

Diversity and use of ethnomedicinal plants in coastal Karnataka, India

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ABSTRACT

Bhandary MJ, Chandrashekar KR. 2014. Diversity and use of ethnomedicinal plants in coastal Karnataka, India. *Biodiversitas* 15: 89-93. A study was undertaken in Coastal Karnataka, a culturally and floristically diverse region between the Western Ghats and the Arabian sea in India, to document the diversity and uses of ethnomedicinal plants of the area. This study resulted in the documentation of ethnomedicinal uses of 342 species of plants belonging to 34 families. The dominant families of ethnomedicinal plants were: Fabaceae (38 species), Euphorbiaceae (22 species), Rubiaceae (11 species), Acanthaceae, Asteraceae, Apocynaceae and Rutaceae (10 species each). Among the plants used, 30% are herbs, 27% trees, 25% climbers and 18% shrubs. Majority of the plants are used against several diseases, either alone or in combination with other plants. The most popular medicinal plants, in terms of the number of diseases against which they are used, are *Cyclea peltata*, *Aristolochia indica*, *Cuminum cyminum*, *Curcuma longa*, *Tamarindus indica*, *Asparagus racemosus*, *Ficus racemosa*, *Hemidesmus indicus*, *Ficus religiosa*, *Calotropis gigantea*, *Vitex negundo*, *Aegle marmelos* and *Leucas aspera*. A list of 50 important ethnomedicinal plants of the region which are used in the treatment of 5 or more disorders is provided.

Key words: Coastal Karnataka, ethnobotany, ethnomedicinal plants, traditional medicine

INTRODUCTION

Plants are the important source of medicines both in traditional and modern methods of treatment. About 50,000 of the flowering plants occurring in the world are believed to be having medicinal properties. According to an estimate of the World Health Organization (WHO), about 80% of the populations in the developing countries still rely on traditional medicine for their primary health care needs.

Knowledge of indigenous cultures about medicinal uses of local plants is an important input for understanding traditional utilization of biological resources, for promoting community healthcare practices and also for developing modern plant-based drugs.. The importance and urgency of scientific documentation of such traditional wisdom on medicinal properties of plants, much of which is restricted to local cultures and transmitted only orally, has been realized by ethnobotanists as it is being irreversibly eroding due to the fast acculturation of traditional cultures.

India is a rich repository of information on traditional uses of plant resources owing to its rich cultural and floristic diversity. This has been amply proved by the multitude of studies reported on this aspect from the country (Binu et al. 1992; Lalramnghinglova and Jha 1999). The tribal and indigenous communities of India were found to be using more than 10,000 species of wild plants for various purposes which includes about 8,000 species for medicinal uses (Pushpangadan and George 2010). However, the ethnobotanical wealth of some geographical areas of the country, such as the State of Karnataka, is still not fully explored and the studies

reported so far pertains only to ethnomedicinal practices specific to some areas, tribal groups and disease categories (Bhandary and Chandrashekar 2001, 2003, 2011; Bhandary et al. 1995, 1996; Harsha et al. 2002, 2003, 2006; Rajkumar and Shivanna 2010; Shivanna and Rajkumar 2010; Prakash et al. 2010). In an attempt to fill this lacuna, an extensive study of the plants used in the ethnomedicinal tradition of the coastal areas of Karnataka was undertaken and the findings are reported in this paper.

MATERIALS AND METHODS

Coastal Karnataka, comprising of three revenue districts, namely Dakshina Kannada, Udupi and Uttara Kannada, is a diversified region lying to the western edge of the State of Karnataka in India (Figure 1). Situated between latitudes 12°28'-15°31' N and longitudes 74°32'-75° 4' E, it is a narrow belt of land that lies between the Western Ghats and the Arabian Sea having an average width of 50-80 km. and a length of 267 km. The total geographical area is 19,753 sq km. This region receives heavy rainfall, in the range of 2,500-3,000 mm, and it harbors different types of vegetation such as littoral, scrub, moist deciduous and evergreen. The littoral and the scrub forests are found along the coastal belt, the moist deciduous forests mainly in the inland plateaus extending to the foot of the Western Ghats and the evergreen forests localized only in the Ghats.

