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Magic, wind-borne fear, and nature's Nerf ball: Ethnobiology in Siruvattukkadu Kombai.

May 5, 1995

Kodaikanal, Tamilnadu, South India

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Dear Peter,

I recently returned from one month of field research in Siruvattukkadu Kombai (Kombai for short). Kombai is a small enclave of villages almost dead-center in the middle of the forested area that comprises the Siruvattukkadu-Parapallar Watershed in the northeastern Palni Hills. A proposal has been sent to the Tamilnadu State Government by the Palni Hills Conservation Council (PHCC) to declare the watershed region as a wildlife sanctuary. This petition is not only an attempt to keep the forest cover intact for the region's hydrology, but also to protect the wildlife that lives in the area, particularly the endemic grizzled giant squirrel. Mr. R. Kannan, PHCC president, asked me to conduct a survey in Kombai of food production and procurement from the surrounding forest. The study includes both plant and animal species. He also requested that I write an ecodevelopment plan (a guide to conservation and livelihood strategies) for the villages in this interior region (Map on pages 10 - 11). This month-long stay was my second visit to Kombai. I visited the area for a few days in mid-February.

I decided not to limit myself to only agricultural crops and edible forest species. One month of interviews and observations would not yield all of the knowledge and information about edible species that the surroundings provide. The best way to collect the information that Kannan wanted was to accompany individuals into the forest. Interviews held in the village would only yield information about the species most commonly used. Considering that nearly 300 species from Kombai's forests have important uses to the local population, it would have been nearly impossible for one resident to rattle-off a hundred or so species during any one occasion. On the other hand, seeing a leaf or flower in its natural setting triggers embedded information about plants no longer employed or those infrequently used. Walking through the forest also allowed me to collect samples for later identification and verification against herbarium sheets. I expanded upon Kannan's suggestion to encompass my own interest in local forest knowledge.

I spent my first day in Kombai walking around the village of Perukaraikadu introducing myself and engaging in small talk with residents who asked me questions about America, my family, and my reasons for coming to India. Vengopal initiated our meeting. He called out to me from his house three lanes above the home of another basket-weaver I was speaking with. Vengopal knows some

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English. I correctly assumed he wanted to practice. Our English conversation was quickly exhausted. From then on, we always spoke in Tamil with a sprinkling of English words. Vengopal is the only villager I met in Kombai who has any knowledge of English. Like everyone else in the area, he wanted to know if I was a missionary from a hospital in the plains.

I replied that I was a forester interested in edible fruits, seeds, leaves, the inner pith of tree stems, roots, materials for construction, medicinal plants, religious and sacred plants, fibers, firewood, and anything else from the forest that residents use, or know has a special use.

"Botany," he asserted in unwavering English.

"Yes, exactly. One day when you go into the forest, may I come with you?"

"Ok, we will go tomorrow at 8:30 a.m. to the eastern side of the forest."

Mr. Vengopal became my first informant. We went into the forest on my second day in Kombai. Setting up this first trail survey was effortless.

He assured me that he had no important work the following day. We agreed to my daily field assistant fee of Rs. 40, the equivalent of \$1.33 (Rs. 31 = \$US 1.00). I based my daily wage on those wages paid by local lime orchard owners and private and government forest produce contractors. Orchard owners pay Rs 25 per day. March through May is the season for edible tamarind fruits. Private forest contractors are paying men a daily wage of Rs. 35. Government-operated forest contracts pay men between Rs. 20 - 30 per day and women between Rs 15 - 20 per day. The PHCC nursery pays its female laborers Rs. 14 per day. Forty rupees is an attractive fee. The work that an ethnobotanical trail survey entails is easier than harvesting and hauling gunny sacks of seeds, barks, and fruits from the forest.

The following morning I arrived promptly at 8:30. Vengopal was not home. His wife gave me a cup of tea. I sat on the stoop in the intermittent rays of the morning sun and talked with her while she wove a bamboo basket.

"You are not wearing a sari today," she remarked.

"No, not today. It is very difficult for me to walk a long distance in the forest when I wear a sari," I explained. "Furthermore, this bag is not the proper bag for a sari. This part (I point to my left shoulder to indicate where the knee-long *muntanee* of the sari would drape down my back) becomes tangled in the strap." She nodded knowingly. Inside my knapsack were two cameras, a small plant press and a 1.5 liter bottle of water. I carried a small field notebook and slipped a pen through my hair just above the elastic band holding my ponytail. Shortly thereafter, Vengopal swung himself around the trunk of the large silk cotton tree in front of their home. He collected his machete. Off we went.

Trail surveys follow a very simple method. The informant points out plants that he or she uses or knows has some sort of use, even if it is not immediately recalled. For all herbaceous species, I collect a sample of the leaves, and if available, the flower and fruit. When a plant's root is

beneficial, I dig out a root sample. Large timber trees present a problem for leaf collection. During such encounters we search the forest floor for fallen leaves and cut away a slice of the bark. Unfortunately, March and April is one of the driest seasons in Tamilnadu just before June's monsoonal rains. Therefore, the vast majority of herbaceous species are neither in flower nor fruit. Unless leaves have a distinct venation or characteristic glands, it is very difficult to positively identify a specimen at the species level. Never the less, I conducted 14 trail surveys: one with a backward caste member (Vengopal), 10 with Pulaiyar tribals and 3 with Paliyan tribals.

In the field, I write down the local name of the species in Tamil, and a one word description of its use: medicinal, edible, religious, timber, firewood, construction, ornamental, fencing, fodder, and in Vengopal's case, magic. My Tamil spellings are far from perfect, but writing in Tamil is an example of one of those little things that help me establish rapport with literate members of the community. Even people who are illiterate show an appreciation for my Tamil script. At the end of each collection trip, I interview the informant, sometimes with the assistance of Thirumurugan, the PHCC nursery supervisor, about the exact use for each plant and the part of the plant employed. If the use is medical, I record the ailment cured and the antidote's preparation.

The first time Vengopal handed me a leaf specimen and said, "magic", I discounted magic as religion and continued on. About the fourth or fifth time a species had magical powers, I asked if by magic, he meant religion and Hinduism or if he really meant magic. (Up until that time, not one of the specimens collected had religious or ceremonial uses.) "I mean magic," he said.

Six hours and 34 specimens later we returned to Kombai. We had walked to the southeastern border of the proposed wildlife sanctuary to a location called Chinna Nayaker Estates. Upon reaching the estates, we stopped at double-row of empty whitewashed bunkhouses and spoke to the estate manager. Vengopal arranged work for himself for the coming Saturday. This trip to the forest was planned after all. It was sheer luck that I met Vengopal when I did. We returned to Kombai by the morning's route. Earlier there was little activity in the forest - only chirping birds, the rustle of leaves in the wind, and our own footsteps interrupted the silence. With the household chores completed, the crisp sound of snapping branches and the tearing of leaflets and lianas clearly filled the afternoon air. Some women were grazing their goats. Others had sacks tied around their waists to hold the fruits of the soapnut and shivakai trees that they were collecting for the Forest Department. Both of these fruits are used in the cosmetic industry, one in soap, the other in shampoo.

