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Ethnomedicinal Plants of Kapilash Wildlife Sanctuary, Odisha, India

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ABSTRACT

Ethnomedicine is the term used when human and plant interaction is in such a way that plants reduces the human health issues or acts as medicines. Ethnobotany or interaction of plants and human in a systematic manner has always been associated since time immemorial. In fact, modern science mostly depends on natural phenomena of surrounding gift of nature. Indigenous knowledge of plants has been passed down generation after generation and are now confined to the tribal communities residing near the forest area. Their knowledge forms a strong base for most scientific development either in terms of food sustainability or drug development. On this account a survey was undertaken in 2019 with local tribal communities in and around Kapilash Wildlife Sanctuary (KWS) to document the traditional knowledge of the plant diversity and its uses. The results revealed that about 60 species are used by tribal communities of KWS. The most common are *Gymnema sylvestre* (Gudmari), *Nyctanthes arboristis* (Gangasiuli), *Terminalia chebula* (Harida), *Tinospora cordifolia* (Guduchi), etc. The survey was to bring out the awareness of the plant diversity in the sanctuary to the scientific communities so that broader lookout can be done for exploring the plant diversity and validating its indigenous knowledge for future sustainable development in various fields.

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INTRODUCTION

Ethnobotany is a study of interrelation between human and plants. Plants have a great influence on human culture and civilization on many different ways in addition to its food and medicine. The current studies of ethnobotany reflect the indigenous or traditional knowledge of plants that have been passed down by earlier generations but which has now been confined to the tribal communities or aboriginals living in the forest or nearby areas (Shah 2008). With rapid urbanisation and deforestation, such tribal communities form a minority in almost every place. Odisha, having been blessed with diverse landscapes including hills, plains, coastal regions form a diverse range of forest and its resources. It is proud of its diverse landscape with 2 National Parks, 18 Wildlife Sanctuaries and 1 Biosphere Reserve. This enables an immense diversity in flora including epiphytic, lithophytic, terrestrial and aquatic plants and faunal diversity including avifauna. Kapilash Wildlife Sanctuary (KWS) located in the Dhekanal district of Odisha, covering an area of 4,599 square kilometres enjoys a semi evergreen forest, moist mixed deciduous forest and dry mixed deciduous forest. The sanctuary is located between 20° 35′ N and 21° 10′ N latitude and 85° 05′ E and 86° 10′ E longitude. The elevation of the sanctuary varies from 46m to 752m. Geomorphologically, KWS is divided into the Northern hill Ranges, the Southern hill Ranges and the intervening Brahmani river (Mukesh et al. 2014) It also represents one of the Eco-Sensitive Zone (ESZ) of Odisha having many threatened floral and faunal species. KWS is also a home for many flora and fauna especially for Asian elephants. The common floral diversity includes *Helicteres isora*, *Shorea robusta*, *Strychnos-nux-vomica*, *Streblus asper*, *Terminalia alata*, *Terminalia belerica*, *Hemidesmus indicus*, *Smilax zelanica*, *Dioscorea bulbifera*, *Dioscorea hamiltonii*, *Dioscorea pentaphylla*, *Ficus benjamina*, *Dellenia pentagyna*, *Mallotus phillipensis*, *Terminalia chebula*, *Desmodium pulchellum*, etc. The tribal communities living around the fringe of the KWS are well aware of the plant diversity of the Sanctuary along with its uses. They also depend on the forest for their food, medicine, intoxicant, timber, etc. On this account, a survey was undertaken in 2019 to document the ethnobotanical knowledge of the tribal communities living around the KWS.

MATERIALS AND METHODS

Ethnomedicine gives the knowledge on the traditional medicinal plants. Ethnomedicinal survey was conducted during 2019 in the Kapilash Wildlife Sanctuary by the help of tribal communities living at the fringe of the KWS. The information on ethnomedicinal plants were obtained by interviewing, interacting with the tribal communities, discussion with Kabirajs of different villages and by the field visit. By these procedures, information was collected about the medicinal plants, their local name, parts of the plant used for the medicinal purpose, their economic importance and the ecology of the plant as per standard methods (Kumar et al. 2012; Kumar et al. 2013; Kumar et al. 2017). The identified plants are deposited as digital Herbarium in the Biodiversity and Conservation Lab, Ambika Prasad Research Foundation, Bhubaneswar. The rest plant species were characterized using morphological characteristics followed by the Flora's book. All the information was documented on the Passport Data Form (PDF) by the help of information with the details of informant (Kumar et al. 2017).

