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REVIEW ARTICLE

ETHNOBOTANICAL APPROACH TO DRUG DEVELOPMENT IN AYURVEDA

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ABSTRACT

Ayurveda, our ancient medical science is well established as a complete medical science. The development of Ayurveda is made by its integrative approach to adopt the best things in other sciences like botany, pharmacy, pharmacology, photochemistry, taxonomy etc. The major part of *Ayurvedic* treatment is based on plant and plant products. So ethnobotany plays a major role in the development of*Ayurvedic* drugs. The complex relationship between the plants, humans and human cultures is studied with the help of ethnobotany. The development of *Ayurveda* is achieved with the help of ethnobotany. The approach is made by field work or survey study of folklore remedies or locally used less known plants or acquiring the knowledge of such plants which are not mentioned in *Ayurveda.* Preparation of herbarium sheets and museum of less known plants, study of ancient literature like Veda, local publication study, and database preparation are the way of getting additional knowledge of drugs. After this the authentication, screening for standardization and from animal and clinical trials the unknown facts are proved and established.

Keywords: ethno botany, drug development, folklore medicine

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INTRODUCTION

Man is always influenced by plant and plant products. The folklore people use plants as a medicine for their common aliments in day to day life. Large number of these remedies have survived through ages and passed from generation to generation. The interdisciplinary science of ethnobotany is trying to throw much light on this subject. In 1895 Harsberger first coined the term ethnobotany for uses of plants. Ethnobotany is defined as the study of complex relationship between plants, their uses and cultures [1]. The focus of ethnobotany is on the multiple uses of plants and their management and perception in human society.

Today it is well established branch of science. Our studies on ethnobotany in India have added many more information and unknown properties of many plants. The root of ethnobotany can be seen in *Ayrveda* also. Our ancient *acharyasCharak* and *Sushrut* has mentioned that the knowledge of medicinal plants can be obtained from *gopas(*cowherds) and *ajapas*(goatherds). These and other forest dwellers know the drugs by name and form. It is not the identification but the knowledge of the principles governing the proper application of these drugs that counts most from the stand point of the science of medicine [2]

Tools used in ethnobotany :

Ethnobotany is an integrative multidisciplinary field of learning. So the tool of ethnobotanical investigations are many; botany, mycology (study of fungi), taxonomy, anthropology, archeology, comparative folklore studies, religious studies, medicine, pharmacology, mythology and cosmology. As far as *Ayurveda* is concerned the following methods are used as the tools for search for new information of drug.

With regard to search for unknown or less known medicinal plants the following approaches are proven valuable.

Field work or survey study

For field work or survey study certain standardized procedures and methods are adopted; knowledgeable and reliable informants are to be located and unexaggerated information is solicited. Information is collected regarding the habit and habitat of plants; its part or different parts used for different remedies, collection, dosage, in which form the folk people use that particular medicine. For authentication of information and future references voucher specimens are collected. The local names of the plants are recorded. They help us in future for further study or collection in large scale if required. The local names also sometimes give indications of morphological characters, habit or uses of the plant.

Inventive field work has been done among tribal areas of several parts of India by Central Council for Research in*Ayurvedic*sciences (CCRAS) and botanical survey of India. It has given a good output also. It has embarked on a systematic survey of medicinal plants including identification, collection, and supply of medicinal plants, besides locating the zones where particular drugs are available. Council has collected about 4000 folk claims and 15 books have published on them [3].An ethnobotanical survey of Ambikapur district of M.P. was carried out in 1990-91 and folklore information on forty medicinal plants was recorded. Some noteworthy plant species which are used in the treatment of various diseases are *Boerhaviadiffusa* in elephantiasis, *Hemidesmusindicus* in stomach ulcer, *Indigoferacassioides* as antifertility agent [4]. In other parts of India like Sikkim, Andhra Pradesh, Punjab the ethno botanical surveys were carried out which added massive research work in development of *Ayurveda.*

Preparation of herbarium and museum

The study and examination of field notes on herbarium sheets and museum specimens provide good source of information regarding identification, part used, uses of unknown or less known medicinal plants. The field reports are attached to actual plant specimen. The area, date of collection, season are also mentioned in that. This information enables us to the specific habit and habitat of particular plant or plant species, part used local uses etc. In many parts of India many botanically identified and authenticated plants are used and known by different names which create controversy. This study helps us to solve the problem of controversy of plants. The CCRAS has preserved more than 10,000 plant species in the form of herbarium and a total of 3784 crude dry samples were collected for museum through its 18 medico-botanical survey units [5].

Literature resource

Survey and study of ancient published or unpublished literature have proved a good source of ethnobotanical data. Most of the plants used in today's era have their root in our ancient literature *veda*. In *Atharvaveda* occurrence, uses and structures of some medicinal plants is also available. In Buddhists and Jain *granthas* and other philosophical literature many plants used at that time are found [6]. The *Ayurveda* physicians and research scholars have find out the correct botanical identity of many plants and established the relation between local names of ancient literature and of present with the help of habit, habitat, uses and remedial properties.

Local publications

In the tribal areasof Nashik district a well-known social worker and teacher Mr. Awariguruji has written a book named 'Ranavanataliaushadhi'. In this book he has mentioned the locally used plants, their remedies, part used, mode of administration and form [7]. Such a useful and valuable work regarding plant remedies is available in other parts of India. This can be a good source of ethnobotany and development of *Ayurveda*.

