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## Data Article

## Data of antibacterial activity of plant leaves crude extract on bacterial isolates of wound infections



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## ABSTRACT

Wound infections are caused by various pathogenic microbes such as *S. aureus*, Non-coagulase *Streptococcus*, *Enterococci*, *E. coli*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Enterobacter*, *Streptococci*, *Candida* and *Acinetobacter*. 10–33% of septic wounds infections were seen in India. Multi-drug resistant bacterial infections are increased by day by day and these organisms showed resistant to most available antibiotics. Drug resistance is a common and natural mechanism in microorganisms, because of unbearable use of antibiotics. In this data provides the use of natural plant leaf extracts as alternatives to the multi-drug resistant bacteria. The present article contains the data on the antimicrobial activity of methanol extracts of plant leaves comprising of 11 natural plant species which are widely used as folk medicine. The leaf extracts were used against multi drug resistant bacterial isolates of septic wound infections which were evaluated by the Kirby-beur disk diffusion method. This data showed that among 11 plant methanol leaf extracts; *Punica granatum* and *Syzigium cumini* have the potential antibacterial activity against the predominant bacterial isolates of septic wounds that are MDR-P. *aeruginosa*, *S. aureus*, *K. pneumoniae* and *E. coli*.

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## Specifications Table

Subject area	BIOLOGY
More specific subject area	MICROBIOLOGY
Type of data	Table and figure
How data was acquired	Collection of medicinal plants, antibiotic susceptibility test
Data format	Raw and analyzed
Experimental factors	MDR- bacterial isolates of septic wounds were shown sensitive to the leaf extracts of natural plants.
Experimental features	We isolated MDR- bacteria from the septic wound patients and analyzed the natural plant leaf extracts against the Multi drug resistant bacteria. <i>Punica granatum</i> and <i>Syzygium cumini</i> methanol leaf extracts exhibited potential antibacterial activity against the predominant isolates of septic wounds namely <i>-P. aeruginosa</i> , <i>S. aureus</i> , <i>K. pneumoniae</i> and <i>E. coli</i> .
Data source location	KADAPA, ANDHRA PRADESH, INDIA
Data accessibility	<a href="https://data.mendeley.com/datasets/7jx8s3pw7c/draft?a=fa1823f1-15cf-4a91-acf8-b473e901bee2">https://data.mendeley.com/datasets/7jx8s3pw7c/draft?a=fa1823f1-15cf-4a91-acf8-b473e901bee2</a>
Related research article	Patel, J.D., Shrivastava, A.K. and Kumar, V., 2009. Evaluation of some medicinal plants used in traditional wound healing preparations for antibacterial property against some pathogenic bacteria. <i>Journal of Clinical Immunology and Immunopathology Research</i> , 1(1), pp.012-007.

**Value of the data**

- This data provides helpful leads for pharmacological intervention from the extraction of pure form of the metabolites which is responsible for the bacteriolytic activity.
- This data will help in further research to identify bioactive molecules from the crude extracts that possessed anti-bacterial activity specifically for the eradication of multi-drug resistant bacteria on the septic wound infections.
- Data provides the information on the elevated levels of drug resistance in bacterial isolates, mostly due to inordinate usages of antibiotics.
- The tested plant leaf extracts have provided a scope for the usage as antimicrobial agents for the application of the wide variety of bacterial and fungal infections of various microbial infections.
- Data proved the natural plant leaf extracts can effectively inhibits the growth of multidrug resistant bacteria which in normal cases are difficult to treat.

**1. Data**

The Data represented in this article showed the potential inhibitory effect of methanol leaf extracts of *Acalypha alinifolia* (AA), *Delonix elata* (DE), *Digera muricata* (DM), *Hygrophilia auriculata* (HA), *Jatropha gasipifed* (JG), *Maeua oblongifolia* (MO), *Pterocarpus santalinus* (PS), *Punica granatum* (PG), *Syzygium cumini* (SC), *Gyrocaspus americana* (GA), *Euphorbia heterophilla* (EH) on the bacterial isolates of septic wound infections. The selected natural plants extract has the antibacterial activities and are tabulated in [Table 1](#).

The drug resistant natures of bacteria were evaluated by using antibiotic susceptibility test of eleven antibiotics belonging to the family of six classes. The inhibitor zone around the antibiotic disc on Muller-Hinton agar media were represented in [Fig. 1](#).

