

Survey of Weed Distribution in Ambikapur District of Chhattisgarh

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ABSTRACT

Survey of Ambikapur district was conducted to know the pattern of distribution of weeds along with the identification of 5 alien weeds. In kