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THREATENED PLANTS OF JAMMU AND KASHMIR, AND CONSERVATION STRATEGIES

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ABSTRACT

Extinction and species-introduction are two major biodiversity crises of the current millennium. A species may become endangered and eventually extinct when death rate exceeds birth for a prolonged duration. The reasons may be natural or anthropogenic. Now-a-days the anthropogenic activities are prominent and causing extinction of many plant species of ecological and economic significance. Many species are facing tremendous pressure and are on the verge of extinction in Jammu and Kashmir, one of the global biodiversity hotspots in the world. In the present paper, an attempt has been made to document the threatened plants of the Jammu and Kashmir the number of which has increased in the past few decades.

KEYWORDS: Extinction, Species, Threatened, Flora

The State of Jammu and Kashmir has been regarded as a 'Heaven on Earth', and is also called the 'Bio-mass state of India'. This area, located in the far north of the Indian republic, is a mountainous zone in the north-west Himalayas that shares international boundaries with Pakistan in the west, Chinese autonomous region of Xinjiang in the north and Tibet in the north-east. It has three main territoriesJammu,Kashmir andLadakhthat differ in terms of climate, physiography, ethnic groups and culture. All the three regions experience different climatic patterns. Cold desert-like conditions prevail in Ladakh, and alpine, temperate and sub-tropical types in the rest of the state. The state is rich in the cultural diversity of the people, as well as diversity of flora and fauna in the forest areas, and domesticated species outside the forest. Plant diversity is the life support of almost all terrestrial eco-systems, with both humans and animals being entirely dependent on plants directly or indirectly. The state of Jammu and Kashmir has a fairly rich diversity of plant life, the area is a storehouse of medicinal and aromatic plants, which are used in pharmaceutical and perfume industries (Ved *et al.,* 2003).

Many factors, both natural and man-made, have been responsible for extinction of species. It is well known that several plant species have become extinct due to certain natural phenomena, of the many causes threatening species, the disappearance of wild habitats is the most important overall. (Mc Carthy *et al.,* 2012). But for many species, rampant trade and introductions of non-native species are the primary causes. Pollution, pesticides and other toxic chemicals, thinning of the ozone layer and other environmental problems play roles as well. For some species,several of these factors contribute to their decline.Normally for a species the processes involved in its evolution, spread and finally extinction are very slow. While such natural processes in the past had no doubt led to the extinction of species, they had also contributed to the evolution and speciation of plants. Anthropogenic factors, on the other hand, have accelerated rarity and extinction of plants species to a level where the very existence of the eco-system is threatened (Table 1).

Factors Responsible For Extinction of Species

Habitat loss and Degradation

Habitat loss is the primary cause of species loss at local, regional and global scales. Urban development, over drafting of groundwater, road building, recreation, forest fires, agriculture and tree logging all destroy and degrade plant's natural habitats.

Introductions of Invasive Alien Species (IAS)

Aliens are not science fiction, but a nature conservation fact. An "alien" is any species that is moved by humans to an area outside of its native range. In many cases, these species will not survive because they are not adapted to the new area. Nevertheless, in a minority of cases, a species will be able to survive in its new location and sometimes will even thrive in a new location. "Invasive" species are those that spread quickly to become very common and dominant in the new habitat, posing a great threat to native species.

Pollution and Disease

Pollution is the release of chemical, physical, biological or radioactive contaminants in the environment. It is sometimes not visible to the naked eye

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and can disperse through air, water and other mediums into which it is emitted. As a result, its direct effects, especially on plant life, can sometimes be hard to spot. At the very least contamination will cause reduced plant production and ecosystems become more vulnerable to other threats.

Climate change

More recently, the plants are facing an unequivocal warming of the climate. According to the studies more than half of the plant species assessed could be vulnerable or threatened by 2080. The impact of climaticchanges on floral diversity – such as changes in the distribution of species, flowering times etc. are forecast to be most pronounced in Himalayan regions. Climate change poses an enormous challenge to the conservation and management of the plant species and habitats.

Strategies for Conservation of Threatened Plants

Conservation of plant biodiversity is an integral part of biodiversity conservation and is a need of the hour (Troyer *et al.,* 2015). The conservation of the threatened species can be tackled by scientific techniques as well as social actions.Conservation strategies broadly involve two approaches, namely, in situand *ex situ*, based on the site of implementation. *In situ* conservation is the management of species within their natural ecosystems and habitats. This is traditionally used or mostly used traditional conservation approach in case of wild species. However, it is now recognized that *ex situ* techniques can be efficiently used to complement *in situ* methods, and they may represent the only option for conserving certain highly endangered and rare species. The different *ex situ* conservation approaches are Field Gene bank, Seed Gene bank, *in vitro* gene bank, Cryo-Gene bank, Pollen bank and DNA Bank. With widespread awareness on conservation of plant biodiversity in recent days, many organizations have started working towards conservation and management of endemic and threatened plant species. (Hilton, 2012).

Table 2: Threatened Plants of Jammu & Kashmir

Family	Scientific Name	RDB Status
Aceraceae	*Acer caesium*Wall. ex Brandis	Vulnerable
Alliaceae	*Allium stracheyi* Baker	Vulnerable
Asteraceae	*Chondrilla setulosa* C.B.Clarke ex Hook.f.	Rare
	*Inula racemosa*Hook.F	Vulnerable
	*Saussurea bracteata*D.C	Rare
	Saussurea costus(Falic.) Lipsch	Endangered
Berberidaceae	*Berberis huegeliana* Schneider	Indeterminate
	*Berberis kashmiriana*L.	Rare
Caryophyllaceae	*Silene kunawarensis* Benth. in Royle,	Rare
Dioscoreaceae	*Dioscorea deltoidea*Wall. ex griseb	Vulnerable
Fabaceae	*Hedysarum astragaloides* Benth. ex Baker	Rare
	Hedysarum cachemirianum Benth. ex Baker	Rare
	Hedysarum microcalyx Baker in Hook.	Vulnerable
Liliaceae	*Eremurus himalaicus* Baker	Rare
	Lloydia himalensis Royle	Rare

Orchidaceae	Cyprip*edium cordigerum* (D.Don)	Rare
	Neottia inayatii (Duthie) Schltr	Rare
Papaveraceae	*Meconopsis latifolia* (Prain)	Vulnerable
Poaceae	*Puccinellia kashmiriana* Bor.	Rare
Ranunculaceae	*Aconitum deinorrhizum* Stapf.	Vulnerable
	Delphinium uncinatum Hook.f. & Thoms	Vulnerable
Rubiaceae	*Rubia himalayensis* Klotzsch	Vulnerable
Scrophulariaceae	*Picrorhiza kurrooa* Royle ex Benth	Vulnerable

CONCLUSIONS

As the time goes by, intervention of the man with nature is increasing. The uncontrollable increase in population which demands the space and other needs is aggravating this problem. On the other hand increased pollution, natural calamities etc. bringing threat to biodiversity and causing endangerment to several wild species which are also useful. Endemic and threatened plant species are a vital component of plant biodiversity which require immediate human intervention to ensure their long-term survival (Anonymous, 2010). As the part of biosphere, it is our responsibility to protect its diversity which in turn helps us to be benefited from them and sustain on this earth.

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