

**FLORAL DIVERSITY OF ROSACEAE FAMILY IN DIR KOHISTAN FOREST KHYBER PAKHTUNKHWA PROVINCE-PAKISTAN**

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**ABSTRACT**

*Dir Kohistan is a floristically rich area having great biodiversity and is located at the foothills of Hindukush range, Khyber Pakhtunkhwa, Pakistan. In this study, several tutorial trips were accompanied for several times to explore the type of species of the Rosaceae family in the target area. In total, 30 species were collected belonging to 15 genera from different localities of the selected area, in which the highest number of seven plant species belonged to genus Prunus, five to genus Rosa, three to genus Potentilla, two to each genus Cotoneaster, Rubus and Pyrus and one to each genus Crataegus, Eriobotrya, Fragaria, Malus, Sibbaldia, Sorbus, Sorbaria and Spiraea. It was concluded that members of the selected family need devotion not only for its cultivation, but emphasis must be made on conservation for sustainable utilization of plant resources.*

**Keywords:** Dir Kohistan Valley, Key to species, Rosaceae, Taxonomy.

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## INTRODUCTION

A study was conducted in Dir Kohistan Forest, located in District Upper Dir, Khyber Pakhtunkhwa Province, Pakistan. The area is located between 34° to 10' N latitude and 72° to 20' E longitude in a subtropical, dry, and a temperate portion of Hindukush Range (Hazrat *et al.*, 2011). District Dir Upper is one among the 34 districts of Khyber Pakhtunkhwa, with a total area including the selected area measuring 3,699 sq. km<sup>2</sup>. Kohistan valley is also a part of Dir upper District which starts with a gateway of Bab-i-Kohistan called Khawgo Ooba near Dir city and extended up to Kumrat valley. According to Dir Kohistan Forest Division, the area of Kohistan is 1,038 sq. km<sup>2</sup>. Out of this area, the 56140 ha area was covered by Pines/coniferous forests (DCR, 1998). The study area is lush green with a variety of species, belonging to angiosperms, gymnosperms and other groups of plants. A rich diversity of the selected family plant species is also noted in the research area (Hazrat *et al.*, 2007). The selected family species are available in the form of deciduous trees, herbs, and shrubs. The leaves of Rosaceae are alternate, simple, trifoliate, and palmately compound (Perveen and Qaiser, 2014). Pakistan has a very prominent position among the developing countries because of its rich flora of medicinal plants and variable edaphic and climatic factors. Furthermore, the landscape is blessed with many ecological areas and topographical regions which pay significantly to the rich biodiversity of the area (Hussain *et al.* 2009; Nasir *et al.* 2011). A total of 6000 plant species have been reported and tested to have medicinal value, while most of them are yet to be investigated (Shinwari, 1996). Conservational strategies are the need of the hour for medicinal plants as well as indigenous knowledge (Shinwari *et al.*, 2003; Shinwari and Qaiser, 2011). The species of the selected family are very important for medicinal purposes. People everywhere in the area are familiar with their cultivation, usage,

and any toxic effect (Hazrat *et al.*, 2014). Due to this reason, the Valley was explored for the first time in the history of this area and all the available data of plants of the selected family were documented.

## MATERIALS AND METHODS

The present study was conducted in the study area during 2010-2011. The plants were collected, pressed in newspapers, dried, poisoned and preserved for identification. These were identified with the help of available literature (Stewart, 1972 and Ali and Qaisar, 2009). The information collected about the plants in the form of locality, local name, flowering, and fruiting period of the plants was obtained from the local people through questionnaires. The photographs of wild plants were taken with the help of a digital camera of 16 megapixels. The data obtained were analyzed with the help of Microsoft excel software prepared figure with help of this software and put in the result below as Fig. 1 then compared the results with literature (Rubina, 1998; Ali and Fefevre, 1996; Khalid, 1995). The plant species of Rosaceae were identified with the help of Keys and the data were tabulated (Table-1).

