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Diversity of Family Leguminosae in Raipur District of Chhattisgarh (India)

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Abstract

Plants show great diversity in their habit, habitat and morphology. Higher plant families are full of diversities. Leguminosae is the third largest family of flowering plants "Angiosperms" after Compositeae and Orchidaceae. According to different workers the number of Genera and species varies for ca 650-670 and 8000-20000 respectively in the world. The family exhibits greatest diversity in the tropics and sub-tropics. The family is divided into three subfamilies. The Papilionoideae constitute *ca* 71% of total legume flora while Caesalpinoideae and Mimosoideae constitute 14.6% respectively.

Raipur is the capital of the state of Chhattisgarh with the Mahanadi River to the East and thick forests to the South. The Maikal Hills rise on the North-west of Raipur; on the North, the land rises and merges with the Chota Nagpur Plateau. Raipur is situated on 22^0 15'- 21^0 14' North latitude and 82^0 6'- 81^0 38 East longitude'. The climate of the city is quiet warm during the months of summer from March to June with temperature reaching up to 48°C. The winters last from November to January are quiet pleasant with temperature dropping up to 10 °C.

In the present study Leguminous plants of Raipur show diversity in habitats three sub-family 1) Papilionoideae having 48 plants, 2) Mimosoideae-20 plants, 3) Ceasalpinoideae- 20 plants. This family exhibit herb, prostrate herb, shrub and trees and climbers both wild and cultivated. Flowering in most plants of this family occurs between march to August. Total 88 plants of the family Leguminosae are found during study. These plants show diversity in habits. Plants recoeded during survey : Herbs- (36), shrubs- (15), Trees- (37), Some of the plants are *Acacia catechu(*Khair), *Butea monosperma*(Palas), *Hardwickia binata*(Anjan), *Aeschynomene indica*(Phulan), *Desmodium gangeticum*(Salparni), *Albizzia lebbeck*(Siris) . Most of the plants are economically important plants. Presence of Nitrogen fixing bacteria in

the root nodules of plant increases fertility of soil. Plants are sources of pulses, edible oils. Some Trees are forest produces as timber, dye, gum, nonwood forest produce.

The present study provides the present status of the Family Leguminosae and database for future studies. The plants of the family controls pollution, increases fertility of soil, checks soil erosion and are of aesthetic value.

Diversity of Plant life is quintessential foundation of our ecosystems especially the terrestrial ecosystem. They are responsible for improving soil quality, moderating climate and provide habitat for wild fauna. Life on earth directly depends upon the sun's energy converted by the plants during photosynthesis. Thousands of higher plants (Gymnosperms, Angiosperms) as well as lower plants (Algae, Fungi, Bryophyte, Pteridophyta) are used by humans worldwide for a variety of purposes.

Present work emphasize on diversity of one of the largest family of flowering plants- Leguminosae (Fabaceae) of Raipur. Leguminosae is largest in its diversity in Raipur area with 129 plant species according to Flora of Raipur, Durg and Rajnandgaon[13]. Legumes provide food crops(Pulses, vegetable, oil yielding crops), timber, gum, resins, medicines etc. Similar work done earlier by Arora[3], George, *et al.*,[6], their work also emphasizes on diversity of plants in area of their interest.

Study site: Raipur district is situated in the state of Chhattisgarh in Central India. The District is situated between 22º 33' N to 21º14' N Latitude and 82º 6' to 81º38'E Longtitude. The District is surrounded by District Bilaspur in the North, District Bastar and part of Orissa state in the South, District Raigarh and part of Orissa state in the East and district Durg in the West. Raipur district is divided into plains and hilly areas and occupies southern eastern part of the upper Mahanadi river valley.

Survey is conducted during a period of March 2014 to March 2016 in the study area. Plants were identified with the help of morphological characters (Vegetative and floral characters) and by referencing floras – Hooker[7], Panigrahi and Murty[10], Verma, *et al.*,[13]. Plant samples were collected from the site and information like survey date, locality, ecological description, habit were noted. Herbarium is prepared following standard procedures of Jain and Rao[8].

