occurs when someone swallows a borax-containing product, like roach powder.
- Chronic poisoning can result in those who have regular exposure to it or who use it regularly.

SYMPTOMS:

a. Acute borax poisoning symptoms:
   - Ingestion may cause gastrointestinal distress including nausea, persistent vomiting, abdominal pain, and diarrhoea.
   - Effects on the vascular system and brain include headaches and lethargy, but are less frequent.

b. Chronic borax poisoning symptoms:
   - Sufficient exposure to borax dust can cause respiratory and skin irritation.
   - A beefy red skin rash affecting palms, soles, buttocks and scrotum.
   - Unconsciousness,
   - Respiratory depression and renal failure.

FATAL DOSE:

15 - 20g

FATAL PERIOD:

3- 4 days
3.11 TOXICOLOGICAL ASPECT OF LEMON:

POISONING:

- The thorns of the lemon tree inflict painful punctures and scratches.
- Lemon peel oil may cause contact dermatitis, chronic in those who handle, cut and squeeze lemons daily.
- Parts of the body touched by contaminated hands may show severe reactions after exposure to the sun.
- People that suck lemons may suffer irritation and eruptions around the mouth.
- The wood of lemon trees and its saw-dust may induce skin reactions in sensitive woodworkers.
4.1 COLLECTION, AUTHENTICATION, PURIFICATION AND PREPARATION OF “KARASOODA SATHU PARPPAM”

COLLECTION OF DRUG:

The raw drugs of Karasooda sathu parpam were collected from raw drug store in Chennai.

AUTHENTICATION:

Silasathu and Vengaram were authenticated by SCRI, Arumbakkam, Chennai -106.

PURIFICATION:

1. Purification of Vengaram:

1 palam (35 gm) of Vengaram was fried till the moisture gets removed.

- Gunapadam thathu jeeva vagupu.

2. Purification of Karpurasilasathu:

1 palam (35 gm) of Silasathu was powdered and soaked in 2 part of tender coconut water for 24 hr. It was then filtered and dried. This process was repeated 2 times.

- Anuboga vaitheya navanitham part 2.

PREPARATION OF THE MEDICINE:

Ingredients:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purified Venkaram</td>
<td>1 palam (35 gm)</td>
</tr>
<tr>
<td>Purified Silasathu</td>
<td>1 palam (35gm)</td>
</tr>
<tr>
<td>Lemon juice</td>
<td>Require qty.</td>
</tr>
</tbody>
</table>
Method of Preparation:

35 gm of Vengaram and 35gm of Silasathu were purified separately and it combination has been grinded with lemon juice for 6 hrs and then made into tablets(villai). These tablets were dried in sunlight and then put into mud lid and surmount an equivalent mud lid and sealed by clay plaster winded it for 2 times and then burnt using varrati(dried cow dung) and allowed it to cool. Finally the mud lid was taken out and the seal was opened to collect the leftover available in the lid. This leftover was grinded as fine powder. This powder Karasooda sathu parpam was stored in closed container.

Dose of drug : 1- 1 ½ Panavedai (488mg to 732mg)
Adjuvant : Honey
Therapeutic uses : Neeradaipu, Kalladaipu( Renal calculi), Sathai adaipu(Pymosis)

- Sigicharathna deepam vaithiya sinthamani part-2 p.no121
4.2 PHYSICO CHEMICAL PROPERTIES

Sample description: Karasooda sathu parpam

COLOUR:

About 50 gm of karasooda sathu parpam was taken in a clean glass beaker and tested for its colour by viewing again a white opaque back ground under direct sunlight.

ODOUR:

About 50 gm of the karasooda sathu parpam was placed in 100 ml of beaker and tested for its odour by wafting the air above the beaker.

pH:

The pH of the Karasooda sathu parpam was estimated as per the method prescribed in the Indian standard (IS) -6940(1982). One gram of the Karasooda sathu parpam was taken in to a 100ml graduated cylinder containing about 50 ml of water and filled up to the mark with water. The cylinder was stoppered and shaken vigorously for two minutes and the suspension was allowed to settle for hour at 25°C to 27°C. About 25 ml of the clear aqueous solution was transferred in to a 50 ml beaker and tested for ph using.DIGISUN digital pH meter (DIGISUN electronics, Hyderabad, India)

DETERMINATION OF ASH VALUE:

Weighed accurately 2gms of the karasooda sathu parpam was taken in tarred platinum or silica dish and incinerate at a temperature not be exceeding 450°C until free from cobran cooled and weighed calculate. The percentage of ash with reference to the air dried drug was then calculated.

WATER SOLUBLE ASH:

To the gooch crucible, containing to the total ash, added 25 ml of water and boiled for 5 minutes. The insoluble matter was collected in a sintered glass crucible or on ashless filter paper.

Then washed with hot water and ignited in a crucible for 15 minutes at a temperature not exceeding 450°C.the weight of the insoluble matter was subtracted from the weight of the
sample. The difference of the weight represents the water soluble ash. Calculate the percentage of water soluble ash with the reference to the air dried drug.

**ACID INSOLUBLE ASH:**

Boiled the ash 5 minutes with 25 ml of 1:1 dil. HCL collect the insoluble matter gooch crucible on an ash less filter paper; wash with hot water and ingnite. Cooled in desiccators and weighed, calculated the percentage of insoluble ash with reference to the air dried drug.

**LOSS ON DRYING:**

Five grams of the *Karasooda sathu parpam* was heated in a hot oven at 105ºC to constantly, and weighed. The percentage of loss of weight was calculated there from.
4.3 QUALITATIVE ANALYSIS

Preparation of extract:

5g of **unpurified vengaram** was taken in a 250 ml of clean beaker and 50 ml of distilled water was added to it. Then it was boiled well for about 10 min. Then it is allowed to cool and filtered in a 100 ml volumetric flask and made up to 100 ml with distilled water. This preparation is used for the qualitative analysis of acidic/basic radicals and biochemical constituents in it.

5g of **purified vengaram** was taken in a 250 ml of clean beaker and 50 ml of distilled water was added to it. Then it was boiled well for about 10 min. Then it is allowed to cool and filtered in a 100 ml volumetric flask and made up to 100 ml with distilled water. This preparation is used for the qualitative analysis of acidic/basic radicals and biochemical constituents in it.

5g of **unpurified silasth** was taken in a 250 ml of clean beaker and 50 ml of distilled water was added to it. Then it was boiled well for about 10 min. Then it is allowed to cool and filtered in a 100 ml volumetric flask and made up to 100 ml with distilled water. This preparation is used for the qualitative analysis of acidic/basic radicals and biochemical constituents in it.

5g of **purified silasth** was taken in a 250 ml of clean beaker and 50 ml of distilled water was added to it. Then it was boiled well for about 10 min. Then it is allowed to cool and filtered in a 100 ml volumetric flask and made up to 100 ml with distilled water. This preparation is used for the qualitative analysis of acidic/basic radicals and biochemical constituents in it.

