



STUDIES ON WILD EDIBLE PLANTS CONSUMED BY THE TRIBES OF KANYAKUMARI WILD LIFE SANCTUARY, INDIA

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Abstract

This study documents a total of 81 wild edible plants belonging 37 families and 62 genera, utilized as a source of nutritional and medicinal purposes by the indigenous communities of Kanyakumari District. Among them 80 species are Angiosperms and only one is Gymnosperm. Information was gathered by interviewing kani traditional healers, administrative heads of tribal community and elderly people. Solanaceae was the most dominant family with six wild edible plants followed by Phyllanthaceae, Moraceae, Rutaceae, Dioscoreaceae and others. An ethno-botanical exploration of traditional wild edible plants consumed by the kanikars of Kanyakumari District was carried out and this study focused on the identification and documentation of these plants with their ethno-botanical values and health benefits. All the 81 plants consumed by the tribal people having medicinal values. These edible plants provide significant health benefits because of their high antioxidant content, vitamins and minerals, fiber, folic acid etc. The wild edible plants sustain numerous phytochemicals and significantly contribute to the nutritional security of mankind.

Key words: Traditional healers, Moothukani, Traditional knowledge, Edible plants.

Introduction

Forests have a large and indispensable role to play in improving food security of tribes. Kanyakumari forest provide a large number of wild edible plants. Its fruits, tubers, leaves, seeds, roots, young shoots, toddy etc. make an important contribution to the food of tribal people contain nutritional and medicinal values. Tribal communities have been largely depends on nature either directly or indirectly of food, clothes, shelter and medicine. Due to the improvement of traditional knowledge and technology people obtain our agricultural practices the traditional knowledge is useful to develop new food sources now a days. Wild edible plants are most commonly used method of preparation for medicines, paste, raw, juice, boiling and oil are used by tribal people of Kanyakumari wild life sanctuary.

Further, traditional knowledge on wild edible plants due to improvement of economy of people and availability of marketable products with high nutritional values in the Agasthyamalai region. Keeping in view the importance of these wild edible plants resources, various researchers have documented the information on their medicinal uses.

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Traditional knowledge on natural products used by the tribal people is well documented in Kanyakumari forest resources. (Brisca Renuga and Mary Mettilda Bai, 2013; Sujatha and Brisca Renga, 2013) and documentation of Bamboo seeds used by indigenous people in the Kanyakumari forests (Kiruba *et al.*, 2007). There are few ethnomedicines studies on wild edible plants in Kanyakumari forests (Pushpakarani and Natarajan, 2014; and Palanichamy *et al.*, 2010). Although number of reports are available on ethnobotany of Kanyakumari district (Anitha *et al.*, 2008; Kingston *et al.*, 2009; Ayyanar and Ignacimuthu, 2009; Sukumaran and Raj, 2010; Ariharan *et al.*, 2012). The survey on wild edible plants in India are conducted by many researchers (Jana and Chauhan, 1998; Jain, 1964; Singh and Arora, 1978; Negi, 1988; Sundriyal and Sundriyal, 2003; Arinathan *et al.*, 2007; Banik, 2012; Binu, 2010; Haridasan *et al.*, 1990).

The wild edible plants diversity are widely distributed in maintain forest and are valuable source of food and medicines for domestic and commercial purposes. Additionally, these plants also provides some useful products like fiber, fodder, tannin, resin and dyes etc. (Kayang, 2017). In other parts of the world such as USA,

Europe and Australia, the health roles of wild edible vegetable consumption are also receiving attention as functional foods, nutraceuticals or phyto-nutrients (Craig, 1999). Tribal people consume the wild edible plants with which the source of their food, income and considered a healthy diet. Diets consumed by tribal population have been subject of interest since antiquity, with more recent investigation focused on their evident health benefits (Gupta, 1989). The objectives of my work is to indigenous knowledge of these plant taxa evaluated and nutritional value benefit for urban communities.