Later that evening, I went to Vengopal's house to review the day's collections. I was anxious to discuss his knowledge of magic. I also brought with me Father K.M. Matthew's book, *A Flora of the Tamilnadu Carnatic*, as I had promised earlier in the day.

Reading about magic for both good and evil purposes is one of Vengopal's hobbies. Because he is literate, books provide him with an additional body of knowledge about the natural world that Kombai's tribal groups do not have access to. He reads thin pamphlets published in Madras about indigenous medicine as well.

"The root of this plant is eaten with sugar and cures 'yellow urine' or kidney problems," he explained, "but, the leaves are magic." This is his only sample from the day's collection that is used

for black magic. Take approximately 100 grams of the leaves of this particular plant (The plant was not scientifically identified). Place them on the floor in front of you. Think you enemy's name in the next village. Repeat these words (which he refuses to reveal to me ) one lakh (1 lakh = 100,000) times. Your enemy will die. Vengopal refused to let me touch his magic book nor to reveal the book's title.

Magic for good luck. Cut the root of the *nattasurhi* plant with an axe or a knife. Place the root in front of the swami (god or local deity) for good luck. Say a few prayers. Only educated people living in villages use this magic. It is only practiced before looking for a government job.

Magic for good health. The edible leaves of plants are called *kirai* in Tamil. *Solanum melongena* grows in the piles of vegetable scraps that mound-up under kitchen windows. The leaves are edible, but have other secrets. Take one kilogram of the leaves. Crush them in a mortar until they are reduced to a liquid. Take 1/2 liter of the liquid and place it in a new pot. Inside the pot also place a large cup of water and a piece of iron. Cover the pot. Dig a hole in the ground. Place the pot inside. Cover the hole. Keep the pot underground for 48 days. After 48 days the iron piece is dissolved. Exhume the pot. Take one teaspoonful of the liquid. Heavy breathing will come, but it is good for the body. Vengopal insists that this is magic. I insist that it sounds more like medicine. Perhaps it is a combination - only the magical disappearance of the iron can bring about the medicine.

Magic for extraordinary powers. To crush huge rocks. Draw a square on the ground with a stick. Arrange twenty-five thorns of the *karai* tree in five rows of five. Chant some words. (Again, he won't reveal the magic words) The rocks will break apart into small pieces.

Place the root of the *kaddukodee* plant in water. Add a zinc rod. Say the phrase *nama sevaya* (which neither I nor my Tamil friends have yet to understand) 100,000 times. Tie the zinc rod around the waist. Proceed to a deep body of water and walk on top of it. "This is the how Swami Vivekananda walked on water in Kanyakumari," Vengopal informed me. Kanyakumari is a small Tamilnadu town located at the very tip of the Indian sub-continent. In 1892 the Indian philosopher Swami Vivekananda meditated on a large rock that lies 200 meters off Kanyakumari's shore. This coastal town is sacred as it is the spot where the waters of the Bay of Bengal, Arabian Sea and Indian Ocean mix. Today a temple memorial on the rock is accessible by ferry. Legend has it that when the Swami first went out to the rock over 100 years ago he walked (and it was not low-tide).

There are magic potions to treat eye defects and those offered to the gods for sustaining good health. Vengopal knows medicinal plants for snake bite, mending broken bones and healing-over deep skin wounds. He pointed out many of the commercially-valuable minor forest products (tannins, soaps, and cosmetics) that the Forest Department hires local people to collect. As my Pulaiyar informants would repeat in the weeks to come, he also disclosed and collected the leaves and flowers that were important foods for wildlife, especially for deer and birds.

After my share of the interview was over, I obliged Vengopal by reading aloud sections of Father Matthew's book, *Materials for a Flora of the Tamilnadu Carnatic*. I began with the shortest chapter, Ethnobotany of the region, a mere three pages. (Coincidentally, the Tamil vocabulary of this chapter is well-known to me as my study is similar). Vengopal was keen to know about the

remedies that the tribals who assisted Father Matthew with his floristic survey in the northern regions of Tamilnadu had for snake-bite and stomach ache. When I mentioned the plant that the tribals used for committing suicide, Vengopal boasted of the three that he knew. He seemed also to lament that younger people knew much less about useful plants than the older generation. When I flipped back to an earlier section about field work in execution, he disagreed with carrying tablets for snake-bite in a first aid kit. "This snake-bite medicine is too expensive. Who can afford to buy it? The only snake-bite medicine is to cut the part with the bite off and tie a piece of cloth around the area - that is snake-bite medicine," he asserted.

### Ethnobotanical knowledge of the Pulaiyars of Kombai

Three of my six informants are Pulaiyars, a tribal group of the Palni Hills. Before I went to Kombai I read that Pulaiyars are well-known for their understanding of the powers of medicinal flowers and herbs. How is it that settled farmers like the Pulaiyars are famed for such knowledge over their nomadic, forest-dwelling neighbors the Paliyans (who are discussed below)? Do the Pulaiyars have shamans? Do they take special care in transferring this pharmaceutical knowledge between generations? I thought I would look to history for assistance.

The Madurai Jesuit Archives at Sacred Heart College, five kilometers south of Kodaikanal, house a fragile seven-volume set of Edgar Thurston's *Castes and Tribes of Southern India*. Published in 1909, this encyclopedic-set compiles a vast amount of information from the personal accounts of British field officers and missionaries stationed throughout Kerala, Tamilnadu, Andhra Pradesh and Karnataka. The entries, which we would hold as racist today or at least not politically correct, were the first attempt at a comprehensive ethnographic account of the southern interior. Thurston for all his thoroughness though, fails to have an entry for the Pulaiyars of the Palni Hills. This in spite of the fact that he makes references to them three times. In his description of the Paliyans, the hunter-gatherers of the hills, he writes, "They (Paliyans) are much less civilized than the Pulaiyars, but do not eat beef, and consequently carry no pollution" (p.463). According to Thurston, "The Kunnuvans are the principal cultivating caste of the Palnis...fuedal chieftains in the area helped them to settle in the Palnis and evict the Pulaiyars who were cultivating the land" (p.120). Lastly, the Malasar hill-tribe of Coimbatore are excellent baggage handlers who "carry for the most part on their heads like the low-country coolies, but unlike the Pulaiyars, who when they can be induced to carry at all, carry loads on their backs." Relying solely on Thurston this is all we can learn about the Pulaiyars - beef-eating, back-carrying, Kunnuvan-bonded individuals. Spelling is not the problem either. I searched under Puliyar, Puliyan, Pulavar and Poliyar without any success.

The most extensive writing on the Pulaiyars that I have found was written in 1906 by Mr. W. Francis, an Indian Civil Servant from Fort St. George in Madras. In the Madras District Gazetteer - Madura, in Chapter 3 entitled, *People*; there are two type-written pages devoted to the Pulaiyars. "The Pulaiyars were apparently the earliest inhabitants of the Palni Hills and had things all their own way until the arrival of the Kunnuvans." Unfortunately, he gives no reference for this statement. Several paragraphs later he cites a letter written by a catechist of The Society for the Propagation of the Gospel. In the 1850's, this society was actively trying to convert "the heathens" of Tamilnadu including the Pulaiyars. The letter from the Madras Quarterly Missionary Journal for 1850-1982, furnishes the most descriptive account of Pulaiyar life I have yet to read.

