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The Keerai Project

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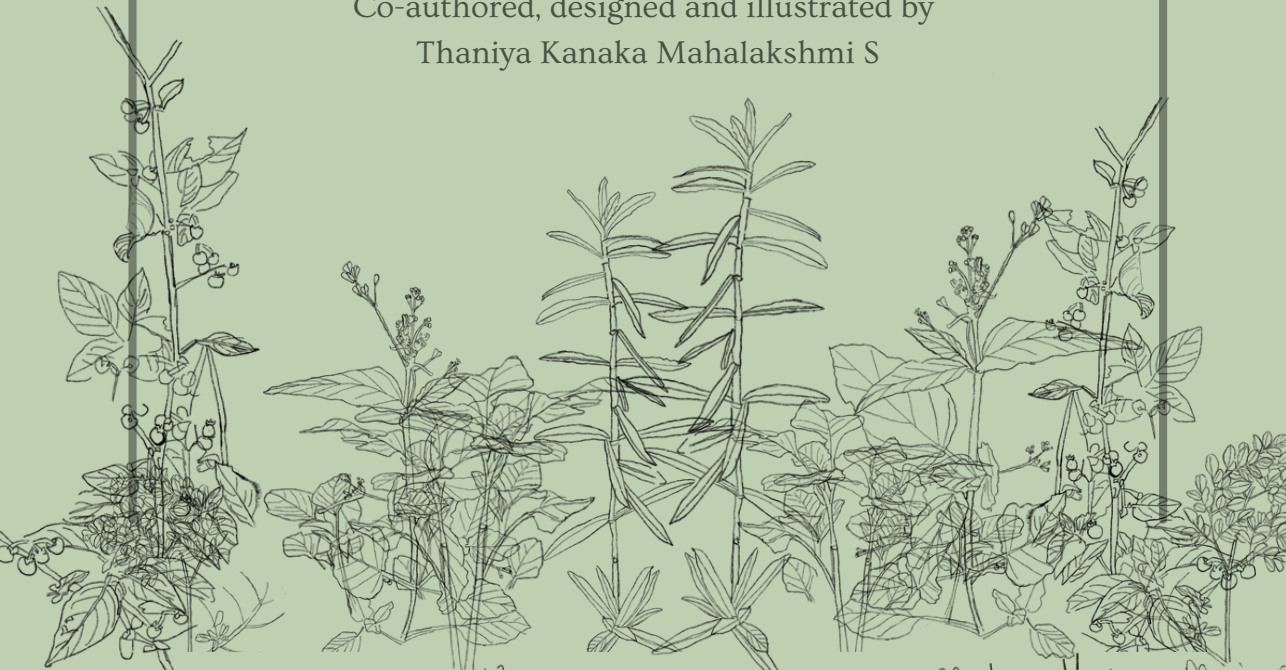
Science & Society Series - 2

THE KEERAI PROJECT

LEAFY GREENS IN THE FOOD CULTURE
OF PUDUCHERRY AND ITS BIOREGION

By Hélène Guétat-Bernard, Brigitte Sébastia
& Balachandran Natesan

Co-authored, designed and illustrated by
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Institut Français de Pondichéry

Institut Français de Pondichéry (French Institute of Pondicherry): Created in 1955 under the terms agreed to in the Treaty of Cession between the Indian and French governments, the IFP (UMIFRE 21 CNRS- MAE) is a research centre under the joint authority of the French Ministry of Foreign Affairs (MAE) and the French National Centre for Scientific Research (CNRS). It fulfills its mission of research, expertise and training in human and social sciences and ecology, in South and South-East Asia. Major research works focus on Indian cultural knowledge and heritage (Sanskrit language and literature, history of religions, Tamil studies etc.), contemporary social dynamics (in the areas of health, economics and environment) and the natural ecosystems of South India (sustainable management of biodiversity).

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This booklet would not have seen the light of day without the support of several people who collect, plant, cook and eat herbs and edible weeds (*keerai*) in Puducherry and its bioregion. It is the result of a collaboration between the departments of Social Sciences and Ecology of the French Institute of Pondicherry (IFP), a research centre under the French Ministry of Foreign Affairs and the CNRS. The Ecology department was represented principally by botanist Balachandran Natesan. The mammoth task of organising and facilitating interviews as well as transcribing and translating them was done by Antony Raj, field-assistant at the IFP. Venkatasubramanian G. (Department of Social Sciences, IFP) also played a crucial role in assisting Antony for the Tamil translation of this publication.

Several people, women especially, were kind and generous enough to share their knowledge and time for the Keerai Project. Our gratitude to Banushree C Reddy (Bangalore & Pondicherry) for her constant support and feedback, Shobana Vaithyanathan (Molasur Village, Tamil Nadu) for always keeping her kitchen open for documentation and knowledge sharing, Dr. R Vaidhyanathan, Ph.D (Agriculture) (Molasur, Tamil Nadu) and Herbalist Parvathi Nagarajan (Sri Siddha Forest Herbals, Auroville) for being ever willing to give expert advice and valuable insight on *keerai*, Manimegalai and Uthrambazzh (Molasur village, Tamil Nadu) for helping in foraging and collecting *keerai*, Chef Christmann Michel (La Villa), Fleur Soumer Loti and Danalatchoumi Siva (SITA Cultural Centre, Pondicherry) for sharing their story and recipes, and last but not least, all the interviewees for their time and patience.

This publication was financially supported by NABARD and the French Institute in India – a section of the French Embassy in India –, and is part of the Fickus-B project (France-India Circulation, Knowledge and Usages of Biodiversity), 2021-2022, that creates a platform for dialogue and exchange on biodiversity between Indian and French scientists, academics, experts, farmers' organizations and representatives of civil society. The aim of the booklet is to facilitate debates and encourage policies for the preservation of knowledge about *keerai*.

INTRODUCTION

The Keerai Project brings to light the living story of a food culture around leafy greens known as *keerai* on the East coast of South India, namely Tamil Nadu and Puducherry. It attempts to foster discussions about *keerai* in relation to women, gender politics and to explore its socio-economic and cultural aspects.

Over the past two decades, and especially since the Covid-19 pandemic, the perception of *keerai* has changed from being a food for the impoverished to being a dietary requirement. There is a growing movement towards eating local foods, and *keerai* constitutes an integral part of Tamil cuisine. It is gaining popularity for its health and nutritional benefits, but the younger generation — influenced by fast food and take-aways — is still not aware of them and is moving away from locally-sourced and seasonal food. This publication aims to change the way this generation looks at edible (wild) plants and to show it the relevance of what it perceives as obsolete and unpopular.

Several interviews and testimonies as well as formal and informal discussions and observations, spanning three years, have culminated in the making of this booklet which seeks to share research experiences and encourage action. The focus is on *keerai* in the modern world: practices around collecting, cooking and eating these (wild) edible plants and also the disregard for them in scientific discussions, public policies and public health.

The French Institute of Pondicherry has been conducting research with a gender approach for many decades. This project spotlights the role of women as experts and knowledge-bearers and the kitchen as a central space in the discussion on food democracy.

In the year 2019, at the instigation of H el ene Gu etat-Bernard, Head of the IFP’s Social Sciences department from 2017-2021, the Institute began a discussion around food at the city-scale (called the Local Food System - LFS-platform) and the politics around food, alongside a research project focused on *keerai*. The study was part of a long-term IFP research programme on food carried out by Brigitte S ebastia, with whom H el ene collaborates on the question of traditional foods such as millets. The scientific analysis contained in this booklet is linked to two of their forthcoming publications: Gu etat-Bernard and S ebastia, 2022 and S ebastia and Gu etat-Bernard, 2022. The booklet is also the result of intensive discussions between H el ene who is a French scientist and Thaniya Kanaka Mahalakshmi S, a young urban woman from Pondicherry, educated in the cosmopolitan city of Bengaluru, yet deeply rooted in village reality. Being part of the food platform, Thaniya has learnt a lot about issues relating to *keerai* and through this booklet she has been able to articulate scientific and vernacular knowledge for the new urban and rural generations.

The aim of the Keerai Project is to facilitate discussion, in an interactive way, around *keerai* as a “traditional” valuable food. It hopes to build curiosity about the nutritional, cultural and socio-economic panorama of “greens” in cuisine and in the Tamil food culture.



SNEAK PEEK





Aarai Keerai

Botanical name: *Marsilea quadrifolia*
English name: Four leaf clover,
European water clover



Agathi Keerai

Botanical name: *Sesbania grandiflora*
English name: Vegetable hummingbird



Arai Keerai

Botanical name: *Amaranthus dubis*
English name: Red spinach, Chinese spinach,
Spleen amaranth



Kodai pasalai Keerai

Botanical name: *Basella alba*
English name: Malabar spinach



Paruppu Keerai

Botanical name: *Portulaca oleracea*
English name: Common purslane,
Duckweed, Little hogweed



Kuppai Keerai

Botanical name: *Amaranthus viridis*
English name: Slender amaranth, Green
amaranth



Manathakkali Keerai

Botanical name: *Solanum nigrum*
English name: European black nightshade, Black
nightshade, Blackberry nightshade



Mookiratai Keerai

Botanical name: *Boerhavia diffusa*
English name: Red spiderling,
Spiderling, Hog-weed



Mudakathan Keerai

Botanical name: *Cardiospermum blicacabum*
English name: Balloon vine, Balloon plant,
Love in a puff, Heart seed



Mulai Keerai

Botanical name: *Amaranthus tricolor*
English name: Purple amaranth



Murungai Keerai

Botanical name: *Moringa Oleifera*
English name: Ben nut, Drumstick plant,
Horse-radish tree



Ponnankanni Keerai

Botanical name: *Alternanthera versicolor*
English name: Mukunuwenna,
Water amaranth



Siru Keerai

Botanical Name: *Amaranthus blitum*
English name: Chinese spinach,
Spleen amaranth



Sivappu Ponnankanni

Botanical name: *Alternanthera ficoidea* (=A.
dentata)
English name: Blood leaf, Copper leaf,
Jacob's coat



Thai velai Keerai

Botanical name: *Cleome gynandra*
English name: African cabbage, Cat whiskers,
Stinkweed



Thandu Keerai

Botanical name: *Amaranthus cruentus*
Accepted name: *Amaranthus hybridus* L.,
subsp. *cruentus* var. *paniculatus* Thell.
English name: Vegetable amaranth



Tharai pasalai Keerai

Botanical name: *Portulaca quadrifida*
English name: Wild purslane, Chicken weed,
Small-leaves purslane



Thooduvelai Keerai

Botanical Name: *Salanum trilobatum*
English name: Purple fruited pea egg plant



Vallarai Keerai

Botanical name: *Centella asiatica*
English name: Asiatic pennywort



Vathanarayanan Keerai

Botanical name: *Delonix elata*
English name: White gul mohur, Creamy peacock flower, Yellow gulmohar



Vella Keerai

Botanical name: *Ipomoea aquatica*
English name: Swamp morning glory, Water ipomoea, Swamp cabbage, Water spinach



Vellai

Karisalankanni Keerai

Botanical name: *Eclipta prostrata*
English name: False daisy, Eclipta



Yeli-kaadhilai Keerai

Botanical name: *Merremia emarginata*
English name: Kidney leaf morning glory

Look out of your window, or step outside with this booklet in your hand. Take a sneak peek into the world of small plants, growing beneath tall trees, between stones or along walls. The so-called “weed” might be just the thing missing in your diet.



Can you identify this plant?

RESEARCH TO ACTION



(Field visit organised by the IFP at Aavani collective's TDEF Forest, Molasur Village)

Research holds significant value as it can be the seed for action. The IFP would like this booklet to be a means through which research can lead to action and have a ripple effect. Since 2018, the IFP has been working on creating the "Local Food System" network through which people can interact with research scholars and with each other to gain knowledge and experience. The above picture is from a field visit where thirty women from Amirtha Herbal Enterprise, Pitchandikulam Forest, headed by Parvathi Nagarajan (towards the left corner, clad in orange) exchanged knowledge and discussed plants with the team at Aavani Collective in the TDEF Forest at Molasur village, Tamil Nadu.

THE LFS PLATFORM IN ACTION:

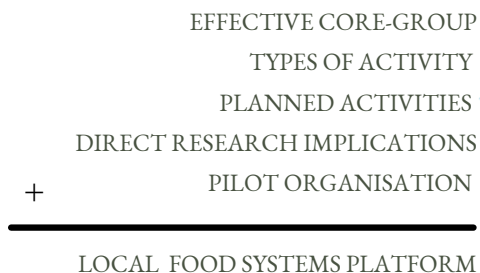
The challenge is to create a collaborative network that integrates sustainable food production, processing, distribution, and consumption in order to enhance environmental, economic, and social aspects of the food system in the Puducherry bioregion. The platform is a place for collective thinking, discussion and suggestion for specific actions to determine the 'food priorities' of the region's community.

THE OBJECTIVES OF THE LFS PLATFORM:

1. Promote awareness on food democracy among the population (social and power relationships along the entire food chain: implementation of an inclusive food system);
2. Collect scientific and citizen data on food practices and heritage of the different communities in Pondicherry and its bioregion, with citizen participation;
3. Organize scientific debates on food, including the whole food chain from production to consumption and waste management through a systemic approach;
4. Organize discussions with public policy stakeholders;
5. Educate people on food (and flavours);
6. Create a festive moment to share emotions around food;
7. Develop community gardens based on permaculture in urban environments;
8. Raise awareness about where our food comes from and have deeper conversations on who grows our food and on the importance of being fair;
9. Add value to organic farm produce at the farm level, so that farmers can increase their income and ensure a sustainable livelihood;
10. Revive traditional recipes and link them directly to consumers through various platforms (restaurants, cafes, e-commerce, farmers' markets);
11. Study the regional regenerative economy;
12. Monitor waste across the food value chain and evaluate zero waste models;
13. Introduce the concept of circularity within the food chain;
14. Cook recipes with locally grown ingredients, thereby promoting better health and well-being for ourselves and our soil;
15. Encourage conversations on non-exploitative and non-discriminatory production practices that enhance the livelihood of vulnerable farmers.

