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An ethnobotanical study of medicinal plants used by traditional healers in silent valley of Kerala, India

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ABSTRACT

Ethnopharmacological relevance: Medicinal plants are treating and preventing a variety disease. There is urgency in recording such data. This is the first ethno botanical study in which statistical calculations about plants are done by ICF method. The present study was aimed to identify plants collected for medicinal purposes by the traditional healers of silent valley, located in Palakad district of Kerala, India and to document the traditional names, preparation and uses of these plants.

Materials and methods: Field study was carried out a period of 2 years in Kerala. The ethno medicinal information was collected through interviews among traditional healers. The collected data were analyzed through use value (UV) informant consensus factor (F_{ic}) and fidelity level (FL).

Results: A total of 102 species of plants distributed in 95 genera belonging to 53 families were identified as commonly used ethno medicinal plants by traditional healers in silent valley for the treatment of 19 ailment categories based on the body systems treated. Leaves were the most frequently used plant parts and most of the medicines were prepared in the form of paste and administrated orally. F_{ic} values of the present study indicated that dermatological infections/diseases and gastro-intestinal disorders had highest use reports and 7 species of plants has the highest fidelity level of 100%. The most important species according to their use value were *Moringa oleifera* (2.62), *Curculigo orchioides* (2.5) *Amorphophallus paeoniifolius, Vitex negundo* (each 2.37), *Carica papaya* (2.12), *Annona squamosa* (1.87).

Conclusion: Gathering the present study, we can recommended the plants *Moringa oleifera, Curculigo orchioides, Amorphophallus paeoniifolius, Vitex negundo, Carica papaya, Citrus hystrix, and Tribulus terrestris* (with high use values), *Amorphophallus paeoniifolius, Aloe vera, Carum capticum* and *Discorea pentaphylla* (newly reported claims with highest FL) for further scientific investigation based upon the traditional knowledge of medicinal plants can be an approach in the discovery and development of novel drug leads.

1. Introduction

Traditional herbal medicine is still an important component of human healthcare in world-wide. According to the world health organization (WHO), about 80% of the world's people depend on traditional indigenous medicines, since a large majority of rural people in the developing countries still use these medicines as the first defense in healthcare (Goleniowski et al., 2006). The reliance of people an ethno-medicine has been for seasons of cost-effectiveness, acceptability, biomedical benefits and accessibility. There has been a continuous growth of demand for herbal medicines globally (Haile et al., 2008). The demand has been increasing as a result of growth of human population, habitat loss and alteration, over exploitation, overgrazing, deforestation and the frequently inadequate provision of modern medicine (Savikin et al., 2013). In recent years, use of ethnobotanical information in medicinal plant research has gained considerable attention in segments of the scientific community (WHO, 2008).

During the last two decades, some notable progress has been made in the field of medicinal plants and their traditional use in different parts of India (Nimasow et al., 2012). Indigenous use of medicinal plants all over the world precedes the origin of modern medicine in healthcare system (Aburai et al., 2007). The flowering plants used for medicinal purpose worldwide are estimated to be about 50,000 out of total 422,000 flowering plant species (Govaerts, 2001; Schippmann et al., 2002). World Health Organization (WHO) estimated that prescribed drug (25%), consider drug (11%) and precursor compound produced as a result of various synthetic drugs are of plant origin (Rates, 2001). Treatment of diseases with medicinal plants is more beneficial than synthetic and modern medicines as, ease of use, treatment efficacy, affordable cost and minimal side effects.

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Silent valley is located in the Palakkad district of Kerala. Palakkad is one of the 14 districts in Kerala and also the richest state in India in terms of plant diversity; traditional healing systems are still popular here. The richness of silent valley flora is based on geographic, climatic, topographic and edaphic factor. The tribal region (traditional healers) is the remote area of Kerala where the people have no urgent access to modern medicinal facilities. Therefore, the traditional medicines are the preferred for such people. There is no hospital for intimate treatment of people in the remote area of silent valley, and people rely on indigenous medicinal plant for basic health care treatment. So far no systematic ethno botanical survey has been made in this area and this is the first report on the medicinal plants used by the local traditional healers. Life styles of people are poor and economically they depend on cattle grazing, agriculture and use of natural resources. The current study was aimed to explore and document the indigenous knowledge of plants and to evaluate the importance of medicinal plants used in local healthcare system. This study was also aimed to educate the traditional healers about conservation status of medicinal plants.

