



PLANTS USED AS TOXIN FOR COLLECTION OF FISHES

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ABSTRACT

The present paper deals with the identification of those plants which are used as natural toxins for capturing fishes. As Jammu And Kashmir State is rich in ethno biological diversity, its different districts have their own toxicant plants which can be used for capturing fishes. Kathua district is one of them rich in ethno illogical diversity. So this ethno biological survey was conducted in different regions of Kathua district. As fishes are the important source of protein for poor people living near the banks of rivers, they use few plants which are natural toxicants for fishes and capture the fishes. During this study, a number of toxicant plants are identified with the help of the people living near the river. The general information related to vernacular name of the plant in different regions and plant parts used, have been identified by elders and knowledgeable people. Plants are identified taxonomically with the help of Botanist of Jammu University. Extensive literature was also consulted for identification.

Key words:- *Fishes, fish toxins, traditional fish folk, different regions of Kathua*

I. INTRODUCTION

Plants are the important source of medicines for treating different human and animal diseases. A number of animal and human diseases are treated by the administration of different doses of plants extract. These plants used in treating human ailments and animal diseases are may be considered poisonous and their beneficial effects often occur at lower doses whereas overdose can induce poisoning (Botha and Penrith, 2008). These plants produce toxic substances such as alkaloids, glucosides, picrotoxins, resins, tannins, toxalbumins, saponins etc. Some of the toxins are harmful to humans and animals life, under certain conditions (Katewa *et al*, 2007). Now if we come in case of fishes which are important cheap and rich source of high quality proteins for poor people. Traps and nets are important tools used for capture fishes from rivers and streams but use of various plants as fish poison is also very old practice in the history of human kind. Plant species with ichthyotoxic properties that are frequently used, have subsequently been less studied. Hence, the communication gives the detailed information of various plants, which are used as fish toxicants by the people.

II. METHODOLOGY

Plants are observed, identified, and their parts used for collection of fishes are identified. In the first step, extensive and frequent field observation was done by field visits of the different fields. Now the plants and their



parts used as fish poison are identified with the help of local tribal communities of different fields. Plants were identified taxonomically by referring to different Botanist. Extensive literature search helps to verify the name of plants and their use in fish poisoning. Traps and nets are an important tools used for capture fishes from rivers and streams but use of various plants as fish poison is also very old practice in the history of human kind. A number of toxins extracted from different plants parts were used to stun fishes when it passes through the gills or in some cases when ingested. The fishes then float on surface and captured easily by traps and nets.

III. DISCUSSION

The study revealed that different species of plants belonging to different families have poisonous effects on fish and animals. The plants are arranged alphabetically, each by its botanical name followed by the family name, local names and notes on harmful effects were reported along with photographs

3.1 *Abrus precatorius*

It is a shrub belongs to the family *Fabaceae*. The poisonous parts of this plant are the seeds so chewing of seeds is lethal to humans and animals. In fishes the toxin in the seed of this plant will stun fishes when passes through the gills or in some cases ingested. The fishes come to the surface and exhibit abnormal behaviours due to may be nervous breakdown and lack of oxygen. The fainted fishes are collected by the fishermen and by local people using cloth or cast net. The poison has narcotic and debilitating action on fishes without killing them.



Abrus precatorius L.

3.2 Argemone mexicana

is also a herb belongs to the family *Papavaraceae*. Its seeds are narcotic causing headache, nausea, vomiting, and diarrhoea. Mustard oil