"They used to assemble for regular hunting excursions. When any animal was killed, its skin or some other part was brought to the local temple so that the local deity might give them more good sport in the future. Anyone who was killed on these occasions was buried in the jungle and his memory treated with much respect. The Pulaiyars were kept in the greatest subjugation by their masters, the Kunnuvans, who would not let them have a light at night or sleep on a cot, lent them money at usurious interest and turned them into slaves if they were not able to pay it back. None the less, the Pulaiyars were considered indispensable in all cases of sickness as they alone knew the power of the medicinal herbs of the hills; and also in cases of demoniac possession, as the local devils could only be propitiated through their intervention. They were clever at poisoning tigers, and any man who did so was given a new cloth by public subscription and chaired around the village with dancing and music" (p. 105).

What methods were used to poison tigers or to hunt wildlife? The Paliyans would rub the leaves of the *karungakodi* (vine) and drop them into the river to kill fish. The Muduvars of the neighboring Cardamom Hills and Annamalais of the Western Ghats hunted small birds with blow pipes and erected special fences with nooses to break the necks of ibex (wild goat) fleeing their pursuit.

Pulaiyars of Kombai hunt jungle fowl and rat at night. To catch jungle fowl, they construct a small noose out of thin wire. Lying the circle on the ground, they place rice inside and take the free end with them and wait behind a tree. When a fowl approaches, the end is pulled and hopefully the noose is around the fowl's neck or feet. The technique for catching rats takes more than just a quick wrist, but speed and agility. Rats are flushed out of their burrows, chased, and beat simultaneously with a stick. When I commented that rat hunting sounded a bit difficult; Velsami, one of my Pulaiyar guides, confided that indeed it is a little bit difficult. Pulaiyars eat termites and a flying insect which they call *esal* meaning "winged white-ant" in Tamil. The latter insect dwells in the forest and swarms after heavy rains. The only swarming during my stay in Kombai occurred on the night of April 29<sup>th</sup>. Thirumurgan lit this kerosene lamp and placed it outside. Within minutes the ground and lamp were covered with thin-winged insects. Our female Pulaiyar neighbors brought out buckets filled with water and plunged handfuls of these ants into the liquid. *Esal* is a snack food. They are dried in the sun for a few days and eaten with sugar. Pulaiyars eat guar (bison), but only if they find carrion. They are not guar-hunters. They also hunt and eat deer and monitor lizard, but infrequently. Nobody eats wild boar Velsami informed me. "The government forbids it". I remain skeptical.

If it were not for the dog that accompanied Velsami, Thirumurgan and I on the day we climbed Pachhamalai (1500m), we would have missed the ink-black monitor lizard sunning itself on an equally as dark rock. As we approached to take a photograph it scurried off, but appeared to have smooth, tough skin. I did not find it a particularly attractive creature. On this same day, the dog chased a mouse deer up through the woods. It was my first encounter with this ungulate. Within an hour of this sighting, we came across a mouse deer trap. The trap was fashioned out of split wood, approximately 2 meters long, and one meter in width and height. The end opening onto the trail worked on some type of rock-triggered, spring mechanism. Velsami knew how the trap worked, but did not disclose who it belonged to if he knew. Further down the hill, we came across the

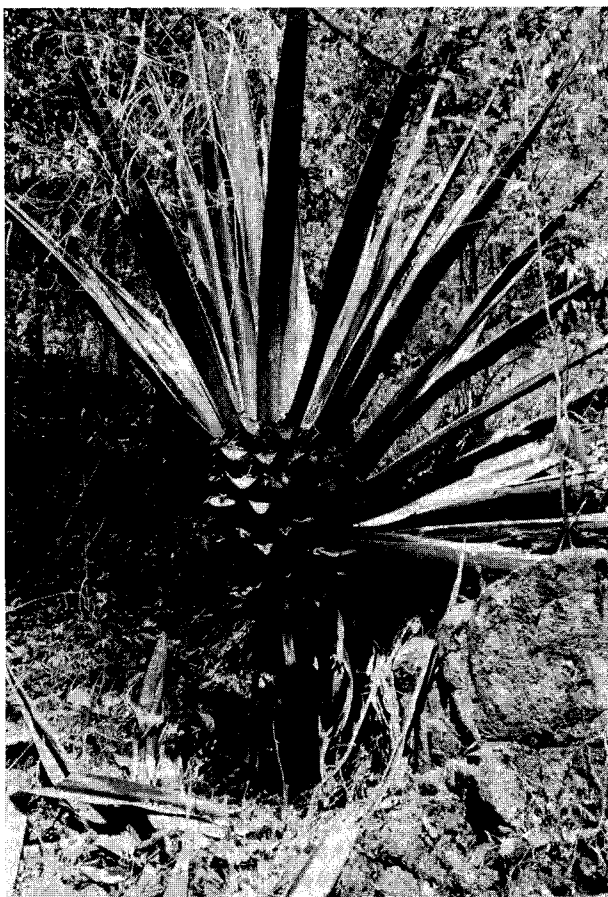
remnants of a wild pig roast. Scattered on a flat rock in the center of a shallow river were scales thick enough for a medieval armory and the black-soot encrusted logs of a bonfire.

To me the most fascinating aspect of ethnobotany is that something weedy-looking is not a nuisance at all. The pharmacy is literally right next door. Villagers all refer to the latex, resin, or the sap of a tree as *pal* which means milk in Tamil. The milky fluid of four different plants cures knee pain or water-on-the-knee. The sap of another vine cures a one-sided headache (Do we have a pill for this at home?). This is just one of seven different medicinal plants for headaches. The drops of "water" extracted from heating the bark of one tree relieve earaches. There are five separate plants to cure stomach aches and ulcers. Eating the root of one vine with salt treats a stomach ache in less than five minutes. Leaves exist that when rubbed on the foot free embedded thorns. The Pulaiyars have prescriptions for burns, worms, broken bones, bridging skin, dog bite, snake bite, kidney problems, heart disease, chest pain, tooth pain, and nagging body aches of all kinds. Their animals are treated with local flora as well. Herbal remedies for cows and buffalos are different than those for horses and goats. They have remedies for diseases I do not fully understand. Along a road-cut in highly-weathered, red soil grows a small fern that cures the fear that babies get when they are attacked by the wind. The fruit of one tree treats the continuous water-drinking sickness.

I have two favorite specimens. The first is a fungus of the genus *Boletus*. The best description I can give of this fungus is it is the size of, shape of, and has the texture of a Nerf basketball. The "ball" is surrounded by a fragile, white shell. A light touch releases a powdery dust of spores. Placing the shelled fungus cools minor burns. The second is the edible fruit of the cactus, *Opuntia monacantha*, a plant native to the Americas. The cactus looks like any flat, oval-leaved one associated with the deserts of the southwestern United States. The contrast of the succulent, bright magenta fruit encased within a pale green endocarp, and the stains on my tongue that made me a source of short-lived envy in the village are particularly fond memories.

