CHAPTER 5

CONCLUSION
The present attempt to analyze 'Quantitative and qualitative assessment of a mixed dry deciduous forest of Bundelkhand' have shown interesting results.

Describing the vegetation of the forest sites, the plant species were assessed quantitively and qualitatively.

Quantitative appraisals for density, IVI and A/F ratio of various species of trees and other ground flora, as recorded in both sites.

Four tree species were altogether common in both site. These were *Acacia catechu*, *Anogeissus pendula*, *Bauhinia racemosa* and *Butea monosperma*.

Percentage distribution of the species in frequency class A was relatively much high in both of the forest blocks because of the presence of numerous sporadic species, whereas, frequency classes D and E were relatively very low in both of the sites. This indicates a heterogenous nature of the tree community present in the forests table 26 as below:

Table 26 : Percentage distribution of frequency class of the tree species present in both sites.

<table>
<thead>
<tr>
<th>Frequency Classes</th>
<th>Percentage Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Site - A</td>
</tr>
<tr>
<td>A</td>
<td>68.18</td>
</tr>
<tr>
<td>B</td>
<td>-</td>
</tr>
<tr>
<td>C</td>
<td>4.54</td>
</tr>
<tr>
<td>D</td>
<td>0.09</td>
</tr>
<tr>
<td>E</td>
<td>18.18</td>
</tr>
</tbody>
</table>
The overall notation of frequency classes in both sites and of Raunkiaer's normal (Raunkiaer C, 1928) can be written as:

Site A : \( A > B < C < D < E \)

Site B : \( A > B < C < D < E \)

R.'s Normal : \( A > B > C \geq D < E \)

Raunkiaer's J-shaped distribution curve and the similar relationships between frequencies and the percentages of species falling within both of the frequency classes in two forest block studied.

Regarding density, site A forest was more thickly populated forest stand with 1578.20 Tree/ha. than site B forest stand with 1073.70 Tree/ha. Contributions made by *Anogeissus pendula* in both forests were relatively the highest with densities of 390 Tree/ha. and 477 Tree/ha.

Monthwise changes in nutrient concentration of leaf litter was not exhibite any definite trend in all tree species and varied according to the tree species however, concentration of nitrogen and phosphorus was higher in comencement month in which leaf fall started. The mean annual concentration of nutrient in leaf litter followed the order calcium, nitrogen, potassium and phosphorus. The nutrient return through leaf fall was considerably low and followed the order Ca>N>K>P. *Anogeissus pendula, Butea monosperma* and *Tectona grandis* returned more than eighty per cent of total nutrient through leaf fall. Alike leaf fall, maximum amount of nutrient also returned during winter season followed by summer and rainy.

In general structural carbohydrates viz., neutral detergent fibre (NDF), acid detergent fibre (ADF), Cellulose, hemi-cellulose and lignin were quite high be
cause leaves in which these parameters are estimated were matured and collected during peak leaf fall period.

Due to fast and seasonal decomposition and mineralization only L-layer and E-layer were found and multistratal. oligostratal and unistratal type of floor were developed due to distribution proccesses.

The soil texture was sandy clay to sandy clay loam and pH was always less than seven. Electrical conductivity and bulk density ranged between 0.023 to 0.062 m mhos/cm and 1.09 to 1.23 g/cc, respectively. In general the soil of studied forest was poor in available nitrogen, low in available phosphate and medium in available potash where as organic carbon was low to high under the canopies of different tree species.

People especially belonging to primitive or aboriginal culture have been found to possess a good deal of information, not only about traditional medicines but also on less known food plants, dyes and tannins etc. (Jain, 1981). The important scope and urgent need of tanical studies for unearthing the secrets of nature through the collection of data from the rapidly disappearing primitive cultures have been recognised by various workers (Harshberger, 1896; Schultes, 1962; Jain, 1967; De, 1968; Jain, 1981). The total belief on plants including herbal medicines among primitive societies are based on their long felt experiences and it will be considerable significance if the value of such experiences be held in proper esteem and due importance.
For any ethnobotanical study it is more convenient and useful to delimit the area of study either by suitable geographical units (Jain, 1967), keeping this in view the present ethnobotanical studies were take up in selected localities of Bundelkhand region. The localities selected for studies are popularly inhabited by rurals etc. The information enumerated in the text is bases on the personal interview and field visits of rurals of the site. Many vaidyas, kavirajans, herbalists, medicineman, street herbal vendor(s) of the area also provided some valuable information about the uses of plants.

