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Prominent weed flora of Chambal ravine

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Abstract

The recognition of plants as weeds is perhaps as old as agriculture itself. When land is cultivated to raise crops, weeds spring-up naturally along with the crop plants. Weeds represent one of the greatest limiting factors to efficient crop production. The invasive weeds disturb the structure and composition of the native vegetation and as a result create pressure on the food chain and web of the ecosystem. The biology of weeds including identification and distribution, also need to effective control. The ecological information has always been prerequisite for such efforts. Weed flora of Chambal ravines have been taken to collect information on distribution of weeds in ravines from different areas of Morena district for the first time. On the basis of present study the major weeds found in ravine lands were identified. Current study is based on survey of weeds in ravines of Morena district of Madhya Pradesh, which provides a preliminary data. It provides information about the prominent weeds of Chambal Ravines. It will also be useful in suggesting suitable weed management recommendation and land utilization patterns for this region.

Keywords: Chambal Ravine, Weed flora, Identification, Prominent weeds

Introduction

The recognition of plants as weeds is perhaps as old as agriculture itself. When, land is cultivated to raise crops, weeds growing naturally along with the crop plants. Weeds are defined as “a plant out of place or an unwanted plant or a plant with a negative or plant that compete with man for the soil” (Kasera *et al.* 1998). Weeds are the plants, which grow where they are not wanted. Weeds differ from other plants in being more adaptive and having peculiar characteristics that make them more competitive (Dangwal *et al.*, 2010) [6]. They are non-indigenous plants that can invade or negatively alternative plant communities (Muhammad *et al.*, 2009) [15]. Weeds represent one of the major limiting factors to efficient crop production. The Weeds cause greater economic losses on agricultural lands than all other pests combined (Kremer and Kennedy 1996) [11]. These weeds effectively compete with the crop for nutrients, water, and space and reduce the yield ranging from 12 to 51 % (Rao and Singh, 1997; Mukharjee and Singh, 2005; Halder and Patra, 2007) [19, 16, 9]. Weeds also serve as reservoir for plant pathogens that may cause significant loss in crop production. They may also support populations of non-native animals and microbes and hybridize with native species subsequently altering the gene pools (Mahanta *et al.*, 2007) [12].

The invasive weeds disturb the structure and composition of the native vegetation and as a result create pressure on the food chain and web of the ecosystem (Pysek and Richardson, 2007 [18]; Bais *et al.*, 2003 [4]; Pimentel *et al.*, 2000) [17]. Weeds establish mutualistic relationship with insect pollinators to successfully invade new area (Jesse *et al.*, 2006; Morale and Aizen, 2006) [10, 14] affecting numerous ecosystems. Certain weeds release into the soil the inhibitors or poisonous substances which are harmful to the plants, human beings and live-stocks (Farkas, 2006) [7]. They increases the expenditure on labour and equipment, render harvesting difficult, and reduce the quality and marketability of agricultural produce.

The biology of weeds including identification and distribution, also deserve attention for effective control. It is also necessary for sustainable land use planning. The ecological information has always been pre-requisite for such efforts. Weed flora of Chambal ravines have been taken to collect information on distribution of weeds in ravines from different areas of Morena district for the first time. Hence the present study was taken up on the diversity and indigenous uses of dominated weeds in ravines of Morena district to fill the back drop.

Material and methods

The climate of the ravine region in, Madhya Pradesh is semi-arid to sub-humid with annual average rainfall of 600 mm to 800 mm, mostly received from July to October in intense storms. The temperatures may vary from 3 to 47 °C during coldest to hottest months. Humidity may be as low as 7% and evaporation was very high (8-10mm/day) during May and June.

All the weeds encountered in the Ravine sites in Morena district of gird zone of the Madhya Pradesh collected and identified. Weed specimens were collected for confirmation of identify and some farmers were interviewed and questioned about problematic weeds in the area. The detailed information was collected with help of internet for proper identification of botanical name and other character of weed.