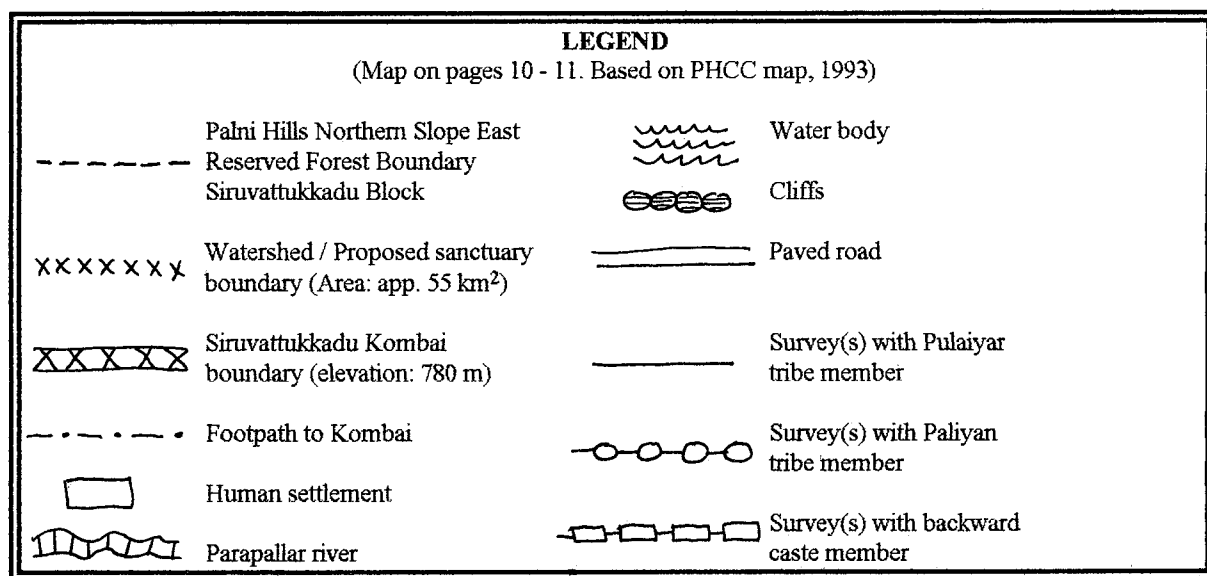
While I find it difficult to comprehend the wind-driven fear, I can personally relate to the itch from the bites of Kombai's microscopic ticks. I quelled the discomfort with a few squirts of Benadryl spray. Brigadier-General R.G. Burton, an avid sport hunter in colonial India, suffered his tick encounters in neighboring Andhra Pradesh. His advice to fellow hunters (and future foresters?), "avoid pitching tents under tamarind-trees. At two such camps I was bitten severely by ticks, which made me quite ill for some hours; my hands and feet swelled, and my ankle, where the bites were became twice its normal size causing pain and discomfort. The natives said that these ticks inflict a poisonous bite after passing through the bodies of crows which have swallowed them. The remedy is to rub the part with a raw onion, which reduces the swelling" (p. 187). Ticks are a fact of life in Kombai. It would not have mattered where I placed my bed at night. I was advised to rub my body with a lime and to bathe immediately after I returned from the forest. If my western medicine ever fails, there are plenty of indigenous remedies for insect bites and itching - three to be exact. All three balms are pastes made from a mixture of the crushed medicinal leaves and onion.

Pulaiyars make rope from three different forest species. The fiber from one plant is a member of the genus *Agave*. The plant looks like a giant pineapple. In some instances, the leaves grow to lengths greater than ten feet. The mesophyll (internal tissue) within the leaf is fibrous and juicy. The mesophyll is carefully cut away from and slipped out the leaf epidermis and set out in the sun to dry. This process is complicated by the fact that the juice is caustic causing a severe burning itch



*An expansive Agave growing along the edge of a well-worn trail.*

if it comes in contact with the skin. Once properly dried, men weave the fibers into rope. My informants only mentioned the use of fiber from this particular *Agave* species. Howard Scott Gentry a brilliant botanist remembered for his pain-staking care in preparing plant specimens as one of his many proficiencies devoted several decades of this career to this genus. His interest in the genus peaked when he discovered that for over 10,000 years native Americans in the Southwest, Mexico and Central America used *Agave* species as sources of "food, drink, fiber, soap, paint, medicine, and construction material" (Cunningham 1994). Many species of the *Agave* genus produce steroidal saponins, the steroid precursor of cortisone. Monroe Wall, the scientist who tested the active ingredients of many of Gentry's finds, was one of the same scientists who first determined the structure of the anti-cancer drug, Taxol derived from the bark of *Taxus brevifolia* in the 1980's (ibid).







