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RESEARCH ARTICLE

PISCICIDAL PLANTS USED BY MALAI PANDARAM TRIBES IN ACHANKOVIL RIVER BASIN, KERALA: AN ETHNOBIOLOGICAL APPROACH.

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Abstract

Malai Pandaram tribes are well known for their nomadic way of life style and inherited wisdom of ethnobiology. An ethnobiological survey for Piscicidal plants used by Malai Pandarams has been conducted during 2013 March to 2015 March in the Achankovil River basin. Information on piscicidal plants and their usage were collected through observation, personal conversation and structured questionnaires among them. 41 plant species belonging to 33 genera and 18 families were found of piscicidal value. The plant species are enumerated in alphabetical order along with families and local names, followed by their ethnobiological uses.

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Introduction:-

Ethnobiology, the scientific study of biological knowledge of particular tribal communities about plants, animals, their interrelationships and uses, shares various methodologies and theoretical frame works has been associated with ethnobotany and ethnozoology¹⁻². Ethnobotany of Kerala is augmented with significant contribution from primogenitors³⁻⁹. Kerala is remarkable with high biodiversity and cultural diversity possesses 35 tribal communities accounting for about 1.45 per cent of the total population¹⁰. Most of them are inhabited in the Western Ghats forests and rely on forest resources for their livelihood. Fish has been an integral part of their diet since time immemorial. Traditionally they have been used plants and plant parts for poisoning or stupefying fishes. The uses of poisonous plants for catching fishes make a distinctive attention in the field of ethnobotany in all over the world¹¹⁻¹⁶.

Malai Pandarams, a typical regional nomadic forest dwelling community distinguished into three categories, viz., the forest nomads, the colonized and the semi-colonized or semi-nomads¹⁷. They are settled in the highland and midland region of Achankovil River basin between 9° 09'N-9°17'N latitude and 77°11'-76° 96' E longitudes. The altitude varies from 50-1000m above msl. The Malai Pandarams contribute 0.49% of the total tribal population of Kerala and most of them are lived in rural regions.

Ethnoichthyology and ethnobotany are the areas of ethnobiology that examines the indigenous knowledge of fishes and plants for their day-to-day life of indigenous communities have attracted the attention of both ethnobotanists and ethnozoologists. Documentation of piscicidal plants in the state has an extensive history from imperial period. The usage of fish poisonous plants by the *Malayadiyars* tribes of Pamba river basin reported by Bourdillon in 1892 was considered as the first report¹⁸. In 1914 Rama Rao reported that there have been 21 plant species as fish poison in the Travancore region of Kerala¹⁹. Prasad et al described 28 plants which belong to 23 genera and 16 families were used for fish poisoning in Kasargod district, Kerala²⁰. A review of the available literature revealed that a few

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indigenous communities of the Kerala have been explored to uncover the use of piscicidal plants and documented their ethnobiological utility. The present study examines the ethnobiological knowledge of Malai Pandarams communities in the Achankovil River basin with particular reference to the piscicidal plants used in tribal areas.

Methodology:-

The study was carried out in the settlements of Malai Pandarams inhabited in the Konni and Achankovil forest division of Achankovil River basin. The river basin is bound on the north by Pamba river and on the south by the basins of Kallada and Pallikkal river. Since time immemorial the basin is coexisted with biodiversity and cultural diversity. The information on ethnobiological knowledge of the Malai Pandaram communities in fish catching was obtained during the period of 2013 March to 2015 March. The piscicidal plants were collected after getting preliminary information from indigenous communities. The plants were collected and identified with the help of regional flora²¹⁻²². The herbarium sheets were prepared with all the taxonomic details and deposited in the Herbarium at School of Environmental Sciences, Mahatma Gandhi University.

