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Comparison of antibiotic activity of tulasi, guava, aloe vera, neem and drumstick in the strains of *Pseudomonas syringae*

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The present investigation is based on the antibacterial activity of bacterial speck disease in *Lycopersion esculentum* (tomato).The disease was caused by the bacterium *Pseudomonas syringae*. The bacteria was isolated from the pathogen leaf extract and confirmed by conventional microbiology method. Antibacterial study was carried out by disc diffusion method against the isolated bacterium by using crude extracts of Neem (*Azadirahta indica*), Guava (*Psidium guajava*), drumstick (*Moringa olifera*), aloe Vera (*aloe barbandensis mil*), tulsi (*Ocimum tenuiflorum*).The comparison of antibacterial study has been observed against all extract with the tested bacteria with varied activity. It is to the hope that the study would be valid to the establishment of some of the compounds that could be used to formulate new patent for antimicrobial drugs of natural origins. The future prospect of this is to develop disease free transgenic plant varieties.

KEY WORDS: Bacterial Speck Disease, *Lycoperiscon Esculentum*, *Pseudomonas Syringae*, Leaf Extract, Disc Diffusion Method, Antimicrobial Drug, Transgenic Plants.

1. INTRODUCTION

Neem (*Azadirahta indica*) is a medicinal tree from the family of Meliaceae. Neem is the fast growing trees that can reach upto 131 feet height. It is said to have more antibacterial and antifungal resistance. Neem is considered to be more medicinal and takes large part of Ayurveda medicine. Neem oil is used to prepare cosmetics and also useful in mosquito repellent. It is also useful for damaging over 500 types of insects, mites and nematodes**.** Guava (*Psidium guajava*) is a common tropical fruit. It is a small tree in myrtle family it contains more amount of carbohydrates 14.32 gms in 100 g. Guava leaves aid in weight loss and also used in diabetics. It prevents the adsorption of glucose from the body. Fruits are useful in digestive by stimulating enzyme production. Drumstick (*Moringa olifera*) is the most useful and widely cultivated tree in the genus of Moringa of the family Moringaceae. It is very useful in the management of cardiac diseases. Rich in calcium and improve the bone density. Moringa leaf contains zinc it plays a vital role in hair growth. Tulsi (*Ocimum tentniflorum*) is also known as holy basil. The two main morph types are cultivated in India are green leaved and purple leaved.it have very potent germinal, antibacterial, antifungal, properties that are great resolving fevers. Tulsi have powerful antioxidant called eugnol. Aloe Vera (*Aloe barbandensis mill*), it is frequently cited as being used in herbal medicines. Stem less plant, which lives in desert. Aloe Vera extracts are widely used in the cosmetics and alternative medicines. Tomato (*Lycoperiscon esculentum*) is an edible fruit often red berry type fruit. Tomato belongs to the night shade family Solanaceae. It grows maximum three meters only. There are many types of varieties and hybrids are available.

Table.1.Typical bacterial diseases in tomato

Disease/defect	Causing agents
Bacterial spot	*X.campestris*
Bacterial cancer	*c.michiganensis*
Early blight	*A.solani*
Bacterial speck	*p.syringae*

Bacterial speck:

Pathogen: *Pseudomonas syringae.* It can be observed that the symptoms are like dark brown colors to light one. Pathogen causes severe lesions of the leaves.

Management: It is well know that that crop changing is better to avoid spread of diseases. In the present study, the above mentioned five plants leaves extracts were taken for study of antibacterial activity. The bacterium was isolated from the affected plant. The extract has the sensitivity against the *pseudomonas syringae* in tomato.

Figure.1. Bacterial speck disease in tomato leaf

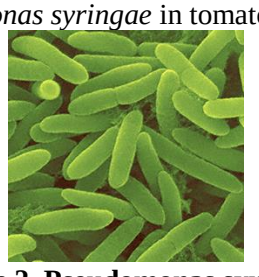

Figure.2. Pseudomonas syringae

2. MATERIALS AND METHODS

Collection of plant materials: The pathogen plant as collected from Indian Council for Agricultural Research (ICAR) in Kamatchipuram, Theni (District). The pathogen plant was affected by bacterial speck disease. All other herbal plants are collected from same place only.