*Field assistant, Thunggamma. A 65-year-old Pulaiyar woman.*



*Two Pulaiyar children adorned with the resin of *Pterocarpus marsupium**

CMC-12

10

Parapallur  
Dam

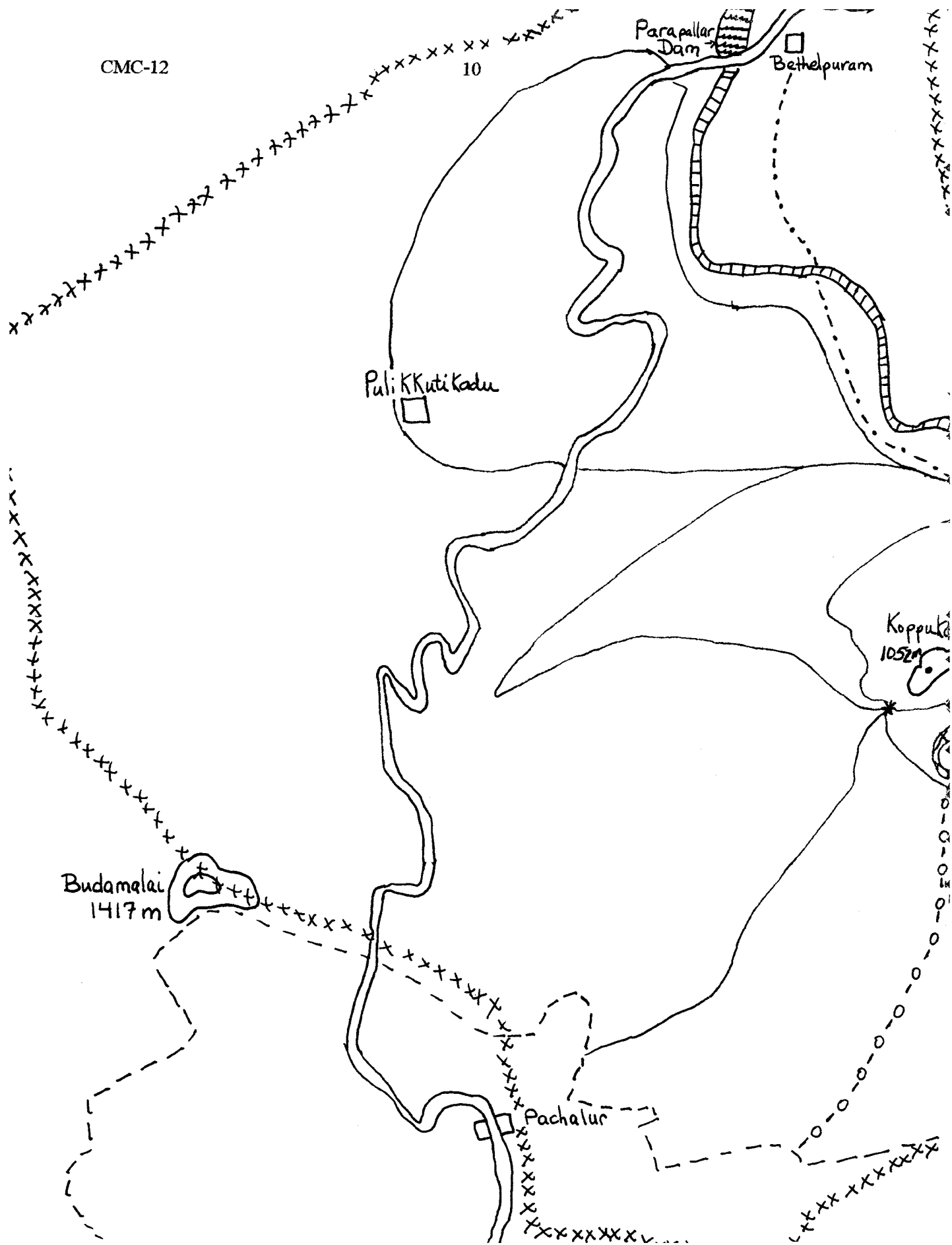
Bethelpuram

Puli Kkutikadu

Koppuk  
1052m

Budamalai  
1417m

Pachalur



CMC-12

Kottaiyali

11

Pacchamalai  
1500m

Perukarai Kadu

Sheddakadu

Arailiparai

Thaliyattukadu

Swami Estates

Periyar

Marumalai  
1437m

Siruvattukadu - Parapallar  
Watershed Region  
Palni Hills, Tamilnadu  
Scale 1:25,000  
4 cm = 1 km

### Ethnobotany of the Paliyans of Kombai

Historically, the Paliyans were a nomadic tribe migrating in small parties throughout the jungles of the upper Palni slopes. At the turn of the century, the British described them as, "very backward...residing in grass huts. living on platforms up in trees. in caves or under rocks. Their clothes are the scantiest and dirtiest and are sometimes eked out with grass and leaves." The Paliyans are a tribe of hunter-gatherers believed to have lived in the forest from time immemorial. "An axe, a knife and a pot are all the impedimenta he carries," wrote Rev. F Dahmen in 1908. Paliyans subsisted on yams, honey combs, nuts, leaves, wild fruits, the products of the chase such as flying squirrel, porcupines, sambar deer and wild boar, and occasionally hiring out their labor to Kunnuvans in exchange for salt, rice, tobacco, or chilis. The medicinal knowledge documented by Dahmen included remedies for snake bite and purgatives from roots and herbs.

Today, many Paliyan families still maintain a semi-nomadic lifestyle oscillating between coolie labor in upland coffee estates and in low-country enterprises, and several months of self-isolation in the forest. Their sudden and unannounced migration from daily labor earns them lower wages than their Tamil counterparts as contractors consider them unreliable (Gardner, 1993). Their intervals of retreat are times strictly for foraging roots and honey.

Unlike many of the hill-tribes in Tamilnadu, the Paliyans though culturally-distinct from Tamilians do not speak a "corrupted form of Tamil", but rather a Tamil dialect with uncanny similarities to the Tamil of the low-country, plains people. Peter Gardner (1972), an American anthropologist who studied the social structure and organization of this food-gathering society in the 1960's, claims that this linguistic similarity is one of two points that complicates ascertaining Paliyan origins. Since Paliyans are a shy people persisting in remote enclaves (as most hill people do), then they should have a "relict culture" and most probably an independent language. The fact that they speak a colloquial Tamil understood by the ordinary plains inhabitant means that Paliyans have either spoken Tamil since prehistoric times (the first written account of the Paliyans was by Megasthenes in the third century B.C.), or that they have had continuous, low-level contact with Tamils without adopting their culture. Where then did the Paliyans reside before they isolated themselves in the hills? Did the Paliyans flee the plains and retain only the language as a strategic economic asset to supplement or complement their subsistence? But Paliyans as Thurston puts it are not of the same "stock" as the Tamilians. This is the second issue complicating the derivation of Paliyan origins. Paliyans (Kombai residents included) are physically heterogeneous falling within the range of phenotypes formally termed Negrito, Veddid (referring to the aboriginals of Sri Lanka), and proto-Australoid. They share physical features with other hill tribes of the South Indian peninsula, but few plains people share their characteristics. If Paliyans are runaways from the Indian plains (a hypothesis Gardner rejects), then why is it that only people with the same phenotypic characteristics found their way into the hills? The mystery remains unsolved.

Today the Paliyans are still able to maintain themselves solely as foragers without bartering forest produce or selling their labor. According to Gardner (1993), only a small number of Paliyans isolate themselves regularly for months at a time and subsist off the forest. In addition to the herbaceous species and animals mentioned above, Paliyans hunt a number of game that seek refuge in Kombai's surrounding forests. One of my informants (female) eats wild pig (*Sus scrofa*) squirrel, monitor lizard (*Varanus spp.*) and contrary to Thurston (1909) does not abstain from

taking beef. Members of her family eat monkey and deer, though she does not. Monkey consumption is surprising as langurs and loris are considered improper food. Paliyan deities forbid their consumption. This prohibition may have evolved also from the belief that these creatures were once human. (Gardner, 1993). Paliyan honey collection is an entire topic of study in itself. It has been the subject of considerable intrigue as in the quest to extract honey combs, Paliyans perform death-defying feats by hanging-off and repelling down vertical cliffs. Both Paliyans and Pulaiyars know the location of and consume the finest honey-producing bees (and their grubs) in Kombai.

My two Paliyan informants, a man and woman both 35 years of age identified 74 useful plant species during three trail surveys. The majority of the species were edible, medicinal or timber trees. Domestic, commercial and other uses (See Table I below) include basket-weaving, red-coloring dye, cotton, soap, firewood, and matchsticks. Palms are the most heavily utilized species - the leaves are used as animal fodder, basket-weaving, and house construction and roofing material, and the fruits and the pith are edible. While I saw little evidence of Paliyan handiwork in Kombai, Dahmen (1908) noted their talent at weaving mats and baskets according to "an indigenous pattern" and partly colored with red and green vegetable dyes.

The leaves of one herbaceous species are crushed and smeared on the head and forehead of a baby to stop incessant wailing. Many women scrape off and cook with a light green lichen that grows on rocks. It adds a spicy flavor to food. Several of the medicinal remedies for earache, toothache, headache, burns, and stomach ache are different from the remedies of the Pulaiyars.

### Concluding remarks

I met with Father K.M. Matthew of the Rapinat Herbarium one afternoon to identify several of my specimens. Matthew, a systematic botanist, is considered by many natural scientists as the expert on Tamilnadu flora. He spent seven years compiling data for the flora of the Tamilnadu Carnatic region. A four-volume set on the Palni Hill's flora is ready for publication once he accumulates sufficient funds to defray the production costs. The Palni set is dedicated to a British couple who lived in Kodaikanal at the turn of the century. Father chuckled as he told me that almost 50 years after independence he is going to dedicate his work to colonialists. But, he alleges that they left behind the best specimens, written accounts, and sketches of the area and individual species.

