Role of Ethnomedicobotanical Survey in Advancement of Ayurveda

1MN Shubhashree, 2V Rama Rao, 3Shiddamallayya Mathapati, 4Raghavendra Naik, 5Sulochana Bhat

ABSTRACT

Introduction: Ethnomedicobotanical survey focuses on understanding the relation between humans and plants and this endeavor involves multiple disciplines. Ethnomedicobotanical survey helps in obtaining first-hand information on the medicinal plants. Such surveys also provide important data on cultivation and conservation aspects and assist in chalk ing out socioeconomic programs.

Aim: (1) To explore the traditionally used medicinal plants under ethnomedicobotanical survey and include them under Ayurvedic pharmacopeia. (2) To discover new drugs and finding out alternate botanical source plants for rare and endangered species.

Materials and methods: Such an endeavor has been taken up by the Regional Research Institute for Metabolic Disorders (RARI-MD) previously known as Regional Research Institute, Bengaluru. Since the inception of survey of medicinal plants unit in 1971, various forest ranges of Karnataka like Shimoga, Chitradurga, Haveri, Davangere, Coorg, Bellary, South Canara, Gadag, etc., have been surveyed. Special tours have been undertaken in south and north divisions of Nilgiris, Andaman and Nicobar Islands, Madhya Pradesh, and Arunachal Pradesh.

Results: Twenty-seven districts have been covered and more than 42,049 herbarium specimens belonging to 2,619 plant species along with 734 dry drug samples have been collected and deposited in the herbarium of RARI-MD. Many new sources of drugs like Aristolochia tagala are suggested in the absence of Aristolochia indica (Ishwaree) based on ethnobotanical survey. Our Acharyas have stated that knowledge has to be updated by collecting information from all the possible sources. Acharya Charaka also opined that the first-hand information about a drug has to be collected from shepherds (Ajapa and Avipa). This article intends to present a bird’s-eye view on the significance of the ethnomedicobotanical survey and contribution of RARI-MD in this area.

Keywords: Ayurveda, Ethnobotany, Ethnomedicobotanical survey, Medicobotany.


Source of support: Nil

Conflict of interest: None

INTRODUCTION

Traditional folk medicine is usually transferred from one generation to another by oral means and most often not documented. In India, large sections of population still rely on traditional herbal medicine. There are hundreds of different tribes and other ethnic groups in India. Each tribal group has its own tradition, folk language, beliefs, and knowledge about use of natural resources as medicines.1 Since time immemorial, there has been a close association between human and plant life.2 The relationship between the indigenous people and their surroundings forms the subject of ethnobotany, a science3 dealing with the study of plants used by tribes for food, medicine, and clothing.4 Tribal knowledge about plants forms the storehouse of information and plays a key role in improving the Ayurvedic Materia Medica. It also helps in collection of authentic drug material. Due to various human activities, such as deforestation, rapid industrialization, urbanization, and other developmental activities, both natural vegetation and traditional culture of planting trees in India are declining fast. There is an urgent need to document all ethnobotanical knowledge available with different ethnic and folklore communities before the traditional culture is completely lost.5 The term ethnobotany was first used in 1895 by Harshberger and refers to the study of “plants used by primitive and aboriginal people.”6 However, the concept of ethnobotany is reflected in the ancient treatises of Ayurveda. Ayurveda emphasizes on the fact that there is nothing which is not a medicine, which implies that all plants have some medicinal uses. Charaka has stressed on having direct interaction with the persons who are intimately acquainted with the use of herbs for procuring ideal medicine.7 Sushruta et al8 also mention that medicinal herbs and plants should be recognized and identified with the help of shepherds, cow herd, and other foresters who are acquainted with the names and forms of plants. Dalhana, commentator of Sushruta, has also emphasized on identification of plants from the tribal people. In this context, he mentioned that it is very difficult to know about the poisonous plants and as such they may be known by interacting...
with tribal people in the Himalayan region. Probably, it is a hint about the poisonous aconites growing on high altitudes. These references in classics point toward the poisonous aconites growing on high altitudes. These references in classics point toward the poisonous aconites growing on high altitudes.

The survey studies have been undertaken in Nilgiris (Ooty), Andaman and Nicobar Islands, Madhya Pradesh, and Arunachal Pradesh, and this study is based mainly on the observations of the survey.

**RESULTS**

Out of 28 districts in Karnataka, ethnomedicobotanical survey has been carried out in 27 districts out of which 6 are in Western Ghats. A total number of 9,854 field collections were made with pertinent phenological data useful to Indian System of Medicine (ISM). About 42,049 herbarium specimens belonging to 2,619 plant species have been collected and deposited in the herbarium of RARI-MD along with 734 dry drug samples in the museum (Table 1).