5g of **karasodasathu parpam** was taken in a 250 ml of clean beaker and 50 ml of distilled water was added to it. Then it was boiled well for about 10 min. Then it is allowed to cool and filtered in a 100 ml volumetric flask and made up to 100 ml with distilled water. This preparation is used for the qualitative analysis of acidic/basic radicals and biochemical constituents in it.
<table>
<thead>
<tr>
<th>S.NO</th>
<th>EXPERIMRNT</th>
<th>OBSERVATION</th>
<th>INFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Appearance of the sample</td>
<td>Unpurified vengaram: White in colour</td>
<td>Purified vengaram: White in colour</td>
</tr>
</tbody>
</table>
| 2    | Solubility:  
a. A little of the sample is shaken well with distilled water  
b. A little of the sample is shaken well with con.HCl con.H2SO4 | No sparingly soluble | No sparingly soluble | No sparingly soluble | No sparingly soluble | Absence of silicate | |
| 3    | Action of heat:  
A small amount of the sample is taken in a dry test tube and heated gently at first and the strongly | No colour fumes | No colour fumes | No colour fumes | No colour fumes | Absence of carbonate and nitrate | |
| 4    | Flame test:  
All amount of the sample is made into with con.HCl in a watch glass and into minus part of the Bunsen flame | No colour flames appeared | No colour flames appeared | No colour flames appeared | No colour flames appeared | Absence of copper | |
| 5    | Ash Test:  
A filter paper is soaked into a mixture of sample and cobalt nitrate solution and introduced into the Bunsen flame and ignited | yellow colour flame | yellow colour flame | yellow colour flame appeared | yellow colour flame appeared | No yellow colour flame | presence of sodium |
<table>
<thead>
<tr>
<th>S.NO</th>
<th>EXPERIMENT</th>
<th>OBSERVATION</th>
<th>INFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Test for sulphate:</strong>&lt;br&gt;2ml of the above prepared extract is taken in a test tube to this added 2ml of 4% ammonium oxalate solution b. 2ml of the above prepared extract is added with 2ml of dil HCl until the effervescence ceases off. Then 2ml of barium chloride solution is added</td>
<td>cloudy appearance</td>
<td>No Cloudy appearance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cloudy appearance</td>
<td>No Cloudy appearance</td>
</tr>
<tr>
<td>2</td>
<td><strong>Test For Chloride:</strong>&lt;br&gt;2ml of the above prepared extract is added with dil HNO₃ till the effervescence ceases off. Then 2ml of silver nitrate solution is added</td>
<td>No cloudy appearance</td>
<td>No Cloudy appearance</td>
</tr>
<tr>
<td>3</td>
<td><strong>Test for phosphate:</strong>&lt;br&gt;2ml of the extract is treated with 2ml of ammonium molybdate solution and 2ml of con.HNO₃</td>
<td>Mild yellow appearance</td>
<td>Mild yellow appearance</td>
</tr>
<tr>
<td>4</td>
<td><strong>Test for carbonate:</strong>&lt;br&gt;2ml of the extract is treated with 2ml magnesium sulphate</td>
<td>No characteristic changes</td>
<td>No characteristic changes</td>
</tr>
<tr>
<td></td>
<td><strong>Test For Nitrate:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1gm of the substance is heated with copper turnings and concentrated H2SO4 and viewed the test tube vertically down</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Characteristic Changes</td>
<td>No Characteristic Changes</td>
<td>No Characteristic Changes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><strong>Test For Sulphide:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 gm of the substance is treated with 2ml of con.Hcl</td>
</tr>
<tr>
<td></td>
<td>No rotten egg smelling evolved</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><strong>Test for fluoride &amp; oxalate:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2ml of extract is added with 2ml of dil.acetic acid and 2ml calcium chloride solution and heated</td>
</tr>
<tr>
<td></td>
<td>No cloudy Appearance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><strong>Test for nitrite:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 drops of the extract is placed on a filter paper on that 2 drops of acetic acid and 2 drops of benzidine solution is placed</td>
</tr>
<tr>
<td></td>
<td>No Characteristic Changes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><strong>Test for borate:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 pinches of the substance is made into paste by using sulphuric acid and alcohol(95%) and introduced into the blue flame</td>
</tr>
<tr>
<td></td>
<td>Yellow Precipitate is obtained</td>
</tr>
<tr>
<td>S.NO</td>
<td>EXPERIMENT</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Test For Lead: 2ml of the extract is added With 2 ml of potassium iodide solution</td>
</tr>
<tr>
<td>2</td>
<td>Test of Copper: a. One pinch of substance is made into paste with con.Hcl in a watch glass and introduced into the non luminous part of the flame b. 2ml of extract is added with excess of ammonia solution, Blue colour flame is not formed</td>
</tr>
<tr>
<td>3</td>
<td>Test For Aluminium: To the 2ml of the extract sodium hydroxide is added in drops to excess</td>
</tr>
<tr>
<td>4</td>
<td>Test For Iron: To 2ml of extract 2ml of ammonium thiocyanate solution and 2ml of con.HNO3 is added</td>
</tr>
<tr>
<td>5</td>
<td>Test For Zinc: To 2ml of the extract sodium hydroxide solution is added in drops to excess</td>
</tr>
<tr>
<td>S.NO</td>
<td>EXPERMRTNT</td>
</tr>
<tr>
<td>------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>6</td>
<td><strong>Test For Calcium:</strong> 2ml of the extract is added with 2ml of 4% ammonium oxalate solution</td>
</tr>
<tr>
<td></td>
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<tr>
<td>7</td>
<td><strong>Test For Magnesium:</strong> To 2ml of extract sodium hydroxide solution is added in drops to excess</td>
</tr>
<tr>
<td></td>
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<tr>
<td>8</td>
<td><strong>Test For Ammonium:</strong> To 2ml of extract few ml of Nesslerr’s reagent and excess of sodium hydroxide solution are added</td>
</tr>
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<tr>
<td>9</td>
<td><strong>Test For Potassium:</strong> A pinch of substance is treated with 2ml of sodium nitrite solution and then treated with 2ml of cobalt nitrate in 30% glacial acetic acid.</td>
</tr>
<tr>
<td></td>
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<tr>
<td>10</td>
<td><strong>Test For Sodium:</strong> 2 pinches of the substance is made into paste by using Hc&amp; Introduced into bunsen burner</td>
</tr>
<tr>
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<tr>
<td>11</td>
<td><strong>Test For Mercury:</strong> 2ml of the extract is treated with 2ml sodium hydroxide solution</td>
</tr>
<tr>
<td></td>
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<tr>
<td>S.NO</td>
<td>EXPERIMRNT</td>
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<tr>
<td>------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td><strong>Test for Starch:</strong> 2ml of extract is treated with weak iodine solution</td>
</tr>
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<td></td>
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<tr>
<td>2</td>
<td><strong>Test For Reducing Sugar:</strong> 5ml of Benedict’s qualitative solution is taken in a test tube and allowed to boil for 2 minutes and added 8 to 10 drops of the extract and again boil it for 2 minutes. The colour changes are noted</td>
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<td></td>
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</tr>
<tr>
<td>3</td>
<td><strong>Test For Alkaloids:</strong> a. 2ml of the extract is treated with 2ml of potassium iodide solution b. 2ml of extract is treated with 2ml of picric acid c. 2ml of the extract is treated with 2ml of phosphotungstic acid</td>
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<td></td>
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<tr>
<td>4</td>
<td><strong>Test For Tannic Acid:</strong> 2ml of extract is treated with 2ml of ferric chloride solution</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>S.NO</td>
<td>EXPERIMENT</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td>5</td>
<td>Test For Unsaturated Compound: To the 2ml of extract 2ml of Potassium permanganate solution is added.</td>
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<tr>
<td></td>
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<tr>
<td>6</td>
<td>Test For Amino Acid: 2 drops of the extract is placed on a filter paper and dried well</td>
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<tr>
<td>7</td>
<td>Test of type of Compound: 2ml of the extract is treated with 2ml of ferric chloride solution</td>
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</tr>
</tbody>
</table>
4.4 QUANTITATIVE ANALYSIS

Experimental Procedure: Done at SAIF, IIT Madras, Chennai-36

4.4.1 HR SEM-METHODOLOGY: (High resolution scanning electron microscope)

An SEM is essentially a high magnification microscope, which uses a focused scanned electron beam to produce images of the sample, both top-down and, with the necessary sample preparation, cross-sections. The primary electron beam interacts with the sample in a number of key ways:

- Primary electrons generate low energy secondary electrons, which tend to emphasize the topographic nature of the specimen.
- Primary electrons can be backscattered which produces images with a high degree of atomic number (Z) contrast.
- Ionized atoms can relax by electron shell-to-shell transitions, which lead to either X-ray emission or Auger electron ejection. The X-rays emitted are characteristic of the elements in the top few \( \mu m \) of the sample.

SAMPLE PREPARATION:

Sample preparation can be minimal or elaborate for SEM analysis, depending on the nature of the samples and the data required. Minimal preparation includes acquisition of a sample that will fit into the SEM chamber and some accommodation to prevent charge build-up on electrically insulating samples. Most electrically insulating samples are coated with a thin layer of conducting material, commonly carbon, gold, or some other metal or alloy. The choice of material for conductive coatings depends on the data to be acquired: carbon is most desirable if elemental analysis is a priority, while metal coatings are most effective for high resolution electron imaging applications. Alternatively, an electrically insulating sample can be examined without a conductive coating in an instrument capable of "low vacuum" operation.
The SEM is carried out by using FEI-Quanta FEG 200-High Resolution Instrument.

