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A preliminary report on ethnomedicinal study in Chandli Reserve Forest, Balangir District, Western Odisha, India

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Abstract

Ethnomedicinal plants are playing an important role to cure various diseases. In this present manuscript the authors were documented the conventional practices of therapeutic medicinal plants of Chandli Reserve Forest, Balangir District, Odisha, India. The Reserve Forest was frequently visited and close interactions were made with the local practitioners to extract the data. In this present manuscript we had documented a total of 39 plant species belong to 34 genera and 25 families based on their ethno-botanical significance. Due to lake of communication and systematic transmission among young generation the conventional knowledge may be decline. Hence it is urgent to document such knowledge of elderly peoples. Several species can be further studied for their pharmacological activity and active compounds.

Keywords: Balangir District, Chandli reserve forest, ethnomedicine, phytodiversity, western Odisha

Introduction

In traditional medicine system, medicinal plants are the backbone; in less developed countries >3.3 billion depend on plants and plant parts as medicine source in their day today life. Medicinal plants consist of rich source of secondary metabolites that secondary metabolites used in drug developments in different pharmaceutical industries[1,2]. Till yet several communities of different countries like China, India, Japan, Pakisthan, Srilanka, Thiland, etc. depends on traditional medicines[3]. The ancient ethnic communities throughout the World had utilized their local flora to cure several diseases as well as immune booster[4,5]. The uses and interested of conventional medicines has been changed by peoples in last few decade[6]. As per the World Health Organization (WHO) more than 80% of the world depends on conventional medicines, further in India about 65% of people in the rural area used Ayurveda and different plants for their primary healthcare purpose[7]. The tribal people are not like to share their ethnomedicinal knowledge except some commonly useful medicinal plants[8]. In India, more than 43% of the angiosperms are reported for their medicinal importance[9]. Tribal people had knowledge on local utilization of plants or plant parts as foods and medicine purposes. Many tribal communities also worship plants as per their religious believes, hence they were associated towards conservation of plants. The collection and documentation of ethno-medicinal knowledge has great importance towards modern drug development[10]. Many of these plants are rare and endemic and found only in forest region medicinal plants are known to be in uses by mankind since the time of immemorial[11,12].

Odisha is one of the tribal dominated state of India where variable in climatic conditions, huge forest area and many number of tribal communities were staying and depends on forest for their primary healthcare purpose[9,13]. The tribal district of Odisha is inhabited by large rural population. Several scheduled tribes like Bhunjia, Bhottada, Gonda, Kandha, Banjara, Sabar and scheduled castes like Chamara, Dhoba, Dom, Ganda and Ghasi are present[14].

Methodology

Study area: The district of Balangir was formed on 1st November 1949. It is surrounded by Sonepur, Nuapada, Kalahandi and Bargarh in east, west, south and north respectively. The Balangir district is situated between 20°11’40” to 21°05’08” and 82°41’15” to 83°40’22”, North latitude and East longitude respectively. Bolangir district covers geographical area of 6,575 sq.km with 1,543.85 sq.km forest areas and supports a population of about by 13, 35, and 760. It comprises of three Sub-divisions, 14 Blocks and 285 Gram panchayat. The maximum temperature goes up to 48.7ºC in the month of May and minimum temperature fall down to 16.6 ºC in the month December. The floristic study as well as Ethnomedicinal study was carried out from the winter season to early summer seasons i.e. December 2018- April 2019 in Chandli Reserve Forest of Balangir district, Odisha, The Chandli Reserve Forest covers a geographical area of 718.04 ha, which is lies between 20º43'20"-20º45'00 North Latitude and 83º24'42"-83º27'07"East Longitude and comes under Balangir range[13].

Data collection: Extensive field surveys were made and plant samples from different parts of the study area were collected and preserved as herbarium. With the help of Flora Books of Orissa the collected plant species were identified[15]. The voucher specimens were stored in the Laboratory of Post Graduate Department of Botany, Rajendra College (Auto), Balangir[13]. Further the local names were cross checked by using available previous report of western Odisha[9,16-18]. The plants are categories and compiled in tabular form, in the first column the botanical name were written alphabetically, next column contains the local name, third columns contains the family, then plant parts, and last column contains the conventional uses.

