THREATENED NATIVE PLANTS OF DIR KOHISTAN VALLEY, KHYBER PUKHTUNKHWA, PAKISTAN

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Abstract

This study was carried out to document the conservation status a "red data book" and to determine the threatened status of native plants of Dir Kohistan. Regular study trips were undertaken during 2008-2011. During this study, the exotic plants, weeds and naturalized species were not taken into consideration. The main focus was given to the native species. According to personal observation, 84 species were assessed is threatened plants and out of them 32 species were critically endangered in the study area, while 25 species were as endangered plants, 14 species belonged to vulnerable and 13 species were infrequent.

Introduction

The forests are amongst the most important natural recourses to sustain life in both Hindukush and Himalayan ranges (Ali *et al*, 2010). The role of these forests lies in the maintenance of biodiversity, watershed protection as well as in the supply of timber, non-wood forest products, grazing land for domestic animals, habitat for threatened fauna and flora (Khan *et al*, 2010).

Due to climate, District Dir Hindukush range embodied a diverse and characteristics vegetation distribution over a wide range of topographical variation (Ahmed *et al* 2009; Ali *et al* 2010). These varieties of forests were distributed in moist and dry parts of the valley. The areas have sub-tropical dry temperate forest and form altitudinal belt extended from around 975m to 6000 m elevation above sea level and is of immense significance for the environmental conservation and sustainable development viewpoint. District Dir has a ridge mountain and a number of valley. The variable topography of the area supports luxuriant vegetation ranging from sub-tropical to alpine (Ali *et al*, 2010).

Plants constitute major life sustaining system. It forms the earth as a soft green protection layer. It controls the atmosphere, preserve hydrological cycle, feed the animals and provide raw materials for pharmaceutical and scientific purposes. It has been estimated that out of total plant species present world wide as many as 60,000 plant species may become extinct by the year 2050.The destruction crisis is a threat to mankind and the survival of Homo sapiens is dependent upon the survival of rest of the species (Dyke, 2003). The rainforest washing a rich biological diversity has been disappearing at the rate of 50 acres per minute. It has been estimated that with the disappearance of one plant, some 30 abnormal species also vanished (Krishnamurthy, 2003). According to Nasir *et al* (1995), the majority of our native plants have never been examined for food and medicine, while many have potential sources for pharmaceutical companies as raw materials. District Dir Kohistan (DDK), which is a part of Malakand division, Khyber Pukhtunkhwa (KPK), Pakistan. The area is located between 34º 10 N latitude and 72º 20 E longitude in sub-tropical dry temperate part of Hindukush range. However, some parts of the area also lie in the moist temperate areas of the country (Khan *et al*., 2010). Geographically, the area is surrounded by Swat in the East, the Bajur agency and Afghanistan in the West, District Dir lower in the south, while Chitral in the North. The Dir Kohistan area is situated in the north east of Dir Upper which is bounded by the Hindu Raj on the north and the north west by the Torwal and Gabral range in the east. Dodbah Sar ghar and Batarai ghar located towards the south and south-west, respectively. District Dir upper (DDU) is one of the 24 districts of KPK province covers an area of 3,699 sqkm^2. Kohistan valley starts with its gate way called "Khawgo Ooba" and extend to up to Kumrat about 120 km. However, according to forest division the area of Dir Kohistan comprised of 645 square miles. Out of this, the area of 1, 40351 acres is covered with coniferous forests. These forests in the form of woodlots are located close to one another.

Materials and Methods

During 2008-2011, different exploratory trips were carried out to explore different collection sight. Subsequently, the sight was explored for maximum collection of plants. A total of 84 plants were documented as threatened (Table 1), were photographed and collected. The plants were identified with the help of available literatures Flora of Pakistan and experts. The specimen were pressed by using standard preservation procedures (Stewart, 1972), (Nasir & Ali, 1970-89), Ali & Qaiser, (1986).

Results and Discussion

In this survey, all the threatened plants were categorized on the basis of their habit as trees, shrubs, and under-shrubs, woody climbers, herbaceous climbers and herbs.

After this survey, we came to the conclusion that 84 species were assessed as threatened plants. Among them, some species were critically endangered, while some were endangered, others were vulnerable and infrequent species were recorded for the fist time from this research area.

