

An In-Vitro Study On The Assessment Of Antimicrobial Potential Of Vidangarishta On Wound Pathogens

Dr. Subash Chandra Bose M¹, Dr. Kavana G N^{2*}, Dr Siddesh Gowda S³, Dr. Kaveri⁴, Dr Kumar K⁵

¹Professor, Dept. of PG studies in Roga Nidan evam Vikriti Vigyan, JSS Ayurveda Medical College, Mysuru, Karnataka, India.

²PG Scholar, Dept. of PG studies in Roga Nidan evam Vikriti Vigyan, JSS Ayurveda Medical College, Mysuru, Karnataka, India. ORCID ID-0009-0002-4232-3249

³PG Scholar, Dept. of PG studies in Shalyatantra, Ashwini Ayurvedic medical college & PG Centre, Davangere. ORCID ID-0009-0008-0167-1179

⁴PG Scholar, Dept. of PG studies in Roga Nidan evam Vikriti Vigyan, JSS Ayurveda Medical College, Mysuru, Karnataka, India. ORCID ID: 0009-0009-9495-2291

⁵PG Scholar, Dept. of PG studies in Roga Nidan evam Vikriti Vigyan, JSS Ayurveda Medical College, Mysuru, Karnataka, India.

⁶Department of Environmental Science, School of Life Sciences, JSS Academy of Higher Education & Research, Mysuru, Karnataka, India.

*Corresponding author

Dr Kavana G N*

E-mail(s)- kavanareddy474@gmail.com

ABSTRACT

Introduction: Wound infections remain a major health concern, contributing significantly to morbidity, prolonged hospitalization, and increased healthcare costs. Disruption of skin barrier provides an entry point for microorganisms, resulting in colonization and infection. Wound infections remain a significant clinical challenge due to increasing prevalence of antimicrobial resistance. Traditional Ayurvedic formulations are being explored as alternative therapeutic agents. Vidangarishta is used widely for its therapeutic benefits, particularly in managing gastrointestinal disorders and promoting digestive health. The present study aims to evaluate the in-vitro antimicrobial activity of Vidangarishta against common wound microbes.

Objective: To evaluate the in-vitro antimicrobial activity of Vidangarishta on wound pathogens.

Materials and methods: A sterile cotton swab was employed to obtain the pus specimen from the wound using the Levine technique. Pathogens were identified using standard culture and biochemical methods. The extract of Vidangarishta was prepared for the evaluation of its antimicrobial activity.

Results & Conclusion: The extract of Vidangarishta was found sensitive against *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumoniae* and *Klebsiella oxytoca*. Among them Vidangarishta extract showed significant in-vitro antimicrobial activity against *Escherichia coli* & *Staphylococcus aureus*. Minimal activity against *Klebsiella pneumoniae*, and *Klebsiella oxytoca*. A maximum zone of inhibition of 24mm was observed on *E. coli* at 100 µl concentrations.

Keywords: Vidangarishta, Antimicrobial activity, Zone of inhibition, Wound microbes.

How to cite this article: Bose M SC, Kavana GN, Gowda SS, Kaveri, Kumar K. An In-Vitro Study On The Assessment Of Antimicrobial Potential Of Vidangarishta On Wound Pathogens. *Int J Drug Deliv Technol.* 2026;16(58s): 854-858. DOI: 10.25258/ijddt.16.58s.92

Source of support: Nil.

Conflict of interest: Nil.

INTRODUCTION

Asava and *Arishta* are medicinal preparations made by soaking the drugs either in powder form or decoction, in jaggery solution for specified period of time, during which it undergoes fermentation producing alcohol thus facilitating the extraction of active principles contained in the drugs¹. *Vidangarishta* is a traditional Ayurvedic formulation widely used for its medicinal effects, especially in treatment of gastrointestinal diseases and enhancement of digestive health. *Vidangarishta* is mainly useful in *krumiviyadhi* (worm infection) and other *vyadhi* like *Urustambha*, *Ashmari*, *Gandamala*, *Prameha*, *Vidradhi* and *Bhagandara*.²