Father confirmed my suspicion that probably twice as many plants than I collected have human-defined values/uses in Kombai. This lower number of species has two explanations. First, it is the dry season. Fewer species are in flower or fruit and can be easily missed by even the most knowledgeable individual. The best conditions for collecting floral specimens occurs in October after the monsoon. Second, members of backward caste groups and Paliyan tribals are under-represented. Harijians and Muslims are not represented.

On the other hand, he cautioned me about the reliability of any ethnobotanical survey results. "People make things up," he explained. This is true especially of medicinal plants. He claims that "there is much myth and superstition regarding the medicinal properties of plants, so that gross exaggeration is all too common...further, those who possess real knowledge of medicinal plants are shrewd enough not to divulge such knowledge!" (Matthew, 1981). A colleague of his in Delhi

once conducted bioassays on 100 species that were supposed to have medicinal qualities only to discover that not one of them did. I take his points as solid advice, not discouragingly. Unfortunately, Father left for a three month sabbatical at the Kew Gardens in England at the beginning of May. His absence impedes my access to the herbarium. He was not able to assist me with the identification of specimens gathered at the end of April. For this reason, the Paliyans appear under-represented in the appendix.

The data in Table I summarize the results of the trail surveys with respect to the total number of species identified and gathered by the six informants. Two-hundred and eighty-four species were collected. While only 138 of these species were positively identified, the table is included to demonstrate the importance of non-timber forest products in the local economy.

Table I  
Plant parts utilized by residents of Siruvattukkadu Kombai

Plant part used	Edible/Food	Medicinals	Other uses	Total number used*
Leaf	20	59	37	109
Flower	1	3	8	11
Fruit	28	10	19	57
Seed	3	1	1	5
Root	1	11	3	15
Stem	1	4	64	65
Bark	0	7	9	16
Resin	0	6	3	9
Fungus	2	1	0	3

Total\* Totals are not row sums as 22 species have parts with two or more uses, nor are they column sums as 29 species have more than one part used.

The appendix at the end of this document represents species from 59 different plant families. Only lists those species that have been positively identified by myself, Father Matthew, and PHCC president, Kannan who comes from an agricultural family and always has lived in the Palnis are given. Several species could not be identified from the leaf specimens alone. I have chosen not to rely on any of the indexes that transliterate Tamil plant names into English as I believe they are completely unreliable. There are 238 characters in the Tamil language, including some Sanskrit characters. Everyone transliterating Tamil words into English does so differently. Additionally, the names for species vary within and between districts. Thus, no Tamilnadu index can be authoritative. The following story by Gardner (1966) illustrates this point:

"Three Paliyans sat around a healthy bush with plentiful leaves and fruit, the wood of which is one of five used as digging sticks. They gave me three different names for the bush and argued among themselves over the name for several minutes because the alternatives were not synonymous. Finally, one of them laughed, turned to me, and said, "Well, we all know how to use it!" This would have little significance in an isolated case, but many similar incidents were recorded. For

example, a snake misidentified by a young man was discovered to be one of the three lethal vipers of South India." (1966: 397-398)

Gardner (1966) also states that Paliyans have problems with natural taxonomy and do not have color categories. This citation further justifies my rejection of transliterated indexes.

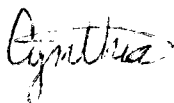
Due to the multi-purpose uses of trees and their parts, 22 species in Table I have parts with 2 or more uses (a leaf may be eaten as a vegetable and used as a medicinal when crushed, kneaded with onion, and rubbed on the body to relieve aching muscles, one particular bark may have medicinal properties and uses in chemical extraction and witchcraft). Likewise, 29 of the 284 species have more than one part used (one tree may have edible fruits, a medicinal root, and branches cut for firewood; another may have medicinal fruits and edible leaves).

Much of the medicinal knowledge held by Kombai residents is known throughout India. The flowers of the wild silk cotton tree (*Ceiba pentandra*) are collected and sold to middlemen at a rate of Rs. 6 per Kg. (US\$0.19). The flowers are used in laxative manufacture. The entire *Emilia sonchifolia* plant has medicinal uses. It is prescribed to relieve pharynx and bone pain, asthma, and fever (Warrier et al., 1994). The dried fruits of *Terminalia chebula* are used to produce a balm applied externally for ulcers and wounds or as a gargle in inflammation of the mouth's mucous membranes. The fruits are cooked into sweets and spicy pickle as they are believed to be digestive and a mild laxative. The other two *Terminalia* species growing in Kombai (*T. arjuna* and *T. bellirica*) have medicinal purposes that were not mentioned by the informants. *Terminalia bellirica* though was identified as a timber tree. The timber keeps well under water and is used for building boats and agricultural tools (Jain, 1968).

Valuable timber trees grow on the steep forest slopes. The *vengai* tree (*Pterocarpus marsupium*) is sought after for temple construction. A tar-like resin oozes from wounds inflicted to the tree's bark. Local women collect this resin and use it as the forehead's *potthu* and as a beauty mark placed on the cheek of small children to keep evil spirits away (Page 9). These two markings are generically termed *mai*, for black pigment. Forest department-planted teak (*Tectona grandis*) and sandalwood (*Santalum album*) plantations line the footpath leading into Kombai. These two species also grow within the surrounding forest. Rosewood (*Dalbergia latifolia*) and *Diospyros ebenum* are another two local species with high consumer-demand and market value. Six board feet of the later sells for over Rs. 2000 (US\$ 67.00).

I do not have any statistically-valid proof, but it appears that the highest density of medicinal and edible plants are concentrated in areas normally defined as wasteland. (Recently, I find many texts replacing 'wasteland' with 'by the wayside'.) Wastelands are the relatively small areas near homes where vegetable scraps mound up, the small jungles of over-grown weeds along village footpaths and fences as well as the flat, dry, well-trodden areas between lime trees in the orchids. All have an abundance of useful plants. To the untrained eye, these areas look very similar to the disarray of vacant lots in New York or New Haven. Those with a trained eye and others like myself who are still learning, may think twice before insulting a plant by christening it a weed and referring to its home as a wasteland.

Best regards,



Cynthia

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## Appendix 1

Ethnobotanical trail surveys - Siruvattukadu Kombai. March - April 1995.

Location: (Loc.): Area where specimen was collected. Forest (F), Village (V; village includes common and degraded areas, but not gardens), or Both (B)

Part used: B=bark, FL=flower, FR=fruit, L=leaf, RE=resin, R=root, SD=seed, W=wood