RESULTS AND DISCUSSION

Earlier ethnomedicinal practices among the tribal communities of Dhekanal district of Odisha have revealed that 148 plant species (**Figure 2**) were used for the treatment of common diseases (**Mukesh K et al. 2014**). Again, in 2015, Nibedita and her team members reported the use of 109 plant species as herbal folk medicines by the local inhabitants of Dhekanal district, Odisha (**Nibedita et al. 2015**). In the current study, there was an interview and interaction with the Malhar community in Deogan village residing about 50 people and Sabar community in Kolha village residing about 330 people from around the fringe of the Kapilash Wildlife Sanctuary (**Plate 1.6**). The inhabitants revealed the use of 60 plant species, 55 genera belonging to 37 families. Plants from Fabaceae and Combretaceae families are found to be predominant for medicinal uses with 6 species and 5 species respectively followed by the predominance of Euphorbiaceae, Asteraceae families with 3 species each and so on according to the survey report. The plant parts used by the tribal communities differ with different plants and with different ailments.

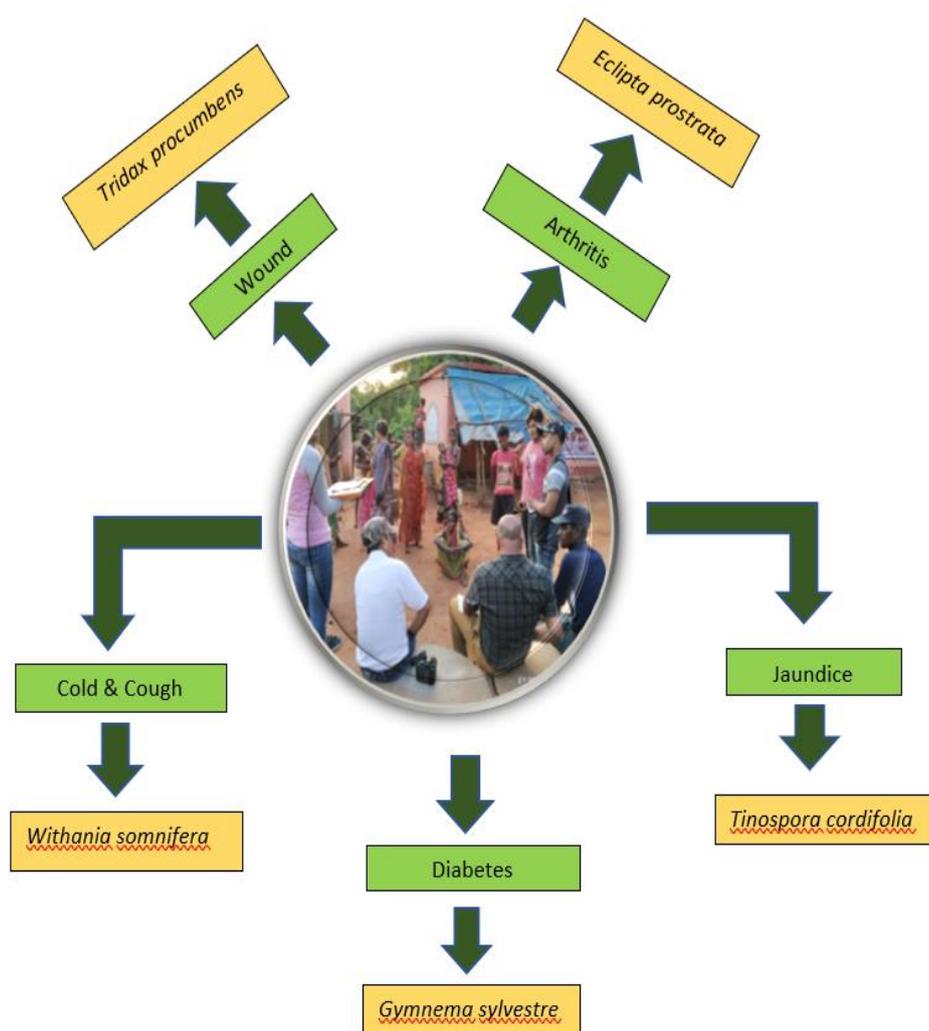


Figure 1: Ethnomedicinal plants used by Tribal communities of KWS, Odisha, India

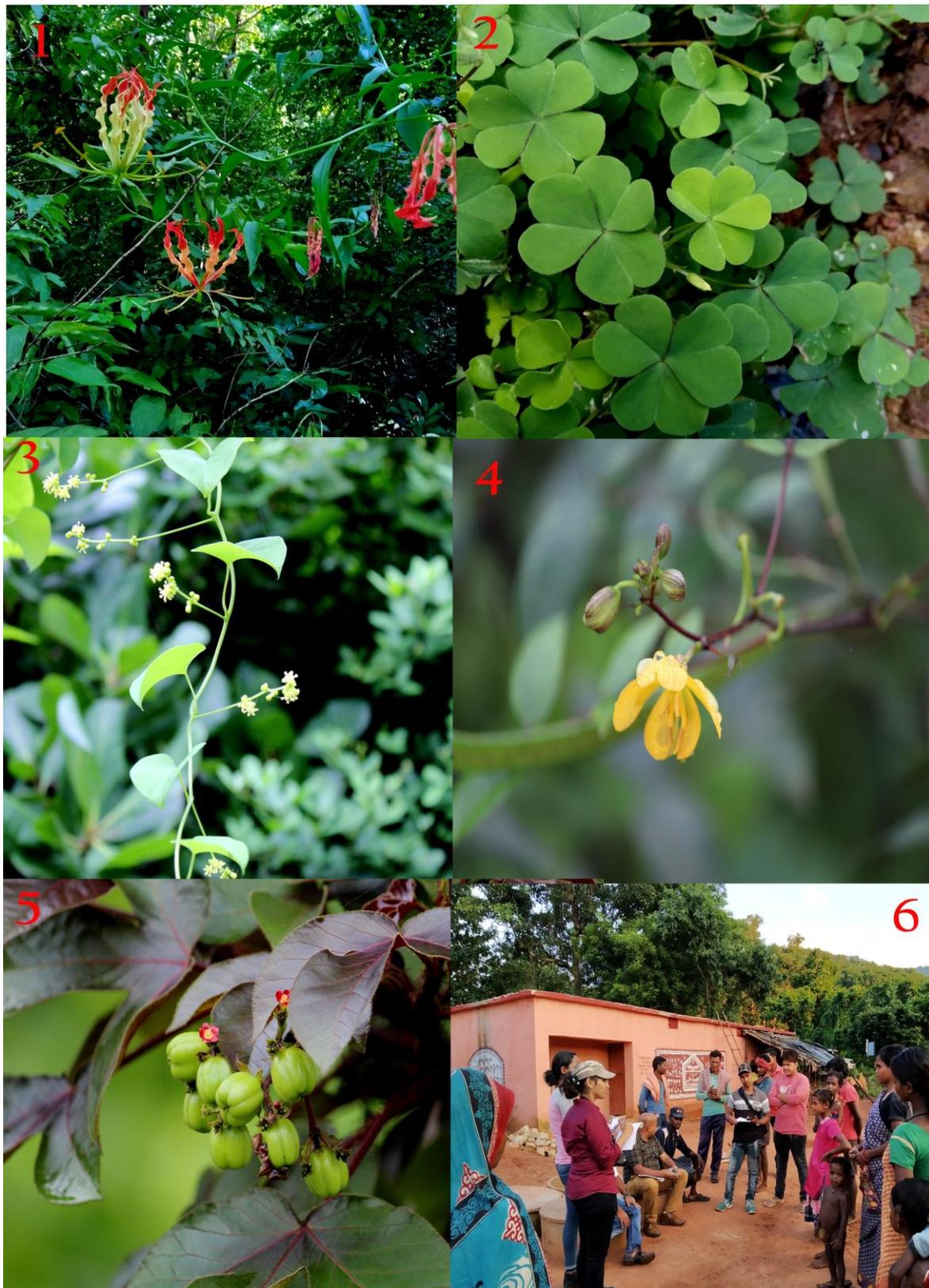


Plate 1: Some Ethnomedicinal plants used by the tribal communities of KWS, 1: *Gloriosa superba*, 2: *Oxalis corniculata*, 3: *Tinospora cordifolia*, 4: *Cassia occidentalis*, 5: *Jatropha gossypifolia*, 6: Ethnobotanical data collection in field