Preparation of agar medium:

- Triple sugar iron agar 6.5gms in 100ml
- Agar Agar in 3 Gms in 100ml
- Auto clave
- Incubator

Other necessities:

- Micro pipettes
- Petri plates
- Test tubes
- Cotton
- Glass rod
- Conical Flask
- Filter Papers
- Droppers
- Mortar and Pestle
- Surgical Spirit(for Cleaning)

Sterilization: Auto clave is generally used for heat sterilization in which steam is heated to 121–134 °C with proper holding time.

Preparation of crude sample: Crude plant extracts were made by maceration with ethanol, by combining raw materials and thanol solution for 10 min at room temperature. We followed dilution method of agar and disc diffusion method for identification of the activity.

The quantity of microbes were estimated by using the pour plate method. The bacteria containing Pseudomonas syringae was isolated from the infected plant material for incubation in nutrient agar at 37°C. Then the isolated bacteria were maintained in broth culture for further use and the sub-cultures were done weekly. By using agar well diffusion assay antibacterial test was carried out. The following is the result.

3. RESULTS AND DISCUSSION

Table.2. Zone of inhibition of various extracts

Test organism	Drumstick zone of inhibition	Neem zone of inhibition	Guava zone of inhibition	Aloevera zone of inhibition	Tulsi zone of inhibition
Pseudomonas syringae	12 mm	3 mm	9 mm	5 mm	8 mm

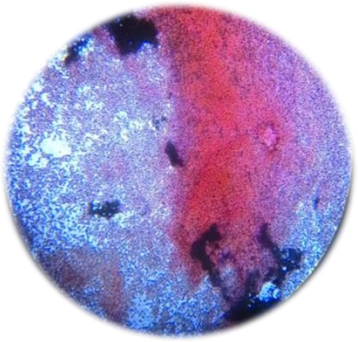

Figure.3.Microscopic view of *Pseudomonas syringae* isolated from affected tomato plant

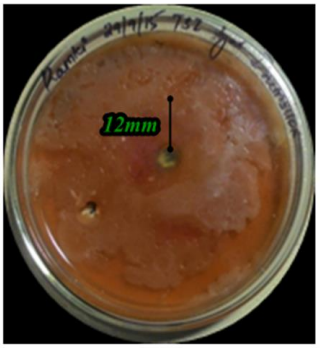

Figure.4.Inhibition zone of Drumstick extract over Pseudomonas syringae

Figure.5. Inhibition zone of Tulsi extract over *Pseudomonas syringae*

Figure.6. Inhibition zone of Aloe vera extract over Pseudomonas syringae

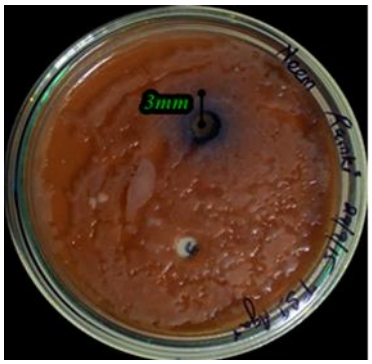

Figure.7. Inhibition zone of Neem extract over *Pseudomonas syringae*

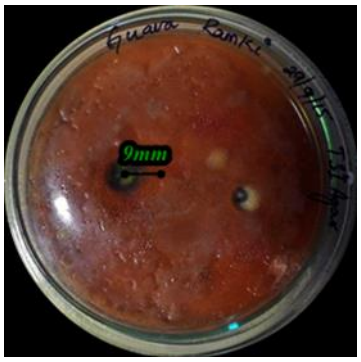

Figure.8. Inhibition zone of Guava extract over *Pseudomonas syringae*

Discussion: The present study shows the antibacterial activity of bacterial speck disease in Lycopersion esculentum (tomato). The disease was caused by pseudomonas syringae. The bacteria was isolated from the pathogen plants leaf extract and confirmed by conventional microbiology method .antibacterial study was carried out by disc diffusion method against by using crude extracts of Neem (Azadirahta indica), Guava (Psidium guajava), drumstick (Moringa olifera), aloe Vera (aloe barbandensis mil), tulsi (Ocimum tenuiflorum).The comparison of antibacterial study has been observed against all extract with the tested bacteria with varied activity .And it shows bacterial sensitivity with that crude extracts and drumstick extracts shows maximum zone of inhibition and this could paved the way to establish some of the compounds that could be used to formulate new patent for antimicrobial drugs of natural origins. In future plan on this project new transgenic plants can be produced.