<table>
<thead>
<tr>
<th>Resolution</th>
<th>1.2 nm gold particle separation on a carbon substrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnification</td>
<td>From a min of 12x to greater than 1, 00,000 X</td>
</tr>
<tr>
<td>Application</td>
<td>To evaluate grain size, particle size distributions, material homogeneity and inter metallic distributions.</td>
</tr>
</tbody>
</table>
4.4.2. ICP –OES: (inductively coupled plasma – optical emission spectrometry)

INTRODUCTION:

Inductively coupled plasma optical emission spectrometry (ICP-OES), is an analytical technique used for the detection of trace metals. It is a type of emission spectroscopy that uses the inductively coupled plasma to produce excited atoms and ions that emit electromagnetic radiation at wavelengths characteristic of a particular element. The intensity of this emission is indicative of the concentration of the element within the sample.

PRINCIPLE:

A Perkin-Elmer Optima ICP spectrometer is used for routine ICP-OES analysis. First, a high-energy radio frequency field is impinged upon a stream of argon gas. Then, a spark is used to ionize the argon gas, which forms sustained plasma due to inductive coupling with the high energy radio frequency field and the continuous supply of fresh argon to the plasma torch. This plasma has solutions passed into it in the form of a fine aerosol. The aerosol is dried, the dried particles broken apart, and the individual elements are excited by interaction with the excited state argon in the plasma. As each atom returns to its ground state from the excited state, they emit light at wavelengths characteristic of the elements from which they originate. The emission intensity for each element is monitored for each standard solution and a calibration curve of emission intensity versus element concentration can be constructed.
EXTRACTION OF INFORMATION:

Obtaining qualitative information, i.e., what elements are present in the sample, involves identifying the presence of emission at the wavelengths characteristic of the elements of interest. Obtaining quantitative information, i.e., how much of an element is in the sample, can be accomplished using plots of emission intensity versus concentration called calibration curves. Typical calibration graph is illustrated below.

![Typical ICP Calibration curve](image)

Perkin Elmer Oplima 5300DV

40 MHz RF generator;

Range: 165-782 nm;

Detection limit: Up to ppm level using SCD detector
SAMPLE PREPARATION:

- Weigh 0.25g of test sample and transfer into a liner provided with the instrument.
- Slowly add 9ml of Nitric acid or Sulphuric acid such that no piece of sample sticks on the slides.
- Mix thoroughly and allow reacting for few minutes.
- Place the liner in the vessel jacket.
- Close the screw cap hand-tight in clockwise direction.
- Seal the vessel and place in the rotor fixed in microwave.
- Set temperature to 180°C for 5 minutes; hold at 180°C for least 10 minutes.
- Allow the vessels to cool down to a vessel interior temperature below 60°C and to a vessel surface temperature (IR) below 50°C before removing the rotor.
- The digested sample was made up to 100ml with Millipore water.
- If visible insoluble particles exist, solution could be filtered through whatmann filter paper.
- Transfer the digested solution into plastic containers and label them properly.
4.5. TOXICOLOGICAL EVALUATION OF KARASOODA SATHU PARPAM

INTRODUCTION:

Safety is a fundamental principle in the provision of traditional medicines and herbal products for health care, and a critical component of quality control. WHO guidelines provide practical technical guidance for monitoring the safety of traditional medicines within pharmacovigilance systems. The safety monitoring of traditional medicines is compared and contrasted with that of other medicines currently undertaken in the context of the WHO International Drug Monitoring Programme. While there are regulatory and cultural differences in the preparation and use of different types of medicines, they are all equally important from a pharmacovigilance perspective.

SCOPE OF TOXICITY STUDY:

Siddha Medicines are becoming increasingly popular as an effective and relatively alternative to allopathic drugs. In order to make global acceptance the quality and its safety are under scrutiny though traditional practitioners prescribed them since long time. In the recent past several western research groups have high lightened these pitfalls reporting the prevalence and concentration of heavy metals in Siddha medicines. In Siddha System of Medicine the formulations prepared with minerals are called as herbo-mineral preparations such as mathirai, parpam, chenduram etc, in traditional language. It is mandatory to test raw materials used in Siddha formulations for the presence of various toxic materials including heavy metal content.

All mineral preparations in Siddha, is prepared under special physico-chemical processes that, according to the ancient Indian belief, 'detoxify', toxic heavy metals in it. Strictly speaking, these constituents are thus not contaminants but ingredients deliberately included for a specific curative purpose. India being a signatory to WHO, to promote its products in the international market, it is imperative to study their safety for human consumption.
PLAN OF WORK

The following studies were carried out on Karasooda sathu parpam

1. Acute toxicity

2. Long term toxicity

The toxicity studies were evaluated after getting permission from The Institutional Animal Ethical Committee clearance. (1248/ac/09/CPCSEA/05/IAEC 2011).

4.5.1 ACUTE TOXICITY STUDY OF KARASOODA SATHU PARPAM

Principle

Acute toxicity was carried out in Swiss albino mice with a single exposure of 10 times of the recommended therapeutic dose of test compound the study duration will be 14 days.

1. Drug profile:
   Test drug : Kara sooda sathu parpam
   Therapeutic dose : 480 to 720 mgs.

2. Experimental animal:
   Animal species : Swiss albino mice
   Age / Weight / : 6 weeks. Mice-20-25 gms.
   Gender : Either sex.
   Number of Animals : 16(8-Male, 8- Female).
   Acclimatization Period : 7 days
<table>
<thead>
<tr>
<th>S.No</th>
<th>Group</th>
<th>No of mice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control: Vehicle-Honey.</td>
<td>6 (3 male, 3 female)</td>
</tr>
<tr>
<td>2</td>
<td>Test drug treated: Toxic dose (10X of therapeutic dose = 12.9 mg/animal)</td>
<td>10 (5 male, 5 female)</td>
</tr>
</tbody>
</table>

**Test Animals:**

Test animals totally 16 (8-Male, 8-Female) were obtained from the animal laboratory of the King Institute, Chennai and stocked at National Institute of Siddha, Chennai. All the animals were kept under standard environmental condition (27 ± 2°C). The animals had free access to water and standard pellet diet (Sai meera foods pvt.ltd, Bangalore). The principles of laboratory animal care were followed.

**Randomization, numbering and grouping of animal:**

The animals were randomly divided into two groups. Each group consists of 6 animals (3 per sex in each group) the first groups kept as control and remaining group (2) was treated with test drug. The animal were allowed acclimatization period of 7 days to laboratory conditions prior to the initiation of treatment. The females were nulliparous and non-pregnant.

**Identification of animal:**

By cage number, animal number and individual marking on fur with picric acid.

**Housing & Environment:**

The animal were housed in polypropylene cages provided with bedding of husk. Dark and light cycle each of 12 hours was maintained.
Route of administration:

Oral route was selected, because it is the normal route of clinical administration.

Test substance and vehicle:

The Karasooda sathu parpam is white coloured without taste and odour. The test substance was insoluble in water, in order to obtain and ensure the uniformity in drug distribution, the drug was dissolved by aqueous Tween 80 solution (10%).

Administration of dose:

Karasooda sathu parpam was suspended in aqueous Tween 80 solution (10%), with uniform mixing and it was administered to Group -2 animals orally at a single dose (12.9mg/animal) by gavage. The control group was received equal volume of the vehicle (honey). The animals were weighed before giving the drug. The administered dose level was calculated according to body weight, and surface area of mice. The human therapeutic dose of Karasooda sathu parpam is 480 to 720 mgs. The principle of laboratory animal care was followed.

Observations

Observations were made and recorded systematically and continuously observed as per the guideline after test drug administration. Animals were observed individually (visual observations included skin changes, Alertness, Grooming, Aggressiveness, sensitivity to sound and pain) for first 4 hrs, then periodically during the first 24 hrs. And the animals were observed for 14 days.

Body Weight

Individual weight of animals was determined before the test drug administration and daily for 14 days. Weight changes was recorded.

