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EVALUATION OF PHYTOCHEMICALS, ANTIOXIDANT POTENTIAL AND ANTIBACTERIAL ACTIVITY OF SIDDHA VEPPAMPATTAI THAILAM PRESCRIBED TO CURE WOUND, KANYAKUMARI DISTRICT - INDIA

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ABSTRACT
The main objective of the present investigation is to evaluate the phytochemical constituents, antioxidant potential and antibacterial activity of Siddha wound medicine prescribed by the Traditional Siddha Practitioner of Kanyakumari District, India. Veppampattai Thailam is an internal form of wound medicine. Phytochemical analysis of the Thailam, aqueous, ethanol and chloroform extract revealed the presence of alkaloid, saponin, reducing sugar and tannin constituents. The unexplored area of hydroxyl radical scavenging assay of Veppampattai Thailam and extracts varied from the minimum inhibition 48.57% (25µl) of aqueous extract to the maximum inhibition 84.21 % (100µl) of Ascorbic acid. On the otherhand, reducing power activity of the Thailam and extracts varied from the minimum inhibition 35.53 % (25µl) of aqueous extract to the maximum inhibition 86.79 % (100µl) of Vitamin C. The antioxidant assay of the Veppampattai Thailam and extracts indicated promising antioxidant activities in concentration dependent manner. The antibacterial activity of Siddha medicine prescribed for wound (Thailam) showed both positive and negative activity. The prescribed Veppampathi Thailam showed the maximum zone of inhibition (26 ± 0.001 mm) against *Pseudomonas aeruginosa* and minimum zone of inhibition (1 ± 0.213 mm) against *Klebsiella pneumonia.* On the other hand, ethanolic extract of the Thailam fail to inhibit the growth of *Klebsiella pneumonia.* The trial Siddha medicine highlights the effect of Veppampattai Thailam as a great potential source to rid wounds.

KEYWORDS: Veppampattai Thailam, phytochemical, antioxidant, Kalanchi.

INTRODUCTION
Pharmacological activities have been extensively investigated as a source of medicinal agents. Phytochemicals with adequate antibacterial efficacy will be used for the treatment of bacterial infections.[1] Antimicrobial drugs currently used in medicinal practices for treating various diseases often not causes serious side effects such as immuno-suppression of the host and development of resistance. Medicinal and aromatic plants and their essences rich in antibacterial compounds could be an alternate way to compact against bacterial diseases.[2] Many chronic diseases were considered incurable in western medicine are able to be treated successfully with Siddha medicine. Most medicines are part of the natural and processed one to be readily absorbed within each cell in the body giving proper nourishment to sustain a long and healthy life. Healthy cells within the body were able to reproduce new cells that are just as healthy, thus slowing the process of aging. Some Siddha medical treatment claim that certain medicines are effective enough, at this stage was able to arrest aging altogether. Phytochemical constituents are the basic source for the establishment of several pharmaceutical industries. These constituents are playing a significant role in the identification of crude drugs.[3] Tannins has astringent properties, hastens the healing of wounds and inflamed mucous membrane. Tannins contribute property of astringency i.e. fasten the healing of wounds and inflamed mucous membrane have received considerable attention in the fields of nutrition, health and medicine, largely due to their physiological activity, such as antioxidant, antimicrobial and anti-inflammatory properties. Phenolic compounds have been extensively used in disinfections and remain the standards with which other bacteriocides are compared.[4]

MATERIALS AND METHODS
The present investigation was aimed to assess the phytochemical constituents, antioxidant potential and antibacterial activity of the Siddha medicine (Thailam) prescribed to cure wound by the Siddha Medicinal Practitioner. 500ml Thailam was bought from the Siddha

Practitioner for the preparation of different solvent extracts was selected for the antibacterial activity test by using different solvents via ethanol, aqueous and chloroform**.** Thailam is prepared by the combination of medicinal plants in the form of Kalanchi. Preliminary phytochemical screening of the crude extracts was determined by following the standard procedure[5] and antioxidant activity.[6] The solvent extract of ethanol, aqueous and chloroform extract of 5ml Thailam were completely dissolved in 5 ml of 0.5% Tween 80 and preserved at 5°C in airtight bottles until further use.[7] All the extracts were subjected to antibacterial activity assay. Disc diffusion method [8] was used to screen the antimicrobial activity. The composition of Siddha Thailam is as follows (Plate 1-10).

