In the last 50 years life has change rapidly world over. This is the high time to conserve biological diversity integrated participatory management (IPM) could be a equilibrium between the government, Civil Society and local tribe communities states should recognize and duty support their identity, culture and interest and enable their effective participation in the achievement of sustainable development. There for a more pragmatic way for conserving biodiversity is through in-situ & x-situ conservation approach for the welfare of man kind.

The purpose of this list is to provide the most up to date information on the status of endangered plant species of concern and to document the precarious existence of many of our native plants. It is hoped that this list will be used to facilitate the conservation and protection of endangered plant species of concern. The defined an endangered plant species as "any native plant species whose survival in the state or the nation is in jeopardy ............" Rules detailing procedures and setting criteria by which plant species would be determined as state endangered were formulated and a list of state endangered plants was then proposed. The endangered plant species list was adopted on Nov. 2008 and most recently revised Oct. 2010.

This list of endangered plant species of concern includes those species not listed as endangered but whose status are monitored by
the Natural Heritage Database. By combining the lists of endangered plant species and plant species of concern, this present list includes all plant species that are considered to be of conservation. Taxa are listed alphabetically by scientific name, followed by common name, family and locality or other status.

Plant species included on the following list differ in their degree of rarity, critical endangered, threatened, vulnerable to existing populations. The conservation of these species is a global priority and unless protected, it is possible that some of these endangered plants may become extinct. The majority of the remaining species on this list are more frequent elsewhere in their range, but rare in district. The conservation of these species is therefore of high state significance.

This listing of endangered and special concern species is dynamic: species new to the state are occasionally discovered, historically ranked species are rediscovered and species are determined to be rare or more frequent than previously documented. Existing population may be reduced in size by disease, predation, or unknown causes. Species are lost because their critical habitats are destroyed or irreversibly altered by direct or indirect human action, such as changes in hydrology, fire suppression by aggressive, nonnative species.

Every forest region of Chhatarpur district is rich in biodiversity but due to some climatic condition, environmental factor, anthropogenic factors, natural and exotic plant community introduction the
biodiversity of this area decreasing day by day. Some plant species become threatened and some become endangered. The list of some endangered plant species and vulnerable plant species have been given here.

Phytosociology is defined as the study of composition, development, geographic distribution and environmental relationships of plant communities (Muller Dumbois and Ellenberg, 1974) Braun Blanquet (1932) elaborated concept of community structure further and paved the way for modern study of plant sociology.

Phytosociology is the study of the characteristics, classification relationships and distribution of plant communities (The American Heritage Dictionary, 3rd ed). It is useful to collect such data to describe the population dynamics of each species studied and how they relate to the other species in the same community. Subtle differences in species composition and structure may point to differing abiotic condition such as soil moisture, light availability, temperature, exposure to prevailing wind, etc. When tracked over time, species and individual dynamics can reveal patterns of response to disturbance and how the community change over time.

The term phytosociology was coined by Braun Blanquet (1932), to investigate the structure and floristic composition of plant communities. Phytosocial concept for studying plant associations is much older that a word "ecology" coined by the German Zoologist
Ernst Haekel (1870) describe phytosociology as one of the major aspect of vegetation study.

Phytosociological study is a prerequisite for understanding the structure and function of any forest tract. Grabherr and Mucina (1989), analyzed 105 phytosociological relieves of forest of differing vitality in the Voralberg region of Austria to determine some air born pollution induced changes in habitats as well as in the floristic composition of natural woodland. In the field of vegetation ecology many investigaitons were mainly based on distribution of vegetation. Buttrick (1979) sampled vegetation of 151 species in the alpine area of British Columbia, from which 16 plant communities were recognized. Vareschi (1980) describes the tropical vegetation with reference to plant types and life forms in his book entitled "vegetation ecology of the tropics." He compared 39 tropical and 21 extropical plant communities on the basis of number of species and diversity indices. Ellengerger (1988) discussed different principles relevant to ecologists in British Isles and in North America as well as to plant Ecologist in central Europe. He discussed the aspect of physiological ecology and influence of agriculture and industrial activity on the vegetation.

Poore (1962) considered that vegetation is not a random assemblage of individuals of many species but these plants are associated in community with a definite structure and often in a regular specific composition. A plant community understood to be a more or less stable and is a combination of naturally occurring species.
which are in ecological equilibrium with one another their environment.

