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Threat Assessment Of Medicinal Plants Of Koria District In Chhattisgarh (India).

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ABSTRACT : *Koria district of Chhattisgarh state has a very rich plant diversity specially of medicinal plants and there is no comprehensive description of the flora as well as vascular cryptogames of the district is available some plant species are on the verge of extinction..The objective of the study was threat assessment of medicinal plants of Koria district based on the criteria developed by the IUCN.*
Keeping these point in view the present investigation was planned to assess the biobiversity of the vegetation of the district.Extensive field surveys were undertaken during 2004-08 Sampling sites were selected randomly covering all the blocks. Quantitative phytosociological characters were studied as per methods described by Misra (1968). The threat categories in the present study have been prepared viewing to the medicinal plants found in the wild only. Assessment of threat was done following the guidelines of IUCN (2000)
Study reveals that 3 medicinal plant taxa were found to be regionally extinct in wild(Ex.) ,14 were critically endangered(CR), 27 were endangered (EN),62 were vulnerable (VU) and 37 were near threatened (NT) and 57 were least concerned(LC).
Key Words*:-, Threat assessment,Koria district, Medicinal plants*

I. Introduction

India contains about 8% of world's biodiversity on 2% of the earth's surface, making it one of the 12 mega diversity countries in the world.

Chhattisgarh, the 26^{th} state of the country, has ample variation in physical and cultural features. It has about 44% of its total geographical area covered with forests

Koria district in Chhattisgarh lies between $22^{0}58'$ and $23^{0}51'$ North Latitude and $81^{0}59'$ and $82^{0}45'$ East Longitude and has a forest area of 81.23%. Average rainfall is 121.36 cm. and annual mean temperature is 24^{0}c. The district is dominated by Upper Gondwana rocks which are rich in deposition of coal.

The district has a sizeable tribal population using enormous range of plants for their basic needs, sustenance and livelihood. The district has very rich plant diversity, including medicinal plants.

Many of them are on the verge of extinction due to over exploitation and destruction of their habitat. There has been no comprehensive study on the enumeration ,distribution and the assessment of threat to the existing medicinal plants.

Keeping these points in view the present investigation was planned to assess the diversity of the medicinal plants. Attempts have also been made to assess the threat status and the extent of damage to medicinal plants of the Koria district.

II. Material and methods

Extensive field survey were undertaken during the years 2004 to 2008.

Covering an area of 20 km to 200 km. radius around the head quarter town of the koria district. The district comprises of 5 Development Blocks, viz. Baikunthpur, Sonhat, Manendragarh, Khadgawan and Bharatpur. The sampling sites were selected randomly covering all the blocks.These include Shivpur, Katghodi, Pahadpara, Tilpandand, Itga, Rakiya, deori ,Orgai, Salgawan, Amhar Narayanpur, Khongapani, Parasgadi, Udalkachhar Podidih, Peeparbahra, Jilda, Bhagwanpur,Patwahi and semaria . Medicinal plants has been collected ,herbarium sheets were prepared identified using standard flora and references. The quantitative phytosociological characters were studied using methods described by Misra (1968).

To assass the threat status guidelines of FRLHT (Foundation for Revitalisation of Local Health Traditions), Bangalore (2003) have been followed and the data thus computed have been expressed in terms of IUCN threat categories.

III. Observation and Results

Two hundred eighty four genera distributed in 93 families were showing the 31% of the total Medicinal plants of state . Evaluation of status of threat reveals that 3 medicinal plant taxa were found to be regionally extinct in wild(Ex) ,14 were critically endangered(CR), 27 were endangered (EN),62 were vulnerable (VU) and 37 were near threatened (NT), 57 were least concerned(LC).

IV. Discussion

There are several reports of the floristic diversity and region threat assessment from many regions of the country.

