Original Research Paper

Volume-8 | Issue-1 | January-2018 | PRINT ISSN - 2249-555X

Biological Science

EFFECT OF TEMPERATURE AND PH ON ANTIBACTERIAL ACTIVITY OF PLANT EXTRACT (MURRAYA KOENGII) IN SOME SELECTED SOLVENT FOR SOME SELECTED BACTERIA

Shailendra Yadav* Assistant professor Department of chemistry basic science AKS university satna (M.P.) *Corresponding Author

Nahid Usmani Mirza Assistant professor Department of chemistry basic science AKS university satna (M.P.)

ABSTRACT The basic aim of the present study to evaluate the antimicrobial activity of Murraya koengii plant extract (root, leave, bark)at different pH and temperature for bacterial species E. coli, K. pneumoniae and Rizobium. Antibacterial activity of acetone extract expressed a slight increment with increment in PH (basic medium) for E.coli, while in case of K. pneumoniae and Rhizobium, increment in antibacterial activity found at low pH (acidic medium). In ethanol extract as the acidity increased, there was a slight increase in zone of inhibition for all three species .water extract did not give more specific result, antibacterial activity of water ,ethanol, and acetone extracts were stable at high temperature[70˚c,100˚c]..

KEYWORDS : Murraya Koengii, antibacterial activity, pH, plant extract.

Introduction- The plant Murraya Koengii also called as "Meethi Neem", belongs to family Rutaceae. In India it is found everywhere in its territory but very common in states of south India and northern states, including Madhya Pradesh and Uttar Pradesh. Murraya koengii plant traditionally used as tonic, anthelmintic, analgesic, piles reduces inflammation, itching, diarrhea, dysentery and insects bites. The green leaves used in making curry and other dishes numerous aromatic spicy and medicinal plants have been examined for their antioxidant potential (Chan, et.al, 2007).many plant components are now isolated which show antibacterial activity. It is estimated that 70-80% of people meet their primary health care needs mostly by using herbal medicine.[1] In ayurvedic , unani and homeopathic drugs field are primarily covered by medicinal plant in Indian sub continent.

The antibacterial activity of aqueous and Ethanolic extract of Murraya koengii against urinary tract infection causative pathogens p. areuginosa K. pneumonia and e. coli by disc diffusion method is well known [2]. M. koengii leaves shows antibacterial effect against bacillus substilis, streptococcus aurous, corny bacterium pyogenes, and mycobacterium tuberculosis [3].

Medicinal plant have some as a models for many clinically proven drugs ,and are now being reassessed as antimicrobial agent[20].mature leaves contains 63.2%mosture, 1.5% total nitrogen,6.15% fat,18.92% total sugar ,14.62% starch,6.8% crude fiber ash 13.06%, acid insoluble ash 1.35% , alcohol soluble extractive 1.82% , cold water extractive 27.33% and maximum of hot water extractive 33.45% constituents.

The aim of this work to find out the optimum condition of temperature and pH at which Murraya Koengii extract is more effective against Rhizobium K. pneumonia and e. coli.

EXPERIMENTAL SECTION

Material and methods-The Murraya koengii leaves, root, bark are collected from the herbal garden of AKS university satna [M.P.] and authenticated in department of biotechnology of AKS university satna.

Selected bacterial species – Rhizobium, K. pneumonia and e. coli. Obtained from the department of biotechnology of AKS university satna [M.P.].

Preparation of extract- the fresh leaves, roots, bark were washed with distilled water and air dried to constant weight for six days. The dried material was grinded and the bioactive components were extracted by soaking 12gm of leave powder in 100ml of each selected solvent at 25˚c. After three days extracts were filtered and filtrate were concentrated in vacuo at 35˚c (Akerele.et al, 2008).

Test for phytochemical constituents – The extracts were subjected to standard phytochemical analysis for different constituents such as tannins, alkaloids, flavonoids, quinones, glucosides, Saponins ,sugars, as described by [Jigna. et al ,2006].

