



# Evaluating Antagonistic Effects Of Leaf Extract Of *MusaParadisiaca* Against *Enterococcus Faecium* MTCC 5695

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## Abstract

The treatment of bacteria using plant extract is common. The extract's inclusion of photochemical substances helps treat ailments as well.

The three genera of the banana plant—*Musa*, *musella*, and *ensete*—belong to the *musaceae* family of herbaceous plants. Puttable *Musa paradisiaca* L.ev. is a widespread plant in the *musaceae* family that goes by the name "banana plant." The purpose of this study is to assess the antibacterial properties of the leaves of *Musa paradisiaca* using soxhlet equipment to prepare leaf extract using solvents like ethanol and chloroform. The leaf extract's antibacterial activity was tested against the bacteria *Enterococcus faecium* (MTCC 5695). In contrast, allof the MP's polar extracts were shown to be able to kill 90% of the tested bacterial pathogens.

**Key words** → Antibacterial agent, banana, chloroform, ethanol, leaf extract, *musa paradisiaca* *Enterococcus faecium*, Zone of inhibition.

## Introduction

Banana plant is one of the eldest medical plant and many studies have aimed to elucidate the efficiency of its naturally active ingredient such as Antimicrobial agents. Because plant extracts contain a large amount of phytochemical compounds, particularly polyphenyloxide, which is used to treat free radicals that cause cell damage by forming superoxides, airlines, and lipid but oxides, plant extracts have been used to treat bacterial-related diseases for a long time (Yan Chun and Rong Liang, 1991).

The blonde banana plant, after rice, wheat, and maize, is the fourth most important agricultural product in the world. Its flower and stem are prized for their antiseptic, anti-diabetic, and anti-ulcer qualities (Leuis et al., 1999; Ohenabal et al., 2010). And they have also been thoroughly examined, although extremely limited numbers of studies have been carried out on its leaves. Around the world, banana leaves have longbeen used for cooking, wrapping, and serving food. Food deterioration bacteria do not significantly affect food. Regarding the treatment of microbiological infections, there are effects on the economy, society, and environment. The World Health Organization(WHO) claims that Over 200 diseases are brought on by contaminated food that contains chemicals or microbes. Eating tainted food puts 1/10th of the world's population at risk of illness and causes 4,20,000 deaths annually.

## Banana leaves –

Banana leaves are also high in tannin, fiber, and flavonoids and polyphenols. Because of its cooling properties, the leaves are traditionally used to treat sunburns, rashes, dandruff, and other ailments. Their large waxy surface makes them ideal for food packaging and serving. Banana tree leaves possess biological properties and antioxidant activities, such as anti-diarrheal and anti-diabetic, anti-tumor, anti-mutagenic, and anti-ulcerogenic qualities.

- Supplies and techniques
1. Glassware: petri plates, test tubes, motor pistols, conical flasks, measuring cylinders, beakers, and forceps.
  2. Equipment: micropipettes, soxhlet, analytical balance, autoclave, hot air oven, hot plate, incubator, laminar air flow, microwave oven.
  3. The test organism, *Enterococcus faecium*, belongs to the *Enterococcus* genus and is a gram-positive, gamma hemolytic or nonhemolytic bacteria. *Enterococcus faecium* (Mt CC- 5695) was the bacterial strain utilized in the investigation. Coexisting organisms in the gastrointestinal tract have been observed in both humans and animals.

## Methodology

### Preparation of leaf extract—

We sterilized banana leaves by washing them with de-ionized water. After allowing the leaves to dry for a full day, we read the temperature again for two hours at 60°C. Next, we powdered it and stored it in a thimble next to the soxhlet extractor. In order to finish 14 cycles, we extended the cycle to continue for an additional 4 days. After that, we took the extract and didn't let it concentrate. Word of the Muslim Paradise leaves was taken from M. Paradise's fresh Indian plant materials. After sterilizing the banana leaves in water, we allowed them to dry for a full day before drying them once more for a further twenty-four hours at 60°C.. Then we'd read lives were granted in motor pistol these crash powder lives were measured by wing balance. Subsequently, we learned that the motor pistol crash powder lives were determined by wing balance. Next, we ground it into a powder and stored it in the thimble. A soxhlet apparatus was used to extract the ethanol, and two weeks later, the solvent was extracted at 90°C for 72 hours. The solvent extract was then stored at 4° in an airtight container until it was needed again. The same residue was then used to create a chloroform extraction, and all of the aforementioned extracts were stored at 4°C prior to use.

