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Biodiversity in the Medicinal Flora of District Bannu Khyber Pakhtunkhwa, Pakistan

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The research work presented was initiated to get information and report the biodiversity in endemic flora of the district Bannu in the weather of winter 2012. The present research deals with preliminary contribution to the classification of native plants of District Bannu. As a whole about 128 plants belonging to 49 families were collected, documented and preserved in the herbarium of Bannu Department of Botany UST, Bannu. The plants were identified botanically, arranged alphabetically along with their photographs, family names, local names, English names, descriptions, part used, flowering seasons, chemicals constituents, methods of applications of their parts and medicinal importance. Most of the plants are wild while few plants are cultivated. Like wise some plant are classified as wild and as well as cultivated. There were found plants with edible fruits e.g. *Mangifera indica* & *Pyrus malus* etc. Several plants are classified as ornamental flora while some are of use as fencing and hedging. Out of collected flora some plants were observed as vegetables i.e. *Lycopersicon esculentum*, *Allium cepa*, *Allium sativa* whilst some plants are classified as cereal crops i.e. wheat, maize, oat and rice. In this way whole of the flora are classified as in six groups. 1 Wild species (73) 2. Cultivated plants (45) 3. Ornamental plants (9) 4. Indicator species (33) 5. Food values species (49) 6. Economically important flora (48). Most of the plants belong to the following families Solanaceae (10), Astraceae (8) cucurbitaceae (8), Poaceae (7), Moraceae (5) and Euphorbiaceae (4).

Keyword: Biodiversity, Flora, Bannu.

1. Introduction

District Bannu is a green valley, situated in the Khyber Pakhtunkhwa Province of Pakistan, irrigated by River Kurram and Hill torrents. It lies between 32.43 to 33.06 North latitude and from 70.22 to 70.57 East longitudes. It is bounded in the North by the Tribal Area and in the East by Karak district, while in the South by Lakki Marwat of Bannu district. The total area of the district is 1227 square kilometers. It is famous for its condiments, fruits and vegetable thus known as vegetable emerald (Edward).

Work on biodiversity received much less attention as compare to food plant species^[6]. They provide us ready made food, medicines for ailment, fodder and forage for our domestic animals, fuel wood for burning, flowers for

celebration materials for making agriculture tools, timbers for constructions and many more useful items. Medicinal plants are the most important approach to study natural resources management of indigenous people. The rich biodiversity is being disastrously impoverished due to human action in the last few decades. Understanding the indigenous knowledge of mountain people in relation to biodiversity resources management is one of the key issues for sustainable development^[7]. The vegetation of the District Bannu is under high biotic pressure such as overgrazing. Ruthless collection of native plants had threatened their existence and more plants are becoming vulnerable due to the destruction of their habitat. *Mentha royleana*, *Solanum nigrum* are rare plants, the *Mentha royleana* is threatened

species. There is a dire need of careful conservation of the endemic plant resources of the region otherwise many plants may be lost forever and become extinct^[3]. The importance of recording the divers' flora in this region is especially imperative because of rapid loss of biodiversity wealth and traditional wisdom. In view of this fact, an attempt has been made in this research work to record the biodiversity in plants of the district of Bannu. These plants are mostly used for curing some common diseases such as, diarrhoea, dysentery, gastric ulcer, intestinal worms, fever, malaria, cough, bronchitis, asthma,

headache, toothache, wounds and sores, skin diseases, snake bite and some other diseases^[10].

2. Materials and Methods

2.1 Area Exploration

Trips were arranged to 25 different sites ((1-Khujari, Bharat, 2- Kakki etc) of District Bannu to explore and collect important flora of the area During 2012. A total of 128 medicinal plants were photographed. All the plants and photographs were conserved systematically in Bannu GeneBank, Department of Botany, University of Science and Technology Bannu (BGB, UST, Bannu).