Result And Discussion:-

Bilateral process of knowledge transfer has been occurs between Malai Pandarams and non tribals inhabited in the Achankovil River basin. Wild edibles and medicinal plants used by the tribes such as *Diplazium esculentum* (Retz.) Sw. (Churali), *Cycas circinalis* L. (Kana), *Pittosporum neelgherrense* Wight & Arn (Analivegam) etc. are commonly used by non tribes in the region in their day today life. This knowledge transfer leads the non tribes to the usage of piscicidal plant in fish catching. Plant species viz., *Gnidia glauca* (Fresen.) Gilg., *Hydnocarpus pentandra* (Ham.) Oken, *Tetrameles nudiflora* R.Br. and chemicals like $\text{Ca}(\text{ClO})_2$ (Calcium hypochlorite), $\text{Ca}(\text{OH})_2$ (Calcium hydroxide) and NH_3 (Ammonia) are used by the non tribes in the region for poisoning of fishes. A total of 46 species of freshwater fish, belonging to 17 families and 31 genera were reported from the Achankovil Reserve Forests of Achankovil River basin; 14 of this species were endemic to the Western Ghats and three were endemic to Kerala region²³⁻²⁴. Malai Pandarams settled in Achankovil River basin contributes 20 % of the total population of them. The sex ratios of females are higher than the male and have equality in social organization and major role in the gathering of fishes, wild edibles and, Non Timber Forest Products (NTFPs). It was observed that the Malai Pandarams forages seasonally in groups of 10-20 peoples with their hunting dogs for gathering of NTFPs. They have been practiced three foraging cycle's viz., in the months of November- December, February-May and June-July. Malai Pandarams catches fishes only for sustenance. The survey indicated that the main fish catching methods practiced by them are hand gathering, hook gathering and stupefying.

The hand gathering and stupefying methods are generally used in summer season. When water level declined the indigenous communities chases the fish in the river until it is get exhausted to continue swim and then caught with bare hands. *Gonoproktopterus curmuca* (Kooral), *Puntius* spp. (Poovali), *Xenentodon cancila* (Kokkola), *Hyporhamphus limbatus* (Kokkola) are the common fish species collected by them using hand picking method. A few fishes collected were used in medicinal purpose also. For example fishes like *Anguilla bengalensis* (Blanijl), *Heteropneustes fossilis* (Cherumeen), *Mastacembelus armatus* (Arakan), *Horabagrus brachysoma* (Koori), *Gonoproktopterus curmuca* (Kooral) were used for diseases like Asthma, Anemia, bronchitis, cough, fever etc.

Slow moving river, streams or ponds were selected for fish poisoning. Once the area is selected branches of plants like *Madhuca neriifolia* (Moon) H.J.Lam. and *Acacia caesia* (L) Willd. were placed in water, the former for the shade and later to protect fishes from the water bird *Microcarbo niger* (Neerkakka) and *Ardeola grayi* (Kokku). Rice, tapioca etc. were put into water as food for fishes. This will attract fishes from various part of the river from the area of poisoning. After one or two days the flow of the river and streams are barred by diverting the water current. Crushed plant parts are put into the water for catching fish.

Present field investigation has recorded a total of 41 species of piscicidal plants belonging to 18 families and 33 genera consisting of 40 species of angiosperms and one species of gymnosperm. The highest numbers of plant species reported were Mimosaceae, Euphorbiaceae and Anacardiaceae. The scientific name, local name, family name, habitat and plant parts used were given in the table 1. The recorded species occur as various life forms with the majority being tree (11 species) and remaining occurring as shrubs (7 species), climbers (5 species) and herb (one species). In addition various plant parts used for fish poison were analyzed; the most frequently used parts were seeds (19 spp.) and remaining are barks (16 spp.), fruit (7 spp.), leaves (3 spp.), whole plants (3 spp.) and tuber (1 spp.).

