

Ethnobotanical Survey of Uses of Leguminosae in Raipur District

Dewangan P* and Acharya V

Research scholar, Govt. D.B Girls P.G. College, Raipur (C.G.) & *Asst. Prof. Botany, Govt. D.B Girls P.G. College, Raipur (C.G.)

Abstract: Plants have been the part of life forms even with the progenitors of man. Term “Ethnobotany” was coined to denote use of plants by human being. Ethnobotany deals with the direct relationship of plants with man. The term today has come to denote the entire realm of direct relationship between plant and man. Plants show enormous diversity in the form of Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms, and Angiosperms of which later are the most diversified plants. Present study focuses on ethnobotanical study of one of the largest family of Angiosperms, the family Leguminosae, of Raipur city area. Leguminosae include three subfamilies viz: Papilionoideae, Caesalpinoideae and Mimosoideae. The family has approximately 18,000 species grouped into around 650 genera with cosmopolitan distribution. During the study seasonal field survey has been made. Information about the plants were obtained by interviewing the common people and folk healers. During the study 8 plant species were found to be used as pulses, 2 plant species (*Glycine max* and *Arachis hypogea*) as edible oil yielding plants, 9 plant species used in different socio religious ceremonies (eg. *Butea monosperma*, *Acacia catechu*, *Prosopis cineraria*, *Acacia pycnthus*, *Vigna sps*), 7 plant species as vegetable (eg. *Trigonella foenum-graecum*), 3 species as dye yielding plants (e.g. *Butea monosperma*), 26 plants used in traditional medicine (e.g. *Cassia occidentalis*, *Acacia concinna*, *Psoralea corylifolia*, *Dolichos biflorus*, *Mucuna pruriens*), 7 plants species are Non-wood Forest Produces (NWFPs), (e.g. *Acacia nilotica*), 13 plants are used as timber yielding plants e.g. *Dalbergia sissoo*). Some are fodder plants (e.g. *Leucaena leucophloea*) and 2 plant species are used as tooth brush (e.g. *Acacia nilotica*) and some plants yields fibre. Some Weeds of this family are used to increase the fertility of soil due to the capacity of nitrogen fixation eg. *Aeschynomene indica*, and *Lathyrus odoratus*. Conservation practices of plants of this family have been observed during the present studies.

Keywords: Leguminosae, ethnobotany, herbal medicine.

I. Introduction

Present work focuses on Ethnobotanical importance of plants of Raipur (Chhattisgarh) belonging to Plant family Leguminosae. Since human starts discovering uses of plants from ancient times its use are integral part of human life from then. Use of plants by human in various ways approach a term “Ethnobotany”. Ethnobotany term was first used by a botanist Harshberger(1895) to describe his work- “Plants used by primitive and aboriginal people”. The first definition provided by Harshberger is “how native tribes use plants for food, shelter, or clothing”. Some of the work in ethnobotanical aspect of plants have been done by Ambasta(1986)², Dastar(1964)⁴, Agharkar(1991)¹, Cotton(1996)³, Jain(1995)⁹.

Leguminosae is third largest family of flowering plants after Asteraceae and Orchidaceae. Leguminosae include three subfamilies- Papilionoideae, Caesalpinoideae and Mimosoideae (Bentham&Hooker 1862-1883)⁷. It has approximately 18,000 species classified into around 650 genera. In India 18 genera and 70 species of Mimosoideae have identified and is the smallest subfamily of Leguminosae. 17 genera and 90 species of Caesalpinoideae are identified in India which is distributed in tropical and sub tropical regions. Papilionoideae is the largest family with about 35 genera and 250 species. Many workers have worked about this family, some of them are Martin(1963)¹², Duke(1986)⁵, Sanjappa(1992)¹⁶, Lewis, Schrire, Mackinder(2005)¹¹, Nair and Khanna(2005)¹³.

Study Area: Raipur is the capital of the state of Chattisgarh with the Mahanadi River to its east and thick forests to the south. Chattisgarh is second densely forested state of India after Assam. The state lies between 17°46’-24°5’ north latitude and 80°15’-84°20’ east longitude. Total area of the state is 1, 46,361 sq km. On the north-west of Raipur rises the Maikal hill, the land rises and merges with the Chota Nagpur Plateau. The state receives an average rainfall of 150 cm. Different areas of the district like Forest areas, urban areas, roadside, wastelands, and grasslands, agricultural fields of the study area were surveyed. Temperature of the area raises to 45° C in Summer and goes down to 8° C in Winter. Soil in the area is red soil which is quite fertile.

