

Ethnoichthyological Practices For Ophthalmic Care And General Health In The Coastal Belts Of South Tamil Nadu Coast-India

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ABSTRACT

Scientific research of the present era has validated the biomedical potential of many ancient ethnomedicine formulations that forms the intellectual property of Tribal people who are aware of medicinal plant and animal species. The traditional use of fish-based ethnomedicine in treating some diseases is found in the coastal belts of the south Tamil Nadu coast. The present study was conducted in the coastal districts of Tamil Nadu, covering Thoothukudi, Kanyakumari, Tirunelveli, and Ramanathapuram, using a specified questionnaire. The respondents interviewed were traditional healers, aged fisher folk, and head of the fisher folk community. In the present study, 18 groups of finfish comprised of different species, seven groups of shellfish comprised of different crustaceans and mollusks, turtles, sea mammals, corals, and sponges used by the people in the study area shows the influence of seafood in the human diet as medicine. The different sea products are cooked or dried and prepare delicious diets using different herbs according to the users. Different preparations are used for pregnant women, lactating women, and women with gynecological issues. Also, the finfish and prawn are salted and dried and used. Dried and smoked Tuna is highly used for convalescing people and lactating women. The data collected shows that the different marine products have novel bioactive compounds for further research.

Keywords: Marine products; ethnomedicine; ethnoichthyology; finfish;shell fish

INTRODUCTION

In this era, an intensive search is focussed on alternate medicine to combat many ailments that escape or overpower much allopathic medicine, particularly antibiotics. In this approach, Indian ethnomedicine can be a good complement or alternative system of medicine. Ethnomedicine is not only used to cure several chronic ailments but also to strengthen immunity. The product outcome of ethnomedicine and occupational therapy varies with the ethnic group and countries.

It is the brainchild of each ethnic group, even within a country. Only after several trials and errors in healing are the ethnomedicine formulated by hundreds of indigenous technology. Scientific research of the present era has validated the biomedical potential of many ancient medicine formulations. Ethnomedical knowledge is the intellectual property of ancient people or tribes involving medicinal plant and animal species (1). According to a WHO report, about 80 percent of the world's population depends on folk medicine of plant and animal origin (2). Ethnomedicine covers the Ayurvedic, Siddha, and Unani medicine of India and other traditional medical systems in Africa and China.

In India, about 645 indigenous tribes have prepared ethnomedicine using native wild flora and fauna to contain or cure diseases. Most of this "traditional wisdom is undocumented and orally passed over generations" (3). In China's traditional Daur medicine (TDM), thirty plant species belonged to nineteen families, and twenty-one animal species representing eleven families were used. Ethnomedicine is a traditional method of treatment. It is based on the action potential of the bioactive compounds in plants and animals. Different preparation processes activate the bioactive compounds.

Various ethnic groups are practicing ethnomedicine across the world. It is disease prevention and curing practice based on the natural resources excised in their habitat or their geographical location. Ethnomedicine was the medical practice before modern medicine came into practice. People living in rural belts with little access to apothecary shops continue ethnohealing. The tribal people in some countries still use insects and their products to prepare homeopathic and other medicines. As plant-based medicine is given much attention and research, little attention is focused on ethnozoology by modern researchers. However, ethnoentomology, ethnoichthyology, and ethnoornithology have a lot of medical applications in ancient India.

The Kani Tribes of Western Ghats use more than Ten species of insects in Tamilnadu to prepare medicine by using plant extracts and indigenous chemical technology to heal many significant problems, including pneumonia, gastritis, piles, wound healing, general weakness, jaundice, mad dog and serpent bites, hydrophobia, etc. The termites and wild ants like *Oecophylla smaragdina* were used to prepare medicine and as food for male infertility (4).

Mozhui *et al.* (5) compiled a list of insects used to prepare traditional medicines. The authors state that more than fifty species of insects belonging to 28 families had been used to prepare medicine for about fifty human ailments. Like insects, fishes are also used in ethnomedicine. In Brazil, forty-four freshwater and forty-one marine fish are listed as ethnoichthyofauna (6). In Bangladesh also, ethnoichthyotherapy is common (7).