During the course of field study it was observed that the tribals appeared more conservative and did not like to share their knowledge with others, while some local medicine man seemed proud of telling the secrets known to them. However other required private consultation and great persuasion. Similar experiences were also recorded by Jain (1965) from the tribals of Bastar (M.P.).

CATEGORISATION OF PLANTS

The ethnobotanical surveys carried in the area under study during last two years have revealed valuable information regarding the ethnobotanical uses of 58 plant species (Table 1). These plants are classified under different categories following the scheme adopted by Sharma and Lakshminarasimhan (1986).

(A) Food Plants

(i) Pickles and Condiments

Pickles: *Mangifera indica.*
Condiments: *Tamarindus indica.*

(ii) Lactation inducing plants in women: *Euphorbia hirta, Launaea nudicaulis.*

(iii) Vegetables

Leaves: *Alternanthera sessilis, Amaranthus spinosus, Cassia tora, Oxalis corniculata, Oxalis latifolia.*

Flowers: *Bauhinia variegata, Madhuca indica.*

(iv) Wild Edible Plants:

The tribals and rural inhabitants were found using wild edible plants or plant parts as supplement of their food during scarcity.

Based on the plant part(s) eaten, they can be classified into following groups:

Flowers: *Madhuca indica.*

Fruits: *Aegle marmelos, Diospyros melanoxylon, Ficus benghalensis, F. racemosa, Flacourtia indica, Launaea nudicaulis, Mangifera indica, Phoenix sylvestris, Zizyphus jujuba.*

Stem apex: *Phoenix sylvestris.*

(B) Fodder Plants

(i) Feeds and fodder for domestic animals: *Acaia arabica, Convolvulus arvensis, Cynodon dactylon, Linum usitatissimum.*

(ii) Lactation inducing plants in cattle: *Tridex procomhans* etc.

(C) Medicinal Plants

In the account given below the plants are categorised on the basis of their ethnomedicinal uses with respect to a particular disease in human beings.
2. Bone fracture: *Vitis quadrangulasis*.
3. Cough/Whooping cough: *Solanum xanthocarpum*.
5. Diabetes/Glycosuria: *Acacia arabica*.
7. Dysmenorrhoea: *Amaranthus spinosus*.
8. Eye diseases: *Alternanthera sessilis, Albizia lebbek, Cassia tora*.
13. Piles/Anal fissures: *Bauhinia variegata, Phyllanthus simplex*.
15. Rheumatism: *Linum usitatissimum, Vitex negundo*.
17. Skim diseases: *Acacia catechu, Ageratum conyzoides, Albizzia procera, Azadirachta indica, Bauhinia variegata, Boerhaavia diffusa, Boswellia serata, Butea monosperma, Cassia tora, Ficus benghalensis, Flacourtia indica, Leucas cephalotes, Madhuca indica, Tectona grandis*.
18. Spermatorrhoea: *Tribulus terrestris*. 

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19. Superficial thromphlebities: *Vitex negundo*.

**Some other Plants Significant to Human Health**

**Antidotes**: Some wild plants are used as antidote to snake bite, scorpion sting, bee sting etc. They are: *Achyranthus aspera, Albizzia lebbek, Anogeissus latifolia, Butea monosperma Cassia fistula, Flacourtia indica, Oxalis corniculata, Sida acuta.*

**Anti-emetic**: *Euphorbia hirta.*

**Brain tonic**: *Convolvulus pluricaulis, Oxalis latifolia.*

**(D) Superstitious Beliefs**

The word tribals/ aboriginals itself implies that the communities own a great number of superstitious beliefs stemmed from their age-old regard for nature God. Some of these superstitious are exhibited in the form of totems using a considerable number of plants. (Table 2): They are: *Achyranthus aspera, Holoptelia integrifolia.*

**(E) Veterinary**

Plants used in the treatment of cattle.