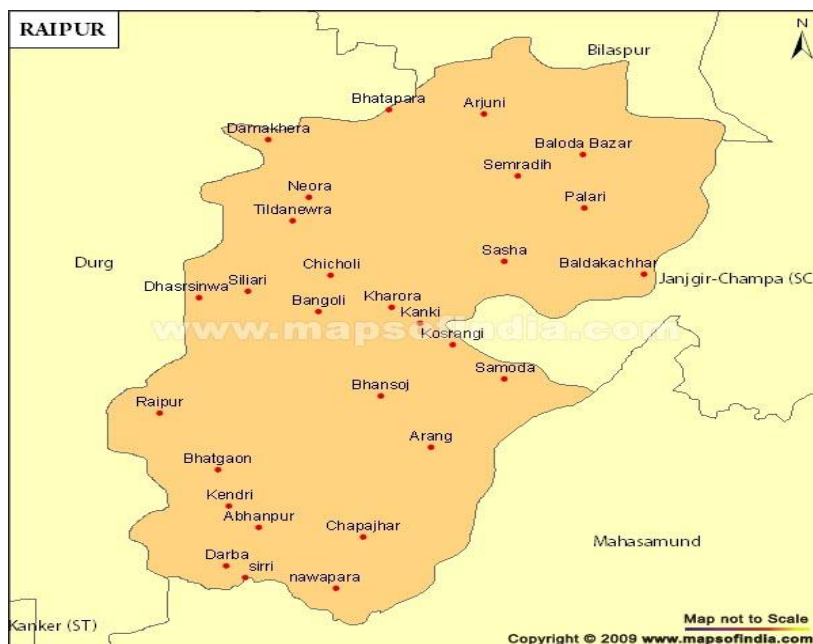


Fig:1- Map of study area - Raipur district

II. Materials And Methods

Periodic field visits were undertaken to the study area for identification and collection of plants. The survey has been done for a period of from June 2014-August 2015. Local people, folk healers were interviewed during the survey. Total 125 People were interviewed with the help of questionnaire including 22 folk healers. Out of 125 people 82 were male and 43 were female. Detailed information regarding the local name of plants, their uses was recorded. Also habit, habitat, soil type, date of the field visit were recorded. Plant samples were collected for herbarium preparation. Herbarium specimens were prepared as per the methodology of Jain and Rao (1977). For identification of plants flora of Hooker (1872-97)⁷, flora of Duthie(1903)⁶, flora of Verma, Pant and Hanfi (1985)¹⁹, flora of Panigrahi and Murti (1999)¹⁵, flora of Verma, D.M., N.P. Balkrishan and R.D. Dixit(1994)²⁰, Oommachan(1976)¹⁴ have been considered.

III. Observation And Result:

The observations made in different regions and localities of the study area have been recorded, information and data gained during the survey are enlisted below:

Table-1: Leguminous plants used as food:

Common name	Botanical Name	Used as	Part used
Mungfali	<i>Arachis hypogaea</i> L.	Food grain/edible oil yielding	Seeds
Arhar	<i>Cajanus cajan</i> (L.) Millsp.	Pulses (source of protein)	Legume
Charota	<i>Cassia tora</i> L.	Vegetable	Leaves
Kasondi	<i>Cassia occidentalis</i> L.	Vegetable	Leaves
Chana	<i>Cicer arietinum</i> L.	Pulses	Legume
Gavarphalli	<i>Cyamopsis tetragonoloba</i> (L.) Taub.	Vegetable	Legume
Sem	<i>Dolichos lablab</i> L.	Vegetable	Legume
Soyabean	<i>Glycine max</i> Merr.	Pulses/edible oil	Legume
Tiwra	<i>Lathyrus odoratus</i> L.	Pulses/ vegetable	Legume
Masura	<i>Lens esculenta</i> Moench.	Pulses	Legume
Urd	<i>Phaseolus radiatus</i> R.	Pulses	Legume
Mung	<i>Phaseolus mungo</i> Hepper	Pulses	Legume
Matar	<i>Pisum sativum</i> L.	Pulses	Legume
Ganga imli	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Fruit	Legume
Vidarikand	<i>Pueraria tuberosa</i> DC	Tuber	Tuber
Imli	<i>Tamarindus indica</i> L.	Fruit	Legume
Methi	<i>Trigonella foenum-graecum</i> L.	Spice	Leaves
Barbatti	<i>Vigna unguiculata</i> L.	Vegetable	Legume
August /Baakphool	<i>Sesbania grandiflora</i> (L) Poiret	Vegetable	Flower & leaves