As per the 3rd Conservation Assessment & Management Plan Workshop for Southern Indian Medicinal Plants held at Bangalore in January, 1997, some endemic, rare, critically endangered and vulnerable floral species in the State of Chhattisgarh were listed. The endemic and rare species of Chhattisgarh state include *Sophera bakeri, Crotalaria trifoliustrum* (Khip), *Uraria prunellaefolia* (Pitharan), *Mucuna imbricata* (Kevanch), *Hoya wrighitii, Desmodium tortosum* (Sarivan) and *Erythrina resupimata* (Pangra).

Among 45 endangered taxa (based on floristic study of 7 districts of Chhattisgarh by NBRI, Lucknow) some of the plant species are *Butea monosperma* var. *lutea, Celastrus paniculata, Chlorophytum tuberosum, C. arudinaceum, Clerodendron serratum, Cordia rothii, Curculigo orchioides, Curcuma aromatica, Pterocarpus marsupium, Rauwolfia serpentina*. In the present study,it was found that, *Curculigo orchioides, Rauwolfia serpentina, Cordia macleodii* were critically endangered *Costus speciosus and Chlorophytum tuberosum, Clerodendron serratum* were endangered plant species

Varghese ,etal. (1999) reported the ecological niches and amplitudes of rare, threatened and endemic trees of Peppara Wildlife Sanctuary. They have documenting 151 tree species belonging to 51 families with 62 endemics (41% of endemism), 6 rare and 8 threatened species.

Mandal *et al.* (2000) reported rare and endangered flowering plants of Bay Islands with special reference to endemics and extra-Indian taxa. They concluded that 110 plant species are considered as rare threatened

Samant, et.al (2003) studied diversity and conservation status of medicinal plants in Uttaranchal state. They have noted that Critically Endangered 18 spp., Endangered 18 spp., Vulnerable 22 spp., Low-risk Near Threatened 6 spp. and Low-risk Least Concern 1 sp.

Badola , et.al (2003) have emphasized threatened medicinal plants and their conservation in Himachal Himalayas. They analysed 133 rare, sensitive and threatened medicinal plant species of Himachal Himalayas.

Jaipuriar (2003)has also dealt with the threatened herbal flora of Jharkhand. he has reported 8 species have been listed as endangered 18 species as vulnerable .*Strychnos nux vomica* (Kuchala) of family Loganiaceae, *Caryota urens* (Mari) of Palmae and *Sarcostemma acidum* (Somlata) have been assessed as extinct(Ex.)

Mathachen (2004) studied ecological amplitude and regeneration of medicinally important threatened trees in the central Western Ghats. They surveyed out of total, 19 species of medicinally important threatened trees were recorded.

Sukumaran *et al.* (2005) carried out the floristic composition of Sacred Groves as a functional tool to analyse the mini forest ecosystem. The study has overall record of flora of the 329 species enumerated 54 are listed rare, endemic and threatened.

Arvind *et al.* (2005) reported a comparative analysis of red-listed and non-red-listed plant species in the Western Ghats, India. They have recorded at both the regional and the local scales.

Udayan (2006) reported a few rare, endemic and red-listed species from high range (Mannavanshola), near Munnar in Idukki district (Kerala state). He collected 25 rare, endemic and red-listed species.

Laloo *et al.* (2006) studied status of medicinal plants in the disturbed and undisturbed sacred forests of Meghalaya. . They have explored *Camellia caduca* (endemic and less frequent), *Cinnamomum pauciflorum* (endemic and rare), *Erythroxylum kunthianum* (endemic) and *Picrasma javanica* (rare) were studied.

Maliya (2007) presented a local assessment of rare species of Katarniya ghat wildlife sanctuary, Dist. Bahraich, Uttar Pradesh, India. Fortyone rare species have been recorded in the sanctuary region by him.

Patil (2007) studied conservation of medicinal plants through people's participation - A case study of Toranmal, Maharashtra. He concluded that out of 24 medicinal plants found in this area, 16 were endangered, vulnerable or threatened.

