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Comparative analysis of antimicrobial activity floral extracts against prevalent Bacterial flora Associated with Earphones Used Among youngsters from Bhojpur(U.P)

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Abstract -Young adults are currently using earbuds more frequently, and students share them frequently. Numerous investigations of the human environment have shown that items including headphones, door handles, faucets, phones, money, fabrics, and plastics have been colonised and contaminated. People come into contact with a variety of fomites on a regular basis, and bacterial and fungal infections are on the rise. From 25 regular student users (Group A) and 25 additional non-frequent student users (Group B), 50 earbuds were randomly chosen for microbiological analysis. The samples were examined by means of conventional microbiological techniques. Haemolytic Streptococci, Bacillus species, coagulase-negative Staphylococci, Escherichia coli, Proteus species, and Staphylococcus aureus were among the bacteria that were identified from the earphones. *Staphylococcus aureus,* 12 (24%), -haemolytic *Streptococci,* 12 (24%), Bacillus spp. 10, *Coagulase-negative Staphylococci (*COANS), 6, *Escherichia coli,* 3, *Proteus* spp. 2 are among the bacteria that were isolated from the earphones. A substantial difference in the mean occurrence values of the isolates from the two groups was shown by statistical analysis (P 0.05).

***Key Words*:**Bluetooth devices, bacteria, medicinal plants, antimicrobial activity.

1.INTRODUCTION

Young adults are currently using earbuds more frequently, and students share them frequently. Numerous investigations of the human environment have shown that items including headphones, door handles, faucets, phones, money, fabrics, and plastics have been colonised and contaminated. People come into contact with a variety of fomites on a regular basis, and bacterial and fungal infections are on the riseof earphones in comparison to nonfrequent use of earphones through analysing the frequency values of the isolates from the two categories of earphone users. The isolates found in Group A had considerably higher occurrence values than those in Group B, which is indicating a positive correlation between microbial frequency and earphone use time. To help reduce the microbial load of earphones and their potential as fomites in the transfer of pathogenic microorganisms to the ear, regular cleaning of earphones with disinfectants prior to and following each usage is advised. This will help reduce the incidence of otitis media and other ear infections among earphone users. About 45,000 kinds of plants in India are thought to possess therapeutic characteristics. The first step in making the best use of these types of extraction as natural antimicrobial agents to increase shelf life and maintain food quality need to comprehend the mechanism of antimicrobial action of medicinal plant extracts. This study aims to examine the antimicrobial activity of propanolic and ether, acetone extracts of roselle (*Hibiscus sabdariffa*), rosemary (*Rosmarinus officinalis*),, and roselle (*Hibiscus sabdariffa*), against microorganism isolated from ear buds. Fruits, tubers, flowers, leaves, and other plant components are eaten as primary or supplemental foods and utilised as medicines. Many phytochemical bioactive substances from the various medicinal plant sections have demonstrated numerous pharmacological properties in response to this increased interest but relatively little research has been done to screen for microbial activity in flower.

2. MATERIAL & METHODS:

2.1 COLLECTION OF PLANT FLOWER & EXTRACTION:

The flowers were air dried at room temperature at 20 °C for 5 days. Two hundred and fifty grams of dried powdered sample was extracted by one liter of solvent 70% at 30 °C for 48 h and filtering through Whatman No. 4 filter paper. In a sand bath, the filtrates were evaporated, and the dried extract was collected and kept in a refrigerator for later use. Depending on the flower utilized, the extract was re-suspended in sterile distilled water at various quantities.

S.no	Flowers name	Scientific name	family	Ethnomedical uses
1	Rose	Rosa Rubiginosa	Rosa ceae	Treatment of diarrhoea, asthma, leukoderma, and inflamation of mouth.
2	Hibiscus	Hibiscus Rosa-sinensis	Malvaceae	To treat constipation
3	Marigold	Genus Tagetes	Asteraceae	Conjunctivitis
4	Pomegranate	Punica granatum	Lythraceae	Treating cardiovascular disorders, diabetes and to manage obesity.

2.2 ANTIBACTERIAL ACIVITIES OF THE FLOWER EXTRACTS:

2.2.1 Bacterial stains:

The samples were examined by means of conventional microbiological techniques. *Haemolytic Streptococci, Bacillus species, coagulase-negative Staphylococci, Escherichia coli, Proteus species, and Staphylococcus aureus* were among the bacteria that were identified from the earphones. *Staphylococcus aureus,* 12 (24%), -haemolytic *Streptococci,* 12 (24%), Bacillus spp. 10, *Coagulase-negative Staphylococci (*COANS), 6, *Escherichia coli,* 3, *Proteus* spp. 2 are among the bacteria that were isolated from the earphones

22.2 Inoculums Preparations:

In Mueller-Hinton agar slants, each bacterial strain was subcultured for a whole night at 35 °C. Using a spectrophotometer, the bacterial growth was harvested using 5 ml of sterile saline water, corrected for absorbance at 580 nm, and diluted to achieve a viable cell count of 10^7 CFU/ml.