The traditional use of fish-based ethnomedicine in treating some diseases in Nepal has been reported (8). Many Ethnomedicine practices have high potential as curative as well as preventive properties. This medicine will act as a salvage when allopathic medicine

goes helpless. For instance, in epidemic outbreaks such as Dengue fever, Chikungunya virus, and even COVID-19, traditional medicine was used by many. Fish are pressed for nourishments that can help the cerebrum, heart, psyche, and general body. It is loaded up with fundamental supplements, omega-3 unsaturated fats, proteins, iodine, and minerals that keep the body slender and muscles solid. Fish skin has rich content of iodine in literature recommends eating fish along with fish skin while frying the fish with its denatured omega -3 fatty acids is recommended as another way of fish preparation (9).

The therapeutic value of several Indian fishes has been explained (10). The Ethno- traditional usage of fish fauna across the Valley of Kashmir has been reported (11). In India's Ayurveda, Siddha, and Unani systems of medicine, several marine organisms have been used as traditional medicine for several years (12). A has been done on publications related to zootherapeutic practices in India from 1987 to 2020. The study brought out 45 freshwater fish species, and their use in ichthyotherapy, in India. The different parts of fish are used to prepare various medicines to treat many ailments (13). An ethnomedicinal survey conducted Bishnupur district of Manipur, N.E. India, confirmed the therapeutic uses of 21 (twenty- one) fishes used by ethnic communities. In India, there are several reports on the ethnomedical importance of freshwater fishes. However, the ethnoichthyological study of marine species is lacking. So, in the present study, details about seafood as ethnomedicinewas made. The present study details the ethnoichthyology of the southern part of Tamilnadu to be collected, and attempts will be made to utilize the data for future applications.

Methodology

The present study was conducted in the coastal districts of Tamil Nadu, covering Thoothukudi, Kanyakumari, Tirunelveli, and Ramnathapuram. The respondents interviewed were traditional healers, aged fisher folk, and head of the fisher folk community.

The study aimed to gather information about the use of various fin and shell fishes used in ethnomedical practice by fishermen and other communities for several generations in their families. Using a specified questionnaire, the surveyor conducted one-to-one interactions with the respondents regarding ethnoichthyological practices in their locations.

RESULTS

The present investigation collects information on 16 finfish and eight groups of shellfish, marine mammals, sponges, and corals. These marine products have been used for several generations to cure various ailments and energize the body (Table .1).

DISCUSSION

Seafood serves as food as well as medicine. Even in ancient Tamil civilization, people used marine products as food and medicine. Several ancient Tamil literatures quotes the different seafood for human medicinal use. In Tamil Literature, "Thirukural," "Purananooru", "Nedunalvaadai" have medical tips that instruct of Antidote, food is medicine. In several Siddha and Ayurveda preparations, corals, Mollusca shells, Pearls and sponges were used to prepare parpam /bhasma of good medicinal value.

An ancient Siddha literature (2000 years old) tells that the Muthuchippiparpam (Calcinated shell of Pearloyster) prepared using plant juices after Pudam (Incineration) was used as a panacea for diseases (14, 15). The uses of several marine products are discussed (16). Another herbo-mineral preparation using the shells of *Turbinellarapa*-Conch has been in use for 2000 years back to cure many ailments (17). The shell powder of conch has been used to cure many ailments for centuries. Chank powder is a panacea for many illnesses like jaundice, general debility, and cough, and the shell grit is used to prepare dental cream and talcum powder. Other evidence shows that from ancient time the herbs-mineral preparations, "Viraalmeenthalai kalparpam"-prepared using- snakehead murrel (*Channa striata*), "nandukalparpam" prepared using the shells of marine crab *Scyllasp.* are reported to give a good cure to Urolithiasis- "Kalladippu ." Several brachyuran crabs are used in Ethno-medicine (18).