Study area

Kanyakumari district is bounded by Tirunelveli district in the North and North East by Kerala state in the North West and the confluence of the Arabian Sea and the Indian Ocean in the west and the south. Kanyakumari district is the Southern most part of Western Ghats region which is located between 77°15' and 77°36' of east of longitude and 8°03' and 8°35' north of latitude. The present study was conducted at Kodayar and its vicinity located in the Southern Western Ghats of Kanyakumari district (77°15'E, 8°29'N) at an elevation of 250-700. It is a part of Agasthyamalai Hill range and falls in the veerapuli forest reserve in TamilNadu (Sundarapandian *et al.*, 1997; Chandrasekaran *et al.*, 1997; Swamy *et al.*, 2000; Sundarapandian *et al.*, 2000). Kanyakumari District is one of the smallest Districts in the Tamil Nadu state having an area of 1684 sq. kms. of which 1541.3 sq. kms. are rural.

Most part of Kanyakumari district enjoy a temperate climate, the south west monsoons period starts from the month of June and September, while the North East monsoon period starts from October and end in the middle of December. During the months of January and February, the atmosphere is mostly dry with high humidity. The

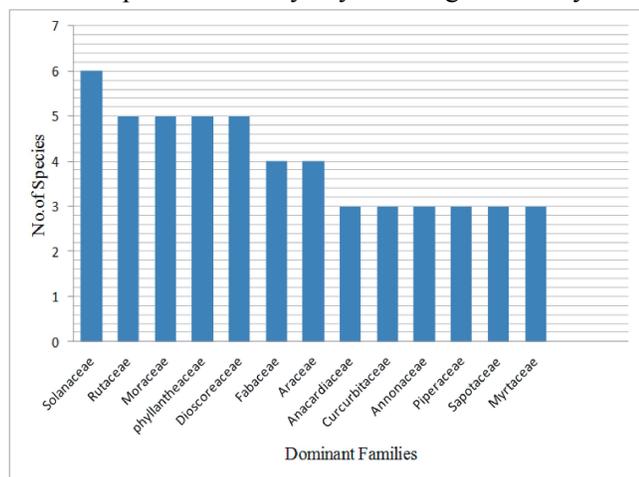


Fig. 1: Dominant wild edible plant families of Kanyakumari District.

total geographic area of the district is about 1,65,810 hectares are used for agriculture 60%. The economy of the district is predominantly 60% of the population are depend on agriculture and it allied activities such as goats for earning their livelihood.

Materials and Methods

The study was conducted during the year January 2018 to July 2019. The aim of the study was to exploration and to preservation of wild and domesticated plants used by tribals as food, medicine, oil, small timber, fuel, fibers, furniture, tools, musical instruments, etc. The tribal communities called as kanikars. There are 48 kani settlements found in the Hilly areas of Kanyakumari district. The study was conducted in eight villages namely Killikonum, Vilsarimalai, Manalikaladu, Pravailai, Thottamalai, Alamparai, Modhiramalai, Valiamalai which are inhabited by kani tribal. Each consisting of 43-105 families disbursed in the deep forest areas. First the Pilathi (traditional healer) and the Moothukani (head of the kani settlement) of each study site was traced and interviewed. Then with the help of Moothukani and other resource persons were selected to collect the edible plants and find out the health benefits of the collected plants and the preparation of ethnomedicines.

Results and Discussion

During the present study, a total of 81 wild edible plant species belonging to 37 families and 62 genera, were recorded from the study area (Table 1). Among the 80 species of angiosperms includes 37 families, Solanaceae dominates with 6 species and Moraceae, Rutaceae, Dioscoreaceae and Phyllanthaceae follows with the later includes 5 species (Fig. 1). Information was gathered by interviewing kani traditional healers and elderly people of eight villages from kanyakumari tribal areas. The data was arranged according to the Botanical name, Tribal name, Family and traditional uses (Table 1). (Yesodharan