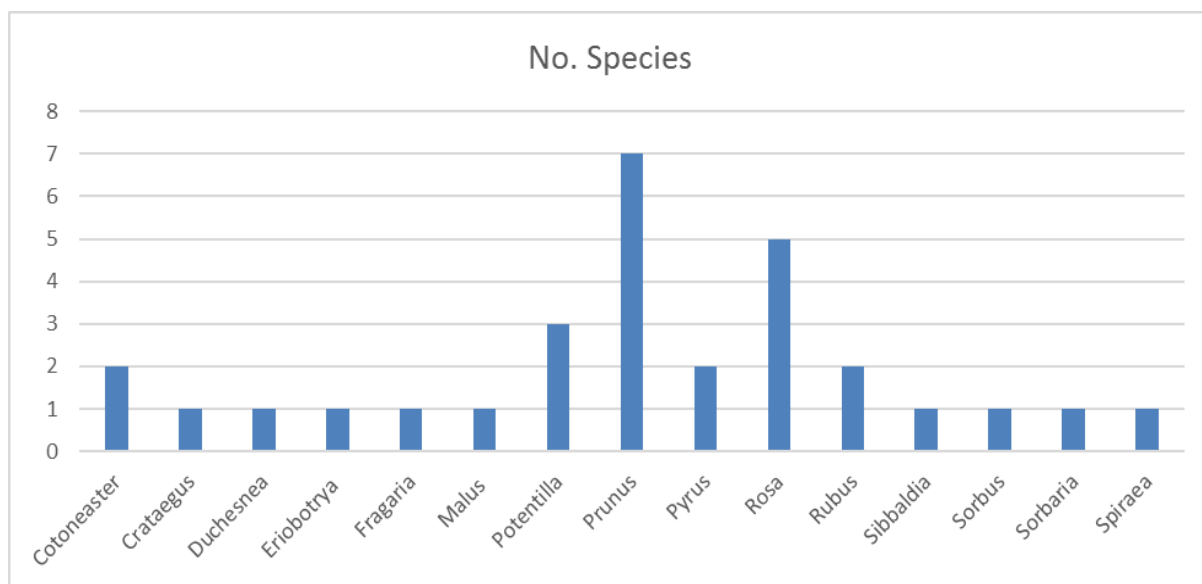
## RESULTS AND DISCUSSION

This research work provides taxonomic information of the selected family. A total of 30 plant species belonging to 15 genera were collected from the study area. Out of all there exist nine species of genus *Prunus* having details in the key bellowed. Most of the species of the selected family grow naturally and some of them are also cultivated in the selected area. Furthermore, plant species are widely distributed in the research area. The plant species were identified with the help of keys in the form of species keys and genera keys are listed below. The species checklist is available in the form of Voucher number, Botanical Name, Vernacular name and research area in Table-1.

**Table-1: Checklist of collected plants species of Rosaceae**

S.No	Voucher No.	Bot. Name	Local Name	Locality in Research Area
1	877	<i>Cotoneaster microphyllus</i> Wall. Ex Lindl.	Kharawa	Sheringal, Dogdara, Sunderae, Lamutai, Janus candio
2	866	<i>Cotoneaster nummularia</i> Fisch. & Mey.	Mamanra	Patrak, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
3	975	<i>Crataegus songarica</i> G. Koch.	Tampasa	Shahoor, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
4	540	<i>Duchesnea indica</i> (Andr.) Focke	Zmake toth	Thall, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
5	950	<i>Eriobotrya japonica</i> (Thunb.) Lindley	Lokat	Cultivated
6	960	<i>Fragaria nubicola</i> Lindl.	Da Zmakay Toot	Sheringal
7	930	<i>Malus pumila</i> Mill.	Manra	Cultivated
8	940	<i>Potentilla nepalensis</i> Hk.	Kunachi	Kumrat, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
9	542	<i>Potentilla reptans</i> L.	Nil	Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
10	989	<i>Potentilla supine</i> L.	Gesg gul	Patrak, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
11	543	<i>Prunus amygdalus</i> Batsch.	Badam	Cultivated
12	979	<i>Prunus armeniaca</i> L.	Khubani	Cultivated
13	969	<i>Prunus bokhariensis</i> Royle ex C.K. Schn.	Alucha	Cultivated
14	545	<i>Prunus cornuta</i> (Wall. ex Royle) Steud.	Changa	Kumrat, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
15	959	<i>Prunus jacquemontii</i> Hk. f.	Changa	Thall, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
16	546	<i>Prunus persica</i> (L.) Batsch.	Shaftalu	Cultivated
17	919	<i>Prunus prostrata</i> Labill.	Nil	Thall, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
18	929	<i>Pyrus communis</i> L.	Nashpatai	Cultivated
19	939	<i>Pyrus pashia</i> Ham. ex D. Don	Shangati Tanga	Common
20	547	<i>Rosa alba</i> L.	Spin Gulab	Sheringal, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
21	909	<i>Rosa brunonii</i> Lindl.	Khwarch, Gorach	Patark, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
22	899	<i>Rosa chinesis</i> Jacq.	Gulab	Common
23	548	<i>Rosa macrophylla</i> Lindl.	Gulisadbor	Sheringal, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
24	836	<i>Rosa webbiana</i> Wall. Ex	Palwarri	Sia Sheringal, Shahoor,

		Royle	Zangali gulab	Dogdara, Sheringal, Sunderae, Lamutai
25	869	<i>Rubus ellipticus</i> Smith	Bagana Ziara Karwara	Ganshal, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
26	849	<i>Rubus niveus</i> Thunb. Non. Wall.	Khwarch	Kumrat
27	998	<i>Sibbaldia cuneata</i> Kunze	Chotial	Kumrat, Thall
28	988	<i>Sorbus lanata</i> (D. Don) S. Schauer	Shanebutay	Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
29	552	<i>Sorbaria tomentosa</i> (Lindl.) Rehdr	Jijrai	Shahoor, Dogdara, Sheringal, Sunderae, Lamutai
30	968	<i>Spiraea canescens</i> D. Don	Nil	Sunderae, Shahoor, Dogdara, Sheringal, Sunderae, Lamutai



