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Antimicrobial activity of *Karuveppilai vadagam* against Enteric pathogens

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Abstract

Siddha system of medicine is a form of traditional medicine which originated from south India. It is the only medical system that is said to be bestow immortality. This system not only deals with medicine but with spirituality, righteous way of living, rejuvenation and its main aim is attainment of perfection. Siddha system emphasizes aetiology and management of various diseases affecting mankind. One of the most important common and infectious disease is Diarrhoea, which is compared to Kazhichal in Siddha literatures. It is an infectious disease occurs due to Kirumigal (Microbes). *KARUVEPPILAI VADAGAM* is a herbo-mineral siddha medicine is indicated for nausea, loss of appetite, diarrhoea specifically. Kazhichal is characterized by abdominal cramps, abdominal pain, urgency to go to the toilet, frequent passing of loose, watery faeces, nausea, vomitting. Anti-microbial study of the test drug *KARUVEPPILAI VADAGAM* carried out by Agar well diffusion method. It observed that *KARUVEPPILAI VADAGAM* is sensitive to *Escherichia coli, Klebsiella pneumoniae, Pseudomonas aueruginosa, Salmonella typhi*. These *KARUVEPPILAI VADAGAM* has significant anti-bacterial activity.

Keywords: Karuveppilai, Anti-bacterial activity, Diarrhoea

Introduction

Diarrhoea is defined as the passage of more than 200gm of stool daily, and measurement of stool volume is helpful in confirming this. The most severe symptom in many patients is urgency of defecation and faecal incontinence is a common event in acute and chronic diarrhoeal illness. According to the Siddha Literatures Kazhichal (or) bedhi is Co-Related to diarrhoea. Abundant availability of extensive range of drugs to relieve the diseases. But there is a need of prompt effective and harmless remedies through scientific validation. In Siddha literature the common symptoms in all types of Kazhichal (bedhi) is urgency of defeacation. So this is also one of the major symptom in diarrhoea. So the Kazhichal can be correlated to diarrhoea. Death rate of 4.5

million in 1980 for gastroenteritis. Diarrhoea remains the second leading cause of infant mortality (16%) often pneumonia (17%) in this age group. The majority of such cases occur in the developing world with over half of the recorded cases of childhood diarrhoea occurring in Africa and Asia with 696 million and 1.2 billion cases respectively, compared to only 480 million in the rest of the world. Infections diarrhoea resulted in about 0.7 million deaths in children under five years old in 2001 and 250 million last school days. In the Americas diarrhoeal disease accounts for a total of 10% of death among children aged 1-59 months. While in south east Asia, it accounts for 31.3% of deaths. It is estimated that around 21% of child mortalities in developing countries are due to diarrhoeal diseases. Worldwide in 2004 approximately 2.5 billion cases of diarrhoea occurred which result in 1.5 million death among children under the age of five greater than half of these were in Africa and south area. In India accounts for 13% of all deaths in Indian children younger than 5 years. There is significant morbidity associated with diarrhoea in children under 5 years of age. Reducing mortality from diarrhoea is clinical to achieving the health care goals.

Materials and Methods

Ingredients :

1. Karuveppilai (Murraya koenigii)
2. Koththumalli (Coriandrum sativum)
3. Common salt (Sodium chloride)
4. Milagu (Piper nigrum)
5. Kichchilikkizhangu (Curcuma zedoaria)
6. Saathipaththiri (Myristica fragrans)

Process:

Method of preparation:

The above drugs are dried and made into powered form. Then the powder have to be grinded well with water and make it into pills and dried well.

