



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2017; 3(1): 595-598
www.allresearchjournal.com
Received: 22-11-2016
Accepted: 27-12-2016

Javed Iqbal

Department of Post-Graduate
Studies and Research in
Biological Sciences, Rani
Durgavati University,
Jabalpur, Madhya Pradesh,
India

Aijaz Ahmad Ganaie

Department of Post-Graduate
Studies and Research in
Biological Sciences, Rani
Durgavati University,
Jabalpur, Madhya Pradesh,
India

Shoket Ali

Department of Post-Graduate
Studies and Research in
Biological Sciences, Rani
Durgavati University,
Jabalpur, Madhya Pradesh,
India

Correspondence

Javed Iqbal

Department of Post-Graduate
Studies and Research in
Biological Sciences, Rani
Durgavati University,
Jabalpur, Madhya Pradesh,
India

Ethno-medicines used by tribals of central India: A review

Javed Iqbal, Aijaz Ahmad Ganaie and Shoket Ali

Abstract

Forest and forest products have historically played a significant role in the economy as well as culture and religious in this region since ancient time. Forest has played an important part in history of civilization. They have affected the distribution of mankind over the earth surface and have influenced the religious life of primitive people. In India, the Indigenous people are predominantly composed of the large and diverse tribal population scattered across several states. Tribal people and medical practices are co-related with forest ecology. There were 46 recognized scheduled tribes and three of them have been identified as "Special Primitive Tribal Groups" in the State. The main tribal groups in Madhya Pradesh are Gond, Bhil, Baiga, Korku, Bhariya, Halba, Kaul, Mariya, and Sahariya. Dhar, Jhabua and Mandla districts have more than 50 percent tribal population. In Khargone, Chhindwara, Seoni, Sidhi and Shahdol districts 30 to 50 percent population is of tribes. Maximum population is that of Gond tribes. Tribal communities in this region like Gond, Bhil, Baiga, Korku, Bhariya, Halba, Kaul, Mariya, Sahariya. Dhar and Jhabua are of distinct in cultures, traditions, languages and customs but have an intimate attachment with forest for their basic needs such as food, fruits, edible roots, leaves, medicinally important plants etc. Their primary health care system is depending on traditional knowledge of medical practices and medicinal herbs. Therefore the objective is to analyze the importance of medicinal plants and secondarily, medicinal plants used by tribal communities in this region.

Keywords: traditional knowledge, ethno-medicine, primitive people, tribal communities

Introduction

Since ancient times, plants have been indispensable sources of both preventive and curative traditional medicine preparations for human beings and livestock. Historical accounts of traditionally used medicinal plants depict that different medicinal plants were in use nearly as 5000 to 4000 BC in China and 1600 BC by Syrians, Babylonians, Hebrews and Egyptians. In India, Ayurvedic system evolved over 5,000 years and is still in practice. The Rig veda and Atharvanaveda have included more than 700 medicinal prescriptions Mnimh, (1996) [15]. Beside their use in fighting various ailments at local level, different medicinal plants are used as export commodities, which generate considerable income (Raiet *al.*, 2000) [19, 20]. These plants are normally traded in dried or freshly preserved form as whole or comminuted and their global markets are found in China, India, Germany, France, Italy, Japan, England and USA. Trends in the use of traditional and complementary medicine are on the increase in many developed and developing countries. In the USA, it was estimated that 42.5 million visits were made to herbalists in 1990, contrasting the 388 million actual visits to primary health care physicians (Gebre-Mariam and Asres, 1996) [5].

India is endowed with a rich wealth of medicinal plants which have been a valuable source of natural products for maintaining human health. A large number of these medicinal plants are used in several formulations for the treatment of various diseases caused by microbes. According to World Health Organization, medicinal plants would be the source of obtaining a variety of drugs. Various societies across the world have shown great interest in curing diseases using plants/ plant based drugs. Microbes are closely associated with the health and welfare of human beings. Some are beneficial and some are detrimental. As preventive and curative measures, plants and their products are used in the treatment of infections for many centuries ago. WHO estimated that 80% of the people world widely on plant based medicines for their primary healthcare (Famsworth, 1985) [4].

and India happens to be the largest user of traditional medical cure, using 7000 plant species.