**Special survey tours (out of state):** Special tours were undertaken in Nilgiris (Ooty), Andaman and Nicobar Islands, Arunachal Pradesh, and Madhya Pradesh, and many medicinal plants of importance in ISM were collected.

**MATERIALS AND METHODS**

Ethnobotanical surveys have been conducted by medicinal plant unit of Regional Ayurveda Research Institute for Metabolic Disorders (RARI-MD), Bengaluru, in various forest ranges of Karnataka like Shimoga, Chitradurga, Haveri, Davangere, Coorg, Bellary, South Canara, Gadag, and special tours conducted in south and north divisions of Nilgiris, Andaman and Nicobar Islands, Madhya Pradesh, and Arunachal Pradesh, and this study is based mainly on the observations of the survey.

**METHODOLOGY**

The survey studies have been undertaken by botanists along with Ayurvedic physician and other assistants. The same district was visited two to three times in different parts of the year to understand the climatic influence on flora. Frequent field surveys have been carried out to invent the “key informants” in the treatment of diseases in the study area. Ethnomedicobotanical data have been collected through conversation with traditional healers, tribal doctors, and old women in the field trips. Data have been collected through structured open-ended interviews with questionnaire in their local/Kannada language. During the interview local names, useful plant parts, method of preparation, and dosage were recorded. All medicinal plants recorded for the treatment of diseases were photographed in the field. The plant species is identified with the help of regional and local florals by pharmacognosy experts. As per the standard procedure, the voucher specimens were collected and herbariums have been preserved. The collected samples are deposited in the herbarium of RARI-MD, Bengaluru. Documentation of botanical name, status, family, vernacular name, habit and habitat, mode of preparation, administration of the drug, dosage as per age, clinical benefits was done with emphasis on use of single plant and polyherbal formulations. The collected information on the medicinal use of these herbs has been correlated to the technical information available in the Ayurvedic science. According to Ayurvedic classics, it is said that if plants are collected in their season, plants will have more medicinal value. Even time factor also plays a major role in attaining the optimum medicinal value in medicinal plants. Keeping all these things in view, survey and interview was carried out in different regions at different times.

**Table 1:** Status of ethnomedicobotanical survey conducted in RARI-MD, Bengaluru

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of plant specimens prepared for herbarium</td>
<td>42,049 specimens</td>
</tr>
<tr>
<td>Species collected</td>
<td>2,619 species</td>
</tr>
<tr>
<td>Total number of drug samples added to the museum</td>
<td>734 specimens</td>
</tr>
</tbody>
</table>
Role of Ethnomedicobotanical Survey in Advancement of Ayurveda

DISCUSSION

Improving the stagnant Ayurvedic Materia Medica is a challenging task and depends heavily on the collection and analysis of the information from traditional sources. Some of these benefits include discovery of new plants, identification of substitutes, unravelling the identity of Ayurvedic drugs as mentioned in classics, and discovery of new drugs. New plant discoveries to Indian flora through ethnomedicobotanical study acts as a bridge between botany and tribal knowledge regarding medicinal properties of plants. The search for new drugs and nutraceuticals invariably starts from the plants mentioned in the traditional source and has become a recognized tool. Identification and documentation of new plants plays a vital role in incorporating them in Ayurvedic pharmacopeia. It is found that a total number of 14 plant taxa, new to the Plant Kingdom, have been discovered and described by ethnobotanical surveys carried out by Regional Research Institute, Bengaluru, (Table 2).

Identification of Substitutes

Plant resources particularly medicinal plants are disappearing at an alarming rate, and not enough attention is being given to seek alternate sources or substitutes for many of these plants. Although scores of medicinal species have vanished from our country or are threatened with extinction, India is blessed with one of the richest floras in the world and still there are hundreds of species, which have equal value to some of the commonly used plants and some of them may even be superior in their properties as compared with those in common use. The quest for identifying and addition of plants of medicinal importance (drugs in Ayurveda) can be solved based on the ethnomedicobotanical survey in the forests with particular reference to find out and establish a new or allied source to the accepted source drug. For example, the drug Ishwari derives the botanical source from the roots of a twiner Aristolochia indica L., which has slender roots which are found scattered. As many plants have to be uprooted to procure the required quantity of roots, it becomes a difficult task for the physicians to obtain the drug. It has been learnt from the medicobotanical surveys that Aristolochia tagala occurring in the forests of Western Ghats can be used alternatively. The species occurs fairly abundantly and hence the collection of the drug is easy and the physician can meet the required demand.

