

## FLORISTIC ANALYSIS (ANGIOSPERMS) AND ECONOMICALLY IMPORTANT PLANTS OF SIDHI DISTRICT, MADHYA PRADESH, INDIA

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### ABSTRACT

The present paper deals with the floristic analysis of angiosperms and economic plants occurring in Sidhi district, Madhya Pradesh (India). A total number of 941 species under 545 genera belonging to 132 families have been recorded. Out of these 265 species in 139 genera and 26 families belong to Monocot and 676 species in 406 genera and 106 families belong to Dicot. Poaceae is the largest family (135 species) while Cyperus and Eragrostis are dominant genera (14 species each). The details of analysis along with rare, threatened and economic plants have been provided in the paper

**Keywords :** Floristic Analysis; Sidhi district; Economic Plants; Madhya Pradesh.

### Introduction

Sidhi district (which was a part of the erstwhile Rewa division) with a total geographical area of 10526.00 sq km is located in the North-east corner of Madhya Pradesh between 22°47'-24°42' N latitude and 81°18'-82°48' E longitude. The district is bounded on the north by Rewa district (M.P.), on the east by Singrauli district (M.P.), on the south by Koriya and Surguja districts (Chhattisgarh) and on the west by Shahdol and Umaria districts (M.P.). It has 6 tehsils namely, Gopad-Banas, Churhat, Kushmi, Majhauri, Rampur Naikin and Sihawal. The total forest area in the district is 4013 sq km which is 38.12 % of the total geographical area of the district. The general aspect is a medley of hill and valley, with comparatively very little level ground. The northern boundary is formed by a scarp of Kaimur hills and consists of a more or less continuous range of flat topped hills running east-west, varying in elevation from 488 m to 678 m. The Son river, just

south of Kaimur hills, flows from west to east, and is more or less parallel to the Kaimur range. The few extensive plains are the Son valley, Jaiwan plain and the plain around Madwas. The river Son has two main tributaries, the Banas, which forms the western boundary of the district, and the Gopad, which practically bifurcates the district south on the Son into two halves. Numerous smaller rivers, streams and large drains criss-cross the area, of which only a few are perennial. Although the district has been botanically explored and few contributions have been made (Sen Gupta & Ram Lal, 1973; Dwivedi, 2004; Srivastava *et al.*, 2005) but no effort has been made to work out the floristic analysis of angiosperms and economic plants of the district which is pre-requisite in formulating any strategy for their conservation and sustainable utilization. Hence, the present paper deals with an account of floristic analysis of angiosperms along with the data on rare, threatened and economic plants of the district.

### Materials and Methods

Several field trips were undertaken during July 2009 to May 2011 for plant collections. All the collected specimens have been properly processed according to the method described by Jain & Rao (1976) and identified with the help of different monographs, published florals and revisions. The specimens have been deposited in the herbarium of Department of Botany, Govt. Science College, Rewa (M.P.). The data on economic plants is based on field information gathered from tribal and rural folks as well as literature.

### Floristic Analysis

The detailed analysis (Table 1) reveals that 941 species of angiosperms under 545 genera belonging to 132 families are found in Sidhi district, Madhya Pradesh. Out of these 265 species in 139 genera and 26 families belong to Monocot and 676 species in 406 genera and 106 families belong to Dicot.

**Table-1. Status of Families, Genera and Species of Angiosperms in Sidhi District**

Group	Families	Genera	Species
Dicot	106	406	676
Monocot	26	139	265
<b>Total</b>	<b>132</b>	<b>545</b>	<b>941</b>

The details of the family-wise break up of number of genera and species under each family have been given in Table 2.

**Table-2. Number of Genera and Species Under Various Families of Angiosperms**

S. No.	Family	Genera	Species
1	Ranunculaceae	3	3
2	Dilleniaceae	1	3
3	Annonaceae	3	3
4	Menispermaceae	3	3
5	Nymphaeaceae	1	2
6	Nelumbonaceae	1	1
7	Papaveraceae	1	1
8	Fumariaceae	1	1

9	Brassicaceae	3	4
10	Capparaceae	2	4
11	Violaceae	2	2
12	Bixaceae	1	1
13	Flacourtiaceae	2	4
14	Polygalaceae	1	5
15	Caryophyllaceae	3	4
16	Portulacaceae	1	1
17	Tamaricaceae	1	1
18	Elatinaceae	1	1
19	Hypericaceae	1	1
20	Dipterocarpaceae	1	1
21	Malvaceae	11	19
22	Bombacaceae	1	1
23	Sterculiaceae	6	7
24	Tiliaceae	3	15
25	Linaceae	1	1
26	Malpighiaceae	1	1
27	Zygophyllaceae	1	1
28	Oxalidaceae	2	4
29	Rutaceae	5	5
30	Simaroubaceae	1	1
31	Balanitaceae	1	1
32	Ochnaceae	1	1
33	Burseraceae	2	2
34	Meliaceae	4	4
35	Olacaceae	1	1
36	Celastraceae	3	3
37	Rhamnaceae	2	7
38	Vitaceae	3	5
39	Leeaceae	1	2
40	Sapindaceae	3	3
41	Anacardiaceae	4	4
42	Moringaceae	1	1
43	Fabaceae	37	87
44	Caesalpiniaceae	6	15
45	Mimosaceae	5	15
46	Rosaceae	1	1
47	Droseraceae	1	1
48	Combretaceae	3	8
49	Myrtaceae	1	3
50	Lecythidaceae	1	1
51	Melastomataceae	3	4
52	Lythraceae	4	8
53	Onagraceae	1	5
54	Trapaceae	1	1
55	Passifloraceae	1	1
56	Cucurbitaceae	9	12
57	Begoniaceae	1	1
58	Cactaceae	1	1
59	Aizoaceae	1	1
60	Molluginaceae	2	3
61	Apiaceae	5	5
62	Araliaceae	1	2
63	Alangiaceae	1	1
64	Rubiaceae	15	23
65	Asteraceae	39	49
66	Campanulaceae	3	6

