Studies on antibacterial activity of some fungi collected from K.R.P Dam, Krishnagiri (TN)

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Abstract— **The present study deals with the antibacterial activity of fungi collected from K.R.P dam, Krishnagiri. The three fungal species were isolated on potato dextrose agar [PDA] amended with streptomycin. Isolated three fungal species were tested for its antibacterial activity against three human bacterial pathogens. Aspergillus niger was found to be an active against some human pathogenic strains.**

Index Terms— **Antibacterial activity, *Aspergillus niger,* KRP Dam, PDA**

I. INTRODUCTION

Nowadays bacteria become more resistant to antibiotics and thus compounds having antibacterial activity should be more identified. The biologically active secondary metabolites including antitumour, antibacterial, antifungal, antiviral and enzyme inhibitor compounds and other pharmacological activities [1,2].

Fungi produce a vast range of secondary metabolites. Some of these are high value products with pharmaceutical application such as Penicillin. More specifically the fungi isolated from water have profilic resources of natural products [3].

The fungi isolated from the water have proved to be a rich source of new biologically natural products because of their particular living condition, salinity, nutrition, pressure, temperature variation and competition with bacteria , virus and other fungi.

Overall research on fungi isolated from water led to the discovery of 272 new natural products until 2004. Hence the present study deals with the antibacterial activity of fungi isolated from Krishnagiri Reservoir Project (KRP- Dam), Krishnagiri.

II. MATERIALS AND METHODS

Isolation of fungi

The sample was collected during the month of January 2013. The water sediment samples were collected in polythene bags and water is added to maintain moisture content. The bags were tied and incubated at room temperature for 7 days. The sedimented samples were used for identification of fungal population and analysed on potato dextrose agar supplemented with streptomycin 100mg/l to avoid bacterial growth [4, 5]. Then the 0.5 ml of inoculums from undiluted sample was inoculated by spread plate and incubated for one week to two weeks at 27^0C until the spore formation occurs.

Identification

The microscopic examination of fungal cultures were done by using lactophenol cotton blue (LCB) staining and observed under microscope [6,7,8]. Finally fungal identification was done [9].

Selection of microorganism

Totally three pathogenic bacteria species were selected for present investigation. Bacterial species such as *Bacillus subtilis, Eschericia coli, Vibrio cholera*. The bacterial samples were collected from slant culture of GH, krishnagiri.TN.

III. EXTRACT PREPARATION

Methanol extraction

Fungal species (*Aspergillus niger, Aspergillus flavus, Penicillium leuteum* were taken from culture tubes. 1mg of mycelium of fungi was washed with water and crushed in methanol to extract bioactive compounds. Then it was filtered by using whattman no.1 filter paper. After filtration the extract was separated and stored.

Crude extraction

Fungal species (Aspergillus *niger, Aspergillus flavus* , *Penicillium leuteum*) were taken from culture tubes . 1mg of Zone of inhibition(mm) →
mycelium of fungi was washed with distilled water and crushed to extract the bioactive compounds. Then it was filtered by using whattman no.1 filter paper. After filteration the extract was separated and stored.

IV. ANTIBACTERIAL ACTIVITY

Screening of antibacterial activity using (Agarwell diffusion method)

The antibacterial activities of fungal species were tested against the selected bacterial strains; about 20ml of sterilized nutrient medium was poured into each sterile petriplates and allowed to solidify. The test bacterial cultures were swabbed on plate and a well of 0.5cm was made using cork borer and 150µl of each fungal extract were transferred into well [10].

Incubation

All the plates were incubated at 37^0C for 24 hours and they were observed for zone of inhibition by measuring the diameter of zone in mm.

V. RESULTS

The present investigation leads to the isolation of three different fungi. Antibacterial activities of isolated fungal species such as *Aspergillus niger, Aspergillus flavus,*

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Penicillium leuteum were tested against human pathogens and results were tabulated.

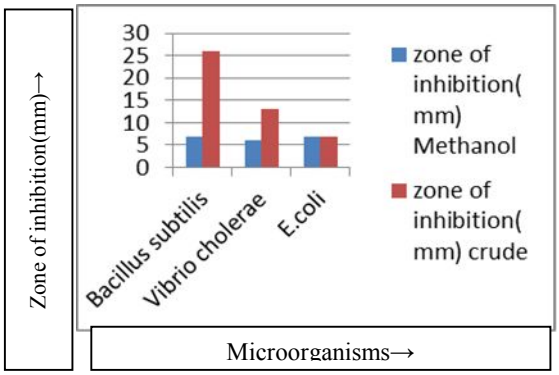

Fig 1: Antibacterial activity of *A.niger*

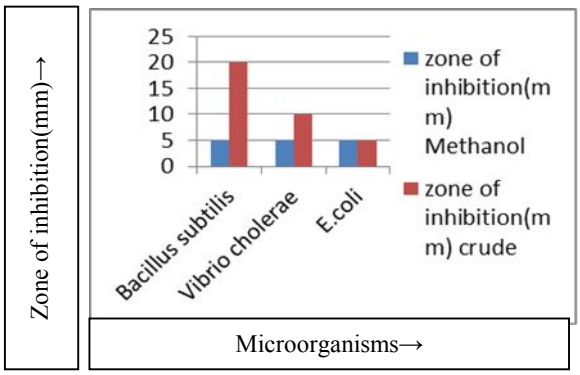

Fig 2: Antibacterial activity of *A. flavus*

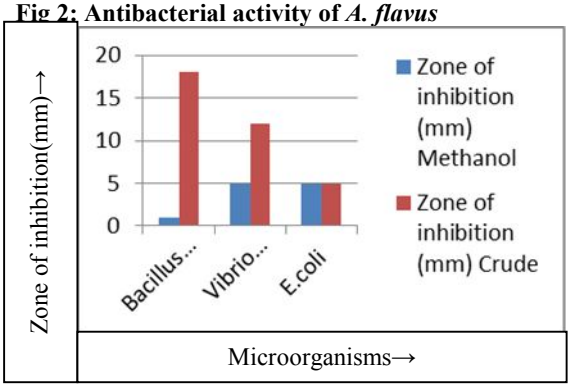

Fig-3: Antibacterial activity of *P. leuteum*

DISCUSSION

Although terrestrial fungi have been major source of the most important antibiotics such as penicillin in human history of decades. In this study, many water borne fungal isolates shows many antibacterial activity against tested biofilm bacteria. In present study the bioactive metabolites from methanol and crude extracts of fungal species such as *Aspergillus niger*, *Aspergillus flavus, Penicillium leuteum* were screened for its antibacterial activity against three human pathogenic bacteria. When compared to methanol extract the antibacterial activity of crude extract of *Aspergillus niger* was active against tested bacterial species due to the presence of more bioactive compounds.

CONCLUSION

In the present study the extract of three fungal species were tested for its antibiotic activity. The Agar well diffusion assay method revealed that when compared to three fungal species ***Aspergillus niger*** gave the best result.

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