Curtis and McIntosh (1950) worked out the mathematical interrelation Curtis and McIntosh (1951) come out with the concept of importance value. They considered the floristic composition, layering, structure, physiognomy, function, periodicity and inter-specific correlation as some of the more useful characteristics vegetation description at an extensive level. Total importance value occupied the most important species is a function of the amount of disturbance and is inverse in function of species richness (Campbell, 1994).

Phytosociological data and status of some endangered, critical endangered and vulnerable plant species of Chhatarpur district are given below in table. These table show the frequency density abundance, relative frequency, relative density, relative abundance, Important Value Index (IVI) of various plants which is found in the study area.

In the present research phytosociological studies were done on 72 plant species in different plant diversity at all sites of Chhatarpur district (Table 5.1). Out of 72 species belonging are as - 30 endangered, 5 critical endangered and 37 species recorded vulnerable. The phytosociological data most frequent species include as Achyranthus-aspera, Andrographis-echioides, Aristida adcensionis, Amaranthus caudatus, Boerhavia diffusa, cuscuta reflexa, Euphorbia-hypericifolia, Euphorbia-millii, Momordica charautia, Ranunculus scleratus,
Chapter 5
Biodiversity of Endangered Plant by Phytosociological Method

Dr. Hari Singh Gour Central University, Sagar (M.P.)
Sagittaria guayanensis, Tridex procombense, Trifolium alexandrianum, Vitex nirgundo, Xanthium strumarium and the less frequent species are Arthraxun lancifolius, Bidens-bitemata, Cissus auodrangularis, Croton-roxburghii, Desmodiium triflorum L., Ficus benghalensis L., Ficus glomerata, Ficus hispida, Ficus palmate, Ficus virens, Finbristylis littoralis, Flacourtia indica, Martynia annua L., Mucuna puriens L., Mukia arn, Nelumbo nucifera Guerth, Nymphaea nouchali, Polygala arvensis, Poa aspera, Rorippa indica, Scripus barbotus, Scripus cyperoides, Tinospora cardifolia, Vanda tessellata, Verbesina prostrata, Vetiveria zizanioides, Zizyphus nummularia. On the basis of our data, it is possible to affirm that there is high diversity of medicinal plants at the district. On the basis of above phytosociological data maximum density recorded in Abrus precatorius, Andographis peniculata, Andographis echioides, Cuscuta reflexa, Euphorbia hypericifolia, Euphorbia pilulifera, Peniculum flavidum, Panicum punctatum, Polygala arvensis are dominant species at the district and Acorus calamus L., Aristida adcensionis L., Aristida Funiculata Trin, Arthraxun lancifolius, Bidens bitemata (Lour.), Chenopodiun valgaris, Cissus auodrangularis, Croton roxburghii, Cuscuta reflexa Roxb., Desmodium gangeticum (L.), Desmodium hetrocarpon (L.), Desmodium laxiflorum, Desmodium polycarpum (poir), Desmodium triflorum L., Euphorbia hypericifolia, Euphorbia pilulifera, Ficus benghensis L., Ficus glomerata Roxb., Ficus hispida, Ficus palmata, Ficus virens Ait, Finbristylis littoralis Craud, Flacourtia indica (Bum F.), Gloriosa superba L., Leucas cephalotes, Momordica charantia, Momordica dioica Roxb, Mucuna puriens L.,

The tropical forests at the district are characterized by strong gradients in elevation precipitation, humidity, soil type, slope, aspect and radiation. Species adapt to these gradients in often contrasting ways, and their distribution depends on the characteristics that define their reproduction and survival. Trees, the most important functional group in the ecosystem, were most diverse at middle elevations, but species composition changes over multiple gradients. Forest communities are subject to periodic disturbances from landslides due to high precipitation and mountainous terrain. Because of disturbances and multiple gradients, tropical deciduous forest are extraordinarily complex spatially; thus habitat diversity and species turnover are prominent attributes of this ecosystem. Chhatarpur district forest communities are similar to lowland forest; however, with increasing altitude and some species rare and endangered. Inventory and monitoring of biodiversity of any area is prerequisite for conservation and management planning.
To reduce the pressure of over exploitation on wild endemic and medicinal plants and to avoid the adulteration of crude drugs, cultivation of endemic and medicinal plants can be encouraged with the participation of local tribes. To be little the negative impact of over explanation, the tribals who are involved in the collection of plant species should be given sufficient training in the scientific way of collection. Collection programmes should be planned properly and restricted to a particular season. Cutting of tree branches to harvest its fruit should be avoided. Annual herbaceous plant species can be continued to be collected by leaving enough propagules for neat season's growth. Thus by rationalizing the collection of the plant species, a sustained yield from the forests and conservation can be achieved.