67	Plumbaginaceae	1	1
68	Primulaceae	2	2
69	Myrsinaceae	2	2
70	Sapotaceae	2	2
71	Ebenaceae	1	3
72	Symplocaceae	1	1
73	Oleaceae	3	3
74	Apocynaceae	6	7
75	Asclepiadaceae	12	13
76	Loganiaceae	1	1
77	Buddlejaceae	1	1
78	Gentianaceae	4	5
79	Menyanthaceae	1	1
80	Hydrophyllaceae	1	1
81	Boraginaceae	8	14
82	Convolvulaceae	12	26
83	Solanaceae	5	9
84	Scrophulariaceae	16	26
85	Orobanchaceae	2	2
86	Lentibulariaceae	1	2
87	Gesneriaceae	1	1
88	Bignoniaceae	4	5
89	Pedaliaceae	1	1
90	Acanthaceae	15	33
91	Verbenaceae	8	10
92	Lamiaceae	16	29
93	Nyctaginaceae	2	3
94	Amaranthaceae	10	15
95	Chenopodiaceae	1	2
96	Polygonaceae	3	6
97	Aristolochiaceae	1	1
98	Piperaceae	1	1
99	Lauraceae	1	2
100	Loranthaceae	2	2
101	Euphorbiaceae	15	33
102	Urticaceae	4	4
103	Ulmaceae	2	2
104	Moraceae	1	13
105	Salicaceae	1	1
106	Ceratophyllaceae	1	1
107	Hydrocharitaceae	4	4
108	Orchidaceae	7	9
109	Zingiberaceae	3	7
110	Costaceae	1	1
111	Amaryllidaceae	1	2
112	Hypoxidaceae	1	1
113	Taccaceae	1	1
114	Dioscoreaceae	1	5
115	Liliaceae	6	7
116	Smilacaceae	1	1
117	Pontederiaceae	2	2
118	Commelinaceae	5	14
119	Juncaceae	1	2
120	Arecaceae	1	2
121	Typhaceae	1	1
122	Araceae	9	10
123	Lemnaceae	2	2
124	Alismataceae	2	3

125	Limnocharitaceae	1	1
126	Najadaceae	1	1
127	Aponogetonaceae	1	2
128	Potamogetonaceae	1	3
129	Zannichelliaceae	1	1
130	Eriocaulaceae	1	2
131	Cyperaceae	14	46
132	Poaceae	70	135
<b>Total = 132</b>		<b>545</b>	<b>941</b>

Analysis of ten dominant families (Fig. 1) indicates that Poaceae (135 spp.) is the most dominant family in the district followed by Fabaceae (87 spp.), Asteraceae (49 spp.), Cyperaceae (46 spp.), Euphorbiaceae and Acanthaceae (33 spp. each), Lamiaceae (29 spp.), Scrophulariaceae and Convolvulaceae (26 spp. each), Rubiaceae (23 spp.).

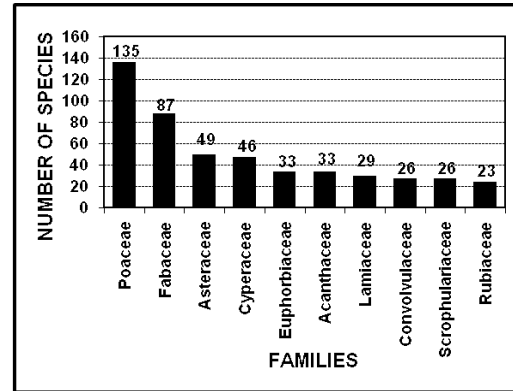


Fig.-1. Ten dominant families in Sidhi district

The ten dominant families comprise of 488 species i.e. 52 % of the total species included in the present work while the remaining 122 families with a total of 456 species constitute 48 %. The families are represented either by a single genus or more genera and either with a single or more species. On the basis of number of genera and species in a family all the families have been categorized in various groups as stated below.