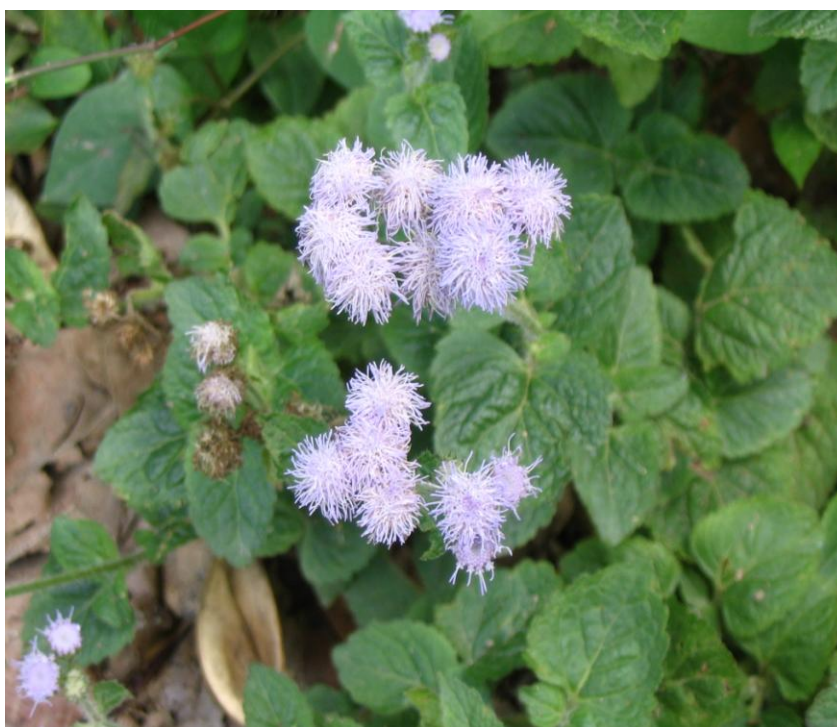
adulterated with its oil resulted causing deaths of several humans. The powdered form of the seeds when spread in stagnant water stun the fishes without killing them. The fishes then float on the surface and easily collected by the fishermen .



***Argemone mexicana* L.**

3.3 Ageratum conyzoides

It is a herb belongs to the family *Asteraceae*. Whole plant paste is used as fish poison.



Ageratum conyzoides

3.4 *Acacia pennata*

It is a climber belongs to family *Fabaceae*. Its crude pounded bark acts fish poison



Acacia pennata

3.5 *Acacia catechu*

It is a tree belongs to the family *Fabaceae*. It is commonly known as khair. Powdered stem of this tree will be used for fish capturing.



Acacia catechu

3.6 Polygonum barbata

It is a herb belongs to family *polygonaceae*. Whole plant paste is used as fish poison. It is also known as knot grass.



Polygonum barbata

3.7 Polygonum hydropiper

It is a herb belongs to family *polygonaceae*. Whole plant paste is used as fish poison.



Polygonum hydropiper

3.8 *Polygonum pubescens*

It is a herb belongs to family *polygonaceae*. Whole plant paste is used as fish poison. It is a slender annual herb, mostly seen in wet places in hill forests (Henry *et al.* 1987). It also grows on sandy alluvial soil near streams, moist soils which are regularly flooded, also found along margins of ponds and irrigation ditches. Frequently found as a weed in fields and along paths.



Polygonum pubescens

3.9 *Acacia nilotica*

commonly called Babool tree belongs to family *fabaceae*. Whole plant (fruits , flowers, bark etc.)



Acacia nilotica

3.10 Achyranthus aspera

family- *amaranthaceae* is flowering herb. Whole plant is used.



Achyranthus aspera

3.11 Ageratum conyzoides

commonly known as goat weed and in hindi known as jangali pudina belongs to family *asteraceae* is a herb. Paste of the plant is used.



Ageratum conyzoides

3.12 Adiantum capillus veneris

belongs to family *pteridaceae* is a fern. Paste of the plant is used.



Adiantum capillus veneris

3.13 Acorus calamus

belongs to family *acoraceae* is a herb. Whole plant is used.



Acorus calamus

3.14 *Anagallis arvensis*

belongs to family *Primulaceae* is a herb. Whole plant is used.



Anagallis arvensis

3.15 *Cuphea micranthus*

belongs to family *lytheraceae* is also a herb.

3.16 *Colebrookia oppositifolia*

belongs to family *lamiaceae* is a shrub.



Colebrookia oppositifolia

3.17 *Nuclea orientalis*

belongs to family *rubiaceae* is a tree. Bark of the tree is used as fish toxin.

3.18 *Parthenium hysterophorus*

belongs to family *asteraceae* is a herb. Whole plant is used as fish toxin.



Parthenium hysterophorus

3.19 *Pterocarpus marsupian*

belongs to family *fabaceae* commonly known as Indian Kino Tree.

3.20 *Solanum aculeatis*

belongs to *solanaceae* family is a herb. Specially seeds are used.



Solanum aculeatis

3.21 Rosa micra

belongs to *rosaceae* family is a herb. Paste of the plant is used as fish toxin.



