

## Medicinal plants used by the *Kandhas* of Kandhamal district of Orissa

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The paper deals with the ethnomedicinal information on the *Kandha* tribe of Kandhamal district of Orissa situated on the Eastern Ghats of India. Use of allopathic drugs by the *Kandhas* inhabiting in the remote part of the district is almost unknown. Several field trips were made to the area and information on the uses of plants was collected along with plant specimens. First hand information on use of 98 plant species under 93 genus and 59 families against 127 ailments was collected from the *Kandha* community of the district. There is a need for further critical phytochemical analysis and bioactive effects of the information collected on plants used by the tribes. The uses that are recorded in the paper are almost new to the literature. Botanical name, local name(s), families and their medicinal uses have been enumerated.

**Keywords:** Ethnomedicine, Kandhamal district, *Kandha* tribe, Medicinal plants, Traditional medicine

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Kandhamal is a tribal district of Orissa, named after the *Kandha* tribe inhabiting the district. The *Kandhas* constitute about 52% of the total population of the district and mostly reside in the forested areas. The population density in the district is 81 persons per sq km while it is 42 persons for the *Kandha* community. The district extends from 19°36' to 20°54' N lat and 83°30' to 84° 48' E long and situated at about 1300 m above the mean sea level (Fig. 1). It spreads across an area of 8021 sq km, 60 % of which is covered with forest. Temperature varies from 0°C - 45°C, with an average annual rainfall of 1587 mm. The climate is sub-tropical, hot and dry in summer, dry and cold in winter. The hills of this district constitute a part of the Eastern Ghats of India. The tribal peoples being economically backward mostly rely on the traditional healers for the treatment of the diseases they suffer.

The primitive knowledge on plants available in the wild is highly acknowledged by the global population. Majority of *Kandha* population of this district is still using the traditional medicines involving different plants and plant parts against various ailments. All these traditional medicinal knowledge are present only in oral form and are transmitted from generation to generation. However, this traditional knowledge is

diluted and diminishing because of many reasons. Therefore, it warrants collection and documentation of this knowledge before this knowledge is lost forever. Some work on the ethnomedicine of Orissa has been documented, however, ethnomedicinal information of the *Kandha* tribe of the district is scanty<sup>1-10</sup>. The objective of the study was to document the traditional medicinal knowledge from various traditional healers of Kandhamal district.

### Methodology

The study mostly covered Phulbani and Ghumsar Udayagiri forest divisions of Kandhamal district, Orissa. Several field trips were made to different parts of the study area during 2001-2002 to collect ethnomedicinal information. The traditional healers were identified and interviewed using questionnaire. The native health practitioners are generally known as *Dehuri*, the village Headman and *Kaviraj*. The plant specimens collected with the help of the local people, were processed, dried and herbarium specimens were prepared. The identification of plant taxa was done and the voucher specimens were deposited in the Herbarium of the Department of Botany, Berhampur University (BOTB), Berhampur, Orissa. The plants are enumerated alphabetically as per their botanical name along with family, vernacular name(s) and uses of the plant.

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Fig. 1 Location Map of Kandhamal district, Orissa

### Observations

*Abutilon indicum* (L.) Sweet (Malvaceae),  
*Pedhipedhica*

Seven leaves of this plant with 7 black pepper seeds are ground and the paste is mixed with one glass of raw milk or with sugar candy (*Misry*) powder and is taken orally in empty stomach for 7 days (daily twice) to cure jaundice.

*Achyranthes aspera* L. (Amaranthaceae), *Apamarang*

About 10 gm leaf with 7 black pepper seeds is ground, small tablets of about 2 gm are made and is taken with water for 7 days to cure bilious fever and typhoid. In rheumatic fever, paste of leaves and roots along with black pepper is administered. The root is fried in castor oil and tide on the cuts and wounds with the help of a cloth for healing. Root paste with sugar candy powder (*Misry*) is prescribed for 21 days in empty stomach against dog and jackal bite. Leaf juice with salt is applied on ringworms. Root paste and black pepper is

administered during cholera, indigestion and diarrhoea. In the decoction made from 50 gm seed of the plant with 10 gm fresh *Eclipta prostrata* leaves in 1 l water, 250 ml of sesame oil is added and boiled to reduce it to 250 ml, which is applied to stop alopecia (hair fall), lies and dandruff. This oil also cures headache, migraine scabies, itches, eczema and different types of skin diseases. Paste of roots of *Achyranthes aspera* and *Cassia sophera* is applied externally on scabies to get relief. This paste with cow urine is applied on leprosy wound daily 2-3 times for one month for cure. One cup leaf extract mixed with 10 gm of refined camphor is applied on face daily twice to clear acne, black spots and leucoderma.