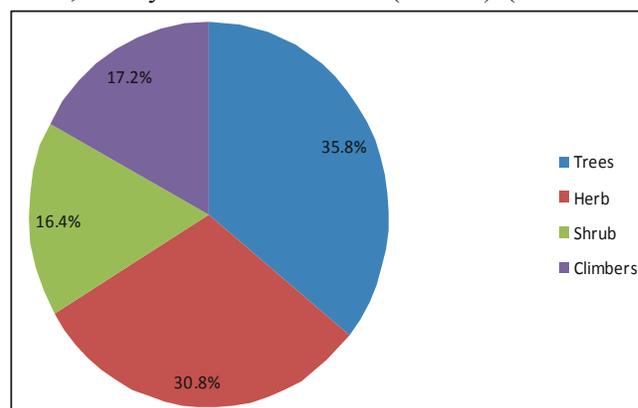


Fig. 2: Percentage of different growth forms/habit of recorded wild edible plants species.

Table 1: Wild edible plants used by indigenous communities of Kanyakumari.

S. No.	Botanical name	Tribal name	Family	Parts used	Traditional Uses
1.	<i>Annona squamosa</i>	Munthri	Annonaceae	Fruits	Fruits are eaten raw and it is used to make hairtonic, burning sensation.
2.	<i>Annona reticulata</i>	Redmunthri	Annonaceae	Fruits	Fruits are eaten raw to treat diarrhea.
3.	<i>Annona muricata</i>	Puzhipumunthri	Annonaceae	Fruits	Fruits are eaten raw to treat cancer and parasitic infections, rheumatism.
4.	<i>Averrhoa carambola</i>	Bilimbipazham	Oxalidaceae	Fruits	Fruits are eaten raw. And its juice is often recommended in folk medicine in a diuretic.
5.	<i>Averrhoa bilimbi</i>	Pulhichi	Oxalidaceae	Fruits	Fruits are cooked to control internal bleeding in the stomach ulcers.
6.	<i>Artocarpus heterophyllus</i>	Palapazham	Moraceae	Fruits	Fruits are eaten raw and help in the healing of stomach ulcers.
7.	<i>Ananas cosmosus</i>	Annacypazham	Bromeliaceae	Fruits	Fruits are eaten raw to treat gastric irritability, Jaundice.
8.	<i>Anacardium occidentale</i>	Kollampazham	Anacardiaceae	Fruits	Fruits are eaten raw to treat of cholera and kidney troubles.
9.	<i>Aegle marmelos</i>	Vilvam	Rutaceae	Fruits	Fruits are cooked and roasted to treat piles.
10.	<i>Artocarpus hirsutus</i>	Aynipazham	Moraceae	Fruits	Fruits are eaten raw to treat skin diseases.
11.	<i>Momordica charantia</i>	Pakarkkai	Cucurbitaceae	Fruits	Fruits are cooked to treat diabetes.
12.	<i>Borassus flabellifer</i>	Panampazham	Arecaceae	Fruits	Fruits are cooked to treat leprosy and dysentery.
13.	<i>Ficus carica</i>	Vittipazham	Moraceae	Fruits	Fruits are eaten raw. It is used for liver and spleen diseases, diabetes.
14.	<i>Garcinia gummi</i>	Kodampuli	Clusiaceae	Fruits	Consumed as raw fruits, as juice, use folk medicine for diarrhea.
15.	<i>Mangifera indica</i>	Mampazham	Anacardiaceae	Fruits	Fruits are eaten raw to treat stomachache.
16.	<i>Manilkara zapota</i>	Sappota	Sapotaceae	Fruits	Fruits are eaten raw to treat cancer causing toxins.
17.	<i>Moringa oleifera</i>	Murungai	Moringaceae	Fruits	Fruits are cooking to treat burning urination.
18.	<i>Manilkara kauki</i>	Elengi	Sapotaceae	Fruits	Fruits are eaten raw to treat fertility in women.
19.	<i>Musa paradisiaca</i>	Vaahzai	Musaceae	Fruits	Fruits are used as roast. To treat dysentery and diarrhea.
20.	<i>Phyllanthus emblica</i>	Nelli	Phyllanthaceae	Fruits	Fruits are used as pickle. To treat jaundice.
21.	<i>Punica granatum</i>	Mathulam	Lythraceae	Fruits	Fruits are eaten raw to treat colic and diabetes, jaundice.
22.	<i>Piper nigrum</i> L.	Nallamilagu	Piperaceae	Fruits	Fruits are cooked to treat body pain, cough.
23.	<i>Piper longum</i>	Tippili	Piperaceae	Fruits	Fruits are cooked to treat fever, cough.
24.	<i>Physalis minima</i>	Kuttythakkali	Solanaceae	Fruits	Fruits are cooked to treat diuretic.
25.	<i>Syzygium jambos</i>	Jambika	Myrtaceae	Fruits	Fruits are eaten raw to prevent diabetes, prevent muscle cramps, skin health.
26.	<i>Pouteria campechiana</i>	Muttapazyham	Sapotaceae	Fruits	Fruits are eaten raw. It is used to cure anemia, coronary Heart diseases.
27.	<i>Psidium guajava</i>	Peraikkai	Myrtaceae	Fruits	Fruits are eaten raw to treat ulcers, diarrhea and dysentery.
28.	<i>Spondias pinnata</i>	Mampulichi	Anacardiaceae	Fruits	Fruits are cooking. It is used as an astringent and antiscorbutic, treatment of bilious dyspepsia.
29.	<i>Syzygium cumini</i>	Naval	Myrtaceae	Fruits	Fruits are eaten raw to relieve stomach pain, heart diseases, diabetes.