Table-2: Leguminous plant yielding NWFPs:

Common name	Botanical name	Plant yield	Plant Part
Babool	<i>Acacia arabica</i> Willd.	Gum/Datoon	Stem
Khair	<i>Acacia catechu</i> Willd.	Kattha/dye	Stem
Charota	<i>Cassia tora</i> L.	Gum	Seeds
Ganga imli	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Fruit	Fruit
Imli	<i>Tamarindus indica</i> L.	Fruit	Fruit
Palash	<i>Butea monosperma</i> (Lam.) Taub.	Dye	Flower
Mahulbel	<i>Bauhinia vahlii</i> Wight & Arn.	Disposable plates	Leaves
Amaltas	<i>Cassia fistula</i> L.	Dye	Flower, Fruit
Shikakai	<i>Acacia concinna</i> DC	Fruit	Fruit
Raktamadar	<i>Erythrina indica</i> Lam.	Dye	Flower

Table-3: Timber yielding leguminous plants:

Common name	Botanical name	Wood Quality
Australian babool	<i>Acacia melanoxylon</i> A.Cunn	Low quality wood
Siris	<i>Albizia lebeck</i> (L.) Benth.	Low quality wood
Siris	<i>Albizia odoratissima</i> Benth.	Low quality wood
Safed siris	<i>Albizia procera</i> (Roxb)Benth.	Low quality wood
Kachnar	<i>Bauhinia variegata</i> L.	Low quality wood
LalKachnar	<i>Bauhinia purpurea</i> L.	Low quality wood
Amaltash	<i>Cassia fistula</i> L.	Low quality wood
Sissoo	<i>Dalbergia sissoo</i> Roxb.	Good quality wood
Shisham	<i>Dalbergia latifolia</i> Roxb.	High quality wood
Anjan	<i>Hardwickia binata</i> Roxb .	Low quality wood
Ganga imali	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Low quality wood
Bija	<i>Pterocarpus marsupium</i> Roxb.	High quality wood

Table-4: Fibre yielding plants of Leguminosae:

Common name	Botanical name	Part used
Jand	<i>Acacia leucophloea</i> (Roxb.)	Stem
Kachnar	<i>Bauhinia purpurea</i> L.	Stem
Mahulbel, Mahulpatta	<i>Bauhinia vahlii</i> Wight & Arn.	Stem
Kachnar	<i>Bauhinia variegata</i> L.	Stem
Salperni	<i>Desmodium gangeticum</i> (L.)	Stem

Table-5: Plants used in Socio-religious ceremonies

Common name	Botanical name	Parts used	Ceremony
Palash	<i>Butea monosperma</i> (Lam.) Taub.	Flower	Shivratri pooja
Kachnar	<i>Bauhinia purpurea</i> L.	Flower, leaves	Dusherra
Sonpatti	<i>Bauhinia variegata</i> L.	Leaves	Dusherra
Aprajita	<i>Clitoria ternatea</i> L.	Flower	Durga pooja
Chana	<i>Cicer arietinum</i> L.	Seeds	Sheetala devi
Urd	<i>Phaseolus radiatus</i> R.	Seeds	Shani pooja
Mung	<i>Phaseolus mungo</i> Heeper	Seeds	Devi pooja
Shami	<i>Prosopis cineraria</i> (L) Druce	Leaves	Shiv pooja

Table-6: Plants used in Traditional medicine:

