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Ethnomedicinal practices in different communities of Uttara Kannada district of Karnataka for treatment of wounds

Pradeep Bhat*, Gurumurthi Hegde, Ganesh R. Hegde

P.G. Department of Studies in Botany, Karnatak University, Dharwad 580003, Karnataka, India

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ABSTRACT

Ethnopharmacological relevance: Uttara Kannada district is located in the heart of the Western Ghats, one of the biodiversity hotspots, in Karnataka state of India. The thick evergreen forests are home to several ethnic communities. The study was under taken for documentation and analysis of ethnomedicinal plants in the treatment of wounds.

Materials and methods: Field trips were made in Uttara Kannada district to identify the key informants. The collection of information was through semi-structured open ended interviews with a questionnaire. The questionnaire was designed to obtain the information about their experience in the field of treatment, number of patients treated per week, knowledge about the medicinal plants, vernacular names, parts of the plants used and other ingredients added during the drug formulations. Plants mentioned for treatment were photographed in the field, cuttings of the samples were taken and voucher specimens are deposited in the herbarium of P.G. Department of Botany, Karnatak University, Dharwad. The information such as botanical name, status, family, vernacular name habit and habitat, statistical analysis like percentage of parts used, Use value (UV) and Informants Consensus Factor (ICF) are provided.

Results: Present study resulted in recording 106 medicinal plant species of 55 families and 86 formulations to treat different types of wounds by 44 key informants. Among the 106 plants recorded four species are endemic to India and 22 species have the nativity outside India. Rest of the species have nativity both in India and elsewhere. The highest number of species belonged to Apocynaceae and Rubiaceae (6 species each). Trees are used more often (35.84%), followed by herbs (28.30%), shrubs (23.58%), climbers (11.32) and parasites (0.80%). Leaves are the major part of the plants used in the formulations (28.57%). The highest Use value is for *Calycopteris floribunda* (1.80), followed by *Rauvolfia serpentina* and *Achyranthes aspera* (1.67). The different types of wounds treated by traditional healers are classified into 15 categories and the highest ICF scored is for the burns (0.66).

Conclusions: Ethnomedicinal survey in Uttara Kannada district of Karnataka revealed uses of 106 plants in traditional practices for curing various types of wounds. The statistical analysis confirmed high degree of sharing the knowledge amongst 44 key informants. Information about the largest number of remedies was obtained from the Havyaka Brahmin ethnic community which has strong Sanskrit background.

1. Introduction

Since time immemorial man has used various parts of plants in either prevention or treatment of many ailments (Chah et al., 2006). The World Health Organization (WHO) estimates that nearly 80% of the population still depends on herbal medicines due to their easy availability, low cost and possible less side effects as compared to allopathic system of medicine (Sandhya et al., 2011). One of the very common problems in day to day activities of human is the wound. It may be due to physical, chemical, thermal, microbial or immunological insult to the tissue. According to the Wound Healing Society, wounds are 'physical injuries that result in an opening or break of the skin causing disturbance in the normal skin anatomy and function' (Strodtbeck, 2001). The process of wound healing consists of integrated cellular and biochemical events leading to re-establishment of structural and functional integrity with regain of strength of injured tissue (Raina et al., 2008). Research on wound healing agents is one of the developing areas in modern biomedical sciences and many traditional practitioners across the world particularly in countries like India and China have valuable information of either less-known or hitherto unknown wild

* Corresponding author. Tel.: +9964796943, +9164633062.
E-mail address: bhat.pradeep08@gmail.com (P. Bhat).

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plants for treating wounds and burns (Kumar et al., 2007). However, ethnobotanical information on plants in India for treatment of cuts, wounds and burns is widely scattered (Bharadwaj and Gakhar, 2005; Kumar et al., 2007; Ayyanar and Ignacimuthu, 2009; Patil et al., 2009; Kuvar and Bapat, 2010; Subramanian et al., 2011).

Karnataka is one of the plant diversity rich states in Southern India. Ethnomedicinal survey started in Karnataka as early as 1993 by Hosagoudar and Henry. Studies on this aspect in Uttara Kannada district in Karnataka have been made by Bhandary et al. (1995, 1996, 2001, 2002, 2003), Harsha et al. (2002, 2003, 2005), Hegde et al. (2007) and Achar et al. (2010). Present study is to document and analyze the plants used in traditional therapies for various wounds and related injuries in humans and cattle by different communities in Uttara Kannada district of Karnataka State.

