Available online on www.ijppr.com
International Journal of Pharmacognosy and Phytochemical Research 2014; 6(1); 7-10

ISSN: 0975-4873

Research Article

Phytochemical Screening and Antimicrobial Activity of *Thespesiapopulnea*linn

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Available online: 15th February 2014

ABSTRACT

The current study was carried out to determine the phytochemicals and antimicrobial activity of *Thespesiapopulnea*. Here the antimicrobial activity of *thespesiapopulnea* was studied by analyzing it under various conentrations. At higher concentrations extract from petroleum ether of *Thespesiapopulnea* showed significant antimicrobial activity against Escherichia coli, kebsiella sp., pseudomonas sp., and bacillus subtilis. The antimicrobial activity of the plant extract was tested by well diffusion assay and thereby measuring the zone of inhibition (ZOI).

Keywords: phytochemical, antimicrobial activity, well diffusion assay, *Thespesiapopulnea.*

INTRODUCTION

There are enormous amount of plants in South India which has numerous medicinal values in it. One such plant is *Thespesiapopulnea*. The word thespesia means 'devine' and populnea means 'like leaves'. *Thespesiapopulnea* belongs to the family malvaceae. This is a quick grown and evergreen tree which have a pointed heart shaped leaves and cup shaped yellow flowers throughout the year. This is also called as umbrella tree. This is predominant in coastal belts. *Thespesiapopulnea* has been traditionally used for ring worms, insect bites,psoriasis, scabies, sprains, wart removal,ranikhet disease virus, antiinflammations, and unripe fruits are used to treat piles. The major constituents present in *thespesiapopulnea* are terpenoids, lipids, glycosides, flavonoids.The aim of this work is to screen the phytochemicals present and to determine the antibacterial and antifungal activity of *thespesiapopulnea.*

MATERIALS AND METHODS

Collection and processing of plant leaves: Fresh leaves of *Thespesiapopulnea* were collected from the village near madhuranthagam. The leaves of the plant was washed under the tap water and shade dried for 10 to 12 days. Now the leaves of the plant was made into a coarse powder. The powdered form of plant leaves was stored for futher use.

Preparation of extract: 10 grams of powdered plant leaves was taken and 100ml of solvent was added and kept overnight in the shaker. The extract is filtered.again the solvent is added and kept in the shaker for 7 hours. In this way the plant extract is collected and stored in the air tight container for futher use.

Preliminary phytochemical analysis: The crude extract of Thespesia populnea was tested for the presence of phytochemicals using standard qualitative procedure.

Test for Carbohydrates: 1ml of different crude extract was dissolved in 10ml of distilled water and filtered. The filtrate underwent molish's test to confirm the presence of carbohydrates.

Molish's test: The filtrate was treated with 2ml of concentrated sulphuric acid along the sides of the test tube. Appearance of violet colour ring at the junction of the two liqud shows the presence of carbohydrates.

Test for Glycosides: A small portion of different crude extract were hydrolyzed with hydrochloric acid for few hours on water bath and the hydrolysate was collected.

Fehling's test: 2ml of extract was taken in a test tube. 1ml of fehling's A solution and 1ml of fehling's B solution was added to the extract, mixed well and boiled. Appearance of yellow or red colour precipitate indicates the presence of glycosides (reducing sugar).

Test for Alkaloids: A small portion of crude extract was stirred separately with few drops of dilute hydrochloric acid and filtered. The filtrate was treated with Dragandroff's reagent. Appearance of organic orecipitate indicatesthe presence of alkaloids.

Test for Proteins: A small portion of crude extract was dissolved in few ml of distilled water and it was subjected to Xantho protein test to confirm the presence of protein.

Xantho test: Take 3ml of extract to which 1ml of concentrated nitric acid was added.a white precipitate was obtained. The solution was heated for 1minute and cooled under the tap water. 40% of NaOH was added to the solution. Appearance of orange colour indicates the presence of protein.

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Test for Phenolic compounds and Tannins: A small portion of crude extract was dissolved in few ml of distilled water and subjected to $FeCl_3$ test.

$FeCl_3$ test: To few ml of extract 5% $FeCl_3$ was added. Appearance of violet colour indicates the presence of phenolic compounds and tannins.