Rosa micra

IV. RESULT & DISCUSSION

People living near the banks of the water bodies mostly near the remote and hilly areas use various conventional methods to catch fishes. This help them to accomplish their nutritional as well as economic requirements. So after the research work, various plants and their parts were identified to catch fishes. So various plants and their product used are

Local people used various conventional methods to catch fishes for their domestic consumption and protein diet requirement. But after few researches, various types of plant products such as leaves of *khinna* (*Sapium insigne*), *rambans* (*Agave americana*), stem bark of *jamun* (*Syzygium cumini*), latex of *surai* (*Euphorbia royleana*), leaves and bark of *akhrot* (*Juglans regia* (*Casearia elliptica*) and *maindul* (*Catunaregam spinosa*), pounded seeds and stem bark of *Zanthoxylum armatum* and oil cake of *mahwa* (*Madhuca longifolia*), etc. are used to catch various size of fishes. These plant products are first well crushed and grinded nearby the aquatic system. The pest is used as a fish poison in stagnant or semi-stagnant pools or slow flowing streams and rivers for fish catch. It is mostly applied during the morning or evening hours. Sometimes, streams would be partly blocked to slow down the water flow to concentrate the power of poison without being washed away or diluted by a strong current. The active ingredients are released by mashing the appropriate plant. A variety of chemicals found in these plants will stun fish when it passes through the gills or in some cases ingested. The fishes come to the surface and exhibit abnormal behaviours may be because of nervous breakdown and lack of dissolved oxygen. The fainted fishes are collected by the fisherman or local people using simple cloth, cast net and put into the basket.



The poison has a narcotic and debilitating action on the fish, without killing them. The sporin produces foam when entering in the water and it paralyzes the fish. At the beginning, all fishes are paralyzed, but those that are in deep pools and those that have not been picked up by fishermen were revived. Plant extract also alters the physico-chemical properties of the water bodies, which ultimately cause decline of small fishes in the stream and rivers. The toxicant released from the paste or slurry of these plants not only affects the fishes but also damage the stream biota like periphyton and macrobenthos. Loss of juveniles and small fishes occurs, as a result of poisoning of streams. Poison flow down stream over a long distance killing all fry and fingerlings of fish.

Different ichthyotoxic plants used for fish poisoning. Powder of stem bark, leaves and pounded seed of *timroo* (*Zanthoxylum armatum*) used as fish poison. Different parts of various plants used as fish poisoning in streams and stagnant or semi stagnant waters. Leaves of *Agave americana*, *Juglans regia* and *Sapium insigne* crushed and the pest was directly employed in the stagnant water of stream and rivers. While, leaf extract of cactus rambans and crushed seed of *Madhuca* sp. is very popular for fish toxicants in the pools and riffles. leaves and stem of *Euphorbia cotinifolia* L. and *Phyllanthus brasiliensis* (Aubl.) containing triterpene for poison of small fish in a stream. Similarly, various toxic plants (*Aesculus indica*, *Sapindus mukorossi*, *Lyonia ovalifolia*, and *Zanthoxylum alatum*) and their parts were used for fish poisoning.

The Carib Indians, who live along the Barama River also in Guyana, use a modified technique. A ball of bait is made from baked Cassava (*Manihot esculenta*) mixed with the pounded toxin-laced leaves of *Clibadium*. The small balls are thrown into the river where the fish swallow the balls whole. As with the previous methods, the stupefied fish floats to the surface for easy capture.

The two primary chemicals that occur in most plants used for stunning fish are saponin and rotenone.

V. SAPONINS

Saponin is the one of the group of glucosides found in many plant species with known foaming properties when mixed with water. Saponins, toxins normally break down in the digestive system and enter the bloodstream. Fishes take in saponins directly into their bloodstream through their gills. The toxin acts on the respiratory organs of the fish. Saponins also cause the breakdown of red blood cells that help the toxin to spread quickly. Fishes that are washed away into untainted water, revive and can return to their pre-toxic condition. Because of this, the fishermen would have to gather the stunned fish quickly as they floated to the surface.

VI. ROTENONES

Plants containing rotenones are the second most utilized fish poison. Rotenone is an alkaloid toxin, in a group called flavonoids and stuns fish by impairing their oxygen consumption. The plant is toxic only to cold-blooded creatures and is found almost exclusively among the family comprised of legumes (Papilionaceae, Mimosaceae, Cesalpiniaceae).

VII. CONCLUSION

The plant toxins target the resources. But some other species which are not targeted are also affected. These also have an impact on the wider aquatic environment. Incalculable loss of juvenile and small fishes occurs, as a



result of poisoning of streams. Poison flow downstream over a long distance killing all fry and fingerlings of fishes. Therefore, use of plant extract and other poisoning should be strictly banned in the streams, rivers and other aquatic resources.

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