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PLANTS RELATED TO BIO-FENCING AND ALLIED USES IN PANIYA TRIBE INHABITING AREAS OF WAYANADU DISTRICT, KERALA, INDIA.

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ABSTRACT

The present paper deals with 72 plants, which are being used by Paniya Tribes of Wayanadu District, Kerala, for bio-fencing. This work is being carried out in collaboration with local Paniya Tribes of Manamthavady and Bathery Taluks of Wayanadu district, Kerala. The collected data is indexed by plant name, family, habit characteristics and conditions at which they are used.

Key Words: Paniya Tribe, Fencing plants, Wayanadu District, Kerala.

INTRODUCTION

The familiarity with plant species providing food, medicine and insecticides, dates back to the beginning of civilization. The tribal people and ethnic races have developed their own cultures, customs, cults, religious rites, taboos, totems, legends and myths, folk tales and songs and foods and medical practices, throughout the world. People started making permanent or temporary boundaries around their field or courtyard using different plants called as 'Biofencing plants. It is the way of establishing a boundary by planting a line of trees, shrubs or herbs at relatively close spacing that provide protection against cattle and wildlife. The indigenous people have revealed various uses of natural resources around them, which is based on their necessities, observation and experience (Jain, 2004; Borkataki *et al.*, 2008). So, a variety of species were checked to discover suitability of plants for use as fencing. Furthermore plant species having spines, thorns, unpalatable leaves or frequent branching are mostly preferred over others because they provide effective protection against cattle or wild animals (Bhattarai *et al.*, 2007). The information of such plants is mainly collected by the populace in the form of traditions and experiences and is inherited over the centuries to the future generations. Hence it is tremendously imperative to save this conventional knowledge of biological heritage and to explore new resources.

Fences in Wayanadu, which are once famous for its multi functionality, are now progressively getting fragmented due to various socio-economic pressures, pushing many species and the associated knowledge into extinction. In

this circumstance, there is an urgent need for the continued conservation of these fencing plants as valuable refugia of diversity and carbon sink. Hence documenting the diversity and ethnobotanical information associated with these plants used for fencing purposes is of national priority. Keeping this in mind, a study was carried out in the live fencing areas of Bathery and Manamthavady taluks of Wayanadu district of Kerala state to understand the floristic attributes of the resident species and also to document their uses and associated ethno botanical information.

STUDY AREA

Wayanad district is characterized by a hilly terrain on the southern Western Ghats and located in the northeast part of Kerala, at a distance of about 76 km from the seashore. The area lies between North latitude 11° 26' to 12° 00' and East longitude 75° 75' to 76° 56'. The altitude varies from 700- 2100 metres above MSL. It is bounded on the east by Nilgiris and Mysore districts of Tamil Nadu and Karnataka, north by Coorg district of Karnataka, on the south by Malappuram district and on the west by Kozhikode and Kannur districts of Kerala.

METHODOLOGY

Extensive field trips were carried out to different paniya colonies. Personal observation of the process of construction of these fences were done and recorded. For the construction of fences one to two year old seedlings

and in case of woody plants, mature cuttings are used. Seeds are very rarely used. Information regarding the different plants used for this purpose, their properties, uses and effectiveness are collected through personal interview with the tribals. Plants were collected, made into herbarium, identified using respective flora (Manilal &