Sores/ Foot Sores: *Cassia fistula.*

Stomachache/ Colic/ Intestinal diseases: *Cassia fistula.*

**(F) Tannin Yielding**

They are: *Acacia catechu, Albizzia procera, Anogeissus latifolia.*

**(G) Dye yielding**

Orange red dye is obtained from flowers of *Butea monosperma.*
(H) Timber, musical and agricultural implement
They are: *Acacia arabica*, *Acacia catechu*, *Anogeissus latifolia*, *Azadirachta indica*, *Cassia fistula*, *Ficus benghalensis*, *Madhuca indica*, *Mitragyna parvifolia*, *Shorea robusta*, *Tectona grandis* and *Zizyphus jujuba*.

(I) Wood craft plants
Basket/ Broom and Brush: Basket of various sizes are made by the sticks of *Vitex negundo*. Roots of *Butea monosperma* are used for making brushes.

(K) Fibre yielding plants
Repes are prepared from bark fibres by beating and retting the bark of the following plants. *Mitragyna parvifolia*.

(L) Dil Yielding Plants
They are: *Azadirachta indica*, *Linum usitatissimum*, *Madhuca indica*.

(M) Plants/Plant Parts as offering to God and Goddess
They are: *Aegle marmelos*, *Butea monosperma*, *Ficus benghalensis*, *Ficus religiosa*, *Ocimum sanctum*.

(N) Festival related plants
They are: *Acacia arabica*, *Butea monosperma*, *Ficus benghalensis*, *Ocimum sanctum*.

(O) Miscellaneous Uses
Bidi making: *Diospyros melanoxylon*.

Leaf plate and pot making: *Butea monosperma*.

The categorisation of plants in the foregoing clearing reveals that there is a exhaustive list of such plants which are recorded to be used as
curing various ailments whether human or veterinary. An over all assessment has indicated that a large number of plants occupy foremost place in curing skin diseases, as per the information gathered from the tribals. Next in order of treatment the ailments come the plants benefiting diarrhoea and dysentery fevers, rheumatism, cuts and wounds etc. In most of the diseases no one plant is administered singly, it is given in combination with many plants or plant parts. It is also found that the same plant is suggested for more than one disease. That is why the number of plants used in treating various diseases. For the sake of academic interest, it is indespensable to mention here those medicinal plants which are adjudged very important in this region after the present survey. These may be summarised as under:

Besides the above it also becomes essential to sort out other ethnobotanically important plants used for more specific purposes in Bundelkhand region. They are:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Botanical Name</th>
<th>Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Aegle marmelos</td>
<td>Dysentery</td>
</tr>
<tr>
<td>2.</td>
<td>Boerhavia diffusa</td>
<td>Jaundice</td>
</tr>
<tr>
<td>3.</td>
<td>Elytraria acaulis</td>
<td>Sores of cattle</td>
</tr>
<tr>
<td>4.</td>
<td>Tribulus terrestris</td>
<td>Spermatorrhoea</td>
</tr>
<tr>
<td>5.</td>
<td>Vitex negundo</td>
<td>Superficial thrombothlebitis.</td>
</tr>
</tbody>
</table>

As for as more ancient use of plants related to the tribal population is concerned the superstitious in the form of totems etc. can not be under estimated. They are still prevalent in the region though their essence has percolated to the civilized population of this backward region of Bundelkhand.
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Botanical Name</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><em>Cassia fistula</em></td>
<td>Veterinary</td>
</tr>
<tr>
<td>2.</td>
<td><em>Achyranthus aspera</em></td>
<td>Antidote</td>
</tr>
<tr>
<td>3.</td>
<td><em>Anogeissus latifolia</em></td>
<td>Tanning</td>
</tr>
<tr>
<td>4.</td>
<td><em>Butea monosperma</em></td>
<td>Dye</td>
</tr>
<tr>
<td>5.</td>
<td><em>Phoenix sylvestris</em></td>
<td>Baskets &amp; Brooms</td>
</tr>
<tr>
<td>6.</td>
<td><em>Diospyros melanoxylon</em></td>
<td>Bidi making</td>
</tr>
</tbody>
</table>