THE KEERAI PROJECT

Research conducted by interviewing people belonging to various socio-cultural categories in terms of economic status, habitat and gender, with special attention given to women from lower social strata who possess significant knowledge and know-how about millet and *keerai*, in particular their (i) cultivation (ii) culinary uses and (iii) therapeutic properties.



Education &
Awareness

Urban Citizens'
Movement

Food Exhibition
(cultural and social
meaning; promoting
gastronomy)

Producer
Consumer
Linkages

Urban Farming &
Gardening

Farm Visits
(building
confidence
& trust)

Fair Food Circles
(exchange of recipes and
knowledge of plants)

KEERAI
and
MILLET
Research

POLLIN Project
(MITI CNRS on
pollination)

IFP Research
AGROECOLOGY

BEE CARE...

The Pollinators of *Keerai*

Information sourced from the POLLIN PROJECT (IFP, funded by MITI, CNRS)

The Amaranthus family (Arai, Siru, Mulai, Thandu, Pannai keerai) - Mostly solitary bees, black ants, butterflies

Mukuruttai / Saranai keerai (Trianthema) - Solitary bees

Paruppa keerai (Portulaca) - Cerena, Trigona, Metallic bee

Pasalai keerai, Ceylon pasalai (Kozhi keerai) - Bees (Cerana, Trigona, Blue banded bee, solitary bee, Dorseta, Florea)

Pullicha keerai (Hibiscus sabdarifa)- Mainly ants, few solitary bees, wasps

Ponnankanni keerai (Alternanthera) - Butterflies, solitary bees

Moringa olifera (Murungai keerai) - Bees (Carpenter, Dorseta)

Agathi keerai / Narunjuvai keerai - Cerena bees



THINKING GREENS



C Banushree at Aavani Vanaspathihi
(Molasur Village)

"To address the knowledge gap around *keerai*, there needs to be an exposure to the diversity of these leafy vegetables and their tastes right from childhood. We must also step out of the capitalistic mindset and acknowledge the value of these edible plants, unfairly named weeds. Just because *keerai* are available at a low price doesn't mean they are cheap or of any less value."

(Banushree C Reddy, Founder of Aavani Thottam, 50 yrs old, Hindu, Pondicherry)

TOUCH POINTS

Socio-cultural



Environmental



Food & Nutritional



Disregarded by the younger generation in favour of junk food (due to keera's strong acquired taste and time consuming efforts to collect and cook.)

Economic accessibility (cheap and available all year round.)

Nutritional values (arguments for the Health Policy): micronutrients, vitamins, minerals.

High social significance: associated with regional food cultures, considered as a healthy food by rural and urban consumers of all castes and classes.






Vegetables overlooked by public food policy and agronomic research: considered as a famine food (for the low castes and the rural working classes)



Urban and rural farming (Easy to cultivate, grows in small spaces, minimal water required and no chemical input).



High diversity (wild and cultivated)




Food practices linked to:



  The ecological and cultural environment (what can be eaten?)




 The political ideology (power relations– Appadurai 1981)




  Food policy (production and supply) organised by the State and the market.



  Food pattern favouring vegetal category: plants neglected due to devaluation of women's knowledge. Women farm workers are often treasure keepers of this knowledge, keeping it alive through their practices.

   Social context: In India and the Tamil region, food practices vary according to communities and their location (Khare and Rao, 1986). Social considerations also distinguish what is eaten in the city and in the countryside.

  1960-90 : Indian food security policies based on the increase of rice (and wheat) undervalue the importance of millets, pulses and green vegetables as the basis of agricultural and food diversity.

   1990-2020: Steep decline of millet, pulses and *keerai* consumption; cultivated plant diversity erosion; socio-economic changes. Maintenance of significant gender and class/caste inequalities in food access and quality. Despite its food and sanitary programs, India has not managed to reduce the high level of malnutrition that affects its population (nutrient and micronutrient deficiencies).

   2020 and the Covid years: new ethos among the rural and urban middle classes who are questioning the linear food transition model.

  New awareness about the food/health/environment link. Millet and *keerai* become “critical actors” (new narratives for nutritious and sustainable food).

Provisional conclusion of the exploratory work undertaken to continue discussions between scientists and society:



- Public authorities should support the re-evaluation of *keerai* (also millet and pulses) for reasons of culinary and nutritional value AND to support small farmers and vendors. The latter must benefit from the new enthusiasm around *keerai*, especially the women who cultivate, collect and sell it. Numerous citizens' initiatives create links between producers and consumers.
- Gap between societal ideals and everyday reality: overworked women, a debt crisis, increase of expenditure (medical fees, education, transport, etc.) that reduce food budgets.
- A difficult balance: preserving culinary pleasures and associated sociability, questioning the role/place of the food industry in domestic kitchens, lightening task loads and sharing them.



- Associated practices, knowledge and skills do not always alienate women but may provide faculties, qualities and recognition (power?)
- In a society that remains highly hierarchical, how can *keerai* build support for new subjects and political spaces: it is not just a question of eating better but of recognising along the food chain who cultivates, collects, distributes, cooks. The question of rights, the recognition of the subjects (those who give and those who receive) is central.

The project hopes to:



- Recognise and valorise women's knowledge, especially those from lower classes and castes, and the aspects of care and care-giving;
- Think collectively about a precious heritage and about sharing;
- Preserve the diversity of the regional food culture;
- Demonstrate that a *keerai* revival movement could contribute to the reduction of malnutrition;
- Bring to notice that *keerai* is overlooked in public policies, that these policies disregard the fact that *keerai* in the diet ensures nutritional intake of fibres and nutrients.

LIVING LIBRARIES



Interviews conducted during the research revealed that each had a unique narrative to share: consumers, sellers, chefs, cooks, women, men and even children had their own *keerai* story from which we learnt something new. We also realised that, like human beings, every plant has a voice and something to say. People and plants are storehouses of knowledge and wisdom, most willing to share if they are approached with humility.

*Deeply observe a plant in solitude; perhaps you may hear its silent voice,
slowly making you realise a thing or two.*

Consumer interview: Francis and Rosalin (husband and wife), Christian family, Nellithope, Pondicherry: 21st Dec, 2020.

Q: Could you please tell me what *keerai* is good for?

"All *keerai* are good for health, specific *keerai* are good for specific reasons.

For instance *manathakkali keerai* is good for ulcer problems and for the intestine.

Arai keerai and *siru keerai* are generally good. I'm not sure what they are specifically good for, but they are common *keerai*. You can find them in every vegetable shop throughout the year.

Ponnankanni keerai is good for blood circulation.

Murungai keerai is good for increasing iron in the body and making the bones stronger. I cook *murungai keerai* weekly, once as *sambar* and once as a fry side dish.

Mudakathan keerai for *dosa*. It's very good for bone joints and back pain.

Palak keerai salad. I don't know what this *keerai* is good for but its taste is good. We call it salad *keerai*."

Consumer interview: Rajasekaran, 48 yr old male: 10th Dec, 2020.

Arai keerai: It cools your body and improves your immunity; it will give enough power to your body.

Siru keerai: It also cools your body and is good for your eyesight; it keeps your body strong.

Manathakkali: It's extremely good for your stomach, intestines and mouth/tongue ulcers. It cools your body as well. When I was young, my mother used to collect this *keerai* from the Annanagar side of Pondicherry. Forty years ago, it was a wild *keerai*, now we are buying it from the shop.


Ponnankanni keerai: I don't know the specific benefits of eating this *keerai*, but the old women say it improves immunity.

Thandu keerai: It's generally good for the body, and specifically for the bones. If you see this *keerai*, it looks like a bone, like a tube. Eating *poriyal* with only the stem makes your bones strong.

Pasalai keerai: It cools your body, purifies your blood and is good for blood circulation.



Quotations from consumers' interviews in different neighbourhoods of Pondicherry and in villages around the town

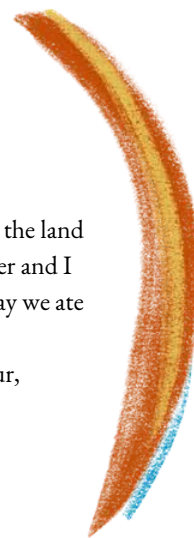


"Initially I didn't like the taste, but because of certain health issues I started eating a variety of *keerai* every week. For instance, *manathakkali keerai* is good for treating stomach ulcers, so I began consuming that. Now I have acquired a taste for *keerai* as it is improving my health and helping me get rid of bodily sufferings."

(Ramalingam, 37 yrs old, Hindu, Udayanthoppu, the settlement near the harbour, Pondicherry: 27th Dec, 2020)

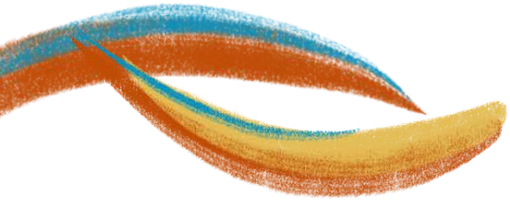
"When I was young, we used to work the whole day on the land and in the evening, before it got dark, my mother, sister and I would roam around the land to collect *keerai*... Everyday we ate a different *keerai*."

(Savitha, 38 yrs old, Udayanthoppu, near harbour, Pondicherry: 23rd Jan, 2021)

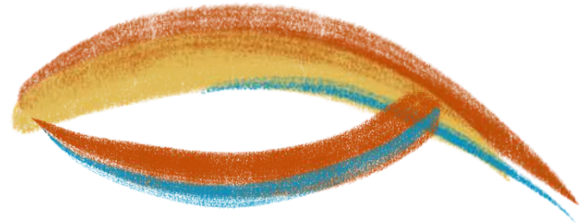


"I used to eat *keerai* six days a week in my parents' joint-family home. After marriage, I am cooking and eating *keerai* only three days a month. On no-moon day (Amavaasai), we cook *agathi keerai* as an offering to God and for our ancestors, and on the second and fourth Friday."

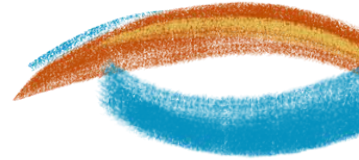
(Dhanalakshmi, 47 years old, Pondicherry, 26 January, 2021)



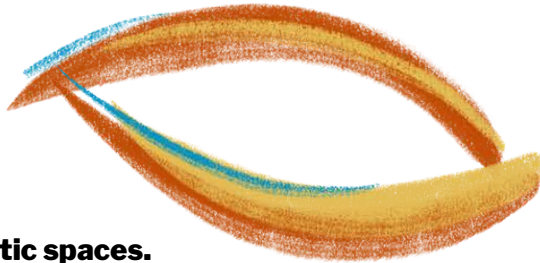
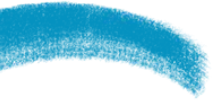
Women as knowledge banks.



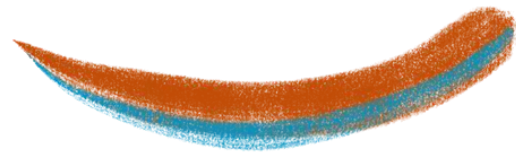
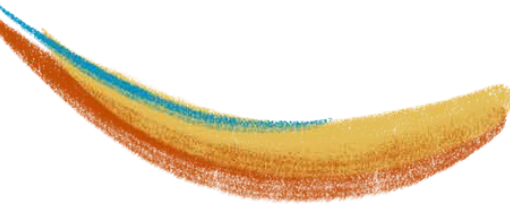
Recognition of local knowledge systems.



Plants as storytellers.

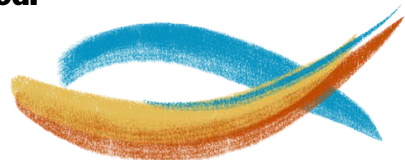


Knowledge flow in domestic spaces.



The generation gap as a space for mutual learning.

The moral associations of *keerai* as good.



KNOWLEDGE IS POWER ?



(Parvathi Nagarajan during the field visit in Molasur Village, TDEF Forest)

"For the past five years, I've had more and more clients, and given the Covid-19 pandemic, their numbers are growing. While purchasing *keerai* they ask me about the different varieties and recipes and I explain it to them. I have been married for 48 years, and have always been a slave. I have had to obey everyone, my husband, my son, my daughter-in-law, my parents-in-law. I was nothing. I was nothing in the world and nobody listened to me or asked me anything. But today, it's not the same. I sell *keerai* and talk to rich people. I teach them how to cook this *keerai* so that they stay healthy. I bow down to a man because he is rich, but indirectly he also bows down to me to have good health. I cure people's diseases through my words. I am a nature-based doctor but a doctor without a certificate!"

Sangunthala, 64 yrs old, Hindu, Karikalambakam.
(Seller's interview on Lenin street, Pondicherry, 15th Sept, 2020)

Keerai consumption is, to varying degrees, shared by all castes and classes living in villages as well as in cities of Tamil Nadu and the Union Territory of Puducherry where many families have maintained relationships with their native village. Among the surveyed women of 35 years and older, both rural and urban, many reported consuming *keerai* two to three times a week.

While urban women are able to name seven to ten varieties of *keerai*, those in villages who gather wild *keerai* know between fifteen to twenty-five varieties.

They know the health benefits of *keerai* such as purifying the body, regulating *dosha*, treating ulcers, improving vision, etc. and the appropriate time to eat them. Some women explain that, throughout the year, the selection, frequency, and rotation of *keerai* species are decided by them through discussions at home that take into account the importance of diversifying menus and the health condition of the family members.

