



# Plant Archives

Journal homepage: <http://www.plantarchives.org>  
 DOI Url : <https://doi.org/10.51470/PLANTARCHIVES.2022.v22.no1.030>

## STUDY OF MEDICINAL FLORA OF BASTAR REGION USED FOR CURING JAUNDICE BY LOCAL COMMUNITIES AND VAIDHYAS

Sajiwan Kumar, Chandrabhan Sethiya and Sukrita Tirkey\*

School of Studies in Forestry & Wildlife

School of Studies in Anthropology & Tribal Studies \*

Shaheed Mahendra Karma Bastar Vishwavidyalaya Jagdalpur (CG) India

Email: skdrsanjoo@gmail.com

Mob No. 7587077876

(Date of Receiving : 20-10-2021; Date of Acceptance : 15-02-2022)

### ABSTRACT

India has century's old heritage of medicinal plants and herbal medicines for curing human illness. Medicinal plants form the only easily accessible health care alternatives for most of our population in rural and tribal areas. The knowledge acquired by local indigenous people or the tribal's through generation shows the in-depth understanding of natural plant resources. The traditional medicine is widely used and accounts for around 40% of all health care delivered. There are several diseases on which remedy of medicinal plants is found most effective. Jaundice is one of the serious diseases of human beings in which yellow coloration of eyes, vomiting of yellowing fluid and yellowish skin is noticed as external symptoms. Many plants and minerals are being used to cure Jaundice by local Vaidhya or tribal people to cure Jaundice, there are sure herbal remedies to cure Jaundice. The present investigation aims to know the most common plants which are useful to cure Jaundice in Bastar region by local Vaidhya. The study was undertaken in Machkot forest range of Bastar region of Chhattisgarh state. The result revealed that the total of 39 plant species belonging to 18 families have been reported for treatment of Jaundice in different forms and doses. The use of these plants and plant parts to treat various illnesses is still needed by the communities because of poor socio-economic conditions, the high cost and difficult access to allopathic medicines. During the investigation following most important medicinal herbs were reported viz.; *Calotropis procera*, *Terminalia chebula*, *Terminalia bellirica*, *Azadiarchta indica*, *Boerhavia diffusa* and *Raphanus sativus* to cure Jaundice by local traditional Vaidyas in different forms and doses as per traditional knowledge system given by previous generation.

**Keywords:** Medicinal plants, Jaundice, Vaidhya, Guniya, Sirha, Bastar, Traditional medicine, indigenous knowledge system, and Plant diversity.

### Introduction

Today according to the World Health Organization (WHO), as many as 80% of the world's population depends on traditional medicine for their primary healthcare needs. There are considerable economic benefits in the development of indigenous medicines and in the use of medicinal plants for the treatment of various diseases (Azaizeh *et al.*, 2003). Among different ailments, Jaundice is the commonest ailments affecting the large population of the developing countries like India. During the last few decades there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of the world (Rossato *et al.*, 1999). Documenting the indigenous knowledge through traditional medicinal plants studies is not only useful for conservation of cultural traditions and biodiversity but also for community healthcare and drug development in the present and future (Pei, 2001).

In India, about 2500 plant species belonging to more than 1000 genera are being used in indigenous systems of medicine. Plants and plant based medicaments are the basis of many of the modern pharmaceuticals we use today for our

various ailments (Atal & Kapur, 1982). There are several diseases on which remedy of medicinal plants is found most effective, the viral hepatitis was known to mankind as Kaval (Jaundice) for more than 1,200 years (Pohekar, 2018). Jaundice is one of the serious diseases of human beings in which yellow coloration of eyes, vomiting of yellowing fluid and yellowish skin is noticed as external symptoms (Bernard *et al.*, 1996; Lamont and Isselbacher, 1973). Scientifically speaking, it is associated with abnormal high level of Bilirubin; it is the breakdown product of haemoglobin. Liver has many functions, one is to produce bile to digest fat and another one is to remove toxic chemicals/wastes like bilirubin. Jaundice occurs when there is too much bilirubin is produced in the blood. Modern therapies are too costly to treat majority of Jaundice. Herbal medicines have good values in the treatment of disorders as well as diseases. Many plants and minerals are being used to cure Jaundice by local Vaidhyas or tribal people to cure Jaundice there are sure herbal remedies to cure Jaundice.

Chhattisgarh has a rich and varied flora due to its diversified topography and variable climatic condition. About 20-25 tribes are living in isolated or in combination in

four different zones like Central, Eastern, Western, Northern and Southern zones respectively (Sinha *et al.*, 2016). Bastar is one of the tribal regions located in the southern part of the Chhattisgarh state at the height of 2000 MSL. Bastar region is found to surround by Chhattisgarh plain (Central) zone in north, Telangana state in south, Maharashtra state in the west, Odisha state in the east. The total forest area of Bastar division is 7112 sq km, which is more than the 75% of total area of the district. Out of total population 70% are tribal like Gonds, Bhatara, Muriya, Mariya Dandami Mariya, Abhujmariya, Doral and Halba etc are the main tribes of Bastar and they have unique identification in the country, which constitutes 26.76% of the total tribal population of the Chhattisgarh state (Census, 2011). All the tribal have their dependence on forests resources for health security and livelihood; therefore, they have rich knowledge of plants and its utilization. This knowledge is transferred from one generation to another by oral discussion (Samy and Ignacimuthu, 1998; 2000). Rich traditional knowledge of medicinal plants amongst local people was studied by (Harsha *et al.*, 2002; 2003 and Parinitha *et al.*, 2005). In remote tribal villages of Bastar regions, traditional medicines are of great importance in the primary healthcare of indigenous people due to their strong faith on these systems and up to some extent the lack of sufficient and reliable health facilities and modern medicines. Hundreds of plants growing in forests are used as source of medicines; some of the plants have pharmacological properties while the others are used in indigenous medicine. Most of these plants has occupied an important place in the past and shall continue in the coming days in traditional as well as in modern medicine system.

