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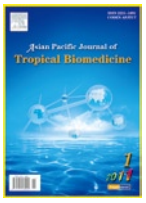

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Ethnomedicinal plant knowledge and practice of people of Javadhu hills in Tamilnadu

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ABSTRACT

Objective: To conduct an ethnobotanical survey and collect information from local people about the medicinal plants used in the treatment of diseases by the tribes of Javadhu hills. **Methods:** A random interview for 237 natives in Javadhu hills was performed by using semi-structured questionnaires and regular field visits. **Results:** The investigations revealed that there were about 40 different plants recorded, with their vernacular names and economically useful parts used in traditional medicine. **Conclusions:** The study indicates that the local inhabitants rely on medicinal plants for the treatment of diseases of microbial origin.

1. Introduction

The World Health Organization (WHO) has reported that about 80% of the world's population mainly depend on traditional medicine and the use of plant extracts is mainly involved in the traditional treatment[1]. This practice is commonly found in rural areas where synthetic drugs are not available or, when available, were too expensive to purchase. Since long throughout the world man has relied on traditional medicine and has since been on the developing his knowledge of medicinal plants. This knowledge has been enriched over numerous generations not just due to experimentation but also through observations of animal behaviour. Most times, this information was only orally inherited and was therefore in danger of being lost in favour of modern medicine. However, for the local population a feasibility of simple and cheap treatment was thus possible. In addition, it was a source of potentially important new pharmaceutical substances[2]. The interest and urgency of ethnobotanical research were thus obvious[3]. Many plant extracts and essential oils isolated from plants have been shown to exert biological activity *in vitro* and *in vivo*, which justified research on traditional medicine and focused on the characterization of antimicrobial activity of these plants[4]. Higher plants produced hundreds to thousands of diverse chemical compounds with different biological activities[5]. It is believed that these compounds played an important ecological role. They could work as pollinator attractants and as chemical defences against insects, herbivores and microorganisms[6]. These antimicrobial compounds produced by plants are active against plant and human pathogenic microorganisms[7]. There are several reports in literature regarding the antimicrobial activity of crude plant extracts and the bioassay-guided fractionation of them to yield active principles[8,9].

The main objective of this study is to search for folklore medicinal plants with strong antimicrobial activity which could serve as good base for the development of new antimicrobial agents and/or standardized phytomedicines. In the present study we report the results of 40 plants used in the folklore medicine for the treatment of microbial diseases.

2. Materials and methods

Javadhu hill, formerly situated in North-Arcot district is now included in the North-Arcot Ambedkar and Tiruvannamalai-Sambuvarayar districts in the recent bifurcation. The North-Arcot Ambedkar district lies amidst the districts of Tiruvannamalai-Sambuvarayar, Chennai, Dharmapuri of Tamilnadu and Chittoor district of Andhra

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Pradesh. The Javadhu hill range comprises hills running from the North to the South attaining a maximum length of 64 kms, and a width of 25 kms, and spreads within the taluks of Polur, Tiruppattur, Chengam, Vaniyambadi and Vellore. The Javadhu hill is complex along with Pudurnadu hills spreadout between $12^0 24'$ and $12^0 55'$ of northern latitude and $78^0 35'$ of eastern longitude at the average height of 2 300 feet, covering an area of 2 405 km^2. Totally 2, 26, 782.96 hectares of area are under the reserve forest in the Javadhu and Pudurnadu hill regions. The forest consists of dry mixed deciduous to thorny shrubs with occasional patches of dry evergreen growth. The maximum temperature raises to 44.4 ℃ in May and minimum lies at 11.7 ℃ in January. The average rainfall is about 886 mm. Ethnobotanical data were collected according to the methodology suggested earlier[10]. The ethnobotanical data were collected using questionnaires, interviews and discussions among local tribal people. A total of more than 237 respondents were interviewed, including males and females who depended on plants as sources of medicines either for self-medication or for treating others. The flora of presidency of Madras[11] and an excursion flora of central Tamilnadu[12] were used to ascertain the nomenclature of the plant species for identification and authentication of the plants. The data of folklore medicinal plants which represent their botanical names followed by their family and vernacular names were collected.

