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Ethnobotanical knowledge about herbals used by tribes of Kerala and Tamil Nadu with special reference to *Begonia malabarica* Lam.

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Abstract

Plant based traditional knowledge has become a valuable tool in the search for new bio resources of drugs and neutraceuticals. During the last few decades various Government agencies, NGOs and pharmaceutical companies have carried immense screening in search of novel molecules. The present report deals with the traditional knowledge of tribes residing in different parts of Kerala and Tamil Nadu with special reference to wild specie *viz*. *Begonia malabarica* Lam. In the present study, traditional uses of species shared by the different tribes of Tamil Nadu such as Malasar, Kanikkars, Paliyan and Irula are enumerated in this paper. They use the species/its parts or their suitable crude preparations for treating various ailments. The information reveals the potentiality of the plant in terms of curing wounds, skin diseases, hair loss, muscle pain, diabetes, rheumatism, stomach ulcer and fever. Interestingly, the aqueous extract was used for most of the treatments. The crude extract was biochemically analyzed qualitatively and quantified and confirmed as anthocyanin pigments. The traditional indigenous knowledge based system particularly associated with extraction and processing of natural dyes from plants is ancient process. They have traditionally been engaged in extraction, processing and preparation of dyes using barks, leaves, fruits and roots of plant. Further studies are designed in extraction, purification and fractionation of anthocyanin from *B. malabarica* and to evaluate its biological potentialities.

Keywords: *Begonia malabarica,* Malasar, Kanikkars, Paliyan, Irula, Natural pigments, Medicinal.

1. Introduction

Traditional aboriginal knowledge of plants is the key for most of the medicine and food used by the modern society. The exploration of ethnic information for cures to common diseases is not only attractive but also overwhelming. There is a chasm between the mountain of Indian traditional knowledge of plants used in society and the handful of plants that supply more than 10563 companies producing medicinal plant products worth 4.5 billion dollars every year as per Directory of Pharmaceutical Manufacturing units in India. Currently, there is phenomenal increase in the application of medicinal plant preparations as a safe alternative to conventional therapies (Raghupathy *et al.,* 2007).

Medicinal plants have been used as healers and health rejuvenators since time immemorial. WHO (World Health Organization) recorded that medicinal herbals play a major role in the primary health care system of about 80% of world population in developing countries. Mega

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biodiversity of plants in India and its record of age old practice may pave way for the commercial phytochemical exploitation in terms of global leadership in the supply of raw materials to the pharmaceutical industries (Ganesan *et al.,* 2016; Farnsworth *et al.,* 1991).

Biodiversity is the variability among living organisms, including genetic and structural difference between individual and within and between individual and within and between species. The world biodiversity has a total of 1,263,500 species of plants and animals, while India has 51,828 species. It provides us with all the necessities of life and sustains and nourishes us. Biodiversity plays a direct role in climate regulation. Climate always changes resulting in evolutionary changes in the species.

Botanical Survey of India (BSI) under Ministry of Environment, Forests and Climate Change, involved in documenting the traditional knowledge of medicinal/aromatic plants associated with national, regional, state and ecosystem level and its conservation in different parts of India. 3.2 million samples in various herbaria, which help in taxonomic characterization and monitoring of species, including medicinal plants. Approximately, 8,000 species of medicinal plants have been recorded in India. Indigenous people of the land depend on wild plants or plant parts to fulfill their needs and often have considerable knowledge on their uses. The local people generally depend on nearby forest areas for their needs such as medicine, timber, fuel wood, wild vegetables and many more. Edwards (2004) recorded that, nearly about two-thirds of medicinal plants in use were still harvested from the natural habitat and about one fifth of them are now endangered. The indigenous knowledge on medicinal plants is gaining worldwide recognition (Vines, 2004; Handa, 1998). In India, Southern Western Ghats recorded rich diversity compared to other parts of Western Ghats. Nearly 1800 species of plants are enlisted and documented along the Tirunelveli hills with their medicinal values (Manickam *et al.,* 2003). This traditional knowledge is transmitted through oral communication from generation to generation. Ethnobotany has evolved into a specific discipline that deals with the people–plant relationship in a multidisciplinary manner, such as ecology, economic botany, pharmacology, public health and other aspects (Balick, 1996; Azaizeh *et al.,* 2003). In a report recently published by the World Bank, Lambert *et al.,* (1997) pointed out that preserving and enhancing the plant knowledge and use was equivalent to 'rescuing a global heritage' (Sheldon *et al.,* 1997). Herbal medicines are comparatively safer than synthetic drugs (Sharma & Mujundar, 2003; Ghosh, 2003). Considering the current rate of deforestation with the concurrent loss of biodiversity, there is a need for accurate documentation of the knowledge and expertise of the traditional herbalists (Grierson & Afolayan, 1999).