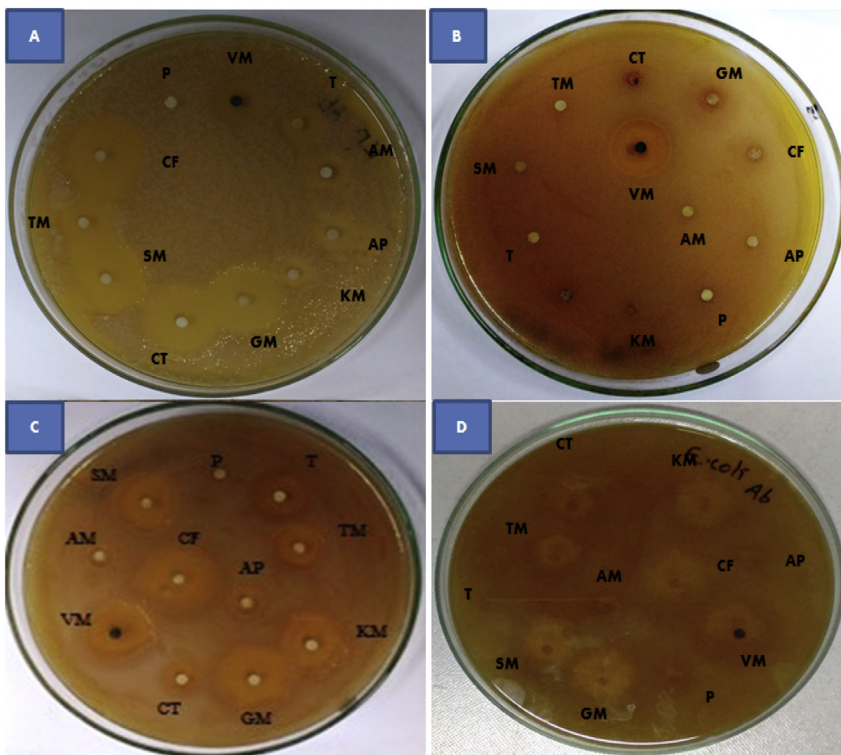
Diameters of zone of inhibition of various concentrations of antibiotics (10–40 µg/mL) were represented in [Fig. 2](#). The antibiotics Ciproflaxin and Gentamycin showed the perfect lysis of MDR-bacterial isolates of septic wound infections.

The bacteria from each species which showed the drug resistant were selected to analyze the antibacterial activity of methanol extraction of leaf extracts. The eleven natural plant leaf methanol extracts were employed to detect the antibacterial activity on the multidrug resistant bacterial species and the zone inhibitions were represented in [Table 2](#).

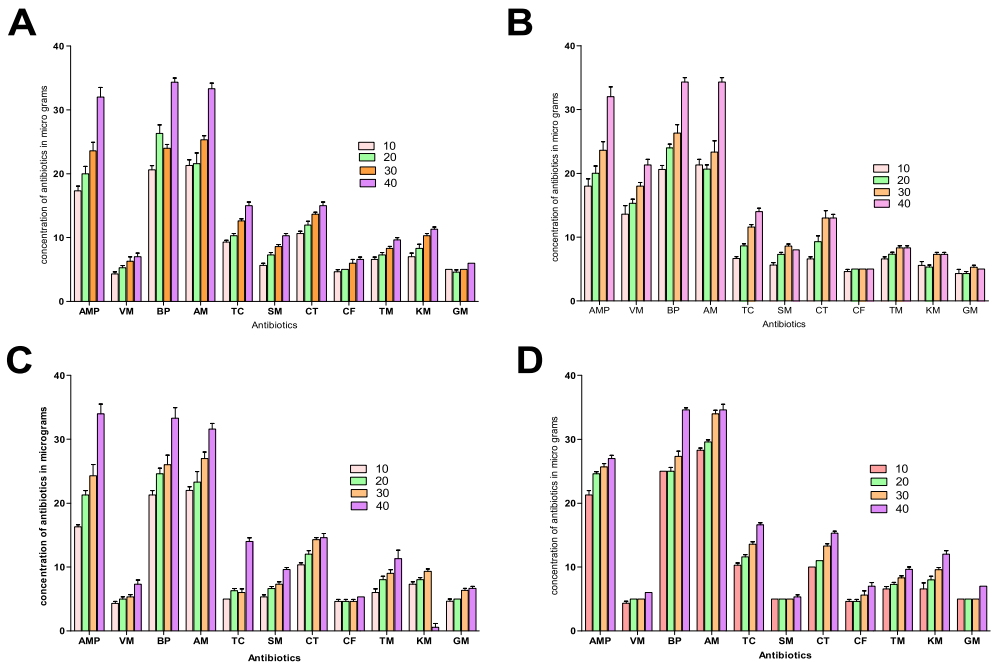
**Table 1**

Uses of the selected plant species in local folk medicine.

