



E-ISSN: 2278-4136

P-ISSN: 2349-8234

<https://www.phytojournal.com>

JPP 2024; 13(2): 605-619

Received: 10-01-2024

Accepted: 15-02-2024

**Oshin Bajrang**

Ph.D. Research Scholar, S.O.S in Anthropology, Pt. Ravishankar Shukla University Raipur, Chhattisgarh, India

**Dr. Jitendra Kumar Premi**

Professor, S.O.S in Anthropology, Pt. Ravishankar Shukla University Raipur, Chhattisgarh, India

## Ethnomedicinal practices regarding curing of chronic fever among the tribes of North Chhattisgarh, India

Oshin Bajrang and Dr. Jitendra Kumar Premi

DOI: <https://doi.org/10.22271/phyto.2024.v13.i2d.14900>

**Abstract**

**Introduction:** The Present article is an empirical investigation of the traditional health seeking practice among the tribal people of North Chhattisgarh of India. It is an attempt to explore the traditional healing practice and traditional knowledge system of the medicinal plant species utilized by traditional healers of North Chhattisgarh for the treatment of chronic fever.

**Objective:** The objective of the present research is to discover and analyses the traditional medicinal practice to cure chronic fever and to find out the phytochemical and medicinal properties of traditional medicine among the tribal of North Chhattisgarh, India for curing chronic fever.

**Methodology:** The traditional healers among the various tribes of North Chhattisgarh were chosen as key informants by using purposive sampling techniques from Raigarh and Korba district of Chhattisgarh, India. The intensive interview was taken to the selected traditional healer by using the interview guide and focused group discussion (FGD).

**Result:** Total 25 medicinal plants and 11 type of medicine are being used for the treatment of chronic fever by the tribal healers of North Chhattisgarh. The quantum of used herbs, method of preparation, direction of use of medicine, and prohibition during medication are discussed in present article. The medico-religious practices are also described in this article which is used to treat chronic fever. The phytochemical and medicinal properties of the medicinal plants which are used for curing chronic fever are find out with the help of earlier published sources. Most of the medicinal plants which have been used for curing of chronic fever are showed appropriate phytochemical and medicinal properties.

**Conclusion:** Present article explores abundance of traditional knowledge on medicinal plants and magico-religious belief which are responsible in treating chronic fever among the tribal and it also shows the trust and relation between nature and tribal hence it can be concluded that knowledge of medicine related with plants and spiritual practice is a part of folk medicine or ethno-medicine, on the basis of above mentioned data described in present article, it can infer that folk medicinal knowledge among tribal of North Chhattisgarh is eventually rich and commendable even though considered as backward socio-economic ethnic groups, hence medicinal plants represented in present article should be given a scientific recognition by executing phytochemical, pharmacological and molecular test and with those results it should be introduced as a drug to cure chronic fever and accompanying with this, royalty should be given to the tribal of these medicine and therefore further studies in this topic appear necessary.

**Keywords:** Ethnomedicine, chronic fever, tribes, Chhattisgarh, India

**Introduction**

Petersdorf and Beeson in 1961 were the first to define fever of unknown origin in which they state that it is a febrile illness, in which body temperature must be 101°F or 38.3 °C or may be higher, where the fever must have duration of three weeks and also with one week of hospitalization <sup>[1]</sup>. However even before the first definition of fever of unknown origin, men used to cure their illness with the traditional and indigenous knowledge of herbs and this knowledge is still beneficial to the modern society for various health ailments.

It is mentioned in many literature that use of herbs is prominent and it plays an important role in medicine <sup>[2]</sup>. However, tribal have been using herbal medicine to treat health related ailments for long time. According to Warren 1991, "Indigenous knowledge is a local knowledge that is unique to a given culture or society. Indigenous knowledge is quite contrasted in comparison to the International knowledge system generated by Universities and Research Institution. It is the basic for local level decision making in agriculture, health care, food preparation, education, natural resource management and as a host of other activities in rural communities" <sup>[3]</sup>. Hence ethno-medicine is a form of Indigenous knowledge among the ethnic communities and passes through generation to generation to their successors.

**Corresponding Author:****Oshin Bajrang**

Ph.D. Research Scholar, S.O.S in Anthropology, Pt. Ravishankar Shukla University Raipur, Chhattisgarh, India

According to WHO, Health has defined as “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” [4]. WHO has also stated that, ethno-medicinal knowledge is a collection of traditional knowledge which includes folk medicine and information on pharmaceutical properties, remedies and associated belief in folk medicine and health aliment [5]. In 2015, according to WHO, the importance of folk medicine has a huge importance in health care delivery system and it is also one of habitual form of practice while using herbal plants [6]. Similarly and 2018, WHO asserts that folk medicines are worldwide commonly utilized by people due to being safe, non-toxic and easily affordable and it encourages and is sustainable for good health [7]. WHO *et al.* 1993 shows its concern that there is still lack of research conducted and documented regarding folk medicine despite of being rich in information and useful for future generation [8]. WHO 2002, preference given to folk medicine is very common among rural communities due to easily availability of folk healers and availability of herbal plant nearby [9].

From few years the attention towards use of ethnobotanical details among the researcher of medicine has been seeking huge recognition [10]. Using natural products for treatment of health ailments are lesser toxic and hence using chemical drug people prefer natural medicine to treat illness [11]. Uses of plant are safe and usually simply attainable locally for the treatment of various illnesses [12]. It is very obvious that herbal medicine are non-toxic or lesser toxic, easily available and merely inexpensive and reasonable which is one of the common reason for using ethno-medicine [13].

It is one of the basic truths of life that, one who has taken birth during its life cycle from birth to death, an individual has to face various health issues. Every household is rich with home remedies for common health problems which were traditionally orally passed generation to generation and it is said to be traditional knowledge. Before the invention of modern health services, man has faced various diseases and health issue were solved and treated by herbal health practitioners, every community has traditional knowledge to deal with health ailments. In modern world, there are various

ethnic community residing in forest and who have vast traditional knowledge on health care system by the use of folk medicine.

### Objectives

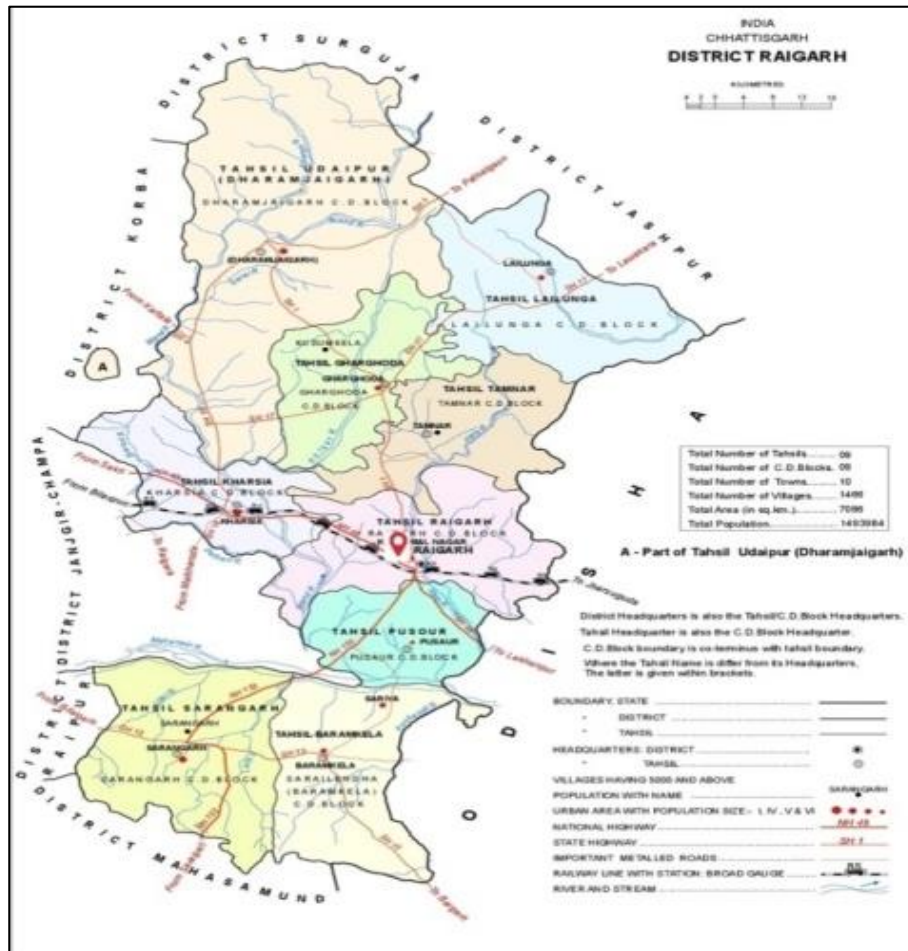
1. To discover the traditional medicine for the curing of Chronic Fever among the tribes of North Chhattisgarh, India.
2. To find out the phytochemical and medicinal properties of the traditional medicine used by tribal of North Chhattisgarh, India for curing the Chronic Fever.
3. To preserve the Indigenous Medicinal Knowledge System (IMKS) through its written documentation.

### Materials and Methods

#### Area

Present research is conducted among the traditional healers of Korba and Raigarh district of Chhattisgarh (India), Data and facts of this research is based on primary data as well as secondary data therefore the information for primary data were especially collected from Katghora block and Korba tehsil of Korba district and Raigarh tehsil of Raigarh district. District Korba comes under Bilaspur division and is mainly inhabited with tribal population, Korba is located at 22.35°North latitude and 82.68° East longitude, altitude is 316 meter, it lies in plateau from Maikal ranges of Satpura hills which is low and high and open, major rivers of this district are Hasdev and Ahiran river, this district falls under hot and temperate zone and has extreme dry and hot climate, average rainfall is 1506.7 mm and Hasdeo river is main river which is tributary of Mahandi river, Korba district is rich in terms of forest wealth and Hill Korwa and Birhor are major tribal groups of this district [14]. Raigarh district is located at 21.9°N 83.4°E, main water source in this area is from Kelo river which flows through city, Climate of Raigarh varies from months and seasons in Summer temperature lies between 49 °C to 21 °C, and in winter it lies between 25 °C to 8 °C. Similarly with the help of online journals useful secondary facts about phytochemical and medicinal properties of medicinal plants are illustrated in present research [15].