3. Results

The ethnobotanical survey revealed that 40 plant species belonging to 24 families were used as traditional remedies in the treatment of microbial pathogens which could cause diseases, among different people in Javadhu hills (Table 1). This treatment is cost effective and curable. Local people use the whole plant or different plant parts such as leaves, bark, roots, stem bark and bulbs for the preparation of remedies for the treatment of diseases. Plants were collected at anytime of the year, depending on their seasonal availability and preferably in the morning. This survey is useful for local people of Javadhu hills during the treatment of diseases.

Table 1
Medicinal plants used for the treatment of disease by local people of Javadhu hills.

Botanical mame		Tamil name	Parts used	Mode of administration	Traditional uses
Acanthaceae	*Andrographis paniculata*	Siriyanangai	Leaf	Decoction is used for snakebite.	Inflammatory
	Adhatoda visica	Adathodai	Leaf	The leaves extract is taken orally to treat asthma.	Asthma
Annonaceae	*Annona squamosa*	Sitapalam	Leaf	Leaves extract is taken orally to cure dysentery.	Diarrhoea
Anacardiaceae	*Mangifera indica*	Mamaram	Bark	Bark is used for dysentery	Diarrhoea
Amaranthaceae	*Achyranthes aspera*	Nayuruvi	Leaf	Decoction of plant is used for skin diseases.	Skin eruptions
	Alternanthera sessilis	Ponnankanni	Leaf	The extract of leaves is given for jaundice.	Jaundice
Asclepiadaceae	*Calotropis gigantean*	Erukku	Latex	Milky latex is applied on the wounds on legs of livestock.	Wound
	Gymnema sylvestre	Sirukurinchan	Leaf	The leaf powder is taken orally to cure jaundice.	Jaundice
	Hemidesmus indicus	Nannari	Leaf	The extract of plant is given for fever.	Fever
Apocynaceae	*Vinca rosea*	Nittiyakalyani	Leaf	Leaves extract is used to treat malaria.	Malaria
	Nerium oleander	Arali	Stem	Juice prepared from the stem bark is boiled with gingerly oil and two drops are poured into ear to treat ear pain.	Cure of ear pain
Aristolochiaceae	*Aristolochia bracteata*	Atutintappalai	Leaf	Fresh leaves are ground into a paste and mixed with butter milk and applied topically on the itches and rashes until cure.	Skin eruptions
Asteraceae	*Eclipta alba*	Karisalanganni	Leaf	Plant is used for the treatment of hepatitis.	Jaundice
Cucurbitaceae	*Momordica charantia*	Pavai kai	Leaf	Leaves are used for gastroenteritis.	Gastroenteritis
Euphorbiaceae	*Acalypha indica*	Kuppamani	Leaf	Decoction of plant is used for throat pain.	Cure of throat
	Phyllanthus amarus	Keelanelli	Leaf	Leave juice is used to cure jaundice.	Jaundice
	Phyllanthus emblica	Nellikkaai	Fruit	Decocotion of fruit extract is used for cold.	Cold
	Euphorbia hirta	Aman pacharisi	Leaf	Leaves is used to cure asthma	Asthma
Fabaceae	*Pongamia pinnata*	Pongam	Seed	Seed oil is used to cure rheumatic pains and swellings.	Skin eruptions
	Sesbania grandiflora	Agatthi	Leaf	Juice of leaves is mixed with coconut milk and the mixture thus obtained is applied topically on skin diseases until cure.	Skin eruptions
Meliaceae	*Azadirachta indica*	Vembhu	Leaf	Leaves extract is used to cure malaria.	Malaria
	Melia azadirachta	Malai vembu	Leaf	The juice of leaves is extensively used for jaundice.	Jaundice
Poaceae	*Cynodon dactylon*	Arugampullu	Root	Root decoction is given to treat fever.	Fever
Puniacaceae	*Punica granatum*	Madulam	Bark	The powder of bark is given for treating diarrhoea.	Diarrhoea
Rutaceae	*Aegle marmelos*	Vilvam	Leaf	A Leaf paste is applied topically to heal wounds	Wounds
	Murrya koenigii	Karuveppilei	Bark	A handful of bark juice of the plant is used to cure stomach pain.	Stomach pain
Solanaceae	*Solanum nigrum*	Manattakkali	Fruit	Fruit is used for digestive and liver disease.	Inflammation
	Solanum trilobatum	Tuduvalai	Leaf	Leaves are used to cure throat infection and cold.	Cough
	Solanum torvum	Sundai-kaai	Leaf	Leaf are administered orally to get relief from cold.	Cough
Sapotaceae	*Mimusops elengi*	Magizham	Leaf	Leaves are boiled with water and the decoction thus obtained is used as a cleansing agent for mouth to cure diseases of the gums and teeth.	Toothache
Myrtaceae	*Eugenia jambolana*	Naval	Seed	Fresh fruits are taken orally to treat stomachache.	Stomachache
	Psidium guajava	Koyya	Leaf	The leaves is used to treat dysentery.	Dysentery
Moraceae	*Ficus bengalensis*	Alaimaram	Stem	Stem latex is applied topically on heel cracks.	Heel cracks
	Ficus religiosa	Arasamaram	Leaf	Leaves powder are taken orally to get relief from body pain.	Body pain
Malvaceae	*Hibiscus rosa-sinensis*	Chemparaththai	Flower	Shade dried and powdered flowers are used for cleaning the hair and to prevent hair loss.	Hair loss
Nyctaginaceae	*Boerhaavia diffusa*	Mookirattai	Root	Paste is applied externally to cure hydrocele.	Hydrocele
Verbenaceae	*Vitex negundo*	Nochi	Leaf	Leaf are used to treat cold.	Cold
Vitaceae	*Cissus quadrangularis*	Pirandai	Stem	A paste of the whole plant is taken for improving the digestion and inducing appetite.	Stomach pain
Zingiberaceae	*Curcuma longa*	Manjal	Rhizome	Rhizome extract is used for itches.	Skin eruptions
	Zingiber officinalis	Injii	Rhizome	The juice of the rhizome, mixed with honey, is taken internally to improve digestion and to relieve giddiness.	Cough