Ayurveda is the basis and foundation of ancient medicinal system of drugs derived from plant species. In Indian Materia Medica, 2000 drugs have been extracted from 1800 plants of forest origin (Nath & Khatri, 2010). The active ingredients are found in one or more parts of the plants in varying proportions. It may be found in root, bark, stem, leaf, fruit, flower or seeds.

These plants are used by tribal either independently as crude drugs or in combination with other plants, however in both the ways it is effective against the Jaundice. This knowledge of tribal is gradually vanishing (Nath & Khatri, 2010), they comprises of one of the unique treasure and rich source of diversified ethno-botanical wealth. Therefore, the present study is an attempt to integrate the traditional indigenous knowledge of tribal communities and traditional healers of the Bastar region to cure Jaundice.

### Material & Methods

The present investigation was completed in forest villages of Bastar region of Chhattisgarh state during year 2017-18. Traditional knowledge study focuses in the indigenous people are the ones who were the original inhabitants of any place and live a life of their own which is of self-sufficient type with no foreign involvement. The indigenous traditional knowledge system data was collected through individual and focus Group Discussion interviews using semi structured open ended questionnaires as per proposed in standard literature (Cotton, 1996). Information obtained through a series of interviews with traditional healers, who still practiced their indigenous system of medicine. Random sampling techniques were employed to

identify potential participants and interviewed a total of 50 people (40 men and 10 women). A total of 50 individuals were interviewed during the survey including medicine men (Vaidhya/Guniya/Ojha etc.), elder villagers, plant collectors and forest dwellers etc. There were herbalist, healers and plants traders among the interviewees as well. The same plant specimens were match with different literatures to confirm the identification of plants as scientific name, vernacular name, their medicinal uses and preparations to cure Jaundice.

The Chhattisgarh, 26<sup>th</sup> state of India, was approximate 44.21% land is covered by forests (State Forest Report, 2019). The Bastar region is located in the southern part of state and situate at a highest of 2000 ft plateau from sea level. The borders of Bastar regions are Telangana and Maharashtra state in the west and Odisha state in the east. Bastar is a region of southern part of state covered by seven districts namely Kanker, Kondagaon, Narayanpur, Bastar, Dantewada, Sukma and Bijapur. As per census, 2011 more than 65.93 % population of this region are tribal people like Gond, Mariya, Muriya, Dhruva, Bhatra, Abhujmariya, Doral and Halba etc. The study area falls under the Southern Bastar Plateau agro-climatic zone of state. The study was conducted in 16 villages comes under Bastar forest division, it lies between 19°4'53" N latitude and 82°1'36" E longitude and angle of elevation is 614.0 m.

### Method of data Collection

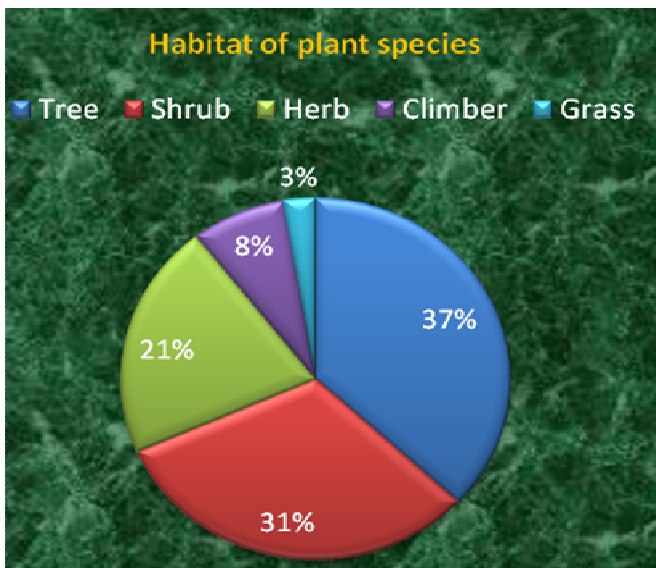
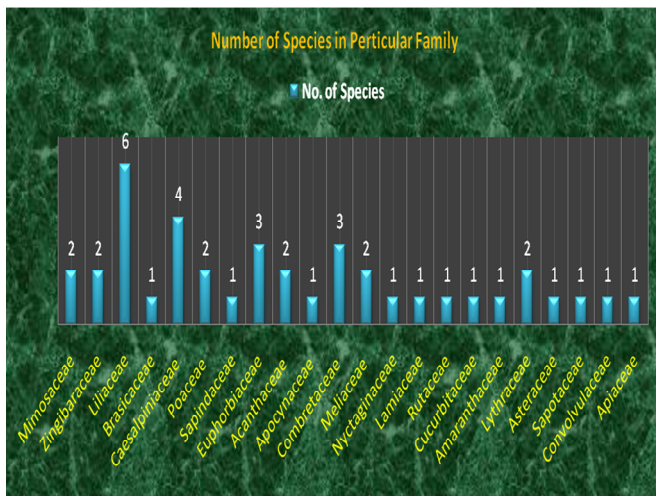
During exploration to this area, to collect the related information, the method described by Jain, (1964) was adopted, comprised of detailed interviews with tribal and witness to the uses of plant by tribal in the villages and the information collected was analyzed and documented. A questionnaire/ schedule have been developed to document the information prevailing in the community over a period of time in periodical visits.

Knowledgeable persons of tribal communities and traditional herbal healers (*Vaidhyas, Ojhas and Guniyas*), were contacted and information was collected through interviews, observations and discussions held during field survey. The discussions revealed local name of species, plant part used formulation of herbal drugs used by traditional healers and tribal communities and the species were scientifically identified with their botanical names and also with the help of existing literatures. The use of their certain words and expression during interview may be helpful to understanding their belief and continuing the dialogue. Interviewer should be neutral while discussing with group or groups to avoid any conflict and the process of interview should be informal so that the person being interviewed may not feel so any middle man may also be helpful while discussing.