It was recommended that in the name of clearing of wilderness or cleanliness drived bulldozing, cutting, burning of wild plants should be stopped forthwith to save some of the remaining representative of plant species of Kohistan, so as to preserve the bio-diversity and the gene pools for the benefits of the coming generation.

Table 1. Showing list of Threatened tree species of Dir Kohistan, Valley

#	Botanical Name	Family	Conservation status			
			1	2	3	4
1	*Hypericum perforatum* L.	Hypericaceae	-	-	+	-
2	*Hypericum dyeri* Rehder	Hypericaceae	-	+	-	-
3	*Caesalpinia decapetala (Roth) Alston*	Caesalpiniaceae	+	-	-	-
4	*Acacia modesta*	Mimosaceae	-	-	-	-
5	*Crataegus songarica* G. Koch.	Rosaceae	+	-	-	-
6	*Prunus prostrata* Labill.	Rosaceae	+	-	-	
7	*Parrotiopsis jacquemontiana* (Dcne.)	Hamamelidaceae	-	-	-	+
8	*Bunium persicum* (Boiss.) Fedtsch.	Apiaceae	-	+	-	-
9	*Carum carvi* L.	Rosaceae	-	-	+	-
10	*Trachyspermum ammi* (L.) Sprague	Rosaceae	-	-	-	+
11	*Berberis lyceum*	Berberidaceae	-	-	-	+
12	*Dioscorea deltoidea* Wall. ex Kunth	Dioscoraceae	+	-	-	-
13	*Dioscorea melanophyma* Burkill & Prain	Dioscoraceae	+	-	-	-
14	*Podophyllum emodi* Wall. Ex Royle	Podophyllaceae	-	+	-	-
15	*Pupalia lappacea* (L.) Juss.	Amaranthaceae	-	-	+	-
16	*Aesculus indica* (Wall. ex Camb.) Hk. f.	Hippocastanaceae	+	-	-	-
17	*Acer caesium* Wall. ex Brandis	Aceraceae	+	-	-	-
18	*Acer cappadocicum* Gled.	Aceraceae	+	-	-	-
19	*Betula utilis* D. Don.	Betulaceae	+	-	-	-
20	*Indigofera heterantha* Wall. ex Brandis	Papilionaceae	-	-	-	+
21	*Lathyrus laevigatus*	Papilionaceae	-	+	-	-
22	*Valeriana jatamansi* Jones	Valerianaceae	+	-	-	-
23	*Valeriana himalayana* Grub.	Valerianaceae	+	-	-	-
24	*Quercus baloot* Griffth.	Fagaceae	-	+	-	-
25	*Quercus dilatata* Royle	Fagaceae	-	+	-	-
26	*Quercus glauca* Thunb.	Fagaceae	-	-	+	-
27	*Quercus incana* Roxb.	Fagaceae	-	-	-	+
28	*Quercus semecarpifolia* Sm.	Fagaceae	+	-	-	-
29	*Bergenia stracheyi* (Hk.f. & Thoms.) Engl.	Saxifragaceae	-	+	-	-
30	*Acorus calamus* L.	Araceae	+	-	-	-
31	*Paeonia emodi* Wall. ex Royle	Paeoniaceae	+	-	-	-
32	*Ilex dipyrena* Wall.	Aquifoliaceae	+	-	-	-
33	*Skimmia laureola* (DC.) Sieb. & Zucc. Ex Walp.	Rutaceae	-	+	-	-
34	*Ampelopsis vitifolia* (Boiss.) Planch.	Vitaceae	-	-	-	+
35	*Trachelospermum lucidum* (D. Don) Schum	Apocynaceae	-	-	-	+
36	*Geranium wallichianum* D. Don ex Sweet	Geraniaceae	-	-	+	-
37	*Rhus punjabensis* J. L. Stewart ex Brandis	Anacardiaceae	-	+	-	-
38	*Rhus lancea* L. f.	Anacardiaceae	-	+	-	-
39	*Primula denticulata* Sm.	Primulaceae	-	+	-	-
40	*Primula rosea* Royle	Primulaceae	-	+	-	-
41	*Cortusa brotheri* Pax ex Lipsky	Primulaceae	-	-	+	-
42	*Atropa acuminata* Royle ex Miers	Solanaceae	+	-	-	-
43	*Datura fastuosa* L.	Solanaceae	-	-	+	-
44	*Withania coagulans* (Stocks) Dunal	Solanaceae	+	-	-	-

