Information bulletin – 1

Garden for Health:

the first options






K. Haridasan,
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Green Ahalia
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Preface

Human health care is a prime concern for humankind since time immemorial. Several systems are in vogue for the mitigation of ill health. These include both codified and non-codified practices. Our country, India is no exception. The most popular systems prevailing include Ayurveda, Siddha, Unani, Tsorigpa and the folk stream. In addition, the recent entrants through colonisation that include western systems Allopathy and the German system Homoeopathy. Indian systems are known for prevention and cure holistically using natural resources which include prominently the plants, fauna and metals and minerals. The approach is mostly preventive and curative. As we know prevention is better than cure, is not it? Some how there are occasions when one gets a bout of health issue at unexpected times which could be of varying degree of intensity or exigency. At that point of time there are options to resort to primary health care which has credibility based on ages of experience, and based on culture and tradition.

Since Indian system of medicine is largely founded on plants prioritised through ayurvedic and folk knowledge. There are studies available on prioritisation of species for Primary health care through the works of FRLHT, Bangalore - a centre of excellence in traditional Knowledge and Medicinal Plants. Following their findings which is applicable to the entire country and modifying the prioritised list to

suit to our conditions prevailing here, we have further shortlisted the species and prepared a thematic composition of plants that could be grown over the Palghat land scape addressing the common PHC issues encountered. We have attempted to grow these plants by establishing our primary health care garden and maintaining it for over 3 years. The experience gained through this effort is the backbone of this publication.

For ease of reference, we have made chapterisation like the nursery technology, planting technology, addressing health care, preparation of medicines and application. Needless to mention there is a disclaimer stating that the suggestion here are exclusively meant for first response to alleviate health issues and not for serious treatments for complicated health issues. If the problem for which the medicine is used is not responding for three days, the patient may be referred to professional health care unit of hospital. However, from our experience there are very many positive responses. Further the plants suggested here are well authenticated through the codified systems on Indian medicine. Another advantage is that, most of them are edible culinary commodities with almost nil side effects.

We have endeavoured in this publication to make it easy to read and understand enabling the reader to authenticate the plant species giving specific features and representative/authentic photographs. The identification of the plants is in consultation with experts in the field and referring to floras. The medical usage is also vetted by health professional from ayurvedic stream.

Nursery and planting suggestions are based on our first-hand experience in propagation, nursery stocking and maintenance, cultivating the plants at Ahalia campus. We recognise that there is a need for such a publication to promote cultivation of medicinal plants as home herbal gardens or institutional gardens. And the result is in your hands. We do not intend to claim that the publication is error free though we tried our best to keep it without serious omissions

or lapses.

As a matter of fact, the production of this publication is the result of involvement of several members especially the Ahalia management and Green Ahalia team, the design and production team. We wish to thank and appreciate their contribution in bringing out this valuable production.

This publication is the outcome of the constant encouragement, support and guidance from Dr. V S Gopal, Chairman, Ahalia Group. We thankfully acknowledge the patronage and support from him.

We do hope, it is user-friendly and you will receive it well. Any further suggestions are welcome for improvement of the forth coming issues.

K. Haridasan, Amrutha M.A.,
Sabik S., Sreejith, E.G., and Shaibu V.T.

Foreword

There has been increased reliance and interest on traditional practices of health care by community to manage health issues experienced by them. The government's thrust to promote Indian systems of Medicines to global level are a pointer towards its relevance. There are efforts to bring out comprehensive treatise across the country at national, regional, or state level or even at the community level as evidenced by the numerous ethnobotanical publications highlighting the relevance of our plants for addressing the health care needs. As the country is vast and diverse in terms of ecosystem specificity, community knowledge, plant composition and so on it is pertinent to bring out smaller area-based publications to promote area-based use of medicinal plants for quick relief of some of the common and seasonal health problems.

In this context its significant to note that the country has over 6500 species of medicinal plants as per medicinal plant data base available recently.

This indicates there could be potential plant-based medicine for most of the diseases of primary health care nature. By using such knowledge and practice we are ensuring speedy health care at the doorsteps with authentic medical preparations. Use of such medicine has not only health security relevance but also contributes to economic and ecological security of the country. Further, for easy

access, these plants can easily be grown in home gardens across the country with differences in composition based on phytogeographical variations. In this present publication Green Ahalia team brings out suitable species for Palakkad region, for that matter the tropical zones of Kerala and adjoining Tamilnadu.

In this context I find this publication is a step towards achieving the desired goal of health for all leading to well acclaimed Athma Nirbharatha and take us towards a step towards our philosophy of Sarvey Sukhino Bhavanthu. At this juncture, I recall that Green Ahalia has an MoU with KFRI in the biodiversity research and development sector.

I congratulate the authors for bringing out this useful compilation for the sake of community adoption and wish more such publications from this group.

Dr. Syam Viswanath
Director, KFRI

Message

Ahalia group is spearheading a movement to greening the campus and conservation of biodiversity. A conscious attempt is made to demonstrate the sustainable utilisation of bioresources which will ensure equitable sharing and survival of the species. One of the areas we are keen to demonstrate is the medicinal plants used for primary health care in this part of the country. This garden is developed with subthemes grouping plants for different ailments /utility like skin and hair care, cough and cold, stomach upsets and so on. Many of these species though frequently found are not familiar to many. Thus, this section of the garden significantly contributes to our knowledge relating to first aid and immediate response to some of our ailments possible to manage with the plants. The species constituting the PHC garden needs familiarisation to public community for their adoption and usage. The present publication brought out by the Green Ahalia Team is going to be a boon for those interested in medicinal plants and creation of herbal garden. It will also familiarise with traditional knowledge based primary health care which is going to be economically beneficial and effective as immediate response medicine for those situations.

The Green Ahalia has several theme gardens for which similar booklet could be brought out which will work as manuals. I congratulate the team for bringing out such easy to refer publication.

Dr. V S Gopal ,

Chairman Ahalia Group.

Contents

Peep into PHC (Primary Health Care)

After food the community requirement for sustenance is obviously health care as per several studies. It is the immediate response to health issues, be it an unexpected fall and injury, a burn and rash, cold, cough and fever or even a stomach upset and diarrhoea. In our country there are several modern hospitals in urban and semi urban areas. However, in rural areas the health care delivery is through traditional physicians and folk healers. In fact, in most

View of Greeen Ahalia PHC garden

Adhatoda as hedge at PHC garden

Coleus and Aloe as intercrop

houses the old wise woman the grannies also involve in taking care of the PHC conditions. Other than western medicines much of it is plant-based medication that is provided. This provides an excellent opportunity to the stake holders to have those plants cultivated in and around their dwellings and harness them at the time of requirement.

