ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES Knowledge to Innovation

Vol 7, Suppl 1, 2014

ISSN - 0974-2441

Research Article

ETHNOBOTANICAL STUDIES ON SELECTED WILD MEDICINAL PLANTS USED BY IRULA TRIBES OF BOLAMPATTY VALLEY, NILGIRI BIOSPHERE RESERVE (NBR), SOUTHERN WESTERN GHATS, INDIA

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Received: 27 October 2013, Revised and Accepted: 17November 2013

ABSTRACT

Objectives: Tribal communities of Irulas have nurture rich knowledge about medicinal plants and its uses, in this respect, an ethnobotanical survey was carried out among the ethnic groups (Irulas) in Bolampatty Valley (NBR, Western Ghats), Coimbatore for future applications.
Methods: An exhaustive ethnobotanical survey was done in the Bolampatty villages of Irula tribes in Coimbatore districts and the field visit was commenced from June2012 to December 2012. The Irulas settlements were identified through a number of field surveys and there were 40 informants between the ages of 25 and 64 were consulted to gather medicinal plants information.
Results: In this present investigation, the tribes are using 28 valuable wild medicinal plant species belonging 23 families, and they were identified with relevant information and documented in this paper with regard to their botanical name, family, local name, parts used and utilization by the local tribal people for different human ailments. Among them plants like Herbs, Shrubs, Small trees, Big trees and Climbers were also identified. Majority of plant species were observed belonging to families of Acanthaceae, Rutaceae, Liliaceae, Asclepidaceae and Solanaceae.
Conclusions: The common diseases were treated by the herbal practitioner for diuretic, snake bites, jaundice, piles, ulcer, swellings, weight loss, diabetics, cough & cold, body pain, diarrhea as anti-inflammatory and anti-cancerous. The collected detailed information on the list of plants and their therapeutic practices among Irula tribals may be helpful to improve the future pharmaceutical applications.

Keywords: Bolampatty Valley, Irulas tribals, medicinal plants, ethnobotanical use.

INTRODUCTION

India is proud to be rich in biodiversity possess about 8 % of the estimated biodiversity of the world with around 12,600 species. It is one of the 12 mega biodiversity centers with 2 hot spots of biodiversity in the Western Ghats and North-Eastern region. It is also rich in ethnic diversity, there are about 67.37 million tribal people belonging to 537 tribal groups living in different geographical locations with various subsistence patterns [1-2]. These tribal groups living in diversity rich areas possess a wealth of knowledge and skills on the utilization and conservation of food and medicinal plants [3-4]. The plants have been used in traditional medicine for several thousand years. The knowledge of medicinal plants has been accumulated in the course of many centuries based on different medicinal systems such as Ayurveda, Unani and Siddha. In India, it is reported that traditional healers use 2,500 plant species and 100 species of plants serve as regular sources of medicine [5]. Documenting the indigenous knowledge through ethnobotanical studies is important for the conservation and utilization of biological resources. Ethnobotanical survey has been found to be one of the reliable approaches to drug discovery [6]. Several active compounds have been discovered from plants on the basis of ethnobotanical information and used directly as patented drugs [7]. Principally, earlier studies in the Nilgiri Biosphere Reserve have dealt with Medicinal species and little attention was paid to wild edible plants [8].

The Ethnobotanical investigation is a prerequisite for any developmental planning concerned with the welfare of tribal and their environment. It is an urgent, necessity to record as quickly as possible all information about plants and the role of tribes in conserving them. The main focus of the present study is to ascertain the detailed information on the use of plants and their therapeutic practices among Irula tribals of Bolampatty Valley, Tamil Nadu.

MATERIALS AND METHODS

Study area

The varied climatic conditions, attributed to the latitude, altitude, topography, the soil and the biotic factors determine the composition of the forests from Southern Thorn Forests to tropical evergreen species in Bolampatty Valley. The forests of Coimbatore district spread over an area of 693.48 sq.Km in the district land area of 7433.72 sq.Km. The forests are responsible for the cool weather, the green landscape and clean air of the district. The forest tract falls between 10°37' and 11°31' North latitudes and 76°39' and 77°5' East longitudes (Figure 1).