Table 1: Different Sites of Plant Collection

1- Nurar	6-Khujary	11-NarJafar Khan	16- Sokari,	21-Bada MirAbas
2-Mandew	7- Kakki	12-Sahmshi Khel	17Mamash khel	22-Bazar ahmad khan,
3- Mandan	8-Ismail Khel	13 Mira Khel	18-Jhando Khel	23Shahbaz Azmat Khel
4- Surani,	9- Mira Khel	14-Metta Khel	19-Baist Kel	24-kalla Khel Masti khel
5-Bharat	10Mama Khel	15-Amandi	20-Ismial Khani	25Manjakhel/Ghoriwala

2.2 Exploration of Local Flora

Map of Bannu was also obtained from concerned office for proper guidance in the collection of plants (Fig 3.1). To explore the flora of the study area, a Performa was designed for the characterization of the flora, i.e., 1. Wild species 2. Cultivated plants 3. Ornamental plants 4. Indicator species 5. Food values species 6. Economically important flora.

During exploratory trips, flora was carefully collected by adopting the recommended procedure used by Ravishankar^[9], Rao^[8] & M. Ahmad and Ali^[2], and photographs were clipped on the spots. This information was then compared with each other and people of other villages of district were provoked to share and added their experiences. Such types of efforts are required to induce awareness in the local people about the conservation of the wealth of useful plants for their coming generations. Repeated queries were made to formulate the correct data. Outcome of the results were rechecked and compared with the available literature.

3. Result and Discussion

The present study was carried out to assess record and report the biodiversity in the local flora of district Bannu in winter months of 2012. As a whole about 128 plants belonging to 49 families were collected, documented and preserved in the herbarium of Bannu Department of Botany UST, Bannu. The plants were identified botanically, arranged alphabetically along with their photographs, family names, local names, English names, descriptions, part used, flowering seasons, chemicals constituents, methods of applications of their parts and medicinal importance.

The significance of biodiversity is in all-prospective. They provide us ready made food, medicines for ailment, fodder and forage for our domestic animals, fuel wood for burning, flowers for celebration materials for making agriculture tools, timbers for constructions and many more useful items^[4]. The energy obtained from food is first converted from sunlight to usable, transferable energy by green plants^[3]. The oxygen supply in the earth atmosphere is result of photosynthesis by green plants. Fossil fuel comes from plant material. Plants also create and modify local environmental condition on which

many species of animals and other plants depend. They also provide us medicine to fight diseases; flowers for celebration, honey collected from its

flowers, timber for constriction and many more useful items. So plants form the basis of life^[1].

1. Food Values Species of District Bannu

In the present research work a total of 45 genotypes were collected on the basis of food value (Table 2).

Table 2: 49 Food values species of Bannu

<i>Abelmoschus esculentus</i> Moench	<i>Citrus reticulata</i> Blanco	<i>Hordeum vulgare</i> L.	<i>Punica granatum</i> L.
<i>Allium cepa</i> L.	<i>Cordia oblique</i> Willd	<i>Lepidium sativum</i> L.	<i>Pyrus malis</i> L.
<i>Allium sativum</i> L.	<i>Coriandrum sativum</i> L.	<i>Luffa cylindrica</i> Roem	<i>Raphanus sativus</i> L.
<i>Amaranthus tricolor</i> L.	<i>Cucumis melo</i> Duthie	<i>Lycopersicom esculentum</i> M	<i>Solanum melongena</i> L.
<i>Arachis hypogaea</i> L.	<i>Cucumis sativus</i> L.	<i>Mangifera indica</i> L.	<i>Triticum aestivum</i> L.
<i>Capsicum annuum</i> L.	<i>Cucurbita maxima</i> D.Lam	<i>Medicago sativa</i> L.	<i>Typha orientallis</i> J. Preslw
<i>Carthamus oxycantha</i> M. B	<i>Cucurbita pepo</i> L.	<i>Momordica charantia</i> L.	<i>Vigna marina</i> (Burm) Merr
<i>Chenopodium ambrosioides</i> L.	<i>Daucus carota</i> Linn.	<i>Morus alba</i> L.	<i>Zea mays</i> L.
<i>Chenopodium album</i> L.	<i>Eriobtry japonica</i> Lindley	<i>Morus nigra</i> L.	<i>Zizphus mauratiana</i> Lam
<i>Cicer arietinum</i> L.	<i>Eugenia jambolana</i> Lam	<i>Oryza sativa</i> L.	<i>Zizphus spinosa</i> Hu.
<i>Citrullus vulgaris</i> Schard	<i>Ficcus carica</i> L.	<i>Pisum sativum</i> L.	
<i>Citrus medica</i> L.	<i>Foeniculum vulgare</i> Miller	<i>Portulaca oleracea</i> L.	
<i>Citrus paradise</i> Macf.	<i>Helianthus annus</i> L.	<i>Psidium guajava</i> L.	