Common name	Botanical name	Part used	Diseases
Babool	<i>Acacia arabica</i> Willd.	Stem Bark	Cough, Dental troubles, Leucorrhoea
Shikakai	<i>Acacia concinna</i> DC	Leaves,Fruits	Gonorrhoea, wounds, skin diseases
Katha	<i>Acacia catechu</i> Willd.	Bark	Boils, ulcers, Dental trouble
Safed Kikar	<i>Acacia leucophloea</i> Willd.	Bark	Bronchitis
Kachnar	<i>Bauhinia racemosa</i> Lamk.	Bark	anti inflammatory
Palash	<i>Butea monosperma</i> (Lam.) Taub.	All parts	antiviral, jaundice, Piles
Arhar	<i>Cajanus cajan</i> (L.) Millsp.	Leaves, Seeds	Wounds, abortifacient
Senna	<i>Cassia angustifolia</i> Vahl.	Leaves	Constipation, typhoid, anemia
Kasondi	<i>Cassia occidentalis</i> L.	Leaves	Skin diseases

Charota bhaji	<i>Cassia tora</i> L	Leaves, pods	Jaundice, dysentery
Amaltas	<i>Cassia fistula</i> L.	All parts	Leprosy, rheumatism, cough
Gawarphalli	<i>Cyamopsis tetragonoloba</i> (L.) Taub.	Pods, Gum	Night blindness, asthma
Sheesham	<i>Dalbergia latifolia</i> Roxb.	Bark	Leprosy, Diarrhoea
Shaalparni	<i>Desmodium gangeticum</i> DC	Root	Fever, vomiting, Vaat Dosh
Kulthi	<i>Dolichus biflorus</i> L.	Seeds	postnatal preparation, colic
Anjan	<i>Hardwickia binata</i> Roxb.	Bark	Swelling, gonorrhoea
Masura	<i>Lens esculenta</i> Moench	Seeds	Ulcers, Costipation
Laajwanti	<i>Mimosa pudica</i> L	Leaf	Diarrhoea, Dysentery. piles
Kevaanch	<i>Mucuna pruriens</i> DC	Root, Fruit	Kidney stone, Snake bites, fertility
Gangaimli	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Bark	Constipation, fever
Babchi	<i>Psoralea corylifolia</i> L.	Fruits, Seeds	Bone disorder, Eczema, leucoderma
Vidarikand	<i>Pueraria tuberosa</i> DC	Tuber	Cardiac tonic, promotes breast milk
Agastya	<i>Sesbania grandiflora</i> (L) Poiret	Leaves, Flower	Nightblindness, Improves eye vision
Imli	<i>Tamarindus indica</i> L.	Bark, Leaf	astringent, rheumatic arthritis.
Sarphonk	<i>Tephrosia purpurea</i> Pers.	Roots	Dyspepsia, diarrhoea, cough
Methi	<i>Trigonella foenum-graecum</i> L.	Seeds	Colic, lactogogue

Table-7: Ornamental & Roadside plants:

Common name	Botanical name	Habit
Jand	<i>Acacia leucophloea</i> DC	Tree
Mangium tree	<i>Acacia mangium</i> Willd.	Tree
Australian babool	<i>Acacia melanoxylon</i> R.Br.	Shrub
Safedsiris	<i>Albizia lebbek</i> Benth.	Tree
Siris	<i>Albizia odoratissima</i> Benth.	Tree
Safedsiris	<i>Albizia procera</i> (Roxb) Benth.	Tree
Kachnar	<i>Bauhinia purpurea</i> DC	Tree
Safedkachnar	<i>Bauhinia vahlii</i> W&A.	Tree
Kachnar	<i>Bauhinia variegata</i> Linn.	Tree
Palash	<i>Butea monosperma</i> (Lam.) Taub	Tree
Krishanchura	<i>Caesalpinia pulcherrima</i> Swtz	Shrub
Calliandra	<i>Calliandra haematocephala</i> Hassk.	Shrub
Amaltash	<i>Cassia fistula</i> L.	Tree
Kassod	<i>Cassia siamea</i> Lam.	Tree
Aprajita	<i>Clitoria ternatea</i> Linn.	Herb
SafedGulmohar	<i>Delonix elata</i> (L.) Gamble	Tree
Gulmohar	<i>Delonix regia</i> (Bojer ex Hook.) Raf.	Tree
Coral tree	<i>Erythrina indica</i> Lam.	Tree
Vilayatishiris	<i>Gliricidia maculeata</i> L.	Tree
Lajwanti	<i>Mimosa pudica</i> Linn.	Herb
Chanduphul	<i>Parkia biglandulosa</i> W&A	Tree
Copper pod	<i>Peltophorum ferrugineum</i> Benth.	Tree



Fig:1-Tephrosia purpurea



Fig:2-Acacia mangium



Fig:3-Delonix regia (Bojer) Raf.