Identified by: B=backward caste member, Pu=Puliyar, Pa=Paliyan

Id. #	Scientific name	Family	Loc.	Part used	Use(s)	Remarks / Treatment for	Identified by
1	<i>Amaranthus viridis</i>	Nyctaginaceae	V	L	Edible		B / Pu / Pa
2	<i>Solanum spp.</i>	Solanaceae	V	L	Edible / Medicinal	Vitamin supplement	B
3	<i>Amaranthus spinosus</i>	Nyctaginaceae	V	L	Edible		B / Pu / Pa
4	<i>Moringa phenigospema</i> (?)	Moringaceae	V	L	Edible		B
5	<i>Dipteracanthus prostratus</i>	Acanthaceae	B	L	Medicinal / Edible		B
6	<i>Strychnos nux-vomica</i>	Loganiaceae	V	FR / B	Medicinal / Green Manure		B / Pu / Pa
7	<i>Rhinacanthus nasutus</i>	Acanthaceae	V	FL	Medicinal		B
11	<i>Acacia concina</i>	Mimosoideae	F	FR	Soap		B
13	<i>Sapindus emarginata</i>	Sapindaceae	F	FR	Soap		B / Pu / Pa
15	<i>Gmelina arborea</i>	Verbenaceae	B	FL / W	Wildlife food / Timber		B / Pu
16	<i>Pterocarpus marsupium</i>	Fabaceae	F	W / RE	Timber / Cosmetic		B / Pu / Pa
17	<i>Coffea robusta</i>	Rubiaceae	V	FR	Beverage		B / Pu / Pa
18	<i>Smilax zeylanica</i>	Liliaceae	F	R	Magic		B
20	<i>Portulaca oleracea</i>	Portulacaceae	F	L	Edible		B
23	<i>Capsicum frutescens</i>	Solanaceae	F	FR	Edible	Wild chili	B / Pu / Pa
24	<i>Oxalis corniculata</i>	Oxalidaceae	B	L	Medicinal / Edible		B
24a	<i>Scoparia dulcis</i>	Scrophulariaceae	F	L / FR	Medicinal / Magic		B
25	<i>Rubia cordifolia</i>	Rubiaceae	F	R	Magic		B
26	<i>Plumbago zeylanica</i>	Plumbaginaceae	F	R	Magic		B
28	<i>Pongamia glabra</i>	Papilionoideae	F	L	Magic		B
30	<i>Asclepias curassavica</i>	Asclepiadaceae	F	FL	Religious		B
31	<i>Mimosa pudica</i>	Mimosoideae	F	L	Magic / Medicinal	Itching	B / Pu
32/33	<i>Acalypha ciliata</i>	Euphorbiaceae	F	L	Magic		B
35	<i>Celosia argentea</i>	Amaranthaceae	V	L	Edible		B
36	<i>Leucas aspera</i>	Labiatae	V	L	Medicinal	Snake bite	B
37	<i>Phyllanthus amarus</i>	Euphorbiaceae	V	L	Medicinal	Kidney problems / jaundice	B / Pu
40	<i>Tarenna asiatica</i>	Rubiaceae	F	L	Medicinal	Headache	Pu
42	<i>Ixora arborea</i>	Rubiaceae	F	W	Timber / Fire-starter		Pu / Pa
43	<i>Santalum album</i>	Santalaceae	F	W	Timber / Religious		B / Pu / Pa
44	<i>Terminalia chebula</i>	Combretaceae	F	FR/L/W	Medicinal / Timber	FR & L: Toothpowder	Pu / Pa

45	<i>Dioscorea oppositifolia</i>	Dioscoreaceae	F	R	Edible			Pu / Pa
46	<i>Aristolochia indica</i>	Aristolochiaceae	F	R	Medicinal	Stomach pain		Pu
47	<i>Mimosa elengi</i>	Sapotaceae	F	FR / W	Edible / Timber			Pu / Pa
50	<i>Dalbergia latifolia</i>	Fabaceae	F	W	Timber			Pu
52	<i>Celtis philippensis</i>	Ulmaceae	F	FR	Wildlife food			Pu
55	<i>Terminalia belerica</i>	Combretaceae	F	FR / W	Wildlife food / Timber			Pu / Pa
56	<i>Piper hymenophyllum</i>	Piperaceae	V	SD / L	Edible	Wild pepper		B / Pu / Pa
57	<i>Solanum spp.</i>	Solanaceae	V	SD	Medicinal	Toothache		B / Pu
58	<i>Jatropha curcas</i>	Euphorbiaceae	V	SD / W	Medicinal	Toothache / twigs to brush teeth		Pu
66	<i>Diospyros ebenum</i>	Ebenaceae	F	W	Timber			Pu
67	<i>Adena cordifolia</i>		F	W	Timber			Pu
68	<i>Anogeissus latifolia</i>	Combretaceae	F	W	Timber / Firewood			Pu / Pa
69	<i>Oplismenus spp.</i>	Gramineae	F	L	Fodder			Pu
71	<i>Cayratia pedata</i>	Vitaceae	F	L	Fodder	Preferred for its high fat content		Pu
72	<i>Agave spp.</i>	Agavaceae	F	L	Fiber	Rope		Pu
73	<i>Psydrax dicoccos</i>	Rubiaceae	B	FL/L / W	Medicinal / Hair combs	Body pain		Pu / Pa
74	<i>Emblia officinalis</i>	Euphorbiaceae	F	FR / W	Edible / Timber			Pu
75	<i>Hemidesmus indicus</i>	Asclepiadaceae	F	R / L	Medicinal			Pu
76	<i>Elaeocarpus serratus</i>	Elaeocarpaceae	F	FR	Soap	Stomach ulcer/body coolness		Pu
77	<i>Phoenix loureirii</i>	Palmae	F	L	Broom-making			Pu
78	<i>Helicteres isora</i>	Sterculiaceae	F	L/B/FR	Fodder/Shampoo/Medicinal	Eaten after childbirth		Pu / Pa
79	<i>Commiphora berriya</i>	Burseraceae	F	W / L	Fencing / Fodder			Pu
81	<i>Sida cordata</i>	Malvaceae	V	L	Edible			Pu
82	<i>Leucas lavandulifolia</i>	Labiatae	V	L	Medicinal	Stomach ache		Pu
83	<i>Ocimum spp.</i>	Labiatae	V	L	Medicinal	Cough and cold		Pu
84	<i>Solanum nigrum</i>	Solanaceae	B	FR / L	Edible			Pu
85	<i>Dendrocalamus strictus</i> Nees.	Gramineae	F	W	Basket-making/Construction			B / Pu / Pa
86		Gramineae	F	W	Basket-making/Construction			B
87		Gramineae	F	W	Basket-making/Construction			B
88	<i>Artocarpus heterophyllus</i>	Moraceae	B	L/FR/SD	Fodder / Edible			B / Pu / Pa
89	<i>Tamarindus indica</i>	Caesalpinioideae	V	FR	Edible			B / Pu / Pa
90	<i>Citrus aurantifolia</i>	Rutaceae	V	FR	Edible			B / Pu
91	<i>Ceiba pentandra</i>	Bombacaceae	V	FR / FL	Cotton / Medicinal	Decoction of FL for laxative		B / Pu / Pa
92	<i>Carica papaya</i>	Caricaceae	V	FR	Edible			B / Pu / Pa
93	<i>Musa spp.</i>	Musaceae	V	FR / L	Edible / Domestic use	Food wrappers / plates		Pu
97a	<i>Boerhavia diffusa</i>	Nyctaginaceae	B	L	Edible			Pu