Necropsy

At the end of the study period all surviving animals were weighed and sacrificed.
4.5.2. LONG TERM TOXICITY STUDY OF KARASOODA SATHU PARPAM

1. **Drug profile:**
   - Test drug: Kara sooda sathu parpam
   - Therapeutic dose: 480 to 720 mgs.

2. **Experimental animal:**
   - Animal species: Wister albino rats
   - Age: 6-8 weeks
   - Weight: 150-200 gms
   - Gender: Either sex.
   - Number of Animals: 24 (12-Male, 12-Female).
   - Acclimatization Period: 7 days

<table>
<thead>
<tr>
<th>S.No</th>
<th>Group</th>
<th>No of Rats</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control: Vehicle(honey)</td>
<td>6 (3 male, 3 female)</td>
</tr>
<tr>
<td>2</td>
<td>Test drug treated: X Therapeutic dose (12.9mg/animal)</td>
<td>6 (3 male, 3 female)</td>
</tr>
<tr>
<td>3</td>
<td>Test drug treated: 5XTherapeutic dose (64.8mg/animal)</td>
<td>6 (3 male, 3 female)</td>
</tr>
<tr>
<td>4</td>
<td>Test drug treated: 10XTherapeutic dose (129.6mg/animal)</td>
<td>6 (3 male, 3 female)</td>
</tr>
</tbody>
</table>
Animal source:

Test animals were obtained from the animal laboratory of the King institute, Chennai, and stocked at National Institute of Siddha, chennai. All the animals were kept under standard environmental condition (27±2 °C). The animals had free access to water and standard pellet diet(Sai meera foods pvt.ltd, Bangalore). The principles of laboratory animal care were followed.

Randomization, numbering and grouping of animal:

The animals were randomly divided into four groups. Each group consist of 6 animals (3 per sex in each group) the fist groups kept as control and remaining groups(2,3,4) were treated with test drug. The animal were allowed acclimatization period of 7 days to laboratory conditions prior to the initiation of treatment. The females were nulliparous and non pregnant.

Identification of animal:

By cage number, animal number and individual marking on fur with picric acid.

Housing & Environment:

The animal were housed in polypropylene cages provided with bedding of husk.

Dark and light cycle each of 12 hours was maintained.

Administration period:

The long term toxicity study was carried out 3 months because the clinical duration of human consumption of test drug is 48 days.

Dose selection:

The long term toxicity study was carried out at different dose level X (12.9mg\animal), 5X (64.8mg\animal), 10X (129.6mg\animal). The selected doses were calculated according to body weight, and surface area of rat. The human therapeutic dose of Karasooda sathu parpam is 480 to 720 mgs.
Preparation and administration of dose:

Karasooda sathu parpam was suspended in aqueous Tween 80 solution (10%), with uniform mixing and it was administered to at dose levels 12.9mg/\text{animal}, 64.8mg/\text{animal} and 129.6mg/\text{animal}. The control group was received equal volume of the vehicle (honey). The animals were weighed before giving the drug. Administration was by oral (gavage) once a day for 90 days.

OBSERVATION:

Experimental animals kept under observation throughout the course of study for the following:

Mortality:

All animal were observed twice daily for mortality during entire course of study

Body weight:

Weight of each rat was recorded on fist day and at weekly intervals throughout the course of study and at termination to calculate relative organ weights. From the data mean body weights and percent body gain were calculated.

Food and water consumption:

The quantity of food consumed by groups consisting of six animal of for different doses was recorded at weekly intervals. Food consumed per animal was calculated for control and the treated dose groups.

LABORATORY INVESTIGATIONS:

COLLECTION OF BLOOD:

At the end of study the blood samples were collected by cardiac puncture using as syringe. The collected blood samples were kept in vaccutainer blood samples were centrifuged at 3000 rpm for 10 minutes and collected serum was used for laboratory investigations.
HEMATOLOGICAL PARAMETER:

Hematological parameter like Hb, total RBC, total WBC, DC, ESR, MCH and MCV were analyzed.

BIOCHEMICAL PARAMETER:

Blood Glucose, Lipid profile, T.bilirubin, D. bilirubin, I. bilirubin, SGOT, SGPT, ALP, T. Protein, albumin, globulin, Urea, Creatinine, Uric acid, Calcium and Potassium were determined.

NECROPSY:

All the animals were sacrificed at end of the study under ether anesthesia. Necropsy of all animals was carried out and the morphological changes of organs including liver, kidneys, brain, heart, and lungs were noted.

HISTOPATHOLOGY:

Tissue samples of organs from control and treated animals were preserved in 10% formalin for preparation of sections using microtome. The organs included liver, kidneys, heart, lungs and stomach of the animals were preserved. They were subjected to histopathological examination.

The organ pieces (3-5 micron) were fixed in 10% formalin for 24 hours and washed in running water for 24 hours. Samples were dehydrated in tissue processor and then cleaned in benzene to remove absolute alcohol. Embedding was done by passing the cleared sample through three cups containing molten paraffin at 50 degree c and then a cubical block of paraffin made by the L moulds it was followed by microtome and the slides were stained with haematoxylin–eosin stain. Stained sections of each organ were examined under light microscope.

STATISTICAL ANALYSIS:

Findings such as clinical sings of intoxication, body weight changes, food and water consumption, hematology and biochemical parameters were subjected to one-way ANOVA followed by Dunnett’s test using a computer software programme-InStat-V3 version.
5 RESULTS

The results of Physicochemical, Chemical, Elemental analysis and Toxicological evaluation are given below as Tables, Charts and Slides.

5.1. PHYSICOCHEMICAL PROPERTIES OF KARASOODA SATHU PARPAM

Sample description - Karasooda sathu parpam
Colour - White
Odour - Odourless

<table>
<thead>
<tr>
<th>S No.</th>
<th>Parameters</th>
<th>Values obtained (%w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total ash value</td>
<td>9.31</td>
</tr>
<tr>
<td>2</td>
<td>Acid insoluble ash</td>
<td>0.94</td>
</tr>
<tr>
<td>3</td>
<td>Water soluble ash</td>
<td>5.5</td>
</tr>
<tr>
<td>4</td>
<td>Moisture content</td>
<td>7.3</td>
</tr>
<tr>
<td>5</td>
<td>Foreign organic matter</td>
<td>5.2</td>
</tr>
<tr>
<td>6</td>
<td>Alcohol soluble extractive</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Water soluble extractive</td>
<td>8.67</td>
</tr>
<tr>
<td>8</td>
<td>Loss of weight at 105°C</td>
<td>7.20</td>
</tr>
<tr>
<td>9</td>
<td>pH at 25 °C (1:10 ration)</td>
<td>7.2 - 7.6</td>
</tr>
</tbody>
</table>
5.2. QUALITATIVE ANALYSIS:

CHEMICAL ANALYSIS

The qualitative analysis of unpurified vengaram shows the presence of

Sulphate  
Calcium  
Phosphate  
Iron  
Sodium  
Borate

The qualitative analysis of purified vengaram shows the presence of

Sulphate  
Calcium  
Phosphate  
Iron  
Sodium  
Borate

The qualitative analysis of unpurified silasthu shows the presence of

Phosphate  
Iron  
Calcium  
Sodium  
Magnesium
The qualitative analysis of purified silasthu shows the presence of

- Phosphate
- Iron
- Calcium
- Sodium
- Magnesium

The qualitative analysis of Karasooda sathu parpam shows the presence of

- Phosphate
- Iron
- Calcium
- Sodium
5.3. QUANTITATIVE ANALYSIS:

5.3.1 ICP - OES (Inductively coupled plasma – optical emission spectrometry)

ELEMENT ANALYSIS OF UNPURIFIED VENGARAM

Equipment used : Optical emission spectrometry

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BDL = Below Detection Limit
ELEMENT ANALYSIS OF PURIFIED VENGARAM

Equipment used : Optical emission spectrometry

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BDL = Below Detection Limit
**ELEMENT ANALYSIS OF UN PURIFIED SILASATHU**

Equipment used : Optical emission spectrometry

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BDL = Below Detection Limit
ELEMENT ANALYSIS OF PURIFIED SILASATHU

Equipment used : optical emission spectrometry

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<td>Si</td>
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<td>166.45</td>
</tr>
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BDL = Below Detection Limit
ELEMENT ANALYSIS OF KARASOODA SATHU PARPAM

Equipment used : Optical emission spectrometry

<table>
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<th>WAVE LENGTH (nm)</th>
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<tr>
<td>Si</td>
<td>288.158</td>
<td>72.842</td>
</tr>
</tbody>
</table>

BDL = Below Detection Limit
5.3.3 HR SEM (High resolution scanning electron microscope) ANALYSIS:

Practical size : 10–50 µ
Surface : smooth
5.4. TOXICOLOGICAL EVALUATION

5.4.1. ACUTE ORAL TOXICITY STUDY:

From the result of acute toxicity studies in swiss albino mice indicated that karasooda sathu parpam did not reveal any mortality and signs of toxicity in 12.9gm/animal of therapeutic dose.