Although men have some knowledge about the nutritional and medicinal value of *keerai*, they rarely know how to use them in food preparations. This knowledge is held by the women who are familiar with the cooking methods and know how to incorporate *keerai* in recipes, including mitigating their sticky organoleptic character, such as the bitterness of *vallaarai keerai* (*Hydrocotyle asiatica*) or the sourness of *puliccha keerai* (*Hibiscus sabdarifa*). Villagers much prefer wild *keerai* to those grown and sold in markets or by women street vendors. They value them for their authentic taste and the health benefits provided by the natural environment in which they grow. Eating wild *keerai* grown on the land where people live ensures good health (Sujatha, 2015), a connection repeatedly emphasized by Siddha practitioners to encourage their patients to eat local food, local being equivalent to traditional.

The value attributed to wild *keerai* is also related to their intense circulation among women of different castes and classes, including, recently, between urban families and their relatives in the village. This circulation is also common among women in the same village who are from lower castes and who collect and give *keerai* to women of higher status. These transactions, devoid of monetary intent, allow upper-caste women to obtain wild *keerai* that they can't themselves collect (except for a few, if grown in their home kitchen gardens) because their status limits their movement within the village boundaries. The gift of *keerai* (raw or cooked) is symbolically the dish of *keerai* prepared to welcome guests, because it is ideologically associated with good health and sustainable food, friendship and mutual trust.

Who are the knowledge bearers?

Women, especially the elderly, hold knowledge about *keerai*, although it is now considered outdated knowledge. It is an inheritance from their past, a rural family history still maintained by many families established in Puducherry. This does not mean that men are devoid of knowledge. They are at least able to recognize the *keerai* because they ensure control over household supplies and authority over the kitchen as they are the ones who generally do the shopping in the market. However, they often ignore the cooking process and recipes.

Prophylactic and therapeutic knowledge is often shared between men and women, but it is the women who master the knowledge on culinary preparations. Some of these women know how to cook the *keerai* so that they retain their nutritional virtues or lose their toxicity, although most of them tend to overcook the *keerai*. There is indeed an overlap in use between *keerai*, plants consumed as food (amaranths, spinach) and *moolikai*, primarily medicinal plants that can be incorporated in dishes. Popular knowledge, or common knowledge collected during the survey, has its own coherence which covers the medical knowledge of practitioners of traditional medicine (Siddha medicine in Tamil Nadu). The bodily conception of diseases has close links with food, whether in vernacular or scholarly understanding (Sujatha, 2015).



THINK ABOUT IT.

Have you given due recognition and thought to the people who know most about food in your family?

TALK ABOUT IT.

Start conversations on the food they cook, ask for personal stories on how they learnt about certain foods.

The kitchen remains a social space of “women-oppression” (see the Malayalam film *The Great Indian Kitchen*, 2021, written and directed by Jeo Baby). Through practice, generated by social norms and socio-sexual division of labour, it creates women-dependent knowledge as regards caring for people through food preparation. This knowledge is a support for domestic female skills, essential for the foundation of the economy, and reflects what women want to offer to their relatives — an act of giving associated with their socialisation, that they must accomplish as a matter of course. The socialisation of women, centred around prioritising relationships, is valuable for the well-being of their families and society. However it is also discriminative, given that men do not share the tasks. Women devote a lot of their time and energy to these tasks with little recognition. These ordinary, repetitive and socially expected tasks, as well as the knowledge associated with them, are seldom questioned and little valued.



Hrudaya Mary, Pondicherry
(gave us detailed recipes and shared knowledge on *keerai*; her sister had a canteen that sold *keerai* specials).

The Working woman and the Mother's guilt

Indian society now wants women in the workforce, but while maintaining their patriarchal household gender roles.

In the *keerai* narrative, office-going women who have knowledge about *keerai* and its health benefits feel guilty about not being able to put their knowledge into practice for their families.



Mother (Kalyani) & Son (Rajasekaran) selling *keerai* at Goubert Market, Pondicherry

A Testimony

**(Kalaiselvi Boobalan, 38 yrs old, Vandipalayam village,
Nadukuppam panchayat, Tamil Nadu)**

“I have been selling medicinal plants for 10 years. Before that, I worked as a coolie in the agricultural fields in my village. Then I joined a SHG (Self Help Group) in my village and received training to prepare 30 types of medicines. Now we train and share knowledge about medicinal plants, mainly local, with the people who don't know about their value and benefits. Some women from other districts give training sessions as well and we go to different districts to do the same. So far we have trained more than 1500 women.”

Q: Since all of you have very good knowledge about *keerai*, how important do you think *keerai* is for the villagers? The younger generation, in particular, does not seem to know the importance of *keerai*. Could you explain what the situation is like in your village?

“Even my grandson never eats *keerai*. I have explained several times to him why *keerai* is important for health but he does not listen to me. In the village, we eat a lot of *keerai*. Basically, village folk eat more *keerai* than the people in town. Of course, we know about their benefits! We eat *keerai* at least 3-4 times a week, in different ways. It constitutes the main dish and, when fried, it is our favourite side dish. We won't buy *keerai* from outside. We have lots of varieties growing in and around the agricultural lands, so we go and collect them directly, such as *ponnankanni*, *thumatti*, *kuppai*, *pannai*, *saattana*, *kaasarai*, *murungai*, *arai*, *siru*, *mulai*, *agathi*, *pasalai*, *manathakkali*, *thuthi*. All are different *keerai* ! When we go to the town for shopping, some people ask us to bring some wild *keerai* for them.”



MONEY PLANTS!



(Rajeshwari, Street Vendor at Goubert Market entrance, Pondicherry)

What is the economic value of *keerai* in the local market, in the local cuisine, and in the international arena? How to determine the value?

In the process of becoming commercial products, millet and *keerai* are becoming less and less embedded in social relationships. They are becoming the "new trend," shifting from home food to outdoor food. It is indeed a new narrative that consumers of these products are witnessing, more detached from culinary cultural rules and reformulated on the attributes of "fast", "easy", and "useful", but still very much linked to the question of the health of the eaters. The rapid commodification and craze for millet has led to their shortage and an increase in their price, resulting in low-income families being deprived of them in their regular diet unless they grow them. The risk of such a situation affecting *keerai* is not negligible. In fact this story around the rediscovery and value-addition of a food that was perceived as a "famine food" is not unlike that of other foods, such as the famous quinoa in Bolivia, South America, which, once it gained popularity for its health benefits, became out of reach of the populations who traditionally consumed it.

"On regular days, I make an average profit of Rs. 300, on auspicious days of Rs. 500. Many people complain that Corona virus has financially disrupted their life, but I am more satisfied now, because, since the pandemic, my revenue and the consideration I get from people has increased a lot!"

Sagunthala, 60 yrs old, Karikalambakam, a village around 15 kms from Pondicherry
(Street vendor interview on Lenin street, Pondicherry: 15th Sept, 2020)

After experiencing illnesses such as chikungunya, dengue and even episodes of the Covid-19 pandemic, all of which can be fatal, people's awareness of food as medicine has greatly increased, especially foods that strengthen the immune system. Just as oranges, lime and turmeric have become everyday dietary essentials as they are rich in vitamin C, *keerai* has also entered the spotlight for its rich content in iron, minerals and vitamin C. The market for moringa (often known as the miracle tree), in particular, is growing exponentially due to its reputation as a popular super-food.



Let's look at some basic math:

$$\begin{aligned}\text{Selling price} &= \text{cost price} + \text{profit} \\ &= (\text{cost}) + (\text{anticipated profit margin})\end{aligned}$$

In the above formula, the revenue is the selling price, cost represents the expenses you incur to produce or purchase goods to sell and the anticipated profit margin is what you hope to earn.

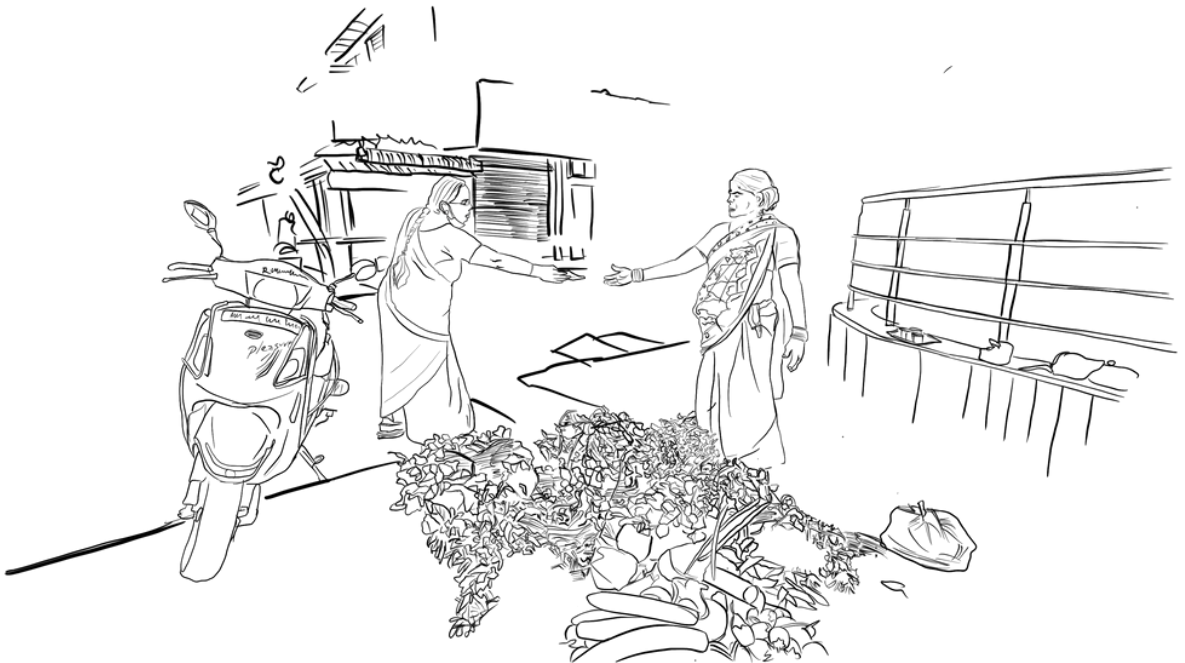
The expense of producing or procuring *keerai* is a combination of the following: agricultural costs in the case of cultivated *keerai*; time, energy and knowledge needed to collect or forage wild *keerai*; bundling and sorting of the *keerai*; transportation from village to town; number of hours spent seated at the *keerai* stall.

TRY THIS:

Imagine you have to sell keerai tomorrow. Come up with a selling price for your produce. Keep in mind that the price of the keerai in the market should include all the above-mentioned steps. Now, split your selling price using the formula above. What is your anticipated profit margin?

Which demographics would this selling price attract?

Now imagine you are the buyer. Would you purchase keerai for the very same selling price? How often would you buy keerai for that price?



(K. Maragadàm amma, selling *keerai* on Bharathi Street, Pondicherry)

Feelings about the keerai trade

"In the past, till about 35 years ago, *keerai* were wild plants that we could collect from anywhere. But nowadays people pay to buy *keerai*, even us. It's becoming a business and I feel ashamed about that. My mom would go and pluck drumstick leaves and make *raagi-adai*, but now my husband buys those drumstick leaves for ₹15 to make soup.

All this makes me think of my childhood, my parents, my sister, and son. We were poor but we had food, in one way or another, even if we didn't have money. But now, we have to pay even for *keerai*, something that we had in our everyday diet for free".

Mrs.Rajasekaran, 45 yrs, Hindu. Pondicherry
(Consumer interview: 10th Nov, 2020)



(Tamizharasi, Street vendor selling *keerai* at Goubert Market.)

A Single Woman's Journey: A Street Vendor's Story (Lathamma, 52 years old, Hindu, Pondicherry)

Just before the Covid-19 pandemic, my son, along with my daughter-in-law and grandchildren, decided to move to Chennai for work. He asked me to vacate the house in which we all used to live on Lenin street in Pondicherry, and to move to my sister's home in Bahour, our native place. He said he wouldn't be able to afford rent for his future Chennai house as well as this one. So he gave me Rs. 1500 for my survival and left.

I felt bad, but I went to Bahour and asked my sister if I could stay with her family. I was welcomed at first, but after a week I felt I was overstaying as I had begun to be disrespected and made to feel remorseful. On the tenth day my sister directly came up to me and said: "Lathamma, I am sorry to say this but we are in a critical situation. We don't have enough food for our daily needs nor does this house have sufficient space, so could you please try and find another place to stay?"

This time, I was deeply hurt. Even if it was past sunset, 8 pm, I left immediately. I stayed on the roadside that entire night and, the next day, I came to Pondicherry and slept next to a small temple. For the next two days I used the money my son had given me. I had Rs. 1150 left from the Rs. 1500.

On the third day, when I woke up near the temple, there was a woman around the same age as me, seated behind a spread of *keerai*, banana leaves and some vegetables. Seeing her I wondered if I could sell these too, and with that thought in mind I approached her. She turned out to be a very nice person and encouraged me in my idea to sell *keerai*. She offered to take me along with her the next day to teach me.

On 14th February at 3.30 am, before the break of dawn, I accompanied her to the Big Market. There were plenty of wholesale dealers selling vegetables and *keerai* to small vendors and retailers. I bought 35 bunches of five different varieties of *keerai* at a total cost of Rs. 280. Then I bought some vegetables, banana leaves and banana flowers which came to around Rs. 700 and odd. So that was my first investment, a grand total of Rs. 1000.



We came back to the temple and she asked me to sit next to her. In the following two hours, she taught me all the selling techniques. That day I made a sale of Rs. 1380. In just half a day, from 6.30 am to 12.30 pm, I was able to make a profit of Rs. 380. This gave me the courage and belief that I could survive on my own, independent of my family. From then on, I invested more and got a daily profit of Rs. 500 to Rs. 600 for an investment of Rs. 2500 to 3000.