*Aegle marmelos* Correa. (Rutaceae), *Bela*, *Belamranu*

One teaspoonful leaf powder is taken orally in empty stomach for 15-30 days to cure gastric problems. Young fruit boiled in raw milk with 7 black pepper seeds is taken empty stomach to cure

gastro-esophageal reflux. Paste prepared from 10 gm of root and 21 black pepper seeds is taken with raw milk in empty stomach twice daily for 21 days to cure rheumatism and rheumatic inflammation.

*Ageratum conyzoides* L. (Asteraceae), *Pokasungha*, *Gandhari*

Leaf juice is applied to cure abscess, boils, itches, cuts and wounds for checking bleeding & for healing. Paste of leaf mixed with turmeric is given to children to cure fever and all types of skin diseases. Leaf and black pepper paste is prescribed to stop dysentery. Leaf juice and fresh leaf juice of *Cyperus rotundus* mixed with small amount of sugar candy is taken in case of vomiting and diarrhoea.

*Andrographis paniculata* Nees (Acanthaceae), *Bhuinimba* (Fig. 2)

Leaf extract is taken orally for 7 days to cure skin diseases and intestinal worms. Leaf paste is prescribed empty stomach for blood purification. Dry leaf powder is used as insecticide. Leaf paste and turmeric is applied on itches. *Andrographis paniculata*, *Melia azedarach* and *Azadirachta indica* are together boiled in water to get 200 ml decoction. One teaspoon of this decoction with one teaspoon of honey is taken twice a day in empty stomach for 15 days to cure rheumatic fever and cholangitis.

*Annona squamosa* L. (Annonaceae), *Sitaphala*, *Bederi*

Dried leaf ash is used as shampoo to kill lice. Leaf juice is applied on itches and boils to kill the worms. Leaf paste is applied on wounds and abscess of cattle to disinfect the area.

*Aporosa octandra* (Bunch.-Ham. ex D. Don) A.R. Vickery (Euphorbiaceae), *Masania*

Stem bark paste is applied for curing rheumatism. Stem bark juice is applied on cuts and abscess. Stem bark paste is plastered on the bone-fractured area with the help of cloth for one month. This paste was also used for healing up of cuts, wounds, and itches.

*Argemone mexicana* L. (Papaveraceae), *Odisamari*, *Nirpania*

Seed oil is applied on itches and ringworm. Latex is applied on herpes, scabies, eczema, angular stomatitis, miliaria, during conjunctivitis, ophthalmia and eye burning.

Latex (half teaspoon) with powder of one black pepper is prescribed to small kids for 3-4 days to cure fever due to cold.

*Asparagus racemosus* Willd. (Liliaceae), *Satabari*, (Fig. 3)

Raw root is taken with equal amount of sugar candy twice a day for 21 days to cure dysentery.

*Bambusa bambos* Baker ex K. Hyne (Poaceae) *Baunsa*, *Maaninga*

The outer layer of the bamboo culm is scrapped and the paste is applied on fresh cuts to stop bleeding and for healing.

*Boerhavia diffusa* L. (Nyctaginaceae), *Puruni*

Plant paste with black pepper is given orally and applied on the snakebite area. Root powder with equal amount of sugar candy is taken to cure cough. Leaf juice with black pepper powder is taken orally empty stomach twice a day for 7 days to cure anasarca. Leaf juice with cow milk is applied on the eyelids to cure ophthalmia, conjunctivitis and swelling of eyes.

*Bombax ceiba* L. (Bombacaceae), *Simili*, *Kambuamrahanu*

Dry powder of fruit, flower and bark is taken orally with water empty stomach to cure chronic abdomen pain and stomach diseases. Young plant rhizome is chewed empty stomach during hyperpyrexia. About 20 gm bark decoction with one teaspoon turmeric powder is taken twice a day empty stomach for one month to cure diabetes.