Generally endemism is a phenomenon in which a taxonomic unit is found to occur in a restricted area, which is isolated by geographical or temporal barriers. Endemics occurring in such isolated and restricted areas possibly survivors of isolated and restricted areas are possibly survivors of their ancient stock that occurred in areas subjected to cataclysmic geological and climatic changes (Santosh Kumar et al., 2004). Engler classified them into paleoendemics and neo-endemics. The former are the ancient endemics representing remnants of older flora and usually occurring in land masses of geological antiquity and the later are newly evolved taxa of relatively recent origin and have closely related taxa occurring
in the same area (Nayar, 1996). The major concentration of endemic plants occurring in a particular geographic zone or ecological niche are "hot spot of endemism". In India the major mega centers of biological hotspots are largely concentrated in the peninsular India. Most of the endemics of peninsular India are paleo-endemics, which found favorable ecological niche in the hill ranges of either side of western and Eastern ghats (Santosh Kumar et al., 2004).

Intensive floristic diversity assessment study was conducted in the study area Chhatarpur district in 2008-2011. This has resulted in the collection of species of different families. Out of this certain little known endemic and endangered plant species such as *Abrus precatorius* L., *Andographis paniculata* (Burh), *Andropogon hirtiflorus* Hook. F., *Aristida adcensionis* L., *Aristida funiculata* Trin & Rupr, *Aristida reducta* staptf, *Amaranthus caudatus* L., *Bauhinia varigata* L., *Desmodium-laxiflorum*, *Eragrostis-minor* Host., *Ficus-hispida*, *Ficus-virens*, *Gloriosa-superba* L., *Nelumbo-nucifera* Guerth, *Nymphoides-cristatum*, *Polygela-arvensis* (wild), *Potamogeton crispus* L., *Scirpus-cyperoides* L., *Strychnus-nuxvomica* L., *Tinospora-Cardifolia*, *Vanda-tessellata* L. and *Vetiveria-zizanioides* Nash of conservation importance have been collected and identified, these species are strictly endemic or endangered to Chhatarpur district. The identification of these species was confirmed with the subsequent matching of flora at Chhatarpur district, Botanical survey of India, Northern circle,
(Allahabad). Among the total number of 30 species are endangered or endemic to Chhatarpur district. They are critically studied and those are notable regarding their conservation aspects (Sharma et al, 1977; Henry et al., 1978; Vajravelu and Daniel, 1983; Nair and Daniel, 1986, Ahmedullah and Nayar, 1987; Nayar and Sastry, 1987, 1988 and 1990; Nayar, 1996, Gopalan, 2000; Ratna, Dutta and Deb, 2004. Apart from these 30 species are reported to be first time from the Chhatarpur district. Hence they are reported as additions to the flora of Chhatarpur district. They are given below with their recent binomial name, family, correct status distribution and description together with phenological data for further collections and easy identification.

**ENUMERATION**

(1) *Abrus precatorius L.* Syst. Nat. ed. 12.472, 1767; Baker in Hook. F. Fl. Brit. India 2:175, 1876 'Ghumchi'. (Photo-1)

Perennial deciduous climbers, woody at base. Leaves 6-12 cm long, leaflets 8-20x, 4-6 mm, oblong, apex rounded-apiculate, base rounded. Flowers fascicled on the swollen nodes of axillary racemes. Calyx 2-2.5 mm long, sparsely hairy; teeth very short. Corolla 8-10mm long, pale pink. Pods 2.5-4×1-1.3 cm, Oblong, wrinkled, turgid, truncate-beaked, appressed hairy; seeds 2-5, 5-6 mm long, ovoid, polished, scarlet with black blotch of the hilum, some times white. with fruit species is endangered in district.