Map of Chhattisgarh [16] Map of Raigarh district [17] Map of Korba district [18]

## People

The present study has been executed to collect ethno-medicinal knowledge among the folk healers of study area, a brief description of study people are described below:

**Birhor:** Birhor are indigenous tribal groups of Chhattisgarh, they mostly resides in the region of Raigarh, Korba and Jashpur district, Birhor referes to “*Banchar/Vanchar*”, they are included in PVTGs groups who are specially recognized and guarded by government of India. On the basis of Census of India 2011, total population in Chhattisgarh is around 3104, out of which 1526 are male and 1578 are female [19].

**Nagesia:** Nagesia are one of the tribal population in Chhattisgarh which are mainly found in Raigarh and Sarguja district, on the basis of census of India 2011, total population of Nagesia tribe in Chhattisgarh is around 114,532, out of which 57,536 lives in rural area and 56996 lives in Urban area [19].

**Gond:** Gonds are the largest tribal groups in South Asia and as well as India, according to the Census 2011, the total population of Gonds in Chhattisgarh is about 4,298,404 where 166 and in Korba district it is 180,485 out of which 90,322 are males and 90,163 are females and about 166,059 lives in rural area and 14,426 lives in urban area [19].

## Tools used for collection of data and facts

A qualitative research approach was used with the help of semi-structured interview guide, the interview of five experienced healers were approached from Korba and Raigarh district, a Birhor healer who lives in Mudhpaar village of Korba tehsil was interviewed as they were practicing healing through folk medicine. Rajgond tribal healer from village Chandanpur of Katghora block was interviewed; he was well known to treat chronic fever like typhoid, malaria, dengue and fever due to evil-eye through his “*Devi-ke-Bol*” ritual. Nagesia tribal healer from Lochan Nagar of Raigarh tehsil was interviewed, he was well known for his folk medicine and home remedies for curing fever, chronic fever and other health ailments.

## Result

### Method of diagnosis of fever by traditional fever

A person body temperature is identified different than normal which is higher than usual body temperature, person wrist is touched and for 30-40 sec to determine they have fever or not, by sensing veins infirmity of body is identified by traditional healers hence in this process they sense the speed inside body and on the basis of their knowledge the intensity of ailment is diagnosed.

### Technique of maintaining body temperature during fever

- 1. By uses of Calabash (*Lagenaria siceraria*):** In this practice, when body temperature of person is higher, a slice of Calabash (*Lauki*) is placed into the feet and tied it with piece of cloth or shocks overnight, it helps in cooling down the body temperature of person.
- 2. By uses of Onion (*Allium cepa*):** In this practice, onion juice is rubbed all over foots and hands of person and which helps to cool down the body temperature.

### Medicines used to curing fever and chronic fever

Traditional healers have been curing health ailments from centuries ago, various herbs and shrub with a long haul, tribal

population resides in geography with rich in flora and fauna, present study made an attempt to know indigenous belief regarding curative methods used by folk healers for fever as well as chronic fever, in this study it was found that total eleven type of medicine were used to treat fever and chronic fever where mixture of plant herbs and substances were used in one medicine correspondingly Hemlatha and Reddy (1982) worked among a hill tribe of Ahobilam on folk medicinal practices and found variety of plant species which was used to cure various health ailments [20]. The present article describes total 11 medicines which were made by various parts of 25 distinct medicinal plants for curing fever and chronic fever are as follows:

### Medicine for Chronic fever

#### Medicine No.1 (Giloy, Daruhaldi, Dhamgajra, Tulsi)

**Ingredients:** 1. Giloy (*Tinospora cordifolia*) 2. Daruhaldi (*Berberis aristata*) 3. Dhamgajra (*Fumaria indica*) 4. Tulsi (*Osimum santum*)

**Quantity of used herbs/substance:** 200 gm of dried Giloy steam, 200 gm of Daruhaldi, 100 gm of Dhamgajra and 100 gm of Tulsi leaf.

**Method of Preparation:** All the ingredients are collected and grinded to form a paste which is mixed in 1 liter of water in clay pot furthermore early morning it is boiled in clay pot until it becomes half and kept it to cool at room temperature.

**Method of Use:** Prepared syrup is taken orally with lukewarm water.

**Dosage:** Twice a day for 10 days in a row.

**Prohibition:** Cold or frizzy water is prohibited to drink, Stale food and fast foods are prohibited, Alcohol/Ciggrates/Gutka are prohibited during medication.

#### Medicine No. 2 (Laung, Kalimirch and Baheda)

**Ingredients:** 1. Laung (*Syzygium aromaticum*) 2. Kalimirch (*Piper nigrum*) 3. Baheda (*Terminalia bellirica*)

This medicine is used to treat chronic fever with cough.

**Quantity of herbs/substances used:** 200 gm of Laung, 50 gm of Kalimirch, 300 gm of Baheda.

**Method of Preparation:** All ingredients are crushed together to form a powder.

**Method of Use:** One tablespoon of powder is taken orally with lukewarm water.

**Dosage:** Three times a day for 5 days.

**Prohibition:** Same as Medicine no.1.

#### Medicine No. 3 (Giloy, Tulsi, Neem, Haldi, Kutki, Laung, Daalcheeni and Bamri/Babool)

**Ingredients:** 1. Giloy (*Tinospora cordifolia*) 2. Tulsi (*Ocimum sanctum*) 3. Neem (*Azadiracta indica*) 4. Haldi (*Curcuma longa*) 5. Kutki (*Picrorhiza kurroa*) 6. Laung (*Syzygium aromaticum*) 7. Daalcheeni (*Cinnamomum verum*) 8. Mulethui (*Glycorrhiza glabra*) 9. Bambri/Babool (*Vachellia nilotica*)

This folk-medicine is used to treat chronic fever with dengue or malaria **Quantity of herbs/substances used:** five stems of

Giloy of about 4-5 cm length, 5 gm of Tulsi leaves, 5 gms of Neem leaves, two tablespoon of haldi, 5 gm of Kutki, 5 gm of Laung, 5 gm of Daalcheeni, 5 gm Mulethi, 3 barks of Babool of about 4-5 cm in length.

**Method of Preparation:** All the Ingredients are air dried and mixed all to form a fine powder in Mortar.

**Method of Use:** One and half tablespoon of powder of mixed herbs is mixed in 100ml of water.

**Dosage:** Taken three times a day for 5 days.

**Prohibition:** Same as Medicine no.1.

**Medicine No 4. (Ganjhak, Ghorbhaj, Devnashak, Bhootnashak, Jogilat, Vidyanashak, Indrajaa)**

**Ingredients:** 1. Ganjhak (Unknown) 2. Ghorbhaj (Unknown) 3. Devnashak (Unknown) 4. Bhootnashak (Unknown) 5. Jogilat (Unknown) 6. Vidyanashak (Unknown) 7. Indrajaa (Unknown).

This medicine is used to cure chronic fever (mainly typhoid fever).

**Quantity of herb/substance used:** 5 stems of each ingredient about 10 cm in length is used in equal amount.

**Method of Preparation:** All the ingredients are sun dried for 2 days, grinded and mixed all together to form a powder.

**Method of use:** Taken one full tablespoon of powder orally in empty stomach.

**Dosage:** Taken two times a day for 7 days.

**Additional practice:** Tabeez is given to the patient for the protection from evil eye

**Prohibition during medication:** Same as Medicine no.1.

**Medicine No.5 (Haldi, Amarbel, Mahua kebanda)**

**Ingredients:** 1. Haldi (*Cucurma longa*) 2. Amarbel (*Cuscuta reflexa*) 3. Mahua (*Madhuca longifolia*) natural resin.

This medicine is used to cure chronic fever (mainly Jaundice fever).

**Quantity of herb/substance used:** Three sticks of dried haldi, 5 sticks of dried amarbel and and 7 Mahua banda or natural resin of Mahua tree.

**Method of Preparation:** All the ingredients are sun dried and mixed all together to form a powder.

**Method of Use:** One tablespoon of powder is taken with 1 glass of milk in empty stomach.

**Dosage:** Two times a day for 8-9 days.

**Prohibition during medication:** Same as Medicine no.1.

**Medicine No. 6 (Laung, kalimirch, Baheda, Kali katha and Bamri/Babool)**

**Ingredients:** 1. Laung (*Syzygium aromaticum*) 2. Kali mirch (*Piper nigrum*) 3. Baheda (*Terminalia bellirica*) 4. Kali katha (*Acacia catechu*) 5. Bamri/babool (*Vachellia nilotica*)

This folk medicine is used to cure chronic fever.

**Quantity of herb/substances used:** 10 gm of Laung, 10 gm of Kali mirch, 20 gm of Baheda, 20 gm of Kali katha, 10 stiks of Babool 4-5cm in length.

**Method of preparation:** one litre of water is boiled in mud pot with all ingredients in it for about 3-4 hours until the syrup becomes its half.

**Method of Use:** Syrup is taken orally with lukewarm water.

**Dosage:** Two to three times a day for 7 days.

**Prohibition during medication:** Same as Medicine no.1.

**Medicine for Typhoid fever**

**Medicine No 7 (Pakdol and Bhakdol)**

**Ingredients:** 1. Pakdol (Unknown) 2. Bhakdol (Unknown).

This folk medicine is use to cure typhoid fever.