5.4.2. LONG TERM TOXICITY STUDY:

Mortality:

All the animals both control and treated dose groups survived throughout the study period of 90 days. Karasooda sathu parpam did not cause any mortality in, 5X(64.8mg/animal) and 10X(129.6mg/animal)dose levels and were considered as safe.

Body weight:

Results of body weight determination of animals (table 2) from control and different dose groups exhibited comparable body weight gain throughout the dosing period of 90 days. No difference in body weight was observed among the groups.

Food & Water consumption:

During dosing period, the quantity of water & food consumed (table 3&4) by animals from different dose groups was found to be compared with control animals. No difference in Food & Water consumption observed among the groups.
Behavioral observations:

These tests were conducted on the experimental animals during time of study and recorded. The results did not reveal any abnormalities.

Hematological investigation:

The results of hematological investigation (table 5) conducted at end of study, revealed no significant changes in values of different parameters investigated when compared with those of respective controls. There was no major alteration in hematological parameter in drug treated group.

Biochemical investigations:

Biochemical investigations were conducted at end of the study and the results were recorded in tables. 6, 7 and 8 revealed the following values of different test group when compared with those of respective control were found to be normal. Urea, Creatinine, Uric acid, Sodium, SGOT, Alkaline Phosphates, Albumin, Globulin, Bilrubin and Lipid profile were found to be within normal ranges. But The levels of SGPT, total protein and blood glucose were slightly altered, but statistically not significant when compared with control rats and 10X dose (129.6mg\animal) shows significant decrease in LDL compared with control group.
Histopathology:

The Karasooda sathu parpam treated rats showed following histopathological changes

- The normal study in all of organs in X(12.9mg/animal) dose levels

- Lung shows alveoli, bronchioles, focal lymphoid aggregates prominent& congested vessels at all the dose levels 5X(64.8mg/animal), 10X (129.6mg/animal)

- Stomach show gastric mucosa with superficial ulceration at 5X (64.8mg/animal), 10X (129.6mg/animal) doses levels.

- Heart, liver, shows normal histology at the dose level 5X (64.8mg/animal), 10X (129.6mg/animal).
### ACUTE TOXICITY STUDY

Table 1. BEHAVIORAL TOXIC SIGNS OF IN SWISS ALBINO MICE

<table>
<thead>
<tr>
<th>DOSE</th>
<th>OBSERVATIONS</th>
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<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19</td>
</tr>
<tr>
<td>CONTROL</td>
<td>+ - - + + - - - + - + + - - - -+</td>
</tr>
<tr>
<td>TEST (12.9 mg/Animal)</td>
<td>+ - - + + - - - + - + + - - - -+</td>
</tr>
</tbody>
</table>


+ Normal sign

- Absence of a sign
LONG TERM TOXICITY STUDY

Table.2 Body wt (g) of albino rats exposed “karasooda sathu parpam” for 90 days

<table>
<thead>
<tr>
<th>WEEKS</th>
<th>GROUPS</th>
<th>Control</th>
<th>X dose(12.9mg/animal)</th>
<th>5X dose(64.8mg/animal)</th>
<th>10X dose(129.6mg/animal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 week</td>
<td></td>
<td>108.3±6.2</td>
<td>115.12±8.17</td>
<td>110.08±6.91</td>
<td>112.18±9.13</td>
</tr>
<tr>
<td>2 week</td>
<td></td>
<td>112.88±71.0</td>
<td>118.12±8.20</td>
<td>114.2±9.1</td>
<td>115.32±10.11</td>
</tr>
<tr>
<td>3 week</td>
<td></td>
<td>113.3±5.1</td>
<td>118.71±9.3</td>
<td>114±7.46</td>
<td>111.30±11.3</td>
</tr>
<tr>
<td>4 week</td>
<td></td>
<td>117.12±9.1</td>
<td>119.34±10.46</td>
<td>118.10±9.58</td>
<td>118±4.4</td>
</tr>
<tr>
<td>5 week</td>
<td></td>
<td>124.11±2.68</td>
<td>122.2±9.54</td>
<td>122.4±10.97</td>
<td>130.25±12.08</td>
</tr>
<tr>
<td>6 week</td>
<td></td>
<td>129.33±3.14</td>
<td>126.41±11.1</td>
<td>121.36±8.44</td>
<td>128.14±11.52</td>
</tr>
<tr>
<td>7 week</td>
<td></td>
<td>128.2±2.62</td>
<td>132±10</td>
<td>118.16±8.65</td>
<td>126.12±12.31</td>
</tr>
<tr>
<td>8 week</td>
<td></td>
<td>120.3±10.88</td>
<td>120.03±11.04</td>
<td>122.07±10.49</td>
<td>120.11±5.84</td>
</tr>
<tr>
<td>9 week</td>
<td></td>
<td>128.5±3.83</td>
<td>122.2±11.61</td>
<td>112.19±10.12</td>
<td>126.12±12.31</td>
</tr>
<tr>
<td>10 week</td>
<td></td>
<td>131±3.44</td>
<td>133.2±12.5</td>
<td>129.2±14.41</td>
<td>130.02±10.85S</td>
</tr>
<tr>
<td>11 week</td>
<td></td>
<td>130.1±3.44</td>
<td>131±11.2</td>
<td>125±13.11</td>
<td>127±12.31</td>
</tr>
<tr>
<td>12 week</td>
<td></td>
<td>131±3.44</td>
<td>131±11.2</td>
<td>130.25±12.08</td>
<td>133.2±3.44</td>
</tr>
<tr>
<td>13 week</td>
<td></td>
<td>132.7±3.5</td>
<td>133.2±12.5</td>
<td>131 ±12.04</td>
<td>134.3±6.7S</td>
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Table 3: Water intake of albino rats exposed “karasooda sathu parpam” for 90 days

<table>
<thead>
<tr>
<th>WEEKS</th>
<th>control</th>
<th>X dose(12.9mg/animal)</th>
<th>5X dose(64.8mg/animal)</th>
<th>10X dose(129.6mg/animal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 week</td>
<td>46.68±2.58</td>
<td>42.3±2.45</td>
<td>42.33±2.08</td>
<td>46.28±2.38</td>
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<tr>
<td>2 week</td>
<td>44.15±3.66</td>
<td>40.75±3.62</td>
<td>43.16±2.8</td>
<td>44.19±2.98</td>
</tr>
<tr>
<td>3 week</td>
<td>45.1±2.15</td>
<td>45.12±2.40</td>
<td>42.31±2.12</td>
<td>45.18±2.16</td>
</tr>
<tr>
<td>4 week</td>
<td>40.14±2.40</td>
<td>43.22±2.19</td>
<td>40.1±2.92</td>
<td>46.13±2.1</td>
</tr>
<tr>
<td>5 week</td>
<td>41.0±3.02</td>
<td>45.54±2.78</td>
<td>42.14±2.3</td>
<td>44.11±2.55</td>
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<tr>
<td>6 week</td>
<td>50.5±6.28</td>
<td>48.33±4.08</td>
<td>44.16±5.84</td>
<td>46.16±3.18</td>
</tr>
<tr>
<td>7 week</td>
<td>52.33±5.16</td>
<td>48.33±2.04</td>
<td>47±3.16</td>
<td>48.16±4.91</td>
</tr>
<tr>
<td>8 week</td>
<td>53.28±4.96</td>
<td>50.5±6.28</td>
<td>55.65±6.12</td>
<td>54.88±5.69</td>
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<td>9 week</td>
<td>52.89±5.9</td>
<td>54.26±5.47</td>
<td>51.2±4.86</td>
<td>52.38±3.09</td>
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<tr>
<td>10 week</td>
<td>56.39±5.8</td>
<td>52.86±4</td>
<td>57.52±5.22</td>
<td>58.92±6.18</td>
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<tr>
<td>11 week</td>
<td>56.39±5.80</td>
<td>54±4.7</td>
<td>56.93±5.33</td>
<td>58.92±6.18</td>
</tr>
<tr>
<td>12 week</td>
<td>58.5±5.28</td>
<td>54.73±5.14</td>
<td>63.21±4.58</td>
<td>65.66±4.77</td>
</tr>
<tr>
<td>13 week</td>
<td>58.5±4.</td>
<td>53.28±2.04</td>
<td>65.6±6.12</td>
<td>62.9± 5.84</td>
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</table>
Table 4: Food intake of albino rats exposed to “karasooda sathu parpam” for 90 days