Table 1 Continue...

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30.	<i>Solanum torvum</i>	Chundaikkai	Solanaceae	Fruits	Fruits are cooking pain killing and anti-inflammatory properties.
31.	<i>Solanum americanum</i>	Manathakkali	Solanaceae	Fruits	Fruits are eaten raw to treat stomach pain, ulcer.
32.	<i>Tamarindus indica</i>	Puzhi	Caesalpiniaceae	Fruits	Fruits are cooking. It is used as spice and checks vomiting.
33.	<i>Zizphus rugosa</i>	Thodalipazham	Rhamnaceae	Fruits	Fruits are eaten raw to treat diarrhea.
34.	<i>Artocarpus altilis</i>	Ayinipila	Moraceae	Fruits	Fruits are cooking to treat tonic for liver.
35.	<i>Baccaurea motleyana</i>	Mootypazham	Phyllanthaceae	Fruits	Fruits are eaten raw to treat prevent cancer, cure some skin diseases, healthy digestive organ.
36.	<i>Citrus limon</i>	Elumechi	Rutaceae	Fruits	Fruits are used as pickle to treat blood pressure.
37.	<i>Citrus aurantium</i>	Narthai	Rutaceae	Fruits	Fruits are used as pickle to treat skin diseases.
38.	<i>Citrus maxima</i>	Pamblimas	Rutaceae	Fruits	Fruits are eaten raw to treat used as weight loss product.
39.	<i>Phyllanthus acidus</i>	Ari neli	Phyllanthaceae	Fruits	Consumed as raw fruits to treat blood enhance to liver.
40.	<i>Capsicum annum</i>	Milagay	Solanaceae	Fruits	Fruits are cooking to treat back pain, cluster head pain.
41.	<i>Carissa carandas</i>	Nullipazham	Apocynaceae	Fruits	Fruits are eaten raw to treat body heat.
42.	<i>Carica papaya</i>	Pappali	Caricaceae	Fruits	Consumed as raw fruits used as digestive, antihelminthic, laxative.
43.	<i>Coccina grandis</i>	Kovakkai	Cucurbitaceae	Fruits	Fruits are cooking to treat diabetic wounds.
44.	<i>Hemidismus indicus</i>	Narunattiveru	Apocyanaceae	Roots	Roots are cooking to treat ulcer.
45.	<i>Morus alba</i>	Malbari	Moraceae	Fruits	To treat ulcer.
46.	<i>Cocos nucifera</i>	Thennai	Arecaceae	Fruits	To treat blood purification.
47.	<i>Abelmoschus esculentus</i>	Vendai	Malvaceae	Fruits	To treat sugar.
48.	<i>Terminalia catappa</i>	Vatham	Combretaceae	Fruits	To treat blood purification.
49.	<i>Phyllanthus niruri</i>	Keezhaneli	Phyllanthaceae	Leaves	To treat jaundice.
50.	<i>Cissus quadrangularis</i>	Perandai	Vitaceae	Leaves	To treat ulcer.
51.	<i>Piper betle</i>	Vetilai	Piperaceae	Leaves	To treat blood purification.
52.	<i>Physalis minima L.</i>	Potalumthukki	Solanaceae	Leaves	To treat cough
53.	<i>Sauropus androgynous</i>	Vellikeeri	Phyllanthaceae	Leaves	To treat blood pressure
54.	<i>Aloe vera</i>	Sothukattalai	Asphodelaceae	Leaves	To treat head ache, hair growth