Results and discussion

During the survey of the Ravines, the number of species were related to total 33 number of families. The major plants were found under *Asteraceae*(11), *Poaceae*(09) *Solanaceae* (05), *Convolvulaceae* (04), *Malvaceae* (04) *Fabaceae* (03), *Euphorbiaceae* (03) *Amaranthaceae* (03), *Asclepiadaceae* (02), *Cyperaceae* (02), and *Lamiaceae* (02) (Table-2). Rest 22 families have only one species was identified in Chambal Ravines of Morena district of gird region in Madhya Pradesh. The weeds especially *Argemonmaxicana*, *Cyperusrotundus*, *Cynadondactylon*, *Fimbristylis* spp., *Partheniumhyterophogus*, *Sanchrusspontanium*, *Achranthusaspera*, *Amaranthusspinosus*, *Alternentherasissilis*, *Asphodelustenuepholeus*, *Echinicloacrusgalli*, *Commelinabenghalensis*, *Convolvulus arvensis*, *Dinebraarebica*, *Eclipta alba*, *Eragriostris* Spp., *Helicotropiumpaniculatum*, *Phylemthusniruri* and *Tryanthemamonogyna* etc. (Anonymous 2000 to 2015^[2] and Tomar *et al.* 2014)^[22] were also profusely found in cropped land or different crops in the region. Description for identification of major weeds was as follows:-

Capparissepriaria

Capparis is a flowering plantgenus in the familyCapparaceae which is included in the Brassicaceae in the unrevised APG II system. These plants are shrubs or lianas and are collectively known as caper shrubs or caperbushes.



Xanthium strumarium

Xanthium strumarium (rough cocklebur, clotbur, common cocklebur, large cocklebur, woolgarie bur) is a species of annual plants belonging to the Asteraceae family. It probably originates in North America and has been extensively naturalized elsewhere.



Pergulariadaemia

Pergulariadaemia, the **trellis-vine**, is a hispid, perennialvine in the Apocynaceae family, with an extensive range in the Old World tropics and subtropics Bhaskar, and Balakrishnan, 2009)^[5]. It has been used traditionally to treat a number of ailments.



Ceropegiabulbosa

Ceropegiabulbosa is a vine which varies widely distributed, growing sporadically almost throughout India in red laterite soil. The leaves are almost stalk less to stalked, round to ovate leaves. The flowers are pale gray, becoming grayish-purple towards the mouth. Flowers are borne in stalked clusters; 3-5 flowered, arising between the leaf-stalks. Stalks are 1.2-2.6 cm long. Flower-stalks are 3-7 mm long. Flowers are up to 2.5 cm long, hairless on the exterior. Whitish green with purple marking lobes deep purple, 4.5 cm long, narrow, hairy. Outer corona lobes are rounded to shortly pointed, inner lobes linear, about 2 mm long.



Argemonemexicana

Argemonemexicana (Mexican poppy, (BSBI List 2007)^[1] Mexican prickly poppy, flowering thistle, Thomas(1986)^[21] cardo or cardosanto) is a species of poppy found in Mexico and now widely naturalized in many parts of the world. An extremely hardy pioneer plant, it is tolerant of drought and poor soil, often being the only cover on new road cuttings or verges. It has bright yellow latex, and though poisonous to grazing animals, is rarely eaten, but has been used medicinally by many people including those in its native area, the Natives of the western US and parts of Mexico Felger, and Moser(1985)^[8].



Tephrosiapurpurea

Tephrosiapurpurea is a species of flowering plant in the pea family, Fabaceae, that has a pantropical distribution. It is a common wasteland weed. In many parts it is under cultivation as green manure crop. It is found throughout India and Sri Lanka Arnold and Harry (1968) [3]. in poor soils. Common names include: Bengali: (Janglineel).



Cleome viscosa

Cleome is a genus of flowering plants in the familyCleomaceae. Previously it had been placed in the family Capparaceae, until DNA studies found the Cleomaceae genera to be more closely related to the Brassicaceae than the Capparaceae. The APG II system Stevens (2001) [20] allows for *Cleome* and the other members of the Cleomaceae to be included in the Brassicaceae.



Tribulusterrestris

Tribulusterrestris is an annual plant in the caltrop family widely distributed around the world, that is adapted to grow in dry climate locations in which few other plants can survive. Its extracts are widely used by body builders.



Glinuslotooides

Glinuslotooides is a species of flowering plant in the family Molluginaceae known by the common names damascisa and lotus sweetjuice. It is native to Eurasia and Africa and it is known in many other places as an introduced species. It is a prostrate to somewhat upright annual herb with a stem up to about 30 or 35 centimeters long and coated in felt like whitish hairs.