<table>
<thead>
<tr>
<th>WEEKS</th>
<th>control</th>
<th>X dose(12.9mg/animal)</th>
<th>5X dose(64.8mg/animal)</th>
<th>10X dose(129.6mg/animal)</th>
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</thead>
<tbody>
<tr>
<td>1 WEEK</td>
<td>39.98 ± 3.18</td>
<td>38.13 ± 2.33</td>
<td>41.66 ± 3.46</td>
<td>45.2 ± 2</td>
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<tr>
<td>2 WEEK</td>
<td>34.51 ± 2.87</td>
<td>38.16 ± 2.10</td>
<td>44.2 ± 2.19</td>
<td>44.20 ± 2.19</td>
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<tr>
<td>3 WEEK</td>
<td>39.98 ± 3.18</td>
<td>39.30 ± 2.44</td>
<td>43.88 ± 2.17</td>
<td>43.88 ± 2.17</td>
</tr>
<tr>
<td>4 WEEK</td>
<td>38.12 ± 2.8</td>
<td>38.16 ± 2.78</td>
<td>46.53 ± 3.96</td>
<td>46.53 ± 3.96</td>
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<tr>
<td>5 WEEK</td>
<td>38.56 ± 3.10</td>
<td>40.12 ± 3.71</td>
<td>42.82 ± 2.6</td>
<td>45.40 ± 2.75</td>
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<tr>
<td>6 WEEK</td>
<td>47.45 ± 6.66</td>
<td>43.72 ± 5.52</td>
<td>42.6 ± 4.50</td>
<td>42.34 ± 4.486</td>
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<tr>
<td>7 WEEK</td>
<td>49.48 ± 6.79</td>
<td>41.33 ± 5.35</td>
<td>45.83 ± 3.76</td>
<td>48.33 ± 6.05</td>
</tr>
<tr>
<td>8 WEEK</td>
<td>48.35 ± 5.10</td>
<td>46.61 ± 3.86</td>
<td>43.00 ± 3.88</td>
<td>46.37 ± 5.17</td>
</tr>
<tr>
<td>9 WEEK</td>
<td>49.24 ± 5.29</td>
<td>48.11 ± 4.38</td>
<td>45.3 ± 5.22</td>
<td>47.68 ± 4.14</td>
</tr>
<tr>
<td>10 WEEK</td>
<td>48.35 ± 5.10</td>
<td>46.61 ± 3.86</td>
<td>43.0 ± 3.88</td>
<td>46.37 ± 5.13</td>
</tr>
<tr>
<td>11 WEEK</td>
<td>50.32 ± 5.21</td>
<td>47.5 ± 2.73</td>
<td>49.33 ± 3.67</td>
<td>48.35 ± 6.65</td>
</tr>
<tr>
<td>12 WEEK</td>
<td>50.32 ± 5.21</td>
<td>48.44 ± 6.52</td>
<td>48.33 ± 6.65</td>
<td>49.16 ± 4.91</td>
</tr>
<tr>
<td>13 WEEK</td>
<td>49.16 ± 4.91</td>
<td>48.35 ± 5.1</td>
<td>52.43 ± 4.5</td>
<td>53.21 ± 5.2</td>
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</table>
Table 5. Effect of treatment with “karasooda sadhu parpam” hematological parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Xdose(12.9mg/animal)</th>
<th>5Xdose(64.8mg/animal)</th>
<th>10XDOSE(129.6mg/animal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBC (mm³)</td>
<td>4.05 ±0.24</td>
<td>4.4 ±0.37</td>
<td>4.47 ± 0.5</td>
<td>4.36 ± 0.3</td>
</tr>
<tr>
<td>Hb (mg/dl)</td>
<td>12.4 ± 0.8</td>
<td>13.1 ± 1.3</td>
<td>12.5 ± 1.2</td>
<td>13 ± 0.9</td>
</tr>
<tr>
<td>Leukocyte (x 10⁶/ml)</td>
<td>9050 ± 354</td>
<td>8450 ± 109.3</td>
<td>8767 ± 205.4</td>
<td>8132 ± 170.7</td>
</tr>
<tr>
<td>Platelets(ul)</td>
<td>2.7 ±0.82</td>
<td>2.3 ±0.29</td>
<td>2.6 ±0.62</td>
<td>2.4 ±0.51</td>
</tr>
<tr>
<td>DLC(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>32 ±1</td>
<td>45 ± 20</td>
<td>23 ± 6</td>
<td>32 ± 12</td>
</tr>
<tr>
<td>L</td>
<td>69 ±1</td>
<td>62 ±15</td>
<td>75 ±7</td>
<td>67 ± 12</td>
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<td>E</td>
<td>1 ±1</td>
<td>1 ±0</td>
<td>2 ±1</td>
<td>2 ± 1</td>
</tr>
<tr>
<td>PCV</td>
<td>35 ±1</td>
<td>40 ±4</td>
<td>41 ± 5</td>
<td>41 ± 3</td>
</tr>
<tr>
<td>ESR (30 MIN)</td>
<td>7 ±1</td>
<td>7 ± 2</td>
<td>9 ± 2</td>
<td>7 ± 1</td>
</tr>
<tr>
<td>ESR( 1 HR)</td>
<td>14 ±2</td>
<td>15 ±5</td>
<td>19 ± 3</td>
<td>15 ±4</td>
</tr>
</tbody>
</table>

N= 6 values are mean of 6 animal ±S.D (Dunnett’s) *P < 0.05 , **P < 0.01
Table 6. Effect of treatment with “karasooda sadhu parpam” biochemical parameters.

**Liver Function Test**

<table>
<thead>
<tr>
<th>parameter</th>
<th>control</th>
<th>x dose (12.9mg/animal)</th>
<th>5x dose (64.8mg/animal)</th>
<th>10x dose (129.6mg/animal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total bilirubin (mg/dl)</td>
<td>0.7±0.1</td>
<td>0.7±0.2</td>
<td>0.7±0.1</td>
<td>0.7±0.2</td>
</tr>
<tr>
<td>Direct bilirubin (mg/dl)</td>
<td>0.4±0.1</td>
<td>0.4±0.1</td>
<td>0.5±0.3</td>
<td>0.3±0.1</td>
</tr>
<tr>
<td>Indirect bilirubin (mg/dl)</td>
<td>0.4±0.1</td>
<td>0.4±0.1</td>
<td>0.4±0.1</td>
<td>0.3±0.1</td>
</tr>
<tr>
<td>SGOT (U/L)</td>
<td>69±1</td>
<td>65±7</td>
<td>69±11</td>
<td>68±9</td>
</tr>
<tr>
<td>SGPT (U/L)</td>
<td>59±5</td>
<td>62±4</td>
<td>65±6</td>
<td>57±2</td>
</tr>
<tr>
<td>ALP (U/L)</td>
<td>138±8</td>
<td>134±12</td>
<td>119±12</td>
<td>132±10</td>
</tr>
<tr>
<td>Total protein (g/dl)</td>
<td>6.5±0.5</td>
<td>6.8±0.5</td>
<td>7.7±0.9</td>
<td>6.7±0.5</td>
</tr>
<tr>
<td>Albumin (g/dl)</td>
<td>3.0±0.3</td>
<td>3.3±0.3</td>
<td>3.3±0.4</td>
<td>3.2±0.3</td>
</tr>
<tr>
<td>Globulin (g/dl)</td>
<td>2.95±0.0</td>
<td>3.03±0.350</td>
<td>3.366±0.242</td>
<td>2.583±0.463</td>
</tr>
<tr>
<td>Sug (r) (mg/dl)</td>
<td>110±12</td>
<td>103±25</td>
<td>98±8</td>
<td>91±7</td>
</tr>
</tbody>
</table>