Table1. Plants used for fencing

Sl. No.	Botanical name	Family	Habit	Dried	Live
1.	* <i>Acacia torta</i> (L.) Willd	Mimosaceae	S		+
2.	<i>Achyranthus aspera</i> L.	Amaranthaceae	S		+
3.	* <i>Adhatoda zeylanica</i> Medikus.	Acanthaceae	S		+
4.	* <i>Agave americana</i> L.	Agavaceae	S		+
5.	<i>Agave sisalana</i> Perr.ex Engelm.	Agavaceae	S		+
6.	<i>Alamanda cathartica</i> L.	Acanthaceae	S		+
7.	<i>Alpinia calcarata</i> L.	Zingiberaceae	S		+
8.	* <i>Bambusa arundinacea</i> (Retz.) Roxb.	Poaceae	S	+	+
9.	<i>Barleria prionites</i> L.	Acanthaceae	S		+
10.	<i>Bauhinia purpurea</i> L.	Caesalpiniaceae	T		+
11.	<i>Bauhinia variegata</i> L.	Caesalpiniaceae	T		+
12.	<i>Calotropis gigantia</i> L.	Asclpiadaceae	S		+
13.	<i>Calotropis procera</i> L.	Asclpiadaceae	S		+
14.	<i>Caesalpinia bonduc</i> (L.) Roxb.	Caesalpiniaceae	S		+
15.	<i>Caesalpinia mimosoides</i> Lam.	Caesalpiniaceae	S		+
16.	<i>Calophyllum inophyllum</i> L.	Clusiaceae	T		+
17.	<i>Canthium coromandelicum</i> (Burm.f.) Alston	Rubiaceae	S	+	+
18.	<i>Canthium rheedii</i> DC.	Rubiaceae	S	+	+
19.	<i>Cassia tora</i> L.	Fabaceae	H		+
20.	<i>Caryota urens</i> L.	Arecaceae	P		+
21.	<i>Cassia fistula</i> L.	Casuarinaceae	T		
22.	<i>Catunaregam spinosa</i> (Thunb.) Tirveng.	Rubiaceae	S		+
23.	<i>Ceiba pentandra</i> (L.) Gaertn.	Bombacaceae	T		+
24.	<i>Cereus peruvianus</i> (L.) Mill.	Cactaceae	CS		+
25.	<i>Clitoria ternatea</i> L.	Lamiaceae	CR		+
26.	<i>Clerodendrum seratum</i> (L) Moon.	Verbenaceae	S		+
27.	<i>Cordiacylindristachya</i> Roemer &Schultes.	Boraginaceae	S		+
28.	<i>Corypha umbraculifera</i> L.	Arecaceae	P		+
29.	<i>Costus speciosus</i> L.	Zingiberaceae	H		+
30.	<i>Crotolaria retusa</i> L.	Fabaceae	H		+
31.	<i>Eagle marmelos</i> L.	Rutaceae	T		+
32.	<i>Ensete superbum</i> Rox.	Musaceae	S		+
33.	<i>Musa paradisiaca</i> L.	Musaceae	H	+	
34.	<i>Epipremnum aureum</i> L.	Araceae	H		+
35.	<i>Erythrina variegata</i> L. Var. Orientalis (L.) Merr.	Papilionaceae	T	+	+

H-herb, S-shrub, T-tree, P-palm, CS-Cactus, CR-Climber

Table1. Plants used for fencing

36	<i>Euphorbia antiquorum</i> L.	Euphorbiaceae	S		+
37.	* <i>Euphorbia neriifolia</i> L.	Euphorbiaceae	S		+
38.	<i>Euphorbia nivulia</i> Buch.- Ham.	Euphorbiaceae	S		+
39.	<i>Euphorbia tirucalli</i> L.	Euphorbiaceae	S		+
40.	<i>Furcraea foetida</i> (L.)Haw.	Agavaceae	S		+
41.	<i>Glycosmis pentaphylla</i> L.	Rutaceae	S		+
42.	<i>Gliricidia sepium</i> (Jacq.) Walp.	Papilionaceae	T		+
43.	<i>Hibiscus rosasinensis</i> L.	Malvaceae	S		+
44.	<i>Hibiscus schizopetalus</i> (Mast.) Hook.f.	Malvaceae	S		+
45.	<i>Ipomea violaceae</i> L.	Convolvulaceae	H		+
46.	<i>Indigofera tinctoria</i> L.	Fabaceae	S		+
47.	<i>Ixoracoccinea</i> L.	Rubiaceae	S		+
38.	* <i>Jatropha curcas</i> L.	Euphorbiaceae	S		+
49.	<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	S		+
50.	<i>Justicia betonica</i> L.	Acanthaceae	S		+
51.	<i>Justicia gendarussa</i> Burm.f.	Acanthaceae	S		+
52.	<i>Leea indica</i> (Burm.f.) Merr.	Leeaceae	S		+
53.	<i>Mangifera indica</i> L.	Anacardiaceae	T		+
54.	<i>Michelia chempaca</i> L.	Magnoliaceae	T		+
55.	* <i>Mucuna pruriens</i> (L.) DC.	Papilionaceae	H		+
56.	<i>Murrayakoenigi</i> L.	Rutaceae	S		+
	<i>Musa paradisiaca</i> L.	Musaceae	H		+
57.	<i>Mussaenda frondosa</i> L.	Rubiaceae	S		+
58.	<i>Naringic renulata</i> (Roxb.) Nicolson	Rutaceae	T		+
59.	<i>Ochlandra scriptoria</i> (Dennst.) C.Fischer	Poaceae	S	+	+
60.	<i>Ochlandra travancorica</i> Benth.ex.Gamble	Poaceae	S	+	+
61.	<i>Opuntia stricta</i> (Haw.) Haw. Var. Dillenii (Ker-Gawler)L. Benson	Cactaceae	S		+
62.	<i>Oroxylum indicum</i> L.	Bignoniaceae	T		+
63.	<i>Pandanus odoratissimus</i> L.	Pandanaceae	S		
64.	<i>Ricinus communis</i> L.	Euphorbiaceae	S		+
65.	<i>Ruta graveolens</i> L.	Rutaceae	H		+
66.	<i>Sansevieria trifasciata</i> L.	Asparagaceae	H		+
67.	<i>Spondias pinnata</i> L.	Anacardiaceae	T		+
68.	<i>Sterculia urens</i> Roxb.	Malvaceae	S		+
69.	<i>Thumbergia alata</i> L.	Acanthaceae	S		+
70.	<i>Vetiveria zizanioides</i> (Linn.)Nash	Poaceae	H		+
71.	<i>Vitex negundo</i> L.	Lamiaceae	H		+
72.	<i>Ziziphus mauritiana</i> Lamk.	Rhamnaceae	H		+