Indication:

Nausea, Loss of appetite, Diarrhoea

Microbial limit tests

Table 1: Results of Microbial Contamination Test

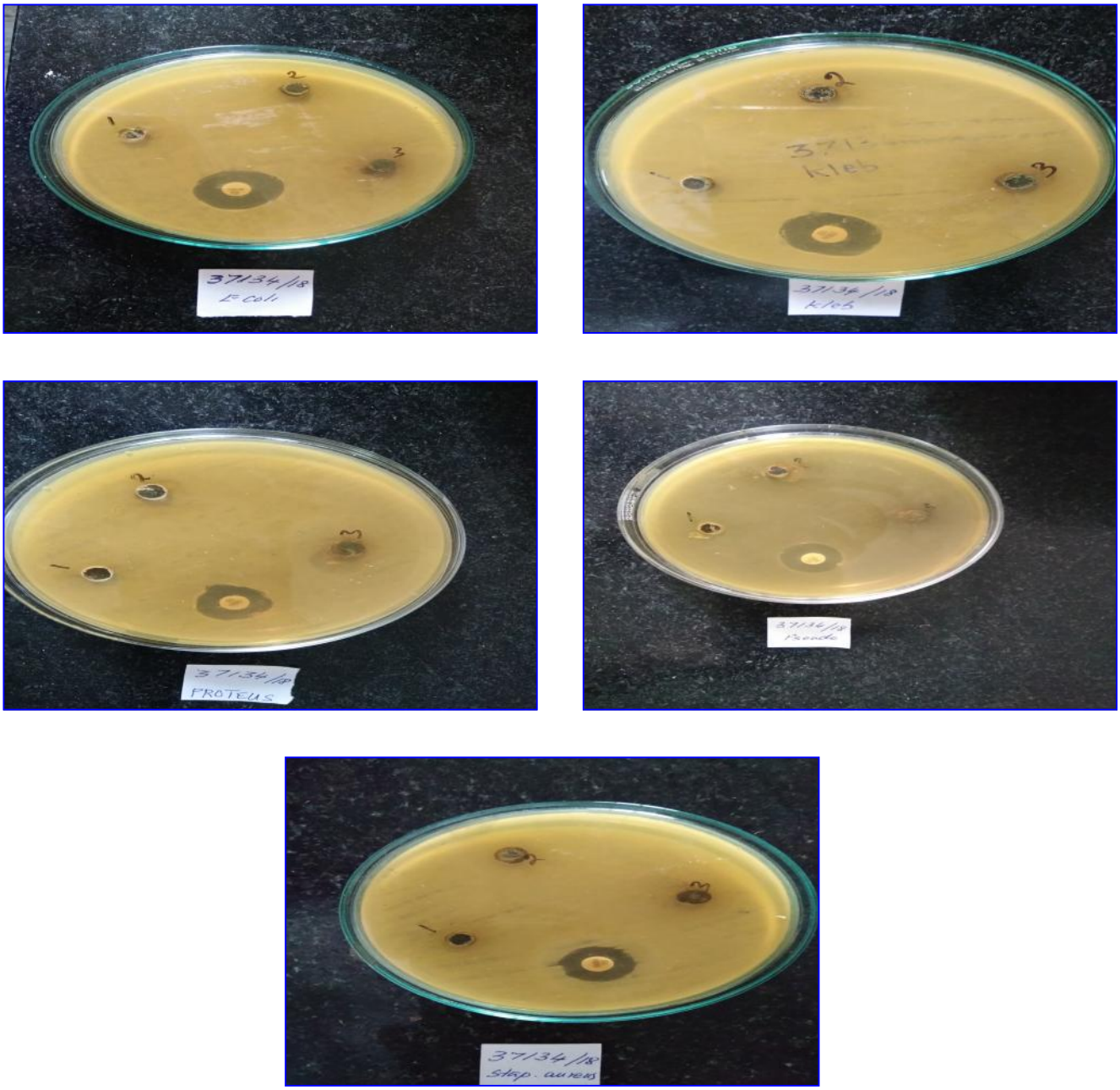
S.No.	Test Particulars	Colony Counts (CFU/ g)	Limits Value (CFU/g)
1.	Total Viable Aerobic Bacterial Count	5.0×10^3	1×10^5
2.	Total Viable Fungal Count	No Growth	1×10^3