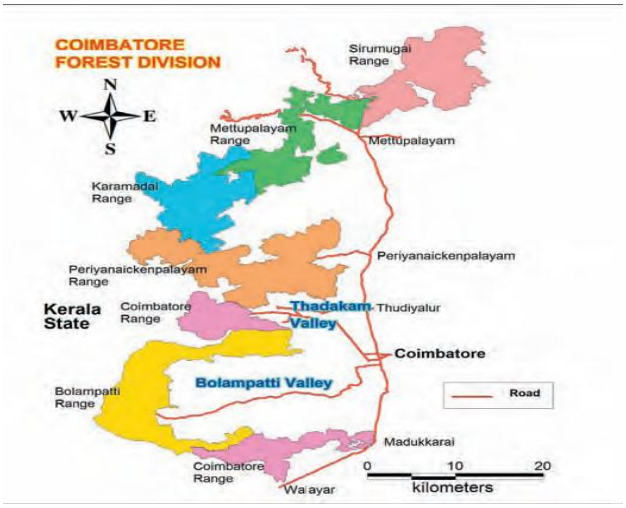

Fig.1: Map showing Bolampatty Valley, NBR, Southern Western Ghats, Tamil Nadu, India

About the Irula tribal

Irulas are a small tribal community that is part of the Dravidian language group that is spoken in South-Eastern India. They are recognized as a Scheduled Tribe (ST) by the Government of India [9-10]. The Irulas as a tribe are traditional snake and rat catchers. The Irulas are the Dravidian inhabitants and one among the 36 sub-tribal communities in Tamil Nadu that holds the population about 26,000 Irulas living in Tamil Nadu, out of the total population of 558 lakh in the state [11], which is less than 0.5 % of the entire state's population [12]. The Irulas, as a percentage of the total population has been a gradual decrease, Census reports show that in 1981. They were 1.5 % of the population of Tamil Nadu whereas in 2001, they constituted only 1 % of the population of the state [13]. This is no longer their means of living, and over these years of existence they have been unable to find a sustainable occupation for themselves. They earn their living by doing `coolie' work. This could be either by working as laborers in the fields of the landlords during the sowing and harvesting seasons or by working in the rice mills. Fishing is also an occupation in some of the Irulas villages. Some of them also collect firewood from the forest to sell. The problem of these people is that, only some get money while the remaining just gets some rice or other things in kind as a payment for their labor.

Data collection

The fieldwork in the Bolampatty villages of Irula tribes in Coimbatore districts was commenced from June2012 to December 2012. The Irulas settlements were located through a number of field surveys and there were 40 informants between the ages of 25 and 64 were consulted to gather medicinal information. Resource persons (informants or tribal practitioners or traditional healers) with the knowledge of medicinal plants were selected based on the experience in the preparation of medicines, whether he/she is a professional medicine man or women, their willingness to share their traditional knowledge and their way of acquiring knowledge as per the methodology suggested by Jain [14]. The information was collected through questionnaire, interviews and discussions among the tribal practitioners in their local language (Tamil). The questionnaire allowed descriptive responses on the plant prescribed, such as part of the plant used, medicinal uses, detailed information about mode of preparation (i.e., decoction, paste, powder and juice), and form of usage either fresh or dried and method of application. The collected plant species were identified taxonomically using The Flora of Presidency of Madras (Gamble, 1915-1935) and The Flora of Tamil Nadu Carnatic [15].

RESULTS

Irula tribes of the Bolampatty Valley are using 28 plant species belonging 23 families (Table 1) for medicinal uses. Among them Herbs (14), Shrubs (3), Small trees (3), Big trees (5) and Climbers (3) were recorded. For each species Botanical name, Family, Local name, Parts used, Mode of preparation and Medicinal uses are provided in the Table 1.