Sukumaran and Raj (2007) reported rare, endemic, threatened (RET) trees and lianas in the Sacred groves of Kanyakumari district. The study enlisted 36 RET species from 21 families, belonging to 29 genera. Out of thirtysix, 23 are endemic to Western Ghats and Tamilnadu at present

Dubey *et al.* (2007) have assessed a total of 313 plant species of Rewa (M.P.). They have categorized 3 species as regionally "Extinct in the wild", 25 as "Critically endangered", 59 as "Endangered", 97 as "Vulnerable" and 46 as "Not threatened" but at lower risk.

Reddy *et al.* (2008) have published first Red List of medicinal plants of Andhra Pradesh (India) in "Ethnobotanical leaflets". Out of total 50 prioritised medicinal plant species found in Andhra Pradesh, 39 were found to be in threatened group. The Red list status was assigned as 'Critically Endangered' 4, 'Endangered' 24, and 'Vulnerable' 11.

A comparison with IUCN status (Wikipedia 2009) the taxa assessed in the present study show that there is an increase of 14 species in Critically endangered category, 71 species in Endangered category and a decrease of 01 species in Vulnerable category, 25 in Near threatened category and 56 in Least concerned category.

V. Conclusion

It is concluded that 03 species as regionally "Extinct in the wild", 25 as "Critically endangered", 59 as "Endangered", 97 as "Vulnerable" and 46 as "Not threatened" but at lower risk

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TABLE:-1 Regional Threat Status of Medicinal Plants of Koria district C.G.(India)

Regionally Extinct in Wild (Ex.):-

S.No.	Botanical Name	Vernacular name	Family
1	*Curcuma amada* Roxb	Ambahaldi,Banhaldi, Amada, Kapurahalad	Zingiberaceae
2	*Elaeocarpus ganitrus* Roxb	Rudraksha	Tiliaceae
3	*Manihot glaziovii* L.	Rubbe	Euphorbiaceae

Critically Endangered (CR.) :-

S.No	Botanical Name	Vernacular name	Family
1	*Bixa orellana*	Sinduri	Bixaceae
2	*Celastrus paniculata* Willd	Malkangini, Malkoni, Maltangun, Umigini, Jyotismati	Celastraceae
3	*Cordia macleodii* Hook.f. & Thomson	Dahiman, Dahipalas, Dhengan	Boraginaceae
4	*Croton tiglium* L	Jamalghota, Dantichhoti, Triphals, Hakani, Dantibeej	Euphorbiaceae
5	*Embelia robusta* Roxb.	Baibrang, Waiwarang, Bebrang, Bhingi, Baberang	Myrsinaceae
6	*Grewia tiliaefolia* Vahl.	Dhaman	Tiliaceae
7	*Leea macrophylla* Horn.	Hatkan	Ampelidaceae
8	*Lepidium sativum* L.	Chandrashoor, Halim, Alevari	Brassicaceae
9	*Litsea glutinosa* Lour	Maida lakdi, Menda	Lauraceae
10	*Oroxylum indicum* Vent	Sauna, Sonpatta, Sonapatha, Arlu	Bignoniaceae
11	*Rauwolfia serpentina* Benth	Sarpgandha	Apocynaceae
12	*Tecomella undulata* Seem	Rakta Rohna	Bignoniaceae
13	*Curculigo orchioides* Gaertn	Kali musli	Amaryllidaceae
14	*Prosopis spicigera* L.	Shami	Mimosaceae

Endangered (EN) :-

S.No	Botanical Name	Vernacular name	Family
1	*Acacia concinna* Dc	Sikakai, Chikakai, Kochi, Ritha	Mimosaceae
2	*Acorus calamus* L	Buch, Ghorbuch, Barja, Gorbach	Araceae
3	. *Adiantum lunulatum* Burm.	Hansraj, Hansiya, Dakul	Polypodiaceae
4	*Aristolochia indica* L.	Ishwarmul	Aristolochiaceae
5	*Buchanania lanzan* Spreng	Char, Chiranji	Anacardiaceae
6	*Chlorophytum tuberosum* Baker	Safe musli	Liliaceae