Test for Flavonoids: The crude extract was treated with concentrated sulphuric acid. Appearance of yellowish orange colour indicates the presence of anthocyanin, on futher adding yellow turns to orange which indicates the presence of flavones, on futher adding turns to crimson which indicates the presence of flavonones.

Test for Terpenoids: 2ml of crude extract was dissolved in 2ml of chloroform to which 2ml of sulphuric acid was added and then heated for 2minutes. Appearance of grayish colour indicates the presence of terpenoids.

Test for Steroids: 2ml of extract was dissolved in 2ml of chloroform and 2ml of sulphuric acid was added. A red colour ring formed at the junction of two layer indicates the presence of steroids.

Test for Phlobatannins: 2ml of extract was taken to which 2ml of 1% HCl was added and boiled. Formation of red precipitate indicates the presence of phlobatannins.

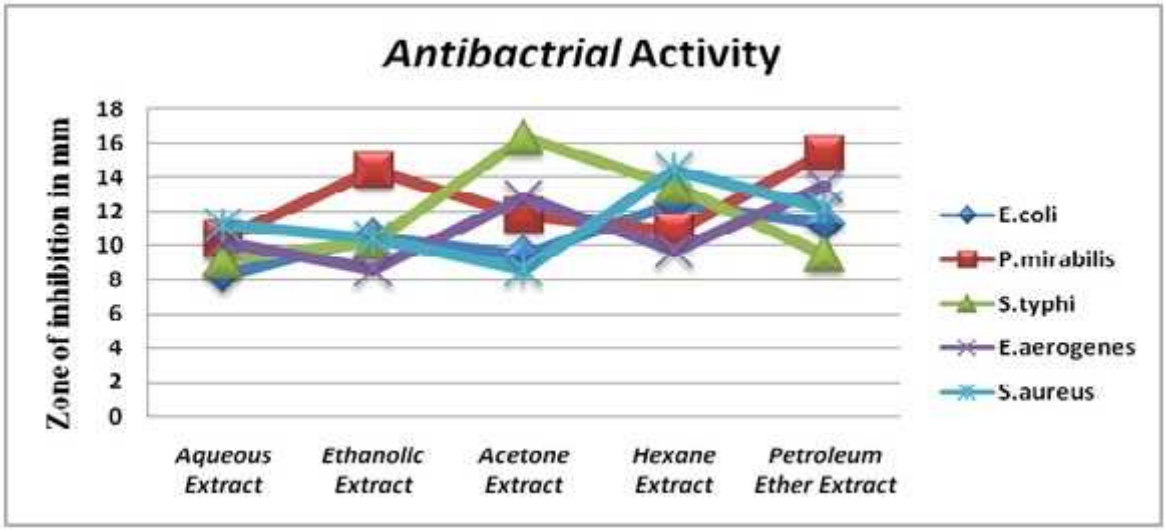
Determination of Antibacterial activity: Antibacterial activity of plant extract was dtetermined by well diffusion method. The bacterial strain as inoculated into the broth and incubated at 37 C for 7 to 8 hours. A sterile cotton swab was immersed into the bacterial culture and swabbed on the surface of sterile plates in an uniform manner. Wells were created and plant extract was injected into the wells with different concentrations. The plates were left in the incubation at 37 c for overnight. Antibacterial activity of the plant extract was determined by measuring the Zone Of Inhibition (ZOI).