In Hyderabad, South India, since 1845, a traditional healer Bathini Goud family, prepares herbal medicine. This medicine in capsules is inserted into the mouth of a live sardine, or mural fish and the wriggling 5cm fish are slipped into the patient's throat, often leaving them gagging [19]. The Siddha wing of the government hospital at Palani in Tamilnadu has used a "fish treatment" for various skin ailments on a trial basis. Certain fish species are allowed to bite the affected skin, which could cure psoriasis, ringworm infections, cellulitis, sores, and even some boils (Mumbai mirror). In the present study, 18 groups of finfish comprised of different species, seven groups of shellfish comprised of different crustaceans and mollusks, turtles, sea mammals, corals, and sponges used by the people in the study area shows the influence of seafood in the human diet as medicine. The different sea products are cooked or dried and prepare delicious diets using different herbs according to the users. Different preparations are used for pregnant women, lactating women, and women with gynecological issues. Also, the finfish and prawn are salted and dried and used. Dried and smoked Tuna is highly used for convalescing people and lactating women. Several ancient palm leaf scripts and ancient Tamil literature have mentioned marine products' ethnomedical importance. The data collected shows that the different marine products have novel bioactive compounds for further research.

Table .1 The different marine products and their ethnomedical importance are given below.

No	Zoological name	Local name and Family	Pharmacological Significance
1	Sardines& Shads – <i>Sardinella longiceps</i> and lesser sardines <i>S.fimbricata</i> , <i>S.gibbosa</i> . <i>S.albella</i> , <i>S.dayi</i> and other <i>Sardinellaspp/Ilisha elongata</i> / <i>Hilsa ilisha</i> - Indian shad / <i>Dussumieria acuta</i>	Mathi Chalai, Chalai/Ullam/ Poovali. Fam: Clupeidae	Improve immune function metabolism and growth, Reduce digestive disorder and lactating women, and prevents heart disease, blood clots, and inflammation. Reduces age-related macular degeneration.
2	Anchovies- <i>Stolephorus indicus</i> , <i>Stolephorus commersonni</i> <i>Stolephorus devisi</i> / <i>Thryssa malabarica</i> - Poruva/ <i>Thryssa dussumieri</i> -Mothakenda	Nethili/ Fam:Engroulade	Eye problems, Thyroid, bone damage, tooth and eye problems. Good for lactating women
3	Ayila- <i>Rastrelligerkanagurata</i> - Indian Mackerel <i>Rastrelligerfaughni</i> <i>Rastrelliger brachysoma</i>	AyilaMeen/ AgalaiMeen	Control of blood sugar levels in diabetics, rheumatoid arthritis, Parkinson s disease bowel cancer. Best for paralytic-affected patients.
4	Nagarai- <i>Upeneusvittatus</i> / <i>Upeneus Moluccensis</i> -Goat fish /Red mullet	Nagarai/Navarai /Sangara/Perciformes :Mullidae	They are used for hypertension, heart, and kidney disease. Goatfish is superior to all four other types of meat, including chicken meat.
5	Paarai -	Carangidae Mosalarai/ Paarai /	For pregnant and lactating women, they are used in dried

	<p><i>Seriolanigrofasciata</i>- Blackbanded trevally/ Butter fish</p>	<p>Kilichai Usiparai Manchalparai</p>	<p>and salty forms. This fish contains a very high amount of calcium and phosphorus. Parai is an appropriate choice for people who are suffering from Calcium Deficiency.</p>
	<p><i>Decapterusrusselli</i> Indian - scad</p>		

