



ISSN (E): 2320-3862
ISSN (P): 2394-0530
<https://www.plantsjournal.com>
JMPS 2023; 11(2): 12-15
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Received: 15-12-2022
Accepted: 28-01-2023

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Inventorizations of some wild angiosperm species from Faridkot, Punjab, India

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Abstract

Total of 25 angiosperm species recorded from the study area (Faridkot, Punjab, India) during August 2022 to December 2022. These species generally occurs as a weed in crops as well as in waste places of the study area. Morphological features of these species were also studied in details for proper identification.

Keywords: Inventorizations, Angiosperm, Species, Morphological, Weed, Taxonomy

Introduction

Human beings and other life forms are depends upon plants for food, fodder and medicines. Plants are also used by humans in cultural and religion ceremonies. Out of all groups of plants, angiosperm is a major and advance group. It consists of two groups such as dicot and monocot which are differentiated from one another on the basis of nature of leaf, stem, root, fruit, seed *etc.* According to Christenhusz and Byng 2016 ^[2], Angiosperms consists of 2, 95,383 species which are distributed all over the world.

There are large number of angiosperms plants growing as a weed in crops, waste places and gardens. Weed plants varies from season to season. *Portulaca oleracea*, *Cyperus rotundus*, *Eclipta alba etc.* are common weeds of kharif season were as *Chenopodium album*, *Medicago Polymorpha*, *Polygonum etc.* are common weeds of rabi season. Some weeds such as *Cynodon dactylon* and *Parthenium hysterophorus* are occur throughout the years.

Morphological features such as leaf, stem, roots, flower, seed *etc.* are used by scientists and taxonomists for identification of plants. This tool is simple, cost effective and easily available (Singh and Sidhu 2022) ^[13].

Sharma & Bir, 1978 ^[6]; Meenakshi & Sharma, 1985 ^[5]; Sharma *et al.*, 1987 ^[8]; Sharma, 1990 ^[7]; Sidhu, 1991 ^[12]; Singh & Singh, 2019 ^[14]; Singh & Singh, 2020 ^[15]; Sidhu & Singh, 2020 ^[9]; Sidhu & Singh 2021 a ^[10]; Sidhu & Singh, 2021b ^[11] and Singh & Sidhu, 2022 ^[13] studied floral diversity from the state of Punjab, India. There is no any updated information about morphological features of wild angiosperms. Keeping this in view, present was planned for documentation of angiosperm wild species.

Materials and Methods

Study Area

Faridkot district situated in northern part of the state of Punjab, India. It is generally considered semi-arid region of the state. Present study was conducted from August 2022 to December 2022 in crops, gardens and waste places for documentation for angiosperms especially wild species.

Taxonomic identification

Morphological features such as leaf, stem, flowers, seeds, fruits *etc.* were examined for identification. For confirmation of identification of species, literature (Hooker, 1872-1897 ^[4]; Collet, 1902^[3]; Bamber, 1916 ^[1]; Sharma & Bir, 1978 ^[6]; Meenakshi & Sharma, 1985 ^[5]; Sharma *et al.*, 1987 ^[8]; Sharma, 1990 ^[7]; Sidhu, 1991 ^[12]; Singh & Singh, 2019 ^[14]; Singh & Singh, 2020 ^[15]; Sidhu & Singh 2021 a ^[10]; Sidhu & Singh, 2021b ^[11] and Singh & Sidhu, 2022) ^[13] was also consulted.

Herbarium preparation and photography

Herbarium sheets of some species were also prepared and deposited to Herbarium (KSF), Biology Lab, S.S.B.P. Khalsa Senior Secondary School, Faridkot, Punjab. Field photographs of plant species were also clicked using mobile camera.

Results and Discussion

During present investigation, twenty five (25) angiosperm wild species belonging to 23 genera and 14 families were recorded as a weed from crops, gardens and waste places (Table.1.) (Fig.1.). Asteraceae is a dominant family with 5 species followed by Poaceae and Solanaceae with 3 species each, Brassicaceae, Malvaceae and Scrophulariaceae with 2 species each (Table.2.A-K). Rest of the families represented with one species each. Out of 23 genera's, only two genera (*Solanum* and *Veronica*) represents two species each whereas rest of the genera's are monotypic. Out of 25 species, 22

species are dicots and only 3 monocots. Singh and Singh (2020) [15], also documented dominant nature of dicots over monocots in wild angiosperms from District Fatehgarh Sahib, Punjab, India.