2. Economically Important Flora of District Bannu

In the present study, 48 species of economically important plants were collected and clipped the photographs of the unique plants. (Table 3).

Table 3: 48 Economically important flora of District Bannu

<i>Allium cepa</i> L.	<i>Citrus paradise</i> Macf.	<i>Ficcus carica</i> L.	<i>Ficus religiosa</i> L.
<i>Allium sativum</i> L.	<i>Citrus reticulata</i> Blanco	<i>Foeniculum vulgare</i> Miller	<i>Melia azedarach</i> L.
<i>Arachis hypogaea</i> L.	<i>Cordia obliqua</i> Willd	<i>Helianthus annus</i> L.	<i>Morus alba</i> L.
<i>Hibiscus cannabinus</i> L.	<i>Coriandrum sativum</i> L.	<i>Hibiscus cannabinus</i> L.	<i>Morus nigra</i> L.
<i>Myrtus cmmunis</i> L.	<i>Cucumis melo</i> Var.	<i>Hordeum vulgare</i> L.	<i>Salix babylonica</i> L
<i>Brassica campestris</i> L.	<i>Cucumis sativus</i> L.	<i>Lepidium sativum</i> L.	<i>Terminalia arjuna</i>
<i>Cannabis sativa</i> L.	<i>Cucurbita maxima</i> Lam	<i>Luffa cylindrical</i> L.	<i>Vitex trifolia</i> L.
<i>Capsicum annuum</i> L.	<i>Cucurbita pepo</i> L.	<i>Lycopersicom esculentum</i> Mill	<i>Withania somnifera</i> L.
<i>Momordica charantia</i> L	<i>Daucus carota</i> Linn.	<i>Acacia nilotica</i> Delile	<i>Xanthium strumarium</i> L
<i>Cicer arietinum</i> L.	<i>Eriobtry japonica</i> Thunb	<i>Albizia lebbeek</i> (L.) Benth	<i>Zizphus mauratiana</i> Lam.
<i>Citrullus vulgaris</i> Schrad	<i>Eucalyptus globulus</i> Labill.	<i>Dalbergia sissoo</i> .Roxb.	<i>Zizphus spinosa</i> Hu.
<i>Citrus medica</i> L.	<i>Eugenia jambolana</i> Lam	<i>Ficus bengalensis</i> L.	<i>Rosa indica</i> L

3. Indicator Plant Species of District Bannu

Indicator species is the actual wealth of the area and 33 indicator species were collected, identified, evaluated through morphological traits and finally kept documented in BGB, UST, Bannu. (Table 4).

Table 4: 33 Indicator species of District Bannu

<i>Abutilon indicum</i> L.	<i>Citrullus colocynthis</i> Schrad	<i>Morus alba</i> L.	<i>Salvadora oleoides</i> Deone
<i>Acacia nilotica</i> Delile	<i>Citrullus colocynthis</i> Schard	<i>Morus nigra</i> L.	<i>Sida cardifolia</i> L.
<i>Achyranthes bidentata</i> Blume	<i>Cynodon dactylon</i> L.	<i>Papaver somniferum</i> L.	<i>Solanum nigrum</i> L.
<i>Achyranthes japonica</i> Nakai	<i>Dalbergia sissoo</i> Roxb	<i>Peganum harmala</i> L.	<i>Solanum surattense</i> Burn, F
<i>Albizia lebbek</i> L.	<i>Datura Metel</i> L.	<i>Physalis angulata</i> L.	<i>Vitex trifolia</i> L.F.
<i>Calotropis procera</i> L.	<i>Datura stramonium</i> L	<i>Physalis minuma</i>	<i>Withania somnifera</i> L.
<i>Cassia fistula</i> L.	<i>Equisetum hyemale</i> L	<i>Portulaca oleracea</i>	<i>Xanthium strumarium</i> L
<i>Chenopodium album</i> L.	<i>Ficus religiosa</i> L.	<i>Ricinus communis</i> L.	<i>Zizphus mauratiana</i> Lam.
			<i>Zizphus spinosa</i> Hu.