**Quantity of herb/ substance used:** 1-2 cm of Pakdol and 1-2 cm of Bhakdol in length.

**Method of Preparation:** Both the ingredients are grinded in Mortar/sillbatta to form a paste.

**Method of use:** Freshly prepared paste is taken orally in empty stomach 1 hour before meal in morning as well as in evening.

**Dosage:** Two times a day for 2-3 days.

**Prohibition during medication:** Same as Medicine no.1

**Medicine No.8 (Giloy stem, Bamribarkand Hing)**

**Ingredients:** 1. Giloy (*Tinospora cordifolia*) 2. Bamri/Babool (*Vachelliantia nilotica*)

3. Hing (*Asafoetida*).

**Quantity of used herbs/substance:** 50 gm of air dried Giloy stems, 30 gm of Babool bark and 1 tablespoon of Hing.

**Method of Preparation:** In this practice, dried stems of Giloy, hing and babool bark are grinded in mortar and a powder is formed.

**Method of use:** One full spoon of above mentioned powder is taken orally with lukewarm water.

**Dosage:** Two times a day for 5 days in a row.

**Prohibition:** Cold or frizzy water is prohibited to drink, Stale food and fast foods are prohibited, Alcohol/Ciggrates/gutka are prohibited during medication.

**Medicine No.9 (Sarso and Khoobkala)**

**Ingredients:** 1. Sarson (*Brassica junacea*) 2. Khoobkala (*Sisymbriumiro*)

This medicine is used to treat Typhoid fever.

**Quantity of used herbs/substances:** Two tablespoon of sarsoon and Khoobkala are used.

**Method of Preparation:** Both the Ingredients grinded in mortar and a paste formed.

**Method of Use:** One tablespoon of paste is taken orally with lukewarm water.

**Dosage:** Thrice a day for about 3-4 days in a row.

**Suggestion:** Supplements like fruits and boiled vegetables are suggested to eat during medication.

**Prohibition:** Same as Medicine no.1.

### Medicine for Fever and cold

#### Medicine No.10 (Anjwin and Gud)

**Ingredients:** 1. Anjwain (*Trachyspermum ammi*) 2. Gud (*Saccharum officinarum*).

This medicine is used to cure common fever, cough and cold. Quantity of herb/substance used: 15 gm of Anjwain and 15 gm of Gud.

**Method of Preparation:** Roasted anjwain is crushed into powder and mixed with old-gud and formed as a laddus/balls.

**Method of use:** One laddu is consumed every morning in empty stomach.

**Dosage:** Taken once in a day every morning for 8-10 days. Prohibition during medication: Same as Medicine no.1.

#### Medicine No.11 fever with boils and rashes in skin with traditional ritual (Nariyal and Hinglaaj)

**Ingredients:** 1. Nariyal (*Cocos nucifera*) 2. Hinglaaj (*Cassia alata*).

This medicine is used to cure.

Quantity of herb/substance used: two and half raw leaf of Hinglaaj and one Coconut.

**Traditional ritual:** Mantras are enchanted by the healer for five days to tribal goddess (devi) to honor and please her and Nariyal is offered to devi.

**Method of Preparation:** Two and half raw leaf is used.

**Method of Use:** Leafs are taken orally, after 5 days of ritual nariyal is broken into pieces and firstly offered to goddess and distributed to devotees.

**Dosage:** Once in a day (morning) for 5 days.

**Prohibition during medication:** Same as Medicine no.1.

### Magico-religious practices for healing chronic fever

Traditional system of treating health ailment with magico-religious practice is one of the common practices seeing among tribal and rural areas of Chhattisgarh, traditional healers are called as Baiga/Baba. Similarly previous studies found that includes treatment of health ailments by folk healer are discussed, Hemlatha and Readdy (1982) observed used of magico-religious practice where when chronic fever which is

not cured with medicinal plant is treated by fighting sorcery of evil spirit<sup>[20]</sup>. Verma *et al.* studied under home remedies, magico-religious treatment for various health ailments including fever among Nicobarese of Car Nicobar, as they believe supernatural powers are responsible for health related issues and the witch doctor who treats and have power to recognize evil spirit are called tamluono or totorong<sup>[21]</sup>. Similarly present study describes three magico-religious practice which is used to treat chronic fever due to sorcery of evil spirit among tribe of North Chhattisgarh.

- 1. Baan-maarna:** After several medications and even hospitalization, if fever does not cool down it is estimated that someone had witch crafted evil eye to harm the individual, hence baan-marna is performed to reverse the witchcraft, in this procedure firstly alcohol is dipped in a Babool stick and manta/hymn is uttered for 10-12 minutes to remove toxic elements from body, as a result physical elements like stone, pin, hair or other is removed from inside body of patient embedded inside body through witchcraft by enemy.
- 2. Jhaar-phook:** It is believed that, fever like typhoid and jaundice are not able to get cured with medication and hospitalization, hence necessary Jhaadphook is required to cool down the fever with typhoid/jaundice, hence 5 day jhaadphook is performed with cowdung ash and Pakdol and bhakdol herbs to treat chronic fever among the infected individuals.
- 3. Devikebol:** Traditional healer in Katghora district, who treats locals and even outsiders with typhoid and other chronic fever by enchanting mantra, firstly the infected individual or their family members are required to offer agarbatti and nariyal to *baba/traditional healer*, secondly agarbatti is enlightened and after some procedure the healer identifies disease or problem of individual however with the permission granted by Devi, rituals are performed by healer and ash of agarbatti is given for a safeguard.

### Phytochemical properties and medicinal properties of the medicinal plants used for curing chronic fever

The phytochemical properties and medicinal properties are described in the table no. 1; the phytochemical properties are cited from various previous studies which have been published by various plant scientists, pharmacologist, biochemist, phytochemist, biotechnologist and the botanist. The phytochemical properties are described separately by - flower (1), climber (1), seeds (3), fruits (3), Bulb (1), stem/bark (8), roots/rhizome (5), leaves (4), Natural resin (1). Herewith secondary article on lauki (6), onion (4), giloy (3), bamri (2), hing (3), daruhaldi (2), dhamgajra (4), tulsi (2), sarson (4), jungle sarson (5), laung (8), golki (6), baheda (5), neem (8), haldi (7), kutki (8), daalcheeni (9), mulethi (9), kalikatha (5), anjwain (4), gud (6), amarbel (4), mahua (5), nariyal (5) and hinglaaj (6) are utilized to describe the phytochemical properties and medicinal properties of plant parts used as medicine by folkhealers.

**Table 1:** Phytochemical properties and medicinal properties of herbs/substances used by tribal healers are reflected.

S. No	Local Name of plants	Scientific name of plant	Parts of plant used as a medicine	Phytochemical properties	Medicinal properties	References
1	Lauki/ Dudhi/ Tuma	<i>Lagenaria siceraria</i>	Fruit	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present	Antiperglycemic activity, Antioxidant activity, Antihyperlipidemic effect	Kumar <i>et al.</i> (2015) <sup>[22]</sup> Kubde <i>et al.</i> (2010) <sup>[23]</sup> Olanipekun (2023) <sup>[24]</sup> AbdEl-Rahman <i>et al.</i> (2021) <sup>[25]</sup>
2	Onion	<i>Allium cepa</i>	Bulb	Tannins- Present Alkaloids - Present Flavonoid- Present Steroidal- Present Pyruvic acid- Present Triterpenoids- Present	Antimicrobial effects, wound healing, Antiplatelet activity, Antiparasitic effect, Bone disorder treatment, Antidepressant effect, Anti-inflammatory effect, Insecticidal effect, Immuno modulatory effect, Hepatoprotective effect.	Chakraborty <i>et al.</i> (2022) <sup>[26]</sup> Matrella <i>et al.</i> (2022) <sup>[27]</sup> Kumar <i>et al.</i> (2022) <sup>[28]</sup> Greeshma <i>et al.</i> (2020) <sup>[29]</sup>
3	Giloy	<i>Tinospora cordifolia</i>	Stem/root/leaf	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Saponins- Present	Anti-inflammatory, antioxidant, anti-allergic, properties, antifungal, antibacterial	Verma <i>et al.</i> (2020) <sup>[30]</sup> Promila <i>et al.</i> (2017) <sup>[31]</sup> Nazir and Chauhan (2018) <sup>[32]</sup>
4	Bamri/ Babool	<i>Vachellia nilotica</i>	Bark/stems	Tannins- Present Alkaloids- Present Phenol- Present Flavonoid- Present Glycosides- Present Saponins- Present Terpenoids- Present	Antimicrobial activity, anti-inflammatory effect, Antioxidant, anti-diarrheal,, antibacterial, antibacterial	Abdalla <i>et al.</i> (2020) <sup>[33]</sup> Rather <i>et al.</i> (2015) <sup>[34]</sup>
5	Hing	<i>Asafoetida</i>	Rhizome/root	Tannins- Present Phenol- Present	Anti-oxidants, Antimicrobial, Antiviral, Antifungal, relaxant effect, hypertensive, antiviral activity	Amalraj <i>et al.</i> (2017) <sup>[35]</sup> Chaudhry <i>et al.</i> (2021) <sup>[36]</sup> Iranshahy <i>et al.</i> (2011) <sup>[37]</sup>
6	Daru haldi	<i>Berberis aristata</i>	Roots	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Saponins- Present Carbohydrate- Present Oxyberberine- Present Berbamine- Present Aromoline- Present Palmatine- Present Oxycanthine- Present Taxilamine- Present Sugar- Present Starch- Present	Antimicrobial, anti-depressant, Immunomodulatory activity	Mazumder <i>et al.</i> (2011) <sup>[38]</sup> According to research by MarAna <i>et al.</i> (2017) <sup>[39]</sup>
7	Dham gajra	<i>Fumaria indica</i>	Leaves/stem	Tannins- Present Alkaloids - Present Flavonoid- Present Glycosides- Present Steroidal- Present Saponins- Present Triterpenoids- Present Anthraquinones- Present Sugar- Present Starch- Present Carbohydrate- Present	Smooth muscle relaxant activity, Hepatoprotective activity, , Anti-inflammatory , antioxidant activity, Antibacterial activity, Antifungal activity Antipyretic, hepatoprotective, hypoglycemic, anti-diarrheal, skin infection, Gastroprotective activity, anti-inflammatory and Analgesic activity Anti-hypertensive activity, antianxiety, anti-inflammatory.	Guna (2017) <sup>[40]</sup> Shakya <i>et al.</i> (2012) <sup>[41]</sup> Gupta <i>et al.</i> (2012) <sup>[42]</sup> Ghumare <i>et al.</i> (2021) <sup>[43]</sup>

