



## ANTIMICROBIAL ACTIVITY OF HYOUTTUNIA CORDATA THUNB

## Pharmacology

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## ABSTRACT

Plant extracts which may be used as antimicrobial drug therapy is a hidden field of research. The use of traditional herbal medicine is an important source for the treatment of illness and it represents one of the most sought after area of research today. This study was undertaken to Houttuynia cordata on standard and resistant microorganism strains of Pseudomonas isolated from clinical samples. Effect of methanolic extract of Hyouttunia cordata on standard strain showing a Mean of 14.14mm +/- 0.936 SEM and resistant strains showing mean of 8.15mm +/- 1.19 SEM in 20 clinical isolates. The result of this study showed methanolic extract of Hyouttunia chordata showed significant inhibition against standard strain of Pseudomonas although less activity against resistant strains of the same microorganism.

## KEYWORDS

Methanolic Plant Extract, Hyouttunia Cordata, Pseudomonas, Standard Strains, Resistant Strains

## Introduction

Antimicrobial resistance is a burning issue in the current time and search for novel antibiotics is the focus of research worldwide [Gould, 2013]. The use of traditional herbal medicine is an important hub for the treatment of illness and it represents one of the most sought after area of research today. The World Health Organization (WHO) has reported the utilization of plant extracts in traditional methods of healing in about 80% of the population in the world [Barbour et al, 2004].

Plant extracts which may be used as antimicrobial drug therapy is a hidden field of research. This is more so for infections which are resistant to conventional and currently available drugs. Therefore such potential source of new drug development needs to be explored. Meghalaya has a vast region covering an area of 22,549 km. [Jain SK, 1997 and Samati H, 2004] and it has a large number of plants habitat where they provide an important source of diet to the people and at the same time harbouring great medicinal values. *Houttuynia cordata* Thunb. (Saururaceae) locally known as *jamyrdoh* is a perennial herb found in most part of this region and is edible mostly as a whole plant. Medicinal of this plant have been reported from China and Japan having antiviral, antibacterial, immunostimulant and diuretic activity [Machado TB, 2003]. Hence, the objective of this study was undertaken to *Houttuynia cordata* on standard microorganism strains of pseudomonas as well as multi-drug resistant strains isolated from clinical samples.

## Materials and Methods

Drugs and chemicals needed for the present study were purchased from microexpress and Hi-media through our local agency. The plant as a whole was collected and air dried for two weeks. The leaves were then taken amounting to one kilogram and electrically grinded into coarse powder form. Each 30 g of powder was mixed to 150 mL of (80%) of 4:1 ratio of methanol:water in flat bottom flasks, closed by foil paper and placed on a shaker at 37 °C temperature for 48 hrs [Hadem et al, 2014]. The crude extract was filtered and then concentrated yielding a dark brown mass. After complete solvent

evaporation, extracts were weighed and stored in a refrigerator at 4 °C for further use. The final yield was 5 gram from one kilogram of dried leaves of the plant. The solvent extract was prepared as 500 mg of solvent residue dissolved in 5mL of 20% DMSO and were used as the test extracts for antibacterial activity assay.

**Table 1: Phytochemical screening of *Hyouttunia cordata* leaf and callus extracts**

Phytochemical Compunds	Methanolic extracts of leaves of <i>Hyouttunia cordata</i>
Phenols & Tannins (FeCl3 solution)	++
Sterols ( CHCl3 & H2SO4 )	++
Flavonoids (Shinoda Test)	++

## Antibacterial Activity

Antimicrobial susceptibility testing of the clinical isolates was performed on Mueller Hinton agar by Kirby Bauer disc diffusion method in accordance with CLSI (Clinical Laboratory Standard Institute) guidelines. The clinical isolates of *Pseudomonas aeruginosa* were tested for sensitivity using discs of Gentamicin, Amikacin, Norfloxacin, Ciprofloxacin, Levofloxacin, Ofloxacin, Piperacillin, Ceftazidime, Piperacillin + Tazobactam and Imipenem + Meropenem. The plates were incubated at 37 C. Following overnight incubation, the plates were examined for areas of no growth around the disc (zone of inhibition) (Bauer et al., 1966). A standard strain of *Pseudomonas aeruginosa* (ATCC 27853) was taken as the control. Multidrug resistant isolates of *Pseudomonas aeruginosa* obtained from the above clinical samples were taken and the antimicrobial activity of the extracts of *Houttuynia cordata* was tested by well diffusion method.

## Results

Effect of methanolic extract of *Hyouttunia cordata* on standard strain showing a mean of 14.14mm ± 0.936 SEM and resistant strains showing mean of 8.15mm ± 1.19 SEM with 95% confidence interval in 20 clinical isolates (Table- 2).

**Table 2: Antibacterial Activity showing Zone Of Inhibition**

Test Solutions	Zone of inhibition in mm Standard Strains Pseudomonas ( ATCC -27853) ( Mean $\pm$ SEM )	Zone of inhibition in mm Resistant Strains Pseudomonas (Clinical Isolates) ( Mean $\pm$ SEM )
Methanolic extract of <i>Hyouttunia cordata</i> (100mg/ml)	14.14 $\pm$ 0.936	8.15 $\pm$ 1.19
80% Methanol	Nil	Nil
20% DMSO	Nil	Nil

### Conclusions

The result of this study showed *hyouttunia chordata methanolic* extract showed a good zone inhibition against standard strain of *pseudomonas*. The result is important in support of its use traditionally in treating infections. This may be due to the presence of phenols, saponins and flavonoids and the medicinal property of these plants may be due to the presence of one of these compounds. Regarding its effectiveness against resistant strains even though promising as is seen in the clinical isolates much more work is to be done especially with minimum inhibitory concentrations. Exploration of their antibacterial activity provides insight into the potential benefit obtained by the plant extract of *Hyouttunia cordata*.

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