The tribals settled along the Kerala hilly areas are Adiyan, Aalar, Aranadan, Cholanaikkan, Iravallan, Irular, Kadar, Kammara, Kani, Kattunaikkan, Kochuvelan, Koraga, Koda, Kudiya, Kurichiyan, Kuruman, Kurumban, Malapandaram, Malappulayan, Malavedan, Malakkuravan, Malasar, Malayan, Mala Arayan (Malayarayar), Mannan, Muthuvan, Mudugar, Palaiyan, Ulladar, Paniyan, and Urali (Uraly). Among these tribes, some of them are common tribes of Kerala and Tamil Nadu and are using *Begonia malabarica* as medicinal plant. In

the present study Irular, Malasar, Paliyan, Kanikkaran tribes are focused. Irulars or *Irulan* are seen in Attapady area of Mannarkadu Thaluk in Palakkad District and also seen in Nelliyampathy, Pothuppara, Mayamudi, Palakkapandi, Koonapalam of Chittur Thaluk and Walayar hills. They are engaged in agriculture and cultivate paddy, raggi, dhal, plantain, turmeric, etc. Non-wood forest product collection is also a source of income. They are also seen in Tamil Nadu and Karnataka states. The Irular community in Kerala are different in features and occupation from that of Tamil Nadu. Malasar tribes are seen in Palakkad and Thrisur districts. They were once nomadic people and now they are settled in colonies, provided by the Goverment. Maha Malasar is a sub community among them who are found at some parts of Thekkedi in the Parambikulam forest. Palaiyan tribal groups are seen in Idukky district. Their culture seems to be a mixture of Tamil and Malayalam traditions. Kanikkars are inhabitants of the area around Agastyarkoodam in the Thiruvananthapuram and Kollam districts of Kerala and Mahendragiri peaks of the Western Ghats in the Southern Tamil Nadu region. They are engaged in agriculture and collection of forest produce.

Begonia malabarica belongs to the family Begoniaceae. They are ornamental perennial herbs with soft, succulent stems with variable flower colour like white, pink, red, orange, or yellow. The Begoniaceae family comprises of 5 genera and 920 wild species, majority of them belonging to genus *Begonia*. Begonia's taxonomy is ambiguous due to the enormous number of horticultural varieties and hybrids treated mostly as species. Horticulture researchers categorized Begonia into 8 groups: cane-like, rex-cultorum, rhizomatous, semperflorens, shrub-like, thick-stemmed, trailing or scandent and tuberous. The plant is rich in anthocyanin content and possesses wide industrial and therapeutic applications.

Therefore, an attempt has been made to unravel various traditional knowledge practiced by the tribes of Kerala and Tamil Nadu and also to document the ethnoveterinary plants like *Begonia malabarica* and its uses along with other plants species. In addition, the information gathered from traditional healers using herbals for treating various diseases especially the pigment yielding plants of Tamil Nadu and Kerala, are also presented.

