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

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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.

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## **Exploration of Kani Tribal Botanical Knowledge in Agasthiyamalai Biosphere Reserve - South India**

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### **Abstract**

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

**Key words:** Agasthiyamalai, 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 Agasthiyamalai 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 Agasthiyamalai. 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 departments. Now The Tamil nadu governments recognize them as Schedule Tribes in Tirunelveli 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.

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

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

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

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

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

Figure 1. Sample software screens