#	Botanical Name	Family	Conservation status			
			1	**2**	**3**	**4**
46	*Hyoscymus insanus* Stocks	Solanaceae	-	+	-	-
47	*Hyoscymus niger* L.	Solanaceae	+	-	-	-
48	*Solanum rostratum* Dunal	Solanaceae	+	-	-	-
49	*Ulmus villosa* Brandis ex Gamble	Ulmaceae	+	-	-	-
50	*Ulmus wallichiana* Planch.	Ulmaceae	+	-	-	-
51	*Celtis tetrandra* Roxb.	Ulmaceae	-	+	-	-
52	*Lindelofia stylosa* (Kar. & Kir.) Brand	Boraginaceae	-	+	-	-
53	*Lindelofia longiflora* (Bth.) Baill.	Boraginaceae	-	+	-	-
54	*Cynoglossum glochidiatum* Wall. Ex Bth.	Boraginaceae	-	-	+	-
55	*Onosma hispida* Wall. ex G. Don	Boraginaceae	-	-	-	+
56	*Onosma khyberianum* I. M. Johnston	Boraginaceae	-	-	+	
57	*Salvia nubicola* Wall. ex Sweet	Lamiaceae	+	-	-	-
58	*Thymus linearis* Bth.	Lamiaceae	-	+		-
59	*Salvia hians* Royle ex Bth.	Lamiaceae	-	+		-
60	*Phlomis spectabilis* Falc. ex Bth.	Lamiaceae	-	-	+	-
61	*Phlomis bracteosa* Royle ex Bth.	Lamiaceae	-	+	-	-
62	*Nepeta laevigata* (D. Don) Hand.-Mazz.	Lamiaceae	-	-	+	-
63	*Nepeta erecta* (Royle ex Bth.) Bth.	Lamiaceae	-	+	-	-
64	*Aconitum chasmanthum* Stapf ex Holmes	Ranunculaceae	+	-	-	-
65	*Aconitum heterophyllum* Wall. Ex Royle	Ranunculaceae	+	-	-	-
66	*Aconitum violaceum* Jacq. ex Stapf	Ranunculaceae	+	-	-	-
67	*Aquilegia nivalis* Falc. ex Baker	Ranunculaceae	-	-	+	-
68	*Aquilegia fragrans* Bth	Ranunculaceae	-	-	-	+
69	*Aquilegia pubiflora* Wall. ex Royle	Ranunculaceae	-	-	-	+
70	*Delpinium nordhagenii* Wendelbo	Ranunculaceae	-	+	-	-
71	*Gentianodes kurroo* (Royle) Omer, Ali & Qaiser	Gentianaceae	+	-	-	-
72	*Rheum webbianum* Royle	Polygonaceae	+	-	-	-
73	*Populus ciliata* Wall. ex Royle	Salicaceae	-		-	+
74	*Artemisia vulgaris* L.	Asteraceae	-	+	-	-
75	*Achillea millefolium* L.	Asteraceae	-	-	+	-
76	*Taxus fuana*	Taxaceae	+	-	-	-
77	*Juniperus communis* L.	Cupressaceae	-	-	+	-
78	*Pinus gerardiana*	Pinaceae	-	-	-	+
79	*Mallotus philippensis*	Euphorbiaceae	-	+	-	-
80	*Andrachne cordifolia*	Euphorbiacea	+	-	-	-
81	*Asparagus officinalis* L.	Liliaceae	+	-	-	-
82	*Polygonatum multiflorum* (L.) All.	Liliaceae	-	+	-	-
83	*Polygonatum verticillatum* All.	Liliaceae	-	-	-	+
84	*Myrsine africana* L.	Myrsinaceae	+	-	-	-
		Total:	32	25	14	13

Legend: 1. Critically endangered 2. Endangered 3. Vulnerable 4. Infrequent

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