International Journal for Pharmaceutical Research Scholars (IJPRS)

V-2, I-4, 2013 ISSN No: 2277 - 7873

RESEARCH ARTICLE

Antimicrobial Activity of Euphorbia Thymifolia Linn. Against Superficial Dermatological Pathogens

Dr. Bibhuti Bhusana Panigrahi[*1], Pradipta Ranjan Behera[1], Kumar Vikram[1], Rajendra Kumar Rath[1], Sachidananda Behera[2]

[1]*Hi-Tech College Pharmacy, Hi-Tech Medical College & Hospital Campus, Bhubaneswar-751025.*

[2]*NIPER, Hajipur-844101, Bihar, India.*

Manuscript No: IJPRS/V2/I4/00275, Received On: 30/12/2013, Accepted On: 31/12/2013

ABSTRACT

Extracts of Euphorbia Thymifolia Linn (family-Euphorbiaceae) were investigated for antibacterial activity against Staphylococcus aureus, Streptococcus pyogenes, Enterococcus faecalis, Propionibacterium acnes, Klebsiella pneumoniae and Pseudomonas aeruginosa and antifungal activity against Candida albicans, C. tropicalis, C. krusei, Cryptooccus marinus, Microsporum gypseum, Trichophyton rubrum, Epidermophyton floccosum and Aspergillus niger at 1000 µg/disc using disc diffusion method to optimize the most effective extract. Benzene extract exhibited significant zone of inhibition against bacteria in comparison to chloroform and ethanol (95%) extracts. Ethanol (95%) extract exhibited significant broad spectrum antifungal activity. An attempt has been made to compare the activity of extracts with standard antimicrobials against selected dermatological pathogens.

KEYWORDS

Euphorbia Thymifolia, Antibacterial, Antifungal, Zone of Inhibition

INTRODUCTION

Euphorbia thymifolia Linn (Euphobiaceae) is a small much branched more or less pubescent prostate annual herb with divaricated branches found throughout India on plains and wet lands[1]. The plant is useful in curing skin diseases, purification of blood, cure of worm infections, asthma and other respiratory disease[2]. Leaf paste is applied in mouth of children to treat stomatitis[3]. Antimicrobial activity of leaves against few common pathogens has been reported[4,5]. The present study is intended to determine the antimicrobial activity of the whole plant against specifically selected dermatological pathogens and compare it with the standards.

***Address for Correspondence:**
Dr.Bibhuti Bhusana Panigrahi
Professor of Pharmaceutics
Hi-Tech College of Pharmacy
Pandra, Raulgarh, Bhubaneswar-751025,
Odisha, India.
E-Mail Id: drbbpanigrahi@gmail.com

MATERIALS AND METHOD

The whole plants of Euphorbia thymifolia Linn. Cut at the base of the stem above earth level were collected during the month of the November from wet lands of Bhitarkanika Wild Life Sanctuary in Kendrapada District, Orissa. The herb was authenticated in Central Research Institute (Ayurveda), Bhubaneswar. The plant was collected in bulk, washed under running tap water to remove adhering dust, dried under shade and powdered with the help of a mechanical grinder. The coarse powder was then extracted successively in Soxhlet apparatus using petroleum ether (PE), benzene (BN), chloroform (CL), ethanol 95% (ET) and purified water (AQ). The extracts were filtered and

concentrated to dryness under vacuum. The in-vitro antimicrobial screening was carried out using selected superficial dermatological pathogens including bacteria such as Staphylococcus aureus (Sa), Streptococcus pyogenes (Sp), Enterococcus faecalis (Ef), Propionibacterium acnes (Pac), Klebsiella pneumoniae (Kp) and seudomonas aeruginosa (Pa) and fungi such as Candida albicans (Ca), C. tropicalis (Ct), C. krusei (Ck), Cryptooccus marinus (Cm), Microsporum gypseum (Mg), Trichophyton rubrum (Tr), Epidermophyton floccosum (Efl) and Aspergillus niger (An) obtained from M.T.C.C. Institute of Microbial Technology, Chandigarh, and standard laboratory maintained in the Dept. of Microbiology, Hi-Tech Medical College, Bhubaneswar.

RESULTS AND DISCUSSION

Antimicrobial activity of the extracts were tested separately using disc diffusion method[6,7]. 100 mg/ml solutions of respective extract were prepared by dissolving in 6% DMSO.

Paper discs of 6mm dia. (Whatmann No.1) were sterilized, impregnated with 10µl (1000µg /disc.) of 6% DMSO stock solution of extracts, dried and placed on the surface of inoculated petri plates (for bacteria Nutrient agar plates, for P. acnes Thyoglycolate agar plate and for fungi Sarboud's dextrose agar plates were prepared and sterilized. Plates were inoculated using corresponding broth cultures of bacteria and yeast like fungi by cotton swab whereas for mycelial fungi using subcultures from previously subcultured SDA plates with the help of sterile forceps). Discs of standards (HiMedia, Bombay) such as ciprofloxacin (CF) 10µg for bacteria and clotrimazole (CL) 10µg for fungi were similarly placed on respective plates. The plates were kept for incubation at 37^0 C for 24 hr. for bacteria and at 28 $\pm$ 2^0 C for 72 hr. for fungi. The assessment of antimicrobial activity was based on the measurement of diameter of zone of inhibition formed around the disc. The tests were carried out in aseptic environment and in triplicate and average values of overall observations were recorded in table-1 and shown in fig.1.