*Bryophyllum pinnatum* (Lam.) Kurtz (Crassulaceae), *Hemakedara*

About 10 gm leaf and 7 black pepper seeds is pasted and taken with water to cure diarrhoea and dysentery.

*Calotropis gigantea* R. Br. (Asclepiadaceae), *Arakha*, *Duduramrahanu* (Fig. 4)

Flowers are fried in cow ghee and one flower each time is taken twice a day for 30 days to cure asthma. Latex is applied on the caries teeth to get relief. A piece of clean cloth dipped in latex is dried and burnt; the ash along with mustard oil is applied for scabies, itches, morpion and all type of skin diseases. Latex is also applied on forehead to get relief from migraine and headache.

*Careya arborea* Roxb. (Lecythidaceae), *Kumbhi*, *Kumbhe*

About 100 gm bark juice with raw cow milk is administered to cure dysentery.

*Carica papaya* L. (Caricaceae), *Amrutavanda*, *Amarati*

About 20 gm root paste is applied on breast or taken orally with raw milk to increase lactation.

*Cascabela thevetia* (L.) H. Lippold (Apocynaceae), *Kaniara*, *Kaniyari*

Unripe fruit paste is applied on itches and abscess. Paste of ripe fruit and *Oryza sativa* root is used as human poison.

*Cassia sophera* L. (Caesalpiniaceae), *Chakunda*, *Aadamemeri*

Paste of about 20 gm seed with cow urine is applied on leprosy wounds daily twice for one month.

*Cissus quadrangularis* L. (Vitaceae), *Hadabhanga* (Fig. 5)

In bone crack and bone fracture a coating of castor oil is applied on the area and then plastered with the paste of stem of this plant and cloth. This was also valuable for joining of fractured bones of cattle.

*Cleistanthus collinus* (Roxb.) Benth. ex Hook.f. (Euphorbiaceae), *Karada*, *Karada*

Twigs and dry leaf powder are used as insecticides in rice fields and for seed storage, respectively.

*Clerodendrum indicum* (L.) Kuntze. (Verbenaceae), *Kharakhari*

Paste of 20 gm root with 7 black pepper is prescribed to cure mumps, mouth ulcers, glossitis and angular stomatitis.

*Clitoria ternatea* L. (Fabaceae), *Aparajita*

White flower plant ash (along with root) with cow butter is taken orally for one month to clean pimples and facial spots. Purple flower juice (4-5 drops) is poured directly into the eye to cure conjunctivitis, and eye pain. Fresh root paste of purple flower plant is taken orally with honey to cure lumbago and colic. Leaf juice with little rock salt is applied directly to the eye to get relief from eye swelling, night blindness and blurred disease.

*Crateva magna* DC. (Capparidaceae), *Baruna*

Cakes of equal size prepared from paste of seven leaves with 150 gm wet rice are taken thrice daily to cure fissure. Bark paste with cow urine is applied locally on breasts for lactation after childbirth.

*Curculigo orchoides* Gaertn. (Amaryllidaceae), *Taltmuli*, *Taligajura*, *Kajukuna* (Fig. 6)

Paste of fresh rhizome with equal amount of sugar candy is given empty stomach with cold water for 21 days to cure blood-setting piles. Rhizome powder with raw cow milk is prescribed for improvement of memory power in children. Leaf juice with a little amount of honey is prescribed for intestinal worms, indigestion, gastric ulcer and stomach disorders of children. One teaspoon of rhizome powder is taken

with warm water, twice a day in empty stomach for all types of skin disorders. Two to three teaspoons full of decoction of fresh rhizome is taken with one teaspoon of honey in empty stomach for 21-30 days to cure kidney stone and rheumatic fever.

*Curcuma domestica* Valetton (Zingiberaceae), *Haladi*, *Singanga*

About 10 gm fresh rhizome paste is given orally to small children to cure intestinal worms.

*Cuscuta reflexa* Roxb. (Convolvulaceae), *Nirmuli*

Stem decoction with honey is taken every morning for 7 days to cure epilepsy.