The *Asava* and *Arishta* are classical Ayurvedic medicinal preparations that are easy to use and frequently prescribed owing to better palatability, accelerated therapeutic action enhanced efficacy in treatment of several diseases.³

Ingredients of *Vidangarishta* are mainly, *Ruksha*, *Ushna*, *Teekshna* and *Vata-Kapha Dushtinashaka*. *Vidangarishta* is *krumigna* and *jantunashaka* means anti helminthic as well as antimicrobial also appetiser, and helps to relieve abdominal distension and pain.⁴

For Antimicrobial activity of *Vidanga*, numerous research has been conducted. *Pseudomonas aeruginosa*, *Klebsiella* and *Acinetobacter* are most often encountered microbial species that cause wound infections. But for present study

The isolated four microbes from the patients wound samples were *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, and *Klebsiella oxytoca*.

Wound infections are major cause of morbidity. Increasing antimicrobial resistance among wound pathogens complicate empirical treatments⁵. Utilizing natural antimicrobial agents is a novel way to minimise this. Although hundreds of botanical species have been tested for antimicrobial properties, majority of them remain unexplored. The present study aims to throw light on antimicrobial effects of *Vidangarishta* and a stepping stone for exploring further studies on Vidanga formulations

Composition of Vidangarishta- Acc. to Ayurveda Sara Sangraha,

- | | |
|---|-------------------------|
| 1) <i>Vidanga</i> (<i>Embelia</i> | <i>Ribes</i>) |
| 2) <i>Pippalimoola</i> (<i>Piper Longum</i>) | |
| 3) <i>Rasna</i> (<i>Pluchea</i> | <i>Lanceolata</i>) |
| 4) <i>Kutaja</i> (<i>Holarrhena Antidysentrica</i>) | |
| 5) <i>Indrayava</i> (<i>Holarrhena</i> | <i>Antidysentrica</i>) |
| 6) <i>Patha</i> (<i>Cissampelos Pareira</i>) | |
| 7) <i>Elavaluka</i> (<i>Prunus</i> | <i>Avium</i>) |
| 8) <i>Amalaki</i> (<i>Emblca Officinalis</i>) | |
| 9) <i>Dhataki</i> (<i>Woodfordia</i> | <i>Fructicosa</i>) |
| 10) <i>Ela</i> (<i>Amomum Subulatum</i>) | |
| 11) <i>Tamalapatra</i> (<i>Cinnamomum</i> | <i>Tamala</i>) |
| 12) <i>Tvak</i> (<i>Cinnamomum Zeylanicum</i>) | |

- | | |
|---|----------------------|
| 13) <i>Priyangu</i> (<i>Callicarpa</i> | <i>Macrophylla</i>) |
| 14) <i>Kanchanara</i> (<i>Bauhinia Variegata</i>) | |
| 15) <i>Lodhra</i> (<i>Symplocos</i> | <i>Racemosa</i>) |
| 16) <i>Shunti</i> (<i>Zingiber Officinale</i>) | |
| 17) <i>Maricha</i> (<i>Piper</i> | <i>Nigrum</i>) |
| 18) <i>Guda</i> (<i>Jaggery</i>) ⁶ | |

MATERIALS AND METHODS

Sample Collection and Pathogen Identification

A sterile cotton swab was employed to obtain the pus specimen from the wound using the Levine technique. Culture was carried out on Blood agar and MacConkey agar by the four-streak method and incubated at 37°C for 24–48 hours. The isolates were identified based on colony morphology, Gram staining, microscopic observation, and biochemical analysis.

Preparation of extract for Anti-microbial Screening-

The Ayurvedic drug selected for the present study is *Vidangarishta*. It was purchased from JSS Ayurveda Medical College and Hospital Mysuru.

Extraction process: 40 ml of *Vidangarishta* was taken in a pre-weighted petridish and evaporated using hot water bath at 100°C. Evaporation of the solvent resulted in a concentrated pure extract. The final extract obtained was weighed, preserved and subjected to sensitivity testing after dilution with measured quantity of DMSO. The percentage yield was recorded as 4.36%.



