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SHORT COMMUNICATION

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Antibacterial activity of polyherbal siddha formulation

Aravind Samy M, Gugan A, Poovarasan A, Karthik L, Shree Devi M.S*.

Department of Microbiology, Sivaraj Siddha Medical College, Salem, Tamilnadu, India.

**For correspondence: shreemd@gmail.com*

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ABSTRACT

This paper attempts to bring out the antibacterial activity of several traditional medicinal plants against *Staphylococcus aureus and Klebsiella pneumonia* by *in vitro* methods. The aqueous extract of dried leaves of *Nymphaea nouchali, Zingiber officinale, Tinospora cordifolia, Vateria indica* were screened by agar well diffusion method. The extract of *Nymphaea nouchali, Zingiber officinale, Tinospora cordifolia, Vateria indica* showed significant antibacterial activity. The combinational aqueous extracts of *Nymphaea nouchali, Zingiber officinale, Tinospora cordifolia, Vateria indica* showed zone of inhibition (23mm). This exhibits better activity when compared with recent antibiotics. With these results we conclude that the above given combinational extract possess potential antibacterial activity against *Staphylococcus aureus and Klebsiella pneumoniae*.

Keywords: *Antibacterial activity, Medicinal plants, Agar well diffusion method, Staphylococcus aureus, Klebsiella pneumoniae.*

1. INTRODUCTION

The medicine of Siddha system is the best system in the sense that there are hardly no side effects for the medicines since most of the preparations are based on herb. It was fully based on nature and its element which are directly related to body functions, the magnitude of Siddhars lie in the fact that they have mentioned remedies even for newly identified diseases as well as for the disease which are not yet clearly identified and documented. Herbs and plants have been in use as a source of treatment compounds in traditional medicinal system since ancient time. The traditional medicine system uses the plant products for the treatment of various infectious - diseases. There is a continuous need of the development of new effective antibacterial drugs because of the emergence of new infectious diseases and drug resistance [1,2]. In recent times, plants are being extensively explored for harboring medicinal properties. Currently plants got a great attention to scientists for the development of alternative drugs to cure several lethal diseases [3]. Studies by various researchers have been proved that plants are one of the major sources for drug discovery and development [4,5,6].

Microorganisms are one of the major threats to mankind and microbial infections are the leading cause of motility worldwide. According to the World Health Organization (WHO), microbial infections

collectively resulted in 25% of death worldwide (WHO, 1999). S*taphylococcus aureus* is a Gram positive cocci commonly associated with several clinical conditions. Humans are the natural reservoir and the infection is mostly asymptomatic (Chambers, 2001), however *Staphylococcus aureus* is also reported to cause the symptomatic infection of skin and soft tissues such as abscesses (boils), carbuncles, hidradenitis suppurativa, folliculitis, impetigo, furuncles, and cellulitis, sore throat. Glomerulo nephritis, food poisoning, lymph adenitis, toxic shock syndrome, osteomyelitis, pneumonia, meningitis, endocarditis and bacteremia are few other complications associated with *Staphylococcus aureus* infections (Bamberger and Boyd, 2005) [7]. *Klebsiella pneumoniae*is a Gram negative bacilli widely distributed in nature occurring as commensals in human and animal intestines and also as saprophytes in soil. *Klebsiella pneumonia* commonly associated with several clinical conditions broncho pneumonia, urinary tract infection, septicemia, meningitis and rarely diarrhea [8]. The current study was planned to investigate antibacterial activity against *Staphylococcus aureus, Klebsiella pneumoniae using Nymphaea nouchali, Zingiber officinale, Tinospora cordifolia, Vateria indica.*

Rhizome of *Nymphaea nouchali* is being used as emollient [9]. *Zingiber officinale* possess several important medicinal properties and used extensively in Siddha for the treatment of cough, nausea, pain and diarrhea. In combination with other herbal products, *Zingiber officinale* is used to cure several diseases such as vomiting, pitha diseases, indigestion, tastelessness, gastritis, vomiting, and loss of appetite [10]. Leaves of *Tinospora cordifolia* have an activity of antiperiodic, demulcent, mild diuretic [11]. Damars of *Vateria indica* shows the following medicinal activity expectorant, diuretic, stimulant[12].In this paper we are attempts to bring out the antibacterial activity of traditional medicinal plants against *Staphylococcus aureus and Klebsiella pneumoniae*by *in vitro* methods.

