



## Ethnomedicinal heterogeneity and associated threat status in Karnah Valley forests of Kashmir Himalayas

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### Abstract

Investigations were carried out to access the heterogeneity of medicinal plants in the remote tehsil (Karnah) of border district Kupwara of Jammu & Kashmir Union territory. Onsite study reveals that 70 medicinal plant species belonging to 43 families and 61 genera were used by the local people as remedy to various ailments. Herbal healers (Hakeems) were the most knowledgeable persons for prescribing traditional medicines prepared from these medicinal plants in different forms followed by the old age persons. Various plant parts mostly of herbs and shrubs like roots, inflorescence, barks, juices, leaves, seeds and other extracts are used to treat different health disorders in humans and various livestock animals as well. Among the observed varieties, many species i.e almost (26%) seemed to be in danger either due to the excessive use by applying nonprofessional way of collecting and handling plants for income generation purposes or destruction of the habitat by various natural and anthropogenic ways. Assimilated knowledge during this work will be beneficial for the protection and conservation of this green gold keeping the future perspective in mind.

**Keywords:** ethnomedicine, North West Himalayas, herbal plants, kupwara, karnah

### 1. Introduction

Traditional medicinal knowledge and practices is known to all since human civilizations existed. Indigenous knowledge about medicinal plants only refers to health practices, knowledge and beliefs involving plant-based remedies, manual, techniques and exercise, applied singly or in combination to diagnose, treat and prevent illness or maintain well-being. Continuation of this knowledge is endangered when transmission between the older and younger is no longer connected (Kargioglu *et al.*, 2008). However this knowledge kept flowing from time to time with the help of many ancient scriptures, literatures and also by orally transmitting into the offsprings by the ancient people. Proof for that can be traced from many ancient scriptures and literatures. For example ancient texts like Rig veda (4500-1600 B.C) and Athar veda mention the use of many plants as medicines. Books on Ayurvedic medicine such as Chakra samhita and Susruta samhita refer to the use of more than 700 herbs (Jain; 1968). Quran also describes many herbs used as medicines during the era of different prophets. Similarly Unani system was brought to the sub-continent by various muslim scholars and practiced it for centuries. It benefitted from the Ayun system of medicine, which was an important component of Hindu civilization. The materia medica of these system contains a rich heritage of indigenous herbal practices that have helped to sustain the health of most rural people of sub-continent as a whole and India in particular.

In the present scenario 80% of world population strongly believe in this traditional healthcare medicinal systems (Owolabi *et al.*, 2007) and similar numbers also exist for India as well. Advancements in the study and research on plant sciences also lead to a tremendous increase in the use

of plant based health products in all the developing nations. The demand for medicinal plant based raw materials is growing at the rate of 20-25% annually, and according to an estimate of World Health Organisation (WHO) the demand for the ethno medicinal plants is likely to increase more than US \$ 5 trillion in 2050 (Sharma, A.B., 2010). India is also a home to significantly higher number of medicinal plant resources. Over 7500 species of plants are estimated to be used by around 5000 ethnic communities for human and veterinary health across the nation (Baba *et al.*, 2012). With thousands of drug manufacturing units, medicinal plant related trade is estimated to be approximately US \$ 1 billion per year (Joshi *et al.*, 2009).

The Jammu & Kashmir which forms the crown of India possesses the great altitudinal variation in the North western Himalayas with diverse geological formation and different climate zones *viz*; subtropical, temperate and cold arid revealing the diversity in its flora and fauna. Kupwara district of Jammu & Kashmir is considered as the richest one as far as medicinal plant diversity in wild form is considered. District comprises of 16 tehsils. Major section of population being directly or indirectly linked with agricultural activities. Major tourist attractions include Bangus (virgin valley), Lolab (Land of love and beauty), Kalaroos (Gateway to Russia through caves) and Teetwal at line of Control (LOC). Topography of Karnah tehsil has continuous isolated hilly terrains on all sides in between which lie two deep gorge shaped valleys. First valley has villages Baghbella, Tangdar, Loontha, Kandi, Dildar, Bhatpora, Chamkote, Bhaderkote, Dringla, Teetwal and second valley has villages Gabra, Hajitra, Satpora, Tadd, Bandi etc. At the foot of these hilly terrains lies the agricultural lands. These hilly terrains and slopes at