2. Materials and methods

2.1. The study area and ethanobotanical survey

Silent valley occupy Palakad districts of Kerala (Southern western Ghats) and cover an area of 236.74 km^2 and lies between 11′03″ to 11′13″N latitude and 76′2″ to 76′3″E longitude (Fig. 1). The vegetation is floristically rich compared to other regions of Western Ghats and represents several unique habitats. The study was conducted in 5 villages of silent valley (Agali, Kottathara, Mannarkad, Padavayal, Sholayur in palakkad district). The communities adjust to the forest have access right over the forest as stipulated in the village forest management plan by- laws.

2.2. Data collection

The study area was investigated to get information from local traditional healers having practical knowledge of medicinal plants were interviewed in 5 villages during September 2011 to August 2013. During the course of the study, six field trips were carried out in the study area totally 60 days were spent with their local traditional healers. Methods of selecting informants depended upon the distribution of local people having sound knowledge. They were requested to collect specimens of the plants they know or to show the plant species on site. These informants were traditional healers themselves or had tradition of healing in their families and had knowledge of the medicinal use of the plants. The wealth of medicinal plant knowledge among the people of this district is based on hundreds of years of beliefs and observations. This knowledge has been transmitted orally from generation to generation. However it seems that it is vanishing from the modern society since younger people are not interested to carry on this tradition.

2.3. Interview with traditional healers

In the total of eight informants or traditional healers six men and two women were identified between the ages of 42 to 75 to get the ethno-medicinal information through direct interviews or oral conservations (Appendix A). They were selected based on their knowledge of medicinal plants within their families and neighbors. The questionnaires were used to obtain information on medicinal plants with their local names, parts used any other plants/agents used as ingredients mode of preparation and administration etc, were recorded for each collected ethno-medicinal plants. A field data sheet has been prepared to record the plant details with ethno-medicinal information gathered from the traditional healers (Fig. 2).

2.4. Preservation of plant specimens

Standard method was followed with record to collection of plant materials, drying, mounting, preparation and preservation of plant specimens (Jain, 1964). Voucher specimens of medicinal plants in triplicate were collected prepared and identified. Plants with their correct nomenclature were arranged alphabetically by family name, vernacular name ethno medicinal uses. The identification and nomenclature of the listed plants were based on The Flora of Presidency of Madras (Gamble, 1935) and The Flora of Tamil Nadu Carnatic (Matthew, 1983). They were later verified at Botanical Survey of India, Southern Circle, and Coimbatore, India. All the preserved specimens were deposited at the Herbariam of AVVM Sri Pushpam Medicinal unit, Poondi.

2.5. Ailment categories

Based on the information obtained from the traditional healers in the study area, all the reported ailments were categorized into15 categories (Table 1) viz. gastro-intestinal ailments (GIA), dermatological infections/diseases (DID), respiratory systems diseases (RSD), genito-urinary ailments (GUA), fever (FVR), skeleto-muscular system disorders (SMSD), poisonous bites (PB), circulatory system/cardiovascular diseases (CSCD), endocrinal disorders (ED), liver problems (LP), dental care (DC), hair care (HC), ear, nose, throat problems (ENT), cooling agents (CA) and general health (GH). Several diseases were placed in one ailment category based on the body systems treated.

2.6. Data analysis

2.6.1. Informant consensus factor (F_{ic})

The informant consensus factor (F_{ic}) was used to see if there was agreement in the use of plants in the ailment categories between the plant users in the study area. The F_{ic} was calculated using the following formula (Heinrich et al., 1998)

$$F_{ic} = \frac{N_{ur} - N_t}{N_{ur} - 1}$$

where N_{ur} refers to the number of use-reports for a particular ailment category and N_t refers to the number of taxa used for a particular ailment category by all informants. The product of this Factor ranges from 0 to 1. A high value (close to 1.0) indicates that relatively few taxa are used by a large proportion of the informants. A low value indicates that the informants disagree on the taxa to be used in the treatment within a category of illness.

2.6.2. Use value (UV)

The relative importance of each plant species known locally to be used as herbal remedy is reported as use value (UV) and it was calculated using the following formula (Phillips et al., 1994)

$$UV = \frac{\sum U}{n}$$

where UV is the use value of a species, U is the number of use reports cited by each informant for a given plant species and n is the total number of informants interviewed for a given plant. The UV is helpful in determining the plants with the highest use (most frequently indicated) in the treatment of an ailment. UVs are high when there are many use-reports for a plant and low when there are few reports related to its use.