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Exploration of Kani Tribal Botanical Knowledge in Agasthiayamalai Biosphere Reserve - South India

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Abstract

Since traditional herbal remedies are based on ancestral knowledge and empiric experiences of tribes, an ethnomedicinal survey was undertaken to collect information appeared to be useful for the research on medicinal plants of the Agasthiayamalai Biosphere Reserve in Tirunelveli district of Tamil Nadu during October 2005- December 2006. The ancestral traditional knowledge of Kani people including reliable hakims, physicians in five settlements (Tirunelveli zones) the native plants used for the preparation of drugs and methods of their administration along with doses were recorded, collected through questionnaire as well as informal personal interviews during field trips.

The exploration of ethno medicinal survey of medicinal utilization among Kani hakims 76 species of plants distributed in 64 genera belonging to 43 families have been reported. The information was collected and documented in database management systems using Visual Basic 6.0 as front end and M.S Access 7.0 as back end. The practical knowledge of plants in medicines of Kani tribe reveals that they are capable of treating various diseases. Exploitation and documentation of traditional medicine is essential for the future. Such study will be useful to understand the role and importance of the

Tribal Botanical Knowledge (TBK) in the conservation of medicinal plants of this area.

Key words: Agasthiamalai, Kani tribes, DBMS software, Medicinal plants.

Introduction

Bioprospecting is the search of useful products derived from bioresources. The useful products may be chemical compounds, genes, micro and macro organisms and other valuable products that are useful in medicinal, industrial and or agricultural and food sectors.

India has great potential for bioprospecting because it is one of the world's richest countries in biodiversity. This is due to a variety of climatic conditions prevailing on different ecological habitats from tropical, sub-tropical, temperate and alpine to desert. The country has over 45,000 species of plants and 77,000 species of animals. About 5,000 species of flowering plants belonging to 141 genera and 47 families had birth in India. About 166 species of crop plants and 320 species of wild relatives of cultivated crops are native of India. There are 62 % of amphibian species and 50 % Lizards, endemic to the country. India has a long coastline of 7, 5000 km with exclusive economic zone of 2.02 million sq. km supporting the most productive ecosystems such as mangroves, coral reefs, estuaries, lagoons and backwaters. About 70 % of global mangrove species and 50 % of the coral reef species are found in this country (Kathiresan, 2005).

India has a rich tradition in medicinal plant study and is the one of twelve mega biodiversity centres and eighteen hot spots in Eastern ghats and Western Ghats apart from being known for ancient civilization and deep-rooted in tradition, is also known for its rich diversity, both cultural as well as biological (Ravikumar et al., 2000). Totally 427 tribe's communities in India. (Kala, 2005). The state of Tamil nadu having 36 scheduled tribes. The different ethnic groups settled through out this place have their own way of life style even in using the plant resources. Tribes are mostly mingled with the forest ecosystem assisting the native societies to "live in harmony with nature" (Prasana, 2006).

The objective is to establish a database of the plants used by Kani tribes with special reference to their indigenous traditional knowledge and create awareness to the local communities about the conservation strategies of these valuable genetic resources.

Research site

Tamil Nadu is the eleven largest states in India with a geographical area of 13005 sq. Kms and lies between 11° 00' to 12° 00' North latitudes and 77° 28' to 78° 50' East longitudes. One among their hotspot of Western ghats 69703 sq. Kms in geographical area and 24,333 recorded forest area. More than 4000 species also were reported (Annamalai, 2004).

The Agasthiayamalai Biosphere Reserve in south Kerala is extended to parts of Kanyakumari and Tirunelveli districts lying between 77° 5' and 77° 40'E longitudes. 8° 20'and 8° 50'N latitudes. South west monsoon from June – September, and north east monsoon in October and November bring rain to this region, and annual rain fall varies at different places from 89 cm to 625 cm. The Tamil Nadu Government is considering for inclusion of areas adjoining the mountain peak 1868 mt (Agasthyakondam) in the reserve (Map 1.), and its environs, comprising 1,701 sq.kms, was designated as the 13th biosphere reserve with the inclusion of areas of Tamil Nadu, the total area will exceed 2,500 sq.km and have many endemic heritage (MoEF, 2004) and inhabited by various ethnic groups such as Kanis, Paliyars and Thodars. Kani tribals are one of the primitive people and settled in secondary hills. There are five tribal settlements such as Tirunelveli zones of Servalar, Agasthiar Kanikudiyiruppu, Mayilar, Periyamayilar and Inchikuzhi (Hendry et al., 1982).