7	*Clerodendron serratum* Spreng	Bharangi	Verbenaceae
8	*Costus speciosus* Smith	Keo-Kanda	Zingiberaceae
9	*Crinum asiaticum* L.	Amaryllidaceae	Amaryllidaceae
10	*Cymbopogon flexuosus* Hack.	Lemon Grass	Poaceae
11	*Embelia ribes* Burm.	Baibidang, Lamjak, Lamjay, Khavi	Myrsinaceae
12	*Gardenia lucida* Roxb	Deekamali, Kamari, Nadihing	Rubiaceae
13	*Gloriosa superba* L.	Kaliyari, Kolihari, Shankarpushpi, Kalihari	Liliaceae
14	*Gymnema sylvestre* R.Br.	Gurmar, Madhunashini, Ajgandhini	Asclepiadacea e
15	*Hedychium coronarium* Koenig	Gulbakawali	Zingiberaceae
16	*Lasiosiphon eriocephalus* Decne	Ramaitha, Dajdharuha, Ramatta	Thymelaeaceae
17	*Pandanus odoratissimus* Roxb	Ketki, Keura, Keora	Pandanaceae
18	*Passiflora incarnata* L.	Kaurav Pandav, Prempushpi, Shivposh, Ghadiphoo	Passifloraceae
19	*Piper longum* L.	Pipli, Pipari, magham, Peeparmool	Piperaceae
20	*Plumbago zeylanica* L.	Chiutar, Chitrak	Plumbaginaceae
21	*Pterocarpus marsupium* Roxb.	Bija, Paisar, Bijasal	Papilionaceae
22	*Rauwolfia tetraphylla* L	Bada Chandrica	Apocynaceae
23	*Terminalia chebula* Retz	Harra, Harad	Combretacea
24	*Uraria picta* Desv	Pristiparni, Prashnaparni, Pitvan	Papilionaceae
25	*Withania somnifera* Dun.	Ashwagandha, Asgandh, Rasbhari	Solanaceae
26	*Artemisia maritima* Linn	Davana, Kirmala	Asteraceae
27	*Cryptolepsis buchanani* Roem	Nagbel, Karanta	Asclepiadaceae

Vulnerable (VU):-

S.No	Botanical Name	Vernacular name	Family
1	*Abelmoschus moschatus* L.	Kasturi bhindi, Jangli bhindi	Malvaceae
2	*Abrus precatorius* L.	Patha, Ratti, Gunja, Gumchi	Papilionaceae
3	*Adina cordifolia* Hook. f.	Haldu, Karam	Rubiaceae
4	*Alstonia scholaris* Brown	Saptparni, Chhitwan, Satona, Satwan	Apocynaceae
5	*Amorphophallus campanulatus* Blume	Suran Kanda, Ol, Olna	Araceae
6	*Anamirta Cocculus* W. & A.	Kakmari, Jarmeh, Netramal, Huber	Menispermaceae
7	*Andrographis paniculata* Nees	Patthar Neem, Chiretta, Bhuinim	Acanthaceae
8	*Anona reticulata* L	Ramphal, Barhial	Anonaceae
9	*Anthocephalus cadamba* Miq	Kadamba	Rubiaceae
10	*Asparagus racemosus* Willd	Satawar, Satawari, Satmuli,	Liliaceae
11	*Barleria prionitis* L.	Katsariya, Kantaphool	Acanthaceae