Table 2. Results of Specific Pathogens Test

S.No.	Test for Specified Pathogens	Colony Counts (CFU/ g)	Limits Value (CFU/g)
1.	*Salmonella* sp.	No growth	-
2.	*Staphylococcus aureus*	No growth	-
3.	*Escherichia coli*	No growth	-
4.	*Pseudomonas aeruginosa*	No growth	-

Table 3. Antimicrobial Activities of Drug by Agar Well Diffusion Method

S.No.	Test Pathogens	Result	Zone of Inhibition (mm) at 30µl	
			Positive Control (Gentamycin)	Size of Inhibition
1.	*Escherichia coli*	Resistant	19 mm	--
2	*Staphylococcus aureus*	Resistant	17 mm	--
3.	*Klebsiella pneumonia*	Resistant	20 mm	--
4.	*Pseudomonas aeruginosa*	Resistant	20 mm	--
5.	*Proteus vulgaris*	Resistant	17 mm	--



Results and Discussion

The Results of the microbiological analysis for microbial contamination of the drug KARUVEPPILAI VADAGAM is given in Table 1. The total viable aerobic bacterial counts on Nutrient agar plate were 5.0 x 10^3 CFU / g and the No fungal growth was found on SDA agar plates. This results were found to comply with the specification limit for total bacterial count i.e. NMT 1× 10^5 CFU/ml and total fungal count i.e. NMT 1× 10^3 CFU/ml (Protocol for testing Ayurveda, Siddha and Unani medicines).

The analytical screening of sample showed in Table 2 that the product is free from specific pathogen like *Escherichia coli*, *Salmonella*, *Pseudomonas aeruginosa* and *Staphylococcus aureus.*

Microbial contamination usually occurs because of improper drying or storage of the plant material which eventually results in degradation of the plant constituents. Microbial contamination can also render plant material toxic, either by transforming the chemicals in the plant material or through the production of toxic compounds by the microbes. Therefore, microbial quality tests should be applied to starting plant materials, intermediate and finished products where necessary. During the quality analysis, precautions must be taken to ensure that conditions do not adversely affect any microorganisms that are to be measured.

Thus, the present study proves that KARUVEPPILAI VADAGAM is free from microbial contamination and also highlighted the safety of the same. The information obtained from microbial screening tests will be use full in finding out the quality of the drug

The good antibacterial activity of herbal medicines implies that the antimicrobial compounds present in herbal medicines are possibly controlling the microbial activity. Herbal medicines showed varying degrees of *in vitro* antibacterial activity against test bacteria.

Both Gram positive and Gram negative bacteria *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella pneumoniae*, *Proteus vulgaris*, and *Pseudomonas aeruginosa* were found to be resistance to herbal medicines when compared to the standard drug Gentamycin (Broad spectrum) (Table 3). The herbal drug KARUVEPPILAI VADAGAM exhibited broad spectrum activity against bacterial pathogens at 100mg/ml concentration of the drug.

From these results, it is accomplished that this study would lead to the establishment of several important compounds that have to be used to formulate new, different and more potent antimicrobial drugs of natural origin. However, further studies are required to screen the biologically active compounds and to evaluate the efficiency of this compound against pathogenic microorganisms associated with various human diseases.

Conclusion

It was observed that anti-microbial studies of *KARUVEPPILAI VADAGAM* showed that it is sensitive against *Escherichia coli, Klebsiella pneumoniae, Staphylococcus aureus, Pseudomonas aeruginosa, Salmonella typhi* when compared to the standard drug (Gentamycin) which was evident from the zone inhibition. The herbo-mineral drug *KARUVEPPILAI VADAGAM* showed inhibition of the growth of the microorganism at 100mg/ ml concentration for the organism. Our result confirmed the traditional use of *KARUVEPPILAI VADAGAM* has Anti-microbial activity.

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