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OVER EXPLOITATION OF MEDICINAL PLANTS A SET BACK TO GENE POOL

M.SILAR MOHAMMED* AND B.VINAY KUMAR,

DEPARTMENT OF BOTANY, OSMANIA UG & PG COLLEGE (AUTONOMOUS) KURNOOL, A.P.

ABSTRACT

Medicinal plants are the chief source of active compounds for drugs to cure diseases of human beings and his live stock. Presence of these plants in abundance in an area is a gift from god for positive approaches in the preparation of medicine and maintenance of plant diversity. It is the responsibility of all in general and scientists in particular to save the population of these plants by conservational measures when these are subjected to threat of higher level and over exploitation by people for their selfish needs .It is practically observed in Kurnool district at Mahanandi that the two medicinal plants are being exploited by people living near vicinity of the forest. Hence there is an urgent need to educate, to conserve, and to maintain the gene pool before being lost and becomes the threatened category.

Keywords:-over exploitation, medicinal plants, conservation gene pool

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INTRODUCTION

Mahanandi which is 150 kilometers from Kurnool, the famous pilgrimage centre in south India is a catchment area of Nallamalais (Eastern Ghats) in Andhra Pradesh. It is situated between longitude of 78˚-28′ - 76˚ - 58′ E and latitude of 14˚-54′-16˚-14′ N, comes under Nandyal division. It consist of a dry deciduous forest, a treasure trove of medicinal plants .During surveys , field trips and explorations since 5 years, it is observed that the tubers of *Dioscorea hispida* Dennst. Collected by tribal's in great numbers are found in their huts made the authors to astonish and worried. In connection with this the following steps are taken for its conservation, propagation and maintenance of gene pool for future generations

MATERIAL AND METHODS

The two target medicinal plants were collected and their photographs were taken, herbarium mount boards were prepared, following the method of Jain and Rao and deposited in Osmania College {Autonomous} Herbarium Kurnool A, P.India. Data of the two species was recorded year after year for five years period and observations were noted particularly in the months of September and October .These plants are identified with the help of Flora of A.p India and Flora of Kurnool district A.P respectively and further confirmed in consultation with the expert Taxonomists.

DISCUSSION

Of the two important target plants observed, the Dioscorea hispida Dennst. (*Syn.D.daemona Rob*.) Tel ; Magasiri gaddalu occurs in Sikkim, The Himalayas and Khasi Hills, is one that is being exploited by the residents of gudem at Mahanandi of Kurnool District AP, for food and medicine . The genus Dioscorea is represented in Andhra Pradesh with its ten species. Almost all of them are climbers or vines, propagate vegetatively by tubers namely, *D.pentaphylla, D. oppositifolia, D. tomentosa, D. esculenta, D. bulbifera, D. pubera D.hamiltonii, and D.belophylla .D. wallichi* is a widely cultivated species. Of these D. *oppositifolia, D. pentaphylla, D.bulbifera are* occasional in occurrence in all districts of Andhra Pradesh. Rests of the others are of a little known category. The status of *D.hispida* Dennst is becoming worst due to it's over exploitation and because of its medicinal properties. The tubers contain 82 to 83 % carbohydrates, 8 to 9% albuminoids, though the toxic principle is dioscorine which is distributed throughout the plant, the raw tubers due to the presence of furanoid, norditerpenes (They lose their bitterness on roasting and are then eaten) posses hunger suppressing property. The tubers of different species with a little variation are chiefly used externally for reducing swellings .It is important to note that *D. deltoidea* Wall ex Griseb, Syn. D.nepalensis Sweet ex Bernardi due to its over exploitation in Sikkim has became a vulnerable category, to avoid the same condition for *Dioscorea hispida* Dennst.precautions should be taken in advance to conserve it before becoming a vulnerable category if Causal factors continues.