RESULTS & DISCUSSION:

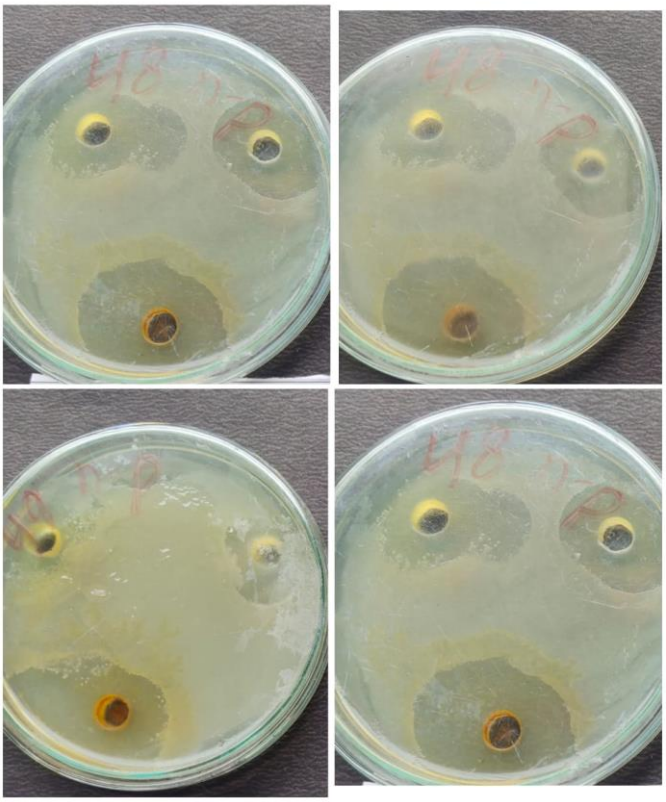
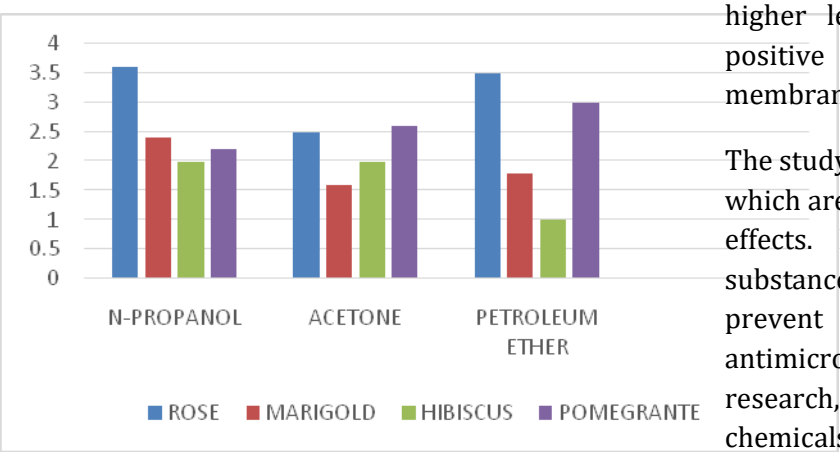


FIG-1 Zone of inhibition of flowers extract of calotropis procera against various pathogens using agar well diffusion essay. (a) Rose, (b) Hibiscus (c) Marigold (d) pomegranate



Antimicrobial activity of ROSA RUBIGINOSA

According to earlier studies, Phytochemical investigation of various medicinal plants revealed that the Flowerof *Rosa rubiginosa*, Rose, *Hibiscus rosa-sinensis* L , *Hibiscus* are particularly abundant in a variety of polyphenolic chemicals (Phenol, flavonoids and tannin etc). Due to their antimicrobial properties, polyphenolic chemicals may be the most likely source of the antifungal and antibacterial effects of *Rosa rubiginosa*, Rose, *Hibiscus rosa-sinensis* L , *Hibiscus* and particularly, *Hibiscus Rosa-sinensis* L. Flowerof these plants can be employed in pharmaceutical business as well as in food sector as bio preservative.

Overall findings showed that Gram negative bacteria were less sensitive to the antibacterial properties of *Hibiscus rosa-sinensis L, Rosa rubiginosa*, Rose than Gram positive bacteria. Gram negative bacteria are less sensitive to antimicrobial substances than Gram positive bacteria, which may be because of variations in the cell walls of the two types of bacteria.