Morphologically, documented species shows great variations from one another in nature of stem, leaves, flowers and fruits. Some plants such as *Ageratum houstonianum*, *Amaranthus viridis*, *Chenopodium album*, *Amaranthus viridis*, *Gnaphalium pensylvanicum*, *Stellaria media* etc. were hairy whereas *Rorippa indica*, *Polypogon monspeliensis*, *Sonchus oleraceus* etc. were glabrous in nature. Singh and Sidhu (2022) [13] studied morphological features of ten species (*Datura innoxia*, *Erigeron bonariensis*, *Nicotiana plumbaginifolia*, *Physalis angulata*, *Sesbania bispinosa*, *Sida cordifolia*, *Solanum americanum*, *Solanum nigrum*, *Solanum villosum*, and *Solanum virginianum*) and concluded morphology is a simple tool and easily available for identification of plants.

Table 1: Taxonomic details of documented Angiosperms.

S. No.	Botanical Name	Family	Life form	Taxonomic note
1	<i>Ageratum houstonianum</i> Mill.	Asteraceae	A	Branched herbaceous to woody herb. Stem hairy, branched, erect and brown. Leaves, hairy, green and heart shaped. Flowers blue, small in capitulum. Seed small and black.
2	<i>Amaranthus viridis</i> L.	Amaranthaceae	A	Erect, medium herb. Stem branched, hairy. Leaves green, lanceolate. Flowers small born on spike. Seeds small, rounded and black.
3	<i>Calotropis procera</i> (Aiton) Dryand	Asclepiadaceae	P	Erect branched shrub. Stem angular, densely hairy, woody. Leaves opposite decussate, oblong, elliptic. Flowers are bisexual, complete. Fruits Follicle, curved, long. Seeds numerous, light brown, with white silky hairs (coma).
4	<i>Cenchrus ciliaris</i> L.	Poaceae	A	Decumbent to erect herb. Stem erect, slender, branched. Leaves linear, hairy and long. Inflorescence terminal spike. Fruit small caryopsis. Seeds small.
5	<i>Chenopodium album</i> L.	Chenopodiaceae	A	Medium size to tall and branched herb or undershrub. Stem is erect, branched, hairy and green. Leaves, lobed, green with white mass. Flowers are small and born in bunches. Seed small and black in colour.
6	<i>Cirsium arvense</i> (L.) Scop	Asteraceae	A	Erect, branched herb. Stem is hairy tall, slender, green. Leaves alternate, pinnately segmented, and spiny. Flowers pinkish-blue, small in capitulum. Seed small, black.
7	<i>Coronopus didymus</i> (L.) Sm	Brassicaceae	A	Decumbent, green and hairy herb. Leaves alternate, pinnate and green. Flowers small, green. Pods small and green. Fruits compressed and 2seeded. Seeds brown to black
8	<i>Cynodon dactylon</i> (L.) Pers	Poaceae	P	Creeping to decumbent erect. Roots are fibrous. Stem glabrous, running, green. Leaves alternate, smooth, linear and long. Flowers small and bisexual. Caryopsis are elongated, glabrous and yellowish-brown in color.
9	<i>Datura innoxia</i> Mill.	Solanaceae	A	Branched herb or under shrub. Stem is branched, hairy and green. Leaves are green and large. Flowers are white and long. Fruit is berry with spines. Seeds brown and small.
10	<i>Fumaria indica</i> (Hausskn.) Pugsley	Fumariaceae	A	Spreading to decumbent herb. Stem slender, branched and green. Leaves broad, linear and green. Flowers purplish red. Fruits round and small.
11	<i>Gnaphalium pensylvanicum</i> Willd.	Asteraceae	A	Erect, annual herb. Stem, erect and hairy. Leaves green and dense hairy. Heads in bunches. Flowers smaller. Fruit achenes.
12	<i>Malva parviflora</i> L.	Malvaceae	A	Erect and decumbent herb. Stem herbaceous to woody, hairy. Leaves circular, base chordate, palmately veined. The petiole is long. Flowers white to pink. Fruits button shaped. Seeds reddish brown to black.
13	<i>Oxalis corniculata</i> L.	Oxalidaceae	P	Decumbent or prostrate herb. Stem is branched, slender, and hairy. Leaves trilobed, hairy and green, Flowers yellow, medium size. Seeds small and black.
14	<i>Parthenium hysterophorus</i> L.	Asteraceae	P	Branched and aromatic herb. Stem is erect, hiry, branched and green. Leaves large, palmately, hairy and green. Flowers small, white capitulum. Seeds small black.
15	<i>Polypogon monspeliensis</i> (L.) Desf	Poaceae	A	Erect tall grass. Stem long, erect, glabrous and green. Leaves linear, long, glabrous, base hairy, green. Flowers small, bisexual and sessile. Fruits small, elongated and green.
16	<i>Rorippa indica</i> (L.) Hiern.	Brassicaceae	A	Annual erect glabrous herb. Stem herbaceous to woody. Leaves oblong. Flowers bisexual and yellow. Fruits lobed, medium size pods. Seeds minute and black.
17	<i>Rumex spinosus</i> L.	Polygonaceae	A	Decumbent to ascending broadleaf annual deep rooted herb. Stem dichotomously branched green, herbaceous and then woody after maturity. Leaves rounded, simple, green, and glabrous. Flowers are pinkish to purple, small. Fruits small and brown.
18	<i>Sesbania bispinosa</i> (Jacq.) W. Wight	Fabaceae	A	Tall branched shrub. Stem branched, green, small spines. Leaves small bipinnate. Flowers yellow, papilionaceous. Fruits green, narrow long pods. Seed brown, smooth.
19	<i>Sida cordifolia</i> L.	Malvaceae	A	Multibranching herb or undershrub. Stem is hairy and whitish green, Leaves smooth, whitish green, heart shaped. Flowers pale yellow, small. Seeds brown with appendages.
20	<i>Solanum nigrum</i> L.	Solanaceae	A	Herbaceous to woody. Stem is bluish green, branched. Leaves green, petiolated. Flowers white, stamens yellow, small and born in bunches. Fruits rounded, smooth and purple. Seed small, white to yellow.
21	<i>Solanum virginianum</i> L.	Solanaceae	A	Branched and procumbent herb. Stem id herbaceous to woody with spines. Leaves are