Table 1: Ethnomedicinal plants used by Irula tribes

S.No	Botanical Name	Family	Local Name	Parts used ,Mode of Preparation, Ethno medicinal uses and some other plants used as ingredients
1	*Acorus calamus L.*	Acoraceae	Vasambu	Rhizome used for cough & fever. Leaf juice used Diuretic
2	*Aegle marmelos* (L.) Correa	Rutaceae	Vilvam	Fruits used for Dysentery
3	*Amaranthus spinosus L.*	Amaranthaceae	Mullu	Leaf juice used for Diuretic & Digestion
4	*Andrographis paniculata* (Burm.f.) Nees	Acanthaceae	Siriyanangai or Nelavembu	Leaf paste mixed with milk internally taken for snake bite, and root used for Diarrhea
5	*Aristolochia bracteolata* Lam.	Aristolochiaceae	Aaduthinnapaalai	Leaf Paste used externally on the wound of snake bite
6	*Artocarpus heterophyllus* Lam.	Moraceae	Palamaram	Leaf juice used for taken internally for ulcer
7	*Basella alba* L.	Basellaceae	Kodipasalai	Leaves boiled in water and taken internally to cure piles
8	*Capparis sepiaria* L.	Violaceae	Thotti chedi	Root & Leaves are pasted with lemon juice and are applied topically to treat swellings.
9	*Capparis zeylanica* L.	Capparaceae	Kevisi	Leaves juice used for Immuno stimulant anti-inflammatory
10	*Caralluma bicolour* Ramach, S. Joseph, H. A. John & C. Sofia	Asclepiadaceae	Kattalae	Plant extract used for Weight loss
11	*Caralluma umbellata* Haw.	Asclepiadaceae	Chirukalli	Whole plant roasted for a few minutes and roasted paste applied for indigestion
12	*Caeselpinia bonduc (L.) Roxb.*	Caesalpinaceae	Kazhichikai	Seed used for Fever. Leaf juice used for diabetics
13	*Canna indica L.*	Scitaminaceae	Kalvazhai	Root juice are used for diuretic & digestion
14	*Canthium coromandelicum* (Burm.f) Alston	Rubiaceae	Bellakarai	Roots & Leaves paste used for Diuretic
15	*Cordia dichotoma* G. Forst.	Boraginaceae	Karadisellai	Seed extract used for Anti-inflammatory
16	*Cyphomandra betacea* (Cav.) Miers	Solanaceae	Maraththakkali or Hill tomato	Fruits used for diuretic, cough and cold
17	*Diplocylos palmatus* (L.) *Jeffrey*	Cucurbitaceae	Sivalingakkodi	Fruits juice used in body pain
18	*Drynaria quercifolia* (L.) J.Sm.	Polypodiaceae	Mudavattukizhangu	Rhizome juice are taken internally for body pain
19	*Gloriosa superba* L.	Liliaceae	Kanvalipoo or Kannuvazhikilangu	Rhizome paste is applied treat wounds.
20	*Glycosmis pentaphylla* (Retz.) Dc.	Rutaceae	Melaekulukki	The plant used for cough, rheumatism, anemia and jaundice.
21	*Justicia adhatoda* L.	Acanthaceae	Aadhatodai	Leaf juice from this plant used for cough and fever. Leaf juice used for diarrhea
22	*Pachygone ovata (*Poir.) Diels	Menispermaceae	Perungkaattukodi	Seeds powder used for Snake bites
23	*Rivea hypocrateriformis* Choisy	Convolulaceae	Mustae	Leaves paste used for diarrhea
24	*Scilla hyacinthina* (Roth) Macbr.	Liliaceae	Kattuvengayam	Paste made from bulb applied externally for body pain
25	*Solanum rudepannum* Dunal	Solanaceae	Toothuvalai	Leaf juice is taken orally for cough and fever
26	*Strychnos potatorum* L.f.	Loganiaceae	Sillakottai	The whole plants used for Urinary & Kidney

				problems
27	*Wedelia urticifolia* (Blume) DC. ex Wight	Asteraceae	Manjalkarisalai	Whole plant taken internally for jaundice
28	*Zizipus abyssinica* Hochst. ex A. Rich	Rhamnaceae	Lanthai	Tree bark used for Anti-cancerous drugs & antibiotics

Ethnobotanical studies on medicinal plants used by Irula tribes

Among 28 wild edible medicinal plants are used for curing various diseases as ailments by Irula tribes (Figure 2).