#### A. Species diversity under families:

Families with 1 species = 47

Families with 2 species = 21

Families with 3 species = 13  
 Families with 4 species = 10  
 Families with 5 species = 8  
 Families with 6-10 species = 13  
 Families with 11-20 species = 10  
 Families with 21-30 species = 4  
 Families with 31-50 species = 4  
 Families with 51-100 species = 1  
 Families with 100-135 species = 1

### B. Generic diversity under families:

Families with 1 genus = 66  
 Families with 2 genera = 16  
 Families with 3 genera = 15  
 Families with 4 genera = 7  
 Families with 5-10 genera = 15  
 Families with 11-20 genera = 9  
 Families with 21-40 genera = 2  
 Families with 41-70 genera = 1

It is worthwhile to record that a few families which are represented by a single genus in India also occur in the district. The families are Alangiaceae, Begoniaceae, Buddlejaceae, Ebenaceae, Eriocaulaceae, Leeaceae, Zannichelliaceae and Potamogetonaceae. Further, it is interesting to note that family Zannichelliaceae represented by single genus and single species in the district is also represented by single genus with single species in India. A comparison of the present data with Madhya Pradesh (Khanna & Kumar, 2006) indicates that ten families viz., Symplocaceae, Taccaceae, Ceratophyllaceae, Balanitaceae, Leeaceae, Trapaceae, Typhaceae, Najadaceae, Aponogetonaceae and Nelumbonaceae which are unigeneric in the state also occur in the district.

The data of ten dominant genera (Fig. 2) indicates that *Cyperus* and *Eragrostis* (14 spp. each), are the most dominant genera in the district followed by *Ficus* (13 spp.), *Crotalaria*, *Fimbristylis* and *Ipomoea* (11 spp.

each), *Desmodium* and *Indigofera* (9 spp. each), *Commelina* and *Euphorbia* (8 spp. each).

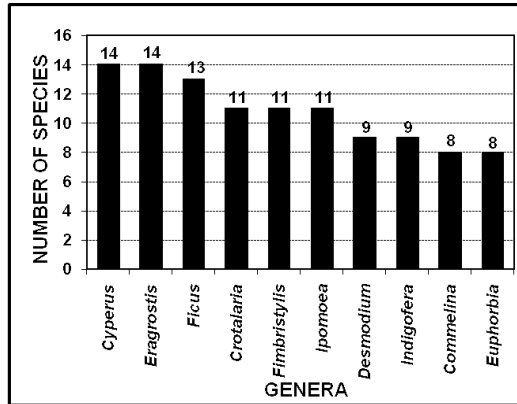


Fig.-2. Ten dominant genera in Sidhi district

It is interesting to record that 37 monotypic genera occur in Sidhi district. These are *Acrachne*, *Allmania*, *Apluda*, *Blumeopsis*, *Brynopsis*, *Butomopsis*, *Caesulia*, *Chloroxylon*, *Coldenia*, *Colebrookea*, *Desmostachya*, *Diectomis*, *Digera*, *Eleiotis*, *Gloriosa*, *Haldina*, *Hemidesmus*, *Hydrilla*, *Hygroryza*, *Limonia*, *Limnophyton*, *Martynia*, *Naringi*, *Nelsonia*, *Nothosaerva*, *Oroxylum*, *Ougeinia*, *Pistia*, *Pongamia*, *Pseudosorghum*, *Ricinus*, *Rotula*, *Schleichera*, *Soymida*, *Tamarindus*, *Thysanolaena* and *Zannichellia*. Further, some of the genera which are represented in India by single species/variety also occur in the district. These are *Aegle*, *Amberboa*, *Blainvillea*, *Centella*, *Centipeda*, *Cheilocostus*, *Chrysanthellum*, *Cissampelos*, *Diplocyclos*, *Dregea*, *Eclipta*, *Elytrophorus*, *Floscopa*, *Grangea*, *Holarrhena*, *Hydrolea*, *Lagascea*, *Nelumbo*, *Ottelia*, *Oxystelma*, *Petalidium*, *Phyla*, *Sebastiania*, *Siegesbeckia*, *Sutera*, *Tectona*, *Tridax*, *Waltheria* and *Woodfordia*.

### Rare Plants

An analysis based on thorough field survey has pointed out that 70 taxa are rare in Sidhi district since these were found to be

restricted only in certain pockets of the district and their population was very few. These are *Abelmoschus crinitus* Wall., *Acorus calamus* L., *Aeginetia indica* L., *Aeschynomene americana* L., *Amorphophallus bulbifer* (Roxb.) Blume, *Argyrea involucreta* C.B. Clarke, *Arisaema tortuosum* (Wall.) Schott, *Aristolochia indica* L., *Ceropegia hirsuta* Wight & Arn., *Chrysopogon serrulatus* Trin., *Citrullus colocynthis* (L.) Schrad. ex Eckl. & Zeyh., *Clematis smilacifolia* Wall., *Cochlospermum religiosum* (L.) Alston, *Conyza semipinnatifida* DC., *Cordia macleodii* (Griff.) Hook. f. & Thomson, *C. monoica* Roxb., *Curcuma amada* Roxb., *C. angustifolia* Roxb., *Cymbopogon martinii* (Roxb.) S. Watson, *Desmodium benthamii* N.P. Balakr., *Didymocarpus pygmaea* C.B. Clarke, *Dillenia aurea* Sm., *Dillenia pentagyna* Roxb., *Dioscorea hispida* Dennst., *Drosera burmannii* Vahl, *Eragrostis zeylanica* Nees & Meyen, *Erythrina suberosa* Roxb., *Eulophia herbacea* Lindl., *Ficus microcarpa* L. f., *Ficus rumphii* Blume, *Gardenia gummifera* L. f., *G. resinifera* Roth, *Globba marantina* L., *G. racemosa* Sm., *Glochidion zeylanicum* (Gaertn.) Adr. Juss., *Gloriosa superba* L., *Gmelina arborea* Roxb., *Hymenodictyon orixense* (Roxb.) Mabb., *Ischaemum duthiei* Stapf ex Bor, *Justicia neesii* Ramamoorthy, *Leea macrophylla* Roxb. ex Hornem., *Litsea glutinosa* (Lour.) Rob., *Litsea monopetala* (Roxb.) Pers., *Marsdenia tenacissima* (Roxb.) Moon, *Maytenus emarginata* (Willd.) Ding Hou, *Ochna pumila* Buch.-Ham. ex D. Don, *Oenanthe javanica* (Blume) DC., *Operculina petaloidea* (Choisy) Ooststr., *Oroxylum indicum* (L.) Vent., *Paederia foetida* L., *Panicum maximum* Jacq., *Peucedanum nagpurensis* (C.B. Clarke) Prain, *Piper longum* L., *Premna latifolia* Roxb., *Pterocarpus marsupium* Roxb., *Pueraria tuberosa* (Roxb. ex Willd.) DC., *Radermachera xylocarpa* (Roxb.) K. Schum., *Rothea serrata* (L.) Steane & Mabb, *Schefflera stellata* (Gaertn.) Harms, *S. venulosa* (Wight & Arn.) Harms, *Sporobolus tetragonus* Bor., *Soymida*