During survey plants were found in forest areas, grasslands, wastelands, agricultural fields, roadsides, public gardens, home gardens, marshy places, near pond, canals, drainage etc. Plants with their habits –herb (prostrate, erect, climbers, shrub, under shrub, tree) are mentioned. Following are the plant species recorded during the survey period divided into three sub families:

List of recorded Plants of Leguminosae subfamilywise

Sub family 1- Caesalpinoideae

S.No.	Plant name	Vernacular name	Habit
1.	*Bauhinia purpurea* L.	Kachnar	Climber/W
2.	*Bauhinia vahlii* Wight & Arn.	Mahul bel, Mahul patta	Tree/W
3.	*Bauhinia variegata* L.	Kachnar	Tree/W
4.	*Caesalpinia crista* L.	Gotaran	Shrub/C
5.	*Caesalpinia pulcherrima (*L) Sw.	Dwarf Gulmohar	Shrub/W
6.	*Cassia fistula* L.	Amaltash, Dhanbahar	Tree/W
7.	*Cassia siamea* Lam.	Kassod	Tree/C
8.	*Cassia tora* L.	Charota bhaji	Herb/W
9.	*Cassia angustifolia* Vahl.	Senna	Shrub/W
10.	*Cassia laevigata* Willd.	Money bush	Shrub/C
11.	*Cassia occidentalis* L.	Kasondi	Herb/W
12.	*Cassia renigera* Benth.	Pink gulmohar	Tree/C
13.	*Cassia sophera* L.	Kasaunda	Undershrub/W
14.	*Cassia surattensis* Burm. F.	Golden senna	Tree/W
15.	*Delonix elata*(L.)Gamble	White gulmohar	Tree/C
16.	*Delonix regia* (Boj. Ex Hook) Rafin	Gulmohar	Tree/W
17.	*Hardwickia binata* Roxb.	Anjan	Tree/W
18.	*Parkinsonia aculeata* Linn.	Kikar	Shrub/W
19.	*Peltophorum ferrugineum* Benth	Copperpod	Tree/C
20.	*Tamarindus indica* L.	Imali	Tree/W

Sub-family 2 - Mimosioideae

S.No.	Plant name	Vernacular name	Habit
1.	*Acacia arabica* (L.)Willd. Ex Del.	Babool	Tree/W
2.	*Acacia auriculiformis* A.Cunn.ex Benth	Australian babul	Tree/C
3.	*Acacia catechu* (L.f.) Willd.	Khair	Tree/C
4.	*Acacia concinna* DC.	Shikakai	Tree/W
5.	*Acacia leucophloea* (Roxb.)Willd.	Jand	Tree/C
6.	*Acacia mangium* A.Cunn	Mangium tree	Tree/C
7.	*Acacia melanoxylon* A.Cunn	Australian babool	Tree/W
8.	*Albizzia lebbeck* (L.) Wild	Siris	Tree/C
9.	*Albizzia odoratissima* (L.f.) Benth.	Siris	Tree/C
10.	*Albizzia procera* (Roxb) Benth.	Safed Siris	Tree/C
11.	*Albizzia saman* (Jacq.) F. Muell	Gulabi siris	Tree/C
12.	*Calliandra emarginata* (H. & B.) Benth.	Powderpuff	Shrub/C
13.	*Calliandra haematocephala* Hassk.	Red powder puff	Shrub/C
14.	*Leucaena leucocephala* (Lam.)De Wit.	Subabool	Tree/C

15.	*Mimosa pudica* L.	Lajwanti	Herb/W
16.	*Parkia biglandulosa* Wight & Arn.	Chanduphul	Tree/C
17.	*Pithecellobium dulce* (Roxb.) Benth.	Gangaimali	Tree/W
18.	*Prosopis juliflora* (Sw.) DC.	Kabuli kikar	Shrub/W
19.	*Prosopis cineraria* (L.) Druce	Shami	Tree/C
20.	*Xylia xylocarpa* (Roxb.) Taub.	Jambu	Tree/W