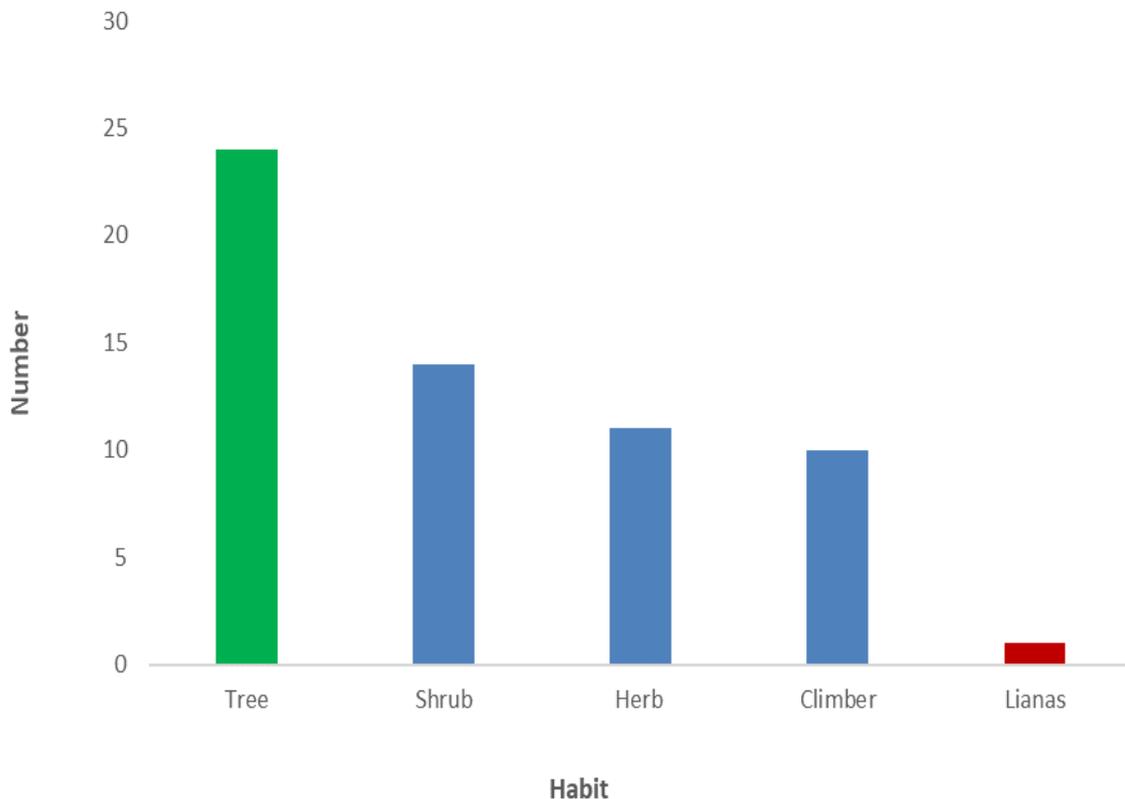


Figure 2: Diversity of Ethnomedicinal plants used among the tribal communities in KWS, Odisha, India