Common on hedges and low shrubs in wastelands open forests.
Flowering : September

Fruiting : February

Locality : Kishangarh, Deora forest of Chhatarpur

Distribution district in (M.P.)

(2) **Andrographis paniculata**, (Burm. F.) Wall ex. nees in wall. P1 As. Rar. 3:116, 1832; Wt. IC. t. 518; FBI. 4:501; FUGP. 2:196; Santapau, Acanth. 50 (Photo-2).

An erect, glabrous annual 30-100 cm tall branches sharply 4 angled or winged. Leaves 5-10×1.5-2 cm, ovate-lan-ceolate. Inflorescence a lax, axillary and terminal, unilateral raceme, forming a panicle, flowers whitish, spotted with rose-purple. Brack opposite, paired. Capsules tapering at ends.

Spontaneous in moist, shady places. Also cultivated in gardens.

Flowers : October

Fruiting : December

Distribution : Kothi, Jatashankar of the Chhatarpur District.

(3) **Andropogon-hirtiflorus** (Hook. F. fl. Brit. India 7-167. 1896, non kunth, 1832) (Photo-3).

Perennials. culms tufted, 15-50 cm tall. Ligule C. 1 mm long, membranous. In florescence of spatheate spike like racemes, 3.5-8 cm long, terminating the culms and the many branches from appear
nodes. Sessile and pedicelled spikelets with an oblique callus with stiff white hairs. Lower glume 7.2 mm long, narrowly lanceolate, margins inflexed, 5-nerved keeled on the back. Upper glume 7.4 mm long, narrowly boat-shaped, keeled on the back, 3-nerved, Scaberulous along the back of the midnerve, margin hyaline lower lemma 6.5 mm long, linear-lanceolate, nerveless, margins ciliolate. Palea 2 mm long, delicately hyaline, long ciliolate. Upper lemma 5.2 mm long, clefted, 1-nerved to the notch and continued thereafter as long as own. pedicelled spikelets, similar to sessile, little broader.

Rare on rocky yellow soil in mixed forest area.

Flowering : Sep.

Fruiting : November

Distribution : Deora forest, Hirapur of Chhatarpur district in M.P.


Annuals, Culms 15-30 cm tall. Ligule a small ciliate membrane panicle 10-15 cm long, lax spikelets laterally compressed. Lower glume 12-22 mm long, linear, 1-nerved, awned upper glum 12-20 cm long, similar to lower. Lemma 3.5-4 mm long, cylindric; awns 3; central own 2.5-4 mm long, cylindric, blackish.

Occasionally found in stony wastelands and exposed roadsides.
Flowering : August

Fruiting : November

Distribution : Jaitpur in Chhatarpur district (M.P.)


Annuals or short-lived perennials. Culms 25-60 cm tall. Ligule of fine short hairs. Panicle up to 30 cm long, contracted, unequally branched from the base or middle. Spikelets laterally compressed. Lower glume 4-7 mm long, linear lanceolate, acute, 1-nerved, scaberulous on keel. Upper glume 6-9 mm long, lanceolate, apex emarginate with a mucro in sinus. Lemma 7-9 mm long, cylindric-oblong, 3-nerved, scabrid on keel; awns 3, central one up to 2 cm long; lateral 2 shorter, diverging. Palea minute, oblong hyaline. Caryopsis 7-9 mm long, cylindric, narrow.

Common in exposed dry places and rocky slopes.

Flowering : September

Fruiting : December

Distribution : Dronagiri in Chhatarpur district M.P.

Chapter 5

Biodiversity of Endangered Plant by Phytosociological Method

Annuals culms slender, erect, 20-100 m tall. Ligule 1.5-2 mm long, oblong, lacerate. Panicle effuse, 10-30 cm long. Spikelets 5-6 mm long. Lower glume 3 mm long, acute, 1-nerved, keel scabrid on the upper surface. Upper glume 5 mm long narrowly acuminate, 1-nerved, glabrous. Lemma 4.3 mm long, charactaceous, scabrid on the side; owns 8-9 mm long, lateral awn reduced and different texture. Palea c. 2.5 mm long. hyaline. Caryopsis 2-3 mm long. Cylindric.

Flowering : October
Fruiting : December
Distribution : Jaitpur in Chhatarpur district (M.P.)

(7) Arthraxon lancifolius (Trin.) Hoehst in flora 39:188, 1856.