Methodology

Kani Tribal traditional medicinal practices experts having practical knowledge of plants in medicine were interviewed in five settlements of Tirunelveli district. The ancestral traditional knowledge of Kani people including reliable hakims, physicians in five settlements (Tirunelveli zones) the native plants used for the preparation of drugs and methods of their administration along with

doses were recorded, collected through questionnaire as well as informal personal interviews during field trips were carried out in the study area totaling 52 days during October 2005- December 2006.

Plants in triplicates were collected in its flowering stage from their natural habitats (Diane Bridson and Leonard forman, 1992). Voucher specimens were deposited in St. Xavier's College (Autonomous) herbarium, Tirunelveli. All plants were identified by using relevant floras (Gamble, 1935; Mathew, 1983). All the collected information were documented in a Computer program using Visual Basic 6.0 and Oracle 8.0. The data base contains all the details of plant such as the Botanical Name, Family ,Vernacular Name, Habit, Description, parts used, ethnobotanical use, ethnomedicinal use, Ethnobotanical Uses, Herbal formulation, Dosage and Pictures.

Results and Discussion

Plants have been used as traditional medicine for several thousand years (Abu Rabia 2005). Kani is one such inhabited in Agasthiayamalai. Kani tribal are primarily a semi-romantic community one of the primitive people and settled in secondary hills and they have been originated from Kerala. They have slowly shifted to Tamil nadu and have been settled in the forest of Tirunelveli region. Tribal Botanical knowledge is a divine gift to humanity. Tribals, even today, depend on wild plants and animals for their livelihood.

The exploration of ethnomedicinal survey of medicinal utilization Kani hakims suggest that 76 species of plants distributed in 64 genera belonging to 43 families. The families of the species are arranged in chronological order. Botanical Name, Family, Vernacular Name, Habit, Description, parts used, ethnobotanical use, ethnomedicinal use, Ethnobotanical Uses, Herbal formulation, Dosage and Pictures are described. Indigenous technological knowledge is also described. Sample software screens (See below, Figure 1) and a collection of plant list (Table 1) are given. A Kani tribe settlement is typically a cluster of few families living interspersed with the forest, isolated from any public transports facility. Tribals are comprised largely illiterates, 90 % above can not read and write. Earlier they lived under rock shades and caves, which

provided shelter to their people. They speak Malayalam mixed Tamil. The Kani tribe live in harmony with nature and the eco-system. They live in bamboo nets, mainly derived their food from forest produce and still maintain the hunter-gather instincts. They follow animistic religion and a practice of magic healing. Steps must be taken to preserve their identity and their various indigenous technological knowledge. Some of them are employed in hydroelectric project, private estates and forests deportments. Now The Tamil nadu governments recognize them as Schedule Tribes in Tiruneliveli district.

They are extremely hard working and can survive without the help of modern agricultural implements. They cultivate edible food plants jackfruits, citrus, pineapple, piper, panama, coconut, areca, *Dioscorea species*, *Manicot species* etc. They are socio-economically very poor and still most of them are the forest workers. They guide tourists and researchers. They are also engaged in seasonal collection of honey and some other forests products.

Traditional knowledge is not protected within the patent system as it stands today. The turmeric case highlights the problems faced by India in preventing bio-piracy. The recording of traditional knowledge seeks to reduce the possibility of bio-piracy, but looks to future legislation to effectively protect the rights of the people. Some important structural changes based on sound legal footing are proposed, which can be easily incorporated within the present database, and would go a long way in preventing bio-piracy and protecting the interests of the knowledge-holders (Sangeeta Udgaonkar, 2002).

Summary and Conclusion

Thus, the present study helped us to understand the Tribal Botanical Knowledge of Kani tribes. The documentation is essential to preserve the Tribal Botanical Knowledge of these tribes. Further, they have to be trained and awareness should be given for the conservation of this biodiversity rich area.

The deterioration of the wild flora of this area is to be blamed on population pressure, forest fires, overgrazing, and browsing. The

present population has little knowledge about the medicinal plants of the area because most of the knowledgeable, older persons have passed away and the younger ones are not as informed of traditional methods. However, as in the past, some empirical knowledge of medicinal plants among the tribes continues to be developed and transmitted orally from one generation to the next.

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Table 1. Systematic Enumeration of Plants Used as Ethnomedicine by Kani Tribes.