Every day, I buy *keerai* at the bus stand and sell them along with vegetables and other produce from 5.00 am to 7.30 am at Uzhavar Sandhai, the farmers' market alongside the botanical garden. I sell almost half of the produce and the remainder I bring back to Lenin Street where I used to live, and sell it there between 1.00 pm and 2.00 pm. I am currently earning almost Rs. 10,000 per month. On average I earn Rs. 7,000 per month. Sales are higher during the summer months than during the monsoon or winter seasons.

Now, I am enjoying my life alone. I have savings of my own and live in a small house where I pay my own rent of Rs. 2000 per month.



Keerai as a USP (Unique Selling Point)

Some restaurateurs in Pondicherry have carved out a niche for themselves by offering meals with *keerai* as the speciality. One such example is Guruswamy who began his business mainly selling *keerai* dishes after giving up working for big hotels. He says this unique selling point attracts customers who are health conscious and aware of the benefits of eating *keerai*, but who do not have the time or the means to cook it at home.

“My uncle gave us the idea of trying something unique, and so we thought of offering *keerai* because many people are no longer able to cook this at home. My uncle is from Villupuram, and he promised me that he would supply *keerai* to the restaurant at a profitable price...”

“Every afternoon we give a *kozhambu* (a curry) of either *siru keerai*, *arai keerai*, *pasalai keerai*, *murungai keerai* or *kalavai* (mixed) *keerai*; a *poriyal* (a cooked vegetable side-dish) of *thandu keerai*, *agathi keerai* or *murungai keerai* and a *kootu* (a thick stew cooked with lentils) of *kozhi keerai*, *paruppu keerai* or *ponnankanni keerai*. In the evenings we give *keerai vadai*, *keerai adai* and *murungai keerai* soup. People who do not know how to cook these buy from us. To prepare them is not expensive, hence we can expect high profits.”

Q: Who decides which *keerai* to cook each day?

“It depends on the availability of *keerai* in the market, and my wife sometimes comes up with good ideas. We always offer at least three varieties of *keerai*.”

Restaurant owner interview: Guruswamy, h/o Parvathy, 100 Ft Road, Near RTO Office, Mudaliyarpet, Pondicherry: 16th Dec, 2020



WHOSE LAND?



“We live in the town but we know where to collect *keerai*; we never buy *keerai*. The land is not owned by anyone, it’s an empty government plot, so we can pluck and collect all the plants we need.”

(Consumer Interview, Pondicherry, 2020)



THINK ABOUT IT:

Where does *keerai* grow?

Foraging in public land and private land.

Commercial *keerai* cultivation vs wild *keerai* collection.

TALK ABOUT IT:

Keerai collection and consumption as a community-centric activity where multiple stakeholders mutually benefit.

Access to any land for *keerai* collection.

Keerai hotspots in urban and rural spaces.

An Innovative Farmer's Narrative

(Banushree C, 51 years old, Reddy community, living in Puducherry and working on her farm about 40 km from the town. Born in Bangalore, active member of the LFS platform.)

“As an enthusiastic mother, cooking food for my children, traditional Indian as well as continental, is a passion and a joy. Being an avid reader and traveller, I always try new recipes to taste innovative foods and flavours. I am very conscious of health and nutrition and the impact of agricultural activities on the environment. This has motivated me to visit various farms and stores where I observe, learn, and meet people from various backgrounds who are also interested in food, culture and soil conservation.

I have visited farms in India and abroad and learnt different methods of farming, such as Bill Mollison’s permaculture, Fukuoka’s natural methods of growing crops, Nammazhvar, Subhash Palekar’s techniques of Zero Budget Natural Farming and Vedic agriculture.

My visit to Rajapalayam Moringa farm under the guidance of Dr. Yathindra Das led me to start a moringa farm recently, where I have included various techniques of multi cropping. Leads and contacts helped me kick-start Aavani Thottam as a challenging yet passionate project. I now grow moringa, herbs, banana, turmeric, ginger, sandalwood, melia dubia, rosewood, kadampa, arjuna, red sanders, bamboo, and many other ethnobotanical plants. With moringa, we grow numerous *keerai* such as *ponnankanni*, *thandu*, *sevapu ponnankanni*, *velle ponnankanni*, *kuppai*, *manathakkali*, *mudakathan* and many other wild *keerai* that sprout up.

As I am very curious to know the health benefits of many wild *keerai*, I have been observing and foraging edible weeds and interacting with rural women to know their names and ways to cook them. The women have helped me learn the various health benefits of *keerai*. I was fascinated to understand the symbiotic relationship between plants and their natural environment.

Village women can always collect edible weeds from any private land, of course, especially if they work as coolies and more generally if they want to cook or even sell them. But some restrictions might have to be imposed if they bring wandering goats and cows for example, that might damage the system that has been set up.

I can also teach them to have their own backyard kitchen and grow medicinal plants. If they ask for information on a particular plant or need some *keerai*, I always share it with them.”

“We are in the process of carrying out the first harvest and pruning of moringa. The yellow leaves and bottommost branches are cut and mulched into the soil so that they become their own fertilizers, since moringa is very rich in minerals...”



C Banushree Reddy, during a field visit organised by the IFP to the reforestation and rural women’s cooperatives at Nadukuppam (a unit of Auroville foundation).

An example of the *keerai* supply chain: A glimpse into the life of a single working mother and *keerai* seller.

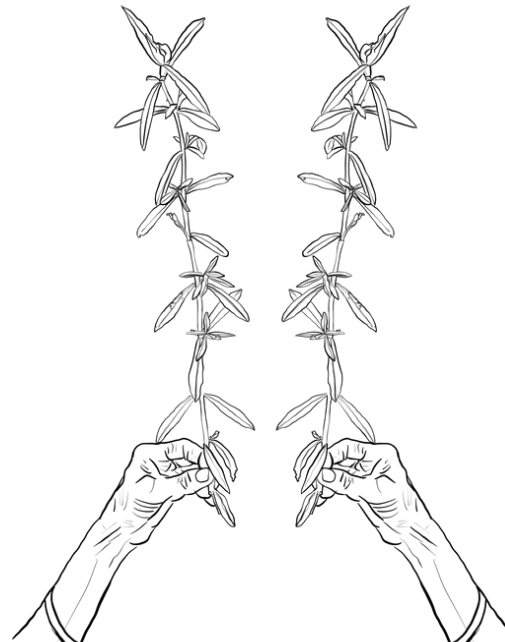
“There are two or three farmers in Purnankuppam (10 kms from Pondicherry) who cultivate *arai keerai*, *siru keerai* and *mulai keerai*. We buy directly from them, because at the bus stand it is sold at a higher price and the price also depends on the quantity of *keerai* available that day. If we go directly to the farm, we get a bunch of *keerai* at Rs 6 - 7. The farmer gives it to us at this price because we have been buying from him for eight years now.

I buy 200 bunches everyday, and, on auspicious days, 250 or 300. This is not just for me, as four of us share these 200 bunches and then we buy other varieties of *keerai* at the bus stand. We buy *manathakkali*, *murungai*, *kalavi keerai* (mixed bunch of wild *keerai*), *pasalai keerai*, two varieties of the same family, *mudakathan*, *thandu*, *ponnankanni* and *palak keerai*.

I have never tried to collect wild *keerai* because I have no time nor do I want to go into the fields. I need to keep time for my children. Every day, I leave home at around 2.30 am along with my neighbours. We reach the Pondicherry bus stand and purchase *keerai* at around 4 - 4.30 am. We take rest until 5.30am and then head to the Botanical Garden and stay there until 7am. Sometimes the sellers at Uzhavar Sandhai (farmers' market alongside the Botanical Garden) do not allow us to set up our stalls there, so we have to move to Bharathi or Chetty Street.

I stay there until 1.00 pm after which my neighbouring shopkeeper looks after my stall. I head home at around 1.45 pm and stay with both my children until 4.30 pm. I get back to my stall on Chetty Street at around 5.15 pm. Depending on the stock, I stay there until 7.30 or 8.00 pm and then go home to cook dinner at 8.45 pm. I spend time with my children then get back to work again the next day at 2.30 am.”

Kavitha, 36 yrs old, Thavalakuppam
(Interview with street vendor, Chetty Street: 30th Dec, 2020)



WHO CARES?

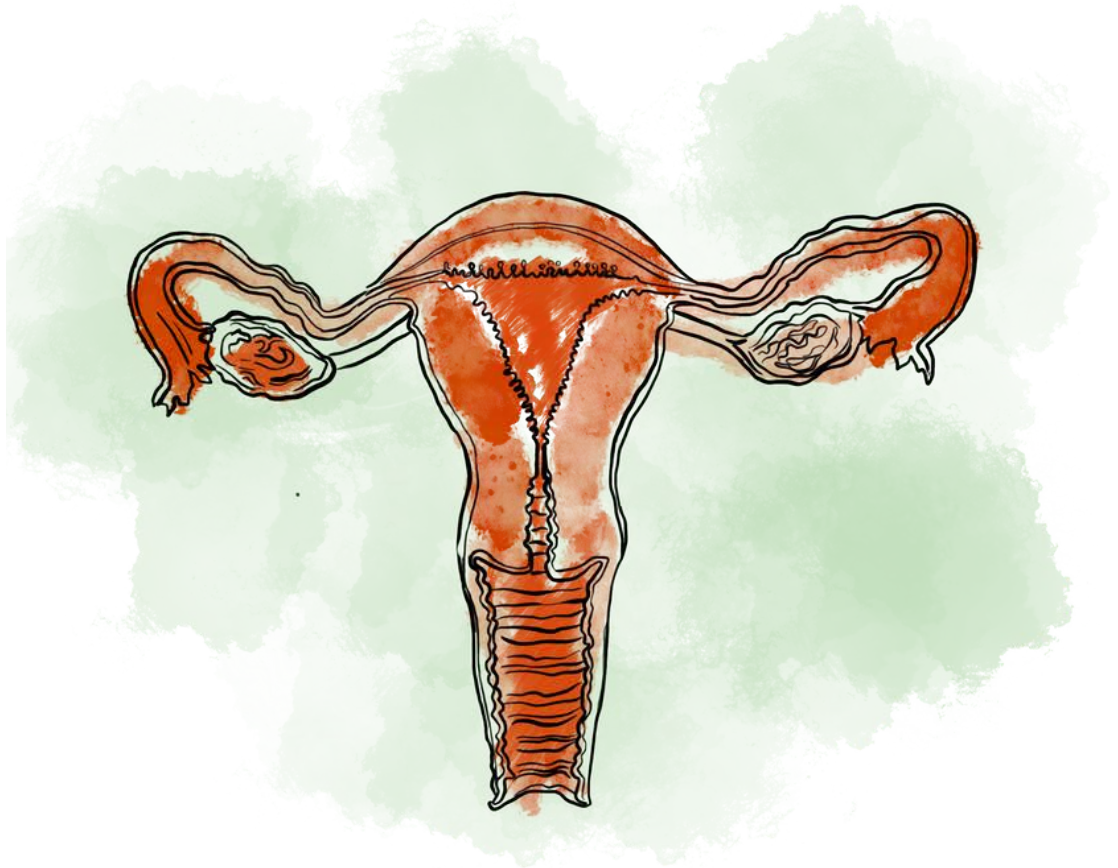


(K. Maragadam amma on Bharathi Street, Pondicherry)

“Care work” may empower women, if conditions exist for the recognition of new political subjects based on new ways and places of participation. Women’s mobilisation can lead to deliberation on and politicization of issues confined to the private “reproductive” sphere by liberal economic models and considered as being less valuable than the public and “productive” spheres. Feminist analysis denounces this separation of private and public spheres and recognises their articulation. In this context, the kitchen can be a place of political recognition because it ensures the link between the inside (the house) and the outside (the fields, the countryside, the city), allowing the cooks — who are mainly women — to resist food commodification. The kitchen (and the cooking of *keerai*) can then be seen as a concrete action of resistance.

The kitchen: a “space for oneself” under social control

Many of the women we met positively associate elements of their feminine identity with the care given to food and the way it is served. The kitchen is experienced as a “space for oneself” in the context of nuclear families, which are becoming increasingly prevalent. “No one in my kitchen, not even my mother-in-law, can tell me why this pot is here and not elsewhere, why I cook like this and not otherwise,” Manju (43 years old, Hindu) tells us. On the other hand, she remembers life in a joint family, before her marriage, when such large families were common in Pondicherry: the kitchen was a space of surveillance and standards had to be respected under the watchful eye of mothers-in-law and sisters-in-law (Appadurai, 1981). In the contemporary context of nuclear families, being appreciated by the in-laws is always a major concern, and in the case of arranged marriages, which remain the norm, the food served to the husband and his appreciation is always a key factor in the life of the young couple. Moreover, even though the new couple lives separately, their parents, in-laws, maternal uncles and aunts often reside nearby and give a lot of advice on *keerai*, especially at important times around childbirth and childcare. Women have to internalise the norms. This internalisation of social norms is instilled in girls' minds from an early age: they are expected to cook with pleasure. This aspect was taken up by several interlocutors who pointed out that the food is touched, when kneaded with the hands, and that these hands are thought to transmit waves, vibrations, positive or negative, to the eater. In other words, it is expected that food is prepared when in a pleasant mood because food is sacred: “to prepare food, is to fill the stomach of each one”, and the stomach is considered as a centre, a neuralgic part of the body. “Giving food is giving pleasure”. The importance of touching, mixing, and cooking “with pleasure” corresponds to a global perspective which should involve all the stages of care: the choice of products from the stalls, the process of cutting them, cooking, serving and finally eating them. Even if the cooking of *keerai* can seem restrictive, elders in the family expect them to be present in the family diet.



“*Kuppaimeni keerai* can help strengthen the uterus if consumed once a week.”