The vision of primary health care is the first level of health care, close to people's homes. Primary health care forms the foundation of any health care system. It is the first point of contact of the community with health services and can meet a majority of the community's health needs.

Most of the medicinal plants that are used in primary health care system are freely available in the surroundings of the households and some of them are also cultivated and maintained in home gardens. In our country we have an age-old tradition of growing and conserving plants for both ornamental and medicinal uses.

Centella and Bacopa in marshy land

Propagation with stem cuttings in Mist chamber

Medicinal plants can also be grown in pots when there is space constraint

Based on certain laid down criteria we have shortlisted thirty eight species that are categorised into subthemes for easy reference. The criteria covered are easy availability of species, ease of propagation and maintenance, focussed action on the problems seasonality, side-effect free, easy to use, and so on. Currently these are grown in our PHC garden at Ahalia campus. The experience in growing them is reflected in this publication.

Preventive and curative PHC issues

Health care essentially is managed either through preventive mode that covers practices which will prevent occurrence of diseases. It certainly

Withania somnifera

Piper longum

Mist chamber for assured propagation

Shade houses for stocking plants

is preferable in most instances as the adage goes "prevention is better than cure," there are medicinal formulations to prevent some of the lifestyle diseases and health issues once they are correctly identified and followed. There are many species that promotes immunity like Guduchi (*Tinospora cordifolia*), Aswagandha (*Withania somnifera*), Amla (*Emblica officinalis*), Pomegranate (*Punica granatum*) and many more. There are also plants that is used for curing the diseases once the disease sets in or affects a patient. There are species like Thulsi (*Ocimum tenuiflorum*), *Andrographis paniculata, Azadirachta indica, Adhatoda zeylanica, Hemigraphis colorata* and many more.

How to grow/cultivate the medicinal plants.

As mentioned earlier the medicinal plants can easily be grown at home or schools, institutes or by other organisations, CBOs, NGOs etc. The number of plants grown in each garden will vary based on the area available to grow them. Thus, the houses in most cases may be having smaller areas where only few plants can be accommodated. Whereas schools and institutes could be having more spaces and more number of plants that can be grown. Based on the availability of land for cultivation we can fix the number of species for each plot. The species can be selected from the attached list. For those staying in flats or in smaller area homes the plants can be cultivated in pots or Grow bags. Under the following enumeration of species a brief remark is attempted to mention the cultivation aspects. There are publications

in vernacular like *Oushadha Sasyangalude Paripalanam* published by agencies like Kerala Agriculture University. Such publications can be referred for further details. Manual of medicinal plans and home garden user guide by FRLHT, Bangalore is a very informative and useful in this regard.

Disclaimer

The common health problems that can be treated with plants and plant products in our home includes fever, cough, cold, pain and swellings, cuts and wounds, burns, digestive issues, stomach upsets, skin and hair problems etc. If the symptoms persist it is advised to consult a doctor/hospital.

Selected plants for PHC

PHC plants at Ahalia garden

Thematic sections

Cuts, burns and wounds:

1 *Hemigraphis colorata*
2 *Aloe vera*
3 *Curcuma longa*
4 *Santalum album*

Fever, cough, cold, pain

5 *Ocimum sanctum*
6 *Coleus aromaticus. = C. amboinicus*
7 *Androgrpahis paniculata*
8 *Adhatoda zeylanica.= A. vasica*

Throat, digestion, stomach

9 *Piper longum*
10 *Piper nigrum*
11 *Acorus calamus*
12 *Zingiber officinale*

Diarrhea

13 *Punica granatum*
14 *Oxalis corniculata*
15 *Holarhaena pubescens* = H. *antidysenterica*

Hair and skin care

16 *Lawsonia inermis*
17 *Curcuma longa*
18 *Aloe vera*
19 *Azadirachta indica*
20 *Hibiscus rosa sinensis*
21 *Santalum album*
22 *Wrightia tinctoria*
23 *Eclipta prostrata*
24 *Emblica officinalis*

Pain, Swelling

25 *Justicia gendarussa*
26 *Vitex negundo*
27 *Calotropis gigantea*
28 *Tamarindus indica*
29 *Abrus precatorius*

Liver, Diabetes, Anaemia

30 *Tinospora cordifolia*
31 *Aegle marmelos*
32 *Emblica officinalis*
33 *Boerhaavia diffusa*
34 *Solanum nigrum*
35 *Phyllanthus amarus*
36 *Saccharum officinarum*
37 *Averrhoa carambola*
38 *Moringa oliefera*

39 *Centella asiatica*
40 *Punica granatum*

General Health & Immunity

41 *Asparagus racemosus*
42 *Tinospora cordifolia*
43 *Withania somnifera*

Growing PHC plants

Growing medicinal plants in the households is an age-old practice in our country. It is very rare to find a home without, at least a single medicinal plant. Contrary to popular belief, there is no need for a large space or courtyard for growing medicinal plants for primary health care. They can be grown even in flats where there is no land availability. Many of these plants can also be grown in pots, or other containers like bottles, cans etc. not only they are easy to keep and maintain but also imparts aesthetic beauty to the premise. Since there are much diversity in habit and habitat requirement a good understanding of their needs will help in nurturing them well. Few of these plants need certain specific conditions like water, as few of these like Centella, Acorus, Bacopa prefer marshy conditions. Others like Aloe prefer less water and might get damaged by over watering. Most of them need moderate light conditions and they could be shade tolerant or light demander. An understanding of this condition will help to cultivate them better.

Most of the high demand species can be grown in large farms or fields either as single crop or as under or intercrop. They are also suitable for multi-tier cropping based on the habit changes.

Site conditions

Well drained soil–some plants require well drained soil for their growth

Marshy/moist soil–plants like Acorus, Centella, Bacopa etc., have to be grown in marshy and moist soil which always need to be wet and

moist for better growth and yield.

Raised beds–some rhizomatous plants like Ginger, Turmeric, Ashwagandha etc., can be planted in raised beds for better production and easy harvest.

Methods

Planting material for establishing a Primary Health Care Garden can be raised through seeds, stem cuttings, off shoots, sprouting leaves, stolons, suckers etc or through wildings that arise in the wild naturally. They can either be planted by direct sowing in case of seed propagation or through nursery stocking.

Hedges: Shrubs like Adalodakam, Vathamkolli, Mailanchi, Hibiscus, etc can be grown as hedge. For a thick hedge 2 rows of cuttings can be planted. If it is well pruned and maintained, it is ornamental too. The pruned materials can be used for medicine manufacture/preparation.