Botanical Name	Vernacular Name	Mode of Administrations
Amaryllidaceae		
Curculigo orchioides Gaertn.	Nilappanai	The raw tubers are consumed to treat as a sexual stimulant.
Apocynaceae		
Rauvolfia serpentina (L.) Benth . ex Kurz.	Amulporri	The leaves and the flowers are consumed to treat Asthma.
Aponogetonaceae		
Aponogeton natans (L.) Engl. & Krause.	Paraikilangu	Leaf pastes are consumed with hot water to treat Cuts & Wounds.
Arecaceae		
Areca catechu L.	Kamugu	Fruits are consumed to kill stomach worms.
Aristolochiaceae		
Aristolochia tagala Cham.	Malaiarasam	Decoction of flower is taken to regulate the Menstrual disorders.
Aristolochia indica L.	Karudakodi	The small amount of leaf juice and powered root is given with honey to treat Antidote.
Asclepiadaceae		
Gymnema sylvestre (Retz.) R.Br.ex Schutt.	Sirukurichan	Leaves are taken raw with hot water to treat Diabetes.
Cryptostegia grandiflora R.Br.	Garudapalai	Plant decoction is consumed to treat Nervous disorders.
Ceropegia candelabrum L.	Kattuvalli	Leaf juice is consumed to treat Stomach disorder.
Pergularia daemia (Forssk.) Chiov.	Veeliparuthi	The crude leaf paste is consumed to treat Lactation.
Hemidesmus indicus (L.) R.Br.	Nannari	Root decoction is consumed to cure Stomach ulcers.
Begoniaceae		
Begonia malabarica Lam.	Kalsirupuli	Plant paste is consumed with water to treat Scabies.
Bromeliaceae		

Ananas comosus (L.) Merr.	Purithipayam	Fruits are consumed to stimulation.
Caesalpiniaceae		
Cassia occidentalis L.	Oolanthavarai	Fruits are consumed to treat Stomach disorder.
Cannabinaceae		
Cannabis sativa L.	Kanchaa	Fruits and leaves ash is applied on the surface of body to treat of Cuts & Wounds.
Capparaceae		
Capparis fusifera Dunn.	Siruvalli	Flowers are mixed with salts to treat Asthma.
Combretaceae		
Terminalia chebula Retz.	Kattukgai	Seed powders are mixed with milk to increase the digesability.
Terminalia bellirica (Gaertn.) Roxb.	Thanni	Park powders are mixed with water to regulate Menstrual disorder.
Cucurbitaceae		
Mukia maderaspatana (L.) M. Roem.	Mosumosukai	Leaf juice is consumed for Giddiness.
Cycadaceae		
Cycas circinalis L.	Salapanai	The toddy when drunk stimulates sexual desires.
Dioscoreaceae		
Dioscorea alata L.	Thavalaikilangu	Tubers are boiled and drunk to used as food.
Dioscorea esculenta (Lour.) Burkill.	Siruvallikilangu	Tubers are consumed to used as food.
Dioscorea pentaphylla L.	Kattuvallikilangu	Tubers are consumed to used as food.
Dioscorea tomentosa J.Koeing ex Spreng.	Norankilangu	Tubers are consumed to used as food.
Trichopus zeylanicus Gaertn.	Arokiyapachai	Leaves are consumed to stimulate the body energy to treat Energy stimulant.
Droseraceae		
Drosera indica L.	Alukaani	Leaves and flowers paste are applied to treat Joint pain.
Euphorbiaceae		
Manihot esculenta C.Rantz.	Eralaikilangu	Tubers are boiled with water to improve body metabolism.
Phyllanthus emblica L.	Nellimaram	The fruit juice is consumed to regulate the body temperature.
Phyllanthus amarus Schum & Thonn.	Manthakali	The leaf extract eaten with the milk cure to hepatitis.
Ricinus communis L.	Amanakku	The seed oil is laxative.
Fabaceae		
Codariocallyx motorius (Houtt.) H.Ohashi.	Tholukani	Leaf juice is applied on the affected parts of treat pain.
Crotalaria albida Heyne ex Roth.	Nagavalli	Leaf paste mixed with water to treat Cough & cold.
Lamiaceae		