### Results and Discussion

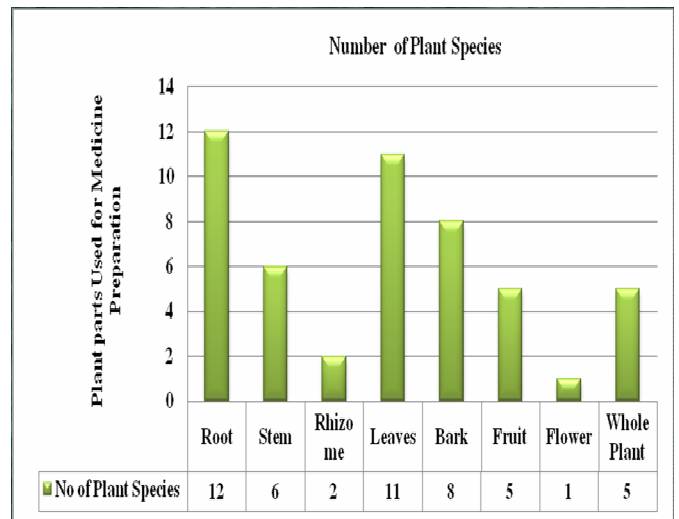
Most of the tribal pockets are undulating densely covered with thick forest cover and tribal are inhabited at hill tops, foot hills since last several hundreds of years. From the very beginning of human civilization man depends on nature for his food, shelter and medicine (Panigarhi & Murti, 1989). Since long tribal and forests are inter-windily related to each other, forests are not only the source of major and minor forest produces, but they depends much on forests for their day to day needs.

In the present investigation, 39 plant species from 22 families traditionally used in treatment of Jaundice by the tribal community of Bastar region of Chhattisgarh state have been identified and documented shows in table No. 1. The maximum number of plants used as medicine by tribal population of Bastar belongs to family *Liliaceae*. There were 6 plants found to be used for curing jaundice followed by family *Caesalpiniaceae* (4 plants), family *Euphorbiaceae* (3 plants), family *Combretaceae* (3 plants), family *Poaceae* (2 plants) and minimum plant used from the family *Brasiaceae*, *Sapindaceae*, *Apocynaceae*, *Meliaceae*, and *Sapotaceae* etc. (1 plant) which shows in figure No.1. Amongst the noted habitat of the plant species 37 % were tree followed by 31 % were noted of shrubs, 21 % of herbs, 8 % of climbers whereas lowest 3 % were found to be grasses plant shows in figure No. 2.



**Fig. 2 :** Habitat of plant species used for curing Jaundice in Bastar Region

The most frequent used plant parts were found maximum used part of plants roots (12 plants) followed by leaves (11 plants); barks (8 plants); stems (6 plants); fruits and whole plants (5 plants); rhizome (2 plants) whereas minimum used plant part noted in flower (1 plant) shows in figure No. 3. Part of the plant used, dosage, duration, restriction on intake of food etc. has been reported in present study shows in table No. 1.



**Fig. 3 :** Medicinally Useful plant parts for curing Jaundice in Bastar Region

The plants have been enumerated alphabetically according to their scientific name, habit, local name, family, parts used, mode of preparation and medicinal uses. Literatures on the ethno medicinal plants used to cure Jaundice by various tribal communities in India was extensively searched and reviewed. Among the reported plants there are various species of trees, shrubs and herbs. The local healers and tribal population mostly used fresh plant parts and dried plant parts are used in powdered form. These medicinal plants are used as hepatoprotective agents and do not directly cure the disease. The local tribes mainly used leaf, root, bark, rhizome, stem, fruit, seed and latex of these plants as medicine for jaundice. Among these leaves were highly utilized followed by fruit, whole plant, root seed and flower. In majority of the cases these formulation were prepared by using water and sugar. The reported plants were mostly administered into six categories as decoction, extracts, paste, juice, powder and fresh part etc. and in all the case mode of application were oral. In regard to the patient’s condition, the preparations were used more than two times daily from the week to month till the problem is cured.

In case of any illness, village people contact their local medicine practitioner to whom they call Vaidhya (Traditional herbal healer). Vaidhya is a person who has inherited the knowledge of curing various diseases from his fore fathers and others by using only plants. There is one or two such type of person live in the village community of Bastar. Traditionally, the local knowledge is transferred from one generation to other generation within family of the Vaidhya and in this way Vaidhya system survives; this is the especial & identical feature of tribal culture in the study area. The traditional herbal healing properties contain much medicine for a single ailment out of the various medicines; one is selected by the herbal healer for curing a particular disease according to symptoms and secondary effects and several plants are used in case of one disease according to their availability in the region.

The Vaidhya consider diseases as manifestation of evil spirit or to the wrath of certain divine spirits. The usual theory of disease in tribal society is that disease is caused by the breach of some taboo or by hostile spirit of dead. Sickness is the routine punishment for every lapse and crime meted out to them by these spirits (Verma *et al.*, 1993).

Whenever an epidemic breaks out, the traditional healers perform magico-religious rites for the cure. Tribal's belief in this regard is so deep rooted that even educated tribal would not ignore the traditional healer (Sirha/Guniya). The traditional medicine men and other dignitaries still have a hold on the illiterate masses. Mahant, (2015) observed in his studied, the villager's first preference is to seek traditional healer for treatment (75.33%) and majority of young generation do not know many plants and their medicinal values. Only few younger are followed the medicinal practices and traditional knowledge in the Bastar. A traditional method of using plants as a medicine was found to be prevalent in the study area reported by Ekka, (2013). Treatment was found to be done by the Vaidhyas, Gunias and medicine man by collecting various plants and plant parts from surrounding of the forest and use them as a medicine.