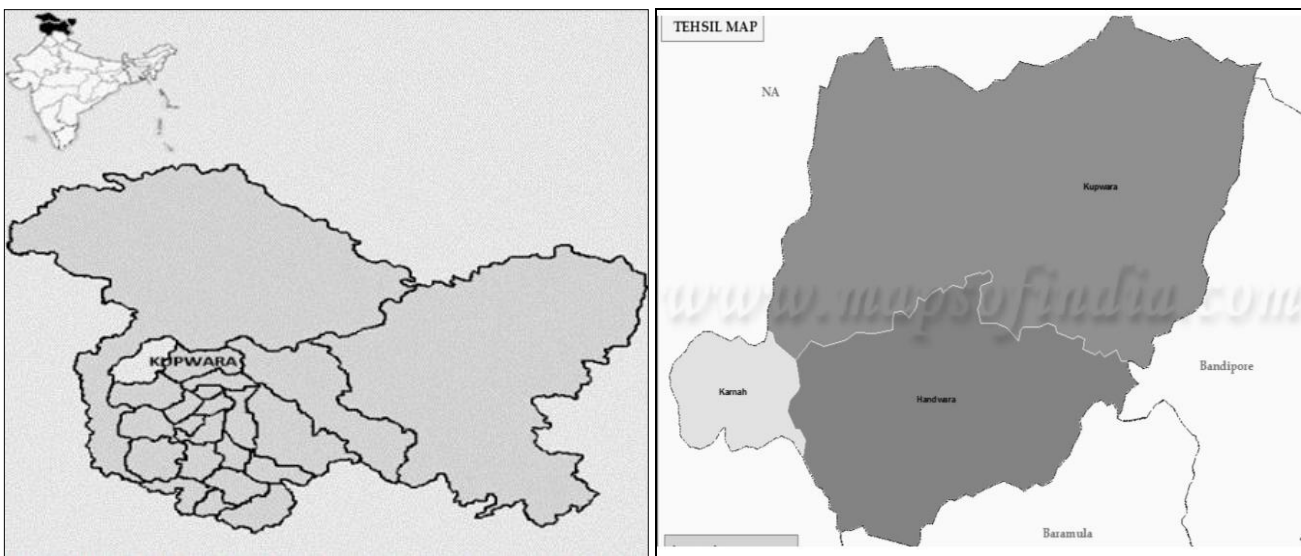
variational altitudes has dense plantation cover which includes different varieties of wild herbal plants and animal species and 70-80% of the population depends on these traditional medicines for healthcare (Pie and Manandhar, 1987).

Scientific exploration of traditional uses of these herbal plants, their proper handling and protection of species under stress or any type of threat is the need of the hour. As no data is available solely for the medicinal plants of this rich area, hence documentation and ethnobotanical exploration was carried out which will be helpful to the local people, people of industry, students and researchers in near future to come.

### Materials and Methods

**Description of Study Area:** “Tangdar” tehsil headquarter of subdivision Karnah valley is located almost 80 kilometres from district headquarter Kupwara (Figure 1). Comprising of 42

Villages and expected population of almost 65,000. The total area of Karnah valley is 16 sq. kms on this side of LOC excluding forest areas and Dhoks. It lies in the North West corner of Kashmir valley in between mountain ranges of Nanga parbat and Qazinag. It is a small deep valley between Shamasbari and Kranu series of mountains. Snowy peaks on high mountains, lush green forests and scattered habitations presents full natural splendor. Majority of population comprises of brave, courageous and tough pahari people followed by Gujar tribes and kashmiri speaking ethnic groups. Languages spoken are Pahari, Gojri and Kashmiri. Famous tourist destinations of the valley are Sadna Top (10,300 feet above sea level), Dana and Teetwal area. The area of the valley has moist temperate forests, alpine pastures, scrubs which are sub alpine and high peaks. During winters the valley usually remains cut from the rest of the Kashmir and whole country due to heavy snowfall at and around Sadna Top which remains the only connective link to the outside world.



**Fig 1:** Location map of Tehsil Karnah in district Kupwara of Jammu and Kashmir.

**Methodology Followed:** Extensive field surveys were conducted from time to time during different flowering seasons mostly during the later half and first half of the year 2019 and 2020 respectively. Study sites were selected considering the richness and maximum possibility of discovering different species at various altitudes and all along the length of the valley. Collected plant species were taken to the local knowledgeable persons mostly senior citizens and herbal healers for identification and authentication. In this regard a famous and respectable religious head and herbal healer namely Haji Abdul Aziz Maldayal was also consulted for his services. Local people 200 in number from different villages were also interviewed to elicit the secret knowledge, based upon the questionnaire prepared and later noted in the field book. Pahari and urdu

language was used as a medium of communication while collecting important information. Finally available literatures and various published floral related materials were also consulted to cross check the noted information. Important among them were, (Kachroo, *et al.*, 1978), (Lone *et al.*, 2013), (Wali *et al.*, 1964), (Malik *et al.*, 2011).