Extract preparation process

Preparation of media

Muller Hinton Agar media (MHA) is used for this method. MHA media was prepared & sterilized by autoclaving. The medium was poured in to sterile 10cm diameter petridishes up to 4mm thickness in every plate & allowed to solidify. MHA plates were swabbed by Lawn method⁷ after bacterial inoculation, cut wells on the plate with a well puncture and wells are marked for each dilution of extract.

Method of In-vitro antimicrobial study

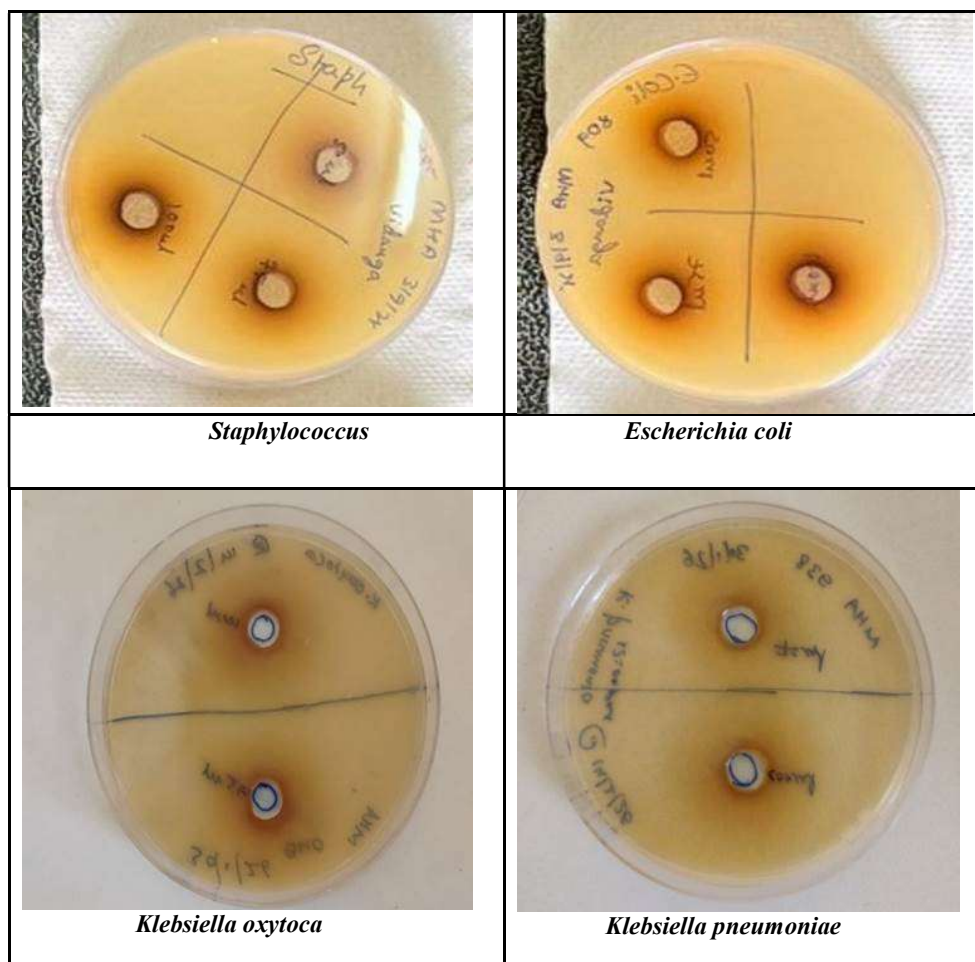
An in-vitro antimicrobial study was performed in JSS Ayurveda college Laboratory. four microorganisms i.e

Zone of inhibition of microorganisms

E. coli,⁸ *Staphylococcus aureus*⁹, *Klebsiella pneumoniae* and *Klebsiella oxytoca*¹⁰ were tested for antimicrobial activity¹¹.

Agar well diffusion method¹²

The well diffusion method is common procedure for evaluating antibacterial activity. Bacterial strains were inoculated on surface of Muller Hinton Agar plates by lawn culture method using sterile swabs. Wells were made measuring 6mm in diameter on inoculated MHA plates using standard borer. A volume of 50 µL, and 100 µL of herbal extract was added in separate wells using calibrated micropipette. All inoculated plates were incubated aerobically at 35°C for 18 hours in laboratory incubator. Calipers are used to measure the diameter of clear zones of inhibition in millimeters. This provides a quantitative assessment of antibacterial activity.