99	<i>Murraya peniculata</i>	Rutaceae	F	W	Timber / Medicinal	Pu
101	<i>Ficus spp.</i>	Moraceae	F	W	Timber / Medicinal	Pu
105	<i>Terminalia arjuna</i>	Combretaceae	F	W	Timber	Pu
107	<i>Grewia spp.</i>	Tiliaceae	F	L	Fodder	Pu
109a	<i>Drymaria cordata</i>	Caryophyllaceae	B	L	Medicinal	Pu
111	<i>Citrus medica</i>	Rutaceae	V	FR	Edible	Pu
113	<i>Atalantia racemosa</i>	Rutaceae	V	FR	Edible	B / Pu / Pa
114	<i>Michelia champaca</i>	Magnoliaceae	F	FL	Medicinal	Pu
115	<i>Blepharis maderapatensis</i>	Acanthaceae	V	L	Medicinal	Pu
116	<i>Coccinia grandis</i>	Cucurbitaceae	V	L	Edible	Pu
117	<i>Eucalyptus tereticornis</i>	Myrtaceae	V	L	Medicinal	Pu
120	<i>Vitex negundo</i>	Verbenaceae	V	L	Medicinal	Pu
127	<i>Jasminum flexile</i>	Oleaceae	F	FL / L	Hair decoration / Fodder	Pu / Pa
128	<i>Adiantum spp.</i>	Andiantaceae	F	Fern (R)	Medicinal	Pu
129	<i>Borassus flabellifer</i>	Palmae	B	Pith / L	Edible / Fodder / Roofing	Pu / Pa
131	<i>Mimosa inisia</i>	Mimosoideae	F	B	Basket-weaving	Pu
134	<i>Lantana camara</i>	Verbenaceae	V	FR	Chemical making	Pu
135	<i>Achyranthes aspera</i>	Amaranthaceae	V	L	Edible	Pu
143	<i>Vigna spp.</i>	Papilionoideae	F	SD	Medicinal	Pu
144	<i>Thunbergia fragrana</i>	Acanthaceae	F	L / FR	Edible	Pu
147	<i>Acrocarpus fraxinifolius</i>		F	W	Medicinal / Ornamental	Pu
149	<i>Carotya urens</i>	Palmae	F	FR	Timber	Pu
151	<i>Stribilanthus spp.</i>	Acanthaceae	F	L	Religious / Medicinal	Pu
153	<i>Memecylon umbellatum</i>	Melastomataceae	F	W	Medicinal	Pu
155	<i>Canarium strictum</i>	Burseraceae	F	RE / FR	Timber	Pu
156	<i>Cassine glauca</i>	Celastraceae	F	FR	Perfume-making	Pu
158	<i>Cinnamomum spp.</i>	Lauraceae	V	B	Edible	Pu
160	<i>Emilia sonchifolia</i>	Asteraceae	V	L	Perfume-making	Pu
161	<i>Calotropis gigantea</i>	Asclepias	V	L	Medicinal	Pu
162a	<i>Actinopteris spp.</i>	Actinopteridaceae	Road-cut	Fern	Suicide	Pu
164a	<i>Commelina spp.</i>	Commelinaceae	V	L	Medicinal	Pu
166	<i>Opuntia monacantha</i>	Cactaceae	V	FR	Edible	Pu
167	<i>Cissus quadrangularis</i>	Euphorbiaceae	V	L	Medicinal	Pu
168	<i>Tectona grandis</i>	Verbenaceae	F	W	Timber	Pu
169	<i>Alternanthera spp.</i>	Nyctaginaceae	V	L	Medicinal	Pu
171	<i>Datura metel</i>	Solanaceae	V	L	Medicinal	Pu
					Eye problems	
					Wild lemon	
					Headache	
					Headache	
					Body coolness	
					Dog bite	
					Weddings	
					Headache	
					Body pain	
					Wind-blown fear in babies	
					Eye problems	
					Stomach pain in animals	
					Chest / body pain / eye coolness	

172	<i>Murraya koenigii</i>	Rutaceae	B	L	Medicinal	Eye coolness	Pu
173	<i>Boletus spp.</i>		F	Fungus	Medicinal	Burns	Pu
175	<i>Cassia fistula</i>	Caesalpinioideae	F	W	Timber		Pu
176	<i>Solanum volaceum (indica)</i>	Solanaceae	F	L	Medicinal	Stomach ache	Pu
177	<i>Mukia maderaspatana</i>	Cucurbitaceae	F	FR	Medicinal	For excessive tiredness	Pu
178	<i>Zehneria mayorensis</i>	Cucurbitaceae	F	L	Edible / Medicinal		Pu
179	<i>Cytopogon spp.</i>	Gramineae	Grassland	Oil extract	Medicinal	Headache	Pu
180	<i>Euphorbia hirta</i>	Euphorbiaceae	F	L	Medicinal		Pu
181	<i>Ageratum conyzoides</i>	Asteraceae	F	L	Medicinal	Headache	Pu
182	<i>Chromolaena odorata</i>	Asteraceae	F	FL	Medicinal		Pu
183	<i>Secamone emetica</i>	Asclepiadaceae	F	All parts	Medicinal		Pu
185	<i>Asparagus remotus</i>	Liliaceae	F	L	Medicinal	To free thorns from underneath skin	Pu
186	<i>Bombax malabaricum</i>	Bombacaceae	F	FL / FR	Mattress / Wildlife food		Pu
188	<i>Ocimum spp.</i>	Asclepiadaceae	F	Vine	Medicinal	For children with dysentery	Pu
190	<i>Gnidia glauca</i>	Lamiaceae	F	L	Medicinal	Cough, cold and fever	Pu
196	<i>Syzygium cumini</i>	Myrtaceae	F	RE	Medicinal	Itching	Pu
197	<i>Alstonia venenata</i>	Apocynaceae	F	FR / W	Edible / Timber		Pu
201	<i>Sida cordifolia</i>	Malvaceae	F	W	Religious		Pu
206	<i>Sterculia foetida</i>	Sterculiaceae	F	L	Medicinal	Hand and leg pain	Pu
207	<i>Premna spp.</i>	Verbenaceae	F	W	Firewood		Pu
208	<i>Strychnos potatorum</i>	Loganiaceae	F	W	Firewood	Purifies water	Pu
209	<i>Dimocarpus longan</i>	Sapindaceae	F	FR	Medicinal		Pu
211	<i>Ficus tsiela</i>	Moraceae	F	L	Thatching / Construction		Pu
212	<i>Vitex altissima</i>	Verbenaceae	F	Entire	Shading coffee		Pu
213	<i>Ixora spp.</i>	Rubiaceae	F	W / L	Timber / Medicinal		Pu
214	<i>Argemone mexicana</i>	Papaveraceae	F	W	Firewood		Pu
215	<i>Sansevieria roxburghiana</i>	Agavaceae	V	R	Medicinal	Knee pain	Pu
225a	<i>Lycopersicon esculentum</i>	Solanaceae	V	FR	Medicinal		Pu
226	<i>Solanum torvum</i>	Solanaceae	F	L	Edible		Pa
231	<i>Albizia lebeck</i>	Mimosoideae	F	FR	Edible		Pa
232	<i>Albizia amara</i>	Mimosoideae	F	W	Timber		Pa
237	<i>Ficus spp.</i>	Moraceae	F	L	Medicinal	To stop babies from crying	Pa
241	<i>Lepisanthes tetraphylla</i>	Sapindaceae	F	FR	Edible		Pa
242	<i>Trichilia connaroides</i>	Meliaceae	F	All parts	Poisonous		Pa
252	<i>Hardwickia binata</i>	Caesalpinioideae	F	FR	Wildlife food		Pa
				L / FL	Religious / Ornamental		Pa