### Observations

The important data and traditional knowledge collected about the observed medicinal plant species is enumerated in alphabetical order of their botanical names followed by the concerned family to which they belong, vernacular name, plant part used, applicability against various health disorders and availability status/ Species under various threats in (Table 1) below.

**Table 1**

S.No	Botanical Name	Family	Vernacular Name	Part Used	Used Against	Threat Status
01	<i>Aconitum chasmanthum</i> Stapf.	Ranunculaceae	Mohri	Whole plant	Chest and back pain	✓
02	<i>Aconitum heterophyllum</i> Wall.	Ranunculaceae	Patrees	Roots	Diarrohea, cough	✓
03	<i>Ajuga bracteosa</i> Wallich ex. Benth	Lamiaceae	Ratti booti/ Jaan-e-Adam	Leaves	Fever, Blood purifier	✓

04	<i>Amaranthus caudatus</i> L.	Amaranthaceae	Ganhaar	Seeds, Leaves	Diuretic, Stangury, Astringent, Anthelmintic	×
05	<i>Amaranthus viridus</i> L.	Amaranthaceae	Ganhar	Whole plant	Intestinal infections, obesity, Insect and snake bites	×
06	<i>Anemone obtusifolia</i> D. Don.	Ranunculaceae	Ratanjot	Root, Seeds	Rheumatism, Mouth sores, Contusions	×
07	<i>Angelica cyclocarpa</i> (C. Norman) M. Hiroe	Apiaceae	Chora	Roots and Rhizome	Ulcers, Menorrhagia, wounds, Gastric pains and Spasms	✓
08	<i>Arisaema jacquemontii</i> Blume	Araceae	Kirala, Sarap	Rhizome	Skin problems, Allergies	×
09	<i>Arnebia benthamii</i> (Wall. ex G. Don) Johnst.	Boraginaceae	Gazbaan	Whole plant	Urinary and liver problems	✓
10	<i>Artemisia absinthium</i> L.	Asteraceae	Chou/ Taethwana	Leaves	Anti-cancerous and Anti-microbial	✓
11	<i>Berberis lyceum</i> Royle	Berberidaceae	Kala Sumbal	Fruit and roots	Stomach and joint problems	✓
12	<i>Bergenia ciliate</i> (Haw.) Sternb. Revis	Saxifragaceae	Zakhm-e-Hayat	Roots and Rhizome	Antiseptic, Fever, Diarrhoea, stone problems	✓
13	<i>Betula utilis</i> D. Don.	Betulaceae	Bhojpatar	Bark	Antiseptic	×
14	<i>Cannabis sativa</i> L.	Cannabinaceae	Phang	Leaves	Skin problems, Sedative	×
15	<i>Cedrus deodara</i> (Roxb.)	Pinaceae	Deodar	Oil of wood	Toothache, skin disorders and allergy	×
16	<i>Colchicum luteum</i> L.	Liliaceae	chalundri	Dried roots	Skin problems, Liver problems, Gout, pain relieving	×
17	<i>Coriandrum sativum</i> L.	Apiaceae	Dhaniya	Whole plant	Stomach problems, Piles, cold	×
18	<i>Cucurbita pepo</i> L.	Cucurbitaceae	Safaid Dubri	Seeds, Fruit	Urinary disorders, Stomach ulcers, anti-viral	×
19	<i>Curcuma longa</i> Linn.	Zingiberaceae	Haldar	Roots	Antiseptic, Stomach ulcers, Liver problems, tonic	×
20	<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Neladhari/ Amarbel	Stem, climber	Rheumatism, anti inflammatory, Skin problems	×