In many cases, the occurrence of the species is found to be in the Himalayas and thus the physicians in South India in particular are at a disadvantage to procure such species, e.g., Tagara (Valeriana jatamansi Jones Wall./V. wallichii DC.). To overcome such situation, medicobotanical surveys can help in detecting the allied species of the genus in South India. There are four species of Valeriana occurring in the hills of South India which remain unexploited. Preliminary studies on one species V. arnotitiana at our center have revealed that the volatile oil used for drug is present in higher quantities than in V. jatamansi (Himalayan species). It is logical to explore the medicinal benefits of valerian species occurring in South India as a substitute for the one available in Himalayan region.

New Source/Identity for Ayurvedic Drug

As an example, the tribal people of Silent Valley and Idukki in Kerala use fruits of Chittelam in digestive complaints (personal observation). This drug has been identified as fruits of Hercleum rigens Wall. ex DC. of Apia-ceae. Review of available literature has revealed that this plant has not been mentioned in Ayurveda and forms a new data to be added to Materia Medica. Such studies are carried out by Regional Research Institute, Bengaluru, in the tribal pockets of Nilgiris, and Andaman and Nicobar Islands. Arunachal Pradesh and Madhya Pradesh have brought out many plants/drugs that could be exploited by the ayurvedists.

Table 2: New plant discoveries to Indian flora through ethnomedicobotanical study by RARI-MD, Bengaluru

<table>
<thead>
<tr>
<th>Botanical name</th>
<th>Family</th>
<th>Place of report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marsdenia raziana Yog.</td>
<td>Asclepiadaceae</td>
<td>Chikmangalur District</td>
</tr>
<tr>
<td>Oldenlandia nudicaulis Yog.</td>
<td>Rubiaceae</td>
<td>Chikmangalur District</td>
</tr>
<tr>
<td>Thelasis pygmaea Lindl.</td>
<td>Orchidaceae</td>
<td>Andaman and Nicobar</td>
</tr>
<tr>
<td>Utricularia sampathkumarii</td>
<td>Lentibulariaceae</td>
<td>Bengaluru</td>
</tr>
<tr>
<td>Saurauia bracteosa DC.</td>
<td>Sauruiaceae</td>
<td>Andaman and Nicobar</td>
</tr>
<tr>
<td>Chilocarpus suanianus Yog.</td>
<td>Apocynaceae</td>
<td>Andaman and Nicobar</td>
</tr>
<tr>
<td>Ilex tadiandamolense Keshav.</td>
<td>Aquifoliaceae</td>
<td>Kodagu District</td>
</tr>
<tr>
<td>et Yog.</td>
<td>Clusiaceae</td>
<td>Kodagu District</td>
</tr>
<tr>
<td>Litsea lakshmanmaniania Keshav.</td>
<td>Euphorbiaceae</td>
<td>Kodagu District</td>
</tr>
<tr>
<td>et Yog.</td>
<td>Dipterocarpaceae</td>
<td>Kodagu District</td>
</tr>
<tr>
<td>Garcia darwiniana Keshav.</td>
<td>Orchidaceae</td>
<td>Kodagu District</td>
</tr>
<tr>
<td>et Yog.</td>
<td></td>
<td>Khasia and Juntia Hills, Assam</td>
</tr>
<tr>
<td>Baliospermum raziana Keshav.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>et Yog.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hopea ponga Mabb. var.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cauveriana Keshav. et Yog.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oberonia ranganniana Keshav.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>et Yog.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taeniophyllum khasianum Yog.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

JDRAS
New Drug Discovery

Based on the ethnomedicobotanical studies, a research paper “Origin and identification of Kuduhunchi, a hitherto unknown Ayurvedic drug, introduced by Rajanarharhi” was published correlating the botanical identity of “Momordica cymbalaria Cogn. (= Luff atuberosa Roxb.).” The often cited case of antileukemic studies on “Catharanthus roseus” is not considered as an example of ethnopharmacology, which is a subdivision of ethnobotany, because the drug’s traditional use is mentioned as antidiabetic and not as an antileukemic agent. This is an interesting example where a new action of the drug was discovered. R. serpentina (L.) Benth. ex-Curz, Cannabis sativa L., Papaver somniferum L., Gymnema sylvestre (Retz.) R. Br. ex Sm., Picrorhiza kurroa Royle ex-Benth., Azadirachta indica A. Juss., and Curcuma longa L. are examples of modern pharmacological confirmation of traditional uses of plants.

CONCLUSION

Ethnomedicobotanical surveys play a vital role in rescuing the disappearing knowledge and returning it to the local communities. This will help in conserving at least a part of ethnobotanical heritage as a living cultural ecosystem. Ethnobotanical studies give us information about the plants which are endangered. If the rates of harvest are high and not replaced with new plants of same species, plants will become extinct soon. Hence, there is an urgent need to record the traditional knowledge of various ethnic communities before this culture is wiped off completely due to the nonavailability of the drug. The use of medicinal herbs as food and medicine is common among the different communities under primary health care in rural areas. There is an urgent need for documentation of ethnomedicobotanical research before indigenous cultures and natural habitats are destroyed.