### Media culture and vaccination planning

Mueller Hinton culture medium was employed for both extracts, which were serially diluted at ratios of 1, 1/10, and 1/100. A reputable board spectrum antibiotic was used as the positive control and a negative control, respectively. supplied by distilled water disc diffusion method. The discs of five M MD5 at different concentrations were soaked before being placed on each of the two cultured plates, which had been prepared by spreading bacterial inoculation for fifteen minutes. The plates were then incubated for twenty-four hours in a BOD incubator. The *Enterococcus faecium* (MTCC 5695) bacterium strains were employed in the investigation.

### observations

The data pertaining to the antibacterial potential extract of *Musa* sp. leaves were studied using another well diffusion method in the current study, which examined the evolution of antibacterial activities of and polar distilled water ethanol extracts of the leaves against gram positive bacteria. The results showed that each extract's inhibitory concentration varied when tested against a panel of growth inhibition zone. The highest inhibition zone was observed in the range of 10.6 ± 0.5 MM and

minimum  $8.0 \pm 0.5$  MM, where all *M. paradise eagle* extract was tested against *Staphylococcus* ( $18.6 \pm 0.5$ mm) *p. deruginosa*. On the other hand, 90% of the tested bacterial pathogens were inhibited by the polar extract ethanol of *M. paradisaca*. extract ethanol of *m. paradisaca* able to inhibit 90% of tested bacterial pathogens

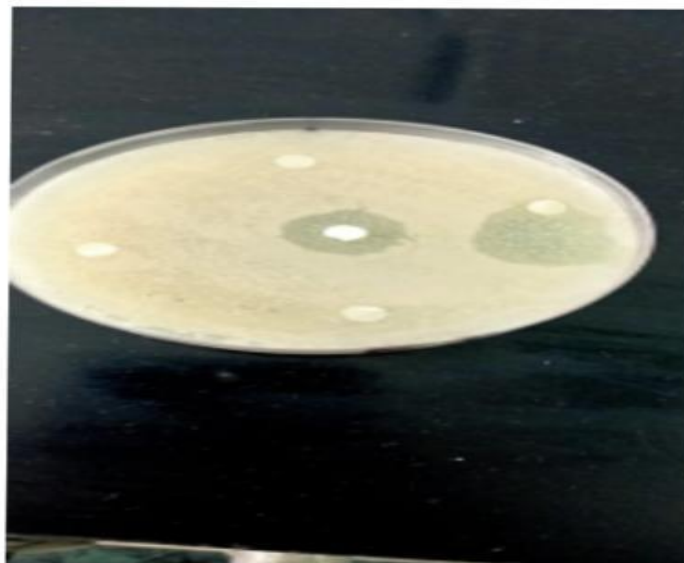
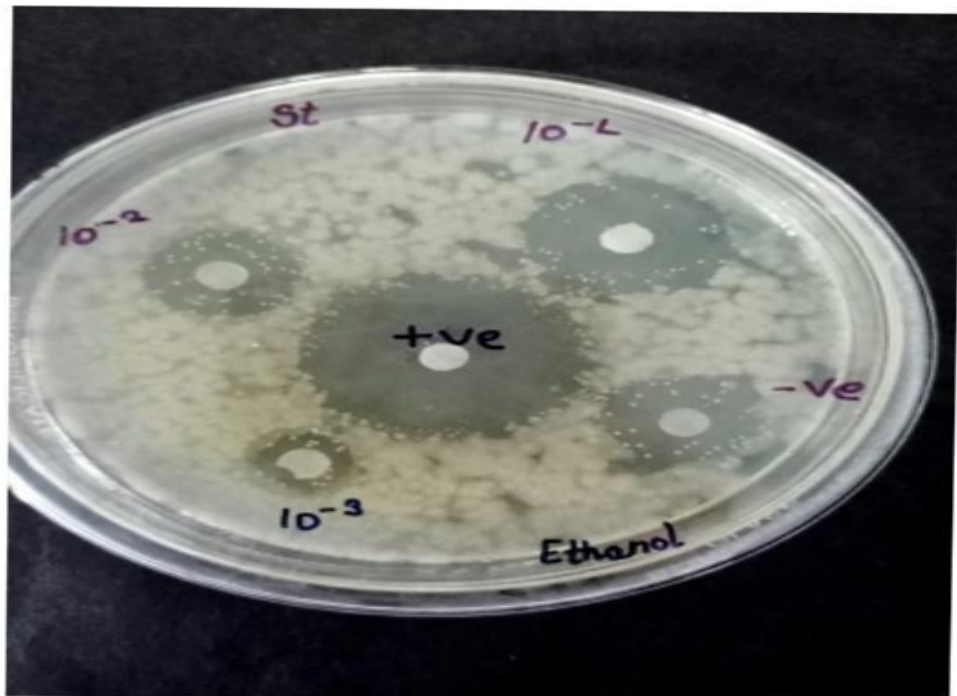
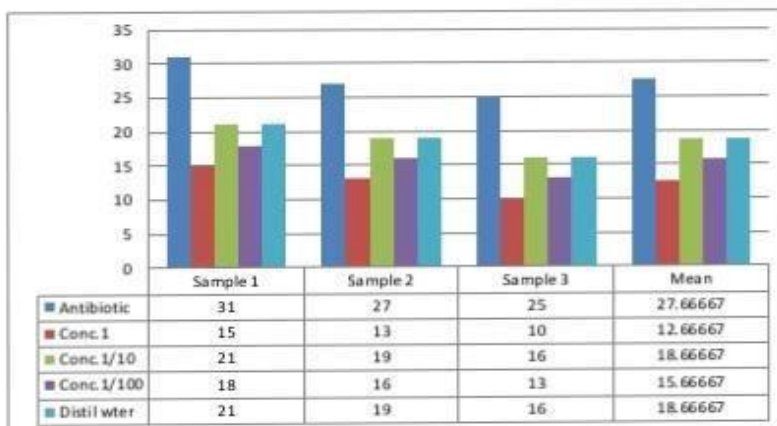