India is a veritable emporium of medicinal plants and is bestowed with rich natural wealth due to its diverse ecological conditions. Indian forests are source of a large proportion of the world's recognized medicinal plants and constitute an enormous potential source of useful plant derived chemicals. Jain and De (1966) reported the use of some medicinal plants in the treatment of various ailments, used by various tribes of Puruliya. Wester and Yongvanit, (1995), has noted in his study literate people were found to be less knowledgeable on the use of medicinal plants as compared to illiterate ones due to modernization. Panda *et al.* (2017) reported Haridra, Katuki, Chireeta, Punnanava, Kiratatikta, Bhumi Amalaki are commonest single herb used by the herbalist and Ayurveda physician in the treatment of Jaundice and other liver disorders. Dupare, (2016), reported in his study, the traditional use of medicinal plants for preventive and creative purposes among the people from generation to generation. Several species of medicinal plants such as *Ailanthus excels* Roxb., *Cichorium intybus* L., *Echinops echinates* Roxb., *Ricinus cummunis* L. etc were also reported in maintaining good health by the traditional practitioners.

Sharma *et al.* (2016) reported in their results revealed that the ninety seven plant species belonging to 48 families are used by the people of northeast India for the treatment of Jaundice. 12 plant species namely *Andrographis panicula* (Burm.f.) Nees, *Averrhoa carambola* L., *Curcuma zedoaria* Rosc., *Cuscuta reflexa* Roxb., *Eclipta alba* (L.) Hassk., *Eclipta prostrata* L., *Embllica officinalis* Gaertn., *Garcinia pedunculata* Roxb., *Momordica charantia* L., *Morinda angustifolia* Roxb. and *Phyllanthus fraternus* etc. Webster has been reported repeatedly by many worker of North East India. This study would help the future workers to select and illustrate plants enlisted for treatment of Jaundice in Bastar region of Chhattisgarh state.

India has a vast knowledge of tribal and folk medicine, which utilized around 7500 species of plants as medicine.

Ayurvedic and other traditional system of Indian medicines fully depend on wild plants for preparation of drugs. Bibliography of ethnobotany (Jain and Puri, 1984) contains nearly 2000 references covering almost all the major publications in Indian as well as foreign. Sarkhel (2015) investigate the ethno medicines used in treatment of Jaundice by tribal communities in Paschim Medinipur district, West Bengal and enumerates 12 species of plants belonging to 12 families used for treatment of Jaundice by three important indigenous communities of Paschim Medinipur district- Santhals, Mundas and Lodhas.

Lavate *et al.* (2015) explores the traditional knowledge of many common medicinal plants useful to cure jaundice. They have recorded the use of 30 medicinal plants belonging to 21 families of angiosperms that can cure or reduce jaundice infection. Paul *et al.* (2014) in his study ethno-therapeutic remedies and also documented 27 medicinal plants that are used for healing in Jaundice in Dang district of Gujarat, India. They also report traditional healers of this region totally depend on plants for healing Jaundice. Naikade (2014) studied tribal people from Konkan region provide traditional medicines in curing Jaundice and he also report majority of the formulations are prepared in the form of decoction by local Vaidus and Bhagats. India is repository of herbal medicines & there are evidences that herbs are predominant in the treatment of various diseases for revitalizing body system from ancient civilization and also report majority of cases, extract from the whole plant were used for curing jaundice Annalakshmi *et al.* (2012). Abbasi *et al.* (2009) reported a total of 30 plant species belonging to 24 families were reported by local practitioners for the treatment of jaundice and hepatitis. In Bastar region various medicinal plants has been used traditionally for the management and treatment of Jaundice. The list of these medicinal plants, traditionally used for the treatment of Jaundice was gathered from the field survey and also from the different literatures.

The tribal depend on the plants around them which made them acquire knowledge of medicinal properties of many plants by trial and error. Consequently they became the storehouse of knowledge of many useful as well as harmful plants accumulated and enriched through generations and passed on to one another without any written documents. It must be properly documented and preserved urgently because most of the tribal are being assimilated into modern societies and the treasure of knowledge of uses of plant resources is fast disappearing (Shali Saheb *et al.*, 2018). It is not only essential to conserve such a wealth of information found among the tribal but also enumerate and record such details and diverse information, which constitute a modern system to meet the ever increasing requirement of mankind.

**Table 1 :** List of Medicinal flora used for curing Jaundice in Bastar region of Chhattisgarh State

SN	Local Name	Botanical Name	Family	Habit	Useful part	Preparation and Dosage application
1	Adusa	<i>Adhatoda Vasaca</i> Nees.	Acanthaceae	Shrub	Stem, Root & Bark	<b>Preparation &amp; Uses:</b> One cup full of fresh stem bark. Juice is given to the patient for the treatment of Jaundice, twice a day for one week. The root paste along with goat milk is given orally also.
2	Aloe	<i>Aloe vera</i> L. Burm. f.	Liliaceae	Shrub	Leaves	<b>Preparation &amp; Uses:</b> Fresh pulp of leaves twice daily (sure remedy than any system of medicine). The leaf sap is mixed with <i>Curcuma longa</i> Linn rhizome of root paste and cow milk is taken daily for 10 15 days twice a day