Annuals Culms 15-40 cm tall. Ligule membranous, ciliate, Racemes 3-6, 1-3 cm long. Sessile spikelets 2.5-3 mm long, linear-lanceolate. Lower glume 2.3-2.5 mm long, linear-lanceolate, faintly 5-nerved, scabrid on nerves above, keeled 2-toothed. Upper glume 2.4-2.6 mm long, scabrid on keel above, awned. Lower lemma, minute, hyaline. Upper lemma 1.2-1.5 mm long, lanceolate, hyaline 2-nerved, with 6-8 mm long, awn, epaleate, caryopsis 0.8 mm long, cylindric, light brown.
Common in unused ground near habitations, damp habitats in forests and along the streams.

Flowering : July

Fruiting : November

Distribution : Bhimkund in Chhatarpur district M.P.


Annual erect herbs, 50-100 cm tall. Leaves 5-20×3-12 cm, ovate-elliptic or rhomboid-oblong, sub- entire, Apex obtuse-mucronate, base cuneate decurrent, tinged with purple. Flowers clustered in terminal and auxiliary spikes or panicles. Bracts and bracteoles 2-2.8 mm long, ovate, acuminate. Male flowers. Tepals 2.5-3 mm long, ovate oblong, shortly mucronate. Female flowers. Tepals 2-2.5 mm long, ovoid, circumscissile; seed 1 mm across, subglobose, compressed, shining black.

Fairly common in fields, nursery beds and humus rich soil near villages; after cultivated.

Flowering : September

Fruiting : March

Distribution : Jhanjhan Devi nursery in Chhatarpur district (M.P.)

Trees, 4-7 m tall leaves 10-15 cm across, base cordate, lobes rounded at apex. Racemes subcorymbose, short, lateral. Calyx pubescent outside; tube 1.2-2 cm long; limb 1.8-2.5 cm long, spathulate, 5-loothed at apex. Petals 5, obovate, long clawed, purple; median petal variegated with white. Pods 15 1-20x 1-2 cm, flat, hard, dehiscent, dark brown; seeds 10-15, 1-12 cm long, ellipsoid, brown.

Occasionally planted in gardens, near temples and along the roads for its showy flowers.

Flowering : November
Fruiting : January
Distribution : Bhagwan in Chhatarpur district M.P.


Annual erect herbs, upto 70 cm tall. Leaves 3-5 faltiate; leaflets 1.5-7x 1-2.5cm, ovate lanceolate, dentate or pinnatifid, apex acute acuminate, base caneate. Heads 1-1.8 cm long, solitary. Invol. bracts 2 seriate; outer bracts 8-12 mm long, ovate lanceolate. Ray florets
usually 3, female or sterile; ligules 3-4 long, yellowish. Disc florets bisexual; corolla 3.5-4 mm long, 5 lobed, yellow. Achenes 0.8-2 cm long, linear, obscurely 4-angular, narrowed towards apex, black hairy; puppus bristles 2.5-4 mm long, rigid, unequal.

Common is shady waste places roadsides, forest edges and waste corner of fields and gardens.

Flowering : August
Fruiting : January
Distribution : Chandranagar, Mandla in Chhatarpur district M.P.


Perennial extensive climbers; stem spongy, leaflets 8-14×2.5-9 cm obovate or ovate rhomboid, Serrate. Flowers in much branched Cymes. Calyx truncate, pubescent outside. Petals oblong, hooked at apex, pubescent outside. Berries 1.2-1.7 cm across, globose smooth, dark red when ripe.

Rare climber on forest trees in foot hills and rocky slopes.

Flowering : August
Fruiting : January
Distribution : Deora forest in Chhatarpur District (M.P.)

Perennial undershrubs, up to 1.25 m tall. Leaflets 7-15×3.2-8 cm, ovate-elliptic or broadly lanceolate, apex acute, base rounded, appressed hairy beneath. Racemes lax, auxiliary and terminal. Calyx 2.5-3 mm long, hairy; teeth lanceolate. Corolla 6-6.5 mm long, bluish-white. Pods, linear, 6-10 jointed, nearly straight, slightly constricted; joints 4-5.5×1.8-2.5 mm, with viscid hooked hairs; seeds c. 1.7 mm long.

Found as an undergrowth of mixed forests on hilly slopes.

