SHORT COMMUNICATION

DISTRIBUTION OF FAMILY APIACEAE (UMBELLIFERAE) IN DISTRICT BANNU, KHYBER PAKHTUNKHWA, PAKISTAN

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خلاصہ

زیر نظر تحقیق میں بارہ انواع سے متعلق بحث کی گئی ہے۔ جن کا تعلق Apiaceae خاندان سے ہے، جن کا ایف آر بنوں اور ضلع بنوں کے مختلف علاقوں میں مشاہدہ کیا گیا ہے۔ ان جنگلی انواع میں سے کچھ کا تعلق قابل کاشت زمینوں اور بعض کا تعلق دریائے کرم کے کنارے ریتلی مٹی سے ہے۔ ان میں *Psamogeton biternatum* جیسے انواع خصوصی طور پر قابل ذکر ہیں۔ ان انواع میں سے زیادہ تر کا تعلق موسم بہار سے ہے مثلا *Scandix pectin-veneris*. قابلِ کاشت انواع میں *Coriandrum sativum* جیسی نوع کو عام پر طور پر کاشت بھی کیا جاتا ہے۔ جبکہ *Foeniculum vulgare* کی نوع کئی قابل کاشت علاقوں میں بھی پائی جاتی ہے۔ *Daucus carota* کو عام طور پر ایف آر بنوں کے علاقے میں اگایا جاتا ہے۔ چند قابلِ کاشت انواع گندم کے کھیتوں میں بھی پائی جاتی ہیں مثلاً *Foeniculum vulgare* اور *Carum copticum* خصوصی طور پر اس سلسلے میں اہم تصور کی جاتی ہیں۔ *Eryngium coeruleum* خودرو حالت میں گنے کے کھیتوں اور ان کی پگڈنڈیوں پر اگتی ہے۔ زیر بحث تحقیق سے یہ واضح ہوتا ہے کہ یہ علاقہ Apiaceae کے نشوونما کے لیے موسمیاتی طور پر موزوں نہیں ہے۔ اس سلسلے میں مزید تحقیقی کاوش درکار ہے تاکہ مستقبل قریب میں چند نئے انواع کی دریافت بھی ممکن بنائی جاسکے۔

Abstract

The current research work reports 12 species, belonging to Family Apiaceae, recorded from different areas of Bannu District, including F.R Bannu. The wild species are found in or near cultivated fields, some restricted to sandy soil near Kurram River or F.R Bannu, such as *Psamogeton biternatum*. Most of the wild species are found in spring season e.g. *Scandix pectin-veneris*. Among the cultivated species such as *Coriandrum sativum* is commonly grown. However *Foeniculum vulgare* have been found in cultivated state in some areas. *Daucus carota* is very commonly grown in Terhoba, F.R Bannu. Some cultivated species are also found in wild state in wheat fields.e.g. *Foeniculum vulgare* and *Carum copticum. Eryngium coeruleum* occurs wild in sugar cane fields and on field boundaries. The present study shows that the area is not rich in Apiaceae flora chiefly due to climatic conditions. Further efforts are required; perhaps some other species may be discovered from the area in near future.

Key words: Apiaceae, Bannu, Kurram River, Spring season, Wild

Introduction

Apiaceae, a family of about 300 genra and 3000 species is cosmopolitan in distribution, chiefly in North Temperate region (Willis 1973; Mabberley, 1978). In Pakistan it is represented by 56 genra and 167 spescies (Nasir, 1972). Plants are herbs. Stem hollow. Leaves alternate, usually much divided, sheathing exstipulate. Inflorescences generally simple or compound umbel. Flowers small, hermaphrodite, actinomorphic, 5-merous, epigynous. Sepal 5, free. Petal 5,free. Stamen 5, free. Carpals 2, syncarpous ovary inferior. Fruit schizocarpic cremocarp, mericarps ribbed and with vittae.