	<i>Caranx sexfasciatus</i> - scad		
	<i>Caranx ignobilis</i> - Yellowfin trevally	Tangaparrah	
	<i>Carangoides ferdau</i> -scad		
6	Karal <i>Leiognathus spp.</i> <i>Gazzaminuta</i>	Silverbellies/Ponyfish Fam: Leiognathidae	Silver belly fish karapodi is used in the fresh and dried form [Karuvadu] for respiratory problems, colds, and coughs. Asthma, lungs problems
7.	Shark- <i>Scoliodon laticaudus</i> - <i>Rhizoprionodon acutus</i> <i>Carcharhinus limbatus</i> <i>Sphyrna zygaena</i> & <i>Sphyrna lewini</i>	Carcharhinidae Pillai sorrah, Palsorrah, Kundansorrah Komban sorrah,	Vitamin A is extracted from the liver. Fins are used for soup, and liver oil and cartilage are used for medicine preparation.
8.	Skates & Rays Thirukkai- <i>Rhincobatus djiddensis</i> <i>Rhinobatus granulate</i> <i>Pristimicrodon</i> / <i>Pristispectinata</i>	Velaameen-Rajidae Kallu vai/ Padangan /Paaluluva	Flesh consumed fresh and dried salted form. Liver Oil is rich in Vitamin A. Thirukkai Fish reduces the risk of depression in pregnant women, and the dried form is suitable for pregnant women and breastfeeding mothers. Sting rays Reduce the risk of heart disease, Asthma, Cancer, Diabetes, Inflammatory conditions, Better skin and hair, brain development, and Eyesight, and reduce the risk of Alzheimer's disease.
9	Wolf herring – <i>Chirocentrus dorab</i> <i>C. nudus</i> / <i>Chanoschanos</i> - Milk fish	Fam: Chirocentridae Mulluvalai/Vala/Palkendai:	Milkfish scales (MSCP) have antioxidant, anti-inflammatory, and DNA-protective activities.
10	Tuna - <i>Thunnus tonggol</i> <i>Thunnus spp.</i> .. <i>Auxisthazard</i> , <i>Euthynnus affinis</i>	Fam: Scombridae Choorai-	Improves the Immune System, Prevents the risk Of Cancer, Improves Skin Health, and Strengthens Bones. The dried Tuna called Masi is used for lactating women

11	Seer fish- <i>Scomberomorus</i> spp.	Vanjiram,/Seelameen /-Fam: Scombridae	Good for the heart and nerves and prevent Cancer, eye, skin, and mental health. This fish meat has medicinal properties that include antibacterial, anticancer, antioxidant, antihypertensive, antithrombotic, and immunomodulatory. Seer fish is crucial for hormonal and metabolic healthy activities. Seer fish has a low level of saturated fats and helps in appetite control, resulting in reduced blood glucose
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			development after eating the fish.
12	Catfish- <i>Arius spp.</i> <i>Clariasbatrachus</i>	Keluthi, Keliru /Magur Ictaluridae	<i>Clarius</i> spp. are good medicinal food for pregnant and lactating women, the aged, and children. Regular intake of this fish prevents anemia and good nutrient supplement for malnourished individuals and convalescent patients. This fish is believed to give good nutrient support for brain and heart functioning. Magur with a specific recipe, is given to lactating women and people suffering from smallpox infection. The fish Magur is believed to promote wound healing and strength.
13	Eel- Conger spp	Vilangu Anguilliformidae	Relieve fatigue and sexual debility. Its swim bladder is rich in collagen and used for skin health and bone health, and it assists digestion in increasing metabolism in the body. To improve Baby health, formation of DNA, Regeneration of cells and tissues,
14	Barracuda <i>Sphyraena spp.</i>	Ooli Fam:Sphyraenidae,	Rich in bodybuilding protein, Good Source of Pyridoxine to Promote Hemoglobin Formation, increases male vitality, Eye Health, and is good for brain health. It helps fight depression, prevents dementia, and improves memory.
15	Ribbon fish <i>Lepturacanthussavala /</i> <i>Trichiuruslepturus</i>	Valai, Savalai Fam:Trachipteridae	This fish-in diet is believed to give good cardiovascular health, reduce inflammation, improve eye health, and reduce depression. This fish is recommended for arthritis, joint pain, blood clotting, and many chronic diseases. This fish in a regular diet boost brain power and improve dermal health
16	Pomfret – <i>Johnius</i> spp/ <i>Otolithes</i> spp	Vaval Fam:Bramidae	Used to give pregnant and lactating women with spicy preparation. Reduce cholesterol and hypertension, boost immunity, and reduce the cognitive issue

