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STUDY ON THREATENED FLORA OF ACHANAKMAR TIGER RESERVE OF CHHATTISGARH

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ABSTRACT

An endangered species is a population of organisms, at risk of becoming extinct because it is either few in numbers, or threatened by changing environmental or by predation. An endangered species is a species which has been categorized as likely to become extinct. Extinction is the situation when there are no longer any living individuals of a species left. The Achanakmar Tiger Reserve is a biosphere reserve in India that extends across the states of Madhya Pradesh and Chhattisgarh**.** The natural vegetation in the Achanakmar Tiger Reserve varies across the reserve. During the investigation it has been revealed that the forest of Achanakmar Tiger Reserve is very rich in term of plant diversity. As per the floral documentation of Achanakmar Tiger Reserve, 28 species are found under various categories of threats. According to IUCN Red Data List, the species have been categorized as Critically Endangered (CR), Endangered (EN), Vulnerable (VU). The Biosphere Reserve has 1 Critically Endangered, 5 Endangered and 22 Vulnerable plant species. Threatened plant species reported like, Hansraj (*Adiantum capillus veneris),* Climbing fern (*Lygodium flexuosum),* Kalmegh *(Andrographis paniculata),* Tejraj *(Peucedanum nagpurense),* Sarpgandha *(Rauvolfia serpentine)* (CR), *Gurmar (Gymnema sylvestre), Indian trumpet flower (Oroxylum indicum),* etc. for the conservation of these plants the ex situ method was applied and the genetic material is conserved in herbal garden of Dr. C.V.Raman University, Kota Bilaspur, Chhattisgarh.

KEYWORDS: Kota, Bilaspur, Endangered, Threatened, Extinct, Chhattisgarh.

INTRODUCTION

An endangered species is a population of organisms, at risk of becoming extinct because it is either few in numbers, or threatened by changing environmental or by predation.

An endangered species is a species which has been categorized as likely to become extinct. Endangered (EN), as categorized by the International Union for Conservation of Nature (IUCN) Red List, is the second most severe conservation status for wild populations in the IUCN's schema after Critically Endangered (CR) (Wilcove, and Master, 2008). In 2012, the IUCN Red List featured 3079 animal and 2655 plant species as endangered (EN) worldwide. The figures for 1998 were, respectively, 1102 and 1197.Many nations have laws that protect conservation-reliant species: for example, forbidding hunting, restricting land development or creating preserves. Population numbers, trends and species' conservation status can be found in the lists of organisms by population.

According to a recent analysis done by the International Union for Conservation of Nature, one fifth of the earth's plants are threatened with extinction; endangered plants make up 29% of the plant population in the United States alone. The state of Hawaii has earned the status of "endangered species capital of the world" (Shogren and Parkhurst, 2012). To some people, plants are just pretty to look at; however, there are many reasons why plants are necessary for the survival of the planet. Animals, humans, and plants are intertwined. Plants purify the air and water, regulate climate, soak up water from floods, and prevent erosion. They provide people and animals with food, homes, and jobs. It is estimated that 40% of medicines are made from plants, and only 5% of plant species have been explored for medicinal uses (Ishwaran, and Erdelen, 2005).

In India there is wide range of conditions of climate from the arctic to the torrid and India has varied and rich vegetation, in which only a few countries of the equal size possess. India is divided into 8 different regions of floras namely, the Ganges plain, Assam, the eastern Himalayas, Andaman, the western Himalayas, the Indus plain, the Deccan and the Malabar (Ishwaran and Erdelen, 2005).

Chhattisgarh, the 26th state of the country, has ample variation in physical and cultural features. It has about 44% of its total geographical area covered with forests. Chhattisgarh state has almost sub-tropical humid climate, a climate good to support a rich biodiversity. The state has teak, Sal and mixed forests as climax communities. However, only a fragmentary knowledge of biodiversity of the state is there. There are four major forest types, namely Tropical Moist Deciduous, Tropical Dry Deciduous, Tropical Thorn and Subtropical Broadleaf Hill Forests. Forests are largely distributed in the north and in the southern parts of the State. Teak and Sal are the two most important forest formations of the State.

The Achanakmar- Amarkantak Biosphere Reserve is a biosphere reserve in India that extends across the states of Madhya Pradesh and Chhattisgarh**.** The natural vegetation in the Achanakmar-Amarkantak Biosphere Reserve varies across the Reserve. The reserve is quite rich in plant diversity, having a combination of different climatic and edaphic conditions at various altitudes. Almost 1500 plant species representing over 151 plant families can be found in the reserve. Biodiversity is affected by human activity. The consequences of rapid and tremendous industrialization has manifest as pollution. A polluted environment (or even a changed environment) threatens the survival of any species that cannot adapt to it. Already many species have vanished forever. Many others are poised on the brink of extinction. This is because any species that is unable to survive or reproduce in its environment, and unable to move to a new environment where it can do so, becomes extinct.

MATERIALS AND METHODS

Sample Site- The reserve is located in the northern part of Bio-Geographic zone 6 and Bio-Geographic province 6 A (Deccan peninsula and Central highlands). About 68.10% of this reserve lies in the Bilaspur district in Chhattisgarh. The other major portions of the reserve are in the Anuppur (16.20%) and Dindori (15.70%) districts of Madhya Pradesh. The protected area of the Achanakmar Wildlife Sanctuary is located in the Bilaspur district within the Biosphere Reserve. The forest area of the reserve has tropical deciduous vegetation and it can be classified into Northern Tropical Moist Deciduous and Southern Dry Mixed Deciduous forests.