Seed face (commissural albumen) plane, concave to sulcate (Menglan et al., 2005). The family is of considerable economic importance for food, flavouring, medicinal and ornamental plants. Most of the plants are carminative e.g. *Foeniculum vulgare* (Fennel), *Anethum graveolens* (Dill), *Apium graveolens* (Celery), *Carum carvi* (Caraway), *Coriandrum sativum* (Coriander), *Ferula assa-foetida* (Asafoetida), *Carum copticum* (Lovage). Essential oils are also obtained from seeds of many species (Evergetis et al., 2012). Those of Dill, Celery, Coriander and Fennel have many uses.

Pollen morphology of the family has been studied (Erdtman, 1952 ; Ting, 1961 ; Ting et al., 1964; Punt, 1984 and Cerceau-Larrival, 1961, 1971, 1981). There have been some studies on the phylogeny of the family

(Elibol et al., 2012) and its genra. For example Pimenow and Leonov (1993) recognized the genus Ferula in the tribe Peucedaneae, Downie et al. 2001 on the basis of comprehensive molecular phyllogenetic work in apioid superclade and Ajani and Ajani, 2008 on the basis of ITS sequence analysis placed Ferula group including Dorema, Leutea and Ferula in the tribe Scandiceae. The purpose of present study is to express members of Family Apiaceae in Bannu District.

Materials and Methods

The Following general techniques were applied.
Collection of Plants: Plant species were collected from the area during different season of 2014 and 2015. The specimens were mostly collected in duplicate or triplicate, preferably in flowering or fruiting condition.

Drying and Pressing: The collected specimens were then dried and pressed using ordinary News paper folders and pressers. The pressure was kept gentle to avoid blackening and decay of plant material.

Poisoning: The pressed specimens were poisoned with Mercuric chloride solution to keep away insect and fungal pests.

Mounting, Stitching and Labeling: Dried specimens were glued and stitched on Herbarium sheets made up of thick card sheets cut to the required international size of 44 x 29 cms (Slavik, 1974). The field data was then entered on the right hand side lower corner of Herbarium sheets. To keep away small insects, such as book-warms, silver-fish, etc., the specimens were sprayed with repellants or disinfectants, such as DDT or copper-sulphate solution at suitable intervals

Identification and characterization of plants: The collected plants of family Apiacea were identified by using taxonomic keys. All the collected plants were similarly characterized and placed in the respective group.

Results and Discussion

Of the total 56 genera and 167 species of Apiaceae reported from Pakistan (Nasir, 1972), only following plants were found in Bannu District in wild and/or cultivated state as shown in the Table below.

Basic information of collected Apiaceae Plants.

S. #	Plant Name	Flowering Period	Occurance/ Distribution	Plant habit	Relative abundance
1.	*Coriandrum sativum* L.	Late spring	Cultivated	Annual Herb	Common
2	*Foeniculum vulgare* Mill.	Late spring and Early summer	Cultivated, Also weed of wheat fields	Perennial Herb	Rare
3	*Carum copticum* Benth.	Late spring and early summer	Weed of wheat field, Rarely cultivated	Annual Herb	Rare
4	*Psamogeton biternatum* Edgw.	Spring	Kurram river bank, dry sandy beds.	Annual Herb	Rare
5	*Torilis leptophyla* (L.) Reichb.f.	Spring	Field boundaries	Annual Herb	Common
6	*Scandix pectinveneris* L.	Spring	Field boundaries, Stream banks	Annual Herb	Common
7	*Eryngium coeruleum* M.Bieb	summer	Sugar cane fields, Field boundaries	Perennial Herb	Rare
8	*Daucus carota* L.	spring	Cultivated	Biennial Herb	Common
9	*Cuminum cyminum* L.	Spring	Cultivated	Annual Herb	Rare
10	*Apium graveolens* L.	Spring	Cultivated	Annual or Perennial Herb	Rare
11	*Anethum graveolens* L.	Spring	Cultivated, Weed of wheat fields	Annual Herb	Rare
12	*Petroselinum crispum* (Miller) A.W.Hill.	Late spring	Cultivated	Biennial Herb	Rare

Plants of Apiaceae are widely distributed, most abundant in the north temperate and sub-tropical regions, but largely absent from the tropics. In Pakistan also out of the total 167 species (Nasir, 1972) majority of them is found in temperate regions. The total 12 Apiaceous species in District Bannu are few as compared to other regions of the country. Climate, physiography, pollution, competition and succession determine flora of an area (Bidwell, 1974). The distribution of weeds besides resting upon ecological barriers, edaphic, physiographic and biotic factor also play an important role on the dissemination mechanism, structure, time of germination and viability of seeds.