SN	Local Name	Botanical Name	Family	Habit	Useful part	Preparation and Dosage application
3	Amaltas	<i>Cassia fistula</i> L.	Caesalpiniaceae	Tree	Fruit	<b>Preparation &amp; Uses:</b> Give its juice with equal quantity of juice of sugar cane twice a day.
4	Amarbel	<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Climber	Stem	<b>Preparation &amp; Uses:</b> Small pieces of stem (9-10 pieces) are given twice a day for 10-15 days to recover from the jaundice.
5	Aonla	<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Tree	Fruit & Seed	<b>Preparation &amp; Uses:</b> dried fruit and seeds of <i>Punica granatum</i> L. are grounded together along with sugar and made into powder, two-three teaspoons of the whole powder are dissolved in one cup of water and taken orally twice a day for three weeks. Two cure liver weakness and Jaundice. Prepare a paste of gooseberry fruit with honey. Give this paste to the patient every morning and evening.
6	Arand	<i>Ricinus communis</i> Linn.	Euphorbiaceae	Shrub	Root & Leaves	<b>Preparation &amp; Uses:</b> Give 80 ml. decoction of its root with 2 teaspoonful honey mixed in it. The decoction of the leaves is taken one glassful twice a day for about 2-3 weeks.
7	Arjun	<i>Terminalia arjuna</i> Roxb.	Combretaceae	Tree	Bark	<b>Preparation &amp; Uses:</b> stem bark extract are used to cure patient of jaundice
8	Babul	<i>Acacia nilotica</i> (L.) Wild	Mimosaceae	Tree	Root	<b>Preparation:</b> The above mentioned plant parts are crushed and soaked in a glass of water, and the extract is taken after half an hour. <b>Dosage:</b> Take one tablespoonful twice a day; morning on an empty stomach and evening after the meals. Continue this therapy for a week
9	Bahera	<i>Terminalia bellirica</i> Roxb.	Combretaceae	Tree	Fruit	<b>Preparation:</b> A mixture of Bahera, Harra & Aonla fruits can be given in the form of a decoction. <b>Dosage:</b> 20 gm of powder in a glass of water. This should be filtered and taken twice a day.
10	Bans	<i>Dendrocalamus Strictus</i> L.	Poaceae	Grass	Leaves	<b>Preparation &amp; Uses:</b> Decoction of fresh leaves or stem bark is used for bath after applying the ash of <i>Achyranthes aspera</i> on the body once a day for 3 days.
11	Bel	<i>Aegle marmelos</i> L.	Rutaceae	Tree	Leaves	<b>Preparation &amp; Uses:</b> 10 ml. juices of fresh leaves are mixed 3 pieces of black paper taken morning and evening for 20-25 days. Leaf powder is also given along with goat milk.
12	Bhringraj	<i>Eclipta alba</i> Linn.	Asteraceae	Shrub	Whole Plant	<b>Preparation &amp; Uses:</b> paste of whole plant 20-30 gm is mixed with salt and taken once a day for 15-20 days
13	Bhui-Amla	<i>Phyllanthus niruri</i> L.	Euphorbiaceae	Herb	Root	<b>Preparation &amp; Uses:</b> Fresh roots are used for making of paste & its 5-10 gm. is taken with 10 gm. of Juggary for 8-10 days.
14	Brahmi	<i>Centella asiatica</i> L.	Apiaceae	Climber	Whole plant	<b>Preparation &amp; Uses:</b> Plant paste made in to pills (10-20 gm. each) 4-5 pills is taken – 3 times a day for 7 days. The leaf extract is mixed with <i>Daucus carota</i> Linn. root juice and is taken with sugar.
15	Charota	<i>Cassia tora</i> Linn.	Caesalpiniaceae	Herb	Leaves & Root	<b>Preparation:</b> Equal portions of these plant parts are crushed and the extract is taken. <b>Dosage:</b> Half cup of the extract is taken twice a day, morning on an empty stomach, evening after the meals. This is continued up to a week.
16	Chirchita	<i>Achyranthes aspera</i> Linn.	Amaranthaceae	Herb	Root	<b>Preparation &amp; Uses:</b> the fresh roots (5gm) are ground to fine powder given to patient twice a day for about one week to cure the patient.
17	Dhataki	<i>Woodfordia fruticosa</i> L.	Lythraceae	Shrub	Flower & Root	<b>Preparation &amp; Uses:</b> Take 2-3 gm. powder of its flowers and powder of root of leadwort or turmeric powder and medar leaf. Give any of these to the patient with 50 gm. Jaggery.
18	Giloy	<i>Tinospora cordifolia</i> (Willd.) Hook	Liliaceae	Herb	Whole plant	<b>Preparation &amp; Uses:</b> Take fresh extract or infusions of whole plant along with sugar/ honey are given to patient. Root extract is fever, cold cough, as blood purifier, in acidity and jaundice. Infusions of whole plant along with sugar juice are given to patient.
19	Ginger	<i>Zingiber officinale</i>	Zingiberaceae	Herb	Rhizome	<b>Preparation:</b> Mixed 1/2 tsp ginger juice and 1 tsp each of mint juice and lime juice. <b>Dosage:</b> The mixture is taken after a span of few hours.
20	Haldi	<i>Curcuma longa</i> Linn.	Zingiberaceae	Shrub	Rhizome	<b>Preparation &amp; Uses:</b> paste of rhizome (15-25gm) is mixed with cow milk and taken once daily for 12-15 days
21	Harra	<i>Terminalia chebula</i> Retz.	Combretaceae	Tree	Fruit	<b>Preparation:</b> A mixture of Harra, Bahera & Aonla fruits can be given in the form of a decoction. <b>Dosage:</b> 20 gm of powder in a glass of water. This should be filtered and taken twice a day.