Subfamily 3 - Papilionoideae

S.No.	Plant name	Vernacular name	Habit
1.	*Aeschynomene indica* Linn.	Phulan	Shrub/W
2.	*Aeschynomene aspera* L.	Laugauni	Shrub/W
3.	*Alysicarpus bupleurifolius*(L.) DC.	Sweet alys	Herb/W
4.	*Alysicarpus monilifer* (L)DC.	Juhi ghas	Herb/W
5.	*Alysicarpus vaginalis* DC.	Sauri	Herb/W
6.	*Arachis hypogaea* L.	Mungphalli	Herb/C
7.	*Butea monosperma* (Lam.) Taub.	Palas	Tree/C/W
8.	*Cajanus cajan* (L.) Phillips.	Arhar	Herb/C
9.	*Cicer arietinum* L.	Chana	Herb/C
10.	*Clitoria ternatea* L.	Aprajita	Herb/C
11.	*Crotalaria medicaginea* Lam.	Gulabi	Herb/C
12.	*Crotlaria albida* Heyne ex Roth	Ban-methi	Herb/W
13.	*Cyamopsis tetragonoloba* (L.) Taub.	Gavarphali	Herb/C
14.	*Dalbergia latifolia* Roxb.	Shisham	Tree/W
15.	*Dalbergia sissoo* Roxb.	Sissoo	Tree/C/W
16.	*Desmodium gangeticum* (L.)DC.	Salperni	Herb/W
17.	*Desmodium gyrans* DC.	Dudli, Telegraph plant	Herb climber/W
18.	*Desmodium triflorum* (L.) DC.	Tinpania	Herb/W
19.	*Dolichos lablab* L.	Sem	Herb/C
20.	*Erythrina indica* Lam.	Rakta madar	Tree/C
21.	*Gliricidia sepium* (Jacq.) Steud	Giripushpa	Tree/ C
22.	*Glycine max* Merr.	Soyabean	Herb/C
23.	*Indigofera linifolia* (L.f.) Retz.	Ratnamala	Herb/W
24.	*Indigofera linnaei* Ali.	leel	Herb/W
25.	*Indigofera hirsuta* Linn.	Ghunghuna	Undershrub/W
26.	*Indigoferera cassioides* Rottl ex DC.	Ghirgholi	Shrub/C
27.	*Lathyrus odoratus* L.	Tivra	Herb/ C
28.	*Lens esculenta* Moench.	Masura	Herb/C
29.	*Melilotus indica* (L) All.	Ban Methi	Herb/W
30.	*Mucuna pruriens* (L.)DC	Kemachh	Climber/W

31.	*Phaseolus radiatus* R.	Urad	Herb/C
32.	*P. vulgaris* L.	Lobia	Herb/C
33.	*P. mungo* Hepper	Mung	Herb/C
34.	*Phaseolus trilobus* Ait.	Vanmung	Herb/C/W
35.	*Pisum sativum* L.	Matar	Herb/C
36.	*Pongamia glabra* Vent. Jard.	Karanj	Tree/C/W
37.	*Psoralea corylifolia* L.	Babchi	Herb/W
38.	*Pterocarpus marsupium* Roxb.	Beeja	Tree/W
39.	*Pueraria tuberosa* (Roxb. Ex Willd.) DC.	Vidarikand	Herb/W
40.	*Rhynchosia minima* (L.) DC	kulata	Climber/w
41.	*Sesbania grandiflora* (L.) Poir.	Agastya	Tree/ C
42.	*Sesbania sesban* (L.) Merr.	Jainti	Shrib/W
43.	*Tephrosia purpurea* (L.)Pers.	Sarphonk	Herb/W
44.	*Tephrosia villosa.* (L.) Pers.	Guj: Runchalisarpankho	Herb/W
45.	*Trigonella foenum-graecum* L.	Methi	Herb/C
46.	*Uraria picta* (Jacq.) Desv.	Prishnaparni	undershrub/W
47.	*Vigna unguiculata* (L.) Walp.	Barbati	Herb/C
48.	*Zornia gibbosa* Span.	Neel mari, Samrapani	Herb/W