4. Wild Species of District Bannu

There are lot of wild spp found all over the district of Bannu but presently following 73 wild spp were collected and documented in this research work. (Table 5).

Table 5: 73 Wild species of District Bannu

<i>Abroma augusta</i> (L.) F.	<i>Cuscuta reflexa</i> Roxb	<i>Opuntia ficus-indica</i> (L)Mill	<i>Stellaria media</i> (L.) Cyr.
<i>Abutilon indicum</i> (L.) Sweet	<i>Cynodon dactylon</i> (L.) Pers	<i>Oxalis corniculata</i> L.	<i>Syzygium cornocarpum</i> Muell
<i>Acacia nilotica</i> Delile	<i>Cyperus rotundrus</i> L.	<i>Papaver somniferum</i> L.	<i>Taraxacum officinal</i> webber
<i>Achyranthes bidentata</i> Blume	<i>Dalbergia sissoo</i> Roxb	<i>Peganum harmala</i>	<i>Terminalia arjuna</i> Arn
<i>Achyranthes japonica</i> Nakai	<i>Datura Metel</i> L.	<i>Phyla nodiflora</i> L.	<i>Torilis japonica</i> (Houtt) Dc
<i>Albizia lebbek</i> (L.) Benth	<i>Datura stramonium</i> Miller	<i>Phyllanthus niruri</i> L.	<i>Trachyspermum ammi</i> Sprague
<i>Amaranthus tricolor</i> L.	<i>Eclipta prostrata</i> L.	<i>Physalis angulata</i> L.	<i>Tribulus terrestris</i> L.
<i>Anagallis arvensis</i> L.	<i>Equisetum hyemale</i> L.	<i>Physalis minima</i> L.	<i>Typha orientallis</i> Preslw
<i>Apium graveolens</i> L.	<i>Euphorbia ligularia</i> Roxb	<i>Plantago major</i> L.	<i>Verbena officinalis</i> L.
<i>Bistorta manshuriensis</i> Kom.	<i>Euphorbia pekinensis</i> Rupr	<i>Plantago ovota</i> Forssk	<i>Vigna marina</i> Merr
<i>Calotropis procera</i> (L.) R.Br	<i>Ficus bengalensis</i> L.	<i>Polygonum dichrotomum</i> Bl	<i>Vitex negundo</i> L.
<i>Capparis deciduas</i> Edgew	<i>Ficus religiosa</i> L.	<i>Portulaca oleracea</i>	<i>Vitex trifolia</i> L.F.
<i>Carum copticum</i> Benth	<i>Medicago sativa</i> L.	<i>Ricinus communis</i> Linn	<i>Withania somnifera</i> Dunal
<i>Cassia fistula</i> L.	<i>Melia azedarach</i> L.	<i>Salix babylonica</i> L.	<i>Xanthium strumarium</i> L.
<i>Chenopodium album</i> L.	<i>Mentha royleana</i> L.	<i>Salvadora oleoides</i> Deone	<i>Zizphus mauratiana</i> Lam
<i>Chenopodium ambrosioides</i> L.	<i>Morus alba</i> L.	<i>Sida cardifolia</i> L.	<i>Zizphus spinosa</i> .Hu
<i>Cichorium intybus</i> L.	<i>Morus nigra</i> L.	<i>Solanum nigrum</i> L.	
<i>Citrullus colocynthis</i> Schard	<i>Nasturtium officinale</i> R.Br	<i>Solanum surattense</i> Burn.F	
<i>Convolvulus arvensis</i> L.	<i>Ocimum sanctum</i> L.	<i>Sorghum halepense</i> (L.) Pers	

5. Ornamental plants of District Bannu

In the present study, 09 species of ornamental plants were collected, identified and enlisted (Table 6).

