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Biodiversity of rare and threatened medicinal plants of Dubri wild life sanctuary of Sidhi District Madhya Pradesh

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Abstract
The present study deals with many plant species observed from floristic data. Rare or endangered plants were recorded from the study area. In the present paper 37 plant species have been recorded as rare or endangered plants. All 37 plant species are enumerated with their botanical names, local names, red data categories and present status in the study area. Many of these plant species have immediate attention for their conservation. It is an alarming situation where endangered species requires more and more attentions. The present study also highlights that some rare or endangered plants abundantly found in Dubri Wild Life Sanctuary of Sidhi district. The protected forest area is observed as the best conservation model of the plant diversity and it harbors a large number of endangered and rare plants.

Keywords: Rare, Threatened, Plants, Dubri, Wild Life, Sanctuary, Sidhi

1. Introduction
The biodiversity is a part of our daily lives and livelihood. Every country has the responsibility to conserve, restore and sustainably use the biological diversity within its jurisdiction (Gwalwanshi *et al.* 2014 and Ahmad *et al.* 2006) [1-2]. The importance of biodiversity can be understood, it is not easy to define the value of biodiversity, and very often difficult to estimate it (Mukherjee, 2010) [3]. In India, many rural communities particularly the tribal's obtain considerable part of their daily food from the wild plants. Some examples are: *Ceropegia bulbosa* in Central India and Western Ghats; Codonopisis ovata in Himalayan region; Ardisia sp. and Meliosma pinnata in the North-East; *Eremurus himalaicus, Origanum vulgare and Urtica hyperborea in Lahaul-Spiti and Ladakh; Allium carolinianum and Cicer microphyllum in Kashmir and Sesuvium portulacastrum* in Coastal areas.
The practice of using herbal treatment for diseases dates back to the very earliest of known human history. Due to contrast intimacy with vegetation cover, primitive communities have gained profound knowledge about the utilities of medicinal plants. They have full confidante in them and their time tested medicines (Dushing and Patil, 2010) [4]. Out of the total 4, 22,000 flowering plants reported from the world (Govaert, 2001) [5] more than 50,000 are used for medicinal purposes (Schippmann *et al.* 2002) [6].
In India, almost 95% of the prescriptions are plant-based in the traditional systems. Medicinal plants which play vital roles in human health care are pharmaceutically important, and form an important sector of industry having a potential trade value of over Rs. 3,500 crores. Due to growing recognition of natural products, nontoxicity and easy availability, its demand is increasing and thereby, its cultivation has also been increased (Nayak *et al.* 2000) [7]. People living in tribal localities and in villages are using indigenous plants as medicines from long ago because this knowledge reaches to them through generation to generation, and is based on experience (Pathak and Mishra, 2011) [8]. Also the tribes and villages are far away from cities and mostly there are no health facilities. Inhabitants are dominantly poor or middle class and the prices of synthetic drugs are rising day by day and they cannot withstand the sharply rising prices of synthetic drugs, so as a consequence, non-availability of expensive synthetic drugs (Shinwari and Khan, 1998) [9].
Dubri Wild Life Sanctuary of Sidhi district is another wildlife paradise located in Kusumi and Majhauli blocks of the Sidhi district of central Indian state Madhya Pradesh. The entire park is consist with Sanjay National Park, covers about 466.7 km^2 area, while Dubri is a wildlife life sanctuary covers an area of 370 km^2, both covers more than 835 km^2 area of the park. The park established in 1975 under wildlife protection act of 1972, geologically features are plain, mounds, hills, steep cliffs, water bodies, valleys, deep gorges, while altitude ranges from 200-500m. This is basically a moist deciduous forest consisting mainly of sal (*Shorea robusta*). The forest area of Sanjay Dubri is a main wild corridor connecting Bandhavgarh National Park's wildlife at north and Palamau Tiger Reserve's wildlife, but still there is strict need to ensure the peaceful transit of wild animals and conservation of connecting forest. Guru Ghasidas National Park, which falls in Chhattisgarh State area, shares its forest with Sanjay National Park on its northern boundary with Madhya Pradesh. Before the bifurcation of Madhya Pradesh the entire area of Guru Ghasidas National Park were unite with Sanjay National park. It is 70 km. away from Sidhi district headquarter. Mostly Gond, Kol, Baiga are reside there.
Keeping in view the importance of flora of Dubri wild life sanctuary Sidhi district, the study confined to collect the indigenous knowledge of local people about the medicinal uses of native plants. As the people of the selected areas have empirical observation of the nature and by

communicating the other people of their culture; they get indigenous knowledge of local plants. So in this way the ethno-medicinal knowledge of plants is linked to the local culture and history. As inhabitants of the area are mainly using traditional means to cure diseases and this asset of indigenous knowledge is transferring from generation to generation only through verbal means of communication (Sharma, 1990) [10]. So this research was an effort to document and to preserve this folk asset.