S.No.	Scientific name	Common medical uses
1	<i>Acalipha alinifolia</i>	Anti-bacterial, antifungal, and anthelmintic properties asthma, pneumonia, scabies and skin diseases
2	<i>Delonix elata</i>	The leaf extracts are anti-inflammatory agents
3	<i>Digera muricata</i>	Antibacterial, antifungal, diuretic, laxative, Free radical scavenger activity, anthelmintic.
4	<i>Hygrophilia auriculata</i>	<i>Medicinal usage</i> in Indian Ayurveda
5	<i>Jatropha gasipifed</i>	Produces biodiesel from oils of Jatropha
6	<i>Maeua oblongifolia</i>	The roots of this plant possess alternative, tonic and medicinal properties
7	<i>Pterocarpus santalinus</i>	Antipyretic, anti-inflammatory, anthelmintic, tonic, hemorrhage, dysentery, aphrodisiac, anti-hyperglycemic and diaphoretic.
8	<i>Syzygium cumini</i>	Ayurveda, Unani and Chinese medicine for digestive ailments. Rich source of vitamin C.
9	<i>Gyrocaspus americana</i>	Unknown Medicinal values
10	<i>Punica granatum</i>	unproven anti-disease benefits
11	<i>Euphorbia heterophilla</i>	The latex exuded of this plant used for dermatitis



**Fig. 1.** Antibiotic susceptibility pattern of MDR-bacterial isolates of septic wound infections. The bacterial lawn showed the zone of inhibition around the disc (40 µg/mL) of the used antibiotics on the bacterial isolates of septic wound infections. Where A. *P. aeruginosa*, B. *S. aureus*, C. *K. Pneumoniae* and D. *E. coli* on the MH agar media. Bacteria showed the highly sensitive towards to Gentamycin (GM), Ciprofloxacin (CF), and Vancomycin (VM), moderately sensitive to Streptomycin, Tetracycline, Kanamycin and resistant to remaining antibiotics used in this data.



**Fig. 2. Zone of inhibition showed by eleven antibiotics against bacterial isolates of septic wound infections.** The zones of inhibition of antibiotics on the bacteria at different concentrations (10, 20, 30 and 40 µg/mL) GM: Gentamycin, AMP: Ampicillin, AM: Amoxicillin, CT: Cefotaxime, BP: Benzyl Penicillin, CF: Ciproflaxin, TC: Tetracycline, SM: Streptomycin, VM: Vancomycin, KM: Kanamycin, TM: Tobramycin. Where A. *P. aeruginosa*, B. *S. aureus*, C. *K. pneumoniae* and D. *E. Coli*. 40 µg/mL concentration of Amoxicillin, Ampicillin and Benzyl penicillin forms the wide zone of inhibition than the remaining antibiotics used in this data.

## 2. Experimental design, materials and methods

### 2.1. Antibiotic susceptibility test (AST)

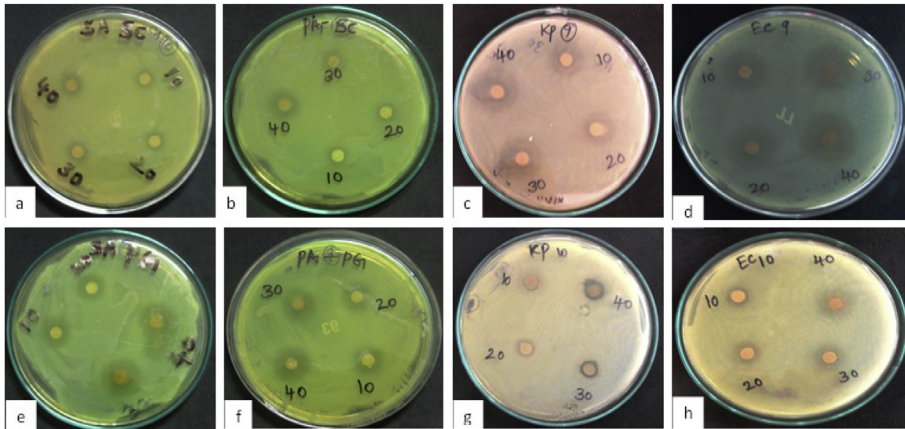
The predominant bacterial isolates from septic wound patients were tested for antibiotic susceptibility pattern by eleven different antibiotics. The used antibiotics are benzyl penicillin, amoxicillin, ampicillin, kanamycin, tobramycin, gentamycin streptomycin, cefotaxime, vancomycin, tetracycline and ciprofloxacin. Antimicrobial susceptibility pattern was detected by performing on Mueller- Hinton agar by the standard method [1] following Kirby-Bauer disk diffusion method. After incubation period, diameter of the zone of inhibition around the discs were measured using