N= 6 values are mean of 6 animal ±S.D( Dunnett’s) *P<0.05 , **P<0.01
Table 7. Renal function test

<table>
<thead>
<tr>
<th>parameter</th>
<th>Control</th>
<th>X dose (12.9mg/animal)</th>
<th>5X dose (64.8mg/animal)</th>
<th>10X dose (129.6mg/animal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea (mg/dl)</td>
<td>42 ± 1.1</td>
<td>39 ± 3</td>
<td>35 ± 7</td>
<td>39 ± 5</td>
</tr>
<tr>
<td>Creatinine (mg/dl)</td>
<td>1.07 ± 0.07</td>
<td>0.99 ± 0.131</td>
<td>0.93 ± 0.184</td>
<td>0.99 ± 0.108</td>
</tr>
<tr>
<td>Uric acid (mg/dl)</td>
<td>2.89 ± 0.891</td>
<td>3.24 ± 0.714</td>
<td>2.64 ± 0.540</td>
<td>2.33 ± 0.79</td>
</tr>
<tr>
<td>Na m.mol</td>
<td>137 ± 1</td>
<td>135 ± 8</td>
<td>132 ± 5</td>
<td>133 ± 5</td>
</tr>
<tr>
<td>K m.mol</td>
<td>21 ± 2.84</td>
<td>19.45 ± 1.50</td>
<td>20.7 ± 1.2</td>
<td>19.25 ± 2.18</td>
</tr>
</tbody>
</table>

N= 6 values are mean of 6 animal ±S.D( Dunnett’s) *P < 0.05 , **P< 0.01

Table 8 lipid profile

<table>
<thead>
<tr>
<th>parameter</th>
<th>Control</th>
<th>X dose (12.9mg/animal)</th>
<th>5X dose (64.8mg/animal)</th>
<th>10X dose (129.6mg/animal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cholesterol (mg/dl)</td>
<td>84 ±8</td>
<td>79 ±9</td>
<td>75 ±7</td>
<td>69 ±7</td>
</tr>
<tr>
<td>HDL (mg/dl)</td>
<td>28 ±2</td>
<td>29 ±4</td>
<td>31 ±2</td>
<td>26 ±4</td>
</tr>
<tr>
<td>LDL (mg/dl)</td>
<td>40 ±3</td>
<td>32 ±11</td>
<td>26 ±7</td>
<td>22 ±8</td>
</tr>
<tr>
<td>VLDL (mg/dl)</td>
<td>19 ±1</td>
<td>17 ±2</td>
<td>18 ±2</td>
<td>18 ±2</td>
</tr>
<tr>
<td>Triglycerides (mg/dl)</td>
<td>80 ±14</td>
<td>86 ±8</td>
<td>90 ±8</td>
<td>81 ±11</td>
</tr>
</tbody>
</table>

N= 6 values are mean of 6 animal ±S.D( Dunnett’s) *P < 0.05 , **P<0.01
LIVER FUNCTION TEST

**Graph 1:**
- **X-axis:** TOTAL, DIRECT, INDIRECT BILIRUBIN
- **Y-axis:** 0 to 0.8
- **Legend:**
  - CONTROL
  - X
  - 5X
  - 10X

**Graph 2:**
- **X-axis:** CONTROL, X, 5X, 10X
- **Y-axis:** 0 to 300
- **Legend:**
  - ALP
  - SGPT
  - SGOT
**BLOODSUGAR**

[Graph showing the comparison of blood sugar levels across different treatments (CONTROL, X, 5X, 10X).]

- Control
- X
- 5X
- 10X

**Axes:**
- Y-axis: Blood Sugar Level
- X-axis: Treatment Levels (CONTROL, X, 5X, 10X)

Legend:
- GLOBULIN
- ALBUMIN
- TOTALPROTEIN
TOTAL RBC AND PLATELET’S COUNT

[Bar chart showing comparisons across different conditions with PLC and RBC indicated]

[Histogram chart showing percentage distributions across different conditions with PVC indicated]
LIPID PROFILE

![Graph showing lipid profile with categories for total cholesterol, triglycerides, and HDL, LDL, VLDL levels for control, x, 5x, and 10x conditions.](image-url)
LUNGS

CONTROL

Section from the lung shows alveoli, bronchioles, focal lymphoid aggregates & few congested vessels.

GROUP X: (12.9mg/animal)

Section from the lung shows alveoli, bronchioles, focal lymphoid aggregates & few congested vessels.

GROUP 5X: (64.8mg/animal)

Section from the lung shows alveoli, bronchioles, focal lymphoid aggregates & few congested vessels.

GROUP 10X: (129.6mg/animal)

Section from the lung shows alveoli, bronchioles, focal lymphoid aggregates prominent & congested vessels.
HEART

CONTROL:
The Section from the heart shows myocardial fibers with normal histology.

GROUP X: (12.9mg/animal)
The Section from the heart shows myocardial fibers with normal histology.

GROUP 5X: (64.8mg/animal)
The Section from the heart shows myocardial fibers with normal histology.

GROUP 10X: (129.6mg/animal)
The Section from the heart shows myocardial fibers with normal histology.
KIDNEY

CONTROL:

The Section from the kidney shows normal appearing of glomeruli, tubules, intestitium.

GROUP  X: (12.9mg/animal)

The Section from the kidney shows normal appearing of glomeruli, tubules, intestitium.

GROUP  5X: (64.8mg/animal)

The Section from the kidney shows normal appearing of glomeruli, tubules, intestitium.

GROUP  10X: (129.6mg/animal)

The Section from the kidney shows normal appearing of glomeruli, tubules, intestitium.
LIVER

CONTROL:

Section from the liver shows normal appearing central vein, rows of hepatocytes and portal triads

GROUP X: (12.9mg/animal)

Section from the liver shows normal appearing central vein with radiating cords of hepatocytes separated by sinusoid.

GROUP 5X: (64.8mg/animal)

Section from the liver shows normal appearing central vein with radiating cords of hepatocytes separated by sinusoid.

GROUP 10X: (129.6mg/animal)

Section from the liver shows normal appearing central vein with radiating cords of hepatocytes separated by sinusoid
STOMACH

CONTROL:

Multiple sections shows gastric mucosa with normal appearing mucosal glands.

The submucosa & muscularis show normal appearance.

GROUP X: (12.9mg/animal)

Multiple sections shows gastric mucosa with normal appearing mucosal glands.

The submucosa & muscularis show normal appearance.

GROUP 5X: (64.8mg/animal)

Multiple sections shows gastric mucosa show focal superficial ulceration.

GROUP 10X: (129.6mg/animal)

Multiple sections shows gastric mucosa show focal superficial ulceration.
LUNGS

Control lung

(12.9mg/animal)

5X Lung

(64.8mg/animal)

X Lungs

(129.6mg/animal)

10X Lung

(129.6mg/animal)
HEART

Control heart  X Heart (12.9mg/animal)

5 X Heart  10X Heart
(64.8mg/animal)  (129.6mg/animal)
KIDNEY

Control kidney

X Kidney (12.9mg/animal)

5X Kidney
(64.8mg/animal)

10X Kidney
(129.6mg/animal)
LIVER

Control liver

X liver
(12.9mg/animal)

5X liver
(64.8mg/animal)

10X liver
(129.6mg/animal)
STOMACH

Control stomach (12.9mg/animal)

X Stomach (64.8mg/animal) (129.6mg/animal)

5X Stomach (64.8mg/animal)

10X Stomach (129.6mg/animal)
6. DISCUSSION

The drug chosen for dissertation was “Karasooda sathu parpam” from Sikicha Rathna Deepam written by Kanusamy Pillai. The ingredients of the test drug were purchased from standard raw drug market in Chennai, then the raw drugs were purified and the medicine was prepared as per Siddha literature. The unpurified, purified raw drugs and test drug were subjected in to Physicochemical, chemical, Elemental analysis(ICP OES, HRSEM) and Safety profile.

