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Chapter

Floristic and Ethnobotanical Study of Indigenous Plants of Ranapur Reserve Forest, Odisha, India

Diptiman Sahoo, Gyanesh Dash, K.T.K.G. Ranjan Mohanty, Srinivas Acharya, Ehsan Amiri Ardakani, Monali Priyadarsini Mishra and Gyanranjan Mahalik

Abstract

The indigenous plants of Ranapur reserve forest of Odisha state, India, possess ample scope in ethnobotany due to their medicinal properties. Keeping in view of the requirements of the urbanites, this work highlights the utilization of native flora, identification, ethnobotany, floristic survey, and preservation of natural and cultivated plant species within the hills of Ranapur, Odisha. A field study around the Ranapur forest resulted in a wide diversity accounting for 143 plant species belonging to 53 families, which were identified and documented alongside their botanical name, family, and habitat following local herbaria, archives of Flora of Orissa, monographs, and standard taxonomic study. *Gmelina arborea*, *Rauwolfia serpentina*, and *Crataeva nurvala* (Varuna) fall into the RET taxa (Rare, Endangered, and Threatened) and are groundbreaking against various diseases. A few wild plants such as *Shorea robusta*, *Dalbergia sissoo*, *Pterocarpus marsupium*, *Murraya koenigii*, and *Schleichera oleosa* were the most dominant species in the study area. The present study adds detailed data-base concerning the floral diversity and their medicinal values, which attracts many researchers as well as the local populace to conserve and explore their wide-spectrum applications. This could be useful in novel drug discovery and authenticates the ethnomedicinal knowledge.

Keywords: ethnobotanical, floristic survey, medicinal, RET, Ranapur, traditional

1. Introduction

Study on bionomics and the allocation of organisms within an abundant elevation slope have been considered in numerous current projects in mountainous ecosystems across the globe [1, 2], particularly with an emphasis on flora and species attributes [3]. From the beginning of human race, the humans have been dependent on plants for their different needs. Plants provide food, shelter, and medicine. It is estimated that around 10 million species of plants occupy the earth, of which, nevertheless 1.7 million species are acknowledged to science [4]. The Ranapur reserve forest has been the home of various

tribal communities. The most dominated tribes are Kondha and Soura, whereas other sub-tribes are also found in the interior forest sub-tribe such as Relli, Jhodia, Dora, Kotia, etc. These tribes depend on traditional medicinal plants for their health care [5].

Besides, information on plant species and their decent variety inside the long slope is essential for any environmental and vegetation investigation, especially for inadequately known zones. With these devices, it is conceivable to grow protection and the management exercises in every territory [6]. The current study is a floristic and ethnobotanical survey of Maninag hill located in Ranapur reserve forest area of Nayagarh district of Odisha. The objectives of the study were collection and identifications of plants in the Maninag hill to study medicinal status of the area, documentation of traditional knowledge, and use of medicinal plants for well-being, to enumerate the collected plant species, to study the distribution pattern of vegetation in the study area.

2. Materials and methods

2.1 Study site

The study area is situated between 20.0628°N, 85.3433°E in Nayagarh district, Odisha (**Figure 1**). Raj Ranapur is a modest community in the region of Nayagarh in the eastern Indian state of Odisha. The town is otherwise called Ranapurgarh or essentially Ranapur according to the cutting-edge use. The town is truly huge particularly during the British Raj when it was the capital of the regal state of Ranapur. The Ranapur town is situated in the lower regions of Maninag Hills, which is a hill framework covering the entire of Ranapur and a significant part of the encompassing territories. It is one of the most significant towns in the Nayagarh district and furthermore one of the significant places in Odisha [7].