Plants have the major advantage of being the most effective and cheaper alternative source of drugs (Pretorius *et al* 2001) [18]. The local use of natural plants as primary health remedies, due to their pharmacological properties is quiet common in Asia, Latin America and Africa (Bibitha *et al.*, 2002) [1]. Medicinal plants contain substances that can be used for therapeutic purposes or which are used as precursors for the synthesis of useful drugs (Soforowa *et al* 1993) [24]. Researches on use of plants as the source of drugs and dietary supplements are increasing in recent years. Plants have been found *in vitro* to have antimicrobial property as they are rich in a wide variety of secondary metabolites (Cowan *et al* 1999) [2]. Potential of higher plants as source of new drugs is still largely unexplored. Among the estimated 250,000–500,000 plant species, only a small percentage has been investigated phytochemically and the fraction submitted to biological and pharmacological screening is even smaller. Thus, any phytochemical investigation of a given plant will reveal only a very narrow spectrum of its constituents. Historically, pharmacological screening of compounds of natural or synthetic origin has been the source of innumerable therapeutic agents.

The herbal medicines occupy distinct position right from primitive period to the present-daytime. The utilization of biologically diverse plant resources for various ailments is the life long struggle of human race. In spite of their availability and utilization by large proportion by the middle hills dweller, no concerted effort has been made for sustainable development of this renewable natural resource. Medicinal plants have been unique sources of medicines and constituted the most common human use of biodiversity (Hamilton *et al.*, 2004) [6]. Among the different diseases reported among the various tribes in the study area the gastrointestinal disorders are the common ones. People are dependent on ethno-medicinal preparations to treat gastrointestinal disorders and other ailments. Abdominal pain, diarrhoea, dysentery, indigestion, dyspepsia and worms are the common ailments reported among the tribes of Madhya Pradesh state.

Madhya Pradesh lies between latitude 21° 6' and 26° 54' N and longitude 74° and 82° 47' E. It covers a geographical area of 308,245 sq.km which is about 9.38% of the total area of India. The State is land-locked and at no point is the sea less than 300kms away. Uttar Pradesh, Chhattisgarh, Andhra Pradesh, Maharashtra, Gujarat and Rajasthan surround it. Most of the State lies on the table land of Central India bounded by the upper Gangetic plains in the north; the Godavari valley in the south; the plains of Gujarat in the west; and plateau of Bundelkhand and Chhattisgarh in the east. The State is traversed by the Vindhya, Satpura and Maikal hill ranges. The state of Madhya Pradesh comprises a large population of tribal communities belonging to various ethnic groups. These forest dwellers live in forests and possess a vast knowledge on various aspects of different plant species. Ethnobotanical studies on different aspects of plants related to many tribal communities have been carried out in various districts of the state. Main tribes of the state are Gond, Bheel, Oraon, Sahariya, Bhilala, Sor, etc. (Jain *et al.* 2010) [11].

Tribals in Madhya Pradesh constitute a sizeable population. The population of tribals in Madhya Pradesh is 12.233 million constituting 20.27% of the total population of

Madhya Pradesh (60.385 million), according to the 2001 census. There were 46 recognized scheduled tribes and three of them have been identified as “Special Primitive Tribal Groups” in the State. The main tribal groups in Madhya Pradesh are Gond, Bhil, Baiga, Korku, Bhariya, Halba, Kaul, Mariya, and Sahariya. Dhar, Jhabua and Mandla districts have more than 50 percent tribal population. In Khargone, Chhindwara, Seoni, Sidhi and Shahdol districts 30 to 50 percent population is of tribes. Maximum population is that of Gond tribes. The differences in the tribal community, spread over in various parts of the state, it's clearly seen not only on the basis of their heredity, lifestyle and cultural traditions, but also from their social, economic structure, religious beliefs and their language and speech. Due to the different linguistic, cultural and geographical environment, and its peculiar complications, the diverse tribal world of Madhya Pradesh has not only been largely cut-off from the mainstream of development. Madhya Pradesh holds 1st rank among all the States/UTs in terms of ST population and 12th rank in respect of the proportion of ST population to total population.

According to the 2011 Census of India, Bhil is the most populous tribe with a total population of 4,618,068, constituting 37.7 per cent of the total ST population. Gond is the second largest tribe, with a population of 4,357,918 constituting 35.6 per cent. The next four populous tribes are: Kol, Korku, Sahariya and Baiga. These six tribes constitute 92.2 per cent of the total ST population of the State. Pardhan, Saur, Bharia and Bhumia have a population ranging from 105,692 to 152,472; together, they form 3.2 per cent. Four tribes, namely Majhi, Khairwar, Mawasi and Panika having population in the range of 47,806 to 81,335 account for another 2.2 per cent of the ST population; remaining thirty three tribes (out of total of 46 tribes) along with the generic tribes constitute the residual 2.5 per cent of total ST population. Tribes having below 1000 population are twelve in number. Medicinal plants have played an essential role in the development of human culture especially religions and different ceremonies. Study of medicinal plants helps to understand plants toxicity and protect human and animals from natural poisons. Medicinal plants are resources of new drugs. Plants are eukaryotic photoautotrophs that include angiosperms, gymnosperms, bryophytes, pteridophytes and algae. Angiosperm are estimated to have more than 250,000 species, Gymnosperms 760 species, bryophytes 15,350 species and pteridophytes about 12,157 species (Katewa *et al.* 2009) [13].