Effect of Ph on antibacterial activity of extracts of Murraya koengii- To find out the effect of ph the each extracts [water, ethanol, acetone] having concentration 250µg/ml were taken in three set of test tubes and 1N HCl added drop wise until the ph of extract is 2 and 5 [ph is determined by systronic digital ph meter 802] increment in pH in every extract is done by using 1N NaOH in three separate test tubes and extracts were then allowed to soaks for one 1 hr. after that period of acid base treatment the extracts were again neutralized with using 1N HCl and 1N NaOH and then every extracts were tested for antibacterial activity by using agar disc diffusion method.[Doughari. et al ,2007].

Effect of temperature-
The antibacterial activity of extract of Murraya koengii 10 ml of 250mg/ml concentration of water, ethanol and acetone extracts were taken in test tubes and treated at 70˚c and 100˚c in a water bath for 1 hr. and then tested for antibacterial activity.

Table 1 – Table for antibacterial activity of water extract at different pH and temperature.

WATER EXTRACT									
Test for phytochemical	protein	glycoside	tannin	Steroid	Alkaloids	flavonoids	Saponins	sugar	quinone
	+	++	++	+	+	++	++	++	-
Bacterial strain	INHIBITION ZONE (m.m.)								
	Effect of PH					Effect of temperature			
	Original PH=6.3	PH=2.0	PH=5.0	PH=8.0		Original temperature 25˚c	70˚c	100˚c	
E.coli	6mm	6.5mm	6mm	6mm		6mm	6mm	6.5mm	
K.pneumoniae	9mm	10mm	10mm	9mm		9mm	10mm	9mm	
Rhizobium	12mm	12mm	13mm	11mm		12mm	12mm	13mm	

Table 2 – Table for antibacterial activity of ethanol extract at different pH and temperature.

ETHANOL EXTRACT									
Test for phytochemical	protein	glycoside	tannin	Steroid	Alkaloids	flavonoids	Saponins	sugar	quinone
	++	+	+	+	++	++	++	+	-
Bacterial strain	INHIBITION ZONE (m.m.)								
	Effect of PH					Effect of temperature			
	Original PH=6.0	PH=2.0	PH=5.0	PH=8.0		Original temperature 25˚c	70˚c	100˚c	
E.coli	9mm	11mm	10mm	7mm		9	10	11	
K.pneumoniae	17mm	13mm	17mm	15mm		17	19	20	
Rhizobium	12mm	14mm	13.5mm	10mm		12	12	13.5	

Table 3– Table for antibacterial activity o acetone extract at different pH and temperature.

ACETONE EXTRACT									
Test for phytochemical	protein	glycoside	tannin	Steroid	Alkaloids	flavonoids	Saponins	sugar	quinone
	+	-	+	+	++	-	-	+	++
Bacterial strain	INHIBITION ZONE (m.m.)								
	Effect of PH						Effect of temperature		
	Original PH=4.8	PH=2.0		PH=5.0	PH=8.0		Original temperature 25˚c	70˚c	100˚c
E.coli	13mm	13mm		14mm	15mm		13	13.5	13.5
K.pneumoniae	14mm	17mm		15mm	13mm		14	15	16
Rhizobium	12mm	15mm		13mm	10mm		12	13	13

Result and discussion- The plant extract [root, bark, leaves] of Murraya koengii in water, ethanol and acetone gave pronounced antibacterial activity. It was due to presence of, phyto constituent's like tannins, glycosides, Saponins, quinines etc. The high antibacterial activity against selected bacterial species found in ethanol and acetone extracts. This result was not changed when extracts were treated in different pH and temperature condition.

