

plants (ethanol, methanol, acetone and water) had antioxidant and antibacterial activity. The cytotoxic activity of the extracts of *V. negundo* L. and *T. divaricata* L. were assessed on THP-1 leukemia cell line using MTT assay and both the plants demonstrated cancer cell inhibitory activity.

Antibacterial activity and powder microscopy of flowers of *T. divaricata* was done and stated by Bijeshmon P.P and Shibu George (2014) using different flower extracts (water, petroleum ether and methanol) were tested by. They found that only the methanolic extract of the flower was effective to inhibit the growth of *Staphylococcus aureus* and *Escherichia coli* by disc diffusion method.

It is necessary to identify the antibacterial activity of ethanolic extract from aerial parts of double flower variety of *Tabernaemontana divaricata* against pathogens such as *Escherichia coli*, *Bacillus subtilis* and *Staphylococcus aureus*.

3. Materials and Methods

3.1 Extract preparation

Leaves, stems and flowers were collected and washed. It was dried in shade and powdered. Powdered materials were macerated with ethanol using cold percolation method for

some days with sporadic shaking. Each mixture was filtered by a piece of clean, white cotton cloth. The filtrates obtained were used for further analysis.

3.2 Microorganisms used for Antibacterial Activity

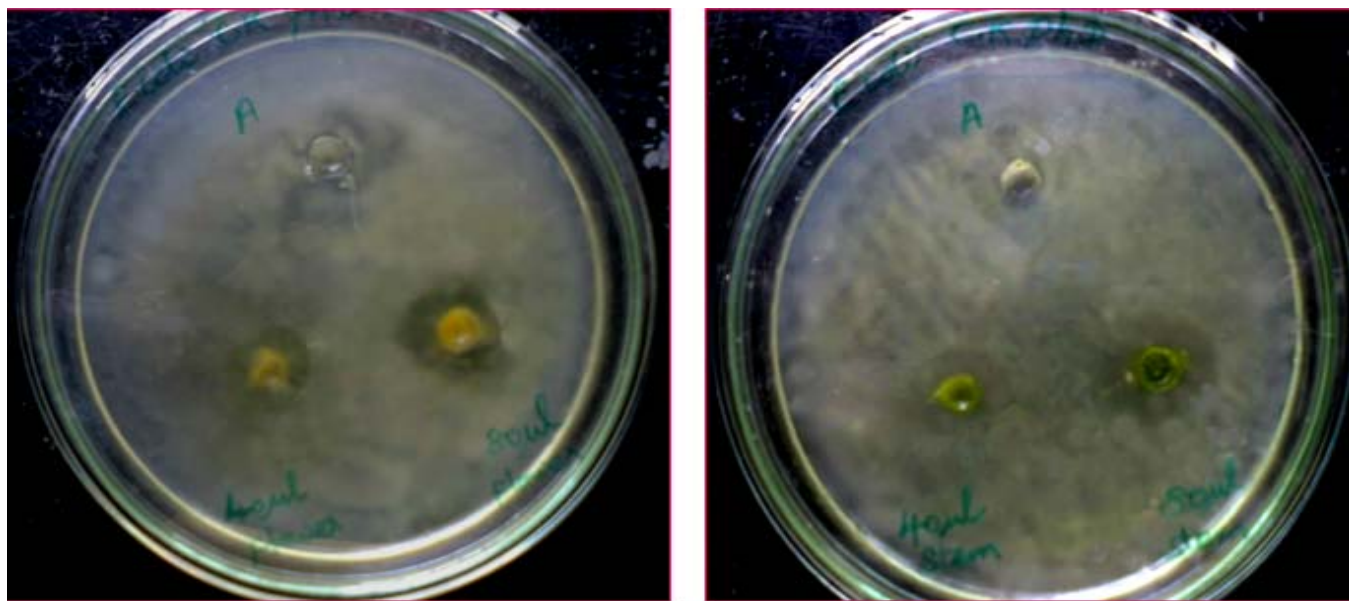
Escherichia coli, *Bacillus subtilis* and *Staphylococcus aureus*

