



“STUDY OF EFFECT OF MEDICINAL PLANTS ON FRESHWATER FISH CHANNA PUNCTATUS AND ITS PATHOGENS: A REVIEW”

Dr. Ajay Kumar Tiwari

Department Of Zoology, Govt. T.R.S. College Rewa (M.P.)

ABSTRACT:

The fish serves as bio-indicator of water quality and this can be easily testified by morphological, physical and behavioral changes in an altered environment since pesticides irrespective of their concentration are known to alter the aquatic environment. The use of plant poisons to catch fish is still used in many places in the world today fish poisons also called ichthyotoxins or piscicides which occur in several related plant species. A variety of chemicals found in these plants when it passes through the gills or in some cases ingested. The fish then floats to the surface for easy capture.



KEY WORDS: Fish, Medicinal plant, freshwater and pathogens.

INTRODUCTION

Plants serve a powerful lifeline to mankind in the world. Their usefulness can be in the form of food, shelter, religious, medicine etc. (Fabeku, 2006). The plant kingdom is most efficient factory of compounds. It synthesizes so many products that can partly consider as weapons to protect the plant against pests and other diseases. Over 40,000 plant species of tropical flowering plants have medicinal properties (Aibinu, 2006). That is why the medicinal plants used for both preventive as well as curative therapies is not new knowledge that can be used from ancient time in various parts of the world. The value base study on plants is a common and it emphasized and showed by various workers (Steep and Moorman 2001, Yesilada, 2005). They stated that illustrate as age long tradition of plants being a major bio resource base for health care.

Present work was undertaken because of highly appreciable values of medicinal plants which needs to study for the well fair of animals. Traditional systems of medicine continue to be widely practiced on many ways. Many epidemic and endemic diseases due to rising of unending of population, inadequate supply of drugs and rise in cost of treatment as well as effect of several allopathic drugs leads to increased emphasis that's why ultimately the use of plant materials becomes a source of medicine for a wide variety of human ailments. This work is mainly based on zoological point of view in which the outstanding medicinal plants such as garlic and curry leaves were tested on physiology, hematology, histology and bacteriological study on fresh water fish *Channa punctatus*.

Historically ancient civilization, India has been known to be rich repository of medicinal plants which are largely collected as raw materials for manufacture the drugs and perfumery products. The earliest of the medicinal plants has been found in "Rig Veda" which was written between 400 and 1600 B.C. The "Ayurveda" which is considered as a "Upveda" that definite the properties of drugs and their

uses in great details. "Charak Samhita" and "Susrut Samhita" are another earliest literary composition on Ayurveda (600 B.c.). "Charak Samhita" includes number of plants and plants products for the use in health management

Aquatic toxicity is an important parameter in evaluating the potential adverse environmental impact of synthetic chemicals in water discharges. The presence of toxic substances in receiving waters and water treatment plants is a major environmental concern. Indiscriminate use of Pesticides and fertilizers constitute the major source of potential environmental hazard to man and animal as they play important role in the food chain. Animals may be poisoned by pesticide residues that remain on food after spraying, for example when wild animals enter sprayed fields or nearby areas shortly after spraying, (palmer W E, 2007).

MATERIAL AND METHODS:

Plant Material and Extraction:

Plants were collected from local area of Rewa. They were identified according to "Flora of Madhya Pradesh. All plant samples and collection reported. All collected plants were oven dried at 40°C and extracted with water, alcohol petroleum ether and ethyl acetate. For aqueous extraction, twenty grams from each powdered plant sample were extracted with 200 ml water at 80°C in a water bath for 12 hours and then filtered. Water was evaporated using a lyophilize. For alcoholic extractions, twenty grams of garlic and curry leaves plant sample were extracted with 350 ml MeOH at 60°C for 12 hours and liquid portion was evaporated under vacuum. For antibacterial assay, each extract was dissolved in sterile distilled water in order to obtain a final concentration of 100 mg ml.

Isolation of bacteria (isolation method):

Channa punctatus were collected from its natural habitat i.e. Bichhia river from Rewa district. Bacterial pathogens isolated from swabbing of various parts of fish. Isolates cultured in Petn plates and then identified on the basis of morphology and biochemical testings. (Holt et al., 1994). After identification each bacteria cultured in its related nutrient agar for antimicrobial assay. The cultures were maintained an NA slant and used as and when required.