17	Shellfish-Shrimp/ Prawn <i>Penaeus spp.</i>	Eral Fam: Penaeidae	Prawns are rich in Vitamins B-6, B-12, and Niacin, Different preparations of prawns/shrimps, are believed to provide energy and strengthen build muscle and red blood cell formation. Prawns are delicious due to their different amino acids and contain Vitamin E necessary for skin beauty. Prawns in diet are recommended to people who
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			have Alzheimer's disease and impotence
18	Lobsters - <i>Palinurus spp.</i>	Singi,/Madakku era Fam: Nephropidae	Lobster hemolymph has antiviral and anticancer properties; Lobster flesh protects against thyroid disease, depression, anemia, and impotence
19	Crab <i>Scylla serrata/ Charybdis cruciata</i>	Scylla/Nandu Fam:Portunidae	<i>Scylla serrata</i> curry has a diuretic, laxative antibilious, and a hematinic and cardiac stimulant. Crab flesh oil is used to prepare oil to treat Otorrhea. The crab shells are powdered and given to children suffering from whooping cough and adults with bronchitis, tuberculosis, pneumonia, Asthma, osteoporosis, boils, womb disorders, and epilepsy. Also, crab preparations are given to people suffering from stomach aches, liver issues, and lung diseases. Medicines are prepared from crab shells for wound healing, osteoporosis, and epilepsy. Regular crab in diet alleviates reproductive malfunction in women.
20	Cephalopods - <i>Loligosp/ Sepia spp</i>	Squid–Kanavai Cuttlefish	The internal shell or cuttlebone of <i>Sepia officinalis</i> is powdered and used as an antacid, astringent, and a local sedative. It is powdered and mixed with sesame oil to heal wounds. Its paste is made with lime juice to treat skin diseases and mixed with rose water to treat prickly heat. The powder is used to prepare toothpowders. Squid ink has several active compounds with therapeutic applications with hemolytic, antioxidant, antimicrobial, and anti-inflammatory properties

21	<p>Bivalves - Pearl oyster –<i>Pinctada spp</i>- <i>Crassostrea madrasensis</i>- Edible oyster- <i>Perna spp</i>, - Asian green mussel <i>Mytilus edulis</i>-Aali/ Blue mussel/Common mussel</p>	<p>Muthu ChippiAali Edible matti Asian green mussel</p>	<p><i>Perna sp.</i>- It is an excellent Prebiotic diet for gut microflora. Its preparations improve osteoarthritis and knee-related problems. <i>Crssostrea sp</i>- The mantle and gill tissues of edible oysters are believed to improve antioxidant, antimicrobial, aphrodisiac & hypertensive problems. Also, the regular intake of edible oysters prevents Cancer, fatigue, and coagulant problems enhancing osteoblast differentiation and wrinkle formation. Shell powder –Kalubhaspam is used for intestinal problems and ear problems. Pearl oyster-Paarl oyster powder-Muktabhaspam/Suktibhaspam is used as an antacid to treat tuberculosis, jaundice, and urinary problems. The flesh is used for heart diseases. Pearl powder is used to treat male impotence</p>
22	<p>Gastropod- <i>Turbinella rapa</i>- Conch <i>Cypraea moneta</i>-Cowrie</p>	<p>Sankha/Sangu Conch Cowrie Palagarai</p>	<p>Powder of the shell[Sankhabhaspam is used for dyspepsia, ocular issues, antacids digestive problems, hepatomegaly, and ulcer. The flesh is used for Asthma, phtthisis, tumor, and cardiac problems. Cowries shell powder or Bhaspam/ ointment is used to treat dyspepsia, jaundice, spleen megaly, and respiratory problems</p>
23	<p>Turtles-<i>Cheloniamydas</i></p>	<p>Green sea turtle</p>	<p>Turtle oil is used as demulcent. Fat of Turtle is used to treatrickets, anemia, and lung issues. Shell extracts are used to treat many eye-related problems.</p>
24	<p>Sea Mammals -<i>Dugong dugon/ Helicore dugong</i></p>	<p>Dugong</p>	<p>Oil is used to treat eye diseases and is an alternative to Cod liver oil</p>
	<p>Sponges-<i>Spongia officinalis</i></p>	<p>Sponge</p>	<p>Ash is used as astringent, mixed with oil to treat goiter, and many gastric problems</p>

25	<p>Corals-</p> <p>Scleractinian -stony corals/ Alcyonacea feather coral</p>	<p>Stony Corals - Feather Corals</p>	<p>Coral or pavalm is used in Ayurvedic, Siddha, and Unani medicine for many ailments. Coral powder called Pavalabhavam/Parvam and choornam is used to treat piles, tuberculosis and other respiratory illness, and urinary issues. Coral ashes are used as tooth powder and to treat oligospermia, eye problems, diuretic, toxic issues and epilepsy</p>
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