Table 6: 9 Ornamental plants of District Bannu

<i>Aristolochia contorta</i> Bunge	<i>Cupressus sempervirens</i> L.	<i>Ocimum basilicum</i> L.
<i>Calendula officinalis</i> L.	<i>Dodonaea viscosa</i> (L.) Jaeq	<i>Rosa indica</i> L.
<i>Chrysanthemum indicum</i> L.	<i>Nerium oleander</i> L.	<i>Thuja orientallis</i> L.

6. Cultivated Plants of District Bannu

A total of 45 species were collected, preserved, identified and classified as cultivated plants in district Bannu, Khyber Pakhtunkhwa (Table 7).

Table 7: 45 Cultivated plants of District Bannu

<i>Abelmoschus esculentus</i> M.	<i>Citrus medica</i> L.	<i>Eucalyptus globulus</i> Labill	<i>Momordica charantia</i> L.
<i>Allium cepa</i> L.	<i>Citrus paradise</i> Macf.	<i>Eugenia jambolana</i> Lam	<i>Myrtus communis</i> L.
<i>Allium sativum</i> L.	<i>Citrus reticulata</i> Blanco	<i>Ficus carica</i> L.	<i>Oryza sativa</i> L.
<i>Arachis hypogaea</i> L.	<i>Cordia obliqua</i> Willd	<i>Foeniculum vulgare</i> Miller	<i>Pisum sativum</i> L.
<i>Avena sativa</i> L.	<i>Coriandrum sativum</i> L.	<i>Helianthus annuus</i> L.	<i>Psidium guajava</i> L.
<i>Brassica campestris</i> L.	<i>Cucumis melo</i> Duthie	<i>Hibiscus cannabinus</i> L.	<i>Punica granatum</i> L.
<i>Cannabis sativa</i> L.	<i>Cucumis sativus</i> L.	<i>Hordeum vulgare</i> L.	<i>Pyrus malis</i> L.
<i>Capsicum annuum</i> L.	<i>Cucurbita maxima</i> Lam	<i>Lepidium sativum</i> L.	<i>Raphanus sativus</i> L.
<i>Carthamus oxycantha</i> M.B	<i>Cucurbita pepo</i> L.	<i>Luffa cylindrical</i> Roem	<i>Trifolium alexandriaanum</i> L
<i>Cicer arietinum</i> L.	<i>Daucus carota</i> Stiva Dc	<i>Lycopersicon esculentum</i> Mill	<i>Triticum aestivum</i> L.
<i>Citrullus vulgaris</i> L.	<i>Eriobotrya japonica</i> Lindley	<i>Mangifera indica</i> L.	<i>Vitis vinifera</i> L.
			<i>Zea mays</i> L.

Table 8: Plant Biodiversity in District Bannu

Plants Group	Percentage
Wild species	73
Cultivated plants	45
Ornamental plants	9
Indicator species	33
Food values species	49
Economically important flora	48

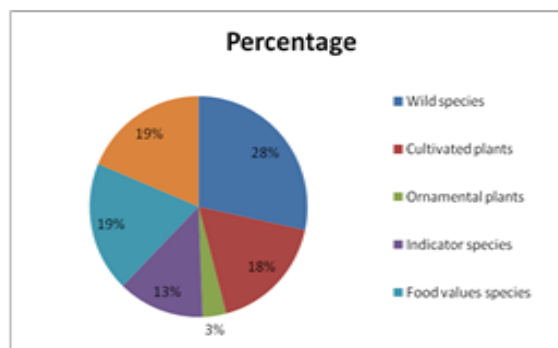


Fig 1: Biodiversity in District Bannu

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