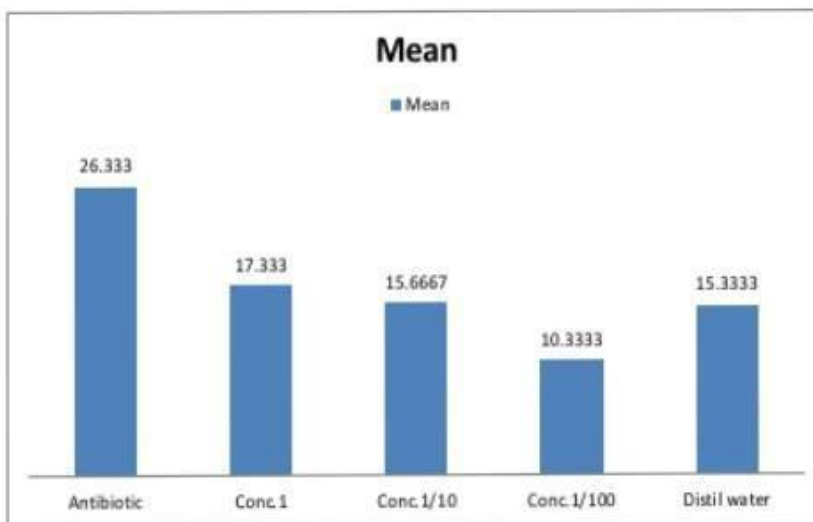
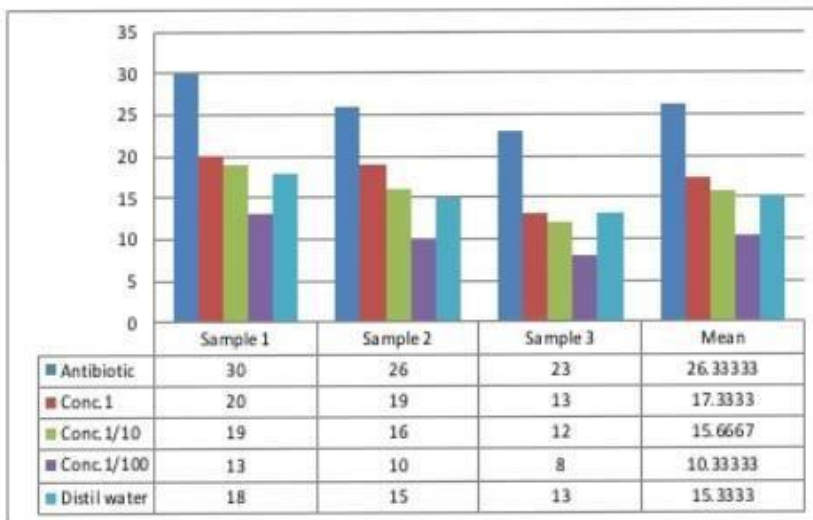
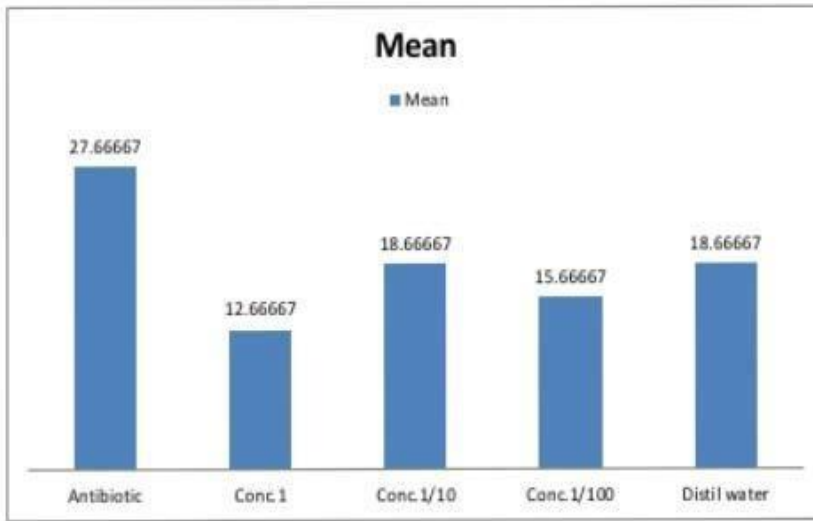
Fig. 8 Chloroform Extract plate

