



COMPARATIVE STUDY ON THE ANTIBACTERIAL ACTIVITY OF *BATIS MARITIMA* AGAINST ANIMAL AND HUMAN PATHOGENS

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Abstract

Mangroves are a group of plants that occur in the coastal intertidal Zones of tropics and the sub tropics. India has a vast coastline of 7000 km mangroves are a group of plants that occur in the coastal intertidal zones of tropics and the sub tropics. Mangrove plants have been used in folklore medicines and extracts from mangrove plants have proven activity against human animal and plant pathogens. Hence an attempt has been made to study the antibacterial activity of *Batis maritima*. The study revealed that the physico chemical analysis showed variation between the seasons. Among the animal pathogen *V. parahaemolyticus* showed maximum zone of inhibition (12+2) and was followed by *V. harveyi* (10+2). Among the human pathogen tested *Pseudomonas aeruginosa* showed maximum zone of inhibition (8.33+1.52) and was followed by *St. mutants* (6.66+2.51). Thus the study revealed that among the pathogens tested, the alcoholic extract showed the maximum zone of inhibition against animal pathogen. The study revealed that the plant may be used as disease controlling agents in aquaculture system.

Key Words: Shrimp, *Batis maritima*, Pathogen, Disc diffusion, In vitro

INTRODUCTION

Mangrove flora have historically been extensively explored for their versatile medicative uses. The application include the treatment of rheumatism, smallpox, abscess, scabies, sores, boils and ulcers as peer reviewed by [1]. Their efficiency may be ascribed to the existence of diverse, Bioactive principles. It is speculated that mangrove flora biosynthesize the richest array of secondary metabolites. The demand for novel therapeutic compounds is still imperative in concern with newly emerging diseases and multidrug resistant strains of bacteria. The marine floral bioactive principles have lower adverse reactions than those currently used synthetic antimicrobial derivatives and can defy the growth of pathogens by diverse mechanisms. Hence, the application of natural bioactivities allows an alternative scope in the management of multidrug resistant microbial strains [2]. The screening of mangroves with higher biological activities could facilitate the discovery of novel natural products, which is suitable for lead compounds in biopharmaceutical sectors literature pertaining to the plant *Batis maritima* are very meagre.

The prophylactic treatment of shrimp diseases with antibiotics has led to the emergence of antibiotic resistant micro organisms due to improper administrative practices. Moreover much interest is now directed towards the vast untapped source of plant based antimicrobials, many of which reduce the side effects of synthetic antimicrobials [3]. Medicinal plants contain large varieties of chemical substances with important therapeutic properties that can be effectively utilized in treatment of animal diseases.

Like vibriosis caused by luminous vibrio pathogens. Mangrove and Mangrove associates contain biologically active antibacterial antifungal and antiviral compounds [4]. The role of mangrove plants in the discovery of drugs has increased notably in recent years due to a substantial improvement in biological screening methods. It is also worth to screen the mangrove and mangrove associates for the presence of new antibacterial to combat the disease in shrimp culture. Unfortunately, only a small percentage of the mangrove have been examined and explored thoroughly for their bioactive potential Hence an attempt has been made to study the antibacterial activity of *Batis maritima* collected along the Muthupettai Estuary.

MATERIALS AND METHODS

The sediment soil, water and the plant *Batis maritima* were collected from muthupettai saline swamp. The physicochemical characteristic of sediment soil and water were analysed by standard methods. The plants were used for extract preparation. The aqueous and alcohol extract of *Batis maritima* were prepared [5]. The test organism, the human pathogens such as *Pseudomonas aeruginosa* and *Streptococcus mutants* were selected and the animal pathogens such as *vibrio harvigi* and *V. parahaemolyticus* were selected for the study. Muller Hinton agar plates were prepared (pH 7±0.2; 8.2±0.2; Himedia, Mumbai) swab was made with the test organism (10⁻⁴; 18 hrs old). Sterilized paper discs were impregnated with the extract and were incubated 37°C for 24 hrs. after incubation the plater were observed and the zone of inhibition were measured.