55.	<i>Acalypha indica</i>	Kuppaimani	Euphorbiaceae	Leaves	To treat cough , fever
56.	<i>Alternanthera sessilis</i>	Pomakani	Amaranthaceae	Leaves	Improve eye vision
57.	<i>Amaranthus viridis</i>	Kuppaikeri	Amaranthaceae	Leaves	Improve eye vision
58.	<i>Plectranthus amboinicus</i>	Navarapachellai	Lamiaceae	Leaves	To treat cold and cough.
59.	<i>Murraya koenigii</i>	Kariveppulai	Rutaceae	Leaves	To treat dog bite.
60.	<i>Solanum trilobatum</i>	Thoothuvalai	Solanaceae	Leaves	To treat asthma.
61.	<i>Sesbania grandiflora</i>	Agathikeerai	Fabaceae	Leaves	Totreat vomiting, stomach ulcer.
62.	<i>Cycas cricinals</i>	Chazhankai	Cycadaceae	Seed	To treat improving health benefits.
63.	<i>Entuda pursaetha</i>	Parandaikai	Legminaceae	Seed	To treat body pain
64.	<i>Mucuna pruriens</i>	Koinkankai	Fabaceae	Seed	imporving blood purification.
65.	<i>Dioscorea oppositifolia L.</i>	Kavalakizhanku	Dioscoreaceae	Tubers	To treat body swelling.
66.	<i>Colocasia esculenta</i>	Neellapalli	Araceae	Tubers	To treat blood purification.
67.	<i>Dioscorea esculenta</i>	Mukkilangu	Dioscoreaceae	Tubers	To treat body swelling.
68.	<i>Dioscorea tomentosa</i>	Noora	Dioscoreaceae	Tubers	To treat body swelling and rheumatism.

Table 1 Continue...

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69.	<i>Alocasia macrorrhizos</i>	Maranchambu	Araceae	Tubers	To treat body swelling.
70.	<i>Arisaema barnesii</i>	Karunaikizhangu	Araceae	Tubers	To treat body swelling and rheumatism.
71.	<i>Maranta arundinacea L.</i>	Koovakizhangu	Marantaceae	Tubers	To treat ulcer
72.	<i>Manihot esculenta</i>	Marichnikizhangu	Euphorbiaceae	Tubers	To improving blood purification.
73.	<i>Ipomoea batatas</i>	Sweet potato	Convolvulaceae	Tubers	To improving blood purification.
74.	<i>Dioscorea alata</i>	Kachikizhangu	Dioscoriaceae	Tubers	To treat stomach pain.
75.	<i>Dioscorea bulbifera</i>	Chrrukizhangu	Dioscoriaceae	Tubers	Totraeat stomach pain.
76.	<i>Centella asiatica</i>	Vallarai	Apiaceae	Leaves	To treat memory power.
77.	<i>Momodica dioica</i>	Malaipovarikai	Cucurbitaceae	Fruits	To treat diabetis
78.	<i>Bambusa bambos</i>	Muzhai	Poaceae	Seed	To treat blood purification.
79.	<i>Arachis hypogaea</i>	Kadalai	Fabaceae	Seed	To treat blood purification.
80.	<i>Anaphyllum wightii</i>	Keeraikezhangu	Araceae	Tuber	To treat snake bite
81.	<i>Cajanus cajan</i>	Thuvarai	Fabaceae	seed	To treat blood purification

and Sujana, 2007) reported the wild edible plants recorded from the Parambikulam wild life sanctuary, of the Kerala has been traditionally used by the tribes of their area.