Flowering : September
Fruiting : December
Distribution : Deora forest in Chhatarpur district M.P.


Annuals Culms 15-50 cm tall. Ligule a minute hairy rim. fanicle 5-20 cm long, ovate not very dense. Spikelate 5-7mm long, linear-oblong, 6-15 flowered. Glumes subequal, 1-16 mm long, ovate, acute, 1-3 nerved, usually glandular on keel. Lemma 1.5-2 mm long, broadly ovate 3-nerved, obtuse. palea slightly shorter than lemma, scabrid on keels, persistent. Caryopsis 0.5-0.7 mm long broadly oblong, dark brown.
Fairly common in cultivated fields, sandy wastelands and open grassy fields.

Flowering: August
Fruiting: November
Distribution: Maharajpur in Chhatarpur district (M.P.)


Deciduous trees, 8-15m tall. Leaves 7-15×3.5-7 cm, elliptic lanceolate, apex subacute, base cuneate, lateral nerves, 5-6 pairs. Receptacles 2-2.2 cm long, ovate. Male flowers sessile; tepals 3. Gall and female flowers subsessile or shortly pedicelled with tabular 3-lobed perianth. Achenes C. 1.2 mm long, ellipsoid, smooth, brown.

Common in wastelands, forest edges, along the rivers and nalas.

Receptacles: April-July
Distribution: Jatashankar in Chatarpur district (M.P.)


Hispid pubescent, shrubs or small trees, 3-5 m tall. leaves 10-22×5-10 cm, ovate or obovate-oblong, toothed, apex abruptly acuminate, base truncate-cordate, hispid-scabrid; lateral nerves 5-7 pairs. Receptacles auxiliary, solitary or in leaf-less branchlets, usually hanging in clusters from tubercles of main branches and trunk, 1.4-2
cm long, hairy. Male flowers with 3 hyaline tepals. Perianth in gall and female flowers absent or obscure. Achenes, C. 1mm long, ovoid less common in dry waste places around villages and along the streams.

Receptacles : January-June

Distribution : Dhubela museum in Chhatarpur district (M.P.)

**Ficus virens** Ait, hort, kew 3; 451. 1789. F. infectoria Roxb. F1 Ind. 3:551. 1832, non wild. 1806; king in Hook. F. F1. Brit. India 5:515, (1888) "Pakar" (Photo-16).

Deciduous trees, 7-12 m tall. Leaves ovate lanceolate with 6-8 pairs of lateral nerves. Receptacles axillary, paired, 6-9 mm long, ovate, subacute, persistent. Tepals linear lanceolate, 2-3 in male flowers, c. 3-4 ovoid, dark brown.

Occasionally found in village and town areas.

Receptacles : October-December

Distribution : Chhatarpur (M.P.)


Annuals, 10-40 cm tall. Anthela decompound; rays 7-12, unequal, suberect or spreading. Bracts filiform, shorter than the umbels. Spikelets 2-5mm long, sub-cylindric. Glumes 1-1.5mm long,
ovate-oblong, obtuse, 2-nerved, stamens 1-2. Nuts c. 0.5 mm long, obovoid, obtusely trigynous verruculose.

Common in open moist and muddy places along roadside ditches and paddy fields.

Flowering : September
Fruiting : December
Distribution : Khajuraho in Chhatarpur district (M.P.)


Perennial herbs. Leaves subsessile, alternate or lowermost opposite, 6-15×1.8-4 cm, ovate-lanceolate, base rounded.

Flowering & Fruiting : Summer and Winter
Distribution : Garhi Malahra in Chhatarpur district (M.P.)


An aquatic floating herb, spreading by runners. Leaves 4-8×4-10 cm, suborbicular, deep cordate, purplish beneath. Flowers white, about 1.5×2 cm, in the temporary ponds near Garih Malahra and Harpalpur. Grown in the fresh water ponds and tanks.

Flowers : Summer and rainy season
Distribution : Garih malahra and Harpalpur in chhatarpur district M.P.