1. Gram +ve bacteria- Enterococcus farcium
2. Solvent was- Ethanol and Chloroform
3. Antibiotic is- Amoxycillin which is used as +ve control.
4. Disc size is 5 mm.
5. Distilled water is used as -ve control
6. Reference size of zone of inhibition is 30 mm.

	Sample 1	Sample 2	Sample 3
Antibiotic	31	27	25
Conc.1	15	13	10
Conc.1/10	21	19	16
Conc.1/100	18	16	13
Distil water	21	19	16

	Sample 1	Sample 2	Sample 3
Antibiotic	30	26	23
Conc.1	20	19	13
Conc.1/10	19	16	12
Conc.1/100	13	10	8
Distil water	18	15	13





## Result and Discussion

When compared to the positive control, amoxicillin, the ethanolic extract of *M. paradisaca* showed a similar inhibitory effect against the tested bacteria based on the diameter of the zones of inhibition. This is most likely because the phytochemicals, such as alkaloids and tenants, that inhibited bacterial growth were present. Antibacterial properties of the ethanol-prepared Musa leaf extract are mostly directed against *Enterococcus feacium*, albeit they also work against other microbes. The Musa leaf extract synthesized in chloroform showed better antibacterial action against *Bacillus subtilis* when compared to an ethanol-made extract. When it came to Moussa leaf's antibacterial activity, chloroform performed better than ethanol extract. When discussing *Enterococcus feacium*, extract was used. Moussa leaf. Extract when it came to *Enterococcus feacium*.

Various extracts from *Musa paradisaca* leaves showed distinct inhibitory patterns when compared to the commonly used board gaming spectrum. When compared to conventional treatments like amoxycillin, the chloroform extract of *Musa paradisaca* was found to be more effective against *Enterococcus feacium*, despite the antibacterial antibiotics amoxicillin being used for several bacterial stains. **Conclusion**

*Musa paradisaca* banana leaves demonstrated antibacterial properties. Chloroform is a more suitable technique, even though the ethanol extract of *Musa paradisaca* demonstrated a noteworthy degree of inhibitory efficacy against *Enterococcus feacium*. The extract of *Musa paradisaca* leaves prepared in chloroform showed good antibacterial activity. The results of the present investigation indicate that the leaf extract derived from the *Musa* species possesses noteworthy antibacterial and antioxidant characteristics.

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