**Table 2**

Effect of methanol plant extracts on the MDR-bacterial isolates.

Bacterial isolates	Leaf extracts of medicinal plants											
	PG	SC	DE	DM	EH	GA	MO	PS	AA	HA	JG	
<i>S.aureus</i>	+	+	-	-	-	-	-	-	-	-	-	
<i>P.aeruginosa</i>	+	+	-	-	-	-	-	-	-	-	-	
<i>K.pneumoniae</i>	+	+	-	-	-	-	-	-	-	-	-	
<i>E.coli</i>	+	+	-	-	-	-	-	-	-	-	-	

Keys: (+) inhibition zone, (-) no inhibition zone, *Punica granatum* (PG), *Syzygium cumini* (SC), *Delonix elata* (DE), *Digera muricata* (DM), *Jatropha gasipifed* (JG), *Maeua oblongifolia* (MO), *Pterocarpus santalinus* (PS), *Gyroscapus americana* (GA), *Acalipha alinifolia* (AA), *Hygrophilia auriculata* (HA) *Euphorbia heterophilla* (EH). *Punica granatum* (PG), *Syzygium cumini* showed the lytic activity and forms the zone around the disc against the MDR-bacteria of septic wound infections.



**Fig. 3.** Natural leaf crude extracts activity against the MDR-bacterial isolates of wound infections. Leaf extracts of *Punica granatum* (PG), *Syzygium cumini* (SC) showed perfect lytic activity on the MDR-bacteria at various concentrations (10, 20, 30 and 40 µg/mL) on the MH agar media after incubation of 24 hrs.

a ruler and classified as sensitive, and resistant (Figs. 1 and 2) according to the standardized table supplied [2].

## 2.2. Collection of medicinal plants

The medicinal plant samples were collected from Yogi Vemana University garden, kadapa district, Andhra Pradesh. The plants such as *Acalipha alinifolia* (AA), *Delonix elata* (DE), *Digera muricata* (DM), *Hygrophilia auriculata* (HA), *Jatropha gasipifed* (JG), *Maeua oblongifolia* (MO), *Pterocarpus santalinus* (PS), *Punica granatum* (PG), *Syzygium cumini* (SC), *Gyrocaspus americana* (GA), *Euphorbia heterophilla* (EH). These leaf extracts were used to test antibacterial efficiency on the predominant bacterial isolates of septic wound patients which are *P. aeruginosa*, *S. aureus*, *E. coli* and *K. pneumoniae* which were previously described in Pallavali et al. [3]. Most of these plants were used as traditional and folk medicinal practices.

## 2.3. Medicinal plant leaf extraction and antibiotic susceptibility pattern

Air dried powder (100 g) of the selected medicinal plant leaves were mixed with 500 mL of 80% methanol and were kept at room temperature for 36 hours. The mixture was then filtered through Whatmann No.1 filter paper and the filtrate were evaporated to dryness by leaving it inside the oven at constant temperature of 50 °C for 3–4 days. The residues obtained were stored at 4 °C until testing. Four different concentrations 10, 20, 30 and 40 (µg/mL) in 20% dimethyl sulfoxide (DMSO) were prepared and used for determination of antimicrobial susceptibility patterns by using Kirby-Bauer disk diffusion method [4] and plant extract sensitive plates were showed in Fig. 3. The methanol leaf extracts of *Punica granatum*, *Syzygium cumini* showed the antimicrobial activity against multi drug resistant- *P. aeruginosa*, *S. aureus*, *K. pneumoniae* and *E. coli* the predominant isolates of septic wound infections.

## Acknowledgments

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## Transparency document

Transparency document associated with this article can be found in the online version at <https://doi.org/10.1016/j.dib.2019.103896>.

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