In India, the systematic field research on ethnobotany and related subject was pioneered by Botanical Survey of India (BSI). Later Dr. E.K. Janki Amal was keenly interested in stimulating ethnobotanical researches in India. She studied sustenance food plants of certain tribals of South India. Though, the systematic studies in ethnobotany in India were really started by Dr. S.K. Jain who is known as the “Father of Indian Ethnobotany”. He undertook a very intensive and extensive field study throughout India, especially in tribal heart land of Madhya Pradesh. “Methods and approaches in Ethnobotany” by Jain (1984) [9, 10] is a book with chapters related to ethno-botany, contributed by different botanists. The ethno-medicinal preparations of various tribes of different parts of the world had been studied by various scientists. However the important literature of last 10 years of this field has being reviewed as below:

Literature review

Dahare and Jain (2010) ^[11] carried ethnobotanical studies on plants resources of tehsil Multai, district Betul (Madhya Pradesh) which is dominated by the Korku and Gond tribes. Study concluded that a large number of traditional herbal healers exist in the tribal community and are utilizing local plants in ethno-medicinal practices. They documented 47 species of medicinal plants, belonging to 45 genera and 29 families. Sharma and Khandelwal (2010) ^[23] studied weeds of Rajasthan in relation to ethnobotanical importance. They recorded 33 weed species belonging to 29 genera. The tribal of the studied area used these weeds in their daily life for example plants like *Amaranthus caudatus*, *A. viridis*, *Cassia tora*, *Celosia argentea*, *Chenopodium album*, *Cyamopsis tetragonoloba* were used for edible purposes by the natives and *Achyranthes aspera*, *Argemone mexicana*, *Cuscuta hyaline*, *Cuscuta reflexa*, *Cyamopsis tetragonoloba*, *Ocimum americanum*, *Solanum virginianum* and *Tribullus terrestris* are used for ethno-medicinal purposes.

Saini *et al* (1996) ^[21] studied angiospermic plants in reference to welfare of tribal and children in certain areas of central India. The disease wise information gathered include botanical name, local name and use of plants. A total of 65 species related to medicinal uses in the diseases of women and children were recorded. The diseases of women mainly include abortion, alopecia, gleet etc. Jain *et al.* (2010) ^[11] reported folklore claims on some medicinal plants used by Bheel tribe of Guna district (Madhya Pradesh). Several field work and herbarium were organized between September 2005 to April 2006 in tribal inhabited localities of Guna district and the information on uses of plants was collected. They presented record on 20 angiospermic species belonging to 18 families, used by Bheel tribes for curing various ailments among human beings and animals.

Jain *et al.* (2010) ^[11] studied unreported ethno-medicinal uses thirty one plants of Betul district of Madhya Pradesh. The tribal people of Betul district use a large number of plants for medicinal and other purpose. Thirty one angiospermic species were found to be used for various diseases such as rheumatism, diabetes, tumour, epilepsy, hydrophobia, skin diseases and for ailments related to digestive system. Jain and Patole *et al.* (2001) ^[7] studied some threatened plants of Pachmarhi Biosphere Reserve of Madhya Pradesh. An account of 20 threatened plants species of the Pahmarhi Biosphere Reserve has been presented. Some threatened plants species are, *Arisaema tortuosum*, *Bigoniamalabarica*, *Cyathea gigantean*, *Dillenia pentagyna*, *Dioscorea wightii*, *Drosera burmannii*, *Eulophia herbacea*, *Gloriosa superba*, *Gymnema sylvestre*, *Isoetes panchananii*, *Leptadenia pyrotechnica*, *Lycopodium cerenuum*, *Ophioglossum nudicaule*, *Osmunda regalis*, *Thalictrum foliosum*. These plants were in the use by the local people for ethno-medicinal preparations.