Antibacterial Assay:

The well diffusion assay (Kirby-Bauer Method) was used to screen the herbal extracts for antibiotic activity (Prescott et al., 1990). The bacteria used were: *Aeromonas hydrophila* and *Yersinia ruckeri* which are gram-negative bacteria and *Lactococcus garvieae* and *Enterococcus faecalis* which are gram-positive bacteria. These bacteria were isolated in laboratory and pure culture of each bacterial strain was grown on nutrient agar plates. The loopful cultures incubated for 2 days at 37°C. Each slant were transferred into culture tubes containing 5 ml sterile nutrient broth and were incubated for 12 hours at 37°C. Mueller Hinton agar plates were inoculated with a microorganism suspension at a density of 10⁶ cells/ml by using cotton swabs. The diameter of the inhibition zone (mm) was measured after 16 to 18 hrs. of incubation at 37°C in an incubator. Inhibition zones > 11mm were stated as "strong", from 9 to 11 mm as "moderate" and < 9mm as "weak" activities. Each antibacterial assay was performed in triplicate. Four plates were used for garlic and curry leaves respectively. Wells were prepared in each plates, extracted samples inoculated in each well. Simultaneously control was run using penicillin as a standard in 100pg/ml concentration. Then plates were incubated at 37 c for 24 hours.

RESULTS AND DISCUSSION:

The aquatic ecosystem is greater part of the natural environment. Natural aquatic environment is most immune to aquatic biota. But due to availability of some favourable Physico-chemical parameter to bacteria. Some infectious and non infectious stain can grow easily. As a results most of die aquatic animals may get infected includes fishes. Many medicinal plants having antifungal, anticancerous, antiprotozoan and antibacterial properties. These medicinal plants are alternative agents to treat the

infectious diseases. Present investigation shows the effect of medicinal plant (garlic and curry leaves) extract on fish isolated bacteria. Present investigations result shows the maximum zone of inhibition was recorded in ethyl acetate extract of garlic against *Aeromonas hydrophila* was 18mm.while the minimum zone of inhibition recorded in alcohol extract of garlic against *Yersinia mckeri* was 8mm. While the maximum zone of inhibition was recorded in water extract of curry leaves against *Aeromonas hydrophila* was 18mm where as the minimum zone of inhibition recorded in alcohol extract of curry leaves against *Lactococcus gravieae* was 7 mm respectively.

The results reveals that the ethyl acetate extract of garlic was more efficient and water extract of curry leaves was more efficient in extraction of the component in the cell hence the inhibition was higher.

Dhayanithi N.B. et al., (2010) reported that the effect of neem extract against the bacteria isolated from marine fish and he observed Gram positive bacteria *Streptococcus* sp. was highly susceptible to the extracts and *Aeromonas hydrophila* was resistant when compared with other test bacteria.

Mylarappa B. et al., (2009) reported that the potent antibacterial property of ape protein from curry leaves the aqueous extract of *M. koenigii* was tested for antibacterial activity against human pathogenic bacteria. *Bacillus subtilis* show maximum and *Staphylococcus aureus* moderate zone.

Omima A.E. Aboud (2010) Application of some Egyptian medicinal Plants to eliminate *Trichodina* sp. and *Aeromonas hydrophila* in tilapia (*Oreochromis niloticus*).lie noticed the long term use of *Allium sathntm* and shell elbaathran has antiparasitic and antibacterial affect and makes tilapia more resistant to infection by *Trichodina sp* and *A. hydrophila*.

Najiah, M. et al, (2011) reported that the antibacterial activity of malaysian edible herbs extracts on fish pathogenic bacteria. They observed methanol extract of *M. Koenigii* was active against some of the bacteria tested.

CONCLUSION:

Plant parts commonly used in powdered form or emulsified liquid form in fisheries management to remove unwanted fish species, such as the eradication of exotic fish from non-native habitats. People catch fish by extracting toxin from plants and releasing it into water. Poisoned fish come to the surface and are easily caught. This method was first practiced by indigenous tribes who smashed the roots. Fish caught this way can be eaten because plant toxin is very poorly absorbed by the gastrointestinal tract of humans.

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Department Of Zoology, Govt. T.R.S. College Rewa (M.P.)