Stand alones: Large trees like *Moringa*, Neem etc. needs quite a large space. In such cases it is sufficient to grow one or two of them from which enough drug material will be available.

Climbers: Plants like pepper, long pepper, Tinospora etc. need support to climb upon or can be spread over the hedge or large trees/shrubs.

Beds: small plants like Andrographis, Coleus etc., can be grown in beds in groups which will give better yield and aesthetic beauty. The creepers can be grown over other plants or arches in gates.

Pots: Plants like *Coleus, Aloe vera* etc. can be grown in pots also in case of limited space.

Tending

Most of the Primary health care plants generally require little care and they can be grown even in harsher conditions with proper care.

Watering–Appropriate watering regime must be followed in respective climatic conditions for the better growth of the plants.

Weeding–Weeding has to be done in correct intervals to promote the growth of the desired plant.

Manuring–Organic manure, farmyard manure or household organic wastes of vegetable, compost etc., can be applied at correct intervals for better yield.

Pruning–Shrubs like Hibiscus, Adalodakam, Mailanchi etc., has to be pruned periodically to maintain their shape and size.

Shading–Shade has to be provided for shade loving plants especially at the earlier days.

Mulching: during very dry weather giving a mulch for the plants will be a good idea and ensure survival.

Canopy thinning–Those plants which demands high sunlight or no direct sunlight is available for the plant due to canopy of any large tree, canopy thinning can be done.

Harvesting

Medicinal formulations specially the ISM stream uses different plants and diverse plant parts. Different parts of the same plant may be used for different medicinal formulations. Thus, the method of harvesting can also be different. Sustainable harvesting is to be done to ensure the growth of the plant for future use. For medicines which demands fresh plant parts, they can be used instantly after the collection or can be cut into small pieces, shade dried and made into powder for future use. It is important to know the period of maturity of each plant that we are growing, then only the harvested plant part can contain the desired quantity of medicine that we need and of desired quality.

Collection of leaves: Mature leaves can be plucked with hand or pruned with secateurs.

Collection of shoots: mature shoots of desirable thickness can be cut with the help of sharp knife or secateurs.

Collection of roots: Uproot the whole plant after watering and then roots are separated from the plant.

Collection of flower buds and fruits: pluck the flower buds with hand as and when required. Fruits can be plucked when ripe.

Collection of aerial parts: once the plant attains maturity the above ground parts can be cut with a sharp knife. New flush emerges from the remaining shoot thereby allowing more than one harvest from the same plant.

In any case we may leave atleast one third of the population unharmed to ensure natural viable propagation.

Methods of application

For each health issue the mode of applying the medicinal preparation will vary according to the severity and the body nature of the patient and also with the age. For infants and children, the amount and concentration of medicine will vary and some of them may be mixed with honey or oil.

For cuts and wounds: The fresh mature leaves of *Hemigraphis colorata* is collected, crushed and is applied to the affected area for quick relief.

For dry cough: 2 or 3 tender leaves of Adalodakam is collected and steam it. Take the juice and drink it in the morning. This can also be mixed with Coleus, Thulsi, Ginger, Black Pepper etc for preparing the decoction

For wet cough: Crush the fresh ginger and extract juice. Take the fresh juice with honey.

For diarrhoea: Extract the juice from Anar fruit and have it twice daily.

For premature greying of hair: Apply the oil prepared with *Lawsonia* while bathing

For pain: After the application of any oils in affected area, keep *Calotropis* leaf after mild heating

For digestive issues: Use powder of dry ginger with honey

For immunity: Powder of Ashwagandha root 3 -5gm daily is good for general health and immunity

For skin problem: Fresh leaves of *Wrightia* in coconut oil. This oil is applied to affected part of skin.

Preparation of medicines

Fresh juice- Wash the plant or plant part, chop into small pieces and crush well. Squeeze the crushed material through a clean cloth and collect the juice. Fresh juice should be used immediately.

Paste- clean the plant material, crush it, add a little water and grind it into paste.

Powder- clean the plant/plant part, dry it in shade. Crush and grind it to make fine powder, sieve it and store in an airtight container.

Decoction- it is made by boiling the plant material in water over low flame. For that, wash the material, chop into small pieces, crush well. Mix 1 part of the crushed material into 16 parts of water and boil on a low flame till the water is reduced to ¼ of original volume. Strain it and use. It can be stored for about twelve hours only.

Herbal tea- crush the herbal materials. Boil 1-2 tsp in 1 ½ cup of water till it reduces to about one cup. Add sugar to taste and drink.

Trikatu- take equal amount (by weight) of Thippali, Black pepper and dry Ginger (chukku), clean them and make them into fine powder, and keep for future use.

Triphala- take equal amount (by weight) of Kadukka, Thannikka and Nellikka, clean them, dry and make it into fine powder, and keep for future use.

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List of Potential Source of Planting Material

Source	Plant name
Rayirath garden, Pattikad.	All tropical medicinal plants
KFRI Central nursery, Peechi	Most medicinal plants
KAU nursery Mannuthi	Herbal garden plants
Benhur Herbal Garden, Mannuthi	Rare plants and common medicinal plants.
CIMH, AVP, Kanjikode	Ayurvedic medicinal plants.
ICAR substation Dindugal	Withania somnifera
Kottakal Ary Vaidya Sala, Kottakal	Most medicinal plants
TBGRI, Pacha Palode, Trivandrum,	Herbal garden plants
MSSRF, Kalpatta	Herbal garden plants
KAU subcentre Ambalavayal	Medicinal plants and other horticulture species
WSS, Boys town, Waynadu	Herbal garden species
FRLHT- TDU, Bengaluru	Most of the medicinal plants.
CSIR – CIMAP, Lucknow	Asparagus racemosus

Enumeration:

1. Name	Hemigraphis colorata

Family	Acanthaceae
Local name	Murivoti, Murikooti
Diagnostic features	Spreading procumbent herbs with purple-coloured leaves. Rooting at nodes. On crushing it smells like iodex/tincture
Habit and habitat	Herbs procumbent. Stem angular, leaves opposite, purple, crenate along margin, flowers white in compact spikes. Grows well in Partially shaded and moist localities. Grown as garden plant.
Flowering fruiting	November to April. Often during other months too. Fruits not seen.
Parts used/ disease and treatment	It is an excellent remedy for cuts and wounds. Apply the juice of leaves to stop bleeding. Rub the leaves in forehead to stop headache.
Collection and post-harvest	Freshly collected twigs can be used. Can store in fridge for few days if need be.
Propagation and cultivation	The plant is easily propagated using growing twigs either in poly bags or directly in beds or garden.