*C= Cultivated, W=Wild

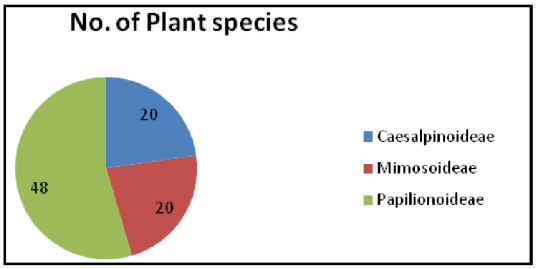

Fig 1: Number of plants of Leguminosae subfamily wise

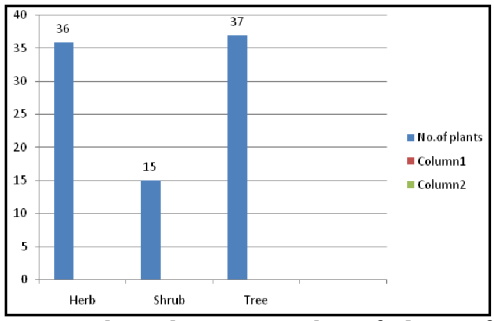

Fig. 2: Chart showing number of plants of Leguminosae in different habits

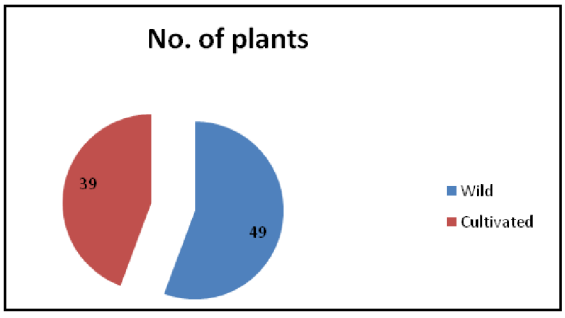

Fig. 3: Chart showing number of plants of Leguminosae found in wild or cultivated habitat

Photographs of some of the plants recorded:

Cassia angustifolia Vahl.

Aeschynomene indica L.

Tephrosia purpurea (L.) Pers.

Tephrosia villosa. (L.) Pers.

Sesbania grandiflora (L.) Poir.

Mimosa pudica L.

Acacia catechu (L.f.) Willd.

Cassia occidentalis L.

During the survey total 88 plant species have been found to be recorded. Out of which maximum 37 are tree, 36 are herbs and 15 are shrubs. Most of the plants recorded are trees and herbs. Subfamily Papilionoideae contains maximum 48 plants, Caesalpinoideae and Mimosoideae both contain 20 plants. Of 88 plants. Herbs (mainly weeds and food crops) are mostly found belonging to sub family papilionoideae. Plants are found out in different sub regions according to their habitat and suitable climatic condition. Number of plants found wild is 49 while 39 plants are found as cultivated plants. All plant species have different flowering seasons, period etc. Similar work in Raipur district is done by Roy[11] on Family Asteraceae(Compositae) in her work in which she has recorded 69 plants of different habits and habitats in the area.

There is a vast diversity of plants present in the study area. These plants are used in variety of purposes like as food, forage, timber, medicine, gum, resin, socio-religious ceremonies, in roadside plantation (like *Butea monosperma*(Palas), *Delonix sps*(Gulmohar), *Albizzia sps*(Siris). etc) and for their aesthetic value. Plants of this family increases soil fertility, in barren lands *Cajanus cajan* (Arhar) and *Arachis hypogaea* (Mungphalli), are grown to increase soil fertility after which land is used as field. Species of *Aeschynomene* are used as green manure. Plants of this family checks soil erosion, helps in controlling noise and air pollution as well as help maintain a moderate climate condition.

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