Ipomoea sp.,

Ipomoea is the largest genus in the flowering plantfamilyConvolvulaceae, with over 500 species. It is a large and diverse group with common names including morning glory, water convolvulus or kangkung, sweet potato, bindweed, moonflower, etc.



Pedalium murex

Pedalium is a genus of plant in the Pedaliaceae family comprising one species, *Pedalium murex*. It is distributed in India, Sri Lanka and Tropical Africa.



Boerhaviadiffusa

Boerhaviadiffusa is a species of flowering plant in the four o'clock family which is commonly known as punarnava (meaning that which rejuvenates or renews the body in Ayurveda) [Bhomik *et al.* 2012] red spiderling, spreading hogweedortarvine. It is taken in herbal medicine for pain relief and other uses. The leaves of *B. diffusa* are often used as a green vegetable in many parts of India.



Cyperusrotundus

Cyperusrotundus (coco-grass, Java grass, nut grass,purple nut sedge, or purple nutsedge,[BSBI List 2007]red nut sedge, Khmerkravanhchruk (Martin and Chanty (2009) [13] is a species of sedge (Cyperaceae) native to Africa, southern and central Europe (north to France and Austria), and southern Asia. It prefers dry conditions, but will tolerate moist soils, it often grows in wastelands and in crop fields.



Fimbristylis sp.

Fimbristylis sp. is a species of fimbry known by the common names rusty sedge and West Indian fimbry. The plant is common along the coast line and estuaries of Australia. It is also native to parts of Africa, southern Asia, and South America. The flowers are a distinctive rusty brown color appearing on a single spikelet from May to July.



Brachiaria Sp.

Brachiaria are annual or perennial grasses, most lacking rhizomes. The inflorescence is a branching panicle, and the plant reaches about a meter in height. Watson and Dallwitz (2008) [23] The plants are bisexual (Watson and Dallwitz (2008)) [23] and the flowers are fleshy, with 3 anthers. Some species have a prominent vein in the center of the leaf. ***Brachiaria*** are C₄ species and can tolerate drier conditions and more light exposure than some other plants.



Cenchrus Sp.

The genus ***Cenchrus*** belongs to the tribe Paniceae, in which the two-flowered spikelets fall when ripe, leaving no glumes. The spikelets are solitary and the pedicels never swollen. ***Cenchrus*** resembles the genus ***Pennisetum***, except that the bristles are wavy and the inner ones flattened at the base. ***Cenchrusciliaris*** has slightly hairy inner bristles, connate at the base only, fine and only slightly flattened at the base. It is a tufted or spreading perennial 12-120 cm tall. It is deep rooting.



Dichanthiumsp

Tufted perennial to 60 cm; the nodes bearded; leaves papillose-pilose at least on the upper surface; first glume of the sessile spikelet not indurate, or slightly indurate. Two to six racemes, sometimes more. Lower glume of sessile spikelet with tubercle-based hairs toward the tip, oblong, obtuse or truncate, keel not winged. Median nerve present, sheaths terete, ligule longis.



Zizyphusnummularia

Zizyphusnummularia is a thorny small bush or a shrub 6-8 m, with widely divaricating, flexuosus, pale-purplish stems and grey velvety stipular prickles in pairs. The branches are widely divaricate, purplish in colour and with a velvety surface. The lateral roots system is deep and extensive.



Calotropisgigantea

Calotropisgigantea is known as Arka in Sanskrit. It is widely used many Ayurvedic treatments, both externally (ksharasutra) and internally. It is a very common herb seen widely throughout India. It is called as Madar in English. Often, its another variety ***Calotropisprocera*** is also used in the same name.