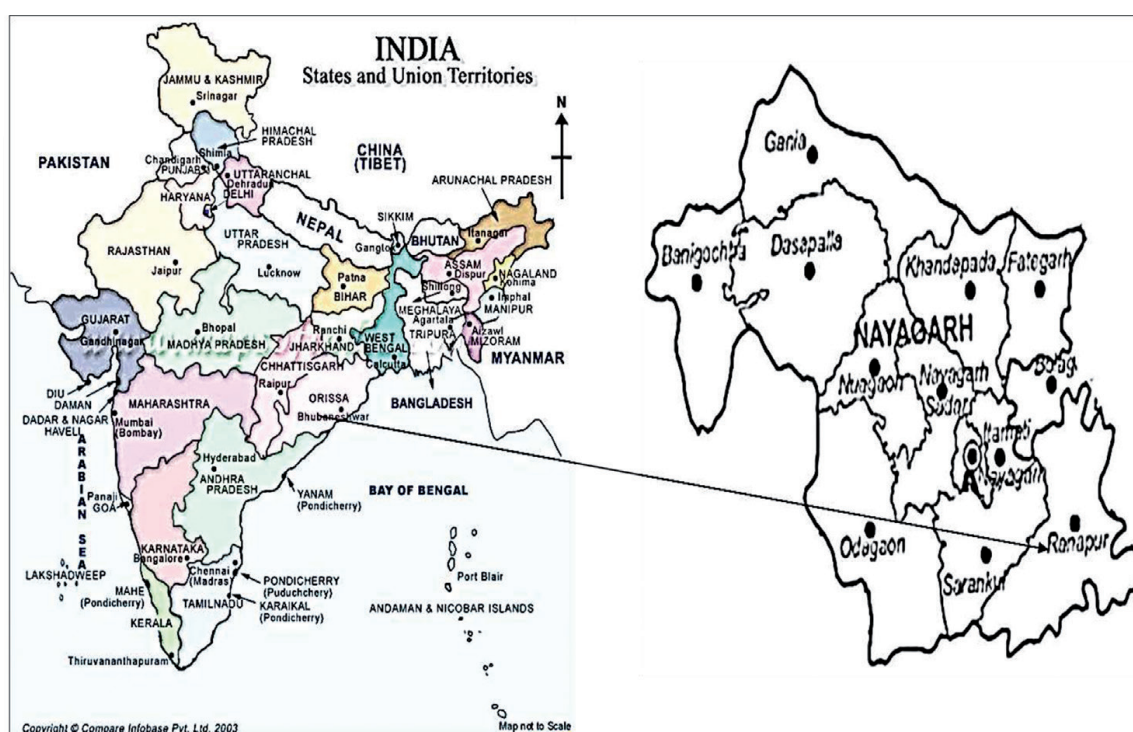


Figure 1. Map of study area (source: compare info base private Ltd., 2003).

2.2 Methodology

Extensive and intensive field surveys were conducted in different seasons to explore the floristic composition and to collect ethnobotanical information. The plant specimens are collected and photographs were also taken from the study area. During this period, interviews with temple priest and local inhabitants were conducted to collect information about the medicinal use of different plant specimens with their vernacular names. Maninag hills being a natural sacred site, religious beliefs, spirituality, and the participation of locals on conservation of this site were also documented [8, 9].

2.3 Plant collection and herbarium studies

The supportive plant specimens were collected, processed, critically studied, identified, and preserved in the Herbarium. Different Herbaria of Bhubaneswar that held the specimens of earlier workers were visited and checked their identity. Voucher specimens were identified by referring standard local floras [10–12].