Results and discussion

Present manuscript deals with a total of 39 species belonging to 34 genera that comprises from 25 families and enlisted in Table-1, photographs of 16 selected species were shown in Figure-1. Both the family Combretaceae and Fabaceae contribute four species each; the family Euphorbiaceae contributes three species; two species each from the family Apocynaceae, Asclepiadaceae, Asteraceae, Convolvulaceae, Smilacaceae and Verbanaceae; one species each from 16 families i.e. (Acanthaceae, Amaranthaceae, Amarylliadaceae, Anacardiaceae, Asparagaceae, Caesalpiniaceae, Capparidaceae, Dioscoreaceae, Liliaceae, Loganiaceae, Menispermaceae, Myrtaceae, Nyctaginaceae, Plumbaginaceae, Rutaceae, and Sapotaceae) (Figure-2). Out of 39 plants, 16 (41%), nine (23%), eight (21%) and six (15%) comes under trees, herbs, climbers and shrubs respectively (Figure 3). The tribal people of Chandli Reserve Forest area were used the whole plants, plant parts like roots, leaves, flower, fruits, seeds, seed oils, gums of different plant species to treat different diseases.

Plants like *Achyranthes aspera* L., *Aegle marmelos* (L.) Corr, *Butea monosperma* (Lam.) Taub., *Madhuca indica* Gmel., *Terminalia arjuna* (Roxb.) Wight & Arn.**,** and *Vitex negundo* L. were used as tooth brush and tongue cleaner. Similar kinds of uses of same plants were reported in Bargarh district[9,18,19] and in Kahalandi district[16]. *Latex of Calotropis gigantean* R.Br. was used to cure gum pain by the native peoples of Kalahandi district[16]. Further, the tribal people of Kalahandi district used the small stem of *Smilax zeylanica* L as tooth brush to cure toothache and pyorrhea[18,19]. The ripe fruit pulp and leaf paste of *Aegle marmelos* (L.) Corr was used as digestive agent and used to cure burn injuries respectively by the tribal communities of Kalahandi district[14]. Dried root powder of *Calotropis gigantean* R.Br. was used to cure diarrhoea by the tribal communities of Kalahandi district[14]. The fruit decoction and stem bark of *Cassia fistula* L. was used to care rheumatism and headache respectively by the tribal communities of Kalahandi district[14].

Table-1: List of medicinal plant of the study area.

Botanical names	Local name	Family	Plant parts	Conventional uses
Abrus precatorius L.	Gunj	Fabaceae	Seeds	Constipation
Achyrantes aspera L.	Apamarga	Amaranthaceae	Leaf, roots, stem	Typhoid, tooth brush and tongue cleaner
Aegle marmelos (L.) Corr.	Bel	Rutaceae	Leaf, stem	Acidity, gastric, toothbrush
Ageratum conyzoides L.	Poksunga	Asteraceae	Leaf	Skin disease, cuts, itches
Andrographis paniculata (Burm. F.) Wall. Ex. Nees	Bhueinlim	Acanthaceae	Leaf	Headache, dysentery, diarrhea
Aristolochia indica L.	Iswarjata	Asparagaceae	Root	Snake and insects bites
Asparagus racemosus Willd.	Satabari	Liliaceae	Root.	Dysentery
Boerhavia diffusa L.	Gadhapurni	Nyctaginaceae	Root	Cough
Butea monosperma (Lam.) Taub.	Palas	Fabaceae	Gum, young twigs	Diarrhea, tooth brush and tongue cleaner
Calotropis gigantean R.Br.	Arakh	Asclepiadaceae	Flower, latex	Asthma, gum pain reliever
Cassia fistula L.	Sunari	Caesalpiniaceae	Fruit, stem bark	Rheumatism, constipation, headache
Cissampelos pareiram L.	Akanbindhi	Menispermaceae	Leaf	Prevent miscarriage and bleeding after childbirth.