Conclusion- Murraya koengii extracts showed antibacterial study in different condition of pH[acidic and basic] and temperature [70˚c,100˚c].In acetone extract antibacterial activity was increased in basic media for E.coli while for k. pneumonia and Rhizobium increased in acidic media [low pH]. Antibacterial activity of ethanol extract was more at low pH [acidic] while water extract did not give specific result. In all the extracts antibacterial activity were maintained after treating them at higher temperature [70˚c, 100˚c].and expressed a slight increment in activity at higher temperature.

REFERENCES

1) Harish K Handral1, Anup Pandith2 and Shruthi sd3* at al. (2012) Reported: - a review on murraya koenigii: multipotential medicinal plant
2) Gabriel Charles Disegha1 Vincent Onuegbu Izionworu at al. (2014) Reported :- Antifungal Activities of Curry Leaf (Murraya Koengii) Extract onSome Selected Fungi
3) M.Prabakaran1,P.Sangeetha1,V.Ranganatha, N.Punniyamoorthy2 and K.Rameshkumar1* at al. (2013) Reported phytochemical screening and antibacterial activity of murraya koenigii (l.) Against escherichia coli, klebsiella pneumoniae and staphylococcus aureus.
4) Akerele jo,ObasuyiO, Ebomoyi. MI,Oboh IE,,Uwumarongie OH(2008).antimicrobial activity of ethanol extract and fraction of seeds of garsenia kola heckle . AfrI.J.Biotechnol.7(2):169-172.
5) Doughari J.H,EI-Mahmood A M, Manzara S(2007).studies on antibacterial activity of root extract of carica papaya L. Afri. J.Microbiol.Res.037-041.
6) Jigna P, .Nehal K, Sumitra C.(2006). Evaluation of antibacterial and phytochemical analysis of Bauhinia variegate L. bark.Afri J.Biomed.Res. 9(1):53-56.
4) Gabriel Charles Disegha1 Vincent Onuegbu Izionworu et al. Antifungal Activities of Curry Leaf (Murraya Koengii) Extract on Some Selected Fungi. Chemistry and Materials Research Vol.6 No.11, 2014.
5) Vaibhav M. Darvekar,Vijay R. Patil and Amol B. Choudhari et al. Anti-inflammatory activity of Murraya koenigii Spreng on experimental animals. Scholars Research Library J. Nat. Prod. Plant Resour., 2011, 1 (1): 65-69
6) Swee Keong Yeap, Nadiah Abu, Nurul Elyani Mohamad, Boon Kee Beh, et al Chemopreventive and immunomodulatory effects of Murraya koenigii aqueous extract on 4T1 breast cancer cell-challenged mice. BMC Complementary and Alternative Medicine (2015) 15:306.
7) Manvi malwal and renu sarin et al. Antimicrobial efficacy of murraya koengii (linn.)sprng. root extract. Indian journal of natural product and resources vol. -2(1) march -2011 pp-48-51.
8) Dr.S.Vijayanand and Dr.E.G.Wesely et al. Antimicrobial and antioxiden activity of melia azadirachta and murraya koengii. International Journal of Pharma Sciences and Research (IJPSR) Vol 5 No 12 Dec 2014
9) Mohammad Danish, Hisamuddin and Meraju Islam Robab et al In Vitro Studies on Phytochemical Screening of Different Leaf Extracts and Their Antifungal Activity against Seed Borne Pathogen Aspergillus niger. J Plant Pathol Microbiol 2015, 6:11 Volume 6
10) Mohar Singh Argal, Sanjay Kumar, Hotam Singh Choudhar , Ravindra M Thakkar Santosh K Verma, Chandrabhan Seniya et al The efficacy of Murraya koenigii leaf extract on some bacterial and a fungal strain by disc diffusion method. Journal of Chemical and Pharmaceutical Research 2011, 3(5):697-704
11) Mohamed Sham Shihabudeen. H ,Hansi Priscilla. D, Kavitha Thirumurugan et al (2010) Antimicrobial activity and phytochemical analysis of selected Indian folk medicinal plants. International Journal of Pharma Sciences and Research (IJPSR) Vol.1(10), 2010, 430-434.