2. Name	Aloe vera

Family	Asphodelaceae
Local name	Kattar Vazha
Diagnostic features	Succulent herbs with thick leaves. Leaves mucilaginous, spiny along margin. Flowers tubular orange red in erect racemes.
Habit and habitat	Rosetted herbs, leaves clustered base thick and overlapping. Flowers appear on erect stout racemes. Dry and exposed areas. Can also be grown in partial shade.
Flowering fruiting	September - November
Parts used/ disease and treatment	Leaves and mucilage. Excellent for skin care, slimy mucilage rubbed over skin and burns. The mucilage is said to be used for preparing sweet dish in north India.
Collection and post-harvest	Usually collected fresh. The cut leaves keep fresh for long time
Propagation and cultivation	The plant produce suckers at the base. These suckers can be severed and planted in poly bags or directly into ground. In many places they are grown in rows and hedge or in clusters. Gives an attractive look.

3. Name	Curcuma longa
	
Family	Zingiberaceae
Local name	Manjal (Turmeric)
Diagnostic features	Rhizomatous herbs, Leaves broad sheathing at base. Flowers in pinkish spikes. Rhizomes spreading much branched. Golden yellow when cut.
Habit and habitat	Tropical well drained areas with abundant sunshine. Usually cultivated. Cultivated in raised beds or in pots.
Flowering fruiting	May–June. Fruits not seen.
Parts used/ disease and treatment	Rhizome paste for skin care. Also used in case of digestive disorders, cold and cough.
Collection and Post-harvest	The rhizomes are extracted after the leaves wilt. The harvested rhizomes are traded fresh or after drying. The rhizomes are processed after boiling and made into pieces dried and powdered.
Propagation and cultivation	Propagation is done through rhizomes in raised beds. They can also be grown in pots.

4. Name	Santalum album
	
Family	Santalaceae
Local name	Chandanam
Diagnostic features	Small trees with sparse slender branches and opposite leaves. Flowers in cymes with spreading petals and tiny white stamens. Fragrance in the Hartwood. Purplish fruits in panicles
Habit and habitat	Small trees with opposite thick glaucous leaves on slender branches. Fruits purplish fleshy with terminal ring.
Flowering fruiting	January–June.
Parts used/ disease and treatment	Hartwood of stem specially of root stem transition zone yield sandal wood. Costly essential oil extracted. Used for skin care and cultural functions. Valuable resource for cosmetic and incense industry.
Collection and post harvest	The wood, to form takes long time. The hearwood from root stem transition zone is extracted and used after pulverising, or as paste or even as oil.
Propagation and cultivation	The fruits are harvested, cleaned, and seeds extracted used for sowing in germination beds. The sprouted seedlings at 3 to 5 leaf stage are transplanted to poly bags along with a legume seedling or some species known as host plant for sandal. When planting too, the host plant is grown along with sandal seedling.

5. Name	Ocimum tenuiflorum		
			
Family	Lamiaceae	Local Name	Thulsi
Diagnostic features	Aromatic hairy herbs with green or purple tinged crenate leaves and terminal inflorescence with 2-lipped flowers.		
Habit and habitat	Branched herbs or even undershrubs. Usually cultivated		
Flowering fruiting	Throughout the year		
Parts used/disease and treatment	leaves are used in the treatment of cold, cough and bronchitis, applied to the skin for treatment of ringworm and fever. Seeds are used for the treatment of urinary problems.		
Collection and post-harvest	Usually collected by pruning the branches. And plucking leaves. By pruning the inflorescence enhances vegetative growth.		
Propagation and cultivation	Propagated through seeds. Wildings can also be used for growing Thulsi. They can also be grown in pots.		
6. Name	Plectranthus amboinicus (*Coleus aromaticus* = *C. amboinicus*)		
			
Family	Lamiaceae	Local Name	Panikoorka
Diagnostic features	Strongly aromatic hairy stems. Opposite Fleshy pubescent leaves, inflorescence terminal with bilipped flowers.		
Habit and habitat	Biennial herbs grown in homesteads.		

Flowering fruiting	January- March
Parts used/ disease and treatment	The plant is used to treat fever, cold and cough, asthma, bronchitis.
Collection and post-harvest	Leaves and fleshy stem are pruned and used fresh as decoction, juice, or poultice.
Propagation and cultivation	propagated through stem cuttings. Can also be easily grown in pots.
7. Name	Andrographis paniculata


Family	Acanthaceae	Local Name	Kiriyath	
Diagnostic features	Bitter plants with swollen nodes and quadrangular stems. Leaves opposite lanceolate. Flowers 2 lipped, Capsules club shaped and rupturing.			
Habit and habitat	Herbs found in scrub jungles and also in plains usually in drier areas. Largely cultivated in farms and homes			
Flowering fruiting	March- December			
Parts used/disease and treatment	The whole plant is used for the treatment of fever. Also as a liver tonic and blood purifier.			
Collection and post-harvest	The whole plant is harvested. Often the shoots dried in shade, bundled, and marketed. The plants are used fresh or dried. Either as decoction or in juice form.			
Propagation and cultivation	These plants are propagated through seeds. Wildings can also used for cultivation. They can also be grown in pots for small family.			

8. Name	Justicia adhatoda = *Adhatoda zeylanica* = *A. vasica*		
			
Family	Acanthaceae	Local name	Adalodakam
Diagnostic features	Dense shrubs with swollen nodes and opposite elongate leaves. Flowers white two lipped with prominent green bracts.		
Habit and habitat	Shrubs growing in plains and often planted as hedges and as stand alone.		
Flowering fruiting	December to February		
Parts used/disease and treatment	Leaf juice, or decoction for cold, cough and fever.		
Collection and post-harvest	Fresh leaves are collected for preparation of medicine.		
Propagation and cultivation	Propagated through stem cuttings and rooted off-shoots.		
9. Name	Piper longum		
			
Family	Piperaceae	Local name	Thippali
Diagnostic features	Scandent undershrubs. Leaves ovate or cordate and strongly oblique at base. Male spikes are erect, cylindrical, slender, pale white or yellow, fleshy with minute male flowers. Female spikes are stout, erect and yellow. Fruits are berries.		