Fig:4-Cassia angustifolia Vahl.



Fig:5-Sesbania grandiflora



Fig:6-Butea monosperma (Lam.) Taub.

IV. Result And Discussion

Observation made during the study suggests the use of leguminous ways in different ways. According to the gathered information the number of plants used as pulses in the area is 08, 2 plants are oil yielding plants, 7 plants are used as vegetables, 8 plants are used in socioreligious ceremonies, 26 plants are used in traditional medicine e.g. *Pueraria tuberosa*, *Tephrosia purpurea*, 10 plants yield NWFPs, 12 plants are used as timber yielding plants, 3 plants yields dye, 22 plants are ornamental and roadside plants. Total 71 plants are found to be used during the survey.

In addition to this many plants are used as fodder (e.g. *Cassia tora*, *Cassia occidentalis*, *Leucaena leucocephala*, *Tephrosia purpurea*, *Alysicarpus vaginalis*, *Bauhinia vahii*, *B. variegata* etc) and for fuel wood (*Acacia nilotica*, *Albizia lebbek*, *A. procera*, *Acacia leucophloea*, *Pithecellobium dulce* etc). The plants used as ornamental and roadside plants are in highest number, next to which is plants used as medicine, preceding plants used in socioreligious ceremonies. The least number of plants are found to be used as edible oil yielding plants.

26 Plant species of Family Leguminosae were found to be used in traditional medicine preparations in the survey area. Some 32 diseases were cured using different parts of these species. Also mode and dosage of the herbal preparation varies with diseases. The data here is based on the information provided by the folkhealers and locals using interview and questionnaire. Also literature is considered to take reference about the plant usage. Plants mentioned here contain secondary metabolites and active principle which are revealed by phytochemical analysis of these plants.

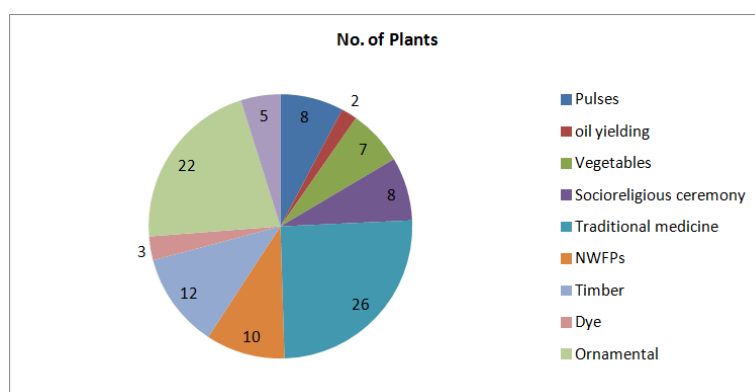


Chart:1 Showing number of plants used for different purposes.

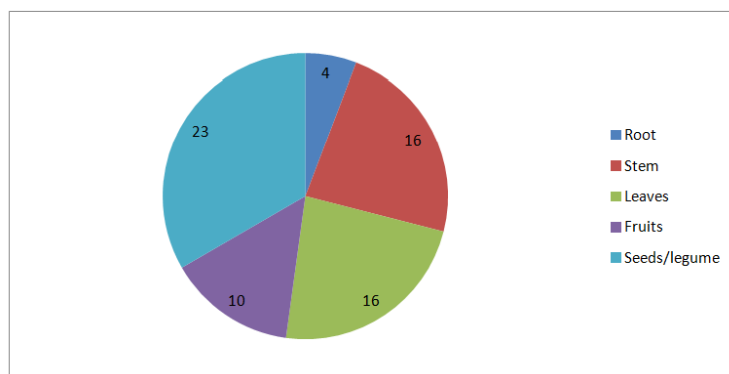


Chart: 2- Morphological constituents of the Plant used in Raipur

V. Conclusion

The present study provides information about diverse uses of leguminous plants in various ways. The documentation of information about ethnobotanical uses of leguminous plants will be prepared for future references. Due to extensive use and habitat destruction wild plants in the area are found low in occurrence. To avoid this, plants can be substituted by another plant for the same purpose after proper assessment. Also information would provide awareness to the people about the uses as in ailments, as fuel, medicine etc. Documentation would help in conservation practices of plants of this family in both in-situ and ex-situ method. To meet the need fulfilled by these plants the plants need to be cultivated and protected by habitat conservation.