“My husband is a gardener, so sometimes he brings *keerai* from the gardens he works in, especially *kuppaimeni keerai*, since it's very good for me. I eat a lot of this *keerai* because I have certain menstrual problems, female issues. To cure all these problems, *kuppaimeni keerai* is the right choice. The best *keerai* among all the *keerai*. Usually we don't find it all year round. When I go to the market, I ask the *keerai* sellers to forage and bring it for me. I have their contact number and they have mine as well, to inform me about the *keerai* they have collected.”

(Consumer interview: Sangavi w/o Ramalingam, Udayanthoppu , The settlement near the harbour, 28/12/2020)

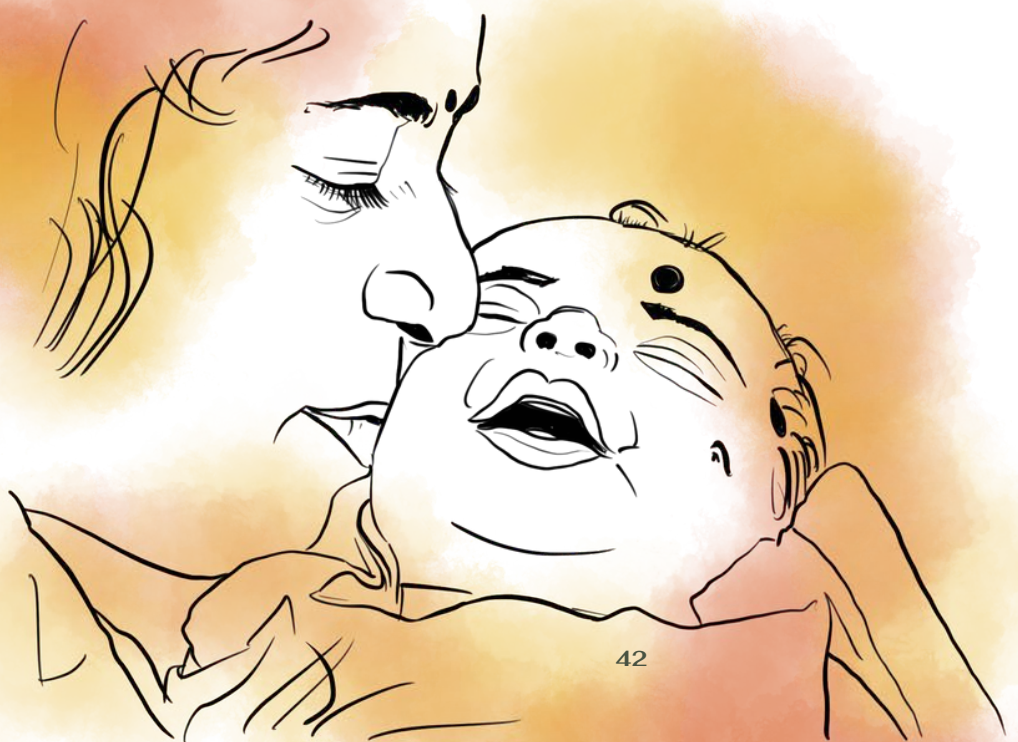
“*Navadanya keerai* is particularly good for women who have delivered a baby”.

“*Navadanya keerai*, *thaali keerai* and *nocha kottan keerai*, fried, are given once to the mothers on the 11th day after delivery.

Recipe: Place the vessel on the stove, pour in 2-3 spoons of sesame oil, add *vadavam* (mixture of spices with onions and garlic), fry the three *keerai* together and eat with *kanji* (watery rice gruel).”

“The reasons for giving the mother these three *keerai* are to improve the quality of the maternal milk given to the baby (it protects from three diseases that may easily affect the baby: wheezing, fever and stomach pain) and, to boost the mother's immunity.”

Nagamma, 48 years old, Hindu, Pondicherry
(Consumer interview, Udayanthoppu, 1st March, 2021)



BABY'S BATH WATER WITH KUPPAIMENI KEERAI

“Babies are at risk of easily catching a cold after their bath, so I give this *kuppaimeni keerai* juice to the baby to drink.

For the preparation, first clean the *keerai* well; then take one piece of rock salt and crush it with the *keerai* to get a juice. Filter this, add *perungayam* (asafoetida, for gastric problems) and give the mixture to the baby.

We use three *keerai* to make the mixture: *kuppaimeni*, *karpooravalli*, and *kalyana murungai*. *Kalyana murungai keerai* is very difficult to find. It stabilizes the body temperature and prevents colds.”

Nagamma, 48 years old, Hindu, Pondicherry
(Consumer interview, Udayanthoppu: 1st March, 2021)

“This *kuppaimeni* has a very spicy taste, so it is not given to new born babies. It is only given to children who can consume solid food, i.e. 1 year-olds and above.
If the child has any skin allergy, or insect bite, then it is mixed with turmeric and added to the bath water.”

Parvathi Nagarajan, 43 yrs old, Herbalist, Sri Siddha Forest Herbs, Auroville, Tamil Nadu
(Review discussion: 16th Dec, 2021)



LET THE FEAST BEGIN!



(Shobana V. making Mudakathan dosa)

"We make *mudakathan keerai dosa* for dinner. The cleaning process takes a lot of time, around three to four hours; then we grind it and mix it with the *idli* batter and make *dosa* with the mix."
(Savithri, restaurant owner in Pondicherry, specializing in *keerai* dishes, 2nd Dec, 2020)

Recipe: "Soak parboiled rice for a minimum of 2 hours, or a maximum of 4 hours. Then grind it along with the cleaned *mudakathan* leaves. Add a little salt and leave the batter mix for 4 to 6 hours after which you can make *dosas*. Mix in a little water if the batter is too thick".

(Interview with Shobana Vaidyanathan, 58 yrs old, Molasur Village, 28th Nov, 2021)

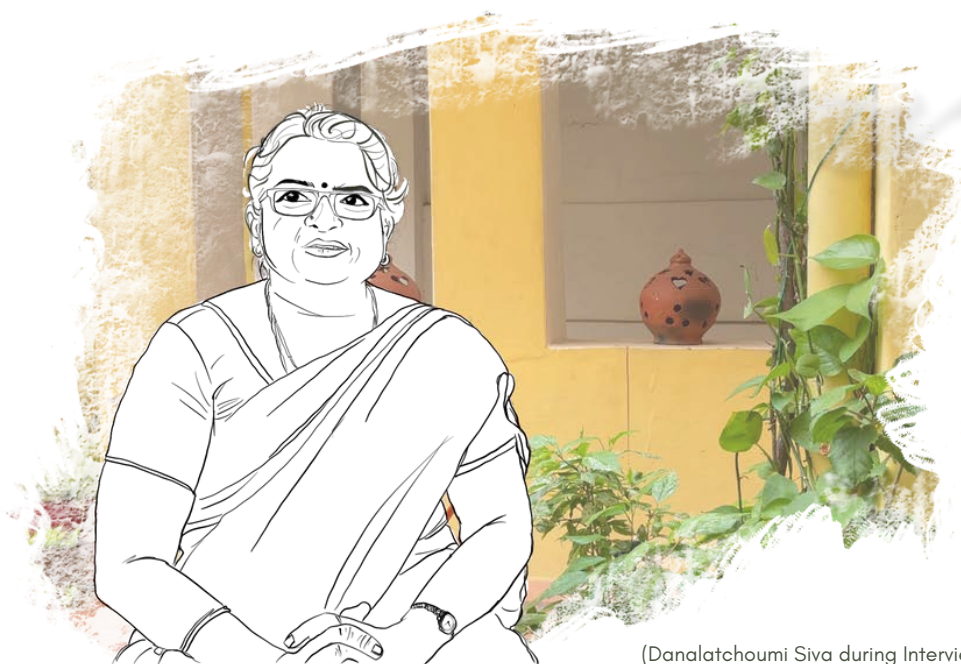
A keerai potluck story at SITA **A cultural centre in Pondicherry and active participant of the LFS platform**

Every Friday, the staff at SITA share a potluck lunch that helps them create strong bonds within the staff and the teachers' team.

A few years ago, one of their potlucks became memorable because out of the five people present, all five brought *keerai*-based dishes. They did not have rice or chapatti to go with it, it was all greens!

Danalatchoumi, the receptionist, loves good food and has loving memories of her mother's cooking. She is increasingly health conscious and is trying to revive the good old healthy recipes that her mother used to make from local seasonal vegetable varieties. Once she even took up a challenge along with her husband to cook a different *keerai* every day for two weeks! And the duo passed the test with flying colours. During the potluck party, Lakshmi brought a *keerai masiyal* that she had rustled up in a few minutes thanks to her pressure cooker. She explained that she had chopped *aarai keerai* finely along with onions, garlic, anise seeds, full green chili, and a walnut-sized tamarind piece. She cooked this mix in a good amount of water, then mashed it and added some salt and *vadagam* roasted in ghee.

The team later had a discussion about the use of pressure cookers. Efficiency and speed were listed as the advantages and loss of vitamins and minerals as overwhelming disadvantages. The team concluded that it is better to steam fresh vegetables, especially *keerai*, and to use the pressure cooker for recipes needing longer cooking time.



(Danalatchoumi Siva during Interview at SITA Cultural Centre, Pondicherry)

Fleur often comes up with a Western or a fusion recipe. For example, she prepared a green lasagna with a big bunch of red *Ponnankanni keerai*, lots of *kozhi keerai* (chicken spinach), garlic, olive oil and black pepper. Everybody enjoyed the mix with the slight bitterness of the *keerai* and the tartness of the goat cheese.

Manisha, the cooking teacher, has a wide background in many different regional recipes, as she has lived in Odisha, Nagaland, Bengal, and Tamil Nadu. So, the entire East coast food culture from North to South has no secrets for her. Once she prepared *pooi saag* which is a very common dish along the East coast (Orissa , Bengal and Tamil Nadu). Like in Odisha, she cooks it with crabs (sometimes prawns) which creates an excellent balance, as the slight bitterness of the *keerai* goes well with the saltiness of the prawns or crabs.



(Potluck Lunch at SITA Cultural centre, Pondicherry)

Pooi Saag

Made with pasalai keerai (Tamil name); botanical name: *Basella alba*; English name: spinach colocasia

Ingredients:

Cooking oil 2-3 teaspoons
Crab 250-500g
Colocasia 100g
Pasalai keerai 400g
Potato 100g
Onion 50g
Tomatoes medium
Ginger garlic paste 2 cs
Coriander paste 1cs
Cumin 1cc
Red chili powder 1cc
Curcuma 1/2cc
Cardamom 2 pods
Bay leaf 2
Cinnamon 2 inches

Method:

Pour 3 spoons of mustard oil or sunflower oil into the wok. Add cardamom, cinnamon, bay leaf; toss in chopped onion and saute until slightly brown; add ginger-garlic paste and cook until the raw smell goes. Add chopped tomatoes and powdered spices, and half a cup of water. Then add crab/prawn and vegetables, and finally *pasalai keerai* followed by coriander.



Murungai Keerai soup

Ingredients:

- 2 cups of murungai keerai with small stems
- 4-5 cloves of garlic
- A couple of small onions
- A pinch of turmeric powder
- 1 teaspoon of pepper powder
- 1 teaspoon of fenugreek
- 1/2 teaspoon of salt

Method:

In a pressure cooker, add all the above ingredients and 2 glasses of water. Keep on the stove until one whistle. Wait for the steam to release and then grind the mixture and filter it. That's it, the tastiest keerai soup is ready to be served.

(Karthik, 38 yrs old, Marakanam, Hindu.

Consumer interview at a *keerai* specialty restaurant, Easwaran Kokil street. 4th Jan, 2021)

Manathakkali kootu

Wash the manathakkali keerai well. In a cooking pot add the keerai with chopped tomatoes, toor dal, green chilli, garlic and 3 cups of water. In case you are using a pressure cooker, wait for three whistles and then drain the water into another vessel. If you are not using a pressure cooker, cook for 20 mins. After draining off most of the water, grind the mixture to make it into 70% paste. In a pan, heat oil and add mustard, urad dal and red chili, keep on heat for 2 minutes and then add the keerai paste. The manathakalli kootu is now ready. You can eat it with rice.

(Consumer interview: Guru, 24 years old. 11th Nov, 2020)



A French Chef's Take on Keerai

"In France, certain *keerai* are known as spinach. When I arrived in India for the first time I found curry leaves very interesting, they have a very specific flavour; also gongura, which is the sour one and looks like sorrel. It was new and exciting for me to see Moringa... very healthy and flavourful. So I came up with a signature Moringa soup at La Villa. The drumstick (moringa pods) and the moringa leaves are got from the same tree, so we make an original soup from both ingredients, using the flesh, seeds and leaves. We also make a keerai soup for our staff every week. We use arai keerai or any of the regular keerai that are seasonally available.

There is a certain way of combining flavour and texture to create an experience. So if there is something sour, we have to find something to balance that. For example, our moringa soup has a kind of bitterness to it, and there is a base of ginger-garlic. So to create the balance, we add a kind of cream, a cumin cream, which perfectly balances the flavour.

We make some homemade crumbs using methi leaves, and a sauce as well. For example, we use the same technique as for pesto sauce in Europe, simply using a different ingredient. The methi gives a specific flavour to the sauce".