SN	Local Name	Botanical Name	Family	Habit	Useful part	Preparation and Dosage application
22	Imli	<i>Tamarindus indica</i> L.	Caesalpinaceae	Tree	Fruit & Root	<b>Preparation:</b> Roots and fruit of <i>Tamarindus indica</i> and fruit of <i>Prunus domestica</i> and are soaked in water for a night. <b>Dosage:</b> One cup of this extract is given to the patient for two to three weeks
23	Kalihari	<i>Gloriosa superba</i> L.	Liliaceae	Shrub	Stem	<b>Preparation &amp; Uses:</b> Garland of fresh tuber pieces put around the neck of patient for 10-15 days to treat the patient.
24	Kalmegh	<i>Andrographis peniculeta</i> (Burm.f.) Wall. Ex Nees	Acanthaceae	Shrub	Whole plant	<b>Preparation &amp; Uses:</b> leaves and young twigs are crushed and made in paste, 20-30 gm paste taken three times daily after meal for 2-3 weeks
25	Kashiphal	<i>Lagenaria siceraria</i>	Cucurbitaceae	Climber	Fruit	<b>Preparation &amp; Uses:</b> Bitter fruit pulp when given for three days at the dose of three gm. Daily, Jaundice may cure.
26	Kathmuli	<i>Bauhinia racemosa</i> Lam.	Caesalpinaceae	Shrub	Bark, Leaves & Root	<b>Preparation &amp; Uses:</b> water attracts of bark, leaves and root taken two times daily after meal for 2-4 weeks.
27	Khair	<i>Acacia catechu</i> Willd.	Mimosaceae	Tree	Bark	<b>Preparation &amp; Dosage:</b> Bark (1-3gm) is mixed with water and the extract is taken two times daily until cured
28	Kusum	<i>Scheleichera oleosa</i>	Sapindaceae	Tree	Bark	<b>Preparation:</b> The abovementioned plant part is crushed and soaked in a glass of water, and the extract is taken after half an hour. <b>Dosage:</b> Take one tablespoonful twice a day; morning on an empty stomach and evening after the meals. Continue this therapy for a week.
29	Madar	<i>Calotropis procera</i>	Apocynaceae	Shrub	Stem	<b>Preparation &amp; Uses:</b> The stem or cane form of garland or neckless.
30	Mahua	<i>Madhuca indica</i> J.F. Gmel.	Sapotaceae	Tree	Stem bark	<b>Preparation &amp; Uses:</b> Decoction of fresh leaves or stem bark is used for bath after applying the ash of <i>Achyranthes aspera</i> on the body once a day for 3 days
31	Mehandi	<i>Lawsonia inermis</i> Linn. Syn. <i>L. alba</i>	Lythraceae	Shrub	Bark & Leaves	Bark and leaves are crushed together and boiled in water. Decoction is taken two times daily after meal for 2-4 weeks.
32	Mooli	<i>Raphanus sativus</i> Linn.	Brassicaceae	Herb	Leaves, Fleshy part	<b>Preparation:</b> Decoction of its leaves & roots is recommended for the treatment of Jaundice. <b>Dosage:</b> Fleshy part and leaves is used powder form
33	Neem	<i>Azadiarchta indica</i> A. Juss.	Meliaceae	Tree	Leaves & Bark	<b>Preparation &amp; Uses:</b> Fresh mature air dried leaves is boiled in water and 5 ml extract is taken once daily for 15-20 days. Extract of bark mixed with sunth ( <i>Zingiber officinale</i> rose) and honey also used. Mixture of same quantity of leaf powder, fruit powder, stem bark powder and flowers powder, taken one spoonful with one spoonful ghee and honey (1/2 spoon) twice a day for one month.
34	Punarnava	<i>Boerhavia diffusa</i> Linn.	Nyctaginaceae	Herb	Whole plant	<b>Preparation &amp; Uses:</b> Fleshy root is tied tightly on to the neck for about a week. It is a very beneficial medicine for jaundice gives 10-20 gm. Juice or its whole plant with powder mixed.
35	Sadabahar	<i>Asparagus racemosus</i> Willd.	Liliaceae	Shrub	Root	<b>Preparation &amp; Uses:</b> the decoction obtained from the root has been used to cure Jaundice
36	Safed musli	<i>Chlorophytum tuberosum</i>	Liliaceae	Herb	Root	<b>Preparation:</b> 2-3 fleshy roots are crushed and boiled with milk and drank. 3 hours later, two fleshy roots of shevur are crushed and soaked in a glass of water for about 10 min. and the extract is taken and drunk. <b>Dosage:</b> This procedure is done morning and evening for up to a week.
37	Satavar	<i>Asparagus racemosus</i> Willd.	Liliaceae	Climber	Root	<b>Preparation:</b> 2-3 fleshy roots are crushed and boiled with milk and drank. 3 hours later, two fleshy roots of shevur are crushed and soaked in a glass of water for about 10 min. and the extract is taken and drunk. <b>Dosage:</b> This procedure is done morning and evening for up to a week.
38	Sugar cane	<i>Sachrum officinarum</i> L.	Poaceae	Grass	Stem	<b>Preparation &amp; Uses:</b> Keep a piece of sugarcane outside the house in open over night so that it gets covered with day. Next day morning, after brushing the teeth suck the sugar cane.
39	Tulsi	<i>Ocimum sanctum</i> L.	Lamiaceae	Herb	Leaves	<b>Preparation &amp; Uses:</b> Leaves extract with equal volume of honey, 2 tsp is taken twice a day. Pure leaves juice is also taken orally.

## Conclusion

It has been realized that medicinal herbs are going to play an important role in future material. It is anticipated that some significant conclusions would emerge from the ongoing study. So, this paper will provide adequate view to academics and researchers working on the promotion and restoration of Indigenous Knowledge Systems (IKS) of tribal communities of India and world. Therefore it is necessary that suitable requirements are needed in order to protect the traditional knowledge in particular area with reference to medicinal plant utilization and it was found that traditional ethno-medicine still persists among the tribal's in District Bastar of Chhattisgarh.

The intensive survey was conducted during 2017-18 and information related to medicinal plants traditionally used in Jaundice was collected from age-old people, headmen, traditional doctors, age old women and the person having a thorough knowledge of traditional medicinal plants practices to cure Jaundice in the study area. The information gathered was confirmed by different local or tribal people, Village people and ethnic groups in different places of investigation and also in previous literatures and books. In Jaundice, medicinal plants are important and doses are prescribed by Vaidhyas with combination of plant parts with juice, extracts, infusion, and decoction, etc.