Gram negative bacteria have three different layers in their cell walls, which serve as an enclosure for some bioactive components. These comprise an inner or cytoplasmic membrane, an outer membrane made of lipopolysaccharide, and a peptidoglycan cell wall made of partly cross-linked peptide chains. Unlike gram negative bacteria, gram positive bacteria often lack this outer membrane. Certain antibiotic components and medications cannot enter the cell because the affected outer membrane serves as a barrier with a low permeability. One of the main factors causing Gram negative bacteria to exhibit higher levels of antibiotic resistance than gram positive bacteria is the existence of this outer membrane.

The study of the plant extracts found phytochemicals, which are known to have physiological and medicinal effects. For instance, tannins are polyphenolic substances that bind to proline-rich proteins and prevent protein synthesis while also possessing antimicrobial properties. According to considerable research, plants create hydroxylated polyphenolic chemicals called flavonoids in response to microbial infections, and these compounds have been shown to have antimicrobial activity in vitro against a variety of bacteria.

Their power has been linked to their capacity to assemble complexes with bacterial cell walls, soluble extracellular proteins, and both. Although terpenoids are mostly employed for their fragrant properties, researchers have discovered that they may also be effective antibacterial agents. Glycosides called saponins have been discovered to have inhibitory effects on *S. aureus*, a grampositive bacterium. As a consequence, the phytochemical characteristics showed that the propanol, ether, and acetone extract include chemical components that have been discovered to have antibacterial activities, which may have contributed to the findings from the antibacterial study.

3. CONCLUSIONS

The results of this experiment indicate that the Flower of Rose (*Rosa Rubiginosa*), and Hibiscus Rosa-sinensis L, have the potential to be a strong candidate in the quest for a natural antibacterial agent against infections and/or disorders brought on by the microbes contained in the ear phones according to the current research however gram-negative bacteria were less sensitive to the antimicrobial effects of the former two plants. The findings show that ether and acetone are superior to ether for extracting the antibacterial characteristics of *Hibiscus Rosa-sinensis* L. Comparisons with relevant data from the literature show that the most varied results can be obtained from studies on antibacterial activity using various approaches. This investigation advances our understanding of the antibacterial principles and offers a new scientific understanding

opens new doors for future research for producing antimicrobial medicines and goods.

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REFERENCES

1. A. M. Whittington, G. Whitlow, D. Hewson, C. *omas, and S. J. Brett, "Bacterial contamination of stethoscopes on the intensive care unit," Anaesthesia, vol. 64, no. 6, pp. 620–624, 2009.

2. B. Liu, R. Ivers, R. Norton, S. Blows, and S. Lo, "Helmets for preventing injury in motorcycle riders," Cochrane Database of Systematic Reviews, vol. 4, 2003.

3. B. H. Normark and S. Normark, "Evolution and spread of antibiotic resistance," Journal of Internal Medicine, vol. 252, no. 2, pp. 91–106, 2002.

4. D. M. Livermore, "Has the era of untreatable infections ar rived?" Journal of AntimicrobChemother, vol. 64, pp. 129–136, 2009.

5. D. Jeyakumari, S. Nagajothi, P. Kumar, R. Ilayaperumal, and G. Vigneshwaran, "Bacterial colonization of stethoscope used in the tertiary care teaching hospital: a potential source of nosocomial infection," International Journal of Research in Medical Sciences, vol. 5, pp. 142–145, 2017.

6. D. Tagoe, L. Adams, and V. Kangah, "Antibiotic resistant bacterial contamination of the Ghanaian currency note: a potential health problem," Journal of Microbiology and Bio technology Research,vol. 1, pp. 37–44, 2011.

7. E. Obinna, A. Leonard, E. Faustina et al., "Antibiotics sus ceptibility pattern and plasmid profile of bacteria isolated from public motorcycle helmets," American journal of microbiological research, vol. 4, pp. 126–131, 2016.

8. G. Dantas, M. O. Sommer, R. D. Oluwasegun, and G. M. Church, "Bacteria subsisting on antibiotics," Science, vol. 320, pp. 100–103, 2008.

9. G. Sepehri, N. Talebizadeh, A. Mirzazadeh, T. R. Mir-shekari, and E. Sepehri, "Bacterial contamination and resistance to commonly used antimicrobials of healthcare workers' mobile phones in teaching hospitals, Kerman, Iran," American Journal of Applied Sciences, vol. 6, p. 206, 2009.

10. L. Adamu, B. Edeghagba, F. Olatomi, O. Ezeokoli, and A. Elijah, "Microorganisms associated with commercial motorcycle helmets in Lagos metropolis," Journal of Micro biology, Biotechnology and Food Sciences, vol. 1, pp. 1179– 1188, 2012.