Sample collection- Field and laboratory research is critical for developing a fuller understanding of the life history, demography, habitat requirements, and management needs of rare plant species. However, the need for research must be balanced with the recognition that manipulating rare species in the wild may have negative consequences for population viability. To minimize harm to native populations while encouraging the development of sound protocols and informative field studies, we have developed the following set of guidelines for performing research on rare plants. These step-by-step guidelines are meant to help prospective researchers design studies on rare plants that are both ethically and scientifically sound.

RESULTS AND DISCUSSION

During the investigation it has been revealed that the forest of Achanakmar Tiger Reserve is very rich in term of plant diversity. As per the floral documentation of Achanakmar-

Amarkantak Biosphere reserve (Anon, 2008, 2010), 28 species are found under various categories of threats. According to IUCN Red Data List have been categorized as Critically Endangered (CR), Endangered (EN), Vulnerable (VU). The Biosphere Reserve has 1 Critically Endangered, 5 Endangered and 22 Vulnerable plant species. Threatened plant species reported like, Hansraj (*Adiantum capillus veneris),* Climbing fern (*Lygodium flexuosum),* Kalmegh *(Andrographis paniculata),* Tejraj *(Peucedanum nagpurense),* Sarpgandha *(Rauvolfia serpentine)* (CR), *Gurmar (Gymnema sylvestre), Indian trumpet flower (Oroxylum indicum),* Salai (*Boswellia serrata Roxb.),* Malkangani *(Celastrus paniculata),* Harra *(Terminalia chebula),* Amla *(Phyllanthus emblica),* Bija *(Pterocarpus marsupium Roxb.),* Maida *(Litsea glutinosa),* long peper *(Piper longum),* Chitrak (*Plumbago zeylanica),* Buch *(Acorus calamus),* Ratalu *(Dioscorea bulbifera),* Safed musali *(Chlorophytum tuberosum),* Jungle pyaj *(Drimia indica),* Tikhur *(Curcuma angustifolia roxb.),* Mahua *(Madhuca indica),* Blue fountain bush *(Cleodendrum serratum),* Jungli dhan *(oryza meyeriana mailli),* Kali haldi *(Curcuma caesia),* Flame lily *(Gloriosa superba),* Crepe ginger *(Cheilocostus spaciosus)* [Table]. The above plant species needs to be conserved and for the conservation of these plants the ex situ method was applied and the genetic material is conserved in herbal garden of Dr. C.V. Raman University, Kota Bilaspur, Chhattisgarh.

According to Akhtar and Chauhan (2007), Biosphere Reserves are representative parts of natural and cultural landscapes extending over large area of terrestrial or coastal/marine ecosystems or a combination thereof and representative examples of bio-geographic zones/provinces. Shukla and Singh (2009) recorded the Achanakmar Tiger reserve is located at the junction of hill ranges with topography ranging from high mountains, shallow valleys and plants. Moist deciduous forests constitute 63% of the area. It is very rich in flora. It has nearly 1527 plant species belonging to 799 plant genera from thallophytes, bryophytes, pteridophytes, gymnosperms and Angiosperms About 68.10% out of the total area of this reserve lies in the Bilaspur district of Chhattisgarh. The sanctuary has a total geographical area of 551.15 sq.km.

Table: Threatened flora reported from Achanakmar Tiger Reserve.

S.No.	Name of species	Common name	Family	Category
1	*Adiantum capilus veneris*	Hansraj	Adiantaceae	EN
2	*Lygodium flexuosum (L.)*	-	Lygodiaceae	EN
3	*Andrographis paniculata*	Kalmegh	Acanthaceae	VU
4	*Peucedanum nagpuranse Prain*	Tejraj	Apiaceae	VU
5	*Rauvolfia serpentine (L.)*	Sarpgandha	Apocynaceae	CR
6	*Gymnema sylvestre*	Gurmar	Asclepiadaceae	VU
7	*Oroxylum indicum*	sheonag	Bignoniaceae	VU
8	*Boswellia serrata Roxb.*	Salai	Burseraceae	VU
9	*Cellastrus paniculata*	Malkangni	Celastraceae	VU
10	*Terminalia chebula Retz.*	Harra	Combretaceae	VU
11	*Phyllanthus emblica*	Amla	Euphorbiaceae	VU
12	*Pterocarpus marsupium*	Bija	Fabaceae	VU
13	*Litsea glutinosa*	Maida	Lauraceae	VU
14	*Piper longum*	Long pepper	Piperaceae	VU
15	*Plumbago zylanica*	Chitrak	plumbaginaceae	VU
16	*Acorus calamus*	Buch	Araceae	EN
17	*Dioscorea bulbifera L.*	Ratalu	Dioscoriaceae	VU
18	*Chlorophytum tuberosum*	Safed musali	Liliaceae	VU
19	*Drimia indica*	Jangli pyaj	Liliaceae	VU
20	*Curcuma angustifolia Roxb.*	Tikhur	Zingiberaceae	VU
21	*Madhuca indica*	Mahua	Sapotaceae	EN
22	*Eulophia herbacea*	-	Orchidaceae	VU
23	*Cleodendrum serratum*	Blue fountain bush	Lamiaceae	EN
24	*Oryza meyeriana mailli*	Jungli dhan	Poaceae	VU
25	*Curcuma caesia*	Kali haldi	Zingiberaceae	VU
26	*Gloriosa superba*	Flame lily	Liliaceae	VU
27	*Cheilocostus speciosus*	Crepe ginger	zingiberaceae	VU
28	*Dioscorea hispida*	-	Dioscoreaceae	VU

[VU= *Vulnerable, EN= *Endagered, CR= *Critically Endangered]

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