12	*Bauhinia vahlii* W. & A.	Mahul	Caesalpiniaceae
13	*Bryonopsis laciniosa* L	Shivlingi	Cucurbitaceae
14	. *Caesalpinia bonducella* Flem.	Katkaranj, Karanjuwa, Gataine	Caesalpiniaceae
15	*Cannabis corniculata* L	Kandamool	Cannabinaceae
16	*Centella asiatica* L	Brahmi, Kotyali, Birhami	Apiaceae
17	*Cinnamomum tamala* Fr. Nees.	Tejpatta, Tejpal, Patraj	Lauraceae
18	*Cissus quadrangularis* L.	Harzor, Harjora, Hadjod	Ampelidaceae
19	*Clitoria ternatea* L.	Aparajita, Koyal, Vishnukanta	Papilionaceae
20	*Convolvulus pluricaulis* Chois	Shankh pushpi	Convolvulaceae
21	*Cordia myxa* L	Lasoda	Boraginaceae
22	*Curcuma angustifolia* Roxb.	Tikhur, Tikari	Zingiberacea e
23	*Curcuma aromatica* Salisb.	Jangli haldi, Vanhaldi	Zingiberacea e
24	*Cyperus scariosus* Br	Nagarmotha	Cyperaceae
25	*Desmodium gangeticum* D.C	Salparni, Galphulli, Acjariya, Serivan	Papilionaceae
26	*Dioscorea bulbifera* L.	Varahikand	Dioscoreaceae
27	*Dioscorea daemona* Roxb	Baichandi	Dioscoreaceae
28	*Eulophia campestris* Wall.	Saalmishri, Salibmisri	Orchidaceae
29	*Ficus glomerata* Roxb	Gular, Paroa, Daduri, Kakmal	Moraceae
30	*Ficus infectoria* Roxb	Pakar, Prarohi	Moraceae
31	*Flemingia chappar* Ham	Gulphulli, Golaphuli	Papilionaceae
32	*Flemingia nana* Roxb	Balraj	Papilionaceae
33	*Fumaria parviflora* Lamk.	Pitpapra, Bag Gajar,	Fumariaceae
34	*Glossogyne pinnatifida* DC	Tejraj	Asteraceae
35	*Grewia hirsuta* Vanb	Gudasakri, Nagbela	Tiliaceae
36	*Hemidesmus indicus* Br.	Anantmool, Kalisar, Kalidudha, Shyamlata, Krishnasariw	Asclepiadaceae
37	*Hymenodictyon excelsum* Wall	Bhawarmaal, Potar, Barita Kanda	Rubiaceae
38	*Hyptis suaveolens* Poit	Bantulsa, Gangatulsi	Labiatae
39	*Ipomoea mauritiana* Lam	Patalkohda, Bhukumda, Badkakanda	Convolvulaceae
40	*Lannea grandis* Roxb.	Gurja	Anacardiaceae
41	*Martynia diandra* Glox.	Baghnakhi	Pedaliaceae
42	*Melia azedarach* L	Bakain	Meliaceae
43	*Mucuna prurita* Hook	Kewach, Kamach, Konch, Khajehra, Kawachhu	Papilionaceae
44	*Murraya koenigii* Spreng.	Gandhela, Meetha Neem, Barsanga	Rutaceae
45	*Nictanthes arbor-tristis* L.	Harsingar, Parijat, Kharsalu	Oleaceae
46	*Operculina turpethum* L.	Nishoth	Convolvulaceae
47	*Oroxylum indicum* Vent	Sauna, Sonpatta, Sonapatha	Bignoniaceae

48	*Pedalium murex* L	Gokharu-bada, Gokara	Pedaliaceae
49	*Picrorhiza kurroa* Benth	Kutki	Scrophulariaceae
50	*Pterospermum acerifolium* Willd.	Kanakchampa, Kathchampa,	Sterculiaceae
51	*Pueraria tuberosa* DC.	Pathal Kohnra, Pathal Bankumra	Papilionaceae
52	*Schleichera trijuga* Willd	Kusum, Kasma	Sapindaceae
53	*Semecarpus anacardium* L.	Bhilawa, Bhilama, Bhelwa	Anacardiaceae
54	*Sida spinosa* L.	Nagbel, Bariar	Malvaceae
55	*Smilax zeylanica* L.	Sherkand, Ramdatoon	Liliaceae
56	*Spilanthes acmella* L	Akarkara, Akalkahra	Asteraceae
57	*Sterculia urens* Roxb.	Kullu, Gulu, Kulli,	Sterculiaceae
58	*Stevia rebaudiana* Bertoni	Mithi buti	Asteraceae
59	*Tectona grandis* L.	Sagon, Sagwan	Verbenaceae
60	*Thalictrum foliolosum* DC.	Mamiri, Piyaranga, Pinjari,	Ranunculaceae
61	*Tinospora cordifolia* Miers	Giloe, Gurach	Menispermaceae
62	*Vitex negundo L.*	Nirgundi, Nigori	Verbenaceae