*febrifuga* (Roxb.) A. Juss., *Sterculia villosa* Roxb. ex Sm., *Stereospermum chelonoides* (L. f.) DC., *Stereospermum colais* (Dillwyn) Mabb., *Tacca leontopetaloides* (L.) Kuntze, *Tragus roxburghii* Panigrahi, *Trewia nudiflora* L., *Uraria rufescens* (DC.) Schindl. and *Wendlandia heynei* (Roem. & Schult.) Sant. & Merchant.

### Threatened Plants

Conservation of plant resources and its sustainable use are essential for human survival and are the prime objectives of Convention on Biological Diversity (CBD). As such our knowledge on the threatened plants of the district is need of the hour. It is noteworthy that out of 70 rare taxa in the district, three species viz., *Acorus calamus*, *Eulophia herbacea* and *Rothea serrata* have been categorized as Endangered while 9 species viz., *Citrullus colocynthis*, *Cochlospermum religiosum*, *Curcuma angustifolia*, *Dioscorea hispida*, *Gloriosa superba*, *Litsea glutinosa*, *Oroxylum indicum*, *Peucedanum nagpurensis* and *Pterocarpus marsupium* as Vulnerable as per recent I.U.C.N. Red List Categories in Madhya Pradesh (Ved *et al.*, 2003). Our field observations in the district indicate that the status of these species are same as in the state and thus in conformity with the findings of Ved *et al.* (2003).

### Economic Plants

Sidhi district has a rich wealth of plants having economic potential as edible, timber, medicinal and other miscellaneous purposes. The sustainable utilization of these species may lead to the social and economic growth of the tribal and rural folks living in the area. Many wild plants occurring in the area are useful in different aspects of life of the common people. A number of economic plants have been collected which have been listed below under their important uses categories.

## 1. Edible plants

(i) **Whole plant:** *Chenopodium album*.

(ii) **Rhizomes/Roots/Tubers:** *Amorphophallus paeonifolius* var. *campanulatus*, *Cheilocostus speciosus*, *Curcuma angustifolia*, *Dioscorea bulbifera*, *D. hispida*, *D. pentaphylla*, *D. pubera*, *Colocasia esculenta*, *Nelumbo nucifera*, *Nymphaea nouchali*, *N. rubra*, *Pueraria tuberosa*, *Sauromatum venosum*, *Tacca leontopetaloides*.

(iii) **Young leaves and tender twigs:** *Abelmoschus manihot* ssp. *tetraphyllus*, *Amaranthus spinosus*, *A. viridis*, *Antidesma acidum*, *Bauhinia malabarica*, *B. purpurea*, *Brassica juncea*, *Centella asiatica*, *Commelina benghalensis*, *Colocasia esculenta*, *Corchorus capsularis*, *Corchorus olitorius*, *Digera muricata*, *Glinus lotoides*, *Grewia tiliifolia*, *Indigofera cassioides*, *Ipomoea eriocarpa*, *Melochia corchorifolia*, *Mollugo pentaphylla*, *Ottelia alismoides*, *Oxalis corniculata*, *Oxystelma esculentum*, *Phyllanthus nodiflora*, *Portulaca oleracea*, *Rivea hypocrateriformis*, *Smithia conferta*.

(iv) **Flowers and inflorescence:** *Bauhinia purpurea*, *Madhuca longifolia* var. *latifolia*, *Moringa oleifera*, *Oxystelma esculentum*, *Woodfordia fruticosa*.