3.3 Antibacterial Susceptibility Testing

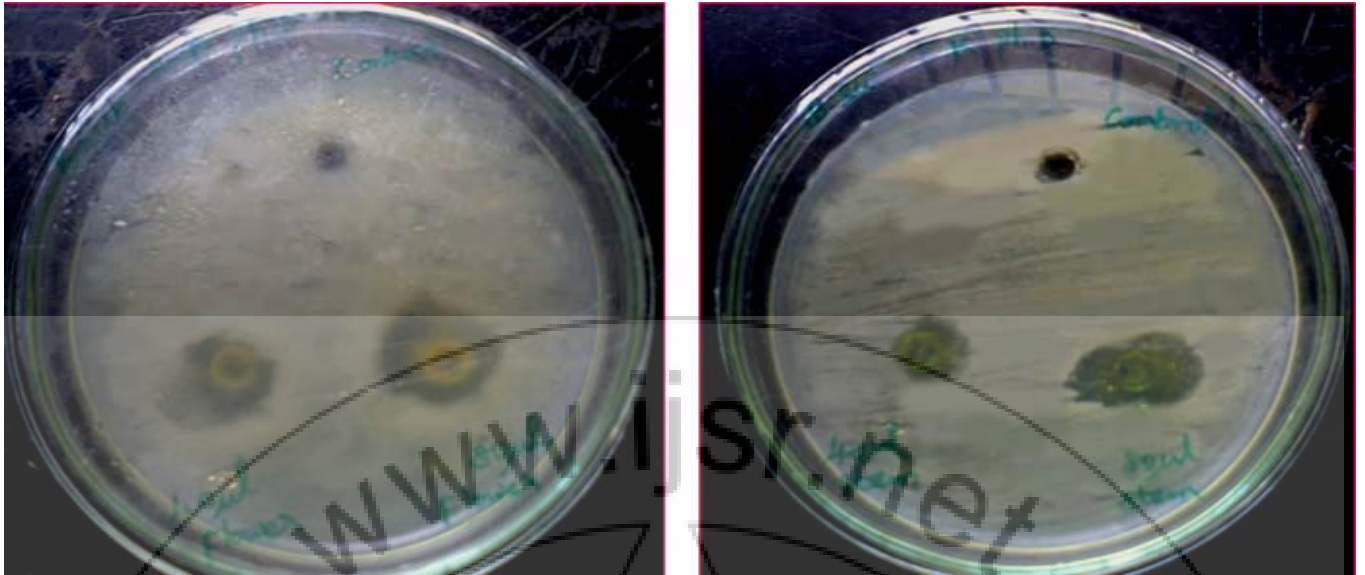
This activity was done using agar well diffusion method. Nutrient agar medium was prepared and sterilized. It was poured into pre sterilized petridishes. Bacterial cultures were spread on the medium using cotton swabs. Three wells could be created. Control (Solvent alone) and two different concentrations of each extracts (40 and 80 μ l) were kept in the respective wells and marked as B and C. The plates were incubated at 37 $^{\circ}$ c for 24 hours in room temperature to allow the diffusion of extracts into the medium. Zone of inhibition was observed after 24 hours of inoculation.