*Cynodon dactylon* Pers. (Poaceae), *Duba*, *Dubasala*

Leaf juice with sugar candy is prescribed to small kids to cure diarrhoea and vomiting. Plant powder is taken with honey in the morning in empty stomach to cure bile, haematemeses and phlegm. Paste of root with raw rice is applied on forehead to cure headache and migraine. Five to six drops of leaf juice with cow butter is taken early morning in empty stomach to cure piles. Plant juice with flower juice of *Tagetes erecta* is given in empty stomach to cure dysentery.

*Cyperus rotundus* L. (Cyperaceae), *Mutha*

One teaspoon of dried rhizome powder is taken every day to cure acidity and other stomach diseases.

*Datura metel* L. (Solanaceae), *Dudura*

Root (black variety) collected on the 4<sup>th</sup> day of full moon is tied around the arm of the male for birth control.

*Dolichandrone falcata* Seem. (Bignoniaceae), *Karalaksana*

Tablets made from paste of rhizome and 7 black pepper are taken with warm water (2 at a time) twice a day in empty stomach for 21 days to cure gastro-esophageal reflux.

*Elephantopus scaber* L. (Asteraceae), *Mayurachulia*

Finely pasted root is taken with salt in empty stomach in the morning for 21 days to cure chronic abdomen and stomach pain.

*Embelia ribes* Burm. f. (Myrsinaceae), *Bidunga*

Decoction of seed powder of the plant and *Coriandrum sativum* (50 gm each) along with 2 teaspoon of honey is taken in empty stomach early morning and evening for 15-20 days to cure headache, migraine, and dizziness. Seed decoction with honey is also taken in empty stomach twice daily for 15 days to cure haematemeses, gastric, bile

and lumbago (stabbing backache). Two to three fruits of this plant are chewed in case of acidity.

*Euphorbia hirta* L. (Euphorbiaceae), *Chitakutei*

A piece of root dipped in turmeric paste is tied on left hand to get relief from intermittent fever and cold fever. Stem juice is applied on candidiasis, white patch, abscess and itches. Root paste is applied on furuncle, boil and abscess for quick healing. Four to five drops of warm leaf juice with a pinch of salt is poured into the ear for otalgia and suppurative otitis media.

*Ficus benghalensis* L. (Moraceae), *Bara*, *Bradibhanu*

Paste of about 10 gm adventitious roots with 3-4 cloves (*Syzygium aromaticum*) is taken with either a cup of *Asparagus racemosus* rhizome juice or *Ficus benghalensis* bark juice in empty stomach, twice a day for 3-4 weeks to cure fissure.

*Ficus racemosa* L. (Moraceae), *Dimbiri*, *Dumermrahanu*, *Dumberi*

Root sap is given in empty stomach in hyperpyrexia. Root sap with sugar candy powder is taken twice a day in empty stomach to cure jaundice. Stem bark paste is taken with water to increase lactation. Stem bark decoction is used for healing quickly of cuts & wounds. Stem bark paste in mother's milk is given to small child to cure diarrhoea and indigestion. To cure mental disorder and high blood pressure, one glass of root sap is administered orally and the head of the patient is also washed with the sap. The method is repeated for 8-10 days in early morning before sunrise. Seed oil and lime in brass container mixed thoroughly until it becomes yellow, is applied on eczema.

*Flacourtia indica* Merr. (Flacourtiaceae), *Kantei Koli*, *Katdikanga*

Root paste is taken orally daily with water in empty stomach for 10-15 days to cure chronic abdomen pain.

*Hemidesmus indicus* R.Br. (Asclepiadaceae), *Sugandhi*

Paste prepared with about 10 gm root with 2-3 black pepper is taken in 3 doses daily to cure diarrhoea of small kids. A small root piece with 7 rice and a little turmeric powder is tied around right hand with the help of 7 thread pieces to cures cold fever and stomachache. One teaspoon root powder with honey is prescribed for 3-4 days to small kids to cure mouth infections, stomatitis, herpes and diarrhoea. About 20 gm root, 20 gm stem bark of *Soymida febrifuga* and 10 gm *Terminalia bellerica*

fruit powdered together is prescribed twice daily in empty stomach for 21 days for treating indigestion, stomach disorder and acidity.