The people of the area should not ignore the importance of Family Apiaceae as member of the Family have different useful economic aspects, such as food value *(Daucus carota, Coriandrum sativum* etc), Medicinal value chiefly carminative (*Carum copticum* and *Foeniculum vulgare* etc.). Cultivated species of the family grown in other district of Pakistan should also be introduced in Bannu for ornamental and other purposes. This will be useful for people of the area.

References

Ajani, Y. and M. Ajani. (2008). A new species of *Ferula* (Apiaceae) from southern Iran. Edinb. J. Bot., 65: 425-431.

Bidwel, R.G.S. (1974). Plant Physiology. USA.

Cerceau-Larrival, M.-Th. (1961). Pl antules et pollen d'Ombellifères. Mèm. Mus. Natl. Hist. Nat., Sèr. 2B, 14: 1-166.

Cerceau-Larrival, M.-Th. (1971). Morphologie pollinique et corrèlations phylogènetiques chez les Ombellifères. In: The Biology and Chemistry of the Apiaceae. (Ed.): V.H. Heywood. J. Linn. Soc. Bot., Suppl., pp. 109-156.

Cerceau-Larrivalm, M.-Th. (1981). World pollen and spore flora 9. Apiaceae Juss. Hydrocotyloideae Drude/Hydrocotyleae Drude. Almqvist and Wiksell, Stockholm, pp. 1-33.

Downie, S.R., Plunkett, G.M. Watson, M.F. Spalik, K. Katz-Dawnie, D.S. Valiejo-Roman, C.M. Terentieva, E.I. Troitsky, A.V. Lee, B.Y. Lahham, J. and El-Oqlah, A. (2001). Tribes and clades within Apiaceae subfamily Apioideae: the contribution of molecular data. Edinb. J. Bot., 58(2): 301-330.

Elibol, Z., Menemen, Y., Sagiroglu, M. and Duman, H. (2012). A molecular phylogenetic study on some Turkish ferula l. (Apiaceae) species using nrdna its sequences. Pak. J. Bot., 44(2): 589-594.

Mabberley, D.I. (1987). The Plant Book. Camb. Univ. Press, Cambridge, New York.

Menglan, S. Pu Fad ng, Pan Zehui; Mark F. Watson, John F. M. Cannon, Ingrid Hol mes-Smith,

Nasir, E. (1972). Apiaceae. In: Flora of Pakistan. (Eds.): Nasir, E. and Ali, S.I. No. 20 pp.1-168. Gordon College Rawalpindi.

Nilsson, S., Praglows ki, J. and Nilsson, L. (1977). An atlas of airborne pollen grains and spores in northern Europe . Natur och Kultur, Stockholm, 159 pp.

Piccaglia, R. and Marotti, M. (2001). Characterization of some Italian types of wild fennel (*Foeniculum vulgare* Mill.). J. Agric and Food Chem., 49: 239-244.

Pimenov, M.G. and Leonov, M.V. (1993). The Asian Apiaceae biodiversity database (ASIUM) with particular reference to south-west Asian taxa. Turk. J. Bot., 6: 139- 145.

Punt, W. (1984). Apiaceae. In: The northwest European pollen flora. (Eds.): W. Punt, S. Rechinger, K.H. (1972). Family Apiaceae. In flora Iranica, Akademische Druck-u. Verlagsanstalt, Graz, Austria.

Slavik, B. (1974). Wild Flowers. Octopus Books, London.

Ting, W.S. (1961). On some pollen of Californian Apiaceae. Pollen et spores. 3: 189-199.

Willis, J.C. (1973). A Dictionary of the flowering Plants & Ferns. VII ed. University Press.