Cleistanthus collinus (Roxb.) Benth. Ex. Planch	Karada	Verbenaceae	Leaf	Insecticides
Crateva magna (Lour.) DC.	Barun	Capparidaceae	Leaf	To cure fissure.
Curculigo orchiodes Gaertn.	Talmulee	Amarylliadaceae	Rhizome	Piles
Cuscuta reflexa Roxb.	Nirmuli	Convolvulaceae	Stem	To cure epilepsy
Dalbergia sisso Roxb.	Sissoo	Fabaceae	Seed oil	applied on burning skin to cure itching problem
Dioscorea pentaphylla L.	Masiakanda	Dioscoreaceae	Tubers	To increase sex power
Euphorbia hirta L.	Chitakuti	Euphorbiaceae	Root	Common cold and fever
Evolvulus nummularis L.	Bichamalia	Convolvulaceae	whole plant	increasing memory power and to decrease hysteria
Hemidesmus indicus L.	Annanta mula	Asclepiadaceae	Root	Diarrhea
Holarrhena pubescens (Buch.-Ham.) Wall. Ex. G. Don.	Kure	Apocynaceae	Seed	Stomach-ache, diarrhea.
Ichnocarpus frutescens (L.) R.Br.	Syamolota	Apocynaceae	Root	To clear stone in the bladder
Madhuca indica Gmel.	Mahul	Sapotaceae	Bark, young twigs	Dysentery, tooth brush and tongue cleaner.
Phyllanthus emblica L.	Anla	Euphorbiaceae	Fruit, Seed oil	Digestion, mature fruit is edible; hair oil
Phyllanthus fraternus Webster.	Bhuein anla	Euphorbiaceae	Root	Dysentery and diarrhea.
Plumbago zeylanica L.	Chitaparu	Plumbaginaceae	Root	Abortification
Pterocarpus marsupium Roxb.	Bija	Fabaceae	Bark, gum	Stomach-ache, cracks cream.
Semecarpus anacardium L.f.	Bheluan	Anacardiaceae	Seed oil	Cuts, wounds healing
Smilax aspera L.	Chopachini	Smilacaceae	Root extract	Scabies and blood purifier.
Smilax zeylanica L.	Muturi	Smilacaceae	Root	Joint pain, spermatorrhea,
Strychnos nux-vomica L.	Kochila	Loganiaceae	Stem	Leucoderma
Syzygium cumini (L.) Skeels	Jam	Myrtaceae	Seed	Diabetics
Terminalia alata Heyne ex. Roth.	Sahaj	Combretaceae	Leaf, bark	Loose motion, itching
Terminalia arjuna (Roxb.) Wight. & Am.	Kahu	Combretaceae	Bark, young twigs	Internal injuries, tooth brush and tongue cleaner
Terminalia bellirica (Gaertn.) Roxb.	Behera	Combretaceae	Fruit	Diarrhea, stomachache
Terminalia chebula Retz.	Harda	Combretaceae	Fruit	To remove cough, stomach problems, skin diseases.
Tridax procumbens L.	Bisalyakarani	Asteraceae	Leaf	Ringworm, to stop bleeding
Vitex negundo L.	Nirgundi	Verbanaceae	Leaf, young twigs	To get relief pain, Tooth brush and tongue cleaner.