8	Tulsi	<i>Ocimum sanctum</i>	Leaves	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Saponins- Present Terpenoid- Present Cardio-Glycosides- Present Quinones- Present	Antiseptic, anti-inflammatory, anti-microbial, anti-stress, immunomodulatory, hypoglycemic, hypotensive and antioxidant activity antifungal, Insecticide, anti-ulcer, nematocide, antiviral, allergenic, analgesic, anaesthetic nematocide, anti-diarrheal	Saranya <i>et al.</i> (2019) <sup>[44]</sup> R and S.P (2018) <sup>[45]</sup>
9	Sarson	<i>Brassica juncea</i>	Seeds	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Saponins- Present	antiviral, antibacterial and anti-inflammatory effect, Antidepressant effect	Jahangir <i>et al.</i> (2009) <sup>[46]</sup> Tian <i>et al.</i> (2020) <sup>[47]</sup> According to the resaerch by Zilenska and others in 2014. <sup>[48]</sup> Mena <i>et al.</i> (2016) <sup>[49]</sup>
10	Junglee sarson	<i>Sisymbrium irio</i>	Seeds	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Saponins- Present Carbohydrate- Present Fatty acid- Present Protein- Present	Antimicrobial, antifungal, anti-inflammatory, anti-depressant, detoxify liver and spleen boils, pimples, cough and stomachic treatments	Butler and Feelisch (2008) <sup>[50]</sup> Tiwari and Bhargava (2021) <sup>[51]</sup> Hedgecoe (2003) <sup>[52]</sup> According to the research by Al-jaber in 2011 <sup>[53]</sup> Kim <i>et al.</i> (2021) <sup>[54]</sup>
11	Laung	<i>Syzygium aromaticum</i>	Flower /bud	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Saponins- Present	Antibacterial activity, Anti-oxidant activity, Anti-inflammatory activity, Anti-fungal activity, Nematicidal activity, Insecticidal activity	According to the research by El Gallab and others in 2019 <sup>[55]</sup> GULCIN (2004) <sup>[56]</sup> According to research by El-Saber and other in 2020 <sup>[57]</sup> Ojo <i>et al.</i> (2022) <sup>[58]</sup>
12	Golki/kali mirch	<i>Piper nigrum</i>	Fruit	Tannins- Present Alkaloids - Present Flavonoid- Present Glycosides- Present Steroidal- Present Amide- Present Lignans- Present Neolignans- Present Terpenes- Present Charcones- Present Carbohydrate- Present Starch- Present Protein- Present Fatty acid- Present Cardiac- glycosides- Present	Antimicrobial effect, intermitent fever, influenza, migraine, antibacterial activity, antioxidant, anti-inflammatory, antimicrobial, gastroprotective, insecticidal activity	Ashokkumar <i>et al.</i> (2021) <sup>[59]</sup> Sutaliya and Singh(2017) <sup>[60]</sup> Takooree <i>et al.</i> (2019) <sup>[61]</sup>
13	Baheda	<i>Terminalia bellirica</i>	Fruit	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Saponins- Present Carbohydrates- Present Terpenoids- Present Cardiac-glycosides- Present	Anti-diabetic, anti-microbial, anti-salmonella, anti-diarrheal antifungal, anti- antihypertensive, , antioxidant, antiulcer, wound healing, anti- cough, gastrointestinal disorder, clear bowels, dysentery, Immunomodulatory	Amalraj and Gopi (2017a) <sup>[62]</sup> Vemuri <i>et al.</i> (2019) <sup>[63]</sup> HAZRA K (2019) <sup>[64]</sup>



14	Neem	<i>Azadiracta indica</i>	Stem/branches	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Saponins- Present Protein- Present Carbohydrate- Present Terpenoids- Present Ketones- Present Carotenoids- Present	Antimicrobial property, antibacterial activity, immunomodulatory, anti-inflammatory, antiulcer, antimalarial, antifungal, antibacterial, antiviral, antioxidant, anti-malarial, antiprotozoal, antioxidative.	Mariana <i>et al.</i> (2017) <sup>[65]</sup> S. <i>et al.</i> (2020) <sup>[66]</sup> Sandhir <i>et al.</i> (2021) <sup>[67]</sup> Hikambo <i>et al.</i> (2022) <sup>[68]</sup>
15	Haldi	<i>Curcuma longa</i>	Roots/rhizome	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Cucuminoids- Present Treprenoids- Present Phytosterols- Present Protein- Present Amino acid- Present Volatile oil- Present	antimicrobial activity, antioxidant activity, anti-inflammmatory activity	Saharwat <i>et al.</i> (2018) <sup>[69]</sup> Rajagopal <i>et al.</i> (2020) <sup>[70]</sup> Shangvi <i>et al.</i> (2020) <sup>[71]</sup> Sivakumar <i>et al.</i> (2022) <sup>[72]</sup> Lim <i>et al.</i> (2022) <sup>[73]</sup> Sabir <i>et al.</i> (2020) <sup>[74]</sup> Nura <i>et al.</i> (2020) <sup>[75]</sup>
16	Kutki	<i>Picrorhiza kurroa</i>	Stem	Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Saponins- Present Protein- Present Carbohydrate- Present Terpenoids- Present Ketones- Present Carotenoids- Present Cucurbitacins- Present Iridoids- Present Picoside I, II- Present Kutkoside - Present Veronicoside- Present Pikuroside- Present Phenolglycosides- Present 4-hydroxy-3methoxy acetophenome- Present	Hepatoprotective, anti-cholestatic, antiulcerogenic, anti-inflammatory and immune regulatory antimicrobial, anti-amoebic, anti-oxidant, Lung fever	Bhatnagar (2021) [76] Rathee <i>et al.</i> (2016) <sup>[77]</sup> Verma <i>et al.</i> (2009) <sup>[78]</sup> Masood (2015) <sup>[79]</sup>
17	Daalcheeni	<i>Cinnamomum verum</i>	Bark	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Carbohydrates- Present Ligin, flavin, suberin are also present	Antimicrobial, antibacterial activity, anti-oxidant, anti-inflammatory, anticancer, antiseptic, antiviral, antifungal	Pathak and Sharma (2021) <sup>[80]</sup> Kaur <i>et al.</i> (2018) <sup>[81]</sup> Ahmed <i>et al.</i> (2020) <sup>[82]</sup> Sharifi-Raf, Quispe (2021) <sup>[83]</sup>
18	Mulethi	<i>Glycyrrhiza glabra</i>	Roots	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Saponins- Present Carbohydrates- Present Pectin- Present Protein- Present Starch- Present	Anti-depressant, antimicrobial, antioxidant, protective, anti-inflammatory, antiulcer	Sharma <i>et al.</i> (2021) <sup>[84]</sup> Sharifi-Rad <i>et al.</i> (2021) <sup>[85]</sup> Sharma <i>et al.</i> (2018) <sup>[86]</sup> Shah <i>et al.</i> (2018) <sup>[87]</sup>
19	Kali katha	<i>Acacia catechu</i>	Stems/ branches	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Carbohydrate- Present Toxifolin- Present	Dysentery, Diarrhea and in wound healing, Antioxidant, healing of sore throat, gingivitis, antidiabetic activity, effective in acne vulgaris. Effect in Intestinal problem, Immunomodulatory activity, and Antiulcer activity, anti-inflammatory	Kartik <i>et al.</i> (2014) <sup>[88]</sup> Devi <i>et al.</i> (2010) <sup>[89]</sup> Stohs and Bagchi (2015) <sup>[90]</sup> Sunil <i>et al.</i> (2019) <sup>[91]</sup> Kumari <i>et al.</i> (2022) <sup>[92]</sup>