(v) **Fruits:** *Alangium salvifolium*, *Annona squamosa*, *Bauhinia purpurea*, *Bridelia retusa*, *Buchanania lanzan*, *Canavalia gladiata*, *Carissa spinarum*, *Coccinia grandis*, *Cordia dichotoma*, *Cucumis melo* var. *agrestis*, *Dillenia indica*, *D. pentagyna*, *Diospyros melanoxylon*, *Ficus hispida*, *F. racemosa*, *F. semicordata*, *Flacourtia indica*, *Garuga pinnata*, *Gmelina arborea*, *Grewia helicterifolia*, *G. hirsuta*, *G. rothii*, *G. tiliifolia*, *Ipomoea turbinata*, *Limonia acidissima*, *Mangifera indica*, *Manilkara hexandra*, *Miliusa tomentosa*, *Momordica dioica*, *Moringa*

*oleifera*, *Mucuna pruriens*, *Nelumbo nucifera*, *Oxystelma esculentum*, *Phoenix acaulis*, *P. sylvestris*, *Phyllanthus emblica*, *Physalis minima*, *Solanum nigrum*, *Pithecellobium dulce*, *Schleichera oleosa*, *Syzygium cumini*, *S. heyneanum*, *S. nervosum*, *Trapa natans* var. *bispinosa*, *Tamarindus indica*, *Tamilnadia uliginosa*, *Ziziphus mauritiana*, *Z. nummularia*, *Z. oenoplia*.

(vi) **Seeds:** *Bauhinia vahlii*, *Buchanania lanzan*, *Echinochloa colonum*, *Eleusine indica*, *Eragrostis tremula*, *Holoptelea integrifolia*, *Madhuca longifolia* var. *latifolia*, *Manilkara hexandra*, *Millettia extensa*, *Nelumbo nucifera*, *Nymphaea nouchali*, *N. rubra*, *Oryza rufipogon*, *Paspalidium flavidum*, *Semecarpus anacardium*, *Senna obtusifolia*, *Sterculia urens*, *S. villosa*.

(vii) **Oil seeds:** *Madhuca longifolia* var. *latifolia*, *Schleichera oleosa*, *Tephrosia purpurea*, *Ventilago denticulata*.

**2. Timber wood and agricultural implements:** Although *Dalbergia sissoo* (seesham) is the most important tree of timber value but *Tectona grandis* (teak), another tree of high timber value, has been planted at various places. Many other tree species also have the potentiality of good timber value apart from teak. Some important such species are *Acacia leucophloea*, *Acacia nilotica* subsp. *indica*, *Albizia lebbek*, *A. procera*, *Anogeissus latifolia*, *Bauhinia racemosa*, *Bridelia retusa*, *Butea monosperma*, *Careya arborea*, *Dalbergia latifolia*, *D. paniculata*, *Diospyros melanoxylon*, *Gmelina arborea*, *Grewia tiliifolia*, *Haldina cordifolia*, *Kydia calycina*, *Lagerstroemia parviflora*, *Lannea coromandelica*, *Madhuca longifolia* var. *latifolia*, *Mangifera indica*, *Miliusa tomentosa*, *Mitragyna parvifolia*, *Ougeinia oojeinensis*, *Pterocarpus marsupium*, *Schleichera oleosa*, *Shorea robusta*, *Soymida febrifuga*, *Syzygium cumini*, *Terminalia alata*, *Ziziphus xylopyra*.

- 3. Rough cordage, hats, mats, rope, cups, plates etc.:** *Abutilon indicum*, *Arundo donax*, *Bauhinia vahlii*, *Butea monosperma*, *Dendrocalamus strictus*, *Desmostachya bipinnata*, *Diospyros melanoxylon*, *Helicteres isora*, *Phoenix acaulis*, *Shorea robusta*, *Sida cordata*, *S. cordifolia*, *S. rhombifolia*, *Typha angustifolia*, *Urena lobata*, *Ventilago denticulata*, *Vetiveria zizanioides*.
- 4. Match-stick:** *Boswellia serrata*, *Butea monosperma*, *Dendrocalamus strictus*, *Diospyros melanoxylon*, *Helicteres isora*, *Phoenix acaulis*, *Sida cordata*, *S. cordifolia*, *S. rhombifolia*, *Typha angustifolia*, *Urena lobata*, *Ventilago denticulata*, *Vetiveria zizanioides*.
- 5. Hut making and thatching:** *Bauhinia purpurea*, *Dendrocalamus strictus*, *Desmostachya bipinnata*, *Lagerstroemia parviflora*, *Phoenix acaulis*, *Saccharum spontaneum*, *Shorea robusta*, *Vetiveria zizanioides*.
- 6. Fodder:** *Apluda mutica*, *Arundinella pumila*, *Bothriochloa pertusa*, *Bridelia retusa*, *Butea monosperma*, *Dalbergia latifolia*, *D. sissoo*, *Dactyloctenium aegyptium*, *Dichanthium annulatum*, *D. aristatum*, *Digitaria ciliaris*, *Echinochloa colonum*, *Eleusine indica*, *Eragrostis gangetica*, *E. tremula*, *Erythrina suberosa*, *Hackelochloa granularis*, *Heteropogon contortus*, *Iseilema laxum*, *Kydia calycina*, *Pennisetum pedicellatum*, *Perotis indica*, *Pithecellobium dulce*, *Vicia sativa*, *Zornia gibbosa*.
- 7. Musical instruments:** *Buchanania lanzan*, *Dendrocalamus strictus*, *Lagerstroemia parviflora*, *Pterocarpus marsupium*, *Tectona grandis*.
- 8. Beverage:** *Madhuca longifolia* var. *latifolia*.
- 9. Bidi making:** *Diospyros melanoxylon*, *Shorea robusta*.
- 10. Dyes:** *Bombax ceiba*, *Butea monosperma*, *Eclipta prostrata*, *Lagerstroemia parviflora*, *Mallotus philippensis*, *Nyctanthes arbor-tristis*, *Pterocarpus marsupium*, *Woodfordia fruticosa*.
- 11. Gum:** *Acacia nilotica* subsp. *indica*, *Anogeissus latifolia*, *Boswellia serrata*, *Cochlospermum religiosum*.
- 12. Tannin:** *Bauhinia racemosa*, *Bridelia retusa*, *Buchanania lanzan*, *Cassia fistula*, *Lagerstroemia parviflora*, *Phyllanthus emblica*, *Terminalia chebula*, *Woodfordia fruticosa*, *Ziziphus oenoplia*.
- 13. Fibre:** *Corchorus capsularis*, *C. olitorius*, *Urena lobata*.
- 14. Host plants for lac insects:** *Butea monosperma*.
- 15. Insecticide:** *Annona squamosa*, *Azadirachta indica*, *Ocimum basilicum*.
- 16. Silky floss for stuffing:** *Bombax ceiba*, *Calotropis gigantea*.
- 17. Religious ceremonies / Magico-religious beliefs:** *Aegle marmelos*, *Asparagus racemosus*, *Buchanania lanzan*, *Canscora diffusa*, *Cassia fistula*, *Desmostachya bipinnata*, *Ficus benghalensis*, *F. religiosa*, *Madhuca longifolia* var. *latifolia*, *Mangifera indica*, *Ocimum tenuiflorum*, *Oryza sativa*, *Phyllanthus emblica*, *Tephrosia purpurea*.
- 18. Broom, baskets:** *Desmodium gangeticum*, *Eragrostis gangetica*, *Phoenix sylvestris*, *Phyllanthus reticulatus*, *Sida acuta*, *Thysanolaena latifolia*, *Vetiveria zizanioides*.
- 19. Toys:** *Aeschynomene indica*, *Ailthanus excelsa*, *Haldina cordifolia*, *Melia azedarach*.
- 20. Gum and resin:** *Anogeissus latifolia*, *Bombax ceiba*, *Boswellia serrata*, *Gardenia*