3. Results

The plants seen in the study region have been listed and documented in the accompanying table with their botanical names, family, and local names. The plants were observed and their development propensities have additionally been recorded. During the investigation, 143 plant species belonging to 53 families were recorded from the study area, i.e., Maninag Hill of Ranapur area, Nayagarh, Odisha (**Tables 1** and **2**). Habit-wise analysis of the available species indicated that 33 (23%) were herbs followed by 57 (40%) trees, 22 (15%) climbers, 21 (15%) shrubs, 10 (7%) grasses (**Figure 2**). Family-wise trend in diversity of species dominance followed a pattern of family Fabaceae (9), Poaceae (7), Apocynaceae (7), Mimosaceae (7), Asteraceae (7), Caesalpiniaceae (7), and Convolvulaceae (6) (**Figure 3**). Out of 143 plants, a few important medicinal plant species were observed during the study, i.e., *Hemidesmus indicus*, *Andrographis paniculata* and *Tinospora cordifolia*, *Vetiveria zizanioides*, *Terminalia bellirica*, *Terminalia chebula*, *Nyctanthes arbor-tristis*, *Lawsonia inermis*, *Justicia adhatoda*, *Phyllanthus fraternus*, *Tridax procumbens*, *Desmotachya bipinnata*, etc., which were used by tribes such as Gond, Khairia, Kolho, Koya, Lodha, Malua, Kandha, Santal, Sabar, etc., to cure diseases such as wound healing, skin diseases, diarrhea, jaundice, urinary tract infections, stomach problems, etc. There are three plants found in this study area that are categorized as RET (Rare, Endangered, and Threatened), i.e., *Gmelina arborea*, *Rauwolfia serpentina*, and *Crataeva nurvala*.

4. Discussion

The plant diversity of a locale is the aggregate of the species within its boundaries, regardless of whether wild or cultivated, which is a reflection of vegetation and plant resources. Plant resources are influenced by agriculture, overgrazing, anthropogenic activities, and catastrophic events. Investigation and checking of biodiversity of any region are essential for the preservation and the board arranging. This investigation

Sl. no.	Scientific name	Family	Local name
1.	<i>Acacia auriculiformis</i> A.Cunn. ex Benth.	Mimosaceae	Akashi
2.	<i>Acacia leucophloea</i> (Roxb.) Willd.	Mimosaceae	Gohira
3.	<i>Acacia catechu</i> (L.f.) Wild.	Mimosaceae	Khaira
4.	<i>Acacia nilotica</i> (L.) Wild ex. Del.	Mimosaceae	Babul
5.	<i>Aegle marmelos</i> (L.) Corr.	Rutaceae	Bela
6.	<i>Albizia lebbbeck</i> (L.) Benth	Mimosaceae	Sirisa
7.	<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae	Chhatiana
8.	<i>Anacardium occidentale</i> L.	Anacardiaceae	Kaju
9.	<i>Annona squamosa</i> L.	Annonaceae	Aata
10.	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Panasa
11.	<i>Azadirachta indica</i> A.Juss	Meliaceae	Nimba
12.	<i>Bauhinia variegata</i> L.	Caesalpiniaceae	Kanchana
13.	<i>Bombax ceiba</i> L.	Bombacaceae	Simili
14.	<i>Borassus flabellifer</i> L.	Arecaceae	Tala
15.	<i>Buchanania lanzan</i> Spreng.	Anacardiaceae	Chara
16.	<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	Palasa
17.	<i>Cassia siamea</i> (Lam.) H.S. Irwin & Barneby	Fabaceae	Chakunda
18.	<i>Cassia fistula</i> L.	Caesalpiniaceae	Sunari
19.	<i>Casuarina equisetifolia</i> L.	Casuarinaceae	Jhaun
20.	<i>Ceiba pentandra</i> (L.) Gaertn.	Bombacaceae	Sweta Simili
21.	<i>Chloroxylon swietiana</i> DC.	Rutaceae	Bheru
22.	<i>Cocos nucifera</i> L.	Arecaceae	Nadia
23.	<i>Dalbergia sissoo</i> Roxb.	Fabaceae	Sisu
24.	<i>Delonix regia</i> (Boj. Ex Hook) Raf.	Caesalpiniaceae	Kruchnachuda
25.	<i>Dillenia indica</i> L.	Dilleniaceae	Oou
26.	<i>Diospyros malabarica</i> (Desr.) Kostel.	Ebenaceae	Mankadalendu
27.	<i>Diospyros melanoxylon</i> Roxb.	Ebenaceae	Kendu
28.	<i>Eucalyptus citriodora</i> Hook.	Myrtaceae	Nilagiri
29.	<i>Ficus benghalensis</i> L.	Moraceae	Bara
30.	<i>Ficus racemosa</i> L.	Moraceae	Dimiri
31.	<i>Ficus religiosa</i> L.	Moraceae	Asta
32.	<i>Haldina cordifolia</i> (Roxb.) Ridsd.	Rubiaceae	Kurum
33.	<i>Holarrhena pubescens</i> (Buch-Ham.) Wall. Ex. G.Don.	Apocynaceae	Kuruchi
34.	<i>Lagerstroemia reginae</i> Roxb.	Lythraceae	Patuli
35.	<i>Leucaena leucocephala</i> (Lam.) de Wit.	Mimosaceae	Nagarjuna
36.	<i>Madhuca indica</i> Gmel.	Sapotaceae	Mahula
37.	<i>Mallotus philippensis</i> (Lam.) Muell.	Euphorbiaceae	Sinduri
38.	<i>Mangifera indica</i> L.	Anacardiaceae	Amba