A large handsome, aquatic herb with milky thick and long, creeping under water rootstock. leaves 60-90×90-60 cm about a metre high above water, orbicular, Centrally peltate. Flowers white or rose-coloured, 10-15 cm. across, fragrant, solitary. Anthers yellow in white flowered and orange in rose-coloured forms. Carpels sunk in a torus, oblong. Seeds with spongy seed coats.

commonly planted during the rainy season in the Garih malahra of the district. The rhizomes, leaves, stalks, flowers and seeds are cold in the market. The leaves are used as food plates. The plant is held in high regard by the Hindus. Cordate. Flowers axillary, solitary or sub-corymbose towards the ends of branches. Tepals 6, 4-5.5cm long, linear-lanceolate, undulate greenish-yellow at first, finally reflexed and orange-red. Capsules 4-5 cm long, oblong, smooth, green.

Occasionally found in shrubberics along the roadsides and in forests edges.

Flowering : August

Fruiting : October

Distribution : Bamitha in Chhatarpur district M.P.

A tall rough undershrub. Roots deep yellow. Leaves large, broad ovate, sticky, long-petioled. Flowers rosy, conspicuous, diandrous. terminal, glandular-sticky raceme. Bracts and bracteol as petaloid. Fruits large, hard, black, with two prominent hooks. It is a conspicuous plant and can be easily identified by its glandular- sticky nature, showy rasy flowers and strange fruits. A semi-lunan, extra- floral nectary occurs at the base of the pedicel.

Flowering : August-September

Fruiting : October-November

Distribution : Deora forest in Chhatarpur district M.P.


Annual, erect of diffuse herbs, upto 25cm tall. Leaves subsessile, 0.3-3.5×0.2-1.3 cm, obovate oblonceolate or elliptic. Flowers greenish-yellow, Solitary or in upto 2 cm long lateral racemes. outer 3 sepals 1.5-2 mm long, ovate; inner 2 (wing sepals) 4-5 mm long lower one keel-shaped. Capsules 3-4.5×2-4, ovate oblong, ciliate on margins; seeds c. 3mm long, elliptic obovate, black; caruncle hook-shaped, with 3 teeth-like appendages.

Common weed in grassy lawns, parks and wastelands.
Flowering : August
Fruiting : October
Distribution : Dhubela Museum in Chhatarpur district M.P.


Annual, submerged, aquatic herbs. Leaves sessile, 2.5-8, 0.3-0.9 cm, obtuse; stipules up to 1 cm long, caducous. Spikes 6-10mm long, few-flowered, lax. Tepals 4-1.5-2mm long, broadly obovate, shortly clawed. Stamens 4, opposite the tepals. Druplets C. 2.5 mm long, obliquely ovoid, beaked.

Common in ditches, ponds and shallow water, usually in association with *Hydrilla veriticellata* (L.F.) Royle.

Flowering : March
Fruiting : April
Distribution : Garhi Malhara in Chhatarpur district M.P.


Annual, decumbent-erect herb, 10-25 cm tall. Radical leaves petioled, deeply pinnatifid, 3-5cm long. Cauline leaves sessile, lanceolate oblong, entire or sinuate-toothed, base amplexicaul. Racemes 6-15 cm long. Sepals 2-2.5 long, ovate. Petals 4, as long as...
the sepals, oblanceolate-cuneate. Siliquae erect to slightly upcurved; seeds 0.5 mm across, subreniform, turgid, reddish-brown, granulate.

Occasional in moist-sandy ground and margins of ditches.

Flowering : January
Fruiting : February
Distribution : Chhatarpur district M.P.


Annual, up to 20 cm tall. Heads 5-12mm across, with 3-many spikelets. Bracts 2-3, unequal, filiform, the largest upto 1.5 cm long. spikelets 2-7mm long, linear-oblong, angular, acute. Rachila stout, zig-zag. Glumes 1.5-2mm long, ovate, keeled, mucronate, chestnut brown. Stamens 1-2. Stigmas 3. Nuts 0.5-0.7mm long, oboviod, trigonous.

Common weed in cultivated and fallow fields, lawans and on sandy to clayey soil.

Flowering : September
Fruiting : October
Distribution : Ranesh Fall in Chhatarpur district M.P.

Perennial climbing shrubs, stem green when young, covered with loose dry, papery bark, leaves 8-15×5-12 cm brodly ovate-cordate, apex acute, base cordate, membranous. Flowers yellowish in racemes. Bracts lanceolate, subulate, male flowers facicled. Sepal 3+3; 3 outer 1-2 mm long, ovte-oblong; 3 inner ± 4 mm long, suborbicular. Petals 6, 2 mm long, wedge-shaped. Stamens 6, Free; filaments clavate. Female flowers usually solitary. Sepals and petals as in male flowers. Drupes 5-6 mm across, red. Endocarp reniform.