ACKNOWLEDGMENT

Authors are grateful to Yoganarasimhan, Research Officer (botany), for his enormous contributions to medicobotanical survey, to all Research Officers participating in the survey, and to Director General, Central Council for Research in Ayurvedic Science, for his constant support and encouragement.

REFERENCES

Role of Ethnomedicobotanical Survey in Advancement of Ayurveda


निहित सारांश
आयुर्वैदिक की प्रगति में प्रागैतिहासिक वास्तविकता सर्वेक्षण की मूलिका

प्रस्तावना: प्रागैतिहासिक वास्तविकता सर्वेक्षण मनुष्य और पादपों के बीच के संबंध को समझने पर केंद्रित है और इस प्रयास में कई विषय शामिल है। प्रागैतिहासिक वास्तविकता सर्वेक्षण औषधीय पैमाने पर प्रथम जानकारी प्राप्त करने में मदद करता है। ऐसे सर्वेक्षण कृति और संस्कृत में पहलुओं पर महानुभव आकर्षक भी उपलब्ध है और प्रागैतिहासिक वास्तविकता सर्वेक्षण मनुष्य पादप से संबंध पर कोई भी विषय विविधता का सम्भावित है। प्रागैतिहासिक वास्तविकता सर्वेक्षण औषधीय पादप प्रभाव: आयुर्विदिक प्रदर्शन में मदद करता है। ऐसे सर्वेक्षण कृतिकरण एवं संस्कृत पहलुओं पर महानुभव आकर्षक प्राप्त करते हैं जो सामाजिक-आचारी कार्यक्रमों को तैयार करने में सहायता करते हैं।

विकल्प: (1) प्रागैतिहासिक वास्तविकता सर्वेक्षण के अन्वरतां पारम्परिक रूप से मनुष्य औषधीय पादपों का पता लगाना और उनमें आयुर्वैदिक फार्माकोपीया के अंतर्गत शामिल करना (2) दुर्लभ और लुप्तप्राय प्रागैतिहासिक प्राप्त से लैसलिक वास्तविकता स्रोत पादप के पता लगाना तथा नवीन औषधि की खोज करना।

समग्री और विविधता: इस तरह का प्रयास वैदिक आयुर्वैदिक दयालुता विकार अनुसंधान संस्थान, जो कि पूरे में क्षेत्रीय अनुसंधान संस्थान, बैगलूर के नाम से जाना जाता था, द्वारा किया गया है। 1971 में औषधीय पादपों के सर्वेक्षण की ईंकाई की स्थापना से कर्नाटक के शिकेंगे, विजयनगर, हावीरी, दाडानगरे, कुर्क, वेलासी, दंकिकन केंद्र, गणदुर्गा इत्यादि विभिन्न क्षेत्रों का सर्वेक्षण किया गया है। नीलामिर के द्वारा व ऊर्जा माध्यम व निर्माण हीम समूह, वैद्यक्ष तथा अन्य योजना प्रदेश के विदेश दौरे किए गए।

परिणाम: 27 जिलों का सर्वेक्षण किया गया तथा 734 सूचक औषधि नमूनों के साथ 2619 पादप प्राप्ति से संबंधित रूप से अधिक वास्तविक विश्लेषण नमूने एकत्रित किए गए और इन्हें वैज्ञानिक औषधीय प्रवेश द्वारा विश्लेषित किया गया। प्रागैतिहासिक वास्तविकता सर्वेक्षण के आवार पर औषधियों के कई नए स्रोत सुझाए गए जैसे परसीटोलोजिक (इंसेंट) के रूप पर एरिक्सोलाइजिया तरतूड़। हमारे आयुर्वैदिक प्रदेश ने कहा है कि समीक्षा अनुसार स्रोतों का एकत्र रूप से आयुर्वैदिक (स्वीटन, अद्वैत) अंतर्गत आए। आयुर्वैदिक चर्चा ने भी कहा है कि औषधि के बारे में प्रथम जानकारी प्रदान (अनुक्रम एवं आविर्भाव) से एकत्रित करनी आवश्यक है। इन उपकरणों के मिश्रण प्रयोजन प्रागैतिहासिक वास्तविकता सर्वेक्षण में एक संगठन पर एक विशेष परिचय लोकोपन करने तथा इस अंत्व में वैज्ञानिक बीमारी को विश्वसनीय नहीं करता है।

शुरूआत: आयुर्वैदिक, प्रागैतिहासिक, प्रागैतिहासिक वास्तविकता सर्वेक्षण, विविधतावादी वास्तविकता।