2. Methodology

The study focused on acquiring ethnobotanical knowledge of pigmented plants like *Begonia malabarica* used by the local people belonging to Malasar community residing at Coimbatore district, Tamil Nadu and Palakkad and Thrisur districts of Kerala. Kanikkars, the predominant tribal community living in Kalakad - Mundanthurai Tiger Reserve and Mahendragiri peaks of the Western Ghats, Tirunelveli in Tamil Nadu and Agastyarkootam in the Thiruvananthapuram and Kollam districts of Kerala. Paliyan tribes of Tirunelveli district in Tamil Nadu and Idukky district of Kerala. Irular tribal community of Attapady area of Mannarkadu Thaluk in Palakkad District and also in Nelliyampathy, Pothuppara, Mayamudi, Palakkapandi, Koonapalam of Chittur Thaluk and Walayar hills, Southern Western Ghats.

Frequent field surveys were made during 2015- 2016 at the respective tribal settlements of Kerala and Tamil Nadu. The Malasar tribal community is visible at Anamalai, Navamalai,

Amaravathi hills, Thirumoorthi hills, Anaikatti and in and around Poondi of Coimbatore District. The tribes are completely dependent on forest for their livelihood. The ethnobotanical data (local name, mode of preparation, medicinal uses) were collected through interviews and discussions among the tribal practitioners in and around the study area. Data were also collected through local languages and with the help of translators. Information were collected through interviews with five persons aged from 40 to 78, who had the traditional knowledge of plants. In addition to the vernacular names, questions were also asked about each plant prescribed, such as part of the plant used, medicinal uses, detailed information about methods of preparation (*i.e.,* decoction, paste, powder and juice); form of usage either fresh or dried, and mixtures of other plants used as ingredients were also collected. The plant was digitally documented and sample specimens were collected for the preparation of herbarium. The collected plant species were identified taxonomically using The Flora of Presidency of Madras (Gamble, 1915-1936) and The Flora of Tamil Nadu Carnatic (Matthew, 1983) (Fig.1).

Fig. 1: *Begonia malabarica* Lam.

The identified plant specimens were then confirmed with the herbaria of Botanical Survey of India (BSI), Southern Circle, Coimbatore, India. The specimens were deposited in the herbarium of University College Trivandrum (Kerala). The tribal information and voucher specimens were kept in the same institute.

3. Results

3.1. Malasar community residing at Coimbatore

Malasar tribes are one of the important tribal groups of Coimbatore. They reside in small villages bordering the forest areas on the hilly parts of the districts including Anamalai, Palakkad and Darapuram. These Malasar tribes converse with each other in a language, which is a blend of the languages of Tamil and Malayalam. Like many tribal communities of Indian subcontinent, these Malasar tribes have proved to be good cultivators, producing ample amount of products such as grains of millets. They are religious minded, worshipping an indigenous god, namely "*Mallung, Kali* and *Mariamman*". To appease these deities, these Malasar tribes make sacrifice of animals once in a year in the month of April.

Their settlements are known as "*pathis*" with a village leader, popularly known as *Vendari*. *Vendari* carries on the work of administration with the aid of a Panchayat council. Mostly, the tribes prefer to live in the plains. Malasar tribes show a good physique and have adopted the occupation like collecting forest products, working as laborers in the nearby estates.

Indigenous methods of treatments for health issues are still an integral part of Malasar community. The most common usage of medicine preparation is; fresh juice, powdered form, paste and decoctions. External application of decotions and crude paste is for treating wounds, skin diseases, hair loss and muscular

pain. The area where they reside is rich in medicinal plants and interestingly, the decotion of *Begonia malabarica* has been used by them for getting stamina and energy.

Pandikumar *et al.,* (2009) reported the hypoglycemic and antihyperglycemic effects of *Begonia malabarica*. This study supports the use of *B. malabarica* by the Malasar tribe for the treatment of diabetes. Fractionation of this extract may yield novel prototypes to manage diabetes mellitus effectively.