4. CONCLUSION

Hence this study is the proof that the medicinal plants have antibacterial sensitivity property and why not by we can able to produce variety of new plant drugs form this plants. And my future plan is to create new transgenic plants with this antibacterial resistance sensitivity.

REFERENCES

Amandeep Singh, Ahmed R, Bilal, *In vitro* antibiotic activity of isolated volatile oil of citrus Sinensis, International journal of pharm. Res. and development, 7 (1), 2009, 1-4.

Caroline ML, Vasudevan S, Growth and characterization of bis thiourea cadmium iodide: A semiorganic single crystal, Materials Chemistry and Physics, 113 (42038), 2009, 670-674.

Chanda S , Baravalia Y, Kaneria M and Rakholiya K, Fruit and vegetable peels – strong natural source of antimicrobics, Current Research Technology and Education Topics in Applied Microbiology and Microbial Biotechnology, 2010, 444-450.

Cushnie TP and Lamb AJ, Antibacterial Activity of Flavonoids, International Journal of Antibacterial Agents, 26, 2005, 343-356.

Farag R.S, Badel A.Z.M.A.l & El Baraty G.S.A, Influence of thyme and clove essential oils on cotton seed oil oxidation, 1989, Journal of the American Oil Chemists Society, 66, 1989, 800–804.

Jayalakshmi T, Krishnamoorthy P, Ramesh Kumar G, Sivamani P, Optimization of culture conditions for keratinase production in Streptomyces sp. JRS19 for chick feather wastes degradation, Journal of Chemical and Pharmaceutical Research, 3 (4), 2011, 498-503.

Johann Susana, Pizzolatti Moacir G, Schripsema Jan, Raimundo Braz-Filho, Branco Alexsandro and Artur Smania Jr. Antimicrobial activity of wax and hexane extracts from Citrus spp. peels., Mem Inst Oswaldo Cruz, Rio de Janeiro, 102 (6), 2007, 681-685.

Kaehkoenen M.P, Hopia A.I, Vuolala H.J, Rauh J.R, Pihlaja K, Kujala T.S, Antioxidant activity of plant extracts containing phenolic compounds. Journal of Agricultural and Food Chemistry, 47, 1999, 3952–3954.

Kathy G, Randel B, Peter T & George C.F, Effect of threedifferent preservative systems on the stability of extended dog foodsubjected to ambient and high temperature storage. Journal ofNutrition, 124, 1994, 26385–26425.

Kiyomi K & Yasuko S, Formation of lipid peroxides in processed foods in storage and the inhibitory effects of vitamin A and vitamin E in lipid peroxidation. Kassigeku Kenkyu, 41, 1995, 91–96.

Kohchi Y, Antioxidative activity of spices and herbs. FoodIngredients Journal of Japan, 163, 1995, 44–55.

Kumar K. Ashok, Subanthini A., Jayakumar M, Antimicrobial Activity and Phytochemical Analysis of Citrus Fruit Peels -Utilization of Fruit Waste, 3 (6), 2011, 5414-5421.

Kumar Vivek R, Anti Typhoid Activity of Aqueous Extract of Fruit Peel Citrus sinensis, International Journal of Pharm. Res. And Development, 2 (9), 2010, 217-221.

Kumaravel A, Meetei O.N, An application of non-uniform cellular automata for efficient cryptography", Indian Journal of Science and Technology, 6 (5), 2013, 4560-4566.

Kumaravel A, Pradeepa R, Layered approach for predicting protein subcellular localization in yeast microarray data, Indian Journal of Science and Technology, 6 (5), 2013, 4567-4571.