Total population of this area is 4,698,380 with an average density of 300 persons per sq km. According to the

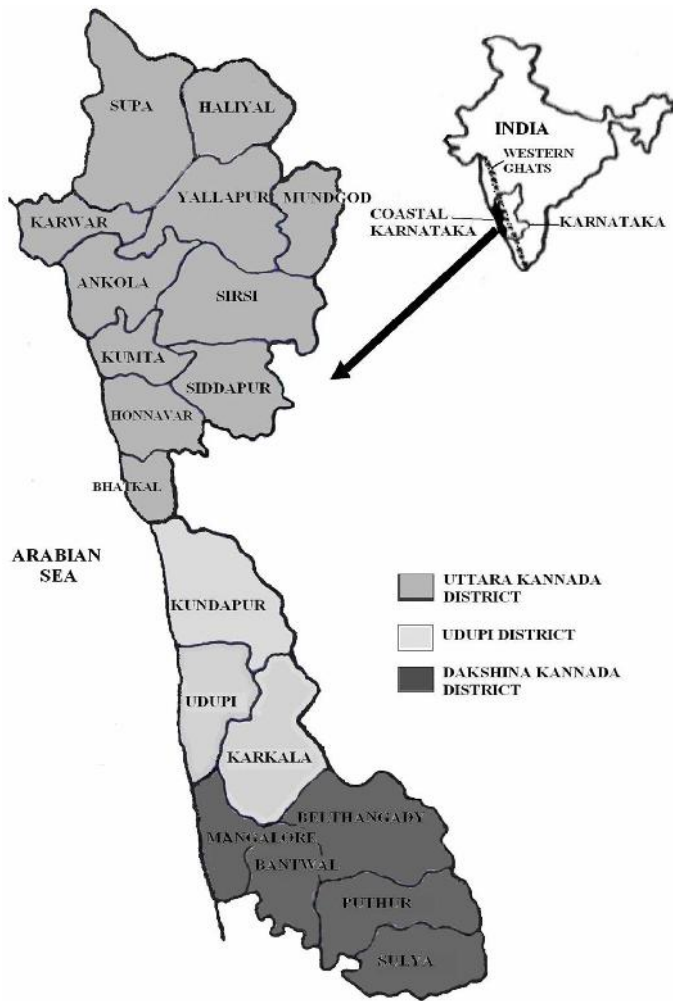


Figure 1. Map of coastal Karnataka showing the study area

Census of India, 2011, Dakshina Kannada has the highest density at 457 persons. Udupi district's density is 304 persons and Uttara Kannada has 140 persons per sq km. The people of the region represent a mixture of rich ethnic and cultural diversity. Besta, Brahmin, Bunt, Devadiga, Gudikar, Idiga, Kumbara and others are the predominant non-tribal indigenous communities while Koraga, Kunbi, Malekudiya, Gowli, Halakki Vokkaliga and Siddi are the important tribal groups inhabiting this region. The area is still predominantly agrarian with about 80 % of the population employed in agriculture and allied activities including growing cash crops of coconut (*Cocos nucifera*), areca nut (*Areca catechu*) and other horticultural products. More than 70 % of cropland is under cereals with paddy (*Oryza sativa*) as the principal crop. Fishing is the other major source of livelihood with about 100,000 people directly engaged in this activity. 'Kannada' and 'Tulu' are the major languages while others like 'Marati' and 'Konkani' are also spoken.

Practicing local herbalists or 'nati vaidya's and other knowledgeable elderly people belonging to various non-tribal communities and three of the tribes, namely the Koraga, the Malekudiya and the Halakki Vokkaliga form

the local guides and source of information for this study, which was the part of a ongoing comprehensive ethnobotanical documentation project started in 1995. During field trips, about 150 herbalists and elders have been repeatedly visited in their own localities, during different seasons. After obtaining their consent, information regarding their knowledge of medicinal plants is recorded with the help of questionnaire-based interviews, open-ended field discussions and also by observation of their actual treatment practices, wherever possible. Simultaneously, recording of information on various aspects of treatment practices such as diseases treated, method of treatment, vernacular names of plants used, method of herbal collection and medicine preparation, etc., is also collected and recorded. Herbarium materials of the plants were also gathered with the help of the local guides, for authentication of the identity of the plants used. They were identified with the help of local floras (Cooke 1967; Gamble 1967; Saldanha 1984).