2. Materials and methods

2.1. Study area

Uttara Kannada is one of the 30 districts of Karnataka State. It is located between 74°09′ to 75°10′E longitude and 13°55′ to 15°31′N latitude with an area approximately 10,327 km^2. Nearly 81% of the total geographical area of the district (10,291 km^2) is under forest cover (Satyanarayana and Rajashekara, 1985). The soil type is alluvial throughout coastal region and mostly lateritic in most part of the district. However, on the interior regions the soil varies from red to sandy red and black towards eastern margin. The average rainfall of the district is 2835 mm per annum. The temperature remains moderate throughout the year. It fluctuates between 37 °C in mid-summer to 15 °C in winter. The vegetation of the Uttara Kannada District shows much diversification similar to its geographical and physiological patterns. It is classified as (a) Littoral vegetation, (b) Evergreen vegetation, (c) Moist deciduous forests and (d) Scrub and thorny forests (Kamath, 1985).

2.2. People communities of Uttara Kannada

The thick evergreen forests are home to several tribal communities such as Siddis, Gowlis, Kunbis, Halakki Okkaligas and Kare Okkaligas. According to the history of the District the Halakki Okkaligas are the original tribe and others are the migrants. In addition to these tribes Havyaka Brahmins, Saraswatas, Nayaks, Harijanas, Idigas and Nadavas are the other ethnic communities. Amongst these, the Havyaka Brahmin community is basically advanced and scholarly community. This community is depending on farming, mainly areca for their livelihood. Siddis were the slaves from Africa, brought to Goa during Portuguese period. Some of them escaped and settled in the deep forests of Uttara Kannada. Similarly the Gowlis and Kunabis are the migrants from Maharashtra, settled deep in the Western Ghats part of Uttara Kannada. All these communities have developed the practical knowledge about medicinal plants (Bhandary et al., 1995, 1996; Hegde et al., 2007) (Fig. 1).

2.3. Ethnomedicinal survey

Keeping the objective in mind several field trips were made in Uttara Kannada District in different seasons between 2010 and 2012. The collection of information was through semi-structured open ended interviews as suggested by Martin (1995) with a questionnaire. The traditional healers were not pressurized to reveal their knowledge and were convinced that the information would be exclusively for academic purpose. The questionnaire was designed to obtain the information about their experience in the field of treatment, number of patients treated per week, knowledge about the medicinal plants, vernacular names, parts of the plants used and other ingredients added during the drug formulations. The questionnaire also involved authentic consent of the informants for sharing their valuable knowledge in a signed proforma. The purpose of taking the sign in the last is for more authentification of their information. To get the consistent information on formulation each informer was interviewed more than twice and only those formulations having consistency are considered. This study focused on the use of plants for treating different types of wounds.

2.4. Plant identification and herbaria

Plants were collected with the help of herbal healers and were identified authentically by using published floras, such as Flora of Presidency of Bombay (Cooke, 1967), Flora of British India (Hooker, 1978), Flora of Presidency of Madras (Gamble, 1984), Flora of Karnataka (Saldahna, 1984). The recent names of the plants have been given based on the Flora of Kolhapur District (Yadav and Sardesai, 2002), Flora of Kerala (Nayar et al., 2006) and IPNI (www.ipni.org). Plants mentioned for treatment were photographed in the field, cuttings of the samples were taken and voucher specimens (Voucher specimen from PB/GRH 1 to PB/GRH 106) are deposited in the herbarium of P.G. Department of Botany, Karnatak University, Dharwad.

2.5. Tabulation and data analysis

The information such as botanical name, family, vernacular name, part used, habit, habitat, status, Use value and voucher specimen number are provided for each species (Table 1). Informants Consensus Factor and formulations of the taxa for the treatment of wounds are tabulated separately (Tables 2 and 3).

2.5.1. Use-value (UV)

The Use value (UV), a quantitative method that demonstrates the relative importance of species known locally, was calculated according to the following modified (Phillips and Gentry, 1993a, 1993b) formula:

$UV = \sum U_i/n$ (Albuquerque et al., 2006). Where UV is the Use value of a species; U_i the number of uses mentioned by each informant for a given species; n the total number of informants.

2.5.2. Informants Consensus Factor (ICF)

For the data analysis, Informant Consensus Factor (ICF) was employed to indicate how homogenous the information is. All the citations were placed into ailment categories for which the plant was claimed to be used. ICF values will be low (near 0) if plants are chosen randomly or if informants do not exchange information about their use. Values will be high (near or more than 1) if there is a well defined selection criterion in the community and/or if information is exchanged between informants.

The ICF is calculated as in the following formula (Gazzaneo et al., 2005):

$$ICF = Nur - Nt/Nur - 1$$

where 'Nur' is the number of use citations in each category and 'Nt' is the number of species used.