*Holarrhena pubescens* Wall. ex G. Don. (Apocynaceae), *Keruan*, *Paadeli*

Seed paste is given with water for curing stomachache and diarrhoea. Seed powder of the plant and black pepper is prescribed with milk to cure diarrhoea of small kids. Paste prepared with about 10 cm root bark with 7 black pepper seeds is taken orally with water to cure diarrhoea. To cure colic pain, bile and acidity, root paste of the plant with black pepper seeds is prescribed with water for 7 days. Root paste is also applied on cut, wound, abscess and boils. Paste of 10 gm of stem bark and 21 black pepper seeds is given in empty stomach twice daily for 21 days with cool water or raw milk to cure fissure.

*Hygrophila auriculata* (Schumach) Heine (Acanthaceae), *Koilekha*

Decoction of roots of the plant and *Barleria cristata* with one teaspoon of honey is taken in empty stomach twice a day for 15 days to get relief from anasarca, bodyache, arthritis and rheumatism.

*Ipomoea mauritiana* Jacq. (Convolvulaceae), *Bhuinkakharu* (Fig. 7)

Rhizome juice with one glass of cow milk is given for 7 days to increase lactation. Raw rhizome is taken to cure blood dysentery and also act as an astringent.

*Justicia adhatoda* L. (Acanthaceae), *Basanga*, *Basanga*

Plant decoction with honey is prescribed empty stomach in twice daily for 7 days to cure jaundice. Leaf juice, long pepper powder and 2 teaspoon honey is taken empty stomach for 2-3 days to cure cough, cold and catarrh. Root bark decoction with honey is taken orally in empty stomach to cure asthma. For chronic patient, medicine is prescribed twice daily for one month. It also cures tuberculosis, chest pain, respiratory diseases and haematemesis. Plant decoction with honey is taken twice daily in empty stomach to cure cold fever and rheumatic fever. Flowers fried in cow ghee, along with one-teaspoon long pepper powder or 2-teaspoon ginger juice is taken twice daily, in empty stomach, for 7 days to cure phlegm. A cloth dipped in warm leaf juice is tied on body to get relief from body ache. Decoction of roots of the plant, *Stephania japonica* root and fruits of

*Terminalia chebula*, *Terminalia belerica* and *Embllica officinalis* with one drop of cow ghee is taken orally thrice a day for one month in empty stomach to cure diabetes.

*Laportea interrupta* (L.) Chew (Urticaceae), *Bichuati*  
Root powder with black pepper is orally administered with water to cure intermittent fever. Root is tied on right hand with a thread to cure cold fever and intermittent fever.

*Lawsonia inermis* L. (Lythraceae), *Manjuati*, *Bendala*

Root paste with black pepper or *Ficus racemosa* fruit juice is taken with cold water in empty stomach to cure jaundice.

*Leucas aspera* Spreng. (Lamiaceae), *Gayasa*

One to two drops of leaf juice is poured in one of the nostrils to cure migraine and headache. Pallets made from the plant leaf and black pepper is prescribed for 7 days in empty stomach to cure cold fever. Leaf juice and honey is taken twice a day to cure phlegm, rheumatism, bilious fever, intermittent fever, cough, asthma, fistula and gastric disorder. Leaf paste with black pepper is given in snakebite as an antidote and leaf juice is poured into nostrils. Leaf paste in milk with honey is taken thrice daily for 7 days to cure typhoid.

*Litsea glutinosa* (Lour.) C.B. Robins (Lauraceae), *Debasandha*

Stem bark paste is plastered on the fractured bone with the help of a piece of cloth for about 10-15 days.

*Madhuca indica* J.F. Gmel. (Sapotaceae), *Mahula*, *Lerpi*

Decoction of equal amount of bark of *Madhuca indica*, *Mangifera indica* and *Syzygium cumini* with honey is taken daily for 4-5 days to cure dysentery and diarrhoea.

*Mangifera indica* L. (Anacardiaceae), *Amba*, *Maska*

Paste of primordial leaf or young fruit is prescribed with water for diarrhoea. Stem bark juice is taken with water to cure dysentery. The young terminal stem is slightly roasted in fire and the oozing foam like juice is put to cuts, wounds, and cracks of the heels. Young leaf juice of the plant and *Psidium guajava* with black pepper powder and raw cow milk is taken twice a day in empty stomach to cure vomiting, gastric disorders, bile and acidity.

*Michelia champaca* L. (Magnoliaceae), *Champa*

Cleaning of hair with leaf decoction helps in removing lice, nit and dandruffs. Dried stem bark

powder with coconut oil is applied against morpion and other skin diseases.