2. MATERIALS AND METHODS

2.1. Collection of Plant materials

The fresh forms of following plant parts were collected on September 2014. Fresh leaves of the *Tinospora cordifolia* plants was collected at the latitude 11° 39' 0" N longitude 78° 10' 0" E in Salem district. They were washed properly with water and allowed to dry under shadow at room temperature and ground into powder with a grinder. Damars of *Vateria indica was* collected at the latitude 11° 0' 0" N longitude 77° 0' 0" E in Coimbatore district. Rhizome of the *Zingiber officinale* plants was collected at the latitude 11° 0' 0" N longitude 77° 0' 0" in Coimbatore district. Rhizome of the *Nymphaea nouchali* was collected at the latitude 12° 32' 0" N longitude 78° 14' 0" E in Krishnagiri district

2.2. Preparation of plant extracts

Plant leaves and rhizome were collected and washed properly with distilled water. The leaves were shade dried at room temperature. Dried leaves, rhizome and dammars were uniformly grinded using mechanical grinder. The leaves, rhizome and dammars- powder were extracted in distilled water.

2.3. Test microorganism

The following two clinical isolates of bacteria were used for the study: *Staphylococcus aureus, Klebsiella pneumoniae.* All these cultures were maintained on nutrient agar plates at 4°C.

2.4. Anti bacterial Assay

The effect of various plant extracts on the several bacterial strainswere assayed by Agar well diffusion method. The bacterial sample was inoculated on the Muller Hinton agar using sterilized swabs and the extracts were pipetted into the wells in the agar medium and labeled. Then these Petri dishes were incubated at 37º C overnight.

3. RESULTS

The results shown in Table 1 conclude that the given formulation posses potential antibacterial activity against *Staphylococcus aureus and Klebsiella pneumoniae*.

Table 1. Antibacterial activity

S.No	Test organism	Conc. of polyextract (mg/ml)	Zone of inhibition (mm)
1.	*Staphylococcus aureus*	100	23±1
2.	*Klebsiella pneumoniae*	100	23±1.5

4. DISCUSSION

Staphylococcus aureus is a common reason for infectious disease that occurs in hospitals and is most liable to infect new born babies, surgical patients, old and malnourished persons and patients with diabetes and other chronic diseases. The patients admitted in hospitals with impaired immunity are at highest risk of getting infection with *S. aureus*. Even though several antibiotics are in use to control *S. aureus* infection, they failed to control the associated morbidity and mortality. This failure of antibiotics to efficiently control *S. aureus* could be attributed to the emergence of drug resistance in microorganisms [13]. Klebsiella has been associated with different types of infections and one of the important aspects of Klebsiella associated infection is the emergence of multi-drug resistant strains particularly those involved in nosocomial diseases [14].So we are using herbal formulation it may not show any drug resistance. *Nymphaea nouchali*, *Zingiber officinale*, *Tinospora cordifolia*, *Vateria indica* separately shows lower zone of inhibition but in combination it shows higher zone of inhibition.

5. CONCLUSION

From the results of antibacterial screening of poly herbal formulation shows better antibacterial activity against *Staphylococcus aureus*, *Klebsiella pneumoniae*. Further research in near future we can get a new lead develop using *in vivo* techniques and finally subjecting to clinical trials, promise to open new avenues in these plants for therapeutic purpose.

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Conflict of Interest

The authors declare that they have no conflicts of interest.

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