The plant may be used as a whole, leaves, root, bark, shoot, latex, fruit, flower, seed, stem or seed oil depending upon the circumstances. The study highlighted the treatment of diabetes with *Gymnema sylvestre*, *Cassia occidentalis*, *Clerodendrum viscosum*, *Terminalis arjuna* and *Strychnos nux-vomica*. Again, *Cynodon dactylon*, *Morinda tinctorial*, *Holarrhena antidysenterica*, *Cuscuta reflexa* and *Asparagus racemosus* are used for treatment of diarrhoea. *Terminalia chebula*, *Terminalia bellirica*, *Emblica officinalis* and *Withania somnifera* are used for the treatment of cold and cough. Study also revealed that treatment of wounds with *Litsea glutinosa*, *Careya arborea*, *Tridax procumbens*, *Terminalia tomentosa*, *Neolamarckia cadamba*, *Bauhinia vareigata*, *Ageratum conyzoides*, and *Cleome viscosa*. Plants like *Combretum roxburghii*, *Strychnos-nux vomica*, *Tinospora cordifolia*, *Calotropis gigantea* are used for treatment of malaria. Plant such as *Mimusops elengi* is used as a brain tonic and *Cissampelos pareira* is used as an intoxicant by these people. The plants, its parts and its vernacular name used by the local communities for different purposes in their day to day life are listed in **Table 1 & Figure 1**. They have also admitted grazing of cattle in the forest and the survey observed the over-grazing of the forest floor. The fringe of the forest area is also prone to agricultural practices.

Table 1: Ethnomedicinal plants of Kapilash Wildlife Sanctuary, Odisha, India

Scientific Name	Local Name	Family	Plant Parts Used	Ethnic Use(s)
<i>Abrus precatorius</i>	Kaincha	Fabaceae	Leaves, seeds	Fever and skin disease
<i>Achyranthes aspera</i>	Apamarga	Amaranthaceae	Fruits, seeds	Loss of appetite and cough
<i>Aegle marmelos</i>	Bela	Rutaceae	Leaves, fruit	Digestion and acidity
<i>Ageratum conyzoides</i>	Pokasunga	Asteraceae	Leaves	Wounds and eye lotion
<i>Andrographis paniculata</i>	Bhuin nimba	Acanthaceae	Whole plant	Cough
<i>Asparagus recemosus</i>	Satabari	Liliaceae	Roots	Diarrhoea, cough and fever
<i>Azadirachta indica</i>	Neem	Meliaceae	Leaves, bark, seeds	Skin disease and diabetes
<i>Baliospermum montanum</i>	Mahasindhu	Euphorbiaceae	Stem	Teeth problems
<i>Bambusa arundinacea</i>	Baunsa	Poaceae	Shoot	Ear pain
<i>Bauhinia variegata</i>	Kanchana	Caesalpinaceae	Roots, bark	Wounds and ulcer
<i>Bryophyllum pinnatum</i>	Amarpoi	Crassulaceae	Leaves	Stomach ache
<i>Buchanania lanzan</i>	Char	Anacardiaceae	Seeds	Skin disease
<i>Calotropis gigantea</i>	Arakha	Asclepiadaceae	Leaves, roots	Malaria and gout
<i>Careya arborea</i>	Kumbhi	Lecythidaceae	Bark	Wounds
<i>Cassia fistula</i>	Sunari	Fabaceae	Root	Stomachache
<i>Cassia occidentalis</i>	Krushnamalli	Fabaceae	Leaves	Diabetes and acidity
<i>Cipadessa bacifera</i>	Nahalbell	Meliaceae	Leaves, bark	Snake bite, cough and cold

<i>Cissampelos pareira</i>	Akanabindhi	Menispermaceae	Roots	Intoxicant
<i>Cleome viscosa</i>	Bansoris	Capparaceae	Leaves, seeds	Wounds, ulcer and ear ache
<i>Clerodendrum viscosum</i>	Kumuti	Lamiaceae	Leaves	Diabetes
<i>Combretum roxburghii</i>	Atundi	Combretaceae	Leaves	Malaria
<i>Curcuma aromatica</i>	Bana haladi	Zingiberaceae	Leaves	Reduce inflammation
<i>Cuscuta reflexa</i>	Nirnuli	Convulvulaceae	Whole plant	Diarrhoea, inflammation and malaria
<i>Cycas circinalis</i>	Urguna	Cycadaceae	Leaves	Inflammation
<i>Cynodon dactylon</i>	Duba Ghasa	Poaceae	Whole plant	Diarrhoea and dysentery
<i>Datura metel</i>	Dudura	Solanaceae	Whole plant	Asthma, skin disease and ulcer
<i>Desmodium gangeticum</i>	Sala parni	Fabaceae	Root	Loss of appetite
<i>Eclipta prostrata</i>	Bhringraj	Asteraceae	Leaves	Arthritis
<i>Emblica officinalis</i>	Amla	Phyllanthaceae	Fruits	Cough and cold
<i>Ficus hispida</i>	Dimiri	Moraceae	Latex	Mumps
<i>Gloriosa superba</i>	Agni sikha	Colchicaceae	Leaves	Snake bite, Asthma and Tonic
<i>Gymnema sylvestre</i>	Gudmari	Asclepiadaceae	Whole plant	Diabetes
<i>Hemidesmus indicus</i>	Anantamula	Asclepiadaceae	Roots, leaves	Asthma and leprosy
<i>Holarrhena antidysenterica</i>	Kurein	Apocyanaceae	Leaves, bark	Diarrhoea and asthma
<i>Jatropha gossypifolia</i>	Bai gaba	Euphorbiaceae	Latex	Tooth paste
<i>Lawsonia</i>	Manjuati	Lythraceae	Root	Jaundice