*Mimosa pudica* L. (Mimosaceae), *Lajakulilata*

Warmed root paste is plastered with the help of a cloth on boils to get relief. Paste of root fried in castor oil is applied on deep cut wounds to stop bleeding and for healing. Warmed leaf paste is applied around furuncle, abscess and boils to burst and release of pus. Leaf paste is applied on the burst boils and itches for quick healing. Paste of root fried in ghee is applied on caries teeth for relief from toothache. Leaf paste is applied on forehead to get relief from headache and migraine. Leaf paste with honey is prescribed twice a day in empty stomach for 3 to 4 days for stomachache and intestinal worms.

*Momordica charantia* L. (Curubitaceae), *Kalara*, *Kareka*

Leaf juice along with raw cow milk and salt is taken in empty stomach to get relief from constipation. Leaf juice mixed with water is taken to kill intestinal worms. Decoction of fresh leaves of the plant & of *Gymnema sylvestre* and fruits of *Phyllanthus emblica* with one teaspoon of honey is taken twice daily in empty stomach for one month to cure diabetes.

*Musa paradisiaca* L. (Musaceae), *Kadali*, *Tadika*

Lime coat applied on a completely ripen banana & kept in open field over night is given next day early morning in empty stomach for 7 days to cure jaundice. One banana with one glass of milk, 2 teaspoon honey and small quantity of *Phyllanthus emblica* fruit juice is given twice daily for one month to cure diabetes.

*Nyctanthes arbor-tristis* L. (Oleaceae), *Gangasiuli*, *Bledamrahanu*

Root bark decoction with black pepper powder is taken empty stomach to cure lumbago or lower backache. Root decoction with equal amount of honey is taken twice daily in empty stomach to cure bilious fever, headache and body ache. Leaf juice is poured into the nostrils twice a day to cure sinusitis, headache and nasal bleeding.

*Phoenix pusilla* Gaertn. (Arecaceae), *Banakhajuri*

Five to six tender leaves are chewed and the juice is taken orally to cure urinary tract infection and burning. Rhizome juice is given empty stomach with water to cure diabetes. Leaf juice kept overnight is taken orally in the morning empty stomach to cure intestinal worms.



Fig. 2 *Andrographis paniculata* Nees



Fig. 3 *Asparagus racemosus* Willd.



Fig. 4 *Calotropis gigantea* R. Br.



Fig. 5 *Cissus quadrangularis* L.



Fig. 6 *Curculigo orchioides* Gaertn.



Fig. 7 *Ipomoea mauritiana* Jacq.



Fig. 8 *Plumbago zeylanica* L.

*Phyllanthus fraternus* Webster (Euphorbiaceae), *Badiamla*

Root powder with black pepper is taken with water to cure amoebic dysentery and diarrhoea of children. Plant juice is taken with water empty stomach in the morning for 7 days to cure jaundice. Leaf or root extract with black pepper and cow urine is taken twice a day for 15 days in empty stomach to cure dropsy, anasarca, rheumatism and body ache. Decoction of root of the plant, root of *Piper longum*, rhizome of lotus and stem of *Pterocarpus santalinus* is taken with one cup of cow urine in empty stomach for 7 days during intermittent fever and fever due to cold.

*Plumbago indica* L. (Plumbaginaceae), *Chitaparu*

Tablets made from paste of equal amount of root of *Plumbago indica*, *Cissampelos pareira* var *hirsuta*, *Caesalpinia bonduc*, flower of *Pterospermum acerifolium* and black pepper seeds is taken with water empty stomach for 21 days to cure stomachache, acidity, bile, constipation and lower abdomen pain. In case of cuts, wounds, sprain and body ache, castor or sesame oil is first applied on the effected area and then a paste of 3-4 leaves of the plant is applied for relief.

*Plumbago zeylanica* L. (Plumbaginaceae), *Dhalachitaparu* (Fig. 8)

Root paste with black pepper is administered orally as an abortifacient.

*Premna latifolia* Roxb. (Verbenaceae), *Gandhana*

Paste of fresh root bark and black pepper with raw cow milk is administered orally and also applied locally for herpes. It is also applied externally to cure polio. Paste of fresh root bark with black pepper seeds is taken twice daily in empty stomach for 15 days to get relief from rheumatism, body ache and muscle pain. Fomentation of leaf paste also gives relief from rheumatism, sprain and body ache.