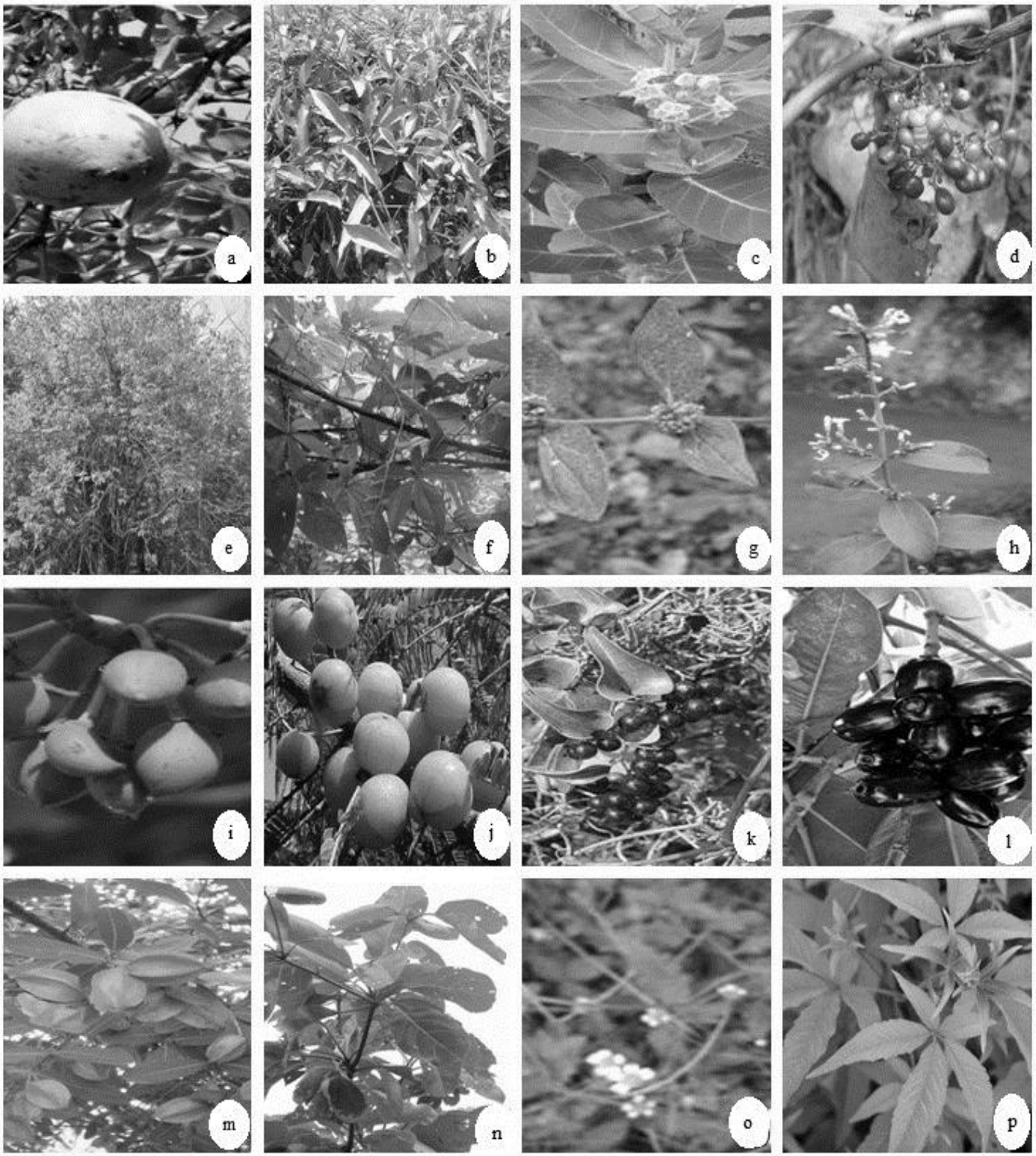

Figure-1: Photograph of *Aegle marmelos* (L.) Corr. (a), *Aristolochia indica* L. (b), *Calotropis gigantean* R.Br. (c), *Cissampelos pareiram* L. (d), *Cleistanthus collinus* (Roxb.) Benth. Ex Planch (e), *Dioscorea pentaphylla* L. (f), *Euphorbia hirta* L. (g), *Ichnocarpus frutescens* (L.) R. Br. (h), *Madhuca indica* Gmel. (i), *Phyllanthus emblica* L. (j), *Smilax aspera* L. (k), *Syzygium cumini* (L.) Skeels (l), *Terminalia ajuna* (Roxb.) Wight and Arn. (m), *Terminalia bellirica* (Gaertn.) Roxb. (n), *Tridax procumbens* L. (o) and *Vitex negundo* L. (p).