Habit and habitat	Trailing or scandent undershrubs or climbers. Often as undergrowth in forest areas. Can be grown in pots and small carries.
Flowering fruiting	August-January
Parts used/disease and treatment	Fruiting spikes and roots are used for the treatment of fever, diarrhoea, cough, hiccups, asthma, flatulence, abdominal diseases and vomiting.
Collection and post-harvest	Mature spikes are plucked and dried for use. Fresh fruit spikes can also be used. In case of roots, stems are uprooted and cleaned and used for drug as dried raw material.
Propagation and cultivation	propagated through stem cuttings. This will ensure quality and sex of the plant thus produced. In fact, we need to grow more female plants in a population. It can also be produced through suckers and seeds though not popular.
10. Name	Piper nigrum


Family	Piperaceae	Local name	Kurumulak
Diagnostic features	Stem clasping climbers usually rooting at nodes with lateral dwarf branches spreading. Leaves betel leaf like thick. Inflorescence thin long drooping white or yellow spikes. Fruiting Spikes cylindrical drooping 6-15 cm long. Fruits globose hard green turning orange then turning black. Pungent in taste.		
Habit and habitat	Usually cultivated in small plots or in large farms climbing over on crops like Arecanut palm, or shade trees like Erythrina in tropical zones. Dwarf varieties are also available to grow.		
Flowering fruiting	July-May		

Parts used/disease and treatment	Used traditionally for the treatment of various diseases including; cough, cold, dyspnea throat diseases, intermittent fever, stomachache.
Collection and post-harvest	The ripe spikes are harvested and dried in shade. They can also be used for pickle with tender fruits. Usually the dried fruits are powdered and traded as powder or as whole fruits.
Propagation and cultivation	Through branch cuttings, suckers and stolons. Two to six noded cuttings are prepared from better clones and planted in propagation beds with slanting bamboo splits filled with soil and the cuttings are tied to them for rooting. The rooted cuttings are severed into single noded rooted plantlets for growing in plantations. They can also be propagated using seeds. For this, seeds are soaked in water for 2-3 Days and then sown in mother beds. 3-month-old plantlets are used for planting.
11. Name	Acorus calamus

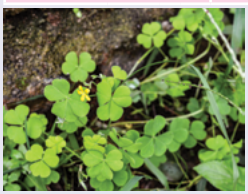
Family	Araceae	Local Name	Vayambu
Diagnostic features	Prostrate herbs with erect blades of leaves. Spreading aromatic rhizomes with sweet fragrance.		
Habit and habitat	Spreading and creeping herbs. Leaves thick flat 0.5 to 1.5 m long and 1 to 3 cm broad and erect with sheathing base over rhizomes. Rooting at each node of rhizomes which are thick and round. Spikes cylindrical at the middle of the leaves. Fruits are berries, small green and angular.		
Flowering fruiting	April- July		

Parts used/ disease and treatment	Rhizomes are used for the treatment of constipation, epilepsy, indigestion and gastritis, colic pain and intellectual development.
Collection and post-harvest	Mature rhizomes are uprooted and cut into pieces and shade dried for trade and as medicine.
Propagation and cultivation	propagated through rhizome cuttings. Cultivated like paddy in most places in wet fields. Possible to grow in pots.
12. Name	Zingiber officinale


Family	Zingiberaceae	Local Name	Inji /Inchi	
Diagnostic features	Aromatic perennial herb. Rhizomes fibrous, fleshy , aromatic and pungent. Leaves linear elliptic. Flowers greenish white in ovoid compact spikes, arising directly from the root stock.			
Habit and habitat	Herbs with fleshy rhizomes that are widely cultivated in tropical zone.			
Flowering fruiting	September- December			
Parts used/ disease and treatment	Rhizome is used to treat nausea and vomiting from motion sickness, digestion problems and throat infection. It is also used to treat mild stomach upset.			
Collection and post-harvest	When leaves change colour and show wilting the rhizomes are uprooted cleaned and used fresh or in dry form.			
Propagation and cultivation	Propagated through rhizome cuttings.			

13. Name	Punica granatum

Family	Punicaceae	Local Name	Mathalam
Diagnostic features	shrubs or small trees. Slender branches terete and opposite, branchlets usually ending in thorns. Leaves apparently clustered, glabrous and lustrous. Flowers scarlet red. Fruit globose, pale red to scarlet, or brownish, partitioned by thin leathery yellow septa.		
Habit and habitat	Small trees or shrubs that are cultivated either singly or in small plots.		
Flowering fruiting		March onwards	
Parts used/disease and treatment	Fruits have medicinal properties like. The rind is used to treat diarrhoea specially in children. It is also nourishing and helps in case of anaemia.		
Collection and post-harvest	Ripe fruits are plucked and stored. Rinds are dried and kept for future use.		
Propagation and cultivation	Through seeds and stem cuttings		
14. Name	Oxalis corniculata		



Family	Oxalidaceae	Local name	Puliyarila
Diagnostic features	Creeping or procumbent herbs with green slender stems. Leaves 3-foliate and sour. Flowers yellow. Capsules beaked, with characteristic dehiscence. seeds many.		

Habit and habitat	Trailing or procumbent Herbs. Often rooting at nodes. Usually in moist and shady localities. Also in planted pots.
Flowering fruiting	March- December
Parts used/ disease and treatment	For diarrhoea in infants. Tender shoots and Leaves paste given to infants with turmeric and rock salt in buttermilk.
Collection and post-harvest	Fresh shoots are collected and stored or used fresh.
Propagation and cultivation	Through seeds and rooted branches.
15. Name	Holarhaena pubescens (= *H. antidysenterica*)

Family	Apocynaceae	Local name	Kutakappala
Diagnostic features	Small deciduous tree with milky latex. Leaves simple and opposite. Flowers are white and fragrant. Fruits paired follicles connected at the tip and then free. Seeds light brown crowned with brown silky hairs.		
Habit and habitat	Trees found in Moist deciduous and dry deciduous forests, also in the plains.		
Flowering fruiting	April- October		
Parts used/ disease and treatment	Bark, seeds, flowers and leaves are used for the treatment of fever, diarrhea, bleeding piles, wounds. Paste of Root bark of Holarhaena and ginger mixed with curd.		

Collection and post-harvest	The bark is striped and peeled. Cut into pieces and dried for use
Propagation and cultivation	Easily propagated through seeds, wildings and cuttings. Can be planted in open spaces and wastelands singly or in groups.
16. Name	Maranta arundinacea

Family	Marantaceae	Local name	Koova	
Diagnostic features	Rhizomatus herbs with long petiole and broad leaves with smooth texture. Flowers white or purplish tinged white in drooping racemes.			
Habit and habitat	Herbs			
Flowering fruiting	October–December.			
Parts used/ disease and treatment	Used as an infant food. Good for flatulence, diarrhoea etc. Tubers can also be eaten cooked fresh. Popular arrow root powder is made from this plant			
Collection and post-harvest	When leaves start wilting, the rhizomes are tilled out and powdered after drying. They are also ground and made to paste or juice.			
Propagation and cultivation	Cutivation is by using rhizomes.			