Sl. no.	Scientific name	Family	Local name
39.	<i>Michelia champaca</i> L.	Magnoliaceae	Champa
40.	<i>Moringa oleifera</i> Lam.	Moringaceae	Sajana
41.	<i>Neolamarckia cadamba</i> (Roxb.) Benth	Rubiaceae	Kadamba
42.	<i>Phoenix sylvestris</i> (L.) Roxb.	Arecaceae	Khajuri
43.	<i>Pongamia pinnata</i> (L.) Pierre.	Fabaceae	Karanja
44.	<i>Psidium guajava</i> L.	Myrtaceae	Pijuli
45.	<i>Semecarpus anacardium</i> L.f.	Anacardiaceae	Bhalia
46.	<i>Shorea robusta</i> Gaertn.f.	Dipterocarpaceae	Sala
47.	<i>Simarouba glauca</i> DC.	Simaroubaceae	Simarouba
48.	<i>Strychnos nux-vomica</i> L.	Loganiaceae	Kochila
49.	<i>Streblus asper</i> Lour.	Moraceae	Sahada
50.	<i>Syzygium cumini</i> (L.) Skeels.	Myrtaceae	Jammu
51.	<i>Tamarindus indica</i> L.	Caesalpiniaceae	Tentuli
52.	<i>Tectona grandis</i> L.f.	Verbenaceae	Saguan
53.	<i>Terminalia alata</i> Heyne ex Roth.	Combretaceae	Asana
54.	<i>Terminalia arjuna</i> (Roxb. ex Dc.) Wight.	Combretaceae	Arjuna
55.	<i>Terminalia bellirica</i> (Gaertn) Roxb.	Combretaceae	Bahada
56.	<i>Terminalia chebula</i> Retz.	Combretaceae	Harida
57.	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	Barakoli
Shrubs			
1.	<i>Calotropis gigantea</i> R.Br.	Asclepiadaceae	Arakha
2.	<i>Cascabela thevetia</i> (L.) Lippold.	Apocynaceae	Kanjar
3.	<i>Cassia occidentalis</i> L.	Caesalpiniaceae	Chakunda
4.	<i>Cassia hirsute</i> L.	Caesalpiniaceae	Chhota chakunda
5.	<i>Chromolaena odorata</i> (L.) King. & Robins.	Asteraceae	Guhia
6.	<i>Clerodendrum viscosum</i> Vent.	Verbenaceae	Kharkhari
7.	<i>Croton roxburghii</i> Balak.	Euphorbiaceae	Masudi
8.	<i>Glycosmis pentaphylla</i> (Retz.) Dc.	Rutaceae	Chauladhua
9.	<i>Ipomoea carnea</i> Jacq. spp <i>fistulosa</i> (Mart. ex Choisy) Austin	Convolvulaceae	Amari
10.	<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	Gaba
11.	<i>Justicia adhatoda</i> L.	Acanthaceae	Basanga
12.	<i>Lantana camara</i> L.	Verbenaceae	Naguari
13.	<i>Lawsonia inermis</i> L.	Lythraceae	Manjuati
14.	<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	Gangasiuli
15.	<i>Pavetta crassicaulis</i> Bremek.	Rubiaceae	Macharanka
16.	<i>Phoenix acaulis</i> Buch.-Ham. Ex Roxb.	Arecaceae	Banakhajur
17.	<i>Punica granatum</i> L.	Punicaceae	Dalimba