20	Anjwain	<i>Trachyspermum ammi</i>	Seeds	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Saponins- Present protein- Present Thymene- Present Amino-acids- Present Cumene- Present Fiber- Present	anti-inflammatory, antioxidant, Antidiarrheal, gastroprotective, digestive stimulant action, detoxification of aflatoxins, ameliorative effect	Asif <i>et al.</i> (2014) <sup>[93]</sup> Bashyal and Guha (2018) <sup>[94]</sup> Kaur and Arora (2009) <sup>[95]</sup> Hossein and Shakha (2015) <sup>[96]</sup>
21	Gud	<i>Saccharum officinarum</i>	-	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Fatty acids- Present Phytosterols higher Terpenoids- Present Protein- Present	anti-inflammatory effect, antimicrobial activity, antioxidant	Bairwa <i>et al.</i> (2012) <sup>[97]</sup> Nayaka Ma <i>et al.</i> (2018) <sup>[98]</sup> Singh <i>et al.</i> (2015) <sup>[99]</sup>
22	Amarbel	<i>Cuscuta reflexa</i>	Climbers(aerial shoots)	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Glycosides- Present Steroidal- Present Carbohydrate- Present Protein- Present Saponins- Present Aminoacids- Present Terpenoids- Present	Antioxidant, antiradical activity, antibacterial, antimicrobial, antihypertensive, antiviral, antiworm, enzyme inhibition activity, antiinflammatory, wound healing, antihelmintic activity, antiviral	Rai <i>et al.</i> (2016) <sup>[100]</sup> Faizi <i>et al.</i> (2017) <sup>[101]</sup> Dar <i>et al.</i> <sup>[102]</sup> Gautam <i>et al.</i> (2015) <sup>[103]</sup>
23	Mahua	<i>Madhuca longifolia</i>	Natural resins	Tannins- Present Alkaloids - Present Flavonoid- Present Steroidal- Present Saponins - Present Folic acid- Present Lipid- Present Triterpenoid- Present	Therapeutic property, Analgesic property, antiulcer, antioxidant property, antimicrobial property, anti-depressant, antiulcer, immunomodulant, activity, antibacterial, antiulcer	Sinha <i>et al.</i> (2017) <sup>[104]</sup> Singh <i>et al.</i> (2020) <sup>[105]</sup> Mansuri and Yadav (2020) <sup>[106]</sup>
24	Nariyal	<i>Cocos nucifera</i>	Fruit	Tannins- Present Alkaloids - Present Phenol- Present Flavonoid- Present Resin- Present Steroidal- Present Terpenoids- Present Phlobatannins- Present Protein- Present Carbohydrate- Present	antioxidants, antibacterial, antioxidant, antiviral, antimicrobial	Sani <i>et al.</i> (2014) <sup>[107]</sup> Ghosh <i>et al.</i> (2014) <sup>[108]</sup>
25	Hinglaaj	<i>Cassia alata</i>	Leaves	Tannins- Absent Alkaloids - Present Phenol- Present Flavonoid- Present Cardio-glycosides- Absent	Antimicrobial, antioxidant, anti-inflammatory, antibacterial activity, wound healing, antifungal, Anti-malarial, antiviral activity, anti-inflammatory, antioxidant, antidiabetic, analgesic, antimicrobial, antiviral, antiulcer, antidepressant, anti-malarial.	Yadav <i>et al.</i> (2010) <sup>[109]</sup> Ahmed <i>et al.</i> (2016) <sup>[110]</sup> Oladeji <i>et al.</i> (2020) <sup>[111]</sup> Angelina <i>et al.</i> (2021) <sup>[112]</sup>

## Discussion

Medicinal knowledge that includes plants or any spiritual therapy to treat health ailment is a part of folk medicine and on exploring the phytochemical properties of above mentioned herb/substances, all of them are rich in tannins, alkaloids and other photochemical properties as well. Herbs are found to be also rich in many medicinal properties such as anti-inflammatory, antioxidant, immune-modulatory, antifungal, antibacterial mentioned in above table no.1 through exploring phytochemical and medicinal properties with the help of prior studies, where Babool was found antidiarrheal

[33, 34]. Tulsi was found anti-ulcer, antiviral as well as anti-diarrheal [44, 45], Jangli sarson was found to cure cough and boils [50-54]. Kali mirch was used to treat intermitent fever [59, 60], Baheda was found Anti-salomonella [62, 63], Neem was anti-malarial [65, 66], Kutki for lung fever [76] and Kali katha for the treatment of diarrhea [88]. Hemlatha and Reddy (1982) found fever was cured by use of decoction made by medicinal plants among tribes of Andhra Pradesh [20]. Chakroborty and Branter (2001) has scientific report which explains plants containing alkaloids and medicinal properties [113]. Zubair *et al.* (2015) folk medicinal practices plays vital role in

management and curing various health issues in Rural and remote areas of India <sup>[114]</sup>. Adhikari *et al.* (2010) states presence of active chemical constituents like alkaloids, saponins, tannins and others in various parts of plant have potential for the treatment of various health issues <sup>[115]</sup>. Nava Kr. Gamet *et al.* (2013) Medicinal pluralism was represented among Mising tribe of Majuli islands of Assam <sup>[116]</sup>. Wubu *et al.* (2023) conducted ethnobotanical study on traditional medicinal plants which were used in Kebridehar and Sherkosha district of Ethiopia, this study documented 44 medicinal plants and species used by local community to treat various health ailments, in this study Informant Consensus factor (ICF) values indicated the effectiveness of certain plants to treat and prevent malaria and fever, this study also provides valuable understanding on medicinal plants and importance of conserving medicinal plants for future generation <sup>[117]</sup>. Oladele *et al.* (2020) conducted a systematic review focusing on curative potential on Nigeria based medicinal plant to treat and battle against COVID-19 pandemic, this study focus attention on the importance of finding out possible substitute to treat COVID-19 through natural sources, this study discusses the antiviral properties of phytochemical properties found in medicinal plant and their potential to treat the effect of COVID-19 <sup>[118]</sup>. Manuel *et al.* conducted ethnobotanical study in Mogovolas district in Northern Mozambique and this study was executed in 14 villages where 16 traditional healers were included, study recorded total 37 plants belonging with 22 families for the treatment of malaria fever and this study highlighted importance of traditional medicine in primary health care and also further pharmacological studies on these identified medicinal plants for antimalarial activities is suggested <sup>[119]</sup>. Adi-Darko *et al.* (2021) conducted study a laboratory based study in Ghana, where MA001 is used to treat typhoid fever, MA001 formulated from various medicinal plants and the study suggested that the formulated solid dosage forms of MA001 have the potential to improve taste, stability and compliance in the treatment of typhoid fever infection <sup>[120]</sup>. Hence, further research should be undertaken to investigate in more detail on ethnomedicinal knowledge among the tribal healers of Chhattisgarh for the promotion of safe chemical drug free treatment of health ailments and for keeping the society healthy, on the basis of above secondary facts we can assume that these semi-literate tribal population have knowledge of medicinal plants from centuries ago which is surprising and interesting fact, hence further studies on this topic seems necessary.

## Conclusion

In the Present research it was found that there is abundance of folk-medicinal knowledge among the tribal healers of North Chhattisgarh, India for curing chronic fever. Tribal population mostly depends upon traditional medicine for health ailments, due to their low literacy and less economic condition they are considered to be underdeveloped, although in spite they are affluent in traditional knowledge of folk medicine or ethnomedicine. The interaction between nature and tribal must recognized with eminence because it convey ecological interaction with nature and with the similar approach present study discusses the folk medicinal knowledge of tribal in North Chhattisgarh. This paper not only explores the folk medicine and traditional practices along with the use of phytochemical, pharmacological and medicinal properties the present study analyze the scientific importance of herbs/substances. 1-flower, 1-climber, 3-seeds, 3- fruits, 1-bulb, 8-stem, 5-rhizome, 4- leaves, 1-natural resin kind of

parts and multi-plants were used in form of decoction, paste and powder to treat chronic fever. Somewhat due to modernization and influence of modern health system traditional knowledge of medicine is declining and disappearing. Importance of discussing the phytochemical and medicinal properties of herbs plays an important role because trusting and using any herb to treat health ailment is challenging and not an easy task. On the basis of above mentioned data described in present article, curiosity emerges after finding abundance of medicinal knowledge of plant species matches medicinal properties and phytochemical properties are also described in prior study, although they are considered as an extremely backward socio-economic ethnic group and hence it can infer that folk medicinal knowledge of Birhor, Gond and Nagesia tribe of North Chhattisgarh on chronic fever is rich and commendable. Medicinal plant represented in present article should be given scientific recognition by executing phytochemical, pharmacological and molecular test and on the basis of their result it should be introduced as a drug to cure chronic fever accompanying with this royalty should also be given to the tribal of these medicines.

## Reference

- Petersdorf RG, Beeson PB. Fever of Unexplained Origin: Report on 100 Cases. *Medicine (Baltimore)*. 1961 Feb;40(1):1-30. doi: 10.1097/00005792-196102000-00001.
- Hachi M, Hachi T, Essabiri H, El Yaakoubi A, Zidane L, Abba EH. Ethnobotanical study of medicinal plants in the Central Middle Atlas region (Morocco). *IOP Conf. Ser. Earth Environ. Sci.* 2022 Oct;1090(1):012027. doi: 10.1088/1755-1315/1090/1/012027.
- Warren DM. Using indigenous knowledge in agricultural development. In: *World Bank discussion papers*, no. 127. Washington, D.C: The World Bank; c1991.
- Constitution of the World Health Organization. Accessed: Mar. 21, 2024. [Online]. Available: <https://www.who.int/about/accountability/governance/constitution>
- Global Mental Health. Accessed: Mar. 21, 2024. [Online]. Available: <https://www.nvtg.org/bestanden/2020-mt-04-global-mental-health.pdf?cd=i>
- Biodiversity and Health. Accessed: Mar. 21, 2024. [Online]. Available: <https://www.who.int/news-room/fact-sheets/detail/biodiversity-and-health>
- WHO-HIS-SDS-2018.37-eng.pdf. Accessed: Mar. 21, 2024. [Online]. Available: <https://iris.who.int/bitstream/handle/10665/326299/WHO-HIS-SDS-2018.37-eng.pdf>
- Guidelines on the conservation of medicinal plants. Accessed: Mar. 21, 2024. [Online]. Available: <https://www.who.int/publications-detail-redirect/2831701368>
- Regional strategy for traditional medicine in the Western Pacific. Accessed: Mar. 21, 2024. [Online]. Available: <https://www.who.int/publications-detail-redirect/9290610115>
- Bain B, Premi JK. An investigation on the ethnogynecological medicinal knowledge of the Birhor tribe of Chhattisgarh, India. *Res. J. Pharm. Technol.* 2019;12(11):5138. doi: 10.5958/0974-360X.2019.00890.4.