Among the various growth forms, herbs shared maximum number with 30.8%; (n=25), shrubs 16.04%; (n=13), trees 35.8%; (n=29) and climbers 17.2%; (n=14) (Fig. 2). All the six members of the plant differs in different species. The major edible plant parts used in fruits with 59.2% tubers 16%, followed by leaves 17.2%, roots 1% and seeds 6.1% (Fig. 3).

Plants, such as *Dioscorea oppositifolia*, *Dioscorea esculenta*, *Colocasia esculenta*, *Cycascircinalis*, *Momodica dioica*, *Solanum torvum* are most commonly used by the kani people due the richness available plate 1. (Nihan *et al.*, 2012) reported by *Apium graveolens*, *Oenanthe pimpinelloides*, *Nasturium officinale*, *Polygonum amphibium*, *Papaver rhoeas*, *Urtica dioica*, are commonly used by the local communities in Manyas.

This study also finds that the wild edible plants consumed by the tribal people as food are also used for medicines for various diseases. For example *Hemidismus*

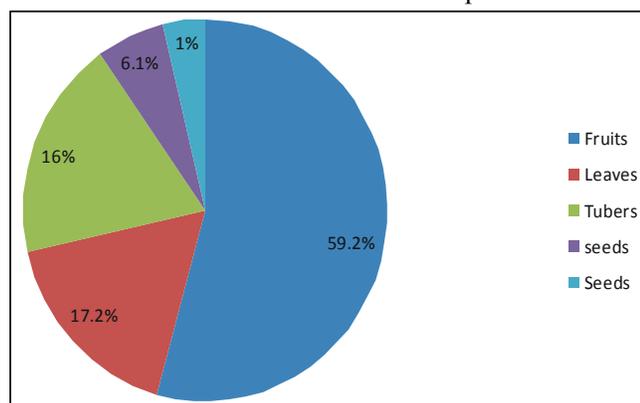


Fig. 3: Percentage of different edible parts of wild edible plants recorded from Kanyakumari district.

indicus, *Aloe vera*, *Solanum americanum*, serve as food and medicines they can cure ulcer (Plate 2). Sahoo *et al.*, (2016) separated that the wild edible fruits