Sl. no.	Scientific name	Family	Local name
18.	<i>Rauwolfia tetraphylla</i> L.	Apocynaceae	Patalagaruda
19.	<i>Ricinus communis</i> L.	Euphorbiaceae	Jada
20.	<i>Vitex negundo</i> L.	Verbenaceae	Begunia
21.	<i>Ziziphus oenoplia</i> (L.) Mill.	Rhamnaceae	Kanteikoli
Climbers			
1.	<i>Allamanda cathartica</i> L.	Apocynaceae	Harakara
2.	<i>Aganosma caryophyllata</i> (Roxb. ex Sims.)	Apocynaceae	Malati
3.	<i>Argyrea nervosa</i> (Burm.f.) Boj.	Convolvulaceae	Bataraj
4.	<i>Aristolochia indica</i> L.	Aristolochaceae	Panairi
5.	<i>Asparagus racemosus</i> Willd.	Liliaceae	Satabari
6.	<i>Bauhinia vahlii</i> Wight. & Arn.	Caesalpiniaceae	Sialilata
7.	<i>Butea superba</i> Roxb.	Fabaceae	Latapalasa
8.	<i>Clerodendrum speciosum</i> L.	Verbenaceae	-
9.	<i>Cucumis sativus</i> L.	Cucurbitaceae	Pitakakudi
10.	<i>Dioscorea alata</i> L.	Dioscoreaceae	Bana-allu
11.	<i>Dioscorea pentaphylla</i> L.	Dioscoreaceae	Karaba
12.	<i>Dioscorea wallichii</i> Hook.f.	Dioscoreaceae	Pitaallu
13.	<i>Hemidesmus indicus</i> (L.) R.Br.	Asclepiadiaceae	Anantamula
14.	<i>Ichnocarpus frutescens</i> (L.) R.Br.	Apocynaceae	Saonllar
15.	<i>Ipomoea cairica</i> (L.) Sweet.	Convolvulaceae	Banakalama
16.	<i>Ipomoea quamoclit</i> L.	Convolvulaceae	Kujalata
17.	<i>Ipomea pes-tigridis</i> L.	Convolvulaceae	Billenandi
18.	<i>Mikania micrantha</i> Kunth.	Asteraceae	Salamari
19.	<i>Mucuna pruriens</i> (L.) DC.	Fabaceae	Baidanka
20.	<i>Passiflora foetida</i> L.	Passifloraceae	Pasaruni
21.	<i>Quisqualis indica</i> L.	Combretaceae	Madhumalati
22.	<i>Tinospora cordifolia</i> (Willd.) Hook.f. & Thomas	Menispermaceae	Guduchilata
Herbs			
1.	<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	Pedipedika
2.	<i>Abelmoschus manihot</i> (L.) Medic.	Malvaceae	Banabhendi
3.	<i>Aerva lanata</i> (L.) Juss.	Amaranthaceae	Paunsia
4.	<i>Agave americana</i> L.	Agavaceae	Agara
5.	<i>Ageratum conyzoides</i> L.	Asteraceae	Pokasunga
6.	<i>Andrographis paniculata</i> (Burm.f.) Wall.ex Nees	Acanthaceae	Bhuinlimba
7.	<i>Atylosia scarabaeoides</i> (L.) Benth.	Fabaceae	Banakolatha
8.	<i>Barleria cristata</i> L.	Acanthaceae	Daskarenta
9.	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Puruni