Antimicrobial activity of Vidangarishta

Test organisms	Zone of inhibition in mm
<i>Escherichia coli</i>	24
<i>Staphylococcus aureus</i>	22
<i>Klebsiella oxytoca</i>	13
<i>Klebsiella pneumoniae</i>	10

RESULTS

Vidangarishta is a poly-herbal formulation, primarily used for digestive & gastrointestinal disorders. The antibacterial activity of *Vidangarishta* extract against *Escherichia coli* exhibited maximum activities of 24mm of inhibition zones respectively at two different concentrations(50µl, 100µl).Where as the sequence of antibacterial activity against *Staphylococcus* exhibited 22mm of inhibition zones at 100µl concentrations.*Klebsiella oxytoca* exhibited 13mm zone of inhibition at 100µl concentrations & *Klebsiella pneumoniae* exhibited 10 mm zone of inhibition at 100µl concentration.

DISCUSSION

The present study evaluated the antimicrobial activity of *Vidangarishta* against wound pathogens isolated from infected wounds. The results of study demonstrated

appreciable antimicrobial activity of formulation against both Gram-positive and Gram-negative organism.

The principal ingredient of *Vidangarishta* is *Vidanga (Embelia ribes)*, which contains Flavonoids & Embelin. Embelin is naturally occurring alkyl-substituted hydroxy benzoquinone, exhibits antimicrobial activity primarily through its unique hydrophobic structure, which allows it to penetrate bacterial cell membranes, disrupt cell wall synthesis, and inhibit critical bacterial enzymes. The molecule contains a lipophilic chain that easily integrates into lipid bilayers. This alters membrane fluidity, causing essential intracellular ions and proteins to leak out of the bacterial cell, ultimately resulting in cell death (bactericidal action)¹³.

Dhataki(Woodfordia Fruticosa)& *Amalaki(Embelica Officinalis)* contains Flavonoids also known as polyphenolic compounds, have been widely evaluated for their antibacterial property due to their tendency to retard

the growth of a wide range of pathogenic microorganisms, including multidrug-resistant bacteria. According to multiple research studies, flavonoids can suppress nucleic acid synthesis, cytoplasmic membrane function, and energy metabolism. Flavonoids have also been found to reduce adhesion and biofilm formation, porin on the cell membrane, membrane permeability, all of which are crucial for bacterial growth¹⁴.

Kutaja(Holarrhena Antidyseptrica) and *Kanchanara(Bauhinia Variiegata)* contain Saponins, glycosylated phytochemicals with amphiphilic structures, have emerged as promising candidates owing to their wide-ranging antimicrobial effects. These substances exhibit potent antibacterial activity against multidrug-resistant pathogens, including methicillin-resistant *Staphylococcus aureus*, and antifungal activity against pathogens. Furthermore, saponins demonstrate potential in combating viral diseases, attributed to their ability to disrupt lipid membranes and modulate host immune responses. Recent advances in saponin research highlight innovations in extraction techniques, formulation strategies, and combination therapies, enhancing their bioavailability and therapeutic potential. Computational studies have further elucidated their mechanisms of action, supporting the development of saponin-based drug delivery systems and synergistic applications with existing antimicrobials. Saponins represent a critical natural resource for addressing the AMR crisis and advancing future antimicrobial therapies.¹⁵

However, certain limitations should be considered. The antimicrobial activity observed under in-vitro conditions may not directly correspond to clinical efficacy in vivo, where factors such as absorption, metabolism, tissue penetration and host immune responses influence therapeutic outcomes. Therefore, further experimental and clinical studies are required to evaluate the wound-healing efficacy and therapeutic applicability of Vidangarishta in infected wounds.

CONCLUSION

The present in-vitro study was conducted to assess the antimicrobial potential of Vidangarishta against wound pathogens. The findings demonstrated that Vidangarishta possesses significant antimicrobial activity against the tested microorganisms, as evidenced by the zones of inhibition observed. These findings scientifically support its traditional therapeutic use and indicate the need for further experimental and clinical investigations to validate its role in wound management.