Table 1: Prominent Weed flora in Chambal Ravines

S. No.	Scientific Name	Family	Common Name
1.	<i>Capparissepriaria</i>	<i>Capparaceae</i>	Caper shrubs
2.	<i>Xanthium indicum</i>	<i>Asteraceae</i>	Rough cocklebur
3.	<i>Pergulariadaemia</i>	<i>Apocynaceae</i>	Gadariakibel
4.	<i>Ceropegiabulbosa</i>	<i>Asclepiadoideae</i>	Bulbous ceropegia
5.	<i>Argemonemexicana</i>	<i>Papaveraceae</i>	PiliKateri
6.	<i>Tephrosiapurpurea</i>	<i>Fabaceae,</i>	Janglineel
7.	<i>Cleome viscosa</i>	<i>Cleomaceae</i>	Bagra
8.	<i>Tribulusterrestris</i>	<i>Zygophyllaceae</i>	Gokharu
9.	<i>Glinuslotoides</i>	<i>Molluginaceae</i>	Gandhi buti
10.	<i>Ipomeapalmata</i>	<i>Convolvulaceae</i>	morning glory
11.	<i>Pedaliium murex</i>	<i>Pedaliaceae</i>	Bara Gokhru
12.	<i>Boerhaviadiffusa</i>	<i>Nyctaginaceae</i>	Hogweed
13.	<i>Chrozophoratinctoria</i>	<i>Euphorbiaceae</i>	Dyer's Litmus
14.	<i>Cyperusrotundus</i>	<i>Cyperaceae</i>	purple nut sedge
15.	<i>Fimbristylis sp.</i>	<i>Cyperaceae</i>	rusty sedge
15.	<i>Brachiaria Sp.</i>	<i>Poaceae</i>	Carib grass
16.	<i>Cenchrus Sp.</i>	<i>Poaceae</i>	Buffel grass
17.	<i>Dichanthiumsp</i>	<i>Poaceae</i>	Delhi grass
18.	<i>Calotropisgigantia</i>	<i>Asclepiadaceae</i>	Madar
19.	<i>Cynodondactylon</i>	<i>Poaceae</i>	Dub ghash
20.	<i>Mimosa pudica</i>	<i>Mimoseae</i>	Chhui-mui
21.	<i>Lantana camara</i>	<i>Verbenaceae</i>	Gotiful
22.	<i>Partheniumhysterophorus</i>	<i>Asteraceae</i>	Gajarghass
23.	<i>Cassia tora</i>	<i>Papilionaceae</i>	Charouta
24.	<i>Ocimumbasilicum</i>	<i>Lamiaceae</i>	Ban Tulsa
25.	<i>Solanumxanthocarpum</i>	<i>Solanaceae</i>	Bhatakateri
26.	<i>Ziziphusnumularia</i>	<i>Rhamnaceae</i>	JangaliBer
27.	<i>Datura alba</i>	<i>Solanaceae</i>	Dhatura
28.	<i>Sacharumspontanius</i>	<i>Poaceae</i>	Kansh
29.	<i>DaturafastuosaLinn</i>	<i>Solanaceae</i>	Kala Dhatura
30.	<i>Solanumnigrum</i>	<i>Solanaceae</i>	Makoy
31.	<i>Abutilon Indicum</i>	<i>Malvaceae</i>	Atibalaa
32.	<i>Achranthusaspera</i>	<i>Amaranthaceae</i>	apamarga
33.	<i>Ammaniabaccifera</i>	<i>Lythraceae</i>	JungliMehandi
34.	<i>Amaranthusspinous</i>	<i>Amaranthaceae</i>	Juggalicholai
35.	<i>Azeratumconizoides</i>	<i>Asteraceae</i>	Jungalipudina/Mahkua
36.	<i>Alhagicamelorum</i>	<i>Fabaceae</i>	yavasha
37.	<i>Alternethrasessilis</i>	<i>Amaranthaceae</i>	Khaki
38.	<i>Asphodellustanuifolius</i>	<i>Xanthorrhoeaceae</i>	Pyaji / Pola
39.	<i>Echinochloa crus-galli</i>	<i>Poaceae</i>	Samaa / Barnyard grass
40.	<i>Blumealacera/laciniata</i>	<i>Asteraceae</i>	Cutleafblumea
41.	<i>Clitoriatematea</i>	<i>Fabaceae</i>	Koyala
42.	<i>Clorisbarbata.</i>	<i>Poaceae</i>	Ghodchabbaghash
43.	<i>Commelinabenghalensis</i>	<i>Commelinaceae</i>	kankaua
44.	<i>Convolvulus arvensis</i>	<i>Convolvulaceae</i>	Hirankuri
45.	<i>Corchorusactengulus</i>	<i>Malvaceae</i>	Jangli jute / Chench
46.	<i>Coculusvillorus</i>	<i>Menispermaceae</i>	Moonseed
47.	<i>Dinebraaraebica</i>	<i>Gramineae</i>	Lona
48.	<i>Eclipta alba</i>	<i>Astaraceae</i>	Bhrigraj
49.	<i>Echinopusachinatus</i>	<i>Astaraceae</i>	Gokhru
50.	<i>Eragrostris spp.</i>	<i>Poaceae</i>	Laboosi
51.	<i>Euphorbia hirta</i>	<i>Euphorbiaceae</i>	Badihdudhi
52.	<i>Euphorbia dracunculoides</i>	<i>Euphorbiaceae</i>	Bumburi
53.	<i>Evolvulusalsinoides</i>	<i>Convolvulaceae</i>	Shankhapushpi
54.	<i>Gnaphaliumlutea</i>	<i>Astaraceae</i>	
55.	<i>Heliotropiumpanniculatum/strigosum</i>	<i>Boraginaceae</i>	Hathisoodnd
56.	<i>Lucusaspera</i>	<i>Lamiaceae</i>	Gumba
57.	<i>Lugasceamallis</i>	<i>Astaraceae</i>	-
58.	<i>Marremiaemerginata</i>	<i>Convolviulaceae</i>	Udirkani
59.	<i>Phyllentusniruri</i>	<i>Phyllanthaceae</i>	Hazardana
60.	<i>Pluchealanceolata</i>	<i>Astaraceae</i>	Indian Comphorweed
61.	<i>Porthulacaoleracea</i>	<i>Portulacaceae</i>	Nunia
62.	<i>Pristrophebicalyculata</i>	<i>Acranthaceae</i>	Chaksoni
63.	<i>Sida spp.</i>	<i>Malvaceae</i>	Chikna
64.	<i>Sonechusarvensis</i>	<i>Asteraceae</i>	Junglipudina
65.	<i>Tryanthemamonogyna</i>	<i>Aizoaceae</i>	Pattharchtta
66.	<i>Tridexprocumbanse</i>	<i>Compositae</i>	Tunki
67.	<i>Triumfritarotundifolia</i>	<i>Malvaceae</i>	Menduli
68.	<i>Vernoniacinnera</i>	<i>Asteraceae</i>	Ironweed
69.	<i>Withaniasominifera</i>	<i>Solanaceae</i>	Ashwgandha