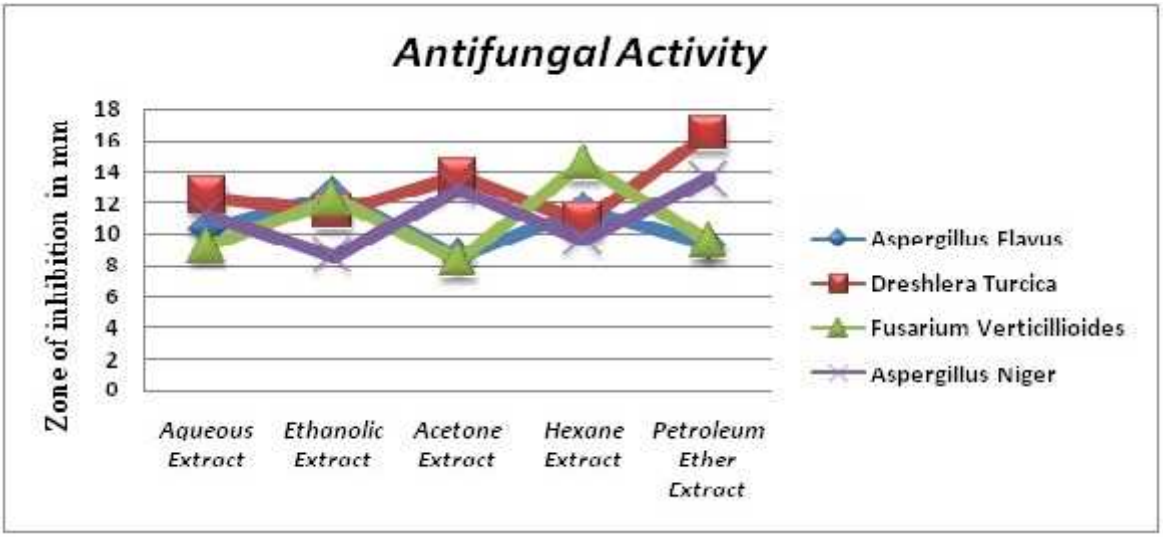
Determination of Antifungal activity: The antifungal activity of the plant extract was determined by disc diffusion method. The fungal culture was inoculated into the plates. The disc of different concentration was immersed into the plates. The plates were left for 3 days in incubation at 28 C. Antifungal activity of the plant extract was determined by measuring the Zone Of Inhibition (ZOI).

RESULT

Phytochemical Analysis

The phytochemical analysis carried out on Thespesia populnea confirmed the presence of