RESULTS AND DISCUSSION

Diversity of ethnomedicinal plants

The indigenous communities of the study area were found to be using as many as 342 species of plants in their traditional ethnomedicinal practices. These plants belonged to 34 families. The dominant families of ethnomedicinal plants and number of plants recorded from each family are shown in Figure 2. Fabaceae with 38 species tops this list while Euphorbiaceae with 22 species and Rubiaceae with 11 species occupy the second and third positions. Fabaceae, along with Asteraceae and Lamiaceae, has been emerged as the most species rich medicinal plant family in studies reported from various other areas also (Kakudidi et al. 2000; Kamatenesi-Mugisha et al. 2008).

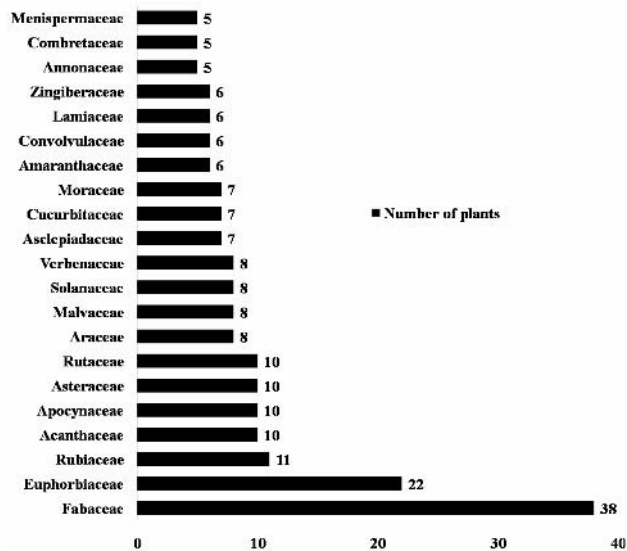


Figure 2. Dominant families of ethnomedicinal plants

Majority of the plants are used against several diseases, either alone or in combination with other plants. 13 species are used in the treatment of 10 or more diseases whereas 72 species are used against 5 or more diseases. The most popular medicinal plants, in terms of the number of diseases against which they are used, are *Cyclea peltata*, *Aristolochia indica* (19 diseases each), *Cuminum cyminum* (17), *Curcuma longa* (13), *Tamarindus indica* (13), *Asparagus racemosus* (12), *Ficus racemosa* (12), *Hemidesmus indicus* (12), *Ficus religiosa* (11), *Calotropis gigantea* (11), *Vitex negundo* (11), *Aegle marmelos* (10)

and *Leucas aspera* (10). 50 most important ethnomedicinal plants of Coastal Karnataka with data on their scientific names, family, common names and part/s used are listed in Table 1. Comparison of the medicinal uses recorded in the present study with important works pertaining to Indian traditional and ethnomedicinal plants (Jain 1991; Husain et al. 1992; Warriar et al. 1994-1996; Yoganarasimhan 1996; Kher 2007) indicated that a major proportion of them are hitherto not known and therefore new additions to the Indian ethnomedicinal literature.