17. Name	Lawsonia inermis (= *L. alba*)

Family	Lythraceae	Local Name	Mailanji	
Diagnostic features	Shrubs or small trees with slender thorn-tipped branches. Leaves elliptic, subsessile and with sharp tips. Flowers creamy white in terminal cymose compact panicles. Fruits dry brown capsules with minute seeds.			
Habit and habitat	Shrub or small trees. Grown as hedge plant also.			
Flowering fruiting		May to December		
Parts used/ disease and treatment	Leaves and seeds are used for the treatment of, skin disease, fever and hair and skin colouring.			
Collection and post-harvest	Leaves are collected and used fresh or dried powdered and stocked for future use.			
Propagation and cultivation	Propagated through stem cuttings. Also through seeds.			

18. Name	Azadirachta indica

Family	Meliaceae	Local name	Veppu	

Diagnostic features	Trees with dense foliage slender brownish branchlets. All parts of the tree bitter. Leaves compound and imparipinnate, with 7 to 15 leaflets. Leaflets are obliquely lance-shaped with serrate margins. Flowers whitish cream-colored in branched lax inflorescences. Staminal tube prominent. Fruits fleshy yellow when ripe, oblong drupes with single seed.
Habit and habitat	Trees found in dry deciduous forests and also widely planted. Seen very commonly in homesteads.
Flowering fruiting	April-September.
Parts used/disease and treatment	Leaves pound cream for skin diseases. Stem and leaves used for the treatment of fever, intrinsic haemorrhage, eye diseases, and jaundice. Seed oil is used as insect repellent. Azadirachtin alkaloid is extracted from seed kernal or seed oil. and oil cake for industry.
Collection and post-harvest	Leaves freshly harvested and used for skin diseases. Ripe fruits plucked and seed extracted, cleaned and dried for use. Oil extracted from seeds. Leaves dried, powdered and stored for future use.
Propagation and cultivation	Through seeds. Wildings can also be used for raising seedling stock in nursery. Seeds lose viability quickly.
19. Name	Hibiscus rosa-sinensis

Family	Malvaceae	Local name	Chembarathi
Diagnostic features	Woody shrubs. Leaves alternate, simple serrate and long petioled. Flowers solitary axillary, large and showy with free red petals and elongate staminal column. New varieties are with variable colours and large showy petals.		

Habit and habitat	Shrub grown as an ornamental plant often used as live hedge or singly.
Flowering fruiting	Round the year. Fruits usually not formed.
Parts used/ disease and treatment	The flowers and leaves are used to treat skin afflictions. Leaves as shampoo and for skin care.
Collection and post-harvest	Leaves and flowers are collected fresh and used. Otherwise, they are collected in bulk, dried and stored for industrial use.
Propagation and cultivation	Easily Propagated through stem cuttings.
20. Name	Wrightia tinctoria

Family	Apocynaceae	Local Name	Dantapala	
Diagnostic features	Trees with slender drooping branchlets with opposite leaves. Milky white latex. White showy flowers in cymose clusters. The fruits slender elongate with two follicles jointed at tip. Seeds with parachute like hairs.			
Habit and habitat	Trees in dry deciduous forests, often in rocky areas.			
Flowering fruiting		March - November		
Parts used/ disease and treatment	Leaves. Crush the leaf and put it in coconut oil and keep it in sun light for 2 to 3 days and filer the oil and apply over the scalp for dandruff and apply over the skin for skin diseases.			

Collection and post-harvest	Leaves are harvested fresh and used in medicine for preparation of oil.
Propagation and cultivation	Propagated through seeds. Root cuttings can also be used for propagation.
21. Name	Eclipta prostrata = *E. alba*

Family	Asteraceae	Local Name	Kayyonni	
Diagnostic features	Erect or procumbent herbs with reddish hairy stem and narrow leaves that turn black when dry. Small terminal heads with white florets. Achenes many in each head and black.			
Habit and habitat	Herbs found in paddy fields and moist or marshy localities.			
Flowering fruiting	Usually September to December but often throughout the year			
Parts used/disease and treatment	Shoot and leaves used to prepare hair oil known to foster hair growth and strength. Used in case of Premature greying and Hair growth.			
Collection and post-harvest	Mature plants are collected cleaned and used fresh or dried and stored for future use. Proper drying is essential to avoid fungal infection.			
Propagation and cultivation	Propagated through seeds and also through wildings.			
22. Name	Emblica officinalis = Phyllanthus emblica			

Family	Phyllanthaceae	Local Name	Nelli, Nellika

Diagnostic features	Deciduous trees, bark grey-brown, irregularly flaking. Branches slender arching. Leaves simple appearing collectively like pinnate leaf like branchlets. Flowers unisexual clustered in leaf axils. Fruits, subglobose, fleshy yellowish-green, seeds hard trigonous stone
Habit and habitat	Trees found in deciduous forests, also cultivated in the plains singly as stand alones or as farms.
Flowering fruiting	July- February
Parts used/ disease and treatment	Fruits are constituent of well-known Ayurvedic formulation Triphala together with *Terminalia chebula* (Kadukka) and *Terminalia bellirica* (Thannikka). It is also widely used in hair care oils. Premature greying and Hair growth—oil prepared with Gooseberry. Apply the powder along with lemon juice for dandruff. It is also a popular culinary commodity and known source of vitamin C.
Collection and post-harvest	Ripe fruits are harvested and used fresh or dried.
Propagation and cultivation	Propagated using seeds. Planted in well drained soils.
23. Name	Justicia gendarussa

Family	Acantahceae	Local Name	Vathamkolli
Diagnostic features	Shrubs with dark purple stem having swollen nodes. Leaves simple linear with purple tinged veins at the back. Flowers white bi lipped in terminal spikes. Fruit is capsule.		