RESULTS

In the present study on the antibacterial activity of *Batis maritima* against animal pathogen revealed the following observation. The physicochemical analysis of Muthupettai estuary water during the premonsoon, monsoon and post monsoon period showed. Variation among the parameters. No heavy metal were recorded during the study period (Table I-III). The Antibacterial activity revealed that no zone of inhibition was observed against negative control and the water extract. But among the animal pathogen the positive control showed maximum zone of inhibition (23 ± 2) against *V.parahaemolyticus* and was followed by *V.harveyi* (21 ± 2). The alcohol extract showed the maximum zone of inhibition (12 ± 2) against *V.parahaemolyticus* and was followed by *V.harveyi* (10 ± 2). The positive control showed among the human pathogen, maximum zone of inhibition (29 ± 2) against *Pseudomonas aeruginosa* and was followed by *Streptococcus mutans* (8 ± 2). The alcohol extract showed maximum zone of exhibition (8.33 ± 1.52) against *P.aeruginosa* and was followed by *St .mutants* (6.66 ± 2.51) (Table IV-VI).

DISCUSSION

[6] reported that the mangrove plants have been represent as an accessible source of secondary metabolites with a spectrum of therapeutic and pharmacological potentials. There is a profound attention in studying the antimicrobial potency of mangroves. As a part of our on-going research on the bioactivities of mangroves this study focuses on the antimicrobial activity of *A. marina* sourced from the south Indian littoral. The reason for preferentially collecting *A. marina* was based on the result of our previous bioactivity studies on same specie sourced from another geographical region of south Indian littoral. Among the gram-positive bacteria, *S.aureus* was observed to be the most susceptible. The *S.aureus* is a normal flora of humans and one of the preeminent causes of nosocomial bacteraemia.

[7] reported that the purpose of the present study was to perform preliminary exploration of potential alternative treatment mode against vibriosis in aquaculture. the anti-vibrio activity of the mangrove leaves, stems, fruits and mangrove associates crude extracts (petroleum ether, chloroform, acetone, ethyl acetate, methanol and water) were screened in vitro by agar well diffusion method against *V.harveyi* VSH5 mangroves and mangrove associates possess novel agrochemical products, compounds of medicinal value and biologically active compounds. Anti-vibrio compound (s) or all anti-vibrio compounds may have extracted by other solvents during sequential extraction.

[8] reported that the ethyl acetate extracts of seed showed strong inhibition zone with 12mm against *V.harveyi* and 10mm against *A.hydrophila* whereas leaf, flower and root showed moderate and mild inhibition zones against all three bacterial. The antifungal and antibacterial activity of methanol extract of *A.ilicifolius* is also reported by Chandrashekar and Varahala Rao. *A.hydrophila* causes disease in fish known as motile *Aeromonas septicemia* (MAS) and red-sore disease. The seed extract of *A.ilicifolius* can prevent these infectious diseases in fish.

[9] reported that the *E.agallocha* leaf extracts were tested for the antimicrobial sensitivity against the fish pathogens disc diffusion assay of the six chloroform fractions of *E.agallocha* leaf extracts. The present result showed by *B.subtilis* (10mm), *V.harveyi*, (10mm) and *A.hydrophila* (8mm). however another chloroform fraction from *E.agallocha* showed no activity selected fish pathogens. The *Exoecara agallocha* is well known to contain skin irritants. In traditional that medicine, the bark and wood of the plant is used to treat flatulence [10] some triterpenoids isolated from this plant have been found to possess anti-tumor promoting activity [11].

[12] reported mangroves are woody plants that grow in the tropical and subtropical latitudes along the sea interface, bays, estuaries, lagoons, Backwaters and in the rivers. The mangroves reach upstream up to the point where the water still remains saline. These plants and their associated organisms constitute the mangrove forest community or the mangal. The mangale and its associated abiotic community constitute the mangrove ecosystem. Minimum p^H was recorded during the summer months could be due to the increased temperature coupled with high salinity. Salinity level was recorded maximum during the summer seasons.

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