Table-1: Zone of Inhibition of various extracts of Euphorbia thymifolia and Standards

Extract 1000 µg / disc & Standards (10µg /disc)	Zone of Inhibition (in mm)													
	Bacteria						Fungi							
	Sa	Sp	Ef	Pac	Kp	Pa	Ca	Ct	Ck	Cm	Mg	Tr	Efl	An
PE	12	9	8	16	9	12	18	17	19	12	11	7	12	11
BN	13	16	17	22	19	24	16	16	17	7	--	--	11	12
CL	9	13	17	17	7	20	12	16	13	11	7	--	7	9
ET	12	8	7	17	11	13	23	22	20	18	12	16	13	17
AQ	--	12	--	13	8	7	9	--	--	15	11	7	--	--
CF	29	21	36	26	36	33	--	--	--	--	--	--	--	--
CL	--	--	--	--	--	--	24	21	20	12	20	18	21	22

—No zone observed, CF – Ciprofloxacin, CL-Clotrimazole

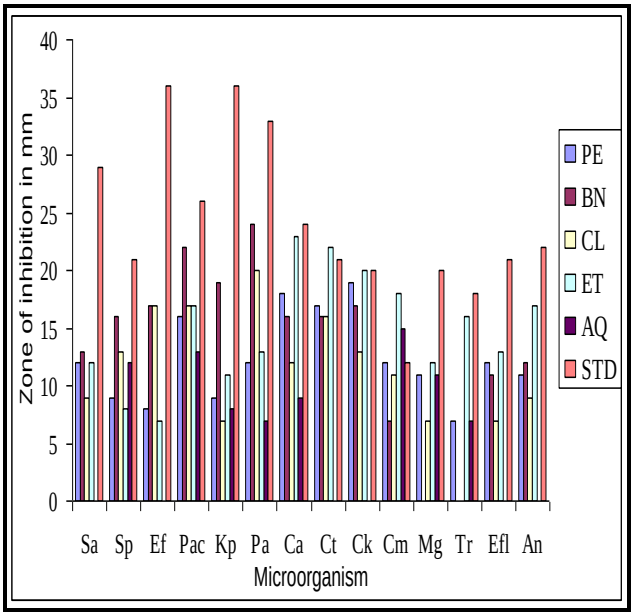

Figure 1: Histogram depicting the comparative zone of inhibition of extracts Euphorbia thymifolia Linn. and standards: antibacterial- ciprofloxacin; antifungal- clotrimazole

Table-1 shows the overall effect of different extracts of whole plant of Euphorbia thymifolia Linn. Benzene extract showed significant activity against all the bacteria as compared to the standard. Chloroform and ethanol extracts showed moderate effect where as aqueous extract the least. Similarly ethanol extract showed maximum antifungal activity against all fungi with higher activity against yeast like fungi than mycelial fungi. Pet. ether extract showed moderate activity where as other extracts showed least activity.

CONCLUSION

These results suggest the presence of separate active principles having antibacterial and antifungal activities in the plant. Further studies aimed at development of herbal creams of the active extracts.

ACKNOWLEDGEMENT

The authors are thankful to Mr. Suresh Kumar Panigrahi, Director, Hi-Tech Group of Institutions, Hi-Tech Medical College & Hospital Campus, and Bhubaneswar – 25, Odisha for providing the necessary facilities to carry out this work.

REFERENCES

1. Kirtikar KR, Basu BD, Indian Medicinal Plants, vol-III, International Book Distributors, Dehradun, India, 1976, 2195-2210.
2. Bhattacharjee SK, De LC, Medicinal Herbs and Flowers, 1st. Edn., Aavishkar Publishers and distributors, Jaipur, India, 2005, 327.
3. Maheswari JK, Ethnobotany and Medicinal Plants of Indian Sub-continent, scientific publishers, Jodhapur, India, 2000, 242, 655.
4. Khan, NH, Rahman M, Kamal Nur-E, Antibacterial activity of Euphorbia thymifolia Linn., Indian Journal of Medical Research, 1988, 87, 395-397.
5. Serrano LG, Plantes Medicinales et phytotherapie, 1988, 22(4), 254-260.
6. Murray PR, Baron EJ, Ptaller MA, Tenover FC, Yolke RH, Manual of Clinical Microbiology, 1995, 6, 45.
7. Bauer, AW, Kirby WMM, Scherris, JC, American Journal of Clinical Pathology, 1966, 36, 493.