Habit and habitat	Shrub found usually in deciduous forests, also in the plains in scrub lands. Cultivated in gardens and as hedges.
Flowering fruiting	January-April
Parts used/ disease and treatment	Leaves. Used in the treatment of muscular pains, inflammatory disorders, rheumatic pain, etc. Half glass of decoction of leaf before food is recommended for rheumatism.
Collection and post-harvest	Well grown leaves and small twigs are harvested and used fresh or dried in shade and used for preparation of medicine.
Propagation and cultivation	Propagated through stem cuttings.
24. Name	Vitex negundo

Family	Lamiaceae	Local Name	Karinochi
Diagnostic features	Aromatic shrubs with slender branches, laves opposite palmate 3-5 foliate purple tinged when young. Flowers bi-lipped purplish white in terminal panicles of cymes. Fruits drupes turning black when ripe.		
Habit and habitat	Shrubs grown as hedge plant, also seen wild.		
Flowering fruiting	February-July		
Parts used/ disease and treatment	Leaves are used for the treatment of headache, muscular pain and rheumatic infections. Roots are used for the treatment of rheumatism. Apply the oil prepared with the paste of Vitex leaves on the affected part. One teaspoon leaf juice along with ½ tsp castor oil at bed time is good in rheumatism		

Collection and post-harvest	Leaves collected fresh and used to prepare medicinal oil and for Kizhi, etc. Water boiled with the leaves are for muscular pain.
Propagation and cultivation	Propagated by stem cuttings and through seeds.
25. Name	Calotropis gigantea

Family	Apocynaceae	Local Name	Eruk
Diagnostic features	Shrubs. The stem greyish green with milky latex. Leaves opposite with very short petioles spreading. Blade broad ovoid or obovoid 10-16 x 8 to 10cm, thick, light green and milky. with 5 thick petals and prominent. Flowers purplish or whitish. Consists of five pointed petals and a small elegant purplish staminal column and corona rising from the centre. Fruits bulbous bulging with two spreading follicles and having many flat seeds tipped by silky pappus.		
Habit and habitat	Shrub found in wastelands often cultivated in spiritual gardens.		
Flowering fruiting		Throughout the year	
Parts used/ disease and treatment	The leaves used for treating swelling. Leaves are heated and placed over swelling. Used in Kizhi treatment. After the application of any oils in affected area, keep the Calotropis leaf after mild heating.		
Collection and post-harvest	Leaves collected fresh and used. Stored in cool shady places.		
Propagation and cultivation	Easily Propagated by seed or stem cuttings.		

26. Name	Tamarindus indica

Family	Fabaceae	Local Name	Puli
Diagnostic features	Large trees growing with ovoid crown, bark brown to brownish-black, rough with vertical fissures; branchlets warty. Leaves sour in taste, paripinnate. Flowers profuse, yellow with reddish-pink marks, in terminal racemes. Fruit is a pod, mesocarp pulpy sour in taste, endocarp septate, leathery, indehiscent; seeds 3-8 or more, obovoid-orbicular, compressed, shining brown.		
Habit and habitat	Tree, Cultivated in homesteads, road sides and often run wild.		
Flowering fruiting		March - January	
Parts used/ disease and treatment	Leaves used in Kizhi also for poultice to reduce swelling. After application of oil pouring the decoction prepared with Tamarindus leaf Apply the oil prepared with Tamarindus leaf over the affected area. Fruits used as condiment and stomach problems. Seeds edible.		
Collection and post-harvest	Fresh leaves collected by lopping slender branches and used fresh or after drying. Ripe fruits are harvested and processed after drying. Fruit pulp for stomach related ailments.		
Propagation and cultivation	Propagated by seeds either direct sowing or through raising nursery seedlings. Better varieties are produced through grafting.		

27. Name	Abrus precatorius		
			
Family	Fabaceae	Local Name	Kunni
Diagnostic features	Twining climbers, Leaves pinnate. Flowers pink, in axillary racemes. Fruits are pods with 5-7 seeds, subglobose, shining scarlet red with black eyes.		
Habit and habitat	Climbers found in Deciduous forests, also in the plains.		
Flowering fruiting	October-May		
Parts used/ disease and treatment	Roots, seeds and leaves are used in the treatment of stiffness in arms. Oil prepared with Abrus root applied over the swelling.		
Collection and post-harvest	Ripe fruits are harvested and seeds extracted dried and stored. Leaves are freshly harvested.		
Propagation and cultivation	Propagated by seeds. Wildings can also be gathered for cultivation.		

28. Name	Tinospora cordifolia		
			
Family	Menispermaceae	Local Name	Chittamruthu
Diagnostic features	Large extensive climbers with aerial roots and cordate leaves. Bark warty, papery peeling in flakes. Young stems and leaves hairy. Flowers greenish yellow. Fruits globose and shining red in bunches.		

Habit and habitat	Climber seen in Moist deciduous forests and scrub jungles, also in the plains and homesteads on trees and in gardens.
Flowering fruiting	January-June
Parts used/ disease and treatment	Stems, roots and leaves are used in case of debility and for the treatment of fever, jaundice. Decoction Prepared with Tinospora before food for liver diseases and in Diabetes. Leaves used to cure boils in traditional medicine. A well known immuno-booster.
Collection and post-harvest	Stems are collected bundled and used for treatment and industrial use. Fresh stem twigs are harvested, bark peeled and placed in water for overnight and the supernatant liquid used.
Propagation and cultivation	Propagated by stem cuttings and seeds. Wildings are also used to produce seedlings.
29. Name	Aegle marmelos

Family	Rutaceae	Local Name	Koovalam	
Diagnostic features	Deciduous trees with thorns and spines. Leaves 3–foliate gland dotted. Flowers fragrant in cymes, greenish-white, stamens prominent. Fruits tennis ball like berries, ovoid, woody pulpy and many seeded.			
Habit and habitat	Trees grown in temple premises and homesteads. Seen in tropical forests			
Flowering fruiting		March-May		

Parts used/ disease and treatment	Fruits, leaves and roots are used to treat diarrhoea. Roots are one of the constituent of well-known Ayurvedic formulation Dashamoola. Kashaya prepared with root of Aegle and Juice prepared with ripened fruit for diabetes. Leaves are also spiritually significant as they are used for poojas.
Collection and post-harvest	Fresh leaves and ripe fruits are harvested. Fruits are used fresh for making juice.
Propagation and cultivation	Propagated by seeds also from coppicing arising from mother trees.
30. Name	Boerhavia diffusa


Family	Nyctaginaceae	Local Name	Thazhuthama
Diagnostic features	Spreading procumbent much branched herb with reddish stem. Branches slender. Leaves simple, opposite and unequal. Flowers small pink in axillary or terminal umbels.		
Habit and habitat	Herbs found in moist and dry deciduous forests, plains and waste lands.		
Flowering fruiting	August- December		
Parts used/ disease and treatment	Roots and leaves are used for the treatment of anaemia. Decoction or juice of Boerhavia for Aneamia.		
Collection and post-harvest	The whole plant is harvested when mature usually after fruiting. It is also used as vegetable.		
Propagation and cultivation	Propagated by seeds and runners.		