The main aims of present research work were: to explore the medicinal plants & know to their status among local people of selected Dubri sanctuary of Sidhi district; to enlist the indigenous medicinal plants used by local people for common day ailments; to create awareness among the local community about the protection of native medicinal flora; and to collect native medicinal plants of the area for proper identification and future references.

2. Materials and methods

Present study was confined to the identification of ethno medicinal plants used by traditional healers of selected Dubri Wild Life Sanctuary of Sidhi district. The study was conducted during February, 2015 to January, 2016 in remote area of sanctuary.

Frequent field trips were arranged in order to collect information about the status of medicinal plants.

During field trips, the questionnaire (Medicinal Plants Datasheet) was used to interview the local inhabitants, older people including men and women both, who were familiar with medicinal plants and their status. In total of 50 informants including 37 men and 13 women were interviewed during survey. Interviews were conducted with local peoples in different remote areas of sanctuary. Repeated queries were made to get the data confirmed.

Frequent field trips of the area were arranged to collect the live specimens. Throughout the field trips, a general collection of plants were made. The fully dried specimens were mounted on herbarium sheets. Plants were identified with the help of available literature (Mudgal *et al.* 1997, Verma *et al.*, 1993, Jain and Rao, 1976 and Saxena *et al.* 1992) [11, 12, 13, 14] and comparing with the already identified plant specimens of the herbarium at Department of Botany, Govt. S.G.S. P.G. College, Sidhi (M.P.). After correct identification, the plants were deposited in herbarium at Department of Botany, Govt. S.G.S. P.G. College, Sidhi for future references. Ethno-medicinal inventory was developed consisting of botanical name followed by their local name, family, habit category in Red data book and present status during study.

3. Results and discussion

Taxonomical surveys were conducted in different tracks in the forest areas of Dubri Wild Life Sanctuary of Sidhi district 422 angiosperm taxa were documented for floristic analysis. During the course of present investigations 422 plant species of which 350 were dicots and 72 monocots were collected and identified. The total number of enumeration of plants with species, genera and families are summarized in Table 1 & Graph 1. The phyto-diversity ratio of species level between monocots to dicots is 1: 4.9 of genera 1: 3.0 and of families 1:5.1. The results are tabulated as below.

Table 1: Diversity of Dicot and Monocot

S. No.		Dicots		Monocots		Total	Ratio
		Number	Percentage	Number	Percentage		
1.	Species	350	83.2	72	16.7	422	1:4.9
2.	Genera	214	79.1	57	20.8	271	1:3.0
3.	Families	83	83.6	16	16.3	99	1:5.1

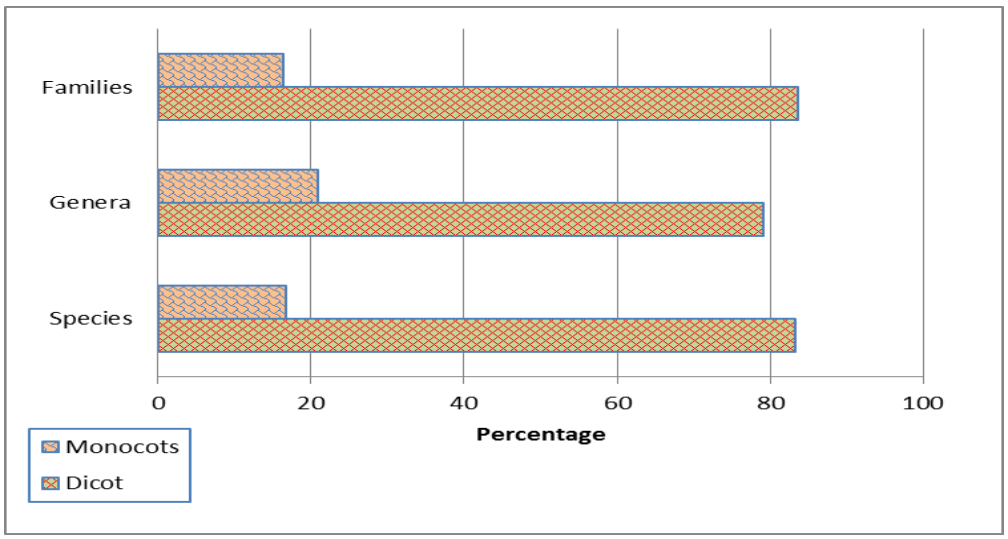

Fig 1: Distribution of Dicot and monocot

Table 2: List of Rare and Threatened Plants of the Study Area.