3.2. Kanikkars of Kalakad - Mundanthurai Tiger Reserve, Western Ghats

The Kanikkars belong to the Southern tribal zone. They are distributed along the Southeastern slopes of the Western Ghats adjoining Kanyakumari and Tirunelveli districts of Tamil Nadu. The Kanikkars are also known as Kanikaran or Kani. They live in low altitude regions of Western Ghats in large numbers. Kanikkars means, hereditary proprietor of land thus recognizing their ancient rights over the forest lands. The Kanikkars are generally very short in stature and meager in appearance. Some have markedly negroid features. They are traditionally a nomadic community. They speak in their own dialect, Kanikkar Bhasha or Malampashi, which is close to the Dravidian language, Malayalam. Kanikkars once practiced shifting cultivation, but now to a large extent, such cultivation has been abandoned. Most of the Kanikkar tribes have a gross knowledge of medicinal plants which are used for first aid remedies, to treat cough, cold, fever, headache, poisonous bites and other simple ailments.

Sutha *et al.,* (2010) recorded 50 medicinal plants belonging to 36 families used by the Kanikkars, the predominant tribal community living in Kalakad - Mundanthurai Tiger Reserve, Western Ghats, Tirunelveli, Tamil Nadu, for the treatment of rheumatism. Plants used by the Kanikkars for the treatment of rheumatism is depicted in Table 1. The fresh leaves were boiled in coconut oil, water, or neem oil and after cooling, the paste applied to the affected joints to get relief from various forms of inflammations. The warm paste extracted from the aerial parts of *Begonia malabarica* (Kalsirupuli) is applied externally on the leg once a day for 14 days to treat rheumatic complaints. Sometimes the fresh leaf juice was administered orally to patients suffering from rheumatism. Also other parts of the medicinal plants like roots, flowers, fruits, rhizome, seeds, stem bark, etc., were also used (Sutha *et al.,* 2010). Paste of whole plant along with stem bark of *Madhuca longifolia*, rootstock of *Begonia malabarica* and leaves of *Hybanthes enneaspermus* is taken internally to cure wounds in stomach (ulcer) were the decotion is rich in minerals.

3.3. Irular tribal community of Walayar region, southern Western Ghats

Irula is an ethnic group of the Nilgiri mountains of Tamil Nadu and Kerala. They belong to scheduled tribe and estimated population is approximately 25,000. People of Irula are ethnically known as *Irular*, and speak Irula, which belong to the Dravidian family. Irular live in two south Indian states namely Nilgiris in Coimbatore and Erode districts of Tamil Nadu, Attapady and Walayar regions of Palakkad district in Kerala.

They are settled around south and north Coimbatore, Avinashi and Madathukulam. There are 4254 Irula houses in 40 settlements comprising of 139 villages in Coimbatore district.

Fig. 2: Irula tribal community

Nearly 100 Vettakada Irula settlements are found in the forest areas or in the deep mountainous jungles. There are 4 tribal settlements in the Siruvani Hills comprising of 14 villages. The root of *Begonia malabarica* is made into a paste and applied all over the body to get rejuvenation and the whole plant as raw and decoction is consumed orally by the Irular tribes for treating arthritis and joint pain. *B. malabarica* along with other herbals have been used for treating various ailments like arthritis and skin diseases (*Artocarpus heterophyllus, Ficus racemosa, Begonia malabarica, Pedalium murex* and *Cardiospermum halicacabum* along with coconut oil); arthritis and joint pain (*Begonia malabarica, Cardiospermum halicacabum, C. canasense* and *Cissus quadrangularis* along with egg white yoke) ; fever (*Justicia adhatoda, Syzygium cumini, Ocimum sanctum, Begonia malabarica, Piper nigrum* and *P. betle*); sterility in women (*Plumbago zeylanica, Hemidesmus indicus, Pavetta indica, Vetiveria zizanioides, Hybanthus enneaspermus, Begonia malabarica* and *Piper nigrum* along with milk/honey); fever (*Withania somnifera, Syzygium cumini, Begonia malabarica, Piper nigrum* and *P. betle* along with Milk/honey) (Venkatachalapathi *et al.,* 2016**).**

3.4. Paliyan tribes

The Paliyans are traditional nomadic hunter-gatherers, honey gatherers and foragers living in the South Western Ghats, especially in Tamil Nadu and Kerala. Their major food source is yam. In the early part of the 20th century, the Paliyans dressed scantily and lived in rock crevices and caves. Presently, they have been transformed into traders of forest products, food cultivators and bee keepers.