11. Heinrich M. Ethnobotany and its role in drug development. *Phytother Res.* 2000;14(7):479-488. doi: 10.1002/1099-1573(200011)14:7<479::AID-PTR958>3.0.CO;2-2.
12. Shukla M, Begum YR, Mishra M. A Case study of medicinal plants used by local women for gynecological disorders in Karaikal (U.T. of Puducherry). *J Phytol.* November 2012. Accessed March 21, 2024. Available from: <https://updatepublishing.com/journal/index.php/jp/article/view/2788>.
13. Mukta N, Neeta P. On Sesame-An Ethno Medicinally Significant Oil Crop; c2017. Accessed March 21, 2024. Available from: <https://www.semanticscholar.org/paper/On-Sesame-An-Ethno-Medicinally-Significant-Oil-Crop-Mukta-Neeta/9da8b36c64a157c2a649097fc1555edb6423030c>.
14. District Administration Korba Energy Hub of Chhattisgarh. India. Accessed March 21, 2024. Available from: <https://korba.gov.in/>.
15. Raigarh District, Government of Chhattisgarh, India | Cultural Capital of Chhattisgarh | India. Accessed March 21, 2024. Available from: <https://raigarh.gov.in/en/>.
16. Chhattisgarh map. political and administrative map of chhattisgarh - Posters. myloview. Accessed March 21, 2024. Available from: <https://myloview.com/poster-chhattisgarh-map-political-and-administrative-map-of-chhattisgarh-no-EAF2485>.
17. Raigarh District Map | Raigarh District, Government of Chhattisgarh, India | India. Accessed March 21, 2024. Available from: <https://raigarh.gov.in/en/about-district/map-of-district/>.
18. Korba District Map. Accessed March 21, 2024. Available from: <https://www.mapsofindia.com/maps/chhattisgarh/districts/korba.htm>.
19. India - A-11 Appendix: District wise scheduled tribe population (Appendix), Chhattisgarh - 2011. Accessed March 21, 2024. Available from: <https://censusindia.gov.in/nada/index.php/catalog/43021>.
20. Hemalatha P, Reddy BVS. The Folk Medical Practices Among a Tribe of Andhra Pradesh.
21. Thangaraji R, Ram N, Krishnan P, Sankar R, V. S., Dam Roy S. Subsistence fishing methods of Nicobari tribes using traditional knowledge. *J Mar Isl Cult.* 2016;5(June). doi: 10.1016/j.imic.2016.05.002.
22. Kumar D, Sharma C, Singh B, Singh D. Pharmacognostical, Phytochemical and Pharmacological Profile of Natural Remedy *Lagenaria siceraria* (Mol.) Standly: A Review. *Br J Pharm Res.* 2015;7(5):340-352. doi: 10.9734/BJPR/2015/17641.
23. Kubde MS, Khadabadi S, Farooqui IA, Deore S. *Lagenaria siceraria*: Phytochemistry, pharmacognosy and pharmacological studies. *Rep Opin.* 2010;2:24-31.
24. Olanipekun MK. Ethnobotanical relevance and conservation of medicinal plants used to treat human diseases in Ifedore, Ondo-State, Nigeria. *Asian J Ethnobiol.* 2023;6(1):1-16. doi: 10.13057/asianjethnobiol/y060102.
25. Abd El-Rahman A, Mahmoud A, Sayed A, Abd El Latif M. Physiochemical properties and phytochemical characteristics of bottle gourd (*Lagenaria siceraria*) seed oil. *Egypt J Chem.* 2021;0(0):0-0. doi: 10.21608/ejchem.2021.96352.4529.
26. Chakraborty AJ, *et al.* *Allium cepa*: A Treasure of Bioactive Phytochemicals with Prospective Health Benefits. *Evid Based Complement Alternat Med.* 2022;2022:1-27. doi: 10.1155/2022/4586318.
27. Matrella ML, Valletti A, Marra F, Mallamaci C, Cocco T, Muscolo A. Phytochemicals from Red Onion, Grown with Eco-Sustainable Fertilizers, Protect Mammalian Cells from Oxidative Stress, Increasing Their Viability. *Molecules.* 2022;27(19):6365. doi: 10.3390/molecules27196365.
28. Kumar M, *et al.* Onion (*Allium cepa* L.) peels: A review on bioactive compounds and biomedical activities. *Biomed Pharmacother.* 2022;146:112498. doi: 10.1016/j.biopha.2021.112498.
29. Greeshma KP, Muthulingam S, Thamizselvi R, Venkatamani GP. Phytochemical analysis and a review on biological importance of *Allium cepa* L. *GSC Adv Res Rev.* 2020;2(2):018-024. doi: 10.30574/gscarr.2020.2.2.0004.
30. Verma DK, K.G., Kumar P, El-Shazly M. Unmasking the Many Faces of Giloy (*Tinospora cordifolia* L.): A Fresh Look on its Phytochemical and Medicinal Properties. *Curr Pharm Des.* 2021;27(22):2571-2581. doi: 10.2174/1381612826666200625111530.
31. Promila, Singh S, Devi P. Pharmacological potential of *Tinospora cordifolia* (Willd.) Miers ex hook. & Thoms. (Giloy): A review. Accessed: Mar. 21, 2024. [Online]. Available: <https://www.phytojournal.com/archives/2017/vol6issue6/PartW/6-6-239-262.pdf>.
32. Nazir I, Chauhan RS. Qualitative phytochemical analysis of *Tinospora cordifolia* and *Withania somnifera*. *Pharma Innov J.* 2018;7(10):333-336.
33. Abdalla AA, Mustafa MI, Makhawi AM. Phytochemical screening and antimicrobial activities studies of *Acacia nilotica* fruit cover. *Biochemistry*, preprint. Feb 2020. doi: 10.1101/2020.02.11.943456.
34. Rather LJ, Shahid-ul-Islam, Mohammad F. *Acacia nilotica* (L.): A review of its traditional uses, phytochemistry, and pharmacology. *Sustain Chem Pharm.* 2015;2:12-30. doi: 10.1016/j.scp.2015.08.002.
35. Amalraj A, Gopi S. Biological activities and medicinal properties of Asafoetida: A review. *J Tradit Complement Med.* 2017;7(3):347-359. doi: 10.1016/j.jtcme.2016.11.004.
36. Choudhary S, Kaurav H, Chaudhary G. Hing (*Ferula asafoetida*). A Review Based Upon its Ayurvedic and Pharmacological Properties. *Int J Pharm Sci Rev Res.* 2021;68(2). doi: 10.47583/ijpsrr.2021.v68i02.006.
37. Iranshahy M, Iranshahi M. Traditional uses, phytochemistry and pharmacology of asafoetida (*Ferula assa-foetida oleo-gum-resin*)—A review. *J Ethnopharmacol.* 2011;134(1):1-10. doi: 10.1016/j.jep.2010.11.067.
38. Mazumder PM, Das S, Das S, Das MK. Phyto-Pharmacology of *Berberis Aristata* Dc: A Review. *J Drug Deliv Ther.* 2011;1(2). doi: 10.22270/jddt.v1i2.34.
39. Furriancan MC, Alvear M, Zambrano T, Fajardo V, Salazar L. Phytochemical Constituents of The Root of *Berberis Microphylla*. *Asian J Pharm Clin Res.* 2017;10(6):225. doi: 10.22159/ajpcr.2017.v10i6.17803.
40. Guna G. Pharmacological activity of *Fumaria indica* - A review. *J Phytopharm.* 2017;6(6):352-355. doi: 10.31254/phyto.2017.6609.