				green, rough with spines. Flowers blue, medium size, stamens yellow. Fruits, green to yellow, rounded. Seed small and brown.
22	<i>Sonchus oleraceus</i> Wall	Asteraceae		Erect and tall herb. Stem hollow, green and smooth. Leaves thin, sessile, lanceolate. Heads yellow. Achenes compressed, narrow, light brown. Pappus are white and longer.
23	<i>Stellaria media</i> (L.) Vill	Caryophyllaceae	A	Ascending, decumbent, glabrous herb. Stem smooth to hairy, branched. Leaves alternate, thin ovate-elliptic to oblong, spatulate green. Flowers hermaphrodite, born in bunches. Fruits capsule. Seeds circular, greyish brown to brown.
24	<i>Veronica anagallis-aquatica</i> L.	Scrophulariaceae	A	Erect tall herb. Stem herbaceous, branched, light green, hollow and glabrous. Leaves long, elliptic, ovate in shape, smooth, sessile. Inflorescence terminal and axillary racemes. Flowers small. Fruit small capsule. Seeds small and brown.
25	<i>Veronica didyma</i> Ten.	Scrophulariaceae	A	Pubescent to prostrate herb. Stem green, hairy, branched. Leaves simple, ovate, dark green and rounded. Flowers small, bisexual and bright blue. Fruit small, rounded.

A= Annual; P= Perennial



Fig 2 (a-k): Field photographs of some Angiosperms. A- *Ageratum houstonianum*, B- *Calotropis procera*, C- *Cirsium arvense*, D- *Coronopus didyma*, E- *Fumaria indica*, F- *Gnaphalium pensylvanicum*, G- *Oxalis corniculata*, H- *Parthenium hysterophorus*, I- *Rorippa indica*, J- *Sonchus oleraceus*, K- *Veronica didymium*. (© Rai Singh, Sukhpreet Singh and Arshdeep Singh).

Table 2: Number of families, genera and species.

S. No.	Family	Genera	Species
1.	Asteraceae	5	5
2.	Scrophulariaceae	1	2
3.	Caryophyllaceae	1	1
4.	Solanaceae	2	3
5.	Polygonaceae	1	1
6.	Chenopodiaceae	1	1
7.	Fabaceae	1	1
8.	Poaceae	3	3
9.	Fumariaceae	1	1
10.	Malvaceae	2	2
11.	Asclepiadaceae	1	1
12.	Amaranthaceae	1	1
13.	Brassicaceae	2	2
14.	Oxalidaceae	1	1
	Total	23	25

Conclusion

Twenty five (25) species of wild angiosperm are identified on the basis of morphological features (Stem, leaf, flower, fruit

and seed). Taxonomic nature of documented species also studied which will be useful of researchers, botanists, taxonomists etc. for identification of species.

Acknowledgment

Authors are thankful to Smt. Bhupinder Kaur Sran (Principal) and Sr. Swarnjeet Singh Gill (Chairman), S.S.B.P. Khalsa Sen. Sec. School, Faridkot, Punjab for providing necessary conditions for this research work.

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