**Figure 1. Number of genera and species in each genus in Dir Kohistan.**

**Key to the genera:**

1. Carpels usually 5, fruit follicles.....2
- + Carpels 1 to many, fruit not follicles.....3
2. Leaves compound.....**Sorbaria**
- + Leaves simple.....**Spiraea**
3. Herbs, shrubs. Carpels 1 to many and free. Fruit an achene.....4
- + Trees or shrubs. Carpels 1 or 3-5 and fused. Fruit a drupe or pome.....9
4. Epicalyx present.....5
- + Epicalyx absent.....8
5. Receptacle fleshy in fruit.....6
- + Receptacle not fleshy in fruit.....7
6. Fruit tasteless, petals yellow.....**Duchesnea**
- + Fruit tasty, petals white.....**Fragaria**

- 7. Stamens 10 or more; carpels numerous.....**Potentilla**
- + Stamens 4-5, carpels 5-10.....**Sibbaldia**
- 8. Hypanthium closed at the mouth.....**Rosa**
- + Hypanthium open at the mouth.....**Rubus**
- 9. Carpel 1, ovary superior, fruit a drupe .....**Prunus**
- + Carpels 3-5, connate, ovary inferior, fruit a pome or drupe.....10
- 10. Fruit a drupe, mature fruit with stony endocarp.....11
- + Fruit a pome or drupe, mature fruit without a stony endocarp.....12
- 11. Leaves entire, plants without spines.....**Cotoneaster**
- 12. Leaves crenate or lobed, plants with spines.....**Crataegus**
- 13. Stamens 20.....13
- + Stamens more than 20.....**Pyrus**
- 14. Evergreen tree.....**Eriobotrya**
- + Deciduous trees.....14
- 15. Fruit depressed, subglobose.....**Malus**
- + Fruit oblong, ovoid- oblong or globose.....**Sorbus**

**Genus: *Potentilla*** L., Sp. Pl. 495. 1753.

**Species Key**

- 1 Flowers yellow.....2
- + Flowers red.....**Potentilla nepalensis**
- 2 Leaves digitately 5-foliolate.....**Potentilla reptans**
- + Leaves 3- foliate or 2-5 pairs pinnate.....**Potentilla supine**

**Genus: *Rosa*** L., Sp. Pl., 1753.

**Species Key**

- 1 Styles united. Stems climbing or arching.....**Rosa brunonii**
- + Styles free. Stems arching then flowers solitary or few.....2
- 2 Leaflets 9-11, usually elliptic or obovate, serrulate. Prickles uniform, infrastipular.....**Rosa macrophylla**
- + Leaflets 5-7, variable in shape, elliptic to roundish, grossly serrate. Prickles often mixed with acicles, bristles or stalked glands.....**Rosa webbiana**

**Genus: *Rubus*** L., Sp. Pl.1: 492.1753.

**Species Key**

- 1. Mature aggregate fruit golden yellow..... **Rubus ellipticus**
- + Mature aggregate fruit black.....**Rubus niveus**

**Species Key**

**Genus: *Prunus*** L., Sp. Pl. 1: 473-475. 1753.

- 1 Flower white..... **Prunus cornuta**
- + Flower pink.....2
- 2 Leaves tomentose beneath.....**Prunus prostrata**
- + Leaves not tomentose beneath..... **Prunus jacquemontii**

**Note: Some species are cultivated in the research area such as *Prunus armeniaca*, *Prunus amygdalus*, *Prunus persica* and *Prunus bokhariensis*.**

**Genus:***Cotoneaster* Medikus., Philos., Bot.1789.

**Species Key**

- 1 Mostly prostrate shrub; inflorescence 1-3 flowered; stamens 15-20.....*Cotoneaster microphyllus*
- + Mostly erect shrub; inflorescence 1-10 flowered; stamens 20.....*Cotoneaster nummularia*

**Genus:***Pyrus* L., Sp. Pl. 1: 479. 1753.

**Species Key**

- 1 Leaves broadly ovate. Fruit large 3-4 inches in diameter usually pyriform.....*Pyrus communis*
- + Leaves narrowly ovate or lanceolate. Fruit small 1 inches in diameter usually globose.....*Pyrus pashia*

**PHOTO GALLERY OF SOME SELECTED FLORA OF THE RESEARCH AREA**



**Plate 1. *Duchesnea indica* (Andr.) Focke**



**Plate 2. *Potentilla reptans* L.**



**Plate 3. *Potentilla supine* L.**



**Plate 4. *Potentilla nepalensis* Hk.**





Plate 5. *Prunus cornuta* (Wall. ex Royle) Steud.



Plate 6. *Prunus jacquemontii* Hk. f.



Plate 7. *Rubus ellipticus* Smith



Plate 8. *Prunus prostrata* Labill.



Plate 9. *Rubus niveus* Thunb. non. Wall.



Plate 10. *Rosa webbiana* Wall. ex Royle



**Plate 11. *Sibbaldia cuneata* Kunze**



**Plate 12. *Sorbaria tomentosa* (Lindl.)  
Rehr**

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