Table 1. Important ethnomedicinal plants of Coastal Karnataka

Name of the species	Family	Vernacular names	Parts used
<i>Cuminum cyminum</i> L.	Apiaceae	Jeerige, Jeerdari	Fruit
<i>Ervatamia heyneana</i> (Wall.) Cooke	Apocynaceae	Maddarasa, Kokke kayi	Stem bark
<i>Rauwolfia serpentina</i> (L.) Benth.	Apocynaceae	Sarpagandha Patalagaruda	Root
<i>Tabernaemontana divaricata</i> (L.) R. Br.	Apocynaceae	Nandibattalu, Nanjatte	Stem bark
<i>Caryota urens</i> L.	Arecaceae	Baine, Indu	Root, Stem
<i>Aristolochia indica</i> L.	Aristolochiaceae	Ishwara beru	Root
<i>Calotropis gigantea</i> (L.) R. Br.	Asclepiadaceae	Akka, Akkamale	Leaf, Latex
<i>Hemidesmus indicus</i> (L.) Schult.	Asclepiadaceae	Namada beru, Nannari, ookurma	Root
<i>Elephantopus scaber</i> L.	Asteraceae	Nela mucchir	Whole plant
<i>Barringtonia racemosa</i> (L.) Spreng.	Barringtoniaceae	Samudra pala	Seed
<i>Caesalpinia bonduc</i> (L.) Roxb.	Caesalpinaceae	Gajjuga, Kaat kalenji kayi	Leaf, seed.
<i>Tamarindus indica</i> L.	Caesalpinaceae	Hunase, Puli	Stem bark, fruit
<i>Celastrus paniculatus</i> Willd.	Celastraceae	Gangamma balli	Root
<i>Calophyllum inophyllum</i> L.	Clusiaceae	Honne. Ponne kayi	Seed
<i>Terminalia arjuna</i> (Roxb. Ex DC.) Wt. & Arn.	Combretaceae	Arjuna, Bili matti, Hole matti	Stem bark
<i>Kalanchoe pinnata</i> (Lam.) Pers.	Crassulaceae	Kadu basale	Leaf
<i>Cucurbita maxima</i> Duch. Ex Lam.	Cucurbitaceae	Sihhi kumbala, Kembude	Fruit, root
<i>Breynia vitis-idaea</i> (Burm.f.) Fisch.	Euphorbiaceae	Palli thappu	Leaf
<i>Croton roxburghii</i> Balak.	Euphorbiaceae	Vayu beru, Somar	Stem bark, root
<i>Phyllanthus amarus</i> Schum. & Thonn.	Euphorbiaceae	Nela nelli	Whole plant
<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Nelli	Fruit
<i>Ricinus communis</i> L.	Euphorbiaceae	Haralu, Alambuda	Leaf, fruit
<i>Salacia reticulata</i> Wight,	Hippocrateaceae	Aka nayaka	Stem, root
<i>Leucas aspera</i> (Willd.) Link,	Lamiaceae	Thumbe	Stem, leaf
<i>Leucas aspera</i> (Willd.) Link,	Lamiaceae	Thumbe	Stem, leaf
<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Thulasi	Leaf
<i>Asparagus racemosus</i> Willd.	Liliaceae	Shatavar,	Root tuber
<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Dasavala	Leaf
<i>Melastoma malabathricum</i> L.	Melastomataceae	Nekkarika, Nekkare	Leaf, root
<i>Memecylon malabaricum</i> (Cl.) Cogn.	Melastomataceae	Ollekodi	Leaf, Tender shoots
<i>Cyclea peltata</i> (Lam.) Hk. F. & Thoms.	Menispermaceae	Hade balli, Padala	Leaf, fruit, root
<i>Tinospora sinensis</i> (Lour.) Merr.	Menispermaceae	Amruta balli	Stem bark
<i>Ficus benghalensis</i> L.	Moraceae	Aalada mara, Goida mara	Stem bark
<i>Ficus racemosa</i> L.	Moraceae	Atthi, Arthi	Stem, root, fruit
<i>Ficus religiosa</i> L.	Moraceae	Aswatha, Attosou	Stem bark
<i>Musa paradisiacal</i> L.	Musaceae	Baale, Baare	Stem
<i>Musa superba</i> Roxb.	Musaceae	Kaadu bale, Kallu bale, Kalbaare	Stem, fruit, seed
<i>Syzygium cumini</i> (L.) Skeels,	Myrtaceae	Nerale, Nerolu	Stem bark, seed
<i>Jasminum malabaricum</i> Wt.	Oleaceae	Betta mallige, Adroli	Stem, leaf
<i>Pongamia pinnata</i> (L.) Pierre,	Papilionaceae	Honge, Korngu, Karanja	Stem bark, fruit
<i>Catunaregam spinosa</i> (Thunb.) Tirvengadam	Rubiaceae	Kaare, Kadu kaare	Stem, leaf, fruit
<i>Ixora coccinea</i> L.	Rubiaceae	Kiskara, Kepula	Stem, root
<i>Mussaenda belilla</i> Buch.-Ham.	Rubiaceae	Bellate, Bolle tappu	Leaf
<i>Aegle marmelos</i> (L.) Corr.	Rutaceae	Bilva, Bilpatre	Leaf
<i>Zanthoxylum rhetsa</i> DC.	Rutaceae	Gamate, Jummana kayi, Kavate	Stem bark, fruits
<i>Mimusops elengi</i> L.	Sapotaceae	Bakula, Renje	Stem bark
<i>Vitex negundo</i> L.	Verbenaceae	Nekki, Lakki	Leaf
<i>Hybanthus enneaspermus</i> (L.) F. V. Muel.	Violaceae	Purusharatna	Whole plant
<i>Curcuma longa</i> L.	Zingiberaceae	Arasina, Manjal	Root
<i>Zingiber officinale</i> Rosc.	Zingiberaceae	Shunti	Root

The analysis of the recorded medicinal plants based on growth habits is shown in Figure 3. The highest proportion is of herbs (30%) while the lowest is of shrubs (18%). Trees make up 27% and 25% plants are climbers. This is similar to the pattern of growth form distribution observed for the ethno-medicinal plants of other regions, such as Kancheepuram district, Tamilnadu (Muthu et al. 2006) and Rewa district of Madhya Pradesh (Shukla et al. 2010). However, the tribals of Pachamalai hills of Tamilnadu use more shrubs (29.5%) than herbs or trees (28.4% each, Geetarani 2010) whereas trees are the major category of plants in the ethnomedicinal practice of Boma community of Ghana (Addo-Fordjour et al. 2008).