Ocimum americanum L.	Naaithulasi	The leaf paste is applied on the face to treat Acne.
Ocimum tenuiflorum L.	Krishnathulasi	The raw leaves are eaten to treat Cough & cold.
Lauraceae		
Cinnamomum verum Presl.	Ellavagam	The bark, when added with non-veg food improves digestibility.
Meliaceae		
Copadessa baccifera (Roth.) Mig.	Siruvemmpu	Leaves juice is applied on the affected parts to treat Skin diseases.
Menispermaceae		
Cocculus hirsutus (L.) Diels.	Kattukodi	The root juice is used to treat Rheumatism.
Mimosaceae		
Entada pursaetha Dc.	Thavallikai	Leaf paste is consumed with milk to treat Stomach disorders.
Mimosa pudica L.	Sottavatti	The fresh leaves are eaten to cure skin disorders.
Pithecellobium dulce (Roxb.) Benth.	Kodukkapuli	The fruit is consumed to kill Stomach worms.
Prosopis juliflora DC.	Cheemaikaruvai	The fruits are consumed for good digesability.
Molluginaceae		
Mollugo pentaphylla L.	Sirupaaraimalli	Plant paste is consumed to regulate Giddiness.
Myrtaceae		
Eucalyptus globulus. Labill.	Ecalptus	Leaves are boiled with water and applied on the face to treat Cough & cold.
Psidium guajava L.	Koyya	The boiled leaf extract is consumed for good digestion.
Syzygium cumini (L.) Skeels.	Navalpayam	The fruits induces digestion.
Papaveraceae		
Papaver somniferum L.	Kazakaza	The seeds are ground in water is consumed to cure dysentery.
Papilionaceae		
Atylosia albicans (Wt.et.Arn.) Benth.	Paarinelikodi	Leaf extracts is used as Fever.
Pedaliaceae		
Sesamum indicum L.	Yellu	The fruits are dried in the oven and eaten, increase body strength.
Piperaceae		
Piper cubeba L.f.	Valmilaku	The fruits extracts are drunk to reduce fever.
Piper longum L.	Kattuthipli	The leaf and the fruit juice are drunk to treat Cough & cold.
Piper betle L.	Vettilai	Leaves are heated on fire and bound on the affected part for relief from swelling and inflammation.

Piper nigrum L.	Nallmilavoo	The seed power is used to treat cut and wounds.
Plumbaginaceae		
Plumbago indica L.	Kodivelli	The leaves are used to treat Scabies.
Poaceae		
Cymbopogon citratus (DC.)Stapf.	Engipullu	Leaves are crushed and inhaled to treat Cough & cold.
Bambusa arundinacea (Retz.) Roxb.	Moongil	The shoot tip is used to treat Nervous disorders.
Vetiveria zizanioides (L.) Nash.	Vetriver	The dried root is applied on the head with coconut oil to treat Anti-dandruff.
Polygonaceae		
Polygonum glabrum Willd.	Aatharali	Plant paste is mixed with oil and applied on the Cuts & Wounds.
Punicaceae		
Punica granatum L.	Madhulam	The outer skin of the fruit is used to treat Menstrual disorders.
Ranunculaceae		
Naravelia zeylanica (L.) DC.	Sirikodipatchilai	Leaf paste is consumed to treat Chest pain.
Rosaceae		
Rosa damascene Mill.	Rosa	Flowers are consumed with milk cure to dysentery.
Rubiaceae		
Coffea arabica L.	Coffee	The seed powder is applied directly on the wounds to treat Cuts & Wounds.
Knoxia wightiana Wall. ex. wight & Arn.	Kalthamarai	Plant paste is consumed with milk to cure impotence.
Rutaceae		
Atalantia monophylla (Roxb.) DC.	Kattunaragam	Fruit juice is consumed to treat Stomach disorder.
Citrus medica L.	Kattunarathai	The fruits are consumed and increase blood.
Toddalia asiatica (L.) Lam.	Milagaranai	Leaf paste is applied on surface of body to treat scabies.
Citrus aurantifolia (Christm.) Swingle.	Kidaranarangai	Fruit juice is consumed to treat Stomach disorders.
Santalaceae		
Santalum album L.	Chandanam	The stem powder reduces the body temperature.
Sapotaceae		
Mimusops elengi L.	Mayilamaram	The flowers are used as Menstrual disorder.
Solanaceae		
Capsicum annuum L.	Vallmilagaai	The dried fruit is boiled and the oil is used to cure Cuts & Wounds.
Withania somnifera (L.) Dunal.	Amkulang	Plant paste is consumed with milk to treat Energy stimulant.
Capsicum frutescens L.	Kantharimilagu	Fruits are burnt and inhaled to treat Cough & cold.

Nicotiana tabacum L.	Pugaiyilai	The leaf ash is applied on the cuts and wounds.
Theaceae		
Camellia sinensis (L.) O.Kuntze.	Thealai	Leaf is extracted and condensed, and used as hair dye.
Verbenaceae		
Phyla nodiflora (L.) Greene.	Pooduthalai	The leaves and fruits pastes are applied on the head to treat the Anti-dandruff.
Tectona grandis L.f.	Tekku	Leaves are boiled and applied on the bone fracture.
Vitaceae		
Cissus quadrangularis L.	Thelligai	Tender stem ground with coconut is used to treat Stomach ulcers.

Figure 1. Sample software screens