(Interview with Chef Christmann Michel at La Villa, a Luxury Concept Hotel, Pondicherry- 07/10/2021)



(Chef Michel at LA Villa, Pondicherry)

Chef Michel's Drumstick and Moringa Leaf Soup

Ingredients:

Drumstick 500g
Moringa leaves 2 bunches (400g)
Tomato 4 pieces
Garlic and ginger paste 20g
Coriander + coriander root pm
Cream 200 ml + cumin powder pm
Curry leaves pm
Onion 250g + garlic chopped 20g
Olive oil 50 ml
Salt + black pepper pm
Coriander seeds + 1 bay leaf + 2 cloves (spices)

Starting the drumstick and moringa soup:

Begin with chopped onions in olive oil, sautéed till they become golden. Add salt and pepper, followed by garlic, coriander root and spices and cook for 5 mins. Then add the ginger-garlic paste, the tomato (cut into big cubes), the drumstick cut into 6 to 8 cm long pieces and cook for 5 mins. Pour water to the same level and cook till the drumsticks are ready (the flesh inside should have softened and feel mushy).

Remove them and keep aside.

Wash and remove the moringa leaves.

Finishing the soup:

Remove the drumstick seeds and the flesh for garnish. Then pour the hot cooking stock through the strainer and add the moringa leaves and cook for a minute. Mix it well and strain.

Cumin foam:

Boil the cream then add the cumin powder and salt then pour it in a siphon with gas.

Curry leaves oil:

Fry the curry leaves at 140 degrees then mix them well with a little refined oil and strain.

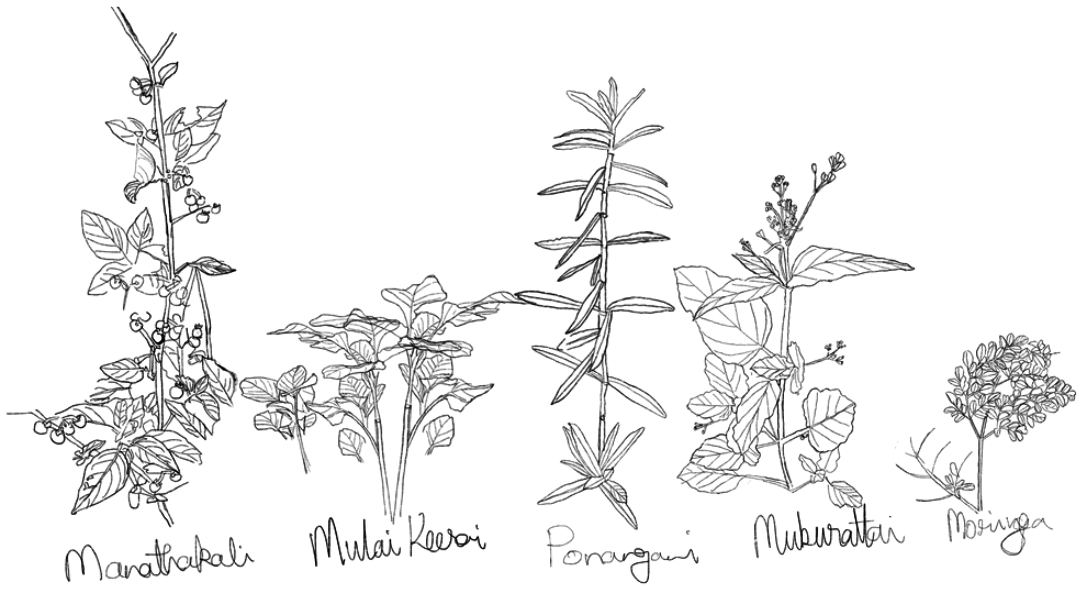
Plating:

Garnish the plate; add the drumstick seeds, the flesh, fresh tomato cubes, fresh coriander, curry leaves oil and cumin foam. Then pour the soup in front of the guest.

Like this all the flavours come together and match really well. This is also an extremely healthy soup.

KEERAI INDEX

By Balanchandran Natesan, botanist, Ecology department, IFP
and Brigitte Sébastia, anthropologist, IFP





Aarai keerai (Tamil Name)

Marsilea quadrifolia (Botanical name)

Four leaf clover, European water clover (English name)

Marsilea is considered as a weed in paddy fields, edges of water bodies, and puddles. It is also known in Tamil as kurantham, neer aarai.

Description: Herbaceous, aquatic fern, bearing 4 parted leaf, floating in deep water or erect in shallow water or on land; leaflets on deltoid, glaucous, petioles up to 25 cm long; fruit (sporocarp, spore bearing bodies) ellipsoid, dark brown, attached to base of petioles.

Uses: In India, during autumn it has been used as food for more than 3000 years. The plant is said to be anti-inflammatory, diuretic, depurative, febrifuge and refrigerant. It is also used to treat snakebite and abscesses.

Ecology: It prefers sandy and loamy soils, in full or partial sun, wet or shallow water up to one foot deep on muddy ground. The sporocarps of this fern may remain dormant for decades. However, once it splits open to release the spores, development of new plants proceeds quickly.

Distribution: This plant is found naturally in Central and Southern Europe, Caucasia, Western Siberia, Afghanistan, South-West India, China, Japan and Vietnam.

Agathi keerai (Tamil Name)*Sesbania grandiflora* (Botanical name)

Vegetable hummingbird, West Indian pea (English name)



It is a short-lived, soft-wooded, loosely branching tree with rather open crown, grows up to 15 m tall, and has a 25 to 30 cm wide trunk. The other Tamil names are acaiyam, attikkirai, cayanti, munipattiri, piraimalar, uppi and vittari.

Description: Agathi is a fast-growing tree with rough and corky bark; compound leaves have 10 to 20 rectangular-shaped leaflets; flowers white or red, in 2 to 4 flowered racemes; fruiting pods are slender, about 30 cm long and contain 15 to 30 seeds.

Uses: This plant has been used in Ayurveda, Siddha, Unani and folk medical systems. Generally leaves and seeds are used, however this tree has a wide range of uses such as food, medicines, timber, gum and tannins. It is sold as a vegetable in the local markets. Large white flowers are used as salad, also cooked, but the centre part is usually removed due to its bitterness. Immature seed pods are cooked as a side dish and the seeds have a high amount of protein. Young leaves and shoots are cooked and eaten as spinach.

Ecology: It grows in dry and wet habitats. Used as host plant for betel leaf plantation. It is also cultivated in many tropical areas as an ornamental green manure crop in soil reclamation schemes for its useful properties. Flowers during the months of September-December.

Distribution: Considered native to South and South East Asian countries including India, Malaysia, Indonesia, Myanmar and Philippines. Now it is cultivated throughout the tropics.



Arai keerai (Tamil Name)

Amaranthus dubis (Botanical Name)

Red spinach, Chinese spinach, Spleen amaranth (English name)



Description: Erect annual herb, up to 150 cm tall; stems slender to stout, branched, especially towards the inflorescence; leaves simple, spirally arranged, lamina ovate or rhomboid, 12(-22) cm × 0.7-8(-14) cm, sometimes the centre of the lamina blotched red; inflorescence spike like or paniculate, axillary and terminal, the terminal one up to 25 cm long.

Uses: This leafy vegetable is used mainly in food. It is cooked, grounded and used as gravy. The leaves become soft after 5-10 minutes of cooking in salted water. The leaves have been used as a diuretic and for jaundice. There are very rich in beta-carotene.

Ecology: It is frequently found in tropical humid lowland from sea level up to 500 m altitude, less at higher elevations up to 2000 m. It is a common plant in waste places, roadsides, flood plains, river banks and cleared forest areas. Vegetable amaranths grow well at day temperatures above 25°C and night temperatures not lower than 15°C. Shade is disadvantageous except in cases of drought stress. Amaranths like fertile, well-drained soils with a loose structure.

Distribution: It originates from tropical America, from Southern Mexico to northern South America, and is common in the Caribbean region. The cultivated type may have been developed from the weedy ancestor in tropical Asia (Indonesia, India) and is found in several African and Central American countries.

Kodi pasalai (Tamil Name)*Basella alba* (Botanical name)

Malabar spinach (English name)

Normally this plant is kept in home backyards and is mostly used as an ornamental climber. In Tamil it is also called shivappu-pasla-keerai, venpacali, venpacalikkoti, cempacalai, perumpacalai and perumpacalaikkirai.



Description: Perennial twinner, grows up to 4(-8) m long, succulent and tender, slightly mucilaginous, smooth, green or purplish; leaves simple, fleshy, ovate to heart-shaped, 2.5-15 cm × 2-12.5 cm, dark green or purplish; inflorescence an axillary spike; flowers white, pink or purple.

Uses: This plant is used in Ayurveda, Siddha and Chinese medicines. Leaves and young shoots are commonly used. This spinach is commonly grown for its young shoots, used as a vegetable to prepare stews or soups, fried with oil or sometimes used as a green salad. It is popular among Europeans in Africa as a substitute for spinach by using young tops and seedlings. Its fruits are used for dyeing in cosmetics and for colouring foods. A number of medicinal applications have been reported; leaves are used as a laxative and the red fruit juice as eye-drops to treat conjunctivitis. The edible leaves contain carbohydrates, protein, fat, vitamin A, C, folate and manganese, vitamin B and dietary minerals.

Ecology: It does well in tropical lowlands at elevations up to 500 m, but it survives even at 2600 m altitude in temperate regions. Under natural conditions, it can be found in forest margins, clearings and in thickets often in slightly wet localities, but it does not tolerate frost. The optimal temperature range is 20-35°C. It responds to light shading by producing larger and more succulent leaves than when fully exposed.

Distribution: It is considered a native of Southern Asia, but its exact origin is not known. Widely cultivated and naturalized in the tropics, it is even grown in temperate zones as an annual. It has been recorded in many countries, but is probably common in the whole of tropical Africa. In India, it runs wild throughout and is also extensively cultivated.

Kozhi keerai (Tamil Name)

Portulaca oleracea (Botanical name)

Paruppu keerai (cultivated form) (Tamil name)

Common purslane, Duckweed, Little hogweed (English name)

This sub-succulent herb is available in the wild and also from cultivation. Other Tamil names are karikkirai, kolikirai, paruppu keerai, passalakkirai and vayalai kodi. Approximately 40 cultivars are currently grown. The specific epithet “oleracea” means “vegetable/herbal” in Latin.

Description: Smooth and reddish stem; leaves simple, alternate, thick, green - reddish green, slimy when bruised; flowers yellow, terminal have five regular parts, 6 mm wide. The tiny seeds are formed in a pod, which splits open when the seeds are mature.

Uses: Commonly used in Ayurveda, Siddha, Unani, ethnomedicine and Chinese medicine. Purslane has been used in folk medicine since ancient times and is included in the World Health Organization’s list of most widely used medicinal plants.

It has diuretic, sedative and analgesic properties. Helps to treat rheumatism, fever, dysentery, choleric, gynaecological diseases, disorders of the urinary tract, intestinal worm infestation, and as cardiogenic. Also used externally to treat skin ulcers, eczema and dermatitis. Ash of purslane helps to treat heart diseases. Purslane is also a source of livestock fodder. It has several dietary minerals and vitamins.

Ecology: Kozhi keerai is a weed of fields and disturbed areas, also occurs in open grassland and bushland, from sea-level up to 2400 m altitude.

Depending upon rainfall, the flowers appear at any time during the year. The flowers open singly at the center of the leaf cluster for only a few hours on sunny mornings. Thick succulent taproot is able to tolerate poor soil and drought. It is usually grown as a summer crop at an optimum temperature of 35°C, tolerating saline soil but it can’t tolerate the frost. It tolerates a wide range of soils, but prefers sand or sandy loams.

Distribution: Cosmopolitan in distribution, but it was considered as an exotic weed. Scientists suggested that the plant was already eaten by aboriginal Americans. Throughout India it is a weed in gardens and cultivated lands.





Kuppai keerai (Tamil name)

Amaranthus viridis (Botanical name)

Slender amaranth, Green amaranth (English name)

Wild and weedy herb normally used to cook with other leafy vegetables as kalavai keerai. This plant is also called iruvati, kollaikkirai, niccata kirai, peypalati kirai (in Tamil) and tanduliya (in Sanskrit).

Description: Annual, erect, herbaceous plant, 40 to 80 cm tall; leaves glabrous, ovate-rhomboid, 2-7 x 1.5-5.5 cm; flowers green, in slender axillary to terminal panicle spikes 2-12 cm long; capsule small, nearly globose; seeds round, slightly compressed, black and shiny.

Uses: Used as a medicinal herb in Ayurvedic medicine, under the Sanskrit name Tanduliya. Also used in Siddha (to clean metals or to prepare complex herbometallic products), ethno and Chinese medicines. Almost all parts of the plant have food and medicinal value. Porridge is prepared from polished seeds and the leaves are commonly used as vegetables in most parts of India. The leaves and seeds contain lysine, an essential amino acid.

Ecology: Weedy herb found in wasteland, roadsides, denuded fields, etc of tropical and subtropical countries. It propagates naturally by seed when the conditions are adequate, especially after the rain. If conditions are unsuitable, the seeds stay dormant, up to a year or more, 2.5 cm below the surface.

Distribution: It is frequent in all warm regions of the world. It is one of the most common weeds in the tropics, subtropics and warm temperate regions.

Manathakkali (Tamil Name)*Solanum nigrum* (Botanical name)

European black nightshade, Black nightshade,

Blackberry nightshade (English name)



Leaves, ripe and unripe berries are used as food traditionally in Southern India. However all parts are used in traditional systems of medicine. It has 92 Tamil names. A few important ones among them are: arecirutakkali, kakaci, kakamaram, karmanakkali, mancara, manithakkaali, milagutakkali, pillaitakkali, tanalarri, ukkiram, vatutukali, veci, venmilakutakkali, vennalarri and yamai.

Description: Annual or biennial herb, 0.5–1.0 m tall; stem ascending or erect, stem herbaceous or even shrubby; leaves alternate, ovate, 2–8 cm long and vary between plants from smooth-edged to shallowly lobed; inflorescence cyme, supraxillary; flowers white with bright yellow anthers; berries round, dull black or purple black.