Sl. no.	Scientific name	Family	Local name
10.	<i>Blumea lacera</i> (Burm.f.) DC.	Asteraceae	Kukursunga
11.	<i>Cajanus cajan</i> (L.) Huth.	Fabaceae	Banaharada
12.	<i>Costus speciosus</i> (Koenig) Sm.	Zingiberaceae	Gaigobara
13.	<i>Crotalaria pallida</i> Ait.	Fabaceae	Jhun-Junka
14.	<i>Curculigo orchioides</i> Gaertn.	Hypoxidaceae	Talamuli
15.	<i>Curcuma longa</i> L.	Zingiberaceae	Haladi
16.	<i>Elephantopus scaber</i> L.	Asteraceae	Mayurachulia
17.	<i>Emilia sonchifolia</i> (L.) DC.	Asteraceae	Sarkara
18.	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Chitakutei
19.	<i>Evolvulus nummularius</i> (L.) L.	Convolvulaceae	Bichhamali
20.	<i>Hedyotis corymbosa</i> (L.) Lam.	Rubiaceae	Gharapodia
21.	<i>Hedyotis diffusa</i> Willd.	Rubiaceae	-
22.	<i>Hybanthus enneaspermus</i> (L.) F.V.Muell.	Violaceae	Madanmastak
23.	<i>Hyptis suaveolens</i> (L.) Poit.	Lamiaceae	Gangatulasi
24.	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Crassulaceae	Hemakedara
25.	<i>Leonotis nepetifolia</i> (L.) R.Br.	Lamiaceae	Kantasia
26.	<i>Leucas aspera</i> (Willd.) Link.	Lamiaceae	Gayasa
27.	<i>Mimosa pudica</i> L.	Mimosaceae	Lajakuli
28.	<i>Ocimum gratissimum</i> L.	Lamiaceae	Banatulasi
29.	<i>Phyllanthus fraternus</i> Webster	Euphorbiaceae	Bhuinonla
30.	<i>Sida acuta</i> Burm.f.	Malvaceae	Bajramuli
31.	<i>Sida cordata</i> (Burm.f.) Borssum	Malvaceae	Bajramuli
32.	<i>Solanum nigrum</i> L.	Solanaceae	Lunlunia
33.	<i>Tridax procumbens</i> L.	Asteraceae	Bisalyakarani
Grass			
1.	<i>Bambusa bambos</i> (L.) Voss.	Poaceae	Baunsa
2.	<i>Chloris barbata</i> Sw.	Poaceae	Gandhi
3.	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Duba
4.	<i>Cyperus flabelliformis</i> Rottb.	Cyperaceae	
5.	<i>Cyperus iria</i> L.	Cyperaceae	Swanti
6.	<i>Cyperus rotundus</i> L.	Cyperaceae	Mutha
7.	<i>Desmostachya bipinnata</i> (L.) Stapf.	Poaceae	Kusha
8.	<i>Eragrostis ciliaris</i> (L.) R.Br.	Poaceae	-
9.	<i>Oryza sativa</i> L.	Poaceae	Dhana
10.	<i>Vetiveria zizanioides</i> (L.) Nash.	Poaceae	Bena

Table 1.
Plant list of Ranapur forest, Odisha.

Sl. no.	Name of the family	No. of species
1.	<i>Acanthaceae</i>	3
2.	<i>Agavaceae</i>	1
3.	<i>Amaranthaceae</i>	1
4.	<i>Anacardiaceae</i>	4
5.	<i>Annonaceae</i>	1
6.	<i>Apocynaceae</i>	7
7.	<i>Arecaceae</i>	4
8.	<i>Aristolochaceae</i>	1
9.	<i>Asclepiadaceae</i>	1
10.	<i>Asclepiadiaceae</i>	1
11.	<i>Asteraceae</i>	7
12.	<i>Bombacaceae</i>	2
13.	<i>Caesalpiniaceae</i>	7
14.	<i>Casuarinaceae</i>	1
15.	<i>Combretaceae</i>	5
16.	<i>Convolvulaceae</i>	6
17.	<i>Crassulaceae</i>	1
18.	<i>Cucurbitaceae</i>	1
19.	<i>Cyperaceae</i>	3
20.	<i>Dilleniaceae</i>	1
21.	<i>Dioscoreaceae</i>	1
22.	<i>Dipterocarpaceae</i>	1
23.	<i>Ebenaceae</i>	2
24.	<i>Euphorbiaceae</i>	6
25.	<i>Fabaceae</i>	9
26.	<i>Hypoxidaceae</i>	1
27.	<i>Lamiaceae</i>	4
28.	<i>Liliaceae</i>	1
29.	<i>Loganiaceae</i>	1
30.	<i>Lythraceae</i>	2
31.	<i>Magnoliaceae</i>	1
32.	<i>Malvaceae</i>	4
33.	<i>Meliaceae</i>	1
34.	<i>Menispermaceae</i>	1
35.	<i>Mimosaceae</i>	7
36.	<i>Moraceae</i>	5
37.	<i>Moringaceae</i>	1
38.	<i>Myrtaceae</i>	3
39.	<i>Nyctaginaceae</i>	1
40.	<i>Oleaceae</i>	1
41.	<i>Passifloraceae</i>	1
42.	<i>Poaceae</i>	7