4. Results

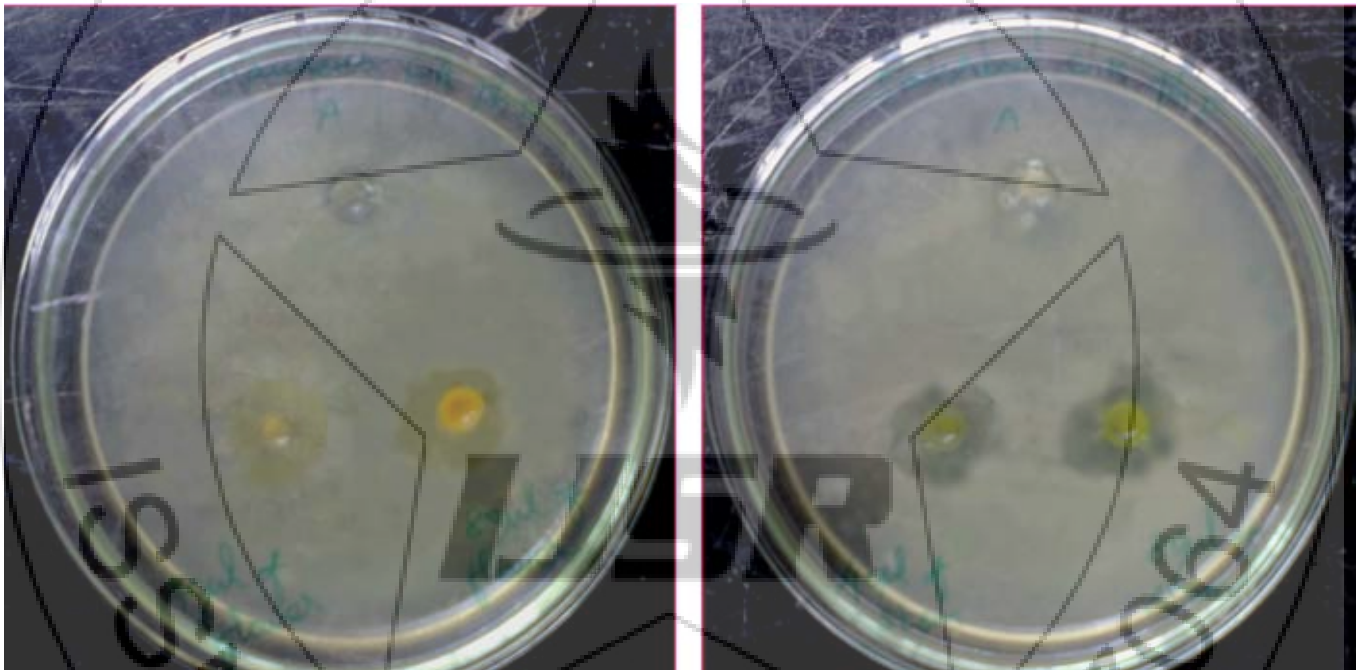
A – Solvent alone, B and C – two different concentrations of extracts (40 and 80 μ l).



Activity of Flower and Stem Extract against *E. coli*



Activity of Flower and Stem Extract against *B. subtilis*



Activity of Flower and Stem Extract against *S. aureus*



Activity of Leaf Extract against *S. aureus*

Volume 3 Issue 10, October 2014

www.ijsr.net

Control (A) with solvent alone did not show inhibition zone around the well. But less concentration (40µl) and high concentration of extracts (80µl) revealed low and more inhibition respectively.

5. Discussion

This study investigated that whether the ethanolic extract from aerial parts of double flower variety of *Tabernaemontana divaricata* has capacity to act against pathogens. Ethanolic extract of flowers and stems showed more resistant capacity against *B. Subtilis*, *E.coli* and *S.aureus* through inhibition zone. Ethanolic extract of leaves had more resistance against *S.aureus* but *E.coli* and *B.subtilis* exhibited no susceptibility to the leaf extract. If concentration of each extracts increased there is the possibility to observe maximum inhibition against these bacterial species.

Antimicrobial susceptibility test could be used to identify the effectiveness of extracts against bacterial infections caused by pathogens. The plant extracts had bactericidal at higher and bacteriostatic at lower concentrations respectively. 80% of rural people utilized herbal medicines in their life cycle as primary healthcare (Rahman Md. Ashikur *et al.*, 2011). In our normal life, antimicrobial substances could be used for bacterial infections at different time intervals (Al-Hussini *et al.*, 2014, Urassa, 1997).

Because of costs and side effects of some synthetic drugs, there was a need for other products as natural medicines from plants (Chinnaperumal kamaraj *et al.*, 2012).

6. Conclusion

The present study concluded that the ethanolic extract from aerial parts of double flower variety of *T.divaricata* had inhibitory action against *S.aureus*. Stems could be taken for the first time in the study of antibacterial activity. Flowers and stems revealed inhibitory action against *E.coli*, *B.subtilis* and *S.aureus*. But no inhibition zone could be found in the leaf extract against *E.coli* and *B.subtilis*.

7. Future Scope

In future aerial parts of double flower variety of *T.divaricata* can be tested beside microorganisms. Further studies can be done to identify and isolate the compounds present in these parts which are responsible for antibacterial activity such as phytochemical screening and free radical scavenging. To be strong double flower variety of *T.divaricata* must be prove that it can be used as a drug for bacterial infections caused by pathogens.

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