REFERENCE

1. Mehta Anil K, Sharma Raghunandan, Ayurvedic Pharmacy Bhaishajya-Kalpana,10th chapter Chaukamba Sanskrit Pratishtan,Varanasi, Edition 2005.pg 187.
2. Rao Prabhakar G, Sarangadhara Samhita, Madhyama Khanda,10th chapter Chaukamba Sanskrit Sansthan,Varanasi, Edition 2021.pg 201.

3. Angadi Ravindra, Bhaishajya Kalpana Vijnana,30th chapter Chaukamba Surbharati Prakashan,Varanasi, Edition 2016.Pg no 289.
4. Shaikh DSA, Dubewar DAP, Shete DAA. A pharmaceutico-analytical study of Vidangarishta. J Ayurveda Integr Med Sci. 2019 Oct 31;4(05):162–7. doi:10.21760/jaims.v4i05.717
5. Thawaba ZA, Al-Shami AS, Al-Mehdar AA, Farzaei SASAA, Al-Daous WMY, Soror MMA. Surveillance of Antimicrobial Resistance in Wound Infections: Insights from a Tertiary Care Hospital. J Pharm Res Int. 2026 Feb 5;38(2):18–33. doi:10.9734/jpri/2026/v38i27810
6. Vidyasagara Shastry Parashurama Pandit, Sharangadhara Samhita, Madhyama khanda,10th chapter , Chaukamba Orientalia, Varanasi, Pg no .237.
7. Sastry AS, Bhat S. Essentials of Medical Microbiology. 4th ed. New Delhi: Jaypee Brothers Medical Publishers; 2026. Pg no 47.
8. Sastry AS, Bhat S. Essentials of Medical Microbiology. 4th ed. New Delhi: Jaypee Brothers Medical Publishers; 2026. Pg no 299-302.
9. Sastry AS, Bhat S. Essentials of Medical Microbiology. 4th ed. New Delhi: Jaypee Brothers Medical Publishers; 2026. Pg no 211-216.
10. Sastry AS, Bhat S. Essentials of Medical Microbiology. 4th ed. New Delhi: Jaypee Brothers Medical Publishers; 2026. Pg no 308
11. Balouiri M, Sadiki M, Ibsouda SK. Methods for in vitro evaluating antimicrobial activity: A review. J Pharm Anal. 2016 Apr;6(2):71–9. doi:10.1016/j.jpha.2015.11.005 PubMed PMID: 29403965; PubMed Central PMCID: PMC5762448.
12. Heriditybio. Antibacterial Efficacy: Step-by-Step Guide to the Well Diffusion Method for Evaluating Activity. Heridity Bioscience [Internet]. 2023 Nov 3 [cited 2026 Mar 14]. Available from: <https://heriditybio.in/blog/antibacterial-efficacy-step-by-step-guide-to-the-well-diffusion-method-for-evaluating-activity>.
13. Sheng Z, Ge S, Gao M, Jian R, Chen X, Xu X, et al. Synthesis and Biological Activity of Embelin and its Derivatives: An Overview. Mini Rev Med Chem. 2020;20(5):396–407. doi:10.2174/1389557519666191015202723 PubMed PMID: 31644404.
14. . Shamsudin NF, Ahmed QU, Mahmood S, Ali Shah SA, Khatib A, Mukhtar S, et al. Antibacterial Effects of Flavonoids and Their Structure-Activity Relationship Study: A Comparative Interpretation. Molecules. 2022 Feb 9;27(4):1149. doi:10.3390/molecules27041149 PubMed PMID:

- 35208939; PubMed Central PMCID: PMC8879123.
15. . Avato P, Bucci R, Tava A, Vitali C, Rosato A, Bialy Z, et al. Antimicrobial activity of saponins from *Medicago* sp.: structure-activity relationship. *Phytother Res PTR*. 2006 Jun;20(6):454–7. doi:10.1002/ptr.1876 PubMed PMID: 16619355.