Another very important plant worthy to mention is *Mucuna pruriens* Baker non Dc. Tel; Duladamma of fabaceae present throughout India including Andaman and Nicobar Islands which is generally of occasional occurrence in the forest of many districts in Andhra Pradesh, is seen in abundance at Mahanandi forest. Based on the habitat, shape of leaflets colour of pod, seeds etc six wild species are recorded in Andhra Pradesh. They *are M. atropurpurea, M.monosperma, M. nigricans, M. gigantea, M. hirsuta, M.pruriens .M. cochinchinensis* is cultivated in Bengal and Bihar for edible pods and seeds and it is known as Lyon Bean.*Mucuna pruriens var pruriens* (L.) DC. is pantropic in distribution. The other varieties are var. hirsuta (Wight & Arnold), var thekkadensis (Thoth & Ravi) which are endemic to southern Western Ghats and var. utilis (Wall ex Wight) Bak ex Burck. is a cultivable one.

The reason for over exploitation of this plant is due to its itching property because of the presence of bristles, on leaves and fruits. To avoid nuisance people set ablaze these plants. Due to its high medicinal value pharmaceutical companies through tribal's procure seeds which contain alkaloids , mucunine, mucanadine, mucanadinine, prurieninine pruriendine and nicotine besides beta sistoterol, gluthione, lecithin vernolicand, Gallic acid. They contain a number of bioactive compounds including tryptamine alkylamines, steroids, flavonoids, coumarins and, cardenolides. L-DOPA is present in the seeds as well as in stem, leaves and roots. The major constituents of the hair on the pod are amines, such as 5-hydroxytryptamine and a proteolytic enzyme mucuanain. As the seeds are astringent, nervine tonic, local stimulant used in impotence , urinary troubles ,spermatorrhoea, leucorrhoea, traditionally used for male virility and also used in depressive neurosis. Hair on fruit is a good vermifuge.pods anthelmentic. Root and fruit spasmolytic and hypoglycaemic.The pod yielded L-DOPA (0.06g) is anti- Parkinson. Only cured seeds and decoction of seeds (3g) is the adequate dosage. Seeds in paralytic agitants and roots in vaginal laxity are recommended by the Ayurvedic Pharmacopeia of India

There is a considerable reduction in the population of the species of *D. hispida* Dennst, which leads to the loss of genotypes and its elimination. Gene erosion occurs much earlier than total extinction of a species. Therefore loss of genotypes is in fact a matter of concern with respect to conservation of these species .For reducing the loss of genotypes documentation of genotypes of the two species is the right step to be followed. Variations with respect to tubers, leaflets,

inflorescence, flower, pod, seed colour etc were evident with respect to the accession of the species collected during field trips. The study on inter-specific variations of *D. hispida Dennst* and intra-varietal variations of *M. pruriens Baker Non DC.* Has provided new insights leading to identification of their potential genotypes and their unique characters, which in turn can augment conservation.

As a precaution to conserve its population and to maintain the gene pool of these medicinal plants, the germplasm of it should be collected through vegetative, reproductive parts and the gene bank be maintained. The biotechnological methods should be adopted for its conservation , along with its vegetative propagation in the centers for conservation of threatened category plants Botanical Gardens maintained by institutes and universities which are funded by MOEF, BSI, DST, DBT,UGC etc. The tribal's be educated with the importance and significance of these medicinal plants. To overcome the problem of over – exploitation the tribal's may be appointed as guides or helpers and temporary forest watchers as an alternative for their lively hood. Permission may be granted by forest personnel to procure forest products such as Gum, Honey etc and the same be purchased at shops such as girijan cooperative societies maintained by the government for the welfare of the tribal's which is an indirect conservational measure to avoid exploitation of these little known category of plants

CONCLUSION

Thus it is necessary to conserve these plants to maintain the gene pool by germ plasm, gene bank establishment by cryogenic method which plays an important role in gene transfer, protoplast fusion etc in case of emergency at the time of sudden spread of dangerous diseases and to check heavy loss of crops. Further it is also important to stop exploitation before the species becomes a threatened category which leads to gene erosion or genotype loss.

1.Dioscorea hispida Dennst . tubers

Figure 1
Dioscorea hispida

2 Mucuna pruriens var , pruriens (L.) DC.

Figure 2
Mucuna Pruriens

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