

# Suitable tree species of Jharkhand Agro-forestry systems for Indigenous Health Practices

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## ABSTRACT

The main objective of the study is to investigate about the indigenous health practices as followed by tribes (belonging to Ranchi district in the Jharkhand state) in a relation to locally available tree species and also to determine their scientific validity for agroforestry systems namely Babool (*Acacia nilotica*), Neem (*Azadirachta indica*), Mahua (*Madhuca indica*), Arjuna (*Terminalia arjuna*) and Bahera (*Terminalia belirica*) are found to be effectively used by the respondents in form of various indigenous health practices for curing their different health related problems. Out of these, usefulness of Babool against bleeding gum and sore throat, Neem as a antibiotic and Arjuna for curing heart diseases are found to be scientifically relevant. While the indigenous technologies of Mahua and Bahera as reported by the respondents are not found to be scientifically proven Hence, there is a need to strengthen the scientific component lacking in these technologies for revival and revitalization of these traditional remedies and also to document other location specific indigenous technological knowledge.

**Key words:** *Indigenous health technologies, health problems, tribal, therapeutic action, medicinal importance.*

## 1. INTRODUCTION

During the last 50 years, the aspects related to restoration/improvement of degraded land have received a good deal of attention. Consequently, rich literature is now available on improvement of degraded rangelands through various approaches such as soil and water conservation and appropriate rangeland management practices. Agroforestry system has shown immense potential in this direction along with meeting various requirements of the society at the same time maintaining ecological balance in different agro ecological regions/ agro-ecosystems of the country.

The trees grown under this system are also very much useful from the health point of view. Considering the paucity of efforts done by researchers on the exploration of medicinal value of tree species both at farmers' level as well as scientific level, present study was conducted with the objective to investigate about the indigenous health practices followed by tribal community in relation to locally available tree species and also to determine their scientific validity. Out of these some of the species suitable for agro-forestry system were found to have great potential for curing various health related problems.

## 2. MATERIALS AND METHODS

The study was conducted in Ranchi district of Jharkhand. Two villages namely Kanke and Namkum were selected randomly from the tribal dominated block "Kanke" of the selected district. Hundred tribes who were found to be preparing Indigenous Health Technologies from different parts of trees were selected with the help of snowball technique in order to explore their methodologies and mode of administration. Then scientific relevance of these trees was explored by consulting the scientists at Central Drug Research Institute (CDRI), Lucknow; Central Institute for Medicinal and Aromatic Plants (CIMAP), Lucknow; National Botanical Research Institute (NBRI), Lucknow and related facts were also collected through the published literature on therapeutic action and medicinal uses of these trees. Five tree species suitable under agro-forestry systems namely Babul (*Acacia nilotica*), Neem (*Azadirachta indica*), Mahua (*Madhuca indica*), Arjuna (*Terminalia arjuna*) and Bahera (*Terminalia belirica*) and have medicinal significance both in terms of indigenous health technologies as well as scientific researches were chosen for this study.

## 3. RESULTS AND DISCUSSION

### 3.1 Babul (*Acacia nilotica*)

Babul is widely found in tribal areas. It is clear from Table 1 that most of the respondents (62%) were using orally the

extract prepared by boiling stem bark with water for curing bleeding gum and sore throat. Gum of Babul was found to be used by 60 per cent of the tribes for filling in tooth cavity to relieve toothache. In case of dermatitis, 58 per cent of the respondents were found to be applying paste obtained by grinding leaves with water on affected portions.

The use of Babul for the treatment of bleeding gum and

Table 1. Indigenous health technology and scientific relevance of Babul ( *Acacia nilotica* )

Indigenous Use				Scientific Use			
Part of plant	Indigenous health technology	Mode of administration	Health Problem	Respondent ( % )	Part of Plant	Therapeutic action	Health problem
Gum	Gum of Babul tree	Filling tooth cavity till healing	Toothache due to cavity	60	Whole plant	Astringent	Bleeding gum, Sore throat, eczema,diarrhea
Bark	Extract prepared by boiling 50 gm stem bark with water	Gardling twice a day for 7 days	Bleeding gum and sore throat	62	Kirtikar and Basu ( 1935), Anonymous ( 1976),Rastogi and Malhotra ( 1990)		
Leaves	Paste obtained by grinding leaves with water	Applying locally , thrice a day for one week	Dermatitis	58			

Sore throat is supported by Kirtikar and Basu ( 1935), Anonymous ( 1976 ) , and Rastogi and Malhotra ( 1990). Hence authors also stated that whole plant is astringent and effective for curing eczema and diarrhea. Thus it can be inferred that respondents were found to be using it for the healing of toothache due to cavity, bleeding gum, sore throat and dermatitis, in case of bleeding gum and sore throat, it was found to be scientifically relevant.