41. Shakya A, Chatterjee SS, Kumar V. Holistic Psychopharmacology of *Fumaria indica* (Fumitory). *Chin Med*. 2012;03(04):182-199. doi: 10.4236/cm.2012.34028.
42. Gupta PC, Sharma N, Rao CV. A review on ethnobotany, phytochemistry and pharmacology of *Fumaria indica* (Fumitory). *Asian Pac J Trop Biomed*. 2012;2(8):665-669. doi: 10.1016/S2221-1691(12)60117-8.
43. Ghumare SS, Ghansawant P, Gangurde M. Phytochemistry and Pharmacology of *Fumaria indica*. Accessed: Mar. 26, 2024. [Online]. Available: <https://www.jetir.org/view?paper=JETIR2112510>.
44. Saranya T, Noorjahan CM, Siddiqui SA. Phytochemical Screening and Antimicrobial activity of Tulsi Plant. *Int Res J Pharm*. 2019;10(6):52-57. doi: 10.7897/2230-8407.1006203.
45. R B, P BS. Tulsi (*Ocimum sanctum*), excellent source of phytochemicals. *Int J Environ Agric Biotechnol*. 2018;3(5):1732-1738. doi: 10.22161/ijeab/3.5.21.
46. Jahangir M, Kim HK, Choi YH, Verpoorte R. Health-Affecting Compounds in Brassicaceae. *Compr Rev Food Sci Food Saf*. 2009;8(2):31-43. doi: 10.1111/j.1541-4337.2008.00065.x.
47. Tian Y, Deng F. Phytochemistry and biological activity of mustard (*Brassica juncea*): A review. *CyTA - J Food*. 2020;18(1):704-718. doi: 10.1080/19476337.2020.1833988.
48. Zielińska S, Matkowski A. Phytochemistry and bioactivity of aromatic and medicinal plants from the genus *Agastache* (Lamiaceae). *Phytochem Rev*. 2014;13(2):391-416. doi: 10.1007/s11101-014-9349-1.
49. Mena P, Cirlini M, Tassotti M, Herrlinger K, Dall'Asta C, Del Rio D. Phytochemical Profiling of Flavonoids, Phenolic Acids, Terpenoids, and Volatile Fraction of a Rosemary (*Rosmarinus officinalis* L.) Extract. *Molecules*. 2016;21(11):1576. doi: 10.3390/molecules21111576.
50. Butler AR, Feelisch M. Therapeutic Uses of Inorganic Nitrite and Nitrate: From the Past to the Future. *Circulation*. 2008;117(16):2151-2159. doi: 10.1161/Circulationaha.107.753814.
51. Tiwari M, Bhargava P. Current Updates on *Sisymbrium irio* Linn: A Traditional Medicinal Plant. *Plant Arch*. 2021;21(no 1). doi: 10.51470/Plantarchives.2021.v21.no1.058.
52. Hedgecoe AM. Terminology and the Construction of Scientific Disciplines: The Case of Pharmacogenomics. *Sci Technol Hum Values*. 2003;28(4):513-537. doi: 10.1177/0162243903256274.
53. Al-Jaber NA. Phytochemical and biological studies of *Sisymbrium irio* L. Growing in Saudi Arabia. *J Saudi Chem Soc*. 2011;15(4):345-350. doi: 10.1016/j.jscs.2011.04.010.
54. Kim HW, Choi TY, Son D, Jo H, Lee SR. *Sisymbrium irio* L. (Brassicaceae): A new alien plant in Korea. *BioInvasions Rec*. 2021;10(2):453-466. doi: 10.3391/bir.2021.10.2.23.
55. El Ghallab Y, Al Jahid A, Jamal Eddine J, Ait Haj Said A, Zarayby L, Derfoufi S. *Syzygium aromaticum* L.: phytochemical investigation and comparison of the scavenging activity of essential oil, extracts and eugenol. *Adv Tradit Med*. 2020 Jun;20(2):153-158. doi: 10.1007/s13596-019-00416-7.
56. Gulcin W. Comparison of antioxidant activity of clove (*Eugenia caryophyllata* Thunb) buds and lavender (*Lavandula stoechas* L.). *Food Chem*. 2004 Sep;87(3):393-400. doi: 10.1016/j.foodchem.2003.12.008.
57. El-Saber Batiha G, Alkazmi LM, Wasef LG, Beshbishy AM, Nadwa EH, Rashwan EK. *Syzygium aromaticum* L. (Myrtaceae): Traditional Uses, Bioactive Chemical Constituents, Pharmacological and Toxicological Activities. *Biomolecules*. 2020 Jan;10(2):202. doi: 10.3390/biom10020202.
58. Ojo AB, et al. *Syzygium aromaticum* (L.) Merr. & L.M.Perry mitigates iron-mediated oxidative brain injury via *in vitro*, *ex vivo*, and *in silico* approaches. *J Mol Struct*. 2022 Nov;1268:133675. doi: 10.1016/j.molstruc.2022.133675.
59. Ashokkumar K, Murugan M, Dhanya MK, Pandian A, Warkentin TD. Phytochemistry and therapeutic potential of black pepper [*Piper nigrum* (L.)] essential oil and piperine: a review. *Clin Phytoscience*. 2021 Dec;7(1):52. doi: 10.1186/s40816-021-00292-2.
60. Sutaliya JM, Singh UP. Effect of Different Crop Establishment Methods, Tillage and Residue on Yield, Yield Attributes and Economics of Rice in RW System of Northern Plains of IGP. *Int J Curr Microbiol Appl Sci*. 2017 Jul;6(7):4174-4183. doi: 10.20546/ijcmas.2017.607.432.
61. Takooree H, et al. A systematic review on black pepper (*Piper nigrum* L.): from folk uses to pharmacological applications. *Crit Rev Food Sci Nutr*. 2019 Jun;59(sup1):S210-S243. doi: 10.1080/10408398.2019.1565489.
62. Amalraj A, Gopi S. Medicinal properties of *Terminalia arjuna* (Roxb.) Wight & Arn.: A review. *J Tradit Complement Med*. 2017 Jan;7(1):65-78. doi: 10.1016/j.jtcme.2016.02.003.
63. Vemuri PK, Dronavalli L, Nayakudugari P, Kunta A, Challagulla R. Phytochemical Analysis and Biochemical Characterization of *Terminalia chebula* Extracts For its Medicinal use. *Biomed Pharmacol J*. 2019 Sep;12(3):1525-1529. doi: 10.13005/bpj/1783.
64. Hazra K. Phytochemical Investigation of *Terminalia bellirica* Fruit Inside. *Asian J Pharm Clin Res*. 2019 Jun;12(18):191-194. doi: 10.22159/ajpcr.2019.v12i18.34347.
65. Mariana CG, Carlos HGM, Jaqueline M, Taís MB, Luís VSS. Phytochemical screening of *Azadirachta indica* A. Juss for antimicrobial activity. *Afr J Microbiol Res*. 2017 Jan;11(4):117-122. doi: 10.5897/AJMR2016.8337.
66. S, Senthilraj R, A TB, S, M TK. Phytochemical Screening and Antimicrobial activity of *Azadirachta indica* and *Plectranthus amboinicus* Extract. *Int J Curr Pharm Res*. 2020 Jan;12:14-17. doi: 10.22159/ijcpr.2020v12i1.36822.
67. Sandhir R, Khurana M, Singhal NK. Potential benefits of phytochemicals from *Azadirachta indica* against neurological disorders. *Neurochem Int*. 2021 Jun;146:105023. doi: 10.1016/j.neuint.2021.105023.
68. Hikaambo CN, et al. Phytochemical Analysis and Antibacterial Activity of *Azadirachta indica* Leaf Extracts against *Escherichia coli*. *Pharmacol Amp Pharm*. 2022;13(01):1-10. doi: 10.4236/pp.2022.131001.
69. Sahrawat A, et al. Phytochemical analysis and Antibacterial properties of *Azadirachta indica* (Neem) leaves extract against *E. coli*. Jan 2018.
70. Rajagopal K, Varakumar P, Baliwada A, Byran G. Activity of phytochemical constituents of *Curcuma longa*

- (turmeric) and *Andrographis paniculata* against coronavirus (COVID-19): an *in silico* approach. *Future J Pharm Sci*. 2020 Dec;6(1):104. doi: 10.1186/s43094-020-00126-x.
71. Sanghvi K, Chandrasheker KS, Pai V, HN AR. Review on *Curcuma longa*: Ethnomedicinal uses, pharmacological activity and phytochemical constituents. *Res J Pharm Technol*. 2020;13(8):3983. doi: 10.5958/0974-360X.2020.00704.0.
  72. Sivakumar P, et al. Nutritional value, phytochemistry, pharmacological and *in vitro* regeneration of turmeric (*Curcuma longa* L.): An updated review. *Ann Phytomedicine Int J*. 2022 Jul. doi: 10.54085/ap.2022.11.1.23.
  73. Lim J, et al. Phytochemical properties and functional characteristics of wild turmeric (*Curcuma aromatica*) fermented with *Rhizopus oligosporus*. *Food Chem X*. 2022 Mar;13:100198. doi: 10.1016/j.fochx.2021.100198.
  74. Sabir SM, Zeb A, Mahmood M, Abbas SR, Ahmad Z, Iqbal N. Phytochemical analysis and biological activities of ethanolic extract of *Curcuma longa rhizome*. *Braz J Biol*. 2021 Sep;81(3):737-740. doi: 10.1590/1519-6984.230628.
  75. Nura Muhammad U, Thaigarajan P, Nafiu A, Seok-Ming T. Phytochemical and pharmacological properties of *Curcuma aromatica* Salisb (wild turmeric). *J Appl Pharm Sci*. 2020 Oct. doi: 10.7324/JAPS.2020.1010018.
  76. Bhatnagar A. A Review on Chemical Constituents and Biological Activities of the Genus *Picrorhiza* (Scrophulariace). *Int J Curr Pharm Res*. 2021 Sep;13(5):18-27. doi: 10.22159/ijcpr.2021v13i5.1901.
  77. Rathee D, Rathee P, Rathee S, Rathee D. Phytochemical screening and antimicrobial activity of *Picrorrhiza kurroa*, an Indian traditional plant used to treat chronic diarrhea. *Arab J Chem*. 2016 Nov;9:S1307-S1313. doi: 10.1016/j.arabjc.2012.02.009.
  78. Verma P, Basu V, Gupta V, Saxena G, Ur Rahman L. Pharmacology and Chemistry of a Potent Hepatoprotective Compound Picroliv Isolated from the Roots and Rhizomes of *Picrorhiza kurroa* Royle ex Benth. (Kutki). *Curr Pharm Biotechnol*. 2009 Sep;10(6):641-649. doi: 10.2174/138920109789069314.
  79. Masood M. *Picrorhiza kurroa*: An ethnopharmacologically important plant species of Himalayan region. *Pure Appl Biol*. 2015 Sep;4(3):407-417. doi: 10.19045/bspab.2015.43017.
  80. Pathak R, Sharma H. A Review on Medicinal Uses of *Cinnamomum verum* (Cinnamon). *J Drug Deliv Ther*. 2021 Dec;11(6-S):161-166. doi: 10.22270/jddt.v11i6-S.5145.
  81. Kaur A, Jain Y, Mittal K, Kaur A, Mittal N. Antioxidant Levels of common Herbs and Spices used in Indian Tea: Black Pepper (*Piper Nigrum*), Fennel (*Foeniculum vulgare*), Clove (*Syzygium aromaticum*), Mint (*Mentha*), Cinnamon (*Cinnamomum verum*) And Tulsi (*Ocimum tenuiflorum*). *Int Res J Pharm*. 2018 Dec;9(11):119-123. doi: 10.7897/2230-8407.0911270.
  82. Ahmed HM, Ramadhani AM, Erwa IY, Ishag OAO, Saeed MB. Phytochemical Screening, Chemical Composition and Antimicrobial Activity of Cinnamon verum Bark. *Int Res J Pure Appl Chem*. 2020 Jul. doi: 10.9734/irjpac/2020/v21i1130222.
  83. Sharifi-Rad J, et al. *Cinnamomum* Species: Bridging Phytochemistry Knowledge, Pharmacological Properties and Toxicological Safety for Health Benefits. *Front Pharmacol*. 2021 May;12:600139. doi: 10.3389/fphar.2021.600139.
  84. Sharma D, Namdeo P, Singh P. Phytochemistry and Pharmacological Studies of *Glycyrrhiza glabra*: A Medicinal Plant Review. *Int J Pharm Sci Rev Res*. 2021 Mar;67(1):187-194. doi: 10.47583/ijpsrr.2021.v67i01.030.
  85. Sharifi-Rad J, et al. *Glycyrrhiza* Genus: Enlightening Phytochemical Components for Pharmacological and Health-Promoting Abilities. *Oxid Med Cell Longev*. 2021 Jul;2021:7571132. doi: 10.1155/2021/7571132.
  86. Sharma V, Katiyar A, Agrawal RC. *Glycyrrhiza glabra*: Chemistry and Pharmacological Activity. In: Mérillon J-M, Ramawat KG, editors. *Sweeteners*. Cham: Springer International Publishing; c2018. p. 87-100. doi: 10.1007/978-3-319-27027-2\_21.
  87. Shah SL, et al. Inhibitory Effects of *Glycyrrhiza glabra* and Its Major Constituent Glycyrrhizin on Inflammation-Associated Corneal Neovascularization. *Evid Based Complement Alternat Med*. 2018;2018:8438101. doi: 10.1155/2018/8438101.
  88. Khatik RK, Sharma A. The Phytochemical and Pharmacological Properties of a Miracle Herb *Acacia catechu* (L.F.) Willd.: A Review. *Ayushdhara*. 2014;1(2). Accessed: Mar. 21, 2024. Available from: <https://ayushdhara.in/index.php/ayushdhara/article/view/16>.
  89. Devi VG, John A, Devi RS, Prabhakaran VA. Pharmacognostical Studies on *Acacia catechu* Willd and Identification of Antioxidant Principles. 2011;3.
  90. Stohs SJ, Bagchi D. Antioxidant, Anti-inflammatory, and Chemo protective Properties of *Acacia catechu* Heartwood Extracts. *Phytother Res*. 2015 Jun;29(6):818-824. doi: 10.1002/ptr.5335.
  91. Sunil MA, Sunitha VS, Radhakrishnan EK, Jyothis M. Immunomodulatory activities of *Acacia catechu*, a traditional thirst quencher of South India. *J Ayurveda Integr Med*. 2019 Jul;10(3):185-191. doi: 10.1016/j.jaim.2017.10.010.
  92. Kumari M, et al. *Acacia catechu* (L.f.) Willd.: A Review on Bioactive Compounds and Their Health Promoting Functionalities. *Plants*. 2022 Nov;11(22):3091. doi: 10.3390/plants11223091.
  93. Asif HM, Sultana S, Akhtar N. A panoramic view on phytochemical, nutritional, ethanobotanical uses and pharmacological values of *Trachyspermum ammi* Linn. *Asian Pac J Trop Biomed*. 2014 Jul;4:S545-S553. doi: 10.12980/APJTB.4.2014APJTB-2014-0242.
  94. Bashyal S, Guha A. Evaluation of *Trachyspermum ammi* Seeds for Antimicrobial activity and Phytochemical Analysis. *Asian J Pharm Clin Res*. 2018 May;11(5):274. doi: 10.22159/ajpcr.2018.v11i5.24430.
  95. Kaur GJ, Arora DS. Antibacterial and phytochemical screening of *Anethum graveolens*, *Foeniculum vulgare* and *Trachyspermum ammi*. *BMC Complement Altern Med*. 2009 Dec;9(1):30. doi: 10.1186/1472-6882-9-30.
  96. Hossein M, Sakha P. Qualitative Phytochemical analysis of Ajwain (*Trachyspermum ammi*) from North-West Iran. *Int Res J Pharm*. 2015 Sep;6(9):610-615. doi: 10.7897/2230-8407.069119.
  97. Bairwa R, Rajawat B, Sodha R. *Trachyspermum ammi*. *Pharmacogn Rev*. 2012;6(11):56. doi: 10.4103/0973-7847.95871.