Patil *et al.* (2010) ^[17] studied the role of crop weeds in traditional medicines in Buldhana district. The ethnobotanical information on total 411 angiospermic species belonging to 90 families from Buldhana district was concluded 31 species of crop weeds belonging 28 genera and 15 families of angiosperms use weed as traditional medicine. Only 3 species belonged to 3 genera of 3 monocotyledonous families. Their observations revealed as many as 31 crop weed species useful in the treatment of about 72 human afflictions. The medicinal recipes are in the form of extract, decoction, infusion, powder, paste, oil or

sometimes used raw directly, apart from latex. Nath and Khatri (2010) ^[16] collected traditional knowledge on ethno-medicinal uses of plants prevailing in tribal pockets of Chhindwara and Betul districts of Madhya Pradesh. They reported 24 herbaceous species, 14 species of shrubs, 22 species of trees and 17 species of climbers used in the preparation of traditional medicines in Chhindwara districts. In Betul district out of 50 plant species, 18 species belongs to herbs, 16 species to trees, 10 species to climbers and 6 species of shrubs.

Rai *et al.* (2000) ^[19, 20] studied the traditional uses of ethno-medicinal plants by Gond tribe of Bhanadahi, district Chhindwara (Madhya Pradesh). In all, 32 plants were reported which were used by Gond tribe and other village people in various ailments. Such plants include *Acorus clamus*, *Argemone mexicana*, *Berberis aristata*, *Butea frondosa*, *Caesalpinia bonducella*, *Calotropis procera*, *Cassia tora*, *Cissampelos pareira*, *Citrullus arometica*, *Costus speciosus*, *Cocculus hirsutus*, *Cuscuta reflexa*, *Embllica officinalis*, *Magnifera indica*, *Moringa oleifera*, *Mucuna prurita*, *Ocimum sanctum*, *Plumbago zeylanica*, *Petrocarpus marsupium*, *Ruta graveolens*, *Semecarpus anacardium*, *Solanum anguivi*, *S. melongena*, *var. incarnum*, *Syzygium cumini*, *Terminalia arjuna*, *T. bellerica*, *T. chebula*, *Thymus serpyllum*, *Tinospora cordifolia*, *Verbascum thepsus*. Verma and Dahake (2011) ^[26] presented study deals with the observation on exotic weeds of Jabalpur. During survey 40 exotic weed are collected, identified and preserved.

Tiwari and Mehta *et al.* (2013) ^[23] conducted the ethnobotanical survey to record information on medicinal plants from traditional healers in Jashpur district (Chhattisgarh) and to identify the medicinal plants used for treating diseases. The investigation revealed that the traditional healers used 55 plants species distributed in 51 genera belonging to 33 families to treat various diseases. The documented medicinal plants are mostly used to cure skin diseases, diabetes, weakness, cough and cold, poison bites, diarrhea, asthma, fever, menstrual disorder, oral diseases, fracture, jaundice and tuberculosis disorders. In this study, the most dominant family is Liliaceae and leaves are most frequently used for the treatment of diseases. This study showed that many people in the studied parts of Jashpur district still continue to depend on medicinal plants at least for the treatment of primary health care.

Conclusion

The following points may be concluded on the basis of previous studies

1. The review of literature of last 10 years indicates that indigenous knowledge base on medicinal and ethno-medicinal preparation since the time of Vedas i.e. between 3500 BC to 800 BC. Along with the erosion of biodiversity, the knowledge about the same is also eroding very rapidly. Some of the reasons behind this erosion are alienation of new generation from the poor documentation, lack of empirical validation and poor standardization.
2. Majority of the studies revealed that a large number of tribal communities live remote in inaccessible parts of the forest and depend much on plant wealth for their basic need livelihood and disease treatment. Ethno-medicinal preparations play a vital role in the economy as well as daily needs of the tribals.

3. The literature concluded indicate that a large number of tribal people suffer from a number of diseases and they are not getting modern medical treatment. Most of the tribals are illiterate or less educated. They are less aware to modern medical treatment and they rely on their own herbal drugs.
 4. The plants are the never ending source for new biodynamic compounds of potential therapeutic value. It is the ethno botanists who can bring out from the field, the suggestions as to which raw plant materials may be useful for specific purposes. The majority of the scientists studied the medicinal properties of only angiospermic plants. They did not studied other plant group like pteridophytes, gymnosperm, bryophytes and algae used by the tribals.
 5. An analysis of the published literature survey shows that very little work has been done on ethno-medicinal preparations of various tribes of Madhya Pradesh. Ethno-medicinal preparations used by the tribes have great potential as antimicrobial agent against majority of pathogens and they can be used in the treatment of infectious diseases. Scientific evaluation of these ethno-medicinal preparations gives better information regarding the antimicrobial efficiency of herbal medicines available in India.
 6. The plants used by the tribal in dietary supplement but also as agent to prevent or control the enteric bacterial infections. Further research is deserved to isolate the compounds responsible for the observed antibacterial activity.
 7. Much of work has been done on the phytochemical screening and survey of medicinal plants only a few of ethnomedicinal preparation checked for antimicrobial activity.
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