Plate: 1 ***Curculigo orchioides***

Plate: 2 ***Solonum xanthocarpum***

Plate: 3 Erythroxylum coca

Plate: 4 ***Abies webbiana***

Plate: 5 ***Acacia pennata***

Plate: 6 ***Acorus calamus***

Plate.: 7 *Actinodaphne hookeri*

Plate: 8 Alpinia speciosa

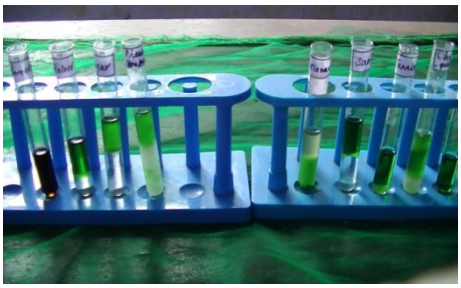
Plate: 9 Andropogan mricatus

Plate: 10 Borreria articularis

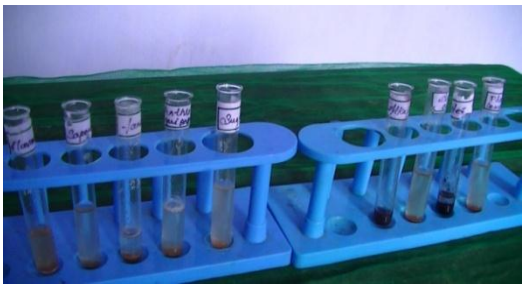
RESULT AND DISCUSSION

Qualitative Analysis of Siddha Veppampattai Thailam and Extracts

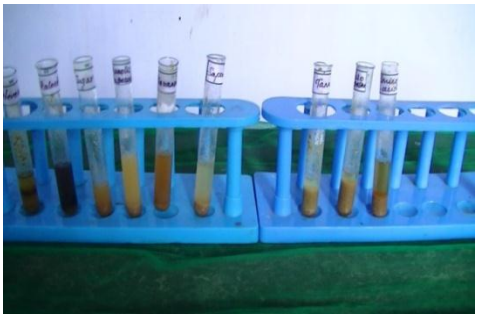
The preliminary phytochemical analysis of Siddha Veppampattai Thailam revealed the presence of alkaloid, saponin, tannin and reducing sugar whereas, the absence of steroids, phenol and flavonoids (Plate: 11a). Aqueous extract of the Veppampattai Thailam revealed the presence of saponin, alkaloid and tannin constituents whereas, the absence of steroids, sugars, .phenol and flavonoids (Plate: 11b). Ethanol extract revealed the presence of tannin whereas, the absence of steroids, alkaloids, sugars, phenolic compounds, flavonoids and saponins (Plate: 11c). Chloroform extract revealed the presence of tannin constituents alone whereas, the absence of steroids, alkaloids, phenol, sugars, saponin and flavanoid (Plate: 11d & Table 1).



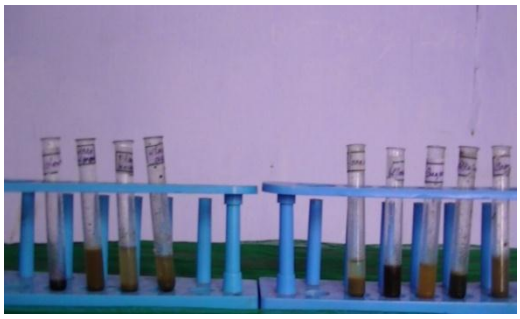
a. Thailam



b. Aqueous Extract



c. Ethanol Extract



d Chloroform Extract

d. Plate – 11 Phytochemical Analysis of Siddha Thailam and Extracts.

Table – 1 Phytochemical Analysis of Siddha Thailam and Extracts.

S.No	Phytochemicals	Thailam	Aqueous	Ethanol	Chloroform
1	Steroids	-	-	-	-
2	Alkaloids	+	+	-	-
3	Sugar	+	-	-	-
4	Phenol	-	-	-	-
5	Flavonoids	-	-	-	-
6	Saponins	+	+	-	-
7	Tannins	+	+	+	+

+ Presence - Absence

Antioxidation Assay

Hydroxyl radical scavenging

Hydroxyl radical scavenging is an extremely reactive free radical formed in biological system. It has been implicated as major active oxygen centered radical formed from the reaction of various hydroperoxides with transition metal ions, which is capable of damaging almost every molecule found in living system causing lipid peroxidation and biological damage. Hydroxyl radical scavenging activity of the Siddha Thailam varied from the minimum inhibition of 52.39% (25µl) to the maximum inhibition of 83.68% (100µl). On the otherhand, hydroxyl radical scavenging of the aqueous extract varied from the minimum inhibition of 48.57% (25µl) to the maximum inhibition of 69.36% (100µl). Meanwhile, hydroxyl radical scavenging of ethanolic extract varied from the minimum inhibition of 52.53% (25µl) to the maximum inhibition of 71.32% (100µl). However, hydroxyl radical scavenging of chloroform extract varied from the minimum inhibition of 58.57% (25µl) to the maximum inhibition of 72.36% (100µl). The antioxidant potential of standard antioxidant ascorbic acid varied from the minimum inhibition of 59.26% (25µl) to the maximum inhibition of 84.21% (100µl) (Fig: 1).

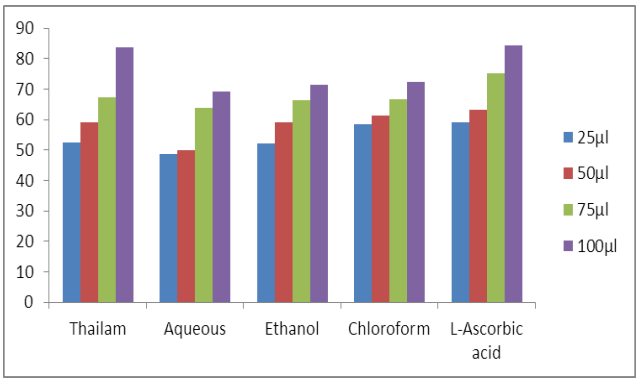


Fig: 1 Hydroxyl radical scavenging activity.