S. No.	Botanical name	Family	Local name	Habit	Red data book category	Present status in study
1.	*Abutilon bidentatum* Hoesh.	Malvaceae	Kanghi	Herb	Invulnerable	VU
2.	*Acacia catechu** (L.f) Willd.	Mimosaceae	Khair	Tree	Invulnerable	LC
3.	*Adina cordifolia* (Willd) *ex* Roxb.	Rubiaceae	Haldu	Tree	Vulnerable	NT
4.	*Ailanthes execlsa* Roxb.	Simaroubaceae	Aruu	Tree	Vulnerable	VU
5.	*Alangium salvifolium* L.f.Wang.	Alangiaceae	Ankol	Tree	Rare	EW
6.	*Alysicarpus vaginalis* (L.)D.C.	Fabaceae	----	Herb	Invulnerable	EN
7.	*Ampelocissus latifolia* Roxb.**	Vitaceae	Pannibel	Climber	Invulnerable	CR
8.	*Argyreia nervosa* Dalz.	Convolulaceae	Naar	Climber	Invulnerable	EW
9.	*Bauhinia vahalli* Wt Arn.**	Ceasalpinaceae	Kachnar bel	Climber	Rare	CR
10.	*Boswellia serrata* Roxb.*	Burseraceae	Salai	Tree	Rare	LC
11.	*Celastrus paniculata* Willd. **	Clastraceae	Malkagini	Climber	Rare	CR
12.	*Chlorophytum laxaum* R. Br.	Liliaceae	Safed mausali	Herb	Rare	EN
13.	*Cissus rependa* Vahl.	Vitaceae	Hadjod	Herb	Rare	EX
14.	*Cordia dichotoma* Forst.	Ehreteaceae	Lasora	Tree	Vulnerable	EN
15.	*Crateva nervosa* DC.	Capparaceae	--	Tree	Rare	EN
16.	*Curcuma pesudomontana* Grah.	Zingiberaceae	Musali	Herb	Invulnerable	VU
17.	*Cythocline purpurea* Roxb.	Asteraceae	Bhandaria	Herb	Vulnerable	VU
18.	*Dalbergia latifolia* Roxb.	Fabaceae	Safed shisham	Tree	Invulnerable	EN
19.	*Didymocarpus pygmea* Clarke.	Gesneriaceae	Pathar phodi	Herb	Vulnerable	NT
20.	*Dioscorea bulbifera* L.**	Dioscoreaceae	Jatashan-kari	Climber	Endangered	CR
21.	*Eranthemum roseum* Vahl *R.Br.***	Acanthaceae	-------	Shrub	Rare	EW
22.	*Feronia limonia* L.	Rutaceae	Kaitha	Tree	Invulnerable	EN
23.	*Gloriosa superba* Linn. **	Liliaceae	Kalihari	Climber	Endangered	EW
24.	*Ipomoea cairica* (L.)Sweet.	Convolulaceae	-----	Climber	Vulnerable	EN
25.	*Justicia neesii* Raman.	Acanthaceae	-----	Herb	Vulnerable	VN
26.	*Mallotus philippensis* Lam.	Euphorbiaceae	Sinduri	Tree	Rare	EN
27.	*Manilkara hexandra* Roxb. Dub **	Sapotaceae	Khirani	Tree	Invulnerable	CR
28.	*Melhania futtetyporensis* Munro	Sterculeaceae	------	Shrub	Rare	EN
29.	*Mimosa hamata* Willd.	Mimosaceae	Bander ki roti	Shrub	Invulnerable	NT
30.	*Morinda tomentosa* Heyne.	Rubiaceae	Aal	Tree	Vulnerable	NT
31.	*Nyctanthes arbortristis* L.**	Nyctagenaceae	Harsingar	Tree	Vulnerable	CR
32.	*Pterocarpus marsupium* Roxb. **	Fabaceae	Bija sal	Tree	Rare	CR
33.	*Salvadora persica* L.	Salvadoraceae	Pilu	Tree	Invulnerable	EN
34.	*Sarcostemma viminale* L.**	Asclepiadaceae	Sambher bel	Climber	Endangered	CR
35.	*Terminalia alata** Heyne. Ex Roth.	Combretaceae	Safeda	Tree	Invulnerable	LC
36.	*Terminalia bellirica* Gaertn.	Combretaceae	Baheda	Tree	Invulnerable	EN
37.	*Wrightia tinctoria** R.Br.	Apocynaceae	Dhudhi	Tree	Invulnerable	LC

*Abundantly found in the study area, ** Extremely high risk of extinction in the wild condition EW - Extinct in wild, CR - Critically endangered – Extremely high risk of extinction in the wild, EN - Endangered – High risk of extinction in the wild, VU - Vulnerable – High risk of endangered in the wild, NT - Near threatened – Likely to become endangered in near future, LC - Least concern –Lowest risk to become near threatened.

It is an attempt to highlights the rare or threatened plants of this study area. The government bodies as well as various NGOS have to come forward to take up responsibility of this important task to save the plant wealth. Efforts should also be made in search of rare plants of every regions of the country for their conservation. Hence, protective measures have to be taken for these precious plants wealth, because they will be danger in near future. It can be concluded that these protected and non-protected forest plays a vital role in conservations of plant wealth. The national parks and sanctuaries also provide good habitats for in-situ conservation of plants.

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