*Psidium guajava* L. (Myrtaceae), *Pijuli*, *Mehu*

Paste of tender twigs is given with cold water in empty stomach thrice daily to cure blood dysentery.

*Pterocarpus santalinus* L. f. (Fabaceae), *Rakta chandana*

Decoction of fresh stem barks of the plant, *Calamus tenuis* root and *Azadirachta indica* stem bark is given orally either with sugar candy or honey in empty stomach for 21 days to cure piles and blood setting piles.

*Punica granatum* L. (Punicaceae), *Dalimba*

Root juice is taken with curd twice daily for 7 days to cure jaundice. Young fruit paste of is given orally with water to cure diarrhoea and dysentery.

*Quisqualis indica* L. (Combretaceae), *Madhumalati*

Root paste is applied on boils and itches.

*Rauvolfia serpentina* Benth. ex Kurz (Apocynaceae), *Patalagaruda*

Root juice is taken with water to cure body ache, anasarca and rheumatism. Root paste is taken either with raw milk or honey in empty stomach twice a day for 21 days to cure mental disorder. Root paste of *R. serpentina* and *Andrographis paniculata* is applied on itches, boils and eczema.

*Ricinus communis* L. (Euphorbiaceae), *Kalo*, *Jada*

Decoction of stem barks of castor plant & *Cissus quadrangulis* and *Vitex negundo* leaves is fomented on the affected area for rheumatic swelling and arthritis.

*Semecarpus anacardium* L. f. (Anacardiaceae), *Kalavalia*

Seed oil is applied on cuts and wounds for healing. For sprain, sesame oil is applied on the affected part of the body and then the seed oil is applied.

*Shorea robusta* Gaertn. f. (Dipterocarpaceae), *Salo*, *Jargi*

Oleoresin (*Jhuna*) extracted from the plant mixed with black pepper is administered with water in diarrhoea. Oleoresin and old jaggery (*gur*) is taken against dysentery.

Bark paste is used as an antidote for insect, dog and jackal bite. Bark paste is applied on cut injuries to stop bleeding and also for quick healing. Decoction of stem bark of the plant along with *Alangium salvifolium* roots, *Madhuca indica* root bark and *Syzygium cumini* stem bark is taken in the morning in empty stomach for 21 days to cure jaundice.

*Sida acuta* Burm.f. (Malvaceae), *Bajramuli*, *Rapee*

Bathing newborn babies with the whole plant decoction makes them healthy.

*Solanum virginianum* Pers. (Solanaceae), *Bhejibaigana*, *Akranti*

Plant decoction and *Piper longum* root powder is taken daily in empty stomach to cure cold, cough, catarrh and cold fever. Flowers fried in ghee are chewed every day for 15 days to cure cough and asthma. Leaf juice with *Piper longum* fruit powder and honey is taken in empty stomach for a weak to cure cough, sputum and tonsillitis.

*Sphaeranthus indicus* L. (Asteraceae), *Vuin kadamba*, *Gadadikusa*

Raw leaf is chewed or leaf juice is administered orally during mouth ulcer, and other mouth diseases. Flower paste is given in empty stomach to cure dysentery, diarrhoea and indigestion. Leaf juice is also given to cure diarrhoea and vomiting.

*Tephrosia villosa* Pers. (Fabaceae), *Kulthia*, *Piderkalata*

Root powder with black pepper powder is taken empty stomach for stomachache and stomach disorders. Root paste with raw milk is taken empty stomach twice daily for 7 days to cure cold fever and typhoid.

*Terminalia chebula* Retz. (Combretaceae), *Harida*, *Bade*, *Tnasu*

Fruit powder with a pinch of iron rust powder is taken with raw milk or honey in empty stomach twice a day for 7 days to cure jaundice.