Sl. no.	Name of the family	No. of species
43.	<i>Punicaceae</i>	1
44.	<i>Rhamnaceae</i>	2
45.	<i>Rubiaceae</i>	5
46.	<i>Rutaceae</i>	3
47.	<i>Rutaceae</i>	3
48.	<i>Sapotaceae</i>	1
49.	<i>Simaroubaceae</i>	1
50.	<i>Solanaceae</i>	1
51.	<i>Verbenaceae</i>	5
52.	<i>Violaceae</i>	1
53.	<i>Zingiberaceae</i>	1
	<i>Total</i>	143

Table 2.
Taxonomic classification (family-wise distribution) of Ranapur forest division, Odisha.

■ Tree ■ Shrub ■ Climber ■ Herb ■ Grass

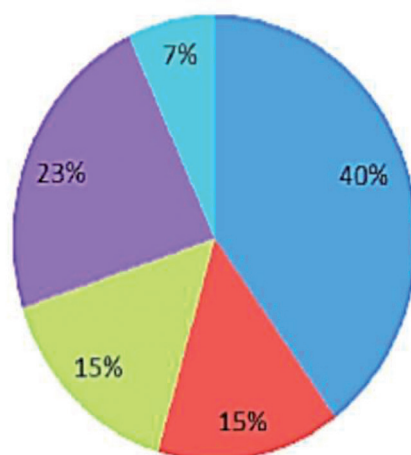
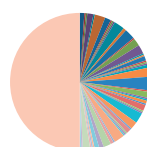


Figure 2.
Floristic diversity of Ranapur forest division, Odisha.



- | | |
|-------------------|---------------------|
| 1. Acanthaceae | 2. Agavaceae |
| 3. Amaranthaceae | 4. Anacardiaceae |
| 5. Annonaceae | 6. Apocynaceae |
| 7. Arecaceae | 8. Aristolochaceae |
| 9. Asclepiadaceae | 10. Asclepiadiaceae |
| 11. Asteraceae | 12. Bombacaceae |

Figure 3.
Family-wise distribution of plant.

reveals that the study area fills in as a wellspring of livelihood for occupying the territory. Ethnobotany is maybe the most significant technique to study natural resources and their administration, which was done by indigenous people since days of yore. It enables us to work with local people to explore knowledge based on experiences of age [13]. Analysis of data reveals various species that have ethnobotanical importance and used for various purposes by the indigenous people of the area. The local herbs particularly medicinal species even today assume a significant job in the financial inspire of the rustic zones and different privately created drugs are as yet being utilized as family unit solutions for different ailments [14–16].

5. Conclusion

Biodiversity is fundamental for human endurance and financial prosperity and for the ecosystem function and stability. The present investigation showed that the Ranapur forest has high species diversity with more than nine different tribes who depend on plants and folk medications. The Fabaceae group of plants are found to be most diverse in the study area. The need of great importance is to aware folks concerning its significance, involvement of people in its.

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Conflict of interest

The authors declare that there is no conflict of Interest.

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