4. Discussion

Nowadays, several biological activities have been evaluated for numerous species of plants. This demonstrates that compounds from medicinal plants are indeed useful either directly as alternative therapy, or as models for new synthetic substances[13]. These studies also show the importance of popular knowledge for selection of plant species with potential use in treating diseases. This knowledge is obtained through studies that combine pharmacology, botany, pharmacognosy, toxicology, and anthropology, showing that through healing practices, the use of plants tested systematically over time, can be made available worldwide[14]. However, the use of these drugs of plant origin is not always monitored by health professionals, which would ensure efficacy and safety procedures, and can lead to absence of biological effects or even to toxic effects[15]. Several previous studies showed the antibacterial activity of *Psidium guajava*. Dry leaf extract showed interesting activity against *Staphylococcus aureus*, *Streptococcus pyogenes* and *Staphylococcus epidermidis*[16]. Several chemical compounds isolated from *Psidium guajava* leaves possessed antibacterial activities against different strains of gram negative bacteria[17], as well as gram positive bacteria[18]. Bark extracts showed a significant antibacterial activity[19]. Several researchers have reported that different parts of many plants such as flower, barks, stem and leaf, *etc* possess antimicrobial properties[20].

In conclusion, the present survey is useful for people of Javadhu hills as the results support the traditional use of many plant of this region. These ethnomedicinal data may serve to provide a base to start the search for new compounds related to phytochemistry, pharmacology and pharmacognosy, and thus provide new sources of herbal drugs and help to understand the molecular basis of their activities. Moreover, it may be further mentioned that over exploitation of these species in the name of medicine may lead some species ultimately to the extinction in future. Therefore, attention should also be focused on improper exploitation and utilization of these medicinal plants and they should be cultivated and maintained.

Conflict of interest statement

We declare that we have no conflict of interest.

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