*Tinospora cordifolia* (Willd.) Miers ex Hook. f. & Thoms. (Menispermaceae), *Guluchi*

Stem powder with equal amount of honey is taken in empty stomach twice daily to cure headache and migraine. Decoction of stem and *Embelia ribes* fruits with honey is taken twice daily in empty stomach to cure headache. To cure arthritis, rheumatism and inflammation, one teaspoon of stem decoction with half teaspoon honey is taken in empty stomach for one month. Stem decoction with sesame oil is applied on body to get relief from rheumatism, body pain and inflammation. Leaf powder with black pepper powder is taken with raw milk twice daily in empty stomach to cure jaundice. Juice from equal amount of roots of the plant, *Ricinus communis* and *Vanda ruxburghii* is taken with equal amount of water in empty stomach for 7 days to cure rheumatism, body ache due to gastric ulcer and colic.

*Trichodesma indicum* R. Br. (Boraginaceae), *Raktachuin*

Leaf paste is applied on cuts, wounds and bleeding for quick healing. Root paste is used for body ache and anasarca.

*Vitex negundo* L. (Verbenaceae), *Nirgundi*

Crushed and warmed leaves are plastered on the body part with thin cloth to get relief from pain. Watery sap from warmed stem is given to children to cure cough, catarrh and cold fever. Stem sap with sesame oil is poured into ear to cure otalgia

and suppurative otitis media. Crushed leaves fried in cow ghee are applied on wounds for healing. Root decoction is prescribed twice a day in empty stomach to cure rheumatism.

*Withania somnifera* Dunal (Solanaceae), *Aswagandha*

To cure asthma, burnt root powder with butter is taken every day early morning.

*Zingiber officinale* Rosc. (Zingiberaceae), *Ada*, *Aada*

Rhizome juice mixed with mustard oil is poured into ear affected by suppurative otitis media and perforation of tympanic membrane.

*Ziziphus oenoplia* Mill. (Rhamnaceae), *Burukoli*, *Bare*

Leaf paste with raw milk is applied on the head twice a day before sunrise and after sunset for one month to cure madness.

## Discussion

Although our ancient sages through hit and trial method developed herbal medicines, the reported uses of plant species do not certify efficacy<sup>12</sup>. The present preliminary report on ethnomedicinal uses of some plant species need to be pharmacologically screened, chemically analysed and tested for bioactive activities<sup>13-14</sup>. Pharmacological screening of plant extracts provides insight to both their therapeutic and toxic properties and helps in eliminating the medicinal plants or practices that may be harmful<sup>15-17</sup>. The study provides information on 98 plant species under 93 genera belonging to 59 families. Euphorbiaceae contributed maximum species. Of the plants species described, 13 species are monocotyledons, 86 are dicotyledons, 44 species are herbs, 15 are shrubs, 30 are trees and 10 are climbers. Some plant species are used for their insecticidal and toxic properties, while others are used to increase memory power and for improvement of health condition. Some of the plant species are under cultivation and are used as medicine.

Asthma, arthritis, eczema, fissure, glossitis, haematemesis, kidney stone, leucoderma, miliarca, nasal bleeding, ophthalmia and tuberculosis are some major diseases treated by the traditional healers. A maximum of 12 plant species are used against diarrhoea, followed by 11 species each against rheumatism, itches, body ache, wounds and cuts. For dysentery and jaundice, 10 plant species are used, 7 species each were used against migraine and acidity. The plant species were used either individually or in combination with other plant parts or animal products.

The processing of crude drugs removes and reduces the toxic components in the unprocessed crude herbs which when alone without composite prescriptions will cause fatal effects<sup>18</sup>. It was observed that importance was given to the ratio of different elements, quantity of plant material and frequency of administration of the medicine. In certain cases, dietary restriction was strictly observed during the treatment. In the area, most of the medicines are prescribed in the form of decoction and paste.

*Kandha* tribes take the medicines from the traditional healers with a strong spiritual belief and the spiritual and magical aspect of this practice cannot be ignored<sup>19</sup>. The study area is rich in medicinal plant resources. An attempt was made to collect information on the traditional medicinal knowledge present with the local tribes; however, more in-depth information may be explored from the tribes residing in the remote parts of the district. This type of study will give new impetus to the traditional system of medicine and will play a great role in primary healthcare. In view of the importance of traditional medicine which provides health service to 75-80 % of world population, increased demand of herbal drugs by the pharmaceuticals and depleting natural plant resources, it is high time to document the medicinal utility of less known plants available in remote areas of the country<sup>20-21</sup>. The study enumerates the ethnomedicinal knowledge of an indigenous tribe of the Eastern Ghats of India, which is fast disappearing, because of acculturation and deforestation.

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