21	<i>Cyperus rotundus</i> L.	Cyperaceae	Deela	Tuber	Emmenagogue, Diuretic, Irritational bowel	×
22	<i>Dalbergia sissoo</i> Roxb.	Fabaceae	Shisham	Root, wood	Leprosy, Vomiting, Burns	×
23	<i>Datura stramonium</i> L.	Solanaceae	Datura	Leaves and seeds	Antiseptic, Hemorrhoids, Dandruff	×
24	<i>Dioscorea deltoidea</i> L.	Dioscoreaceae	Kanees	Tubers	Anti-lice, Constipatio, Source for steroidal drugs	✓
25	<i>Dipsacus inermis</i> L.	Dipsacaceae	Wupalhak	Root, Leaves	Urinary disorders, Leaves used as vegetable by ladies after child birth	×
26	<i>Ephedra gerardiana</i> Wallich ex. C.A. Meyer	Ephedraceae	Deela	Flowers, Fruits	Bronchitis, Cough and Arthritis, stimulant	✓
27	<i>Euphorbia helioscopia</i> L.	Euphorbiaceae	Dudal	Leaves and stem	Warts, Ringworms and skin problems	×
28	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Jatli Dudal	Leaves and Latex	Cough, Asthama, warts and dysentery	×
29	<i>Ficus caria</i> L.	Moraceae	Anjeer	Stems and leaves	Warts	×
30	<i>Ficus palmata</i> Forsskal	Moraceae	Phagwara	Fruit	Constipation, Lung and gall blader disorders	×
31	<i>Foeniculum vulgare</i> Mill.	Apiaceae	Saunf/ Badiyana	Seeds	Cold, cough, blood purifier, Acidity	×
32	<i>Fragaria ananassa</i> Duchesne	Rosaceae	Batmeva	Leaves,Fruits	Rheumatism, Diuretic, Gout,	×
33	<i>Helianthus annulus</i> L.	Asteraceae	Deenhphair	Seeds, Flowers	Diuretic, anti-malarial, stomachache, nutritional	×
34	<i>Inula royleana</i> L.	Asteraceae	Poshgar	Dried rhizomes and Roots	Blood pressure and Intestinal infections	✓
35	<i>Iris nepalensis</i>	Iridaceae	Baikaer	Root	Throat swelling, Cough	×
36	<i>Jasminum humile</i> L.	Oleaceae	Zard Chameli	Flowers and Root	Tonic, Ringworms	×
37	<i>Jasminum officinale</i> L.	Oleaceae	Safaid Chameli	Flowers	Skin disorders, Allergies	×
38	<i>Juglans regia</i> L.	Juglandaceae	Khor	Bark, Fruit and Leaves	Toothache, Frostbite and Sex stimulant	×
39	<i>Jurinea dolomiaea</i> Boiss.	Asteraceae	Gugaldhoop	Root	Fever, Wounds and Burns	✓
40	<i>Lantana camara</i> L.	Verbenaceae	Naera	Leaves	Malaria, Rheumatism, Skin problems, Asthama and Cancer	×
41	<i>Lavateria cashmeriana</i> Cambess	Malvaceae	Sozposh	Leaves, Flowers	Skin irritation, cough and Cold	×
42	<i>Malva neglecta</i> L.	Malvaceae	Sonchal	Leaves and Flowers	Wounds, Cough and Stomachache	×
43	<i>Matricaria chamomilla</i> L.	Asteraceae	Panphor	Flower	Skincare, Bowel syndrome, Sore stomach, Cough and Bronchitis	×
44	<i>Mentha longifolia</i> (L.) Huds	Lamiaceae	Jungli Pudina	Leaves and twigs	Coolant and stomach problems	×