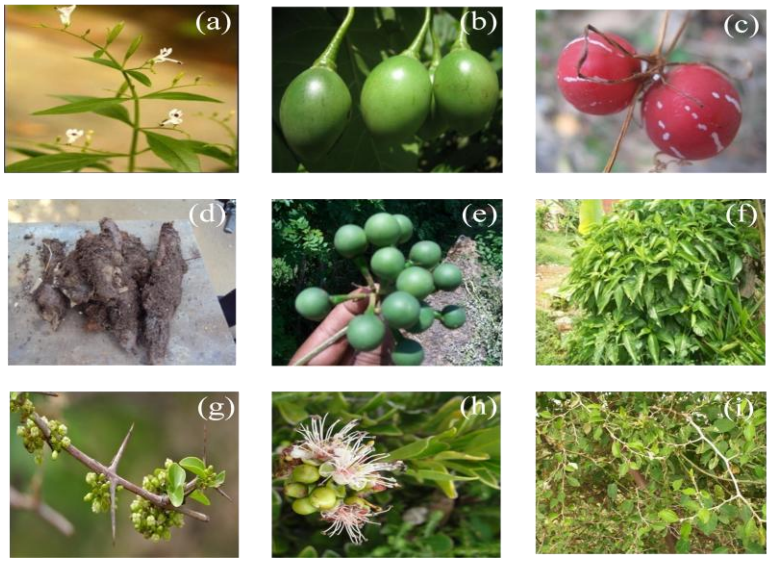

Fig.2: The medicinal plants, (a) *Andrographis paniculata* (Burm.f.) Nees, (b) *Cyphomandra betacea* (Cav.) Miers, (c) *Diplocylos palmatus* (L.) *Jeffrey,* (d) *Drynaria quercifolia* (L.) J.Sm., (e) *Solanum rudepannum* Dunal, (f) *Justica adhatoda* L. Wall. ex Nees, (g) *Canthium coramandelicum* (Burm.f) Alston, (h) *Capparis sepiaria* L., (i) *Zizipus abyssinica* Hochst. ex A. Rich.

Most of the plant species belonging to families of Acanthaceae (2), Liliaceae (2), Asclepiadaceae (2), Solanaceae (2), and are frequently used (Table 2).

Table 2: Family wise distribution and percent uses of medicinal plants

S. No.	Family name	Number of the plants species	Uses (%)
1	Acoraceae	1	3.57
2	Rutaceae	2	7.14
3	Amaranthaceae	1	3.57
4	Acanthaceae	2	7.14
5	Aristolocaceae	1	3.57
6	Moraceae	1	3.57
7	Basellaceae	1	3.57
8	Violaceae	1	3.57
9	Capparaceae	1	3.57
10	Asclepiadaceae	2	7.14
11	Caesalpinaceae	1	3.57
12	Scitaminaceae	1	3.57
13	Rubiaceae	1	3.57
14	Boraginaceae	1	3.57
15	Solanaceae	2	7.14
16	Cucurbitaceae	1	3.57
17	Polypodiaceae	1	3.57
18	Liliaceae	2	7.14
19	Menispermaceae	1	3.57
20	Convolulaceae	1	3.57
21	Loganiaceae	1	3.57
22	Asteraceae	1	3.57
23	Rhamnaceae	1	3.57