*latifolia*, *Mangifera indica*, *Pterocarpus marsupium*, *Sterculia urens*, *Woodfordia fruticosa*.

**21. Mosquito repellent:** *Hyptis suaveolens*.

**22. Fish poison:** *Casearia graveolens*, *C. tomentosa*, *Catunaregam spinosa*, *Ceriscoides turgida*, *Millettia extensa*, *Ougeinia oojeinensis*.

**23. Medicinal plants:**

**Abortion and menstrual disorder:**

*Achyranthes aspera*, *Dendrophthoe falcata*, *Gloriosa superba*.

**Anaemia:** *Casearia tomentosa*, *Ixora pavetta*, *Woodfordia fruticosa*.

**Antidote (snake bite and scorpion sting):** *Alangium salvifolium*, *Andrographis paniculata*, *Aristolochia indica*, *Capparis zeylanica*, *Cassia fistula*, *Cayratia trifolia*, *Ceropegia hirsuta*, *Ceratophyllum demersum*, *Clematis smilacifolia*, *Desmodium gangeticum*, *Dicliptera paniculata*, *Ficus religiosa*, *Lagerstroemia parviflora*, *Radermachera xylocarpa*, *Senna occidentalis*, *Sida acuta*, *Wrightia tinctoria* subsp. *rothii*.

**Antifertility / Contraceptive:** *Abrus precatorius*.

**Asthma:** *Adhatoda zeylanica*, *Biophytum sensitivum*, *Calotropis gigantea*, *Datura innoxia*, *Euphorbia hirta*, *Ranunculus scleratus*, *Tephrosia purpurea*.

**Boils, blisters and ulcers:** *Albizia lebeck*, *Achyranthes aspera*, *Capparis sepiaria*, *Catunaregam spinosa*, *Cayratia trifolia*, *Cleome viscosa*, *Cordia macleodii*, *Mimosa pudica*, *Mollugo pentaphylla*, *Monochoria hastata*, *Pergularia daemia*, *Phyla nodiflora*, *Trichosanthes tricuspidata*, *Tridax procumbens*.

**Bone fracture:** *Litsea glutinosa*.

**Brain tonic:** *Bacopa monnieri*, *Celastrus paniculatus*, *Centella asiatica*, *Convolvulus prostratus*, *Hydrocotyle sibthorpioides*.

**Cough, cold and bronchitis:** *Abrus precatorius*, *Acacia leucophloea*, *Acacia nilotica* subsp. *indica*, *Ailanthus excelsa*, *Anagallis arvensis*, *Barleria prionitis*, *Centipeda minima*, *Cissampelos pareira* var. *hirsuta*, *Coccinia grandis*, *Euphorbia hirta*, *Justicia adhatoda*, *Lepidagathis incurva*, *Leucas cephalotes*, *Ocimum tenuiflorum*, *Piper longum*, *Polygala arvensis*, *P. chinensis*, *P. crotalarioides*, *Rothea serrata*, *Sphaeranthus indicus*, *Solanum virginianum*, *Uraria picta*, *Urena lobata*.

**Cuts and wounds:** *Buchanania lanzan*, *Colebrookea oppositifolia*, *Dillenia pentagyna*, *Dendrophthoe falcata*, *Eriolaena candollei*, *Gardenia resinifera*, *Ipomoea carnea*, *Lanea coromandelica*, *Litsea glutinosa*, *Semecarpus anacardium*, *Tridax procumbens*, *Ziziphus xylopyra*.