Table 2: Total No. of plant as per families

S. No.	Family	No. of plant in Family
01	<i>Acanthaceae</i>	01
02	<i>Aizoaceae</i>	01
03	<i>Amaranthaceae</i>	03
04	<i>Apocynaceae</i>	01
05	<i>Asclepiadaceae</i>	02
06	<i>Astaraceae</i>	11
07	<i>Boraginaceae</i>	01
08	<i>Capparaceae</i>	01
09	<i>Cleomaceae</i>	01
10	<i>Commelinaceae</i>	01
11	<i>Convolviulaceae</i>	04
12	<i>Cyperaceae</i>	02
13	<i>Euphorbiaceae</i>	03
14	<i>Fabaceae</i>	03
15	<i>Lamiaceae</i>	02
16	<i>Lythraceae</i>	01
17	<i>Malvaceae</i>	04
18	<i>Menispermaceae</i>	01
19	<i>Mimoseae</i>	01
20	<i>Molluginaceae</i>	01
21	<i>Nyctaginaceae</i>	01
22	<i>Papaveraceae</i>	01
23	<i>Papilionaceae</i>	01
24	<i>Pedaliaceae</i>	01
25	<i>Phyllanthaceae</i>	01
26	<i>Poaceae</i>	09
27	<i>Portulacaceae</i>	01
28	<i>Rhamnaceae</i>	01
29	<i>Solanaceae</i>	05
30	<i>Sterculiaceae</i>	01
31	<i>Verbenaceae</i>	01
32	<i>Xanthorrhoeaceae</i>	01
33	<i>Zygophyllaceae</i>	01

Conclusion

On the basis of present study the major weeds found in ravine lands were identified. The following conclusions were drawn on the basis of present study

1. Current study is based on weeds survey in ravines area of Morena district of Madhya Pradesh, which provides a preliminary data.
2. It provides the information about the prominent weed flora of Chambal Ravines and there uses.
3. It will also be useful in suggesting suitable weed management recommendation and sustainable land utilization patterns for this region.
4. The maximum numbers of weeds were related to *Astaraceae* and *Poaceae* family.

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