They were using these plants to cure, diuretic (*Acorus calamus, Amaranthus spinosus, Canna indica,*and *Strychnos potatorum*), snake bites (*Andrographis paniculata, Aristolochia bracteolate,* and *Pachygone ovata*), jaundice (G*lycosmis pentaphylla,* and W*edelia utricifolia*), piles (*Basella alba*), dysentery (*Aegle marmelos*), ulcer (*Artocarpus heterophyllus*), swellings (*Capparis sepiaria*), anti-inflammatory (*Capparis zeylanica,* and *cordial dichotoma*), weight loss (*Caralluma bicolor*), diabetics (*Caesalpinia bonduc*), cough & cold (*Cyphomandra betacea*), body pain (*Drynaria quercifolia,*and *Scilla hyacinthina*), wounds (*Gloriosa superba*), diarrhea (*Justicia adhatoda,* and *Rivea hypocrateriformis*), anti-cancerous (*Zizipus abyssinica*). Medicines were prepared in the form of powder, decoction, paste and juice. It was also observed that some plants were used in more than one form of preparation (Figure 3).

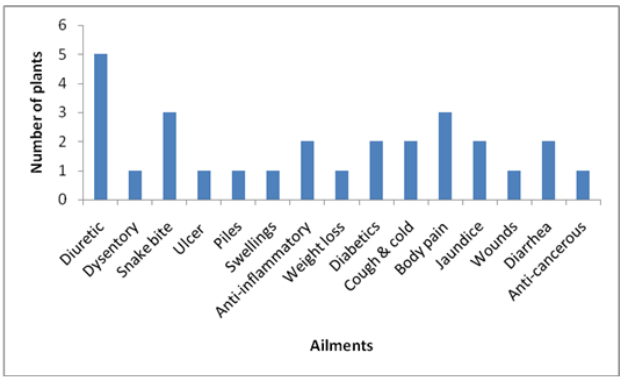

Fig.3: Number of plants used for curing various diseases

Several plants were used in the form of powder, *Pachygone ovata, Diplocylos palmatus,* and *Caesalpinia bonduc.* The plants *Capparis sepiaria, Andrographis paniculata,*and *Aristolochia bracteolata* were used in the form Paste and *Basella alba, Amaranthus spinosus, Capparis zeylanica,* and *Drynaria quercifolia* were used in the Decoction form. Interestingly, some plants were used in the form Juice, *Wedelia utricifolia, Scilla hyacinthina, Aegle marmelos, Canna indica,* and *Artocarpus heterophyllus* and *Caralluma bicolour,*

Cyphomandra betacea, Strychnos potatorum, Acorus calamus, and *Zizipus mauritiana* were used in the form of fruits (Figure 4).

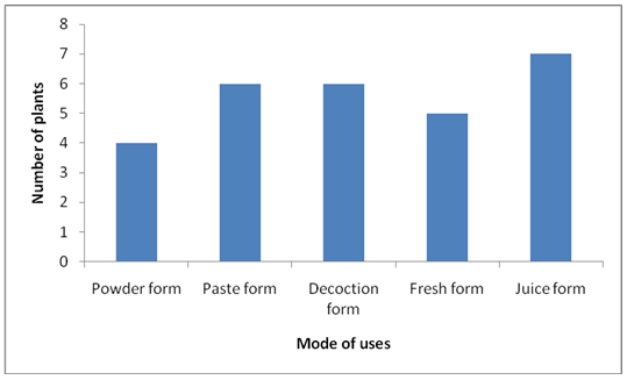

Fig.4: Mode of uses of plant parts for curing various diseases

In general, fresh part of the plants is used for the preparation of medicine while fresh plants parts are not available; the dried parts are also used. The rhizome of *Drynaria quercifolia, Gloriosa superba,* and *Scilla hyacinthina,* the leaves of *Glycosmis pentaphylla, Justicia adhatoda,* and *Rivea hypocrateriformis,* and fruits form of *Acorus calamus, Strychnos coromandilium, Aegle marmelos, Diplocylos palmatus, Capparis zeylanica, Cordia dichotoma,* and *Caralluma bicolour* were used (Figure 5).