45	<i>Mentha sylvestris</i> L.	Lamiaceae	Pudina	Leaves	Stomach problems	×
46	<i>Morchella esculenta</i> (Linn.) Pers.	Morchellaceae	Guchhi	Fruiting body	Stomachache, Antiseptic	✓
47	<i>Morus alba</i> L.	Moraceae	Toot	Fruits, Leaves, wood	Sore throat, dyspepsia, Silkworm rearing	×
48	<i>Nasturtium officinale</i> R.Br.	Brassicaceae	Tarmeera	Leaves and Flowers	Diabetes, Stomach and intestinal disorders	×
49	<i>Nymphaea maxicana</i> Zucc.	Nymphaeaceae	Bumposh	Rhizome and Flowers	Hairfall and Fever	×
50	<i>Origanum vulgare</i> L.	Lamiaceae	Sathra	Leaves, oil and Flowers	Menstrual disorders, diarrhoea, Toothache, Hysteria	×
51	<i>Oxalis corniculata</i> L.	Oxalidaceae	Peeli Khaftibooti	Leaves	Scurvy, Piles, Anaemia, Opacity of corneal eye	×
52	<i>Plantago major</i> L.	Plantaginaceae	Jangli isbghol	Seeds	Gastric complaints and dysentery	×
53	<i>Podophyllum hexandrum</i> Royle	Berberidaceae	Bankhakhri	Rhizome/Roots	Antiseptic, Skin disorders and tumors	✓
54	<i>Populus alba</i> L.	Salicaceae	Safeda	Bark, Leaves, wood	Diuretic, blood purifier, Rheumatism	×
55	<i>Ranunculus arvensis</i> L.	Ranunculaceae	Chochumba	Shoot parts	Fever and Asthama	×
56	<i>Ranunculus scleratus</i> L.	Ranunculaceae	Khand Bariyan	Seeds and Leaves	Fever and Tonic	×
57	<i>Rheum emodi</i> Wall. ex. Meissn	Polygonaceae	Gol Chotial	Leaves and Roots	Boils and Hair problems	✓
58	<i>Rheum webbianum</i> Royle	Polygonaceae	Chafdi chotial	Roots, Leaf, Leaf stalks	Leaf stalks are eaten, Constipation	✓
59	<i>Rosa indica</i> Linn.	Rosaceae	Gulab	Flower	Constipation and Stool disorders, Used as "Attar"	×
60	<i>Rosa macrophylla</i> Lindl.	Rosaceae	Jungli Gulab	Flowers	Internal fever, when mixed with other dry fruits helps in relieving seasonal infections during winters	×
61	<i>Salix alba</i> L.	Salicaceae	Beens	Bark, wood	Headache, Toothache, Rheumatism and skin problems	×
62	<i>Saussurea lappa</i> C.B. Clarke	Asteraceae	Kouth	Root	Ulcers, Liver, Cancers, Arthritis	✓
63	<i>Sonchus oleraceous</i> L.	Asteraceae	Kokarbon	Roots, Leaves, Stems and Gum	Liver problems, Ulcers and Wounds	×
64	<i>Syzgium cumini</i> L.	Myrtaceae	Jamain	Bark, Fruit, seeds	Diabetes, Mouth washes, Prevent diarrhoea when given with goat milk	×
65	<i>Taxus wallichiana</i> Zucc.	Taxaceae	Barmi/ Thunni	Bark, Wood	Anti-cancerous	×
66	<i>Trigonella foenum-graecum</i> L.	Fabaceae	Methi	Seeds, leaves	Diabetes, antacid, stomach disorders	×
67	<i>Urtica dioica</i> L.	Urticaceae	Kandyari	Roots and leaves	Hair Growth and Dandruff cleaning	×
68	<i>Valeriana jatamansi</i> Jones	Valerianaceae	Mushkbala	Dried roots and Rhizome	Diuretic, Liver tonic, skin problems and Hysteria	✓
69	<i>Verbascum thapsus</i> Linn.	Scrophulariaceae	Gidder tobacco	Flowers and leaves	Asthama, Diarrhoea, and stimulant	×
70	<i>Zingiber chrysanthum</i> Roswe	Zingiberaceae	Jungli Adrak	Rhizome	Cough, Fever, Liver problems and anti-cancerous	×

## Results and Discussion

Survey conducted lead to the discovery of 70 medicinal plant species, belonging to 61 genera and 43 families used against various ailments and disorders by the local masses of Karnah valley (Table 1). Wild herbs were the widely used category of plants followed by shrubs and trees for treating various ailments and disorders. Being the residents of mountains with difficult topography and less medical facilities, the inhabitants seemed to have good knowledge about various herbal plants and their uses. However herbal healers (Hakeems) were consulted for prescribing the final treatment to any ailment. Different plant parts like roots, leaves, bark, flowers, seeds, tubers, gum, rhizomes etc. and their extracts were used with various other ingredients and mixing them in different ratio's for the preparation of herbal medicines. These herbal medicines are considered good with very less or no side effects. Time of collection of these medicinal plants determines the quality of the drug or herbal medicine prepared. Many diseases associated with domestic

and poultry animals are also corrected by following ethnomedicinal procedures. Some plant varieties were used to treat more than one disease likewise more than one plant specie was used to treat a particular disease as well.