Near Threatened (NT) :-

S.No	**Botanical Name**	**Vernacular name**	**Family**
1	*Abutilon indicum* G. Don	Kanghi, Kakahi, Kaghai,	Malvaceae
2	*Acacia catechu* Willd	Khair, Kheri, Khadir	Mimosaceae
3	*Amomum subulatum* Roxb.	Bari Ilaichi	Scitaminaceae
4	*Bacopa monnieri* Linn.	Nir Brahmi	Scrophulariaceae
5	*Barleria cristata* Linn	Vajradanti	Acanthacea
6	*Boerhaavia diffusa* L	Punarnava	Nyctaginaceae
7	*Cassia glauca* Lamk	Jamrasi, Kalamuka, Bakra	Caesalpiniaceae
8	*Clerodendron infortunatum* Gaertn	Ghentu, Bhant	Verbenaceae
9	*Cochlospermum religiosum* DC	Kuraya, Gulgal, Kumbi	Cochlospermaceae
10	*Colebrookia oppositifolia* Smith	Kala Bansa	Labiatae
11	*Dalbergia latifolia* Roxb.	Kala Sheesham, Sitsal	Papilionaceae
12	*Dryopteris crenata* Christ	Sarkhas,Kildaru,Vishora	Polypodiaceae
13	*Eclipta alba* Hassk	Bhringraj, Keshraj, Bhangra	Asteraceae
14	*Erythrina indica* Lamk	Pharhada, Dhawal, Dhak	Papilionaceae
15	*Euphorbia neriifolia* L	Sehund	Euphorbiaceae
16	*Ficus hispida* L.	Kathumar, kathgular, Dumar	Moraceae
17	*Garcinia india* L.	Kokam, Pahada, Dancera,	Guttiferaceae
18	*Gmelina arborea* Roxb	Khamhar, Gamari, Gambhar	Verbenaceae
19	*Helicteres isora L.*	Marodphalli, Eaithi	Sterculiaceae
20	*Holarrhena antidysenterica* Wall	Kutaj, Indrayan, Koreya	Apocynaceae
21	*Kaempferia rotunda* L.	Bhui Champa	Zingiberaceae
22	*Leucas cephalotes* Spreng	Dhrodpushpi, Guma, Goma	Labiatae
23	*Mimosa pudica* L.	Lajwanti, Lamjak, Lamjay	Mimosaceae
24	*Mimusops hexandra* Roxb.	Khirni	Sapotaceae
25	*Ougeinia dalbergioides* Benth.	Tinsa, Tinis, Chhadan	Papilionaceae
26	*Oxalis corniculata* L.	Teenpatiya, Changeri, Khatkal	Geraniaceae
27	*Paederia foetida* L	Gandhali	Rubiaceae

28	*Pongamia pinnata* Pierre	Karanj, Kanja	Papilionaceae
29	*Premna integrifolia* L	Arni, Aeran, ganibhari	Verbenaceae
30	*Psoralea corylifolia* DC.	Bakuchi, Bavchi,	Papilionaceae
31	*Randia dumetorum* Lamk.	Mehnar,madan,Menphal	Rubiaceae
32	*Salmalia malabaricum* DC	Semal	Bombacaceae
33	*Solanum indicum* L.	Kanteri Badi, Barhanta	Solanacea
34	*Symplocos racemosa* Roxb.	Lodh	Styraceae
35	*Terminalia arjuna* W. & A	Arjuna	Combretaceae
36	*Terminalia belerica* Roxb	Bahera	Combretaceae
37	*Xanthium strumarium* Linn.	Gokhru, Gokhara,	Asteraceae

Fig. 1 :- THREAT ASSESSMENT OF MEDICINAL PLANTS OF KORIA DISTRICT IN CHHATTISGARH (INDIA)