**Diabetes:** *Aegle marmelos*, *Azadirachta indica*, *Coccinia grandis*, *Ficus benghalensis*, *Gymnema sylvestre*, *Ichnocarpus frutescens*, *Pterocarpus marsupium*, *Scoparia dulcis*, *Syzygium cumini*.

**Diarrhoea and dysentery:** *Aegle marmelos*, *Ampelocissus latifolia*, *Bauhinia purpurea*, *Begonia picta*, *Butea monosperma*, *Curculigo orchioides*, *Desmodium triflorum*, *Elephantopus scaber*, *Ficus benghalensis*, *Fimbristylis falcata*, *Flacourtia jangomas*, *Holarrhena pubescens*, *Lepidium sativum*, *Limonia acidissima*, *Litsea glutinosa*, *Helicteres isora*, *Phyllanthus reticulatus*, *Salvia plebeia*, *Shorea robusta*, *Soymida febrifuga*, *Syzygium cumini*, *Tephrosia purpurea*, *Terminalia arjuna*, *Triumfetta rhomboidea*, *Vicia sativa*, *Wrightia tinctoria* subsp. *rothii*, *Ziziphus mauritiana*.



**Ear diseases:** *Cleome viscosa*.

**Epilepsy:** *Flemingia strobilifera*.

**Eye diseases:** *Argemone mexicana*,  
*Euphorbia nivulia*.

**Fever:** *Abutilon indicum*, *Ailanthus excelsa*, *Andrographis echioides*, *A. paniculata*, *Caesalpinia bonduc*, *Cissampelos pareira* var. *hirsuta*, *Cyanthillium cinerea*, *Enicostema axillare*, *Hemidesmus indicus*, *Holarrhena pubescens*, *Hymenodictyon orixense*, *Nyctanthes arbor-tristis*, *Ocimum americanum*, *Ocimum tenuiflorum*, *Tinospora cordifolia*, *Vanda tessellata*, *Uraria picta*.

**Gonorrhoea:** *Cocculus hirsutus*,  
*Cochlospermum religiosum*, *Sida cordifolia*,  
*Solena amplexicaulis*.

**Headache:** *Celastrus paniculatus*, *Naringi crenulata*, *Stereospermum chelonoides*, *Vitex negundo*.

**Heart disease:** *Boerhavia diffusa*,  
*Terminalia arjuna*, *Tinospora cordifolia*, *Urginea indica*.

**Hypertension:** *Terminalia arjuna*.

**Impotency (aphrodisiac):** *Asparagus racemosus*, *Bombax ceiba*, *Curculigo orchioides*, *Hygrophila auriculata*, *Mucuna pruriens*, *Peucedanum nagpurensis*.

**Lactagogue:** *Asparagus racemosus*.

**Leprosy:** *Anagallis arvensis*, *Calotropis procera*, *Commelina benghalensis*.

**Leucorrhoea:** *Hemidesmus indicus*, *Sida cordifolia*.

**Liver diseases / Jaundice:** *Alangium salvifolium*, *Andrographis paniculata*,

*Boerhavia diffusa*, *Citrullus colocynthis*,  
*Diospyros montana*, *Eclipta prostrata*,  
*Flacourtia indica*, *Fuirena umbellata*, *Fumaria indica*, *Haldina cordifolia*, *Hygrophila auriculata*, *Indigofera tinctoria*, *Marsdenia tenacissima*, *Mitragyna parvifolia*, *Oxystelma esculentum*, *Phyllanthus amarus*, *P. urinaria*,  
*Portulaca oleracea*, *Senna obtusifolia*,  
*Solanum nigrum*, *Thalictrum foliolosum*,  
*Thespesia lampas*.

**Malaria:** *Andrographis paniculata*,  
*Bauhinia racemosa*.

**Pain and swelling:** *Capparis sepiaria*,  
*Cleome viscosa*, *Nyctanthes arbor-tristis*,  
*Trichosanthes tricuspidata*, *Vanda tessellata*,  
*Vitex negundo*.

**Piles:** *Achyranthes aspera*, *Blumea lacera*,  
*Curculigo orchioides*, *Ficus racemosa*,  
*Mimosa pudica*, *Momordica dioica*.

**Pneumonia:** *Ranunculus scleratus*.

**Rheumatism / arthritis / sciatica:**  
*Aristolochia indica*, *Cardiospermum halicacabum*, *Cheilocostus speciosus*,  
*Cryptolepis buchanani*, *Drimia indica*, *Eulophia herbacea*, *Gloriosa superba*, *Hemidesmus indicus*, *Hygrophila auriculata*, *Leea asiatica*,  
*Moringa oleifera*, *Murraya paniculata*,  
*Nyctanthes arbor-tristis*, *Paederia foetida*,  
*Ricinus communis*, *Rothea serrata*,  
*Schleichera oleosa*, *Sida rhombifolia*, *Solanum virginianum*, *Tephrosia purpurea*, *Teramnus labialis*, *Vanda tessellata*, *Vitex negundo*.