The herb, *Begonia malabarica* known as Narayanachanjeeve in Tamil is found in the hilly regions of South India and Sri Lanka (Clarke, 1879). The leaves are substituted for tamarind (*Tamarindus indica*, Caesalpiniaceae) and consumed after cooking by the Paliyan tribes of Tirunelveli. They consume boiled leaves for stomach ulcer, stomach ache and respiratory problems (Ramesh *et al.*, 2002).

Table 1: Ethnomedicinal plants used by the tribes and its mode of preparation

Sl. No	Tribes	Plant	Treatment/ Preparation
1	Malasar	*Begonia malabarica* Lam.	Decoction of plant is used for getting stamina and energy and for the treatment of diabetes
2	Kanikkar	*Aloe barbadensis* Mill., *Anisomeles indica* (L.) Kuntze, *Anisomeles malabarica* (L.) R.Br. ex Sims, *Azadirachta indica* A.Juss., *Begonia malabarica* Lam., *Cardiospermum helicacabum* L., *Datura metel* L., *Jatropha gossypifolia* L., *Justica adhatoda* L., *Leea indica* (Burm. f.) Merr., *Plumbago zeylanica* L., and *Vitex negundo* L.	Combinations of all the plants is used for treating rheumatism
		Madhuca longifolia (J.Konig) J.F.Macbr. *Begonia malabarica* Lam. *Hybanthes enneaspermus* (L.) F.Muell.	Stem bark of *Madhuca longifolia*, rootstock of *Begonia malabarica* and leaves of *Hybanthes enneaspermus* is taken internally to cure wounds in stomach (ulcer)
		Begonia malabarica Lam.	Fresh leaves were boiled in coconut oil, water, or neem oil and after cooling, the paste for inflammations the fresh leaf juice was administered orally to patients suffering from rheumatism
3	Irular	*Begonia malabarica* Lam.	Root of *B. malabarica* is made into a paste and applied all over the body to get rejuvenation and the whole plant as raw and decoction is consumed orally for treating arthritis and joint pain
		Artocarpus heterophyllus Lam., *Ficus racemosa* L., *Begonia malabarica* Lam., *Pedalium murex* L. and *Cardiospermum halicacabum* L.	Combination of these plants used for arthritis and skin diseases
		Begonia malabarica Lam., *Cardiospermum halicacabum* L., *C. canasense* and *Cissus quadrangularis* L.	Paste of all these plants along with egg white yoke used for arthritis and joint pain
		Plumbago zeylanica L., *Hemidesmus indicus* (L.) R.Br., *Pavetta indica* L., *Vetiveria zizanioides* (L.) Nash, *Hybanthus enneaspermus* (L.) F.Muell., *Begonia malabarica* Lam. and *Piper nigrum* L.	Paste of all these plants along with milk/honey is used for treating sterility in women
		Justicia adhatoda L., *Syzygium cumini* (L.) Skeels., *Ocimum sanctum* L., *Begonia malabarica* Lam., *Piper nigrum* L. and *P. betle* L. *Withania somnifera* (L.) Dunal, *Syzygium cumini* (L.) Skeels., *Begonia malabarica* Lam., *Piper nigrum* L. and *P. betle* L.	Treatment of fever
4	Paliyan	*Begonia malabarica* Lam.	Boiled leaves of the plant used for stomach ulcer, stomach ache and respiratory problems

4. Conclusion

This study revealed that medicinal plants play a vital role in the primary healthcare of the people. The information gathered from the tribes is useful for further research in the field of ethnobotany, taxonomy and pharmacology. This study offers a model for studying the relationship between plants and people, within the context of traditional medical system. The purpose of standardizing traditional remedies is obviously to ensure therapeutical efficacy.

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