REFERENCE

1. Ali Yildirim, Manir Oktay, Vahit bilaloglu (2001). The antioxidant activity of the leaves of *Cydonia vulganis*. Tr. J. Med. Sci. 31: 23-27.
2. Arokiyaraj S, Martin S, Perinbam K, Marie Arockianathan P and Beatrice V (2008) Free radical scavenging activity and HPTLC finger print of Pterocarpus santalinus L. – an invitro study. Indian J. Sci. Technol. 1 (7), 1-7. Domain site: http://www.indjst.org.
3. Ateb DA and ErdoUrul OT (2003) Antimicrobial activities of various medicinal and commercial plant extracts. Turk. J. Biol. 27, 157-162.
4. Bailey, L.H. (1978). The standard Encylopedia of Horticulture Vol II, Mac Milan.
5. Brindha V, Saravanan A and Manimekalai R (2009) Drug designing for ring finger protein 110 involved in adenocarcinoma (human breast cancer) using casuarinin extracted from Terminalia arjuna. Indian J. Sci. Technol. 2 (2), 22-26. Domain site: http://www.indjst.org.
6. Chopra, R.N., Nayar, S.L. and Chopra, I.C. (1956). Glossary of India Medicinal Plants. India, CSIR, p. 171.
7. Chung, K.T., W.R. Thomasson and C.D. Wu-Yuan, 1990. Growth inhibition of selected food-borne bacteria, particularly *Listeria monocytogenes*, by plant extracts. J. Appl. Bacteriol. 69: 498-503.
8. De Silva, L.B., De Silva, U.L.L, Mahendran, M. and Jennings, R.C. (1980). 4'-Hydroxy-3,5,6,7,3',5'-hexamathoxyflavone from *Murraya paniculata*. Phytochemistry. 19: 2794.
9. Gangadevi V, Yogeswari S, Kamalraj S, Rani G and Muthumary J (2008). The antibacterial activity of Acalypha indica L. Indian J. Sci. Technol. 1 (6), 1-5. Domain site: http://www.indjst.org.
10. Ghani, A. (2003). Medicinal Plants of Bangladesh: Chemical constituents and Uses. Second edition. Dhaka. Asiatic Society of Bangladesh, 309-310.
11. Hoffman BR, Delas Atlas H, Blanco K, Wiederhold N, Lewis RE, Williams L (2004). Screening of antibacterial and antifungal activities of ten medicinal plants from Ghana. J. Pharm. Biol. 1(42): 13-17.
12. Ibrahim MB (1997) Anti-microbial effects of extract leaf, stem and root bark of Anogeissus leiocarpus on Staphylococcus aureaus, Streptococcus pyogenes, Escherichia coli and Proteus vulgaris. J. Pharma. Devpt. 2, 20-30.
13. Jagadish L, Anand Kumar VK and Kaviyarasan V (2009) Effect of Triphala on dental bio-film. Indian J. Sci. Technol. 2 (1), 30-33. Domain site: http://www.indjst.org.
14. Kinoshita, T. and Firman, K. (1996). Highly Oxygenated Flavonoids from *Murraya paniculata*. *Phytochemistry*, 42: 1207-1210.
15. Kinoshita, T., Tahara, S., Ho, F.C. and Sakawa, U. (1989). 3-Prenylindoles from *Murraya paniculata* and Their Biogenetic Significance. *Phytochemistry*. 28(1): 147-151.
16. Mahesh B and Satish S (2008) Antimicrobial activity of some important medicinal plant against plant and human pathogens. World J. Agri. Sci. 4 (S), 839-843.
17. Maheshwari JK, Singh KK and Saha S (1986) Ethnobotany of tribals of Mirzapur District, Uttar pradesh, Economic Botany Information Service, NBRI, Lucknow.
18. Mann A, Banso A and Clifford LC (2008) An antifungal property of crude plant extracts from Anogeissus leiocarpus and Terminalia avicennioides. Tanzania J. Health Res. 10 (1) 34-38.
19. Matook Sait Mokbel, (2005)Hashinaga. Antioxidant activities of Banana (*Musa* AAA *cv. Cavendish*) fruids peel. Am. J. Biochem. Biotechnol.1 (3):126-132.
20. Milind Pande, Sanjay Ingale and Suryaprakash Gupta (2009) The Pharmacognostic and phytochemical studies on the leaves of Murraya koenigii (L) Spreng. Indian J. Sci. Technol. 2 (3), 53-54. Domain site: http://www.indjst.org.
21. Mistuda H, Yuasumoto K, Iwami (1996). Antioxidation action of Indole compounds during the autoxidation of linoliec acid. Nihon Eiyo Shokuryo Gakkai-Shi. 19: 210-214.
22. Negi KS, Tiwari JK and Gaur RD (1993) Notes on ethno botany of five districts of Garhwal Himalaya, Uttar pradesh, India. Ethno Botany. 5,73-81.
23. Parotta, J.A. (2001). Healing Plants of Peninsular India New York, CABI Publishing, p. 917.
24. Perez C and Paul M and Bezique P (1990) An Antibiotic assay by the agar well diffusion method. Alta Biomed. Group Experiences. 15, 113.
25. Rahman, A.U., Shabbir, M., Sultani, S.Z., Jabbar, A. and Choudhary, M.I. (1997). Cinnamates and Coumarins from the Leaves of *Murraya paniculata*. *Phytochemistry*. 44(4): 683-685.
26. Reddy PS, Jamil K and Madhusudhan P (2001) Antibacterial activity of isolates from Piper longum and Taxus baccata. Pharma. Biol. 39, 236-238.
27. Sastri, B.N. (1962). The Wealth of India: New Delhi. Council of Scientific and Industrial Research, Vol VI, p. 446.
28. Satish S, Raghavendra MP, Mohana DC and Raveesha KA (2008) Antifungal activity of a known medicinal plant Mimusops elengi L. against grain moulds. J. Agri. Technol. 4(1), 151-165.
29. Shanmugavalli N, Umashankar V and Raheem (2009) Anitmicrobial activity of Vanilla planifolia. Indian J. Sci. Technol. 2 (3), 37-40. Domain site: http://www.indjst.org.
30. Sukari, M.A., Azziz, S.S.S.A., Rahmani, M., Ali, A.M., Aimi, N. and Kitajima, M. (2003). Polysubstituted Flavonoid from the Leaves of *Murraya paniculata* (Rutaceae). Natural Product Science. 9(2): 56-59.
31. Swarna Latha L and Neelakanta Reddy P (2009) Antimicrobial, antidiarrhoeal and analysis of phytochemical constituents of Sphaeranthus amaranthoides. Indian J. Sci. Technol. 2 (3), 45-48. Domain site: http://www.indjst.org.

32. Taylor RSL, Manandhar NP and Hudson JB (1996) Antiviral activities of Nepalese medicinal plants. J Ethnopharmacol. 52,157-163.
33. Vetrivel Rajan A, Shanmugavalli N, Greety Sunitha C and Umashankar V (2009) Hepatoprotective effects of Cassia tora on CCl4 induced liver damage in albino rats. Indian J. Sci. Technol. 2 (3), 41-44. Domain site: http://www.indjst.org