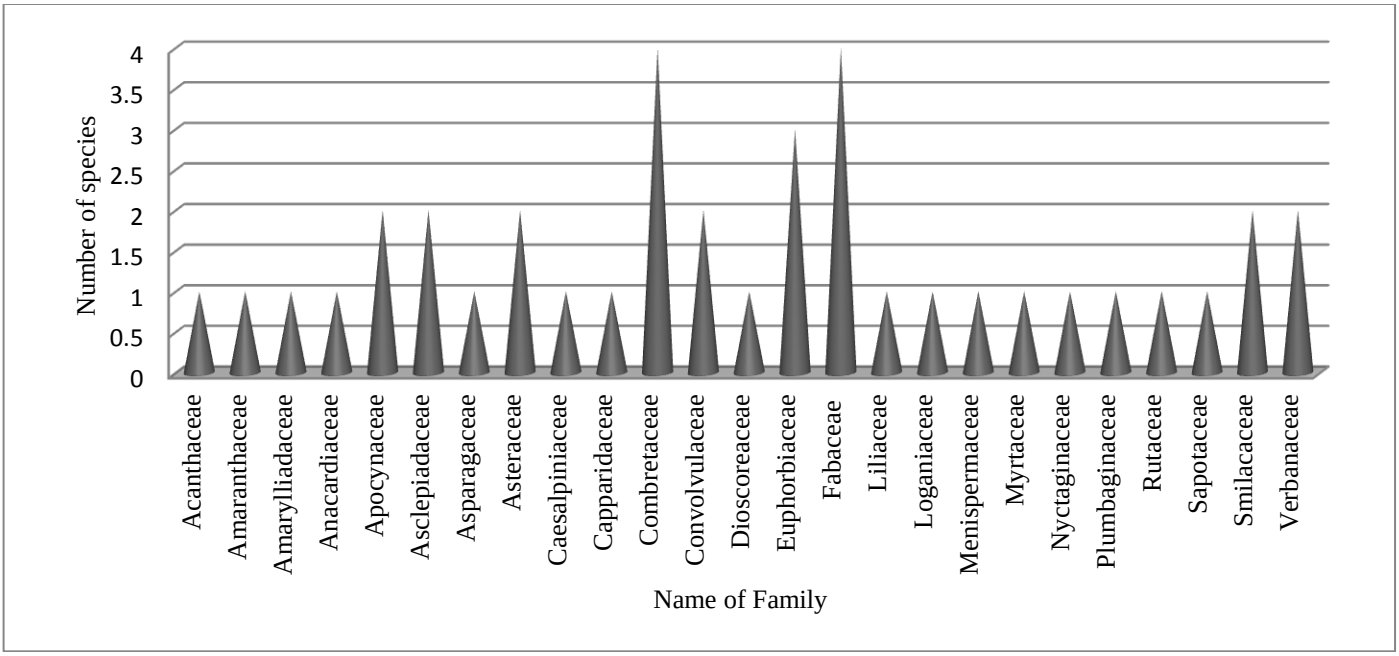

Figure-2: Family-wise distribution of medicinal plant species.

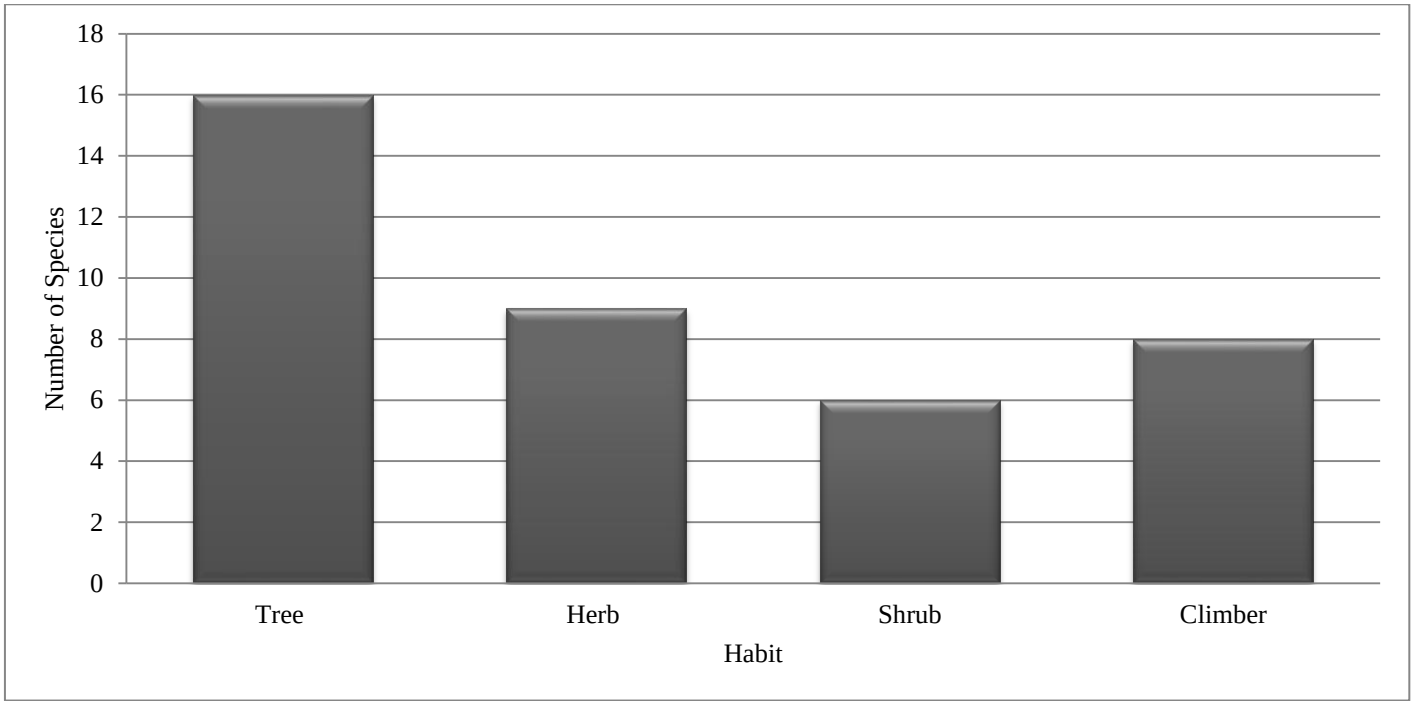

Figure-3: Diversity of plant species by habit.

Conclusion

In this present manuscript a total of 39 plant species have been documented and belonging to eight climbers, nine herbs, six shrubs and 16 trees for their therapeutic use against diseases. Among them trees are more dominant in this place, because the investigation period was in summer season, so the ground vegetation mainly herbs are dried and could not be located. The plant parts used were root, stem, bark, leaves, tubers, fruits and resins and in some cases the whole plant.

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