<i>inermis</i>				
<i>Leea macrophylla</i>	Hati kana mula	Vitaceae		Bodyache and paralysis
<i>Litsea glutinosa</i>	Jaisanda	Lauraceae	Bark	Wounds
<i>Mimusops elengi</i>	Baula	Sapotaceae	Bark, flower, fruit	Brain tonic
<i>Momordica cochinchinensis</i>	Hatia kankada	Cucurbitaceae	Seeds	Eosinophilia
<i>Morinda tinctoria</i>	Anchu	Rubiaceae	Roots,leaves	Diarrhoea
<i>Moringa oleifera</i>	Sajana	Moringaceae	Root	Teeth pain
<i>Neolamarckia cadamba</i>	Kadamba	Rubiaceae	Leaves, bark, fruits	Ulcer, wounds and digestion
<i>Nyctanthes arbortristis</i>	Gangasiuli	Oleaceae	Leaves,flower	Fever and cold
<i>Oxalis corniculata</i>	Sunsuniya	Oxalidaceae	Whole plant	Antihelminthic, Fever and to get sound sleep
<i>Pergularia daemia</i>	Uturudi	Ascleadaceae	Flower	Cough
<i>Pongamia pinnata</i>	Karanja	Fabaceae	Whole plant	Ulcer
<i>Pueraria tuberosa</i>	Bhuin kakharu	Fabaceae	Leaves, fruits	Stay stout
<i>Punica granatum</i>	Dalimba	Lythraceae	Fruits	Dysentery
<i>Rauwolfia serpentina</i>	Patala garuda	Apocyanaceae	Root	Arthritis
<i>Ricinus communis</i>	Jada	Euphorbiaceae	Seed oil	Skin infection and Rheumatism
<i>Strychnos nuxvomica</i>	Kochila	Loganiaceae	Leaves, bark	Diabetes, malaria and ulcer
<i>Strychnos potatorum</i>	Katakala	Longniaceae	Seed,fruits	Gonorrhoea
<i>Terminalia alata</i>	Asan	Combretaceae	Bark	Wounds, ulcer and dysentery

<i>Terminalia arjuna</i>	Arjuna	Combretaceae	Bark	Cardio tonic and diabetes
<i>Terminalia bellirica</i>	Bahada	Combretaceae	Fruits, bark	Cough and cold
<i>Terminalia chebula</i>	Harida	Combretaceae	Fruits, bark	Cough, cold and filaria
<i>Tinospora cordifolia</i>	Guduchi	Menispermaceae	Stem	Malaria, jaundice and antipyretic
<i>Tridax procumbens</i>	Bisalyakarani	Asteraceae	Leaves	Wounds
<i>Withania somnifera</i>	Aswagandha	Solanaceae	Root	Cold and cough

CONCLUSION

The study revealed that for a single kind of diseases or ailments, many different plants are used for its treatment. This give us an idea that comparison study should be done for those plant having the same effect on the single disease to find the best effective among them. Of the many plants used for different purposes, few like *Gymnema sylvestre*, *Rauwolfia serpentina*, *Gloriosa superba* and *Cycas circionalis* are reported to be from the threatened category in the State list of Threatened Plants. There is therefore a need for awareness among the local people that such plants should not be over exploited for day to day uses. Necessary steps should be taken to conserve them as most of these plants have enormous medicinal uses which are not yet explored. This can be beneficial in combating certain diseases as the current drugs are prone to multi-drug resistance.

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