98. Nayaka Ma H, Chikkappaiah L, Ks V, Bs G, S S. Evaluation of Bioactivity of Jaggery Prepared using Plant Mucilage as Clarificant. *Asian J Pharm Clin Res*. 2018 Nov;11(11):294. doi: 10.22159/ajpcr.2018.v11i11.22764.
99. Singh A, Lal U, Mukhtar H, Singh P, Shah G, Dhawan R. Phytochemical profile of sugarcane and its potential health aspects. *Pharmacogn Rev*. 2015;9(17):45. doi: 10.4103/0973-7847.156340.
100. Rai DK, Sharma V, Pal K, Gupta RK. Comparative phytochemical analysis of *Cuscuta reflexa* Roxb. Parasite grown on north India by GC-MS. 2016.
101. Faizi S, Versiani MA, Kanwal A, Naz A. Host-Plant Effect on the Chemical Constituents of *Cuscuta reflexa*. *Chem Nat Compd*. 2017 May;53(3):540-542. doi: 10.1007/s10600-017-2041-0.
102. Dar M, *et al*. Comparative *in vitro* biological activity analysis of *Cuscuta reflexa* Roxb. and *C. campestris* Yuncker. *Bangladesh J Bot*. 2020 Jun;49:349-356. doi: 10.3329/bjb.v49i2.49298.
103. Gautam T, Gautam S, Keservani R, Sharma AK. Phytochemical Screening and Wound Healing Potential of *Cuscuta reflexa*. *J Chin Pharm Sci*. 2015 May;24:292-302. doi: 10.5246/jcps.2015.05.038.
104. Sinha J, Singh V, Singh J, Ak R. Phytochemistry, Ethnomedical Uses and Future Prospects of Mahua (*Madhuca longifolia*) as a Food: A Review. *J Nutr Food Sci*. 2017;07(01). doi: 10.4172/2155-9600.1000573.
105. Singh V, Singh J, Kushwaha R, Singh M, Kumar S, Rai AK. Assessment of antioxidant activity, minerals and chemical constituents of edible mahua (*Madhuca longifolia*) flower and fruit of using principal component analysis. *Nutr Food Sci*. 2021 Feb;51(2):387-411. doi: 10.1108/NFS-04-2020-0129.
106. Mansuri TH, Yadav SS. Physicochemical Properties of *Madhuca longifolia* Flower. *INDIAN J Appl Res*. 2020 Oct. doi: 10.36106/ijar/5802186.
107. Sani I, Owoade C, Abdulhamid A, Musa Fakai I, Bello F. Evaluation of Physicochemical Properties, Phytochemicals and Mineral Composition of *Cocos nucifera*. (Coconut) Kernel Oil. 2014;1:22-30.
108. Ghosh PK, Bhattacharjee P, Mitra S, Poddar-Sarkar M. Physicochemical and Phytochemical Analyses of Copra and Oil of *Cocos nucifera* L. ( West Coast Tall Variety). *Int J Food Sci*. 2014;2014:1-8. doi: 10.1155/2014/310852.
109. Yadav JP, Arya V, Yadav S, Panghal M, Kumar S, Dhankhar S. *Cassia occidentalis* L.: A review on its ethnobotany, phytochemical and pharmacological profile. *Fitoterapia*. 2010 Jun;81(4):223-230. doi: 10.1016/j.fitote.2009.09.008.
110. Ahmed SI, *et al*. Pharmacologically active flavonoids from the anticancer, antioxidant and antimicrobial extracts of *Cassia angustifolia* Vahl. *BMC Complement Altern Med*. 2016 Dec;16(1):460. doi: 10.1186/s12906-016-1443-z.
111. Oladeji OS, Adelowo FE, Oluyori AP, Bankole DT. Ethnobotanical Description and Biological Activities of *Senna alata*. *Evid Based Complement Alternat Med*. 2020 Feb;2020:2580259. doi: 10.1155/2020/2580259.
112. Angelina M, *et al*. Physicochemical and phytochemical standardization, and antibacterial evaluation of *Cassia alata* leaves from different locations in Indonesia. *Pharmacia*. 2021 Dec;68(4):947-956. doi: 10.3897/pharmacia.68.e76835.
113. Chakraborty A, Brantner AH. Study of alkaloids from *Adhatoda vasica* Nees on their antiinflammatory activity. *Phytother Res*. 2001;15(6):532-534. doi: 10.1002/ptr.737.
114. Malik ZA, Bhat JA, Ballabha R, Bussmann RW, Bhatt AB. Ethnomedicinal plants traditionally used in health care practices by inhabitants of Western Himalaya. *J Ethnopharmacol*. 2015 Aug;172:133-144. doi: 10.1016/j.jep.2015.06.002.
115. Adhikari B, Babu M, Saklani P, Rawat G. Medicinal Plants Diversity and their Conservation Status in Wildlife Institute of India (WII) Campus, Dehradun. *Ethnobot Leaflet*. 2010 Jan. Available from: <https://opensiuc.lib.siu.edu/ebl/vol2010/iss1/6>.
116. Gam NK. Ethno Medicinal Claims Existing among Mising tribes of Assam. 2013;2(4).
117. Wubu KA, Ngatie AH, Haylie TA, Osman AD. Ethnobotanical study of traditional medicinal plants in Kebridehar and Shekosh districts, Korahi zone, Somali Region, Ethiopia. *Heliyon*. 2023 Dec;9(12):e22152. doi: 10.1016/j.heliyon.2023.e22152.
118. Oladele JO, *et al*. A systematic review on COVID-19 pandemic with special emphasis on curative potentials of Nigeria based medicinal plants. *Heliyon*. 2020 Sep;6(9):e04897. doi: 10.1016/j.heliyon.2020.e04897.
119. Manuel L, Bechel A, Noormahomed EV, Hlashwayo DF, Madureira MDC. Ethnobotanical study of plants used by the traditional healers to treat malaria in Mogovolas district, northern Mozambique. *Heliyon*. 2020 Dec;6(12):e05746. doi: 10.1016/j.heliyon.2020.e05746.
120. Adi-Dako O, *et al*. Strategies for formulation of effervescent granules of an herbal product for the management of typhoid fever. *Heliyon*. 2021 Oct;7(10):e08147. doi: 10.1016/j.heliyon.2021.e08147.