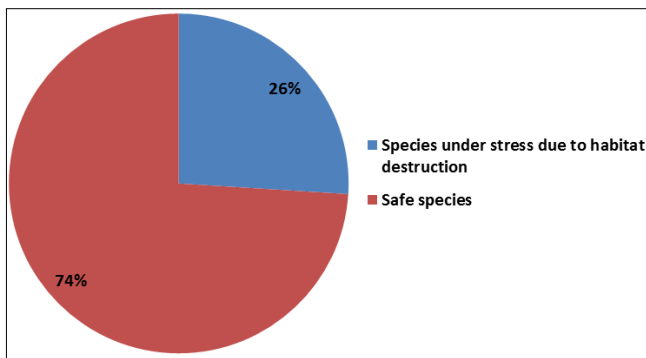
Among the dealt families during the study, Asteraceae (7 species) was found to be the dominant one followed by Ranunculaceae (5 species) and Lamiaceae (4 species). Ten (10) families consisted of 2 species each and remaining 28 families one specie each (Table 1). Medicines were given in the form of paste, poultice, tonic, infusion etc. A good number of plant species like *Morchella esculenta* (Guchhi), *Aconitum heterophyllum* (Patrees), *Saussurea lappa* (Kuth), *Ajuga bracteosa* (Jaan-e-Adam), *Angelica cyclocarpa* (chora), *Berberis lyceum* (Kala Sumble), *Dioscoria deltoidea* (Kanees), *Valeriana jatamansi* (Mushkbala), *Bergenia ciliate* (Zakhm-e-Hayat) etc. also find good market value as a result of which many people generate revenue to support themselves financially (Table 2). This revenue generating practice involves the unscientific and non-

professional way of collecting and handling, which leads to the habitat destruction due to over exploitation of these valuable plants. Other contributing factors towards the destruction of natural habitats includes overgrazing by the livestock, wood cutting for fuel, timber for commercial purposes, poaching and smuggling of important plant and plant parts. Natural factors due to global warming like soil erosion, flash floods and forest fires also play their part. During the present study some 18 important medicinal

plants were found to be under huge stress due to the above mentioned reasons which contributes to around 26% of total observed varieties (Fig. 2). If uncontrolled and unscientific anthropogenic practices continued at the present rate, can lead to the further exploitation of these important natural resources and finally extinction as well. Therefore need of feasible conservation strategy and action plan is of utmost importance, which can be implemented effectively in order to conserve these precious dwindling resources.

**Table 2:** List of medicinal plants extracted by locals for income generation in the study area.

S. No.	Botanical Name of the Plant	Plant Part Used	Market price per Kg (INR)
01	<i>Aconitum heterophyllum</i> Wall.	Roots	6000-7000
02	<i>Ajuga bracteosa</i> Wallich ex. Benth.	Leaves	150
03	<i>Angelica cyclocarpa</i> (C. Norman) M. Hiroe	Roots/Rhizome	450-550
04	<i>Berberis lyceum</i> Royle.	Fruits/Roots	150-250
05	<i>Bergenia ciliate</i> (Haw.) Sternb. Revis.	Roots/Rhizome	80-120
06	<i>Dioscoria deltoidea</i> L.	Tubers	100
07	<i>Jurinea dolomiaea</i> Boiss.	Roots	150-200
08	<i>Morchella esculanta</i> (Linn.) Pers.	Fruiting body	9000-12000
09	<i>Podophyllum hexandrum</i> Royle.	Rhizome/Roots	300
10	<i>Saussurea lappa</i> C.B. Clarke.	Roots	500-600
11	<i>Valeriana jatamansi</i> Jones.	Roots/Rhizome	50-100



**Fig 2:** Figure depicting threat/availability status in percentage for the observed plant species in the study area.

### Conclusion

Karnah being a part of the richest district (Kupwara) as far as plantation cover and medicinal plants are concerned all over the Kashmir valley needs to be explored more. Sustainable use of these resources should be of utmost importance along with the awareness among local masses. Strict law enforcement on ground is a prerequisite to check the illegal practices taking place in a very hassle free manner. People associated with herbal plants needs to get educated about the scientific way of collecting and handling and this can be achieved with the help of experts by organizing workshops, seminars at different levels. Propagation of those plants which are under huge stress should be promoted under expert opinion in nurseries involving local people. Also good revenue can be generated by utilizing and promoting locally available rich medicinal plant varieties in a sustainable way by pharmaceutical companies instead of importing the same varieties from outside, it will also help in generating employment opportunities for the local educated youth. Research work on different aspects of medicinal plants in this rich area should be encouraged by the concerned authorities and for that, help should also be provided in all forms.

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