**Skin diseases:** *Acacia catechu*, *Albizia lebeck*, *Ammannia baccifera*, *Andrographis paniculata*, *Argemone mexicana*, *Azadirachta indica*, *Bauhinia variegata*, *Cissampelos pareira* var. *hirsuta*, *Celastrus paniculatus*, *Centella asiatica*, *Cullen corylifolia*, *Cuscuta reflexa*, *Curculigo orchioides*, *Datura metel*,  
*Embelia basaal*, *Euphorbia neriifolia*, *Hiptage*

*benghalensis*, *Leea macrophylla*, *Leonotis nepetifolia*, *Mallotus philippensis*, *Martynia annua*, *Plumbago zeylanica*, *Pongamia pinnata*, *Semecarpus anacardium*, *Senna obtusifolia*, *S. occidentalis*, *S. sophera*, *S. tora*, *Smilax zeylanica*, *Solanum virginianum*, *Tephrosia purpurea*, *Ventilago denticulata*, *Ziziphus nummularia*.

**Spermatorrhoea:** *Acacia nilotica* subsp. *indica*, *Diospyros melanoxylon*, *Holostemma ada-kodien*, *Marsdenia tenacissima*, *Mucuna pruriens*, *Sida cordifolia*, *Smilax zeylanica*, *Solena amplexicaulis*, *Tribulus terrestris*.

**Sterility:** *Bryonopsis laciniosa*, *Butea monosperma*, *Diplocyclos palmatus*.

**Stomach disorders:** *Abrus precatorius*, *Aegle marmelos*, *Balanites aegyptiaca*, *Boswellia serrata*, *Caesalpinia bonduc*, *Carissa opaca*, *Cassia fistula*, *Careya arborea*, *Citrullus colocynthis*, *Cucumis callosus*, *Ficus hispida*, *F. racemosa*, *Gardenia latifolia*, *Embelia basaal*, *Grangea maderaspatana*, *Grewia hirsuta*, *Helicteres isora*, *Gymnema sylvestre*, *Operculina turpethum*, *Melia azedarach*, *Nyctanthes arbor-tristis*, *Oroxylum indicum*, *Plumbago zeylanica*, *Phyllanthus emblica*, *Phyllanthus urinaria*, *Phyllocephalum anthelminticum*, *Physalis minima*, *Ricinus communis*, *Rothea serrata*, *Senna tora*, *Sphaeranthus indicus*, *Sterculia urens*, *Terminalia bellirica*, *T. chebula*, *Triumfetta rhomboidea*, *Ziziphus oenoplia*.

**Tonic:** *Abelmoschus crinitus*, *A. manihot* ssp. *tetraphyllus*, *Abutilon indicum*, *Asparagus racemosus*, *Bauhinia variegata*, *Bombax ceiba*, *Byttneria herbacea*, *Casearia tomentosa*, *Chlorophytum arundinaceum*, *C. tuberosum*, *Curculigo orchioides*, *Corchorus capsularis*, *Elephantopus scaber*, *Flemingia nana*, *Grewia hirsuta*, *Hymenodictyon orixense*, *Phyllanthus emblica*, *Pueraria tuberosa*, *Sida cordata*, *Sterculia villosa*,

*Teramnus labialis*, *Vigna trilobata*, *V. vexillata*, *Withania somnifera*.

**Toothache:** *Achyranthes aspera*, *Azadirachta indica*, *Barleria prionitis*, *Centipeda minima*, *Elephantopus scaber*, *Ficus benghalensis*, *Pongamia pinnata*, *Smilax zeylanica*.

**Tuberculosis:** *Teramnus labialis*.

**Urinary diseases:** *Baliospermum solanifolium*, *Boerhavia diffusa*, *Citrullus colocynthis*, *Clitoria ternata*, *Crinum asiaticum*, *Drimia indica*, *Hygrophila auriculata*, *Indigofera tinctoria*, *Pterocarpus marsupium*, *Tinospora cordifolia*, *Tribulus terrestris*.

**Veneral:** *Cocculus hirsutus*, *Smilax zeylanica*.

**Veterinary medicine:** *Calotropis gigantea*, *Dalbergia sissoo*, *Ficus racemosa*, *Melia azedarach*, *Millettia extensa*.

## Discussion and Conclusion

It is apparent from the present study that 941 species of angiosperms under 545 genera and 132 families occur in Sidhi district. Further, the findings are of significance in view of the report of 70 rare species and 12 threatened species in Sidhi district. The data on rare and threatened plants of the district is useful in formulating strategies for their conservation. Moreover, under *ex-situ* conservation measure, the rare plants may be grown in Botanical Gardens and forest nurseries. Further, it is suggested that there must be sustainable utilization of plant resources in order to cater the needs of future generations. It is also offered that in order to uplift the economy of the tribal and rural people efforts should be made to grow indigenous economic plants like *Madhuca longifolia* var. *latifolia*,

*Buchanania lanzan*, *Phyllanthus emblica*, *Terminalia arjuna*, *T. bellerica*, *T. chebula*, *Asparagus racemosus*, *Curculigo orchioides*, *Gloriosa superba*, *Vetiveria zizanioides*, *Andrographis paniculata*, *Tinospora cordifolia* and *Centella asiatica* on large scale which will generate more avenues for their income. Thus, the present study on the floristic diversity of Sidhi district provides the complete status of species diversity of angiosperms of the area which is not completely known yet and thus

fulfills the Clause 36 given in Chapter IX of the Biological Diversity Act 2002 as well as Article 7 of Convention on Biological Diversity.

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