Occasionally found on trees and shrubs along fields and gardens.

Flowering : March  
Fruiting : April, May  
Distribution : Bijawar, Jatashankar in Chhatarpur district M.P.


Annual, procumbent ascending herbs, 30-50 cm tall. Leaves 2.5-7×1-3.5 cm, ovate-lanceolate, incised-dentate, apex acute, base. Cuneate, appressed-hairy on both sides. Heads 1-1.2 cm across, solitary terminal. Invol-bracts 2-3; outer 4-5 mm long. Ovate, acuminate, hairy; inner 6-7 mm long, lanceolate, sparsely hairy. Ray florets female, liigulate; ligules 2-3.5 mm long, 2-3 dentate. Disc florets numerous, bisexual; corolla 4-6 mm long, tubular, 5-lobed.
Achenes 2 mm long, obconic, obbscurely angled, silky-hairy; pappus bristles dirty white.

Common among hedges, open wastelands and forest edges, preferably in gravelly soil; often in grows on old walls and rock crevices.

Flowering : All seasons
Fruiting : All seasons
Distribution : Maharajpur in Chhatarpur district (M.P.)

(28) **Vanda tessellata** (Roxb.) Hook ex G. Don in Loud. Hort. Brit. 372; (1830) (Photo-28).

Epiphytic herbs. Stem 15-40 cm long, climbing leafy, with many thick fleshy roots. Leaves sessile, 15-20×1.2-1.8 cm, stap-shaped, recurved, thick, obtusely keeled, apex obtuse. Flowers in 4.10 greenish-yellow with brown lines and white margins. Petals 3, slightly shorter than the sepals. Obovate, yellow; lip 1.5 cm long, 3-lobed, lateral lobes obliquely oblong, median lobe panduriform; spur 5-6 mm long, conical. Column short, oblong, fleshy. Pollinia 2, ellipsoid. Capsules 5-7 cm long, oblong, sharpy winged.

Generally epiphyte on Mangifera L. and Madhuca gmelin.

Flowering : August
Fruiting : February
Distribution : Amoda, Mandla in Chhatarpur district (M.P.)

Annual, erect or decumbent-ascending herbs, 20-30 cm tall. Leaves sub sessile, 1.5-5×0.6-1.5 cm, elliptic lanceolate, entire or faintly serrate, apex acute, base cuneate. Heads 5-9 mm across, solitary or 2-3 together, axillary or terminal. Invol bracts 2-seriate, 4-6 mm long ovate-oblong, appressed-hairy. Ray florets female, ligulate; ligules 1.5-2.5 mm long, linear, 2-toothed. Disc florets bisexual; corolla 1.5-1.8 mm long, tubular, 4-5 lobed. Achenes c.3 mm long, obovate, 3-angled in female and 4-angled in bisexual florets, deep brown.

Abundant in moist-shaded wastelands, roadsides, fields and margins of ditches.

Flowering: Practically all seasons
Fruiting: Practically all seasons
Distribution: Chhatarpur district


Perennials. Culms 1-1.5m tall, tufted, erect, with rhizomatous root-stocks. Ligule a short scarious rim. Inflorescence 15-30 cm long, with whorled racmes. Sessile spikelets. 3.7-4.2 mm long, linear-lanceolate. Lower glume 3.5-3.8 mm long, lanceolate, 5-nerved
tuberculate-mucronate on back. Upper glume 4-4.2 mm long, boat-shaped, 1-nerved, spinous-muricate on keel. Lower lemma empty, C. 3.6 mm long, lanceolate 2 nerved, ciliolate, epaleate. Upper lemma bisexual, c.3 mm long lanceolate, 2-nerved, 2-dentate. Palea minute, hyaline. Stamens 3: anthers c.2.5 mm long caryopsis c.2 mm long, linear. pedicelled spikelets c. 3.4 mm long, male.

Common along streams, low lands and on heavy soil. It is forming a pure stand in dried up pond near Khajuraho.

Flowering : September
Fruiting : December
Distribution : Near Ken bridge in Chhatarpur district M.P.