31. Name	Solanum nigrum = *S. americanum*		

Family	Solanaceae	Local Name	Manathakali
Diagnostic features	Erect slender annual herbs. Leaves simple often oblique. Flowers small white in axillary or extra-axillary umbellate cymes. Stamens yellow clubbed together. Fruits are berries, globose and purplish-black when ripe with discoid seeds.		
Habit and habitat	Herb seen in moist areas and also in plains and wastelands.		
Flowering fruiting		March- November	
Parts used/ disease and treatment	The whole plant is used. Decoction prepared with root and fruit is good for diabetes. Also used as vegetable.		
Collection and post-harvest	Fresh shoots are harvested and sold for use.		
Propagation and cultivation		Propagated through seeds.	
32. Name	Phyllanthus amarus = *P. niruri*		

Family	Phyllanthaceae	Local Name	Keezharnelli
Diagnostic features	Erect slender herb with simple leaves. Leaflets small green and spreading on pinnate leaf like branches. Flowers and Fruits at the axil drooping capsules.		

Habit and habitat	Herbs found in open and shady areas along road sides, field bunds and also in plains.			
Flowering fruiting		July- October		
Parts used/ disease and treatment	The whole plant is used for the treatment of jaundice, indigestion, sores. Paste prepared with Keezharnelli is good for liver			
Collection and post-harvest	Whole plants are collected fresh and used for medicine. In folk medicine the freshly collected shoots are pound and made to a poultice and mixed with milk and given to patients.			
Propagation and cultivation	Propagated through seeds. Wildings can also be used for cultivation.			
33. Name	Saccharum officinarum			

Family	Poaceae	Local Name	Karimbu	
Diagnostic features	Clump forming tall plants with solid purplish or green juicy culms/stem. Culms usually unbranched, erect and waxy below nodes having white ring. Leaf-blades long flat and rough. Flowers are in large terminal white panicles. Spikelet surrounded by dense, white-silky hairs.			
Habit and habitat	Tall grass, Cultivated in large fields or few in home steads.			
Flowering fruiting		September - November		
Parts used/ disease and treatment	Juice prepared with sugarcane is good for anaemia			

Collection and post-harvest	Mature culms are cut and used to prepare Juice, jaggery, sugar, and for other preparations. Spiritually significant too.
Propagation and cultivation	Propagated with stem cuttings

34. Name	Averrhoa carambola

Family	Oxalidaceae	Local Name	Chathurapuli
Diagnostic features	Tree, Dense crown. branches arching, young parts are reddish. Leaves scattered, with leaflets 3-6 pairs. Basal leaflets smaller. Flowers pinkish red in axillary panicles. Fruits ellipsoid with 5 acute longitudinal ridges, lobed at both ends and yellowish green, sour sweetish sour when ripe.		
Habit and habitat		Tree, cultivated for its fruits	
Flowering fruiting		May- August	
Parts used/ disease and treatment	Ripe juicy fleshy Fruits harvested and eaten raw of processed. Said to be good for liver. Consumed for jaundice in northeast India.		
Collection and post-harvest	Fruits are harvested when they are ripe and turn yellow.		
Propagation and cultivation	Propagated through seeds and other vegetative methods.		

35. Name	Moringa oliefera = *M. pterygosperma*			
				
Family	Moringaceae	Local Name	Muringa	
Diagnostic features	Trees with greyish bark and lenticellate branchlets. Leaves large decompound with many leaflets. Panicles axillary profuse, flowers white. Pods very long drooping and are ribbed. Seeds trigonous white winged.			
Habit and habitat	Tree, cultivated mostly in homesteads or in farms.			
Flowering fruiting		November- May		
Parts used/ disease and treatment	Leaves used fresh which are collected from trees. Flowers and fruits are also used as vegetable good for anaemia. Seed powder is a good as immune booster.			
Collection and post-harvest	Fresh leaves are plucked and used.			
Propagation and cultivation	Propagated through stem cuttings and seeds.			
36. Name	Centella asiatica			
				
Family	Apiaceae	Local Name	Kudangal	

Diagnostic features	Slender, creeping, perennial herb with stolons, rooting at nodes. Leaves simple, orbicular-reniform, crenate. Flowers sessile, pink, in umbels. Fruit comprised of two laterally compressed mericarps.
Habit and habitat	Herbs found along moist, marshy and shady localities.
Flowering fruiting	Throughout the year
Parts used/ disease and treatment	The whole plant is used for the treatment of Neuro problems and as a nervine tonic. Leaf juice is good for aneamia. It acts as an intellect-promoting rejuvenator.
Collection and post-harvest	Freshly harvested plants specially leaves used as vegetable and for making medicinal oil and other preparations after making paste.
Propagation and cultivation	Propagated through seeds and runners
37. Name	Bacopa monnieri

Family	Scrophulariaceae
Local Name	Brahmi
Diagnostic features	Trailing or procumbent slender herbs rooting at nodes. Leaves are simple and oblong. Flowers white or bluish white axillary, solitary. Fruits capsules.
Habit and habitat	Herbs found in marshy, moist and shady areas. Often seen as amphibian plants.
Flowering fruiting	Throughout the year

Parts used/ disease and treatment	The whole plant is used neurotonic.
Collection and post-harvest	Fresh shoots are harvested and used.
Propagation and cultivation	Propagated through shoot cuttings.
38. Name	Asparagus racemosus

Family	Liliaceae	Local name	Shatavar
Diagnostic features	Perennial climbers or stragglers, spiny and with leaf like phyllodes and scales. Flowers white borne on dense racemose inflorescences. Fruits are berries, globose, turning red and black when ripe with 3-6 seeds. Rootstock is with fascicled elongated tuberous roots.		
Habit and habitat	Climbers. Grown in shady areas. They can be grown in pots too.		
Flowering fruiting		May- October.	
Parts used/ disease and treatment	Roots are used for as a rejuvenator, lactation etc.		
Collection and post-harvest	Fresh shoots are harvested for consumption and preparation of medicine. The tubers are cleaned and used.		
Propagation and cultivation	Propagated through seeds and root tubers.		

39. Name	*Withania somnifera*

Family	Solanaceae
Local Name	Amukkiram, Aswagandha
Diagnostic features	Shrub with soft hairy green branchlets. Leaves simple hairy. Flowers sessile to subsessile, greenish yellow, in axillary clusters. Berry globose and red covered with accrescent calyx.
Habit and habitat	Shrubs that are cultivated.
Flowering fruiting	July-January.
Parts used/ disease and treatment	Roots are used for the treatment of debility. Used as anti-stress. It is known as Indian Ginseng known for promoting health, vigour and vitality. Powder of root 3 -5gm daily is good for General health and immunity.
Collection and post-harvest	The roots are uprooted when the plants mature. Cleaned, Dried and stored.
Propagation and cultivation	Propagated through seeds.

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