Table 2 Indigenous health technology and scientific relevance of Neem ( *Azadirachta indica* )

Indigenous Use				Scientific Use			
Part of plant	Indigenous health technology	Mode of administration	Health Problem	Respondent ( % )	Part of Plant	Therapeutic action	Health problem
Stem	Filtered extract obtained by boiling descaled 1 kg stem with 1 litre water . Filtrate again boiled and filled in bottle	Oral 50 ml , once a day for one month	Burning foot syndrom	40	Bark	Tonic, antiperiodic, astringent, antiseptic	
Stem bark	Paste obtained by grinding stem bark with water	Applying over infected area twice a day till healing	Insect bite	42	Root and young fruit Leaf Gum Berry	Antiperiodic Literateive Tonic Purgative , emollient, anthelmintic	Snake bite Scorpion sting

Leaf	Decoction of leaves	Washing twice a day till healing	Wound injury	70	Reported by Chopra et al. (1956) Singh and Ali (1998)		
Leaf	Leaves crushed	Spreading over infected part once a day	Boil	68			

Table 3 Indigenous health technology and scientific relevance of Mahua ( Madhuca indica)

Indegenous Use				Scientific Use			
Part of plant	Indigenous health technology	Mode of administration	Health Problem	Respondent (%)	Part of Plant	Therapeutic action	Health problem
Seed	Halwa of wheat flour prepared with mahua seed oil and jaggery	Spread all over the chest , twice a day till healing	Pneumonia cough	66	Flower		Bronchitis lack of milk production
Seed	Seed oil	Body massage twice a day till healing	Pneumonia	62	Leaf		Eczema, wound and itchy skin
Seed	30 ml seed oil	Oral, once a day till healing	Pneumonia	62	Reported by Anonymous ( 1976) Chaterjee and Prakash ( 1991)		
Seed	Seed soaked in water	Filling tooth cavity once and keep as such till healing	Toothache due to cavity	59			

related problems. It is commonly found in this plateau. Data in Table 2 revealed that most of the respondents (70%) were using the decoction of leaves for washing their wounds and injured portions. Application of the crushed leaves over boils was found to be practiced by 68 per cent of the respondents. In case of insect bite, 42 percent' of them prescribed the application of paste obtained by grinding the stem bark with water over infected area twice a day. Some sections of the respondents (40%) also found effectiveness of tile extract obtained by boiling de-scaled stem with water for relieving the burning foot syndrom. In which 50 ml. of extract administered orally, once a day for one month. Chopra et' al. (1956), and Singh and Ali (1998) supported the fact that the bark of neem is tonic, antiperiodic, astringent and antiseptic. The root and young fruits are ant periodic, alterative and effective for the treatment of boil and catarrhal affections. They further added that the leaves of the plant are demulcent and useful for snakebite. Gum of the plant is tonic and useful for the cases of scorpion sting. Berries of the tree are purgative, emollient and

anthelmintics. Thus, it can be interpreted that "Neem is reported to be effective for curing wound, injury, boils, insect bite and burning foot syndrome. Scientists have also confirmed it's antiseptic property.

### 3.3 Mahua (*Madhuca indica*)

Seed oil was extensively used by the tribes for the treatment of pneumonia in various ways (Table 3). Most of the respondents (66%) were using halwa of wheat flour prepared with Mahla seed oil and jiggery by spreading it all over the chest of a person suffering from pneumonia and cough, twice a day till healing. Seed oil was also used for body massage by 62 per cent of the respondents. Same percentages of the respondents were found to be taking Mahua seed oil orally once a day for curing pneumonia. For relieving the toothache due to cavity, Mahua seeds soaked in water was found to be used by 59 per cent of the respondents. Soaked seeds were used for filling in tooth cavity till healing.

Medicinal importance of Mahua is also explained by Anonymous (1976) and Chatterji and prakash (1991). They reported that flowers are effective for curing bronchitis and lack of milk production. Leaves are useful for the treatment of eczema and wound. Seed oil is laxative and useful for itchy skin. It can therefore be inferred that Mahua was commonly found to be used by the respondents for curing pneumonia and toothache due to cavity. However, these uses are not reported scientifically.