The use of these plants to treat various illnesses is still needed by the communities, because of poor socio-economic conditions, the high cost and a difficult access to allopathic medicines. The majority of the reported species are wild and rare. These demand an urgent attention to conserve such vital resources so as to optimize their use in the primary health care system. Now a day, conservation of traditional knowledge is greatly menaced by a lot of factors related to modernization of the region and lack of interest in traditional healers, in transferring it to next generation. It is, therefore, urgent to save the cultural heritage of the natives, by confirming the therapeutically used plants with scientific criteria. In this context, screening for active substances and testing their activities against Jaundice causing organisms form an interesting subject for the feature studies. The present investigation revealed that the study area have a variety of medicinal plants which are used by the local inhabitants for their primary healthcare. The results depicts that traditional healers used 39 species of ethno medicinal plants to cure Jaundice.

## Acknowledgment

Authors are thankful to the Hon'ble Vice-Chancellor, Bastar Vishwavidyalaya, Jagdalpur, Chhattisgarh for his encouragement and support during the study period. The authors are also cordially grateful to the traditional healers of Machkot forest villages because of their kind support and cooperation in sharing their knowledge during the field surveys.

## References

- Abbasi, A.M.; Khan, M.A.; Ahmad, M.; Zafar, M.; Khan, H.; Muhammad, N. and Sultana, S. (2009). Medicinal plants used for the treatment of Jaundice and hepatitis based on socio-economic documentation.
- Annalakshmi, R.; Uma, R.; Chandran, G.S. and Muneeswaran, A. (2012). Common plants used in the treatment of Jaundice in southern India as a natural remefier-A review.
- Anonymous (1946-1976). The Wealth of India-Raw Materials series (Vol. I to XI, A-) Publications and Information Directorate (CSIR), Hillside Road, New Delhi, India.
- Atal, C.K. and Kapur, B.M. (1982). Cultivation and Utilization of Medicinal and Aromatic Plants, Regional Research Laboratory (CSIR), Jammu-Tawi, India.
- Azaizeh, H.; Fulder, S.; Khalil, K. and Said, O. (2003). Ethnomedicinal knowledge of local Arab practitioners in the Middle East Region. *Fitoterapia*, 74: 98-108.
- Badgujar, S.B. and Patil, M.B. (2008). Ethnomedicine for Jaundice used in tribal areas of North Maharashtra. *Natural Products Radiance*, Vol. 7 (1), 79-81.
- Bernard, N.F.; Knipe, D.M.; Howley, P.M.; Chanock, R.M.; Melnick, J.L.; Monath, T.P.; Roizmanand, B. and Straus, S.E. (1996). *Field S Virology*, 3rd edn. (two Vol.set); Lippincott- Raven, Philadelphia, PA; 3216.
- Chopra, R.N.; Nayar, S.L. and Chopra, I.C. (1956). *Glossary of Indian medicinal plants*. Publications and Information Directorate (CSIR), Hill side road, New Delhi India.
- Cotton, C.M. (1996). *Ethnobotany: Principles and Applications* (John Wiley and Sons, Ltd, Chichester, New York).
- Dupare, D.B. (2016). some common medicinal plant recurring jaundices disease as future source of drugs. *Biolife*, 4(1): 94-99.
- Ekka, A. (2013). Some rare plants used by hill- Korwa in their healthcare from Chhattisgarh. *Int. J. LifeSc. Bt & Pharm*. 2(1): 198-203.
- Harsha, V.H.; Hebbbar, S.S.; Hedge, G.R. and Shripathi, V. (2002). Ethnomedical knowledge of plants used by Kunabi tribe of Karnataka in India. *Fitoterapia*, 73: 281-287.
- Harsha, V.H.; Hebbbar, S.S.; Shripathi, V. and Hedge, G.R. (2003). Ethnomedicobotany of Uttara Kannada district in Karnataka, India-plants in treatment of skin diseases. *Journal of Ethnopharmacology*, 84: 37-40.
- Hazarika, R.; Singh, S.K.; Abujam and Bijoy, N. (2012). Ethno Medicinal Studies of Common Plants of Assam and Manipur. *International Journal of Pharmaceutical & Biological Archives*, 3(4): 809-815.
- Hung, L.N.; Le. Huong, N.T. and Thuy An, N.T. (2015). Jaundice in Adult in-Patients at a Tertiary General Hospital. *Journal of Biosciences and Medicines*, 3: 1-11.
- Jain, S.K. (1986). Studies in Indian Ethnobotany-Less known uses of 50 common plants from tribal areas of Madhya Pradesh. *Bull. Bot. Surv. India.*, 5: 223-226.
- Jain, S.K. and De, J.N. (1966). Observations on Ethnobotany of Purulia, West Bangal. *Nelumbo- the Bulletin of the Botanical Survey of India*, 8 (3-4): 237-251.
- Jain, S.P. and Puri, H.S. (1984). Ethnomedicinal plants of Jaunsar- Bawar Hills, Uttar Pradesh, India. *Journal of Ethnopharmacology*, 12(2): 213-222.
- Jain, S.K. (1964). Wild food plants of tribals of Bastar (Madhya Pradesh). *Proc Natl. Inst Sci.*, 30 B: 5-80.
- Janghel, Vandana, P. Patel and Chandel, S.K. (2019). Plants used for the treatment of icterus (Juandice) in Central India: A reviews. *Annals of Hepatology*, 18: 658-672.