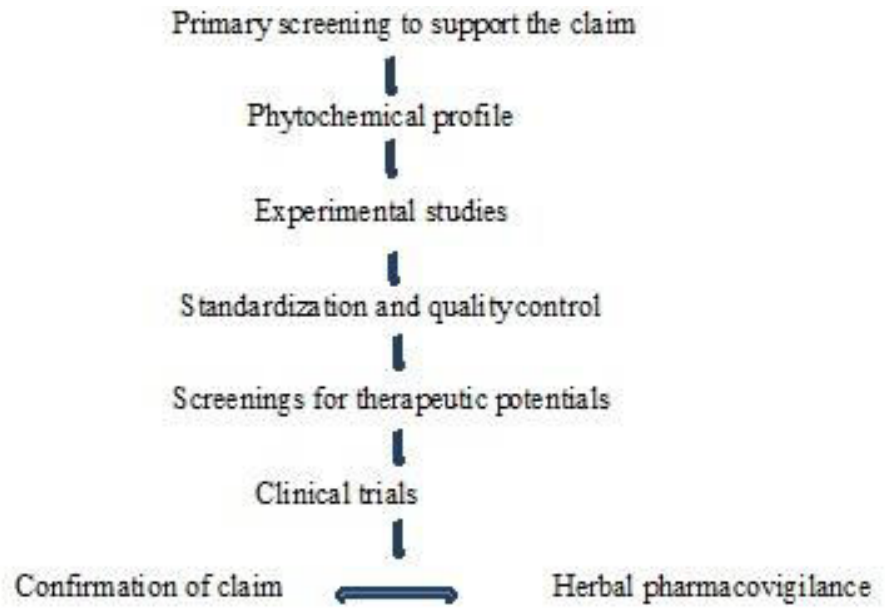
Validation of usage of medicinal plants in Ayurveda by folk people

Ethnobotanical information is mainly based on the plant remedies used by local or folk people and their experiments. Such information must be time tested. Many of these plants in this category are investigated and their validation is proved. Some of examples are; *Withaniasomnifera* roots are used for centuries for tumor by folk people particularly of Rajasthan. Chowdhary (1988) reported chemical compounds 'withanolide-D' and another 'withaferin-A' from the leaves have significant anti-tumor activity in vivo against sarcoma 180 cells in mice [8]. The seeds of *papaya* (*Carica papaya*) are traditionally used to produce temporary infertility in males and females for birth control. It has been experimentally found by Bapana et al (1988) it inhibit spermatogenesis in experimental rats [9].

For such purpose of scientific investigations and validation of plants; under the ministry of Ayush there are 5 research councils, 1 board, 8 educational institutes 2 statutory organizations 1 drug manufacturing unit, 2 laboratories, and 11 national institutes are established at national level [10]. Our research centers like CCRAS, AYUSHand CCRIMH are making an effort for scientific research and documentation on these plants from many years and very good outcomes are seen to develop the drug research in *Ayurveda*. For drug discovery phytochemical, pharmacological, and microbiological screening techniques are applied. Besides widespread use of plants in folklore people their scientific validation, safety aspects, quality evaluation is also essential. For this the regional centers have prepared monograph [11].

Drug development in Ayurveda

As far as ethnobotany is concerned the drug development in Ayurveda through folklore claim, the explanation can be summarized by the following flow chart-



From the various surveys of ethnomedicinal plants the results obtained have confirmed the therapeutic potency of some plants used by tribal people. In addition tothis theresearch forms a good basis for selection of potential plant species for further phytochemical and pharmacological investigations. Many new plants like *Lochnrearosea*, *Podophyllumhexandrum, Caesalpiniadigyna* are added in *Ayurvedic*drug [12]. Many less known medicinal plants or less known or unknown properties have got wide acceptance and application in *Ayurved*; Some of examples are *Rauvolfiaserpentina* as phenotropic, *Phyllanthusniruri* as a good hepatoprotective, *Gymnemasylvestre*asantidiabetic, *Vinkarosea* in leukemia, *Euphorbia hirta* in leucorrhoea and wound healing, *Cardiospermumhalicacabum* in arthritis, leaves of *Alianthusexcelsa* in paralysis[13].The well-known example of the medicine 'Jeevani' prepared from *Tricopuszeilanicus* is used for centuries by the kaani tribal community of the agasty a koodam ranges in Kerala. They use these fruits for energetic purpose. Detail chemical and pharmacological investigations showed the plant contains flavonoid glycosides, glycolipids and some other nonsteroidalcompounds [14].

Commercial use of these etnobotnical resources has given financial strength to *Ayurvedic* pharmaceutical, cosmetic and food industries. Ethnobotanical studies have also helped in locating and conserving the threatened and the endangered species of plants. An ethnobotanical survey done by national botanical research institute (NBRI) Luckhnow, identified many endangered plant species; some of them of high economic value as the source of medicine and food. These are *Aconitum ferox, Aconitumheterophyllum*, *Atropaacuminate,Picrorhizakurroa,*

Swertiachirayitaetc[15]. This has helped to develop strategies for biodiversity, conservation and sustainable use of medicinal plants for *Ayurveda*.

CONCLUSION

The traditionally used medicines and folklore's claims are studied in the science of ethnobotany. Literature of *Ayurveda* has a wide source of information of herbal drugs. Along with addition of new plants many unknown or less known properties of plants are added in *Ayurveda.*Theancient literature study, preparation of herbarium and museum, critical study of local publications and applying scientific screening techniques to analyze these traditionally used plants are the way of ethnobotanical approach to drug development in *Ayurveda.*Ethnobotanical approach has also added less known properties of plants like *sarpagandha*, *bhumymlaki, sadapushpi*etc.Thus promotion of indigenous medicines will also help the people from whom the traditional knowledge is obtained and development of *Ayurveda* also.

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