### 3.4 Arjuna (*Terminalia arjuna*)

It is clear from the Table 4 that among the tribes, the bark of Arjuna has found it's way in the treatment of many ailments. Most of the respondents (69%) were found to be using the stem bark of Arjuna with wheat and sugar candy ground together and mixed with goat milk and honey. It was taken orally for the treatment of heart diseases. Leaf of Arjuna was very much popular for curing menstrual problem (62%). They explained the preparation of extract from the leaves of Arjuna, mango and black berry and half cup extract was administered once a day for three consecutive days. Taking half cup of extract

Table 4 Indigenous health technology and scientific relevance of Arjuna ( *Terminalia arjuna*)

Indigenous Use				Scientific Use			
Part of plant	Indigenous health technology	Mode of administration	Health Problem	Respondent (%)	Part of Plant	Therapeutic action	Health problem
Stem bark	½ cup extract prepared by boiling 15 ggm stem bark with 200 ml water	Oral, once a day till recovery	Diabetes	58	Bark	Styptic antidyseric, diuretic, tonic, febrifuge	Hypertension, Cirrhosis of liver, heart disease, Snake poison
Stem bark	5 gm of bark of arjuna and 5 g wheat mixed with 5 g sugar candy and ground. The mixture is	Oral once a day till healing	Heart diseases	69	Fruit	Tonic and deobstruent Cardiac tonic	Poor coronary circulation

	made a paste with one cup of goat milk & 5 g honey						
Stem bark	½ glass juice obtained by squeezing the crushed stem bark	Oral twice a day for one week	Burning foot syndrome	41	Reported by Kirtikar and Basu (1935) Rastogi and Malhotra (1990)		
Stem bark	10 g bark ground and added with ½ glass goat milk, 5 g honey added in this solution	Oral, thrice a day till recovery	Diarrhea	45			
Leaves	Extract prepared by boiling leaves of arjuna, mango and black berry ½ cup extract given in single dose	Oral thrice a day for three days	Menstrual problem	62			

prepared from stem bark orally, once a day as reported by a fairly large number of respondents (58%) can control diabetes. For controlling diarrhea, 45 percent of them were found to be using ground stem bark mixed with goat milk and honey. It was taken orally thrice a day. The half glass of juice of stem bark was taken orally, twice a day for relieving burning foot syndrome. This practice was followed by 41 percent of respondents.

Kirtikar and Basu (1935), Rastogi and Mehrotra (1990), Chatterji and Ptakash (1991) found that stem bark of the plant is stypitic, antidysenteric, diuretic, tonic, febrifuge, cardiac tonic, lowers blood pressure and reduces cholesterol level. The effectiveness of bark has been found in the treatment of hypertension, cirrhosis of liver, heart diseases, snake poison and poor coronary circulation. They further added that the fruit of plant is a tonic and deobstruent.

It may further be inferred that arjuna was popular among tribes for the alleviation of heart diseases, menstrual

disorder, diabetes, diarrhea and burning foot syndrom. Scientists have also proved that the bark of the tree can be used with authenticity in curing various heart-related problems.

### 3.5 Bahera (*Terminalia bellirica*)

Bahera has been popular among tribes for its medicinal uses since long time. Data in Table 5 indicate that powder obtained by grinding dried fruit without rind was taken orally for relieving the acidity problem by 55 per cent of the respondents. Fifty two per cent of them reported that extract obtained by boiling dried fruit of Bahera and Bharbhar with water to be taken orally for the alleviation of cough and fever while in case of impotency 14 gm fruit and 5 gm jaggery ground together and administered orally in the morning hours with water for 6 days. The practice was found to be common among 37 per cent of the tribes. Thirty two per cent of them were found to be taking orally the crushed dried fruit for the treatment of cough problem. In case of swelling in liver, 30 per cent

Table 5 Indigenous health technology and scientific relevance of Bahera ( *Terminalia bellirica*)

Indigenous Use			Scientific Use				
Part of plant	Indigenous health technology	Mode of administration	Health Problem	Respondent ( %)	Part of Plant	Therapeutic action	Health problem
Seed	5 g seed removed from dried and crushed	Oral twice a day for three days	Cough	32	Fruit	Astringent, tonic, fruit laxative, antipyretic	Piles, dropsy, leprosy, headache
Fruit	15 g dried fruit and 5 g jaggery ground together	Oral during morning hours with water Once a day for six months	Impotence	37	Flower	Spermicidal	
Rind and fruit	Rind a fresh fruit ground with water	Applying over abdomen till recovery	Swelling in liver	30	Reported by Kirtikar and Basu ( 1935), Singh and Ali ( 1998)		
Fruit	Dried fruit ground without rind 5 gm power given in single dose	Oral twice for two days	Acidity	55			
Fruit	100g each of dried fruit of bahera and bharbhar boiled with water ½ cup extract given in single	Oral twice a daily for three days	Cough, fever	52			

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of the tribes prescribed the use of paste obtained by grinding rind of fruits with water to be applied over abdomen till recovery. Kirtikar and Basu (1935), Anonymous (1976) and Singh and Ali (1998) have explored the effectiveness of Bahera. They stated that fruit is astringent, tonic, laxative and antipyretic and also effective for the treatment of piles, dropsy, diarrhea, leprosy and headache. They found that flower of Bahera is spermicidal. Hence it may be concluded that respondents were found to be using Bahera for curing acidity, cough fever, impotence and swelling on intestine. All these uses are not scientifically reported.

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