Reducing power activity

Reducing power activity of the Thailam increased gradually in concentration dependent manner. Reducing power activity of Siddha Thailam varied from the minimum inhibition of 54.45% (25µl) to the maximum inhibition of 85.30% (100µl). On the otherhand, reducing power activity of the aqueous extract varied from the minimum inhibition of 35.53% (25µl) to the maximum inhibition of 54.18% (100µl). Meanwhile, reducing power activity of the ethanolic extract varied from the minimum inhibition of 46.38% (25µl) to the maximum inhibition of 62.74% (100µl). However, chloroform extract of the Thailam varied from the minimum inhibition of 48.75% (25µl) to the maximum inhibition of 77.39% (100µl). The antioxidant potential of standard antioxidant (Vitamin C) varied from the minimum inhibition of 57.96% (25µl) to the maximum inhibition of 86.79% (100µl) (Fig: 2).

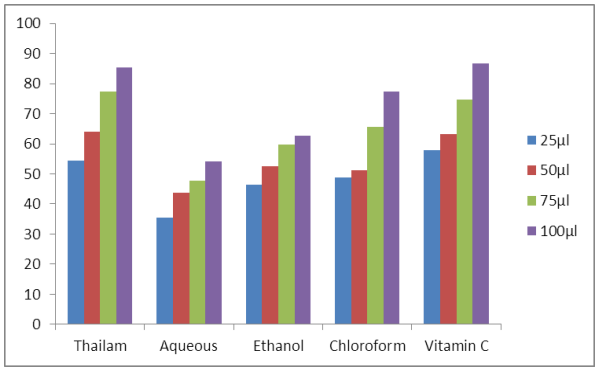


Fig: 2 Reducing power activity.

ANTIBACTERIAL ACTIVITY

Antibiotics provide main basis for the therapy of bacterial infections. However, high genetic variability of bacteria enables them to rapidly evade the action of antibiotic by developing antibiotic resistance. Thus there has been a continuing search for new and more potent antibiotics.[9] The antibacterial activity of Siddha medicine prescribed for Wound (Thailam) showed both positive and negative activity. The prescribed Veppampathi Thailam showed the maximum zone of inhibition (26 ± 0.001 mm) against *Pseudomonas aeruginosa*, whereas, *Staphylococcus aureus* showed the maximum zone of inhibition (15 ± 0.140 mm); *Proteus vulgaris* (17 ± 0.010 mm) and minimum zone of inhibition (7 ± 0.010 mm) against *Klebsiella pneumonia*. On the otherhand, antibacterial activity of the aqueous extract of Thailam showed the maximum zone of inhibition (8 ± 1.031 mm) against *Staphylococcus aureus; Pseudomonas aeruginosa* (5 ± 0.000 mm); *Proteus vulgaris* and minimum zone of inhibition (1 ± 0.213 mm) of *Klebsiella pneumonia*.

Antibacterial activity of the ethanolic extract showed the maximum zone of inhibition (13 ± 0.010 mm) against *Pseudomonas aeruginosa* whereas, (12 ± 0.012 mm) of *Staphylococcus aureus* and *Proteus vulgaris* and absence of zone of inhibition of *Klebsiella pneumonia*. However, the antibacterial activity of chloroform extract of Thailam showed the maximum zone of inhibition (14 ± 0.230 mm) against *Pseudomonas aeruginosa;* whereas, *Staphylococcus aureus* and *Proteus vulgaris* showed the maximum zone of inhibition (13 ± 0.541 mm) and minimum zone of inhibition (2mm) against *Klebsiella pneumonia*. The antibiotic disc Amikacin showed the maximum zone of inhibition (29 ± 0.040 mm) against *Pseudomonas aeruginosa*; (18 ± 0.431 mm) *Staphylococcus aureus and Proteus vulgaris* and minimum zone of inhibition (9 ± 0.120 mm) against *Klebsiella pneumonia* (Table 2).

Table - 2 Antibacterial activity of Thailam and Extracts.

Medicines and extracts	Pa	Sa	Pv	Kp
Thailam	26±0.001	15±0.140	17±0.010	7±0.010
Aqueous	5±0.000	8±1.031	3±0.341	1±0.213
Ethanol	13±0.010	12±0.012	12±0.042	-
Chloroform	14±0.230	13±0.541	13±0.321	2±0.123
Amikacin	29±0.040	18±0.431	18±0.231	9±0.120

Pa-*Pseudomonas aeruginosa;* Sa- *Staphylococcus aureus*
Pv - *Proteus vulgaris;* Kp- *Klebsiella pneumonia*

CONCLUSION

The work carried was a basic approach to find out the phytochemical, antioxidation and antimicrobial activity in Siddha medicine. Further works on the types of phytoconstituents and purification of individual groups of bioactive components might be able to reveal the exact potential of the Thailam to inhibit several pathogenic microbes.

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