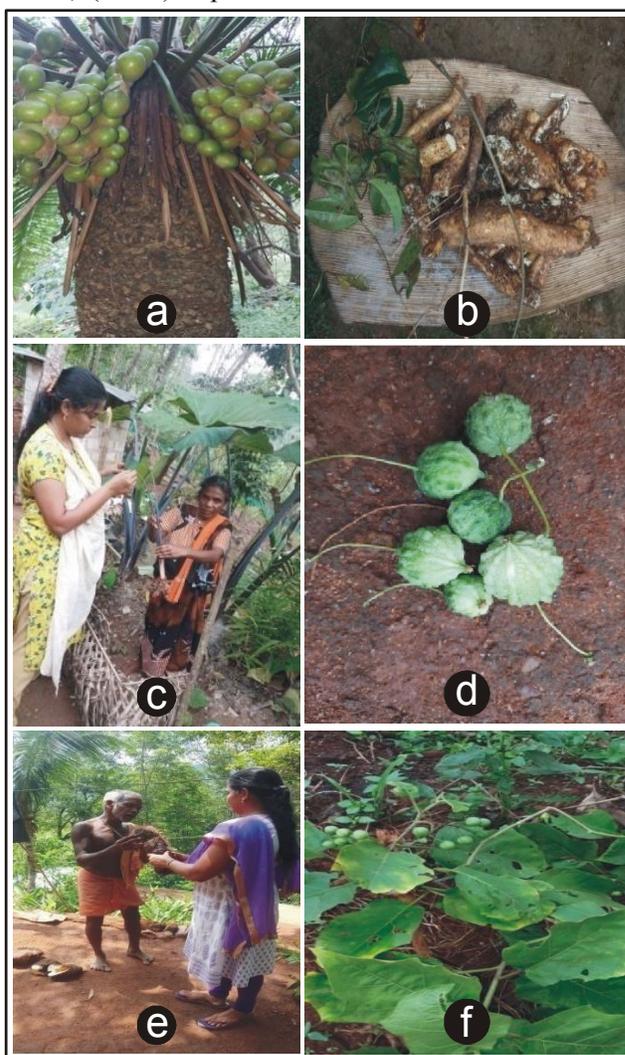


Plate 1: Most Used edible wild plants: a-*Cycas circinalis*, b-*Dioscorea oppositifolia*, c-*Colocasia esculenta*, d-*Momodica dioica*, e-*Dioscorea esculenta*, f-*Solanum torvum*.

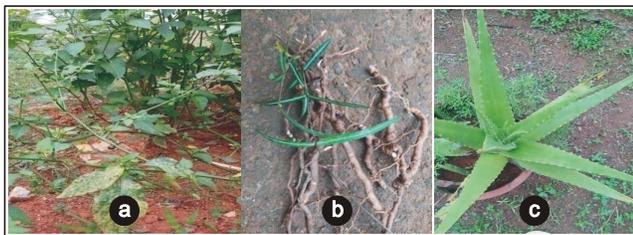


Plate 2: a-*Solanum americanum*, b-*Hemidismus indicus*, c-*Aloe vera*.

consumed by the tribals are used as traditional medicines. Species like *Aegle marmelos*, *Phyllanthus emblica*, *Cassia fistula*, *Capparis zeylanica*, *Solanum viginianum*, *Scindapsis officinalis* etc. are used both as food and medicine by tribes of Similipal Biosphere Reserve.

The knowledge of these wild edible plants and their uses is limited only to older people. Now a days the dependency on wild edible plants is less due to the availability of cereals and vegetables from the private shops nearby. So some vital measures have to be taken for the conservation and utilization of this ethnic knowledge of Kanyakumari tribes on wild edible plants. The nutritive value of the identified edible plants should be worked out and can be effectively utilized to meet the food scarcity of the nation.

Conclusion

The diverse use of wild plant resources for food, medicine, income and socio- cultural purposes by the ethnic communities of Kanyakumari district revealed the high dependence on them with as many as 81 wild edible plants documented and collected. The kanikars have good knowledge about traditional edible plants, its ethnobotanical values and other health benefits. The wild edible plants sustain numerous organic phytochemicals and significantly contribute to the nutritional scarcity of mankind that have been to the promotion of good health. This ethno botanical information could significantly contribute to our knowledge tracing out the sources of edible plants to cater the needs of the human beings.

Wild edible plants preparing acceptable recipes for their meager meals for example preparation of seed powder of *Cycas circinalis*. The toxicity of *Cycas* seeds is removed by placing crushed and powdered seeds in water overnight next morning run off the water and again washes with pure water and decanted off. Then sun dry powder is used for making delicious dishes. It was also observed that high market demand of fruits of few several species such as *Aegle marmelos*, *Phyllanthus emblica*, *Mangifera indica*, *Piper nigrum*, *Carica papaya*, *Tamarindus indica*, *Annona muricata*,

Ananas cosmosus, *Musa paradisiaca*, *Artocarpus hirsutus*, coupled with no organised practice of extraction/ harvest caused a maximum economic loss. The public awareness and community based programmes need to be encouraged at all levels for in-situ and ex-situ conservation, efforts for value addition and large scale cultivation of species of future potential. Further, investigation on bio-chemical analysis of less known wild plants may prove their suitability for selection of superior types for cultivation which may lead to the economic gain of the country. Adoption of these recommended species in traditional agro-forestry system and horticultural support programmes should find a place in the agricultural development programme of the country.

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