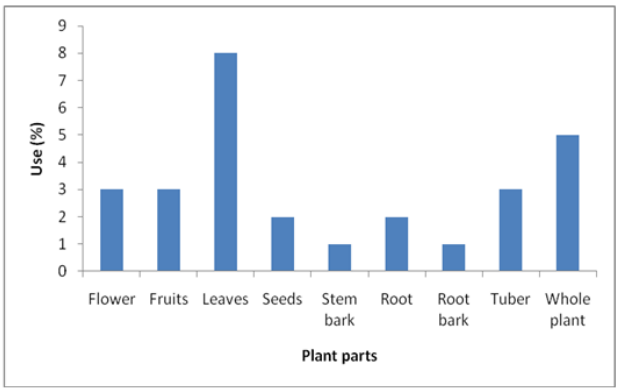

Fig.5: Uses of plant parts as ailments for curing various diseases

The plants are used for common ailments to cure snakebite, diuretic, diabetics, digestion and wounds. Most of the plants species were herb (*Andrographis paniculata, Canna indica, Capparis sepiaria, Amaranthus spinosus, Drynaria quercifolia, Gloriosa superba*), trees (*Artocarpus heterophylla, Caesalpinia bonduc, Zizipus abyssinica)*, climbers (*Diplocylos palmatus, Basella alba*), and shrubs (*Pachygone ovata, Capparis zeylanica, Canthium coromandilium*) (Figure 6).

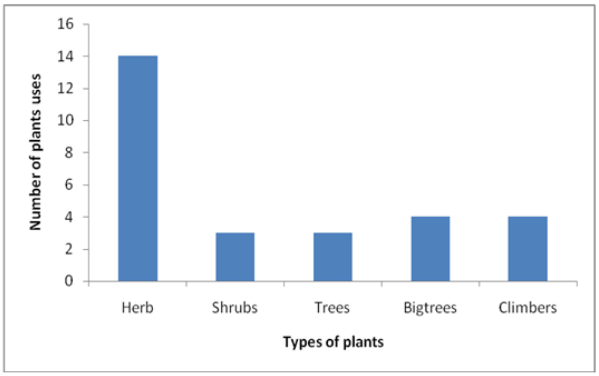

Fig.6: Number of plants used in different types of plants

DISCUSSION

The information collected from this study is in agreement with the previous reports [16-17]. The bioactivities like free radical scavenging, antioxidant and as vitiligo remedy of *Ficus lacor* and *Ginkgo biloba* has been recently investigated [18-19]. The documentation of wild edible plants from ethnobotanical approach is improvement for enhancing the understanding of indigenous knowledge systems [20-22]. The wide consumption and availability of wild plants attest their value, and are especially visible among indigenous cultures. But in recent times, the old traditions in many tribal communities are at a risk and gradually decline; hence, there is urgent need to study such knowledge systems and find innovative ways of tapping their potential for the welfare of mankind [23-24]. The medicinal plant species unfortunately due to their over-exploitation there is a great danger of their extinction. Hence, effort must be taken to protect these species in this area by involving the local communities in preservation and conservation aspects.

CONCLUSION

In the present investigation, the traditionally using plants as medicinal value by Irula tribals were identified. They are using the plants for diuretic, snake bites, jaundice, piles, ulcer, swellings, weight loss, diabetics, cough & cold, body pain, diarrhea as anti-inflammatory and anti-cancerous in various forms like decoction, paste, powder and juice. This valuable survey may be useful to improve the pharmaceutical applications in future.

Conflict of interest statement

We declare that we have no conflict of interest.

ACKNOWLEDGEMENT

We express our sincere thanks to The Management, Administrative authorities of Karpagam University for providing necessary facilities to carry out this study. Authors are also thanks to Coimbatore Forest Department and the tribal people, those who are shared the valuable traditional knowledge.

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