Uses: This plant has a long history of medicinal usages, dating back to ancient Greece. Its leaves, fruits and seeds are used in Ayurveda, Siddha, Unani, ethnomedecine, homeopathy and Chinese medicine. It has hepato, diuretic and antipyretic properties. It is used as a medicinal plant to treat pneumonia, aching teeth, stomach ache, tonsillitis, wingworms, pain, inflammation, skin diseases, burns and fever, tumor, inflammation. It is also used as food.

Ecology: It grows in disturbed habitats, roadsides and gardens. It is regenerated from seeds at temperatures of 20 to 30°C, in all well-drained soil types. Grows well in the autumn, namely September and October.

Distribution: It is common throughout the world, from temperate to tropical regions, and from sea level to 3500 m above sea level.

**Mukkirattai (Tamil name)**

Boerhavia diffusa (Botanical name)

Spreading hog-weed (English name)

Perennial, trailing herb that can climb when it gets support. It has 97 additional Tamil names. A few of the important ones are: punarava, caranai ver, cenatika, ciriya mukkurattai, kadiyirattam, kannika, kattumukkirattai, mookarutty ver, punnakam, purittiyam, putpakam, sattaranai, ticaimali, uruttiranikkoti and varusapu.

Description: Prostrate herb, trailing up to 1 m long; stem branching mainly from the base, prostrate when young, ascending to erect when flowering, often flushed with red; leaves simple, opposite, unequal in size; broadly ovate to elliptical, 1.5–6 cm × 0.5–5 cm; inflorescence terminal with pink-purple coloured flowers; fruit a sticky capsule.

Uses: Mukkirattai keerai is a very popular medicinal plant in India. Especially the roots, leaves and seeds are extensively used in Ayurveda, Siddha, Unani, homeopathy and ethnomedicine. The high potentiality of its root is mentioned in the Indian Pharmacopoeia. Plant parts are used for anaemia, stomachic, cardio tonic, hepato-protective, corneal ulcers, night blindness, jaundice, enlarged spleen, gonorrhoea, internal inflammations, laxative, diuretic, anthelmintic, febrifuge, expectorant, rejuvenative and, in higher doses, as an emetic and purgative.

Ecology: It occurs in rural localities and along roadsides, preferring sunny sites; dieback with thick taproot, and new flushing and flowering appears after summer rains; from sea-level up to 1200 m altitude. It is often grown as a weed in cultivated land, usually on sandy soils, and also found in lawns and grazing pastures.

Distribution: It has pantropical distribution, and possibly originates from the Old World tropics. It occurs throughout tropical Africa. Within India, it is found abundantly, occurring as a weed throughout, ascending to an altitude of 2000 m.



Mudakathan or Mudakatraan(Tamil Name)

Cardiospermum halicacabum (Botanical name)

Balloon vine, Balloon plant, Love in a puff, Heart seed (English name)

A common weed, widespread in India along forest margins, grasslands and cultivated areas, collected and used under different names: erikkodi, intiravalli, korankodi, kuppai mulikai kodi, nakanam, pantantiravalli, periyavilai, pirotta and tirukumulam.

Description: Herbaceous vine, much branched from the base, climbs by means of hooked tendrils and attains up to 2 m high with support; stem has 5 longitudinal ribs; leaf compound, triangular or rhombic in outline, lateral leaflets ovate, or oblong in outline; tendrils in pairs, spirally twisted, at the end of short axillary axes (aborted inflorescences), from which an inflorescence usually develops. Flowers white, fruit a capsule, winged.

Uses: It is cultivated as an ornamental, and also for its medicinal value. The leaves are extensively used in Ayurveda, Siddha, Unani, ethnomedicine, homeopathy and Chinese medicine. It is eaten as a vegetable and is considered to be a diaphoretic, diuretic, emetic, antipyretic and purgative. Apart from its medicinal uses, the stems serve to make baskets and the seeds are used as beads. Edible oil is obtained from the seeds.

Ecology: It is a common weed of forest lands and wastelands. Found under a wide range of ecological conditions, wet or dry climates and on acid or basic soils. It prefers open and sunny places from the coast to 1500 m elevation.

Distribution: The native status of *C. halicacabum* is highly debated and its biogeographical history remains uncertain, but it is globally distributed in the Pantropics and the tropics of the Old World.

Murungai keerai (Tamil Name)*Moringa oleifera* (Botanical name)

Ben nut, drumsticks, Horse-radish tree (English name)

Native to the Indian subcontinent, cultivated for its young seed pods and leaves, used as vegetable and for herbal traditional medicine.

Introduced in most tropical countries for its significant potential source of Vitamin B, C, K, provitamin A, manganese and protein.

This plant has also been named asasuram, karunjanam, kilavi, kiranjanam, sikkuru, suligai and tavuselam.

Description: Fast-growing, much-branched, often crooked tree, up to 10m tall, stem 20-30 cm in diameter, sometimes more; bark corky, whitish grey or pale buff, containing coarse fibre and exuding white gum when wounded and turns to pinkish red; roots tuberous with pungent bark; young shoots purplish or greenish-white, usually puberulous.

Leaves compound, up to 60 cm long, rachis articulated and falling, somewhat crowded towards the branch ends; leaflets 6-11 at every branchlet, elliptical or obovate, 0.5-3 cm × 0.3-2 cm, glabrous or puberulous. Inflorescence an erect to spreading panicle, 8-30 cm long with numerous white to creamy, fragrant flowers.

Ecology: This tree is strictly a tropical plant and grows well at lower elevations, both wet and seasonal conditions, but can be found at up to 1300 m altitude. It is grown in various soils but thrives best in fertile, well-drained sandy loams.

Uses: Almost all parts of this plant have been extensively used in all indigenous medical systems and are good for anaemic, arthritis and joint pains (rheumatism), asthma, cancer, constipation, diabetes, diarrhea, seizures, stomach pain, stomach and intestinal ulcers, intestinal spasms, headache, heart problems, high blood pressure, kidney stones, symptoms of menopause, thyroid, etc.

Distribution: Moringa is an indigenous tree, generally grown in backyards of most households, and found growing wild in Northern India and Pakistan. It was introduced in South-East Asia at an early date, and is now cultivated throughout the tropics. It has also naturalized in most places.



Mulai keerai (Tamil Name)

Amaranthus tricolor (Botanical name)

Purple amaranth (English name)



It is one of the commonly used leafy vegetables in South Indian cuisine, cultivable and available throughout the year in the market.

Description: Annual and erect herb, small to rather tall, up to 100 cm tall; stem simple or branched, glabrous. Leaves are simple, spirally arranged, lamina angular ovate, 1–10 cm × 0.5–6 cm, green or more or less purple. Inflorescence is a spike; flowers clustered together; fruits small, globular capsules containing disc-shaped seeds.

Uses: Mainly used as a leafy vegetable. Leaves and tender shoots are cooked and served, sometimes pickled or preserved by drying. Generally it is recommended as a good food for its medicinal properties for young children, lactating mothers and for patients with fever, haemorrhage, anaemia or kidney complaints and against lung disorders. The leaves are used as a febrifuge and poultice to treat inflammations, boils and abscesses.

Ecology: Vegetable amaranths grow well at day temperatures above 25°C and night temperatures not lower than 15°C. Shade is disadvantageous except in cases of drought stress. The plant likes fertile, well-drained soils with a loose structure. It is fairly resistant to adverse climate and soil conditions.

Distribution: This is a cosmopolitan weed, spread all over the world from the tropics to temperate areas, in some areas reported as rather noxious. It probably originates from the Mediterranean region and has been recorded in many African countries. It is mostly a protected weed in backyards and home gardens.

Ponnankanni (Tamil Name)*Alternanthera sessilis* (Botanical name)

Water amaranth (English name)

It is a semi-aquatic plant known as ponnankanni (in Tamil, it also has 112 other names), ponnaganti-aaku (in Telugu) honnagone (in Kannada) andgudrisag (in Hindi). Other popular common names of the plant are dwarf copper leaf, sessile joyweed, rabbit meat, tangle mat, sessile alligator weed, sessile flower globe amaranth, carpet weed, water amaranth and bread chevrette.

Description: This is a perennial herb with prostrate and ascending stems, often rooting at the nodes. Leaves are simple, opposite, narrow and elongated, very variable in size and shape, 1–5 cm long, 0.5–3 cm wide, glabrous; flowers in the axils of leaves, shiny white.

Uses: Considered as king of keerai, because it is used in all codified medical systems, has enormous medicinal properties, tonic, diuretic, coolant, laxative properties, treating dysuria and haemorrhoids; believed to be beneficial for the eyes and skin; is an ingredient for the preparation of medicinal hair oils. It is very rich in protein, iron, fiber, minerals, phosphorus and calcium.

Health benefits: Good for night blindness, stopping piles, increasing hair growth; cures jaundice, regulates nervous system, cures infertility, prevents cancer, rectifies irritation during urination, helps weight loss, reduces body heat and improves health condition. Cooked as kootu, poriyal, soup, vada, gravy, sambar, roti (adai).

Ecology: Plant grows wild, found in wet or damp spots, adapted to grow on a range of soil types, also cultivated for food and herbal medicines. Flowers and fruits are from December until March.

Distribution: The plant occurs throughout the tropical and subtropical regions of the Old World. In India it is found throughout the warmer parts and up to an altitude of 1200 m in the Himalayas.



Siru keerai (Tamil Name)

Amaranthus blitum (Botanical name)

Chinese spinach, Spleen amaranth (English name)

One of the most commonly used leafy vegetables, it has a long history of cultivation, especially for its leaves. It is also named pitun keerai and sendanu keerai in Tamil.

Description: Vigorously growing erect, annual herb with a branched stem, up to 80 cm tall. It has both green and red varieties, as well as some with mixed colours. Leaves rhombic ovate; inflorescence terminal panicle, erect or often drooping, green densely branched; flowers cream-yellow; seeds black and smooth.

Uses: Amaranth leaves are generally recommended as a good food with medicinal properties for young children, lactating mothers and patients with fever, haemorrhage, anaemia, constipation or kidney complaints. The whole plant is used as a medicine against stomach ache. It is also used for the preparation of potash.

Ecology: This herb has a short life-cycle. Each plant produces a high number of seeds. The emergence of the seedling takes place 3-5 days after sowing. Flowering starts after 4-8 weeks; vegetative development is fast. The plant produces new shoots when older branches are already blooming. It is usually found in waste places or disturbed habitats. It flowers in summer in the tropics, but can flower throughout the year in subtropical conditions.

Distribution: It is native to South America, Mexico and West Indies; naturalized or invasive in Central and South-Western Africa, Asia (India, Indonesia, Nepal, and Taiwan) and Oceania (Australia and many Pacific islands). In Europe, it occurs locally in France and Germany. It is cultivated in many tropical and subtropical countries.





Sivappu ponnankanni (Tamil Name)

Alternanthera ficoidea (Botanical name) (= *A. dentata*)

Blood leaf, Copper leaf, Jacob's coat (English name)

It is a tropical perennial, typically grown as an annual, known for its colourful foliage, and generally used as an ornamental plant.

Description: Fast growing erect and ascending herb, to 45 cm, brightly coloured; leaves are elliptic to broadly ovate, many colourful cultivars with blotches; inflorescence axillary heads, solitary, white.

Uses: The leaves are eaten raw or cooked, sometimes boiled with rice and pepper. It is considered as an antiviral agent. Foliage is particularly attractive when plants are in mass cultivation. Uses recorded in folk medicine .

Ecology: It is an invasive species that degrades native habitat and is known to produce compounds that injure other plants, including crops. It likes rich, consistently moist, and well-drained soil. It has the best leaf colour when in full sun. Pinch stem ends to promote compact business. It is generally propagated through stem cutting.

Distribution: The plant occurs throughout the tropical and subtropical regions of the Old World. It was introduced to the Southern United States and its origins in Central and South America are uncertain.

Thai velai / Nal Velai (Tamil Name)

Cleome gynandra (Botanical name)

African cabbage, Cat whiskers, Stinkweed (English name)

Velai keerai occurs and is commonly available during the Tamil month “Thai”, so it is named as “Thai velai”. It is also called agakanti, abirami muli, camuka velai, carvalai, kanavillai and nallavelai.

Descriptions: Annual or perennial herb, with glandular hairy leaves, spirally arranged, palmately 3-7-foliolate, central leaflet largest; inflorescence a leafy terminal corymbose raceme or panicle, leaves apically gradually reduced; flowers white, petals 4; fruit a capsule, long, with many seeds.

Uses: This plant is used in all indigenous systems of medicine. The leaves are bitter in taste, however the plant is boiled and eaten as a vegetable, or salted and used as a pickle. The seeds are used as a substitute for mustard seeds, as a condiment in curries. It contains folic acid, ascorbic acid, calcium, vitamin E, iron and oxalic acid. The leaves also have anti-oxidative and anti-inflammatory properties.

Ecology: This weed grows along roadsides and in fields, at low altitudes. It grows well in disturbed, well drained soils; it is drought tolerant but does not tolerate cold temperature and frosty weather.

Distribution: It is pantropical and subtropical in distribution. It grows as a weed in hotter parts of India.



Thandu keerai (Tamil Name)

Amaranthus cruentus (Botanical name)

Accepted Name: *Amaranthus hybridus* L. subsp. *cruentus* var. *paniculatus* Thell.

Vegetable amaranth (English name)

It has green and red forms. Other well-known names are Rajgiri (Kannada); jivanta, kumarajiva, rahadri, rajagiri, rajashakini (Sanskrit); and cakini, seveppu mulai kirai, pung kirai (Tamil)

Description: Annual erect herb, up to 2 m tall, often reddish tinted throughout; stems stout, branched, angular; leaves simple, spirally arranged, lamina broadly rhombic-ovate, 2–18 cm × 2–15 cm; inflorescence large and complex, in axillary and terminal racemes and spikes; seeds black and shiny.