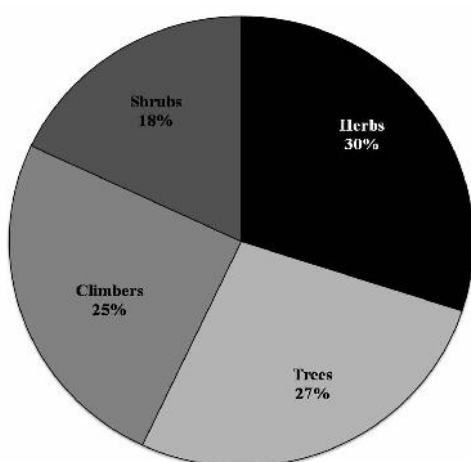


Figure 3. Habit-wise distribution of ethnomedicinal plants

Ethnomedicinal use priorities

The 42 various ailments against which ethnomedicinal treatments have been recorded in the study area can be grouped into 7 major categories of symptomatically and organ-system related diseases/problems, such as skin problems, gastro-intestinal disorders, urino-genital disorders, respiratory disorders, body swellings and pain, animal bites and others. The last category includes unrelated problems like fever, jaundice, diabetes, bone fracture, dental problems, eye and ear problems (Table 2). Diagnosis of the diseases by ethnomedicinal practitioners is mainly based on symptoms, information about which is gathered by both visual examination and description provided by the patients.

Percentage of treatment methods used against each of these main disease categories is shown in Figure 4. The highest number of remedies is documented for skin problems (22%) which are followed by swelling and pain in body parts (20%), and gastro-intestinal and urino-genital problems (15% each). It is important to note that diseases prevailing in modern cultures like cancers, cardio-vascular diseases, hypertension, AIDS, etc., are not found in the list of diseases treated by ethnomedicinal systems of this area. In fact, there are no homologous words for diseases such as cancer, leukemia, hypertension, etc., in the vernacular languages of this region, as generally noted by Balick and Cox (1996) for indigenous medicinal systems of the world, as a whole.

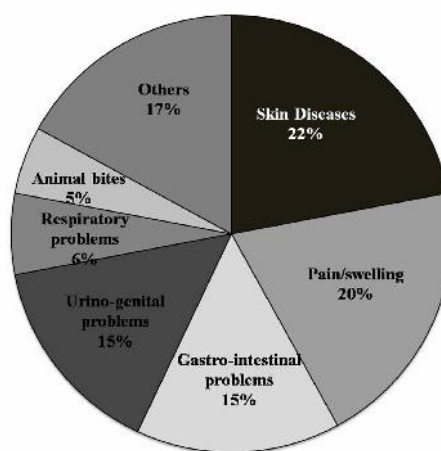


Figure 4. Percentage of ethnomedicinal formulations for various disease categories

CONCLUSION

Indigenous communities of coastal Karnataka possess a rich heritage of ethnomedicinal tradition in which about 342 species of local plants are employed as medicines for treating about 42 different health problems. Much of the ethnomedicinal claims for these plants are hitherto not reported and further pharmacochemical investigations are essential to confirm these uses.

Table 2. Diseases treated in the ethnomedicine of Coastal Karnataka

Category	Diseases/conditions included
Skin problems	Herpes, scabies, eczema, leucoderma, skin ulcer/wounds, cuts, burns
Body pain/Swellings	Body swelling, rheumatic pain, head ache, stomach ache, body ache, mumps
Urino-genital problems	Leucorrhoea, hemorrhoids, emmenagogue, polyuria, dysuria, urinary stones, fertility problems, anti-abortionifacients
Gastro-intestinal problems	Constipation/indigestion, dysentery, diarrhea, flatulence, intestinal worms, piles
Respiratory problems	Cough, cold, asthma
Animal bites	Snake bite, spider bite, scorpion bite, dog bite
Others	Fever, jaundice, diabetes, bone fracture, ear/eye/dental/hair problems

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