Physicochemical properties of karasooda sathu parpam has given the result that the pH of karasooda sathu Parpam was 7.2 -7.6, which was weakly alkali. Hence on oral Intake it will not cause any strong alkali or acid like irritation to the gastrointestinal tract i.e. any physical irritation. The loss on drying at 105 ºc was only 7.20% w/w; hence the drug will not lose much of its volume on exposure to this range of temperature.

Then all the samples were subjected in to qualitative analysis. It was confirmed the presence of Sulphate, Calcium, Phosphate, Iron, and Sodium in Vengaram, Silasathu(before and after purification) and Karasooda sathu parpam. The Aluminum and magnesium was present in silasathu(before and after purification).

The particle size through HR SEM analysis of karasooda sathu parpam was 10 - 50 µ; the particles were homogenously distributed and smooth surface it easy for flowing. Hence the drugs will have chance for smooth flowing within the gastro intestinal tract without any irritation.

The presence of inorganic elements in Vengaram, Silasathu (before and after purification) and Karasooda sathu parpam were confirmed by ICP OES analysis. The results revealed that there was no heavy metal found in Vengaram, Silasathu (before and after purification) and Karasooda sathu Parpam. Potassim, Sodium and Phosphorous present in Vengaram, Silasathu( before and after purification) and Karasooda sathu Parpam.
The potassium, sodium, phosphorous levels gradually reduced after purification and medicine, compared with before purification of vengaram, silasathu. Presence of aluminum, magnesium in silasathu gradually reduced after purification and medicine preparation compared with before purification. These indicates that the drug Karasooda sathu parpam is safe for human consumption. The result of ICP OES as follows;

a) The potassium level showed significant decrease in its level from unpurified to (132ppm) purified (131.25ppm) silasathu, from unpurified (108.524ppm) to purified (100.245) vengaram and then 43.21ppm in karasoodasathu parpam.

b) The sodium level showed decrease in it value from unpurified (258.87ppm) to purified (249.321ppm) vengaram, from unpurified (366.25ppm) to purified (358.754ppm) silasathu and then in the medicine karasooda sathu parpam (106.265ppm).

c) The phosphorous level showed decrease in its value form unpurified (30.65ppm) to Purified (28.52ppm) vengaram from unpurified (100.85ppm) to purified (97.11ppm) silasathu and then in the medicine karasooda sathu parpam (40.247ppm).

d) The aluminum level showed decrease in it value from unpurified (135.25ppm) to purified silasathu (130.95ppm), from and then in the medicine karasooda sathu parpam(50.253ppm).

e) The magnesium level showed decrease in it value from unpurified (145.841ppm) to purified silasathu (142.26ppm), from and then to the medicine karasooda sathu parpam(65.265ppm).

The acute toxicity study reveals that there were no toxic signs and mortality observed during study period at 1.2mg/animal dose level.

The longerm term toxicity study (90 days) reveals that there was no toxic sign and behavioral changes observed in different dose level drug treated groups (X-7.7mg/animal, 5X-38.8mg/animal, 10X- 77.6mg/animal). The body weight, food and water intake were not statistically significant (p<0.05) compared with control group in the 90days of observation period.
Hematological analysis, biochemical analysis of drug treated groups was not statistically significant ($p<0.05$) compared with control group in the 90 days of observation period. Only the LDH was decreased in 10X group compared with control group.

In histopathological study there was no changes seen in heart, liver, kidney, lungs and stomach in X group (12.9mg/animal) compared with control group. In 5X group (64.8mg/animal) and 10X group (129.6mg/animal) showed changes in lungs and stomach and other organs were normal. The change was almost minimal.

Thus it is inferred that the therapeutic dose does not cause any toxic effect.
7. SUMMARY

The Siddha Medicine has been in traditional use for years with proven efficacy and to be safe in experience. Karasooda sathu parpam is one of the Siddha medicine indicated for urethritis and urinary tract infections. Karasooda sathu parpam contain Vengaram (Borax) and Silasathu (Selenite).

The raw drugs of Karasooda sathu parpam were collected from raw drug store and authenticated at Siddha Central Research Institute. The raw drugs of Karasooda sathu parpam were purified and the medicine was prepared as mentioned in the Siddha literature.

Qualitative analysis was confirmed the presence of Sulphate, Calcium, Phosphate, Iron, and Sodium in Vengaram, Silasathu(before and after purification) and Karasooda sathu parpam. The Aluminum and magnesium was present in silasathu(before and after purification).

The presence of inorganic elements in Vengaram, Silasathu (before and after purification) and Karasooda sathu parpam were confirmed by ICP OES analysis. The results revealed that there was no heavy metal found in Vengaram, Silasathu (before and after purification) and Karasooda sathu Parpam. The particle size through HR SEM analysis of *karasooda sathu parpam* was 10 - 50 µ.

The toxicological evaluations were conducted as per WHO guidelines for safety evaluation of Poora Parpam.

In Acute toxicity study there were no abnormal signs developed in Swiss albino mice at 10 times more than the therapeutic dose level (1.29 mg/animal) within 24 hrs. At the end of the study no mortality and reduction in body weight of control and test group animals were observed.
In Long term toxicity study there were no significant changes in behavioral signs, hematological parameters, biochemical investigation, body weight, food and water intake. The lymphocyte count was increased in test groups, but compared with control group it is not statistically significant. The histopathological study on the organs such as heart, kidney, and liver was normal in X and 5 X groups compared with control group. In 10 X group, only the stomach showed focal superficial ulceration in gastric mucosa and the other organs showed no abnormal histological variation.
8. CONCLUSION

The chemical analysis of karasooda sathu parpam revealed presence of important minerals and some alteration in minerals level during preparation.

Also the particle size of karasooda sathu parpam is microns in level and surface is smooth and the flowability is easy this can lead to better bioabsorption and efficacy of this medicine.

There is no mortality and no toxic signs produced in acute. In long term toxicity study mild changes showed in histological and biochemical parameter at the dose level of 12.2 mg/ animal and reveals that different doses of drug does not cause any changes in hematological parameters.

Hence, the karasooda sathu parpam couldn’t produce any toxicity in therapeutic dose. So the therapeutic dose level mentioned in the literature is may be safe and it can be concluded that the karasooda sathu parpam can be used in clinically.
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CERTIFICATE

Certified that the samples submitted for identification by

III Year, M.D. (S), National Institute of Siddha, Tambaram
Sanatorium, Chennai – 600 047, are identified as

1. Venkaaram – Borax
2. Silasathu – Selenite

(SASIKALA ETHIRAJULU)
Asst. Director (Pharmacognosy)

(K.MEENAKSHI SUNDARA MOORTHY)
Asst. Director- In charge
CERTIFICATE

This is certify that the project title... has been approved by the IAEC.

Proposed number: 104/AC/09/05-2015

Name of Chairman/Member Secretary IAEC: Dr. K. Manickavasakam

Name of CPCSEA nominee: Dr. B. Jayachandran Dave

Signature with date

Chairman/Member Secretary of IAEC:

CPCSEA nominee:

(Kindly make sure that minutes of the meeting duly signed by all the participants are maintained by Office)
This Certificate is awarded to Dr. [Name] for participating as a Resource Person/Delegate in the Workshop on "Research Methodology & Biostatistics" organized by the Department of Siddha, Tamil Nadu M.G.R. Medical University from 8th August 2011 to 12th August 2011.
CERTIFICATE

Certified that herbal/mineral drugs Kaara Sooda Sathu Parpam formulated by III Year M.D(s) Department of Nanju noolum maruthuva needhi noolum, National Institute of Siddha, Tambaram Chennai-47, were analysed (qualitative/quantitative) by Physico-Chemical, SEM, ICP and Phyto Chemical Methods at SAIF, IITM, Chennai-36, during October 2011.

Dr. R. MURUGESAN
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Chennai-600 036