Uses: Traditionally, leaves, stem and seeds have been used in the main dish or as an ingredient in sauces. The leaves and tender stems are cut and fried in oil, mixed with meat or fish. Amaranth dishes are eaten with the main dish of cereals or tubers. Traditionally, in arid regions, the dried leaf powders are used in sauces during the dry season.

Ecology: Amaranths grow well at day temperatures above 25°C and night temperatures not lower than 15°C, at up to 2000 m altitude. They like fertile, well-drained soils with a loose structure.

Distribution: As early as 6000 years ago the plant was domesticated as a pseudo-cereal (grain amaranth) in Central America. It was probably introduced in the tropics and subtropics of the Old World during colonial times and became widespread as a traditional vegetable in all countries.



Tharai pasalai (Tamil Name)*Portulaca quadrifida* (Botanical name)

Wild purslane, Chicken weed, Small-leaves purslane (English name)



During summer it is found in the wild on bare patches of ground; it is commonly available in the market and people purchase and consume it in daytime. Other Tamil names are siru pasalai, pasarai keera and siru paruppu kirai.

Description: Plant pinkish red, annual, sub succulent; stems slender, creeping and rooting at nodes; leaves simple, opposite; 4-8 × 2-5 mm, leaf blade flat, ovate-elliptic; flowers solitary, yellow; fruit a capsule with dark shiny black seeds.

Uses: Uses of this plant are recorded in Ayurveda, Siddha, Unani and ethnomedicine. The leaves and young shoots are collected from the wild and eaten raw or consumed as a cooked vegetable and frequently used in salads. In India boiled leaves are mixed with sorghum or pearl millet flour, cooked and then eaten. Plants are also used as a good feed for pigs, chicken and other birds. Medicinally it is used as a diuretic, to treat rheumatism and gynaecological diseases, as a sedative, analgesic and cardiotoxic, to treat fever, disorders of the urinary tract, worm diseases, and as a tonic.

Ecology: It is usually found as patches in cultivated fields — as a weed, it is rarely cultivated — and also in wild habitats from sea-level up to 2000 m altitude. It is tolerant to a wide range of soils but prefers sand or sandy loams. Sometimes it is planted as an ornamental or as a soil binder to prevent erosion.

Distribution: It is widely distributed in Africa and tropical Asia, and has been introduced into the warmer areas of the Americas.



Thoodhu velai (Tamil Name)

Solanum trilobatum (Botanical name)

Purple fruited pea egg plant (English Name)

One of the important medicinal climbers regularly used as a leafy vegetable during the cool season. Almost all plant parts are used in Siddha, Ayurveda and folk systems of medicine. It is also known as alarukakkoti, cankolapattiri, kapanacani, kundalam and nittiravari.

Description: It is a prickly diffuse, bright green perennial herb, woody at the base, climbs to 2–4 m height with the support of host; leaves simple alternate, prickly, blade ovoid; inflorescence a raceme; flowers violet and berries red turn dark purple.

Uses: In India, this thorny climber is traditionally used in the Siddha system of medicine to treat various diseases. The bitter roots and young shoots are given in the form of an electuary, a decoction or a powder for consumption. The medicine is mainly used for asthma, chronic febrile affections and difficult parturition. The fruit is edible, and the leaves are cooked and eaten as a vegetable. The plant has antibacterial, antifungal, antimitotic and antitumour properties due to the occurrences of sugar, protein, alkaloids, flavonoids, saponins, tannins, cardiac glycoside, terpenoides and lipids.

Ecology: This medicinal plant is the weed of gardens, fences, fields, forest borders, roadsides and waste places. Generally it occurs in dry and sunny or slightly shaded sites at low to medium altitudes and is also found in seasonal wet habitats.

Distribution: This species is globally Indo-Malaysian in distribution and found throughout India.

**Vallarai (Tamil Name)**

Centella asiatica (Botanical name)

Asiatic pennywort (English name)

Vallarai is used mainly as a medicinal keerai to improve memory. It is known by 50 names of which some of the important ones are: canthaki, mandukaparani, saraswati mooligai, pintiri, yosanavalli.

Description: Perennial herb, trailing or creeping with long stolons (up to 2.5 m long) and rooting at every node; leaves in rosettes, simple, lamina orbicular-reniform, 1-7 cm in diameter, regularly crenate or crenate-dentate; inflorescence an axillary simple umbel, 3-7 flowered, cream coloured.

Uses: It is a relished vegetable recorded in all codified medical systems of South-East Asian countries, including Sri Lanka. The slightly bitter leaves are eaten raw or cooked. It is used in the form of juice to treat cough, voice disorders, insanity, to enhance and rejuvenate the mind, to treat boils, chronic coryza, and jaundice. It has phytochemical constituents like triterpenoids, asiaticoside, brahmoside, Asiatic acid, Brahmic acid, etc.

Ecology: It occurs in sunny or slightly shaded, damp localities on fertile soils (preferring sandy loams with a lot of organic matter), e.g. along stream banks, on or near paths, alongside walls and in damp, open grassland, from sea-level up to 2500 m altitude. It is an early colonizer of fallow land in shifting cultivation systems, but may occur also on recently disturbed habitats and even on undisturbed sites. It may carpet the ground completely during the rainy season.

Distribution: *Centella* has a pantropical distribution including South-East Asia and extending into some subtropical regions.

Vadhanarayanan keerai (Tamil Name)

Delonix elata (Botanical name)

White gul mohur, Creamy peacock flower, Yellow gulmohar
(English name)

This leafy vegetable is generally used as medicine with other recipes when vaata (gastric) problems increase in the body. Other names are kanuppa vakamaram, mayilkkonrai, perungondrai and vadamudukki.

Description: Medium-sized, deciduous tree, reaching up to 15 m tall, girth to 2 m under favourable conditions. The trunk is buttressed and the top is broad-spreading, open, with umbrella-shaped crowns. The bark is grey or brown, smooth or slightly rough, and exfoliating. Leaves are pinnately compound, with small leaflets; inflorescence axillary or terminal corymb; flowers white turn yellow; fruit a capsule, strap shaped with round shaped brown and shiny seeds.

Uses: Medicinal uses of this plant are recorded traditionally. The tender leaves are collected and served as a side/main dish. Decoctions of boiled roots are used as an antidote for a variety of ingested poisons; infusion of bark is used to treat diarrhoea; leaves are anti-inflammatory, and used in the treatment of mouth ulcers.

Ecology: It prefers hot, dry habitats and normally occurs on rocky, shallow, red soils from the coast to 1400 m above sea level; mean annual temperature 27°C and mean annual rainfall 580-900 mm.

Distribution: This species is globally distributed in Tropical Africa, Egypt, Arabia to India. It has been very widely planted in the tropics, but is becoming very rare in recent days.



Vella keerai (Tamil Name)*Ipomoea aquatica* (Botanical name)

Swamp morning glory, Water ipomoea, Swamp cabbage, Water spinach (English name)



This is a semi-aquatic, tropical plant found throughout India and grown as a vegetable for its tender shoots and leaves. Traditionally it is used in most indigenous medicinal systems. In Tamil it is also known as allaikkodi, kalampan, vallaikkirai, vankaravallai and cakaravartti kirai.

Description: A perennial or sometimes annual, fast growing, trailing or floating climber, stem hollow or spongy, rooting at the nodes; leaves alternate, variable, triangular to lanceolate, 2.5-15 cm × 1-9 cm, base cordate or hastate; flowers solitary or in a few-flowered cyme, corolla funnel-shaped, 4-7.5 cm long, pink or pale lilac; capsule ovoid, 7-10 mm long; seeds hairy.

Uses: The leaves and young stems are used in Ayurveda, Siddha, folk and Chinese systems of medicine. They are cooked and eaten with various dishes as a laxative, tonic, for piles, nosebleeds, anthelmintic, high blood pressure and as an antidote against opium or arsenic poisoning or drinking of unhealthy water. The crushed leaves have antioxidant, anti-microbial and anti-cancer activity and are put on sores and boils. This plant helps to reduce blood sugar, and decoctions of the roots are used as a wash against haemorrhoids.

Ecology: It occurs in moist, marshy or inundated localities, shallow pools, ditches, rice fields, forming dense masses from sea-level up to 1000 m altitude.

Distribution: It originated in tropical Asia (possibly India) and can be found in South and South-East Asia, tropical Africa, South and Central America and Oceania. It is intensively grown and frequently eaten throughout South-East Asia, Hong Kong, Taiwan and in Southern China.

Vellai Karisalankanni keerai (Tamil Name)

Eclipta prostrata (Botanical name)

False daisy, Eclipta (English name)

This plant is mainly used for its medicinal properties and always mixed with other leafy vegetables. It has 174 Tamil names, some of the important ones being: indiravama sedi, indiravamam, kaikesi, karikkan pundu, karisalai, karisalaangkanni, Kayyanta karai, mitukayakkoti, porralai, vatanappudu.

Description: Annual herb, 10-80 cm tall; stem erect, prostrate, decumbent, rooting at the lower nodes, reddish; leaves simple, opposite, oblong-lanceolate, 2-7 cm × 1-2 cm, margins entire or slightly toothed; inflorescence axillary or terminal head, solitary or 2-3 together; flowers white. Achenes yellowish brown, hairy at apex.

Uses: Roots or leaves are used internally for liver and spleen complaints, to treat oedema and applied for conjunctivitis. Also used in the form of oil, powder and juice to treat filariasis, boils, wounds, headache, giddiness, lack of vision, indigestion, enlargement of liver and spleen, jaundice, pain in the abdomen, cough, skin diseases, fever and greying of hair. The juice from the pounded plant turns black on exposure to air and is used for dyeing the hair into black and encouraging its growth. The sap is used in tattooing, applied to wounds, and used to blacken scar-tissue or make it bluish-black.

Ecology: It occurs in open spaces and disturbed soil. It is a very common weed of rice and sugar cane fields and coconut plantations. It is also found in humid locations along water courses and roadsides, from lowland up to 2000 m altitude. It flowers all year round when the conditions are favourable and tends to become perennial. It is a polymorphous and troublesome weed in many crops.

Distribution: Cosmopolitan in distribution especially in the tropics and subtropics. It is widely distributed as a common weed in moist situations and disturbed habitats at all elevations in India.



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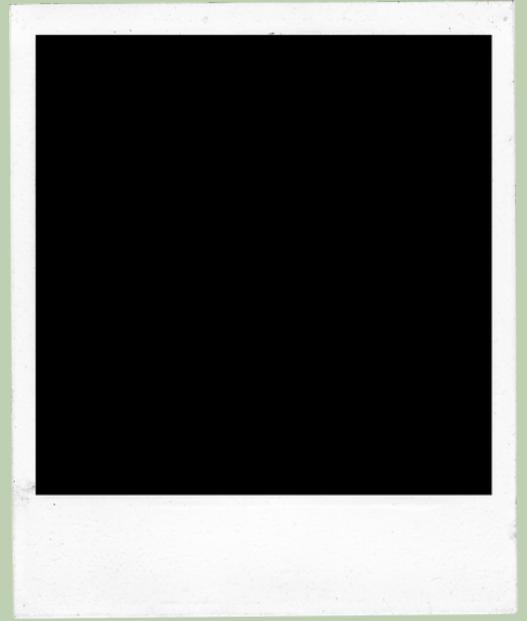
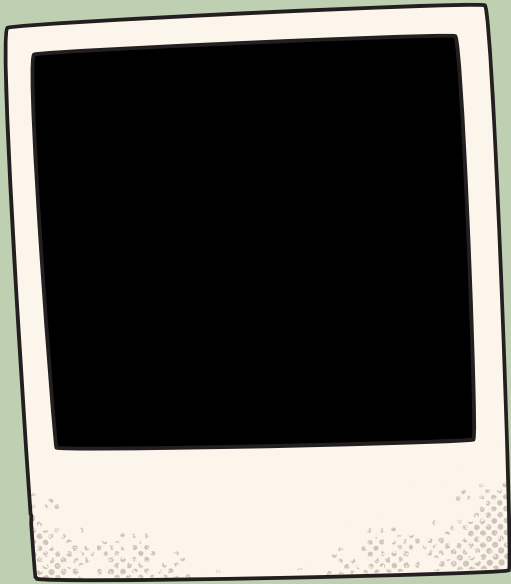
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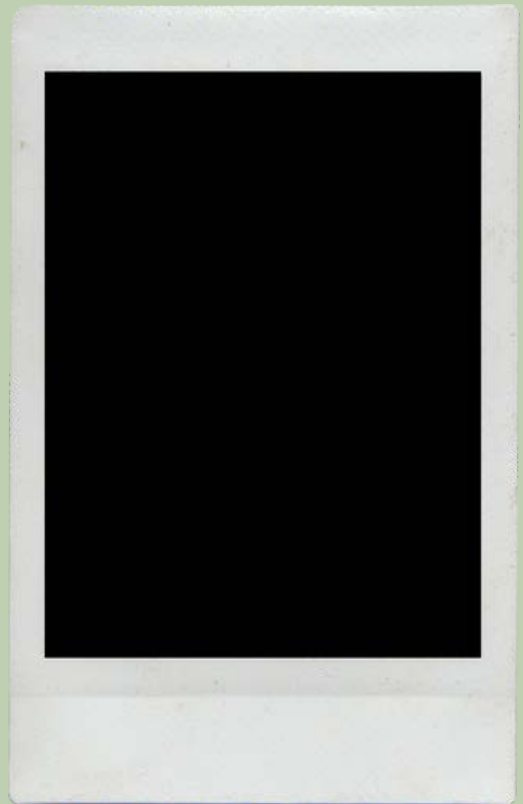
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VANAKKAM

Where are you from?

Do you eat *keerai*?

Do you cultivate *keerai*?

Where do you sell *keerai*?

What kinds of *keerai* do you cook?

Could you please share your recipe?



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