H-herb, S-shrub, T-tree, P-palm, CS-Cactus, CR-Climber

Sivarajan 1982; Ramachandran & Nair, 1988; Gamble & Fischer, 1915 - 1936). The voucher specimens were deposited at the SMC herbaria.

RESULTS AND DISCUSSION

From present study it is clear that the village people were using a total of 72 plant species belonging to 31 families, either live or in dried state for fencing, of which the Rutaceae are represented by 7 species, Acanthaceae represented by 6 species, Euphorbiaceae represented by 5 species, Poaceae, Caesalpiaceae, Fabaceae and by 4 species each and Agavaceae, Papilionaceae and Malvaceae by 3 species each. The different plants used for fencing, their family, local name, habit and other conditions are listed in table 1. Here, shrubs were the main source of fencing in terms of number of species (40 species) followed by herbs (14 species), trees (14 species), cactus (2 species), climbers (1 species) and palm (1 species). The common ailments treated locally in the study areas were skin problems, wound, toothache, abdominal problems, kidney stones, diabetes, bone fracture, arthritis, piles, fits, asthma, head ache, urinary troubles etc.

In this study, it is recorded that maximum plant species were cultivated by the Paniya tribes, whereas 22 species were naturally grown. Important among them were *Calotropis gigantea*, *C. procera*, *Clerodendrum seratum*, *Bauhinia purpurea*, *Bauhinia variegata*, *Ipomea violaceae*, *Pandanus odoratissimus*, *Oroxylum indicum*, *Ziziphus mauritiana* etc. Bamboos, cacti, *Jatropha* spp., *Pandanus* and *Vitex* are capable of preventing soil erosion and are acting as wind breakers and also increase the firmness of the fences. Ornamental plants are often planted along these fences to impart aesthetic view while in some areas these were supplemented with many fruit yielding climbers to make them economically important.

Most abundantly recorded species used as biofencing were *Jatropha curcus*, *Pandanus*, *Vitex*, *Ricinus*, *Musa* and selected species of bamboos. Almost all the species recorded in our study are used by the tribes for their day today life for food, timber, fuel wood, as traditional medicines and also for cultural programmes. Some of the plant species which were unpalatable to cattle were also preferred for biofencing. Notable among them are *Agave Americana*, *Ipomoea violaceae*, *Opuntia stricta*, *Ricinus communis* and *Zanthoxylum armatum*. *Mucuna pruriens* possess stinging hairs which prevent the entry of cattle or wildlife into the field. *A. torta*, *Caesalpinia mimosoides* Lam., *Mucuna pruriens* (L.) DC., *Pandanus* spp. and *A. americana* make their presence, as they form impenetrable thickets.

On comparison with plants used for field fencing in North Gujarat (Bhasker, 1998), it is clear that only 7 plants (indicated by*) are used both in Gujarat and Waynadu. *Bambusa* sp., *Calotropis* sp., *Caesalpinia bonduc* and *Vitex* are used in Wayanadu and Andhrapradesh (Reddy, 2008). Of the study conducted by Prasad and Raveendran (2010), only 5 species were common in Wayanadu and Kasargod district. These plants were also used as fencing plants to protect agricultural fields. Some of them are also used as medicinal plants. *Sansevieria trifasciata* fibre has a unique property, capable of withstanding high temperature without any fibre degradation (Kanimozhi, 2011). The above characteristics confirm that these plants have wide scope in the field as a low cost fencing material.

CONCLUSION

This traditional knowledge contributes to the conservation of biodiversity and provides resources of economic and ecological interest and thereby decreasing the pressure on forest resources. It can also act as a desirable substitute to wall fences in this region. In addition to this, a number of locally developed systems of fencing are currently practiced in this area and are not well documented. Much of knowledge can be gained from the farmers and local folks, who have been practicing biofencing in their farming systems. All the plants used for biofencing are ideal, cheap and available in household premises. Many potential medicinal benefits are also associated with these plants. Further research and documentation on these aspects may help in developing effective drugs for health care. The tribals were using these plants as alternatives to allopathic medicines. Further research on these multipurpose plants may help in developing effective drugs for human health care. In conclusion, a wide category of plants are under use by the tribal population for biofencing purposes, and some of them have higher medicinal properties. There is urgent need for their effective documentation and experimentation for their widespread utilization in other heterogeneous environments outside tribal hamlets.

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