VI. Acknowledgement

Authors are thankful to Sir Dr. M.L.Naik, Retd. Professor SOS in Life Science, Pt. RSU Raipur, Ex-Coordinator of Bastar and Sarguja University and Sir Dr A. Girokar, Principal, Govt. D.B. Girls College, Raipur [C.G.] for their help and support. We are also thankful to the publication house for giving us the opportunity to publish our research work in your referred and reviewed research journal.

References

- [1]. Agharkar, S.P, *Medicinal Plants of Bombay presidency* (Scientific Publishers, Jodhpur India) 1991.
- [2]. Ambasta, S. P., *The useful plants of India* (Publication, and Information on: CSIR, New Delhi) 1986.
- [3]. Banerjee M (2002) Public policy on Ayurveda. *Economic and political weekly*. 37: 1136-1146.
- [4]. Cotton, C.M., *Ethnobotany : Principles and Applications* (John Wiley and Sons, Chichester. New York. Pp-6-8, 15-18.) 1996.
- [5]. Dastur J F, *Useful Plants of India and Pakistan* (Taraporevala and sons, Bombay, India) 1964.
- [6]. Duke J A, *Handbook of Legumes of World Economic Importance* (New York: Plenum Press) 1981.
- [7]. Duthie J F, *Flora of the upper Gangetic plain and the adjacent Siwalik and sub Himalayan Tracts* (BSI. Calcutta.) 1903.
- [8]. Hooker J D, *The Flora of British India, Vols 2* (Reeve & Co., London, England) 1872-97.
- [9]. Jain S K, *Dictionary of Indian folk Medicine and Ethnobotany* (Deep publications, New Delhi, India) 1991.
- [10]. Jain S K, *A Manual of Ethnobotany (2nd Ed.)* (Scientific Publishers, Jodhpur) 1995.
- [11]. Jain S.K & Jain A K, *Introduction To Ethnobotany* (Deep Publications) 2013
- [12]. Jain, S.K. & Rao, R.R.A *Handbook of field and Herbarium methods.*(Scholarly Publications)1977
- [13]. Khare, C.P. *Indian Medicinal Plants.* (Springer) ISBN-978-0-387-70637-5. 2007
- [14]. Lewis G B, Schrire B, MacKinder & M. Lock (eds) *Legumes of the world* (Royal Botanical Gardens, Kew, UK) 2005.
- [15]. Martin J N, *Comparative Morphology of Some Leguminosae. Botanical Gazette vol-58* (University of Chicago. pp 154-167.)1913.
- [16]. Nair N C & Khanna K K, *Floristic Diversity of Chhattisgarh* (Bisen Singh Mahendra Pal Singh, Dehradun) 2005.
- [17]. Oommachan M, *Flora of Bhopal* (J.K. Jain Brothers, Bhopal) 1976.
- [18]. Panigrahi G & Murti S K , *Flora of Bilaspur district, M.P*(Botanical survey of India, Calcutta) 1998
- [19]. Sanjappa M, *Legumes of India* (Bishen Singh Mahendra Pal Singh, Dehradun, 338 pp) 1992.
- [20]. Singh A N, *Caesalpiniaceae. In: Verma D M, Balakrishnan N P & Dixit R D (eds.), Flora of Madhya Pradesh* (Botanical Survey of India, Calcutta, pp. 412–416) 1993
- [21]. The Wealth of India(1950). A Dictionary of the Indian Raw Materials & Industrial Products. Vol-I-IV, ICSIR, New Delhi, India.
- [22]. Verma D M, Balkrishan N P & Dixit R D, *Flora of Madhya Pradesh Vol I* (Botanical survey of India. Calcutta. Pp. 1-668.) 1994.
- [23]. Verma D M, Pant P C & Hanfi M I, *Flora of India Series:3-Flora of Raipur, Durg and Rajnandgaon* (Botanical survey of India, Calcutta) 1985.