Langeswaran K, Gowthamkumar S, Vijayaprakash S, Revathy R, Balasubramanian M.P, Influence of limonin on Wnt signalling molecule in HepG2 cell lines, Journal of Natural Science, Biology and Medicine, 4 (1), 2013, 126-133.

Lee Seong, Antimicrobial Property of 2-Hydroxypropane-1,2,3-Tricarboxylic Acid Isolated from Citrus microcarpa Extract, Agricultural Sciences in China, 8 (7), 2009, 880-886.

Leena Sankari S, Masthan K.M.K, Aravindha Babu N, Bhattacharjee T, Elumalai M, Apoptosis in cancer - an update, Asian Pacific Journal of Cancer Prevention, 13 (10), 2012, 4873-4878.

Leena Sankari S, Masthan K.M.K, Aravindha Babu N, Bhattacharjee T, Elumalai M, Apoptosis in cancer - an update, Asian Pacific Journal of Cancer Prevention, 13 (10), 2012, 4873-4878.

Lydia Caroline M, Vasudevan S, Growth and characterization of l-phenylalanine nitric acid, a new organic nonlinear optical material, Materials Letters, 63 (1), 2009, 41-44.

Lydia Caroline M, Vasudevan S, Growth and characterization of pure and doped bis thiourea zinc acetate: Semiorganic nonlinear optical single crystals, Current Applied Physics, 9 (5), 2009, 1054-1061.

Mahida Y,Mohan JSS, Screening of Indian Plant Extracts for Antibacterial Activity, Pharmaceutical Biology, 44, 2006, 627–631.

Mahmud Shahid, Saleem Muhammad, Siddique Saima, Ahmed Rauf, Khanum Razia and Perveen Zahida, Volatile components, antioxidant and antimicrobial activity of Citrus acida var. sour lime peel oil, Journal of Saudi Chemical Society, 13 (2), 2009, 195-198.

Nagarajan C, Madheswaran M, Experimental study and steady state stability analysis of CLL-T series parallel resonant converter with fuzzy controller using state space analysis, Iranian Journal of Electrical and Electronic Engineering, 8 (3), 2012, 259-267.

Nurmahani MM, Osman A, Abdul Hamid A, Mohamad Ghazali F and Pak Dek MS, Antibacterial property of Hylocereus polyrhizus and Hylocereus undatuspeel extracts, International Food Research Journal, 19 (1), 2012, 77-84.

Parthasarathy R, Ilavarasan R, Karrunakaran CM, Antidiabetic activity of Thespesia Populnea bark and leaf extract against streptozotocin induced diabetic rats, International Journal of PharmTech Research, 1 (4), 2009, 1069-1072.

Rajasulochana P, Dhamotharan R, Krishnamoorthy P, Murugesan S, Antibacterial Activity of the Extracts of Marine Red and Brown Algae, Journal of American Science, 5 (3), 2009, 20-25.

Ramaswamy S, Sengottuvelu S, Haja Sherief SH, Jaikumar S, Saravanan R, Prasadkumar C, Sivakumar T, Gastroprotective activity of ethanolic extract of Trachyspermum ammi fruit, International Journal of Pharma and Bio Sciences, 1(1), 2010.

Saravanan T, Saritha G, Udayakumar R, A Robust H-infinity two degree of freedom control for electro magnetic suspension system", Middle - East Journal of Scientific Research, 18 (12), 2013, 1827-1831.

Saravanan T, Srinivasan V, Sandiya V.P, A two stage DC-DC converter with isolation for renewable energy applications, Indian Journal of Science and Technology, 6 (6), 2013, 4824-4830.

Siddique Saima, shafique Muafia, Parveen Zahida, Khan Shaista Jabeen and Khanum Razia, Volatile components, antioxidant and antimicrobial Activity of Citrus aurantiumvar, Bitter orange peel oil, Pharmacology, 2, 2011, 499-507.

Srinivasan V, Saravanan T, Analysis of harmonic at educational division using C.A. 8332", Middle - East Journal of Scientific Research, 16 (12), 2013, 1768-1773.

Udayakumar R, Khanaa V, Kaliyamurthie K.P, High data rate for coherent optical wired communication using DSP, Indian Journal of Science and Technology, 6 (6), 2013, 4772-4776.