Sl No.	Botanical name	Local name	Family	Habit	Parts used
1.	<i>Abrus precatorius</i> L.	Kunni	Fabaceae	Climbing shrub	Seed
2.	<i>Acacia caesia</i> (L.) Willd.	Incha	Mimosaceae	Climbing shrub	Bark /fruit
3.	<i>Acacia torta</i> (Roxb.) Craib.	Kaarnicha	Mimosaceae	Climbing shrub	Fruit /bark/stem
4.	<i>Albizia lebbeck</i> (L.) Willd.	Vaka	Mimosaceae	Tree	Bark / fruit
5.	<i>Anamirta cocculus</i> (L.) Wight & Arn.	Karandakam	Menispermaceae	Woody climber	Seed
6.	<i>Antiaris toxicaria</i> (Pres.) Leschen.	Araanjili	Moraceae	Tree	Bark / seeds
7.	<i>Archidendron bigeminum</i> (L.) Nielsen	Paranta	Mimosaceae	Tree	Seeds
8.	<i>Atlantia monophylla</i> (L.) Corr.Serr.	Malanarakam	Rutaceae	Tree	Dried stem/ bark/ leaves/ seed
9.	<i>Barringtonia acutangula</i> L.	Attupezhu	Barringtoniaceae	Tree	Bark /seed
10.	<i>Calophyllum inophyllum</i> L.	Punna	Clusiaceae	Tree	Leaves/ bark/ seed
11.	<i>Cycas circinalis</i> L.	Kananga	Cycadaceae	Tree	Fruit
12.	<i>Derris scandens</i> (Roxb.) Benth.	Ponnamvalli	Fabaceae	Climbing shrub	Seed
13.	<i>Diospyros ebenum</i> Koenig.	Karimaram	Ebenaceae	Tree	Leaf / seed
14.	<i>Diospyros paniculata</i> Dalz.	Karivella	Ebenaceae	Tree	Leaf / seed
15.	<i>Entada rheedii</i> Sprengel	Parantakka	Mimosaceae	Liana	Seed
16.	<i>Euphorbia tirucalli</i> L.	Thirukalli	Euphorbiaceae	Shrub	Stem / latex
17.	<i>Gnidia glauca</i> (Fresen.) Gilg.	Nanju	Thymelaeaceae	Shrub	Whole plant
18.	<i>Harpullia arborea</i> (Blanco) Radlk.	Puzhukolli	Sapandiaceae	Tree	Crushed seeds
19.	<i>Holigarna arnottiana</i> J.Hk.	Cahru	Anacardiaceae	Tree	Bark
20.	<i>Holigrana grahami</i> (Wt) Kurz.	Aanacharu	Anacardiaceae	Tree	Bark
21.	<i>Hydnocarpus kurzii</i> (King) Warb.	Marotti	Flacourtiaceae	Tree	Seed
22.	<i>Hydnocarpus pentandra</i> (Ham.) Oken	Marotti	Flacourtiaceae	Tree	Seed
23.	<i>Jatropha curcus</i> L.	Kadalavanakku	Euphorbiaceae	Shrub	Seed
24.	<i>Lagerstroemia microcarpa</i> Wight	Neermaruthu	Lythraceae	Tree	Fruit
25.	<i>Manihot esculenta</i> Crantz.	Cheeni	Euphorbiaceae	Shrub	Tuber
26.	<i>Prunus ceylanica</i> (Wight.) Miq.	Naykambakam	Rosaceae	Tree	Seed
27.	<i>Pterospermum diversifolium</i> Blume	Malavuram	Sterculiaceae	Tree	Bark / fruit
28.	<i>Pterygota alata</i> (Roxb.) R. Br.	Aanathondi	Sterculiaceae	Tree	Fruit
29.	<i>Randia brandisii</i> Gamble	Kara	Rubiaceae	Shrub	Crushed seeds
30.	<i>Randia dumetorum</i> (Retz.) Poiret	Malankara	Rubiaceae	Tree	Crushed seeds
31.	<i>Sapindus trifoliata</i> L.	Pasakotta	Sapandiaceae	Tree	Seed
32.	<i>Schleichera oleosa</i> (Lour.) Oken	Poovam	Sapandiaceae	Tree	Seed
33.	<i>Semecarpus anacardium</i> L.f.	Cheru	Anacardiaceae	tree	Seed /bark
34.	<i>Spilanthes calva</i> DC.	Kammalchedi	Asteraceae	Herb	Whole plant
35.	<i>Strychnos nux-vomica</i> L.	Kanjiram	Loganiaceae	Tree	Seed

36.	<i>Terminalia chebula</i> Retz.	Kadukka	Combretaceae	Tree	Bark /seeds
37.	<i>Terminalia bellirica</i> (Gaertn) Roxb.	Thanni	Combretaceae	Trre	Bark /seeds
38.	<i>Tetracera indica</i> (Christm. & Panz.) Merr.	Vennel valli	Dilleniaceae	Shrub	Leaves/ fruit
39.	<i>Tetrameles nudiflora</i> R.Br	Cheenimaram	Datisceae	Tree	Bark
40.	<i>Trichilia connaroides</i> (W.& A.) Benth.	Karakkodi	Meliaceae	Tree	Bark / seeds
41.	<i>Walsura trifolia</i> (A. Juss.) Harms.	Perillapacha	Meliaceae	Tree	Pulp/ bark

Conclusion:-

The study revealed that the ethnobiological knowledge of Malai Pandarams varies between their settlement types. Tribes living in the interior part of the forest (forest nomads) and living in fringe of the forest (semi colonized) having sound traditional knowledge and great holistic approach to the forest compared to the colonized tribes in Achankovil River basin. The process of assimilation and acculturation among the Malai Pandarams settled in the colonies leads to the deterioration of ethnobiological knowledge. These tribes are inhabited in the river basins of Kallada and Pamba also. Further studies are needed for the complete documentation of piscicidal use of Malai Pandarams in the entire state of Kerala. Plantation forestry, wildfire and over harvesting cause the depletion of piscicidal plants from the forest region. Many of the plant species are extinct from their wild nature. Scientific and sustainable utilization of this species is very important for the conservation of indigenous knowledge and biodiversity.

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