- Khandelwal, J.; Singh, K.R.; Sudipt, R. and Mita, K. (2014). Medicinal therapies in Veda. *Ayurpharm Int J Ayur Alli Sci.*, 3(2):35-40. .
- Lamont, J.T. and Isselbacher, K.J. (1973). Postoperative Jaundice. *N Wngl J. Med.*, 288: 305-307.
- Lavate, R.; Sanjay, S.S. and Patil, S.B. (2015). International Journal of Chemical Science and Technology (ISSN: 2248-9797) 5(4): 409-412.
- Lone, Z.A.; Lone, Y.; Khan, S.S.; Wani, A.A. and Reshi, M.I. (2015). Hepatoprotective medicinal plants used by the Gond and Bhill tribals of district Raisen Madhya Pradesh India. *Journal of Medicinal Plants Research*, 9(12): 400-406.
- Mahant, S.D. (2015). Indigenous Traditional Healing Care: Belief & Practices among Tribals of South Bastar in Chhattisgarh. *IOSR Journal of Humanities And Social Science (IOSR-JHSS)*, 20(1): 49-54.
- Mohammad Sadeq M.S. Amiri, Reza, R.M.; Joharchi, M.R.; Yazdi, M. and T. Ehsan (2014). Ethno-Medicinal Plants Used to Cure Jaundice by Traditional Healers of Mashhad, Iran. *Iranian Journal of Pharmaceutical Research*, 13(1): 157-162.
- Mulay, J.R. and P.P. Sharma (2013). Plants Used in Treatment of Jaundice by Folklore of Ahmednagar district, Maharashtra, India. *Science Research Reporter*, 3(2): 216-222.
- Naikade, S.M. and Meshram, M.R. (2014). International Journal of Pharmaceutical Science Invention ISSN (Online): 2319 – 6718, ISSN (Print): 2319 – 670.
- Naikade, S.M. and Meshram, M.R. (2014). Ethno-medicinal plants used for Jaundice from Konkan Region, Maharashtra, India. *International Journal of Pharmaceutical Science Invention*, 3(12): 39-41.
- Nath, V. and Khatri, P.K. (2010). Traditional knowledge on ethno-medicinal uses prevailing in tribal pockets of Chhindwara and Betul Districts, Madhya Pradesh, India. *African Journal of Pharmacy and Pharmacology*, 4(9): 662-670.
- Panda, A.K.; Bhuyan, G.C. and Rao, M.M. (2017). Ayurvedic Intervention for Hepatobiliary Disorders: Current Scenario and Future Prospect. *J Tradit Med Clin Natur*, 6: 210.
- Panigarhi, G. and Murti, S.K. (1989). Flora of Bilaspur District of Madhya Pradesh, 1: 46-71.
- Panigrahi, G. and Murti, S.K. (1989). Flora of Bilaspur district, M.P. Vol.I, B.S.I. Calcutta.
- Paul Thesia St. and Himatnagar Xavier's, (2014). Ethno-Therapeutic Remedies for JAUNDICE, in Dang Dt. Gujarat, India
- Pei, S.J. (2001). Ethnobotanical approaches of traditional medicine studies some experiences form Asia. *Pharm. Biol.*, 39: 74-79.
- Pohekar, H.R. (2018). Ethno medicinal plants used to cure jaundice by traditional healers kamtee tehsil, ms, India. *Life Science Informatics Publications, RJLBPCS*, 4(6): 287-292.
- Rahmatullah, M.; Ferdausi, D.; Ariful, M.H.; Rownak, J.; Chowdhury, M.H. and Haque, W.M. (2009). Department of Biotechnology & Genetic Engineering, University of Development Alternative House No. 78, Road No. 11A (new), Dhanmondi R/A, Dhaka-1205, Bangladesh 2New York City College of Technology, Brooklyn, NY 11210, USA. *CAM* (2010) 7(2): 91–97.
- Rossato, S.C.; Leitao-Filho, H. and Gegossi, A. (1999). Ethnobotany of Caicaras of the Atlantic forest coast (Brazil). *Econ. Bot.* 53: 387-395.
- Sadegh, A.M.; Joharchib, M.R. and TaghavizadehYazdic, M.A. (2014). Ethno-Medicinal Plants Used to Cure Jaundice by Traditional Healers of Mashhad. *Iranian Journal of Pharmaceutical Research*, 13(1): 157-162.
- Samy, P.R. and Ignacimuthu, S. (2000). Antibacterial activity of some of folklore medicinal plants used by tribals in Western Ghats of India. *Journal of Ethnopharmacology* 69: 63–71.
- Samy, P.R. and Ignacimuthu, S. (1998). Screening of 34 Indian medicinal plants for antibacterial properties. *Journal of Ethnopharmacology*, 62: 173–182.
- Sarkhel, S. (2015). Ethnomedicinal Uses of Some Plants in Treatment of Jaundice by Tribal Communities of Paschim Medinipur District, West Bengal, India, *Med Aromat Plants*, 4: 205. Doi: 10.4172/2167-0412.
- Shali, S.; Rao, T.; Ravi, P.B.; Venkateswarlu, M. and Swamulu, M. (2018). Medicinal plants used for jaundice by the tribal people of nallamalais in Andhra Pradesh. *Journal of Pharmacognosy and Phytochemistry*, 7(4): 528-531.
- Sharma, B.; Ramashanker, K.; Ghosh, S.; Rahaman, L.; Nath, N. and Kaipeng, D.L. (2016). Plant based folk treatments from North East India for Jaundice. *Journal of Medicinal Plants Studies*, 4(5): 234-247.
- Sinha, M.K.; Patel, D.K. and Kanungo, V.K. (2012). Medicinal plants used as antidotes in northern part of Bastar district of Chhattisgarh. *Journal of Ecobiotechnology*, 4(1): 58-60.
- Sinha, M.K.; Kanungo, V.K. and Naik, M.L. (2016). Ethnobotany in Relation to Health Security in District Bastar of Chhattisgarh State, India. *Int. J. Curr. Res. Biosci. Plant Biol.*, 3(5): 120-126.
- Verma, D.M.; Balkrishna, N.P. and Dixit, R.D. (1993). Flora of Madhya Pradesh (Botanical Survey of India), Vol.1.
- Wester, L. and Yongvanit, S. (1995). Biological diversity and community lore in northeastern Thailand. *Journal of Ethnobiology*, 15: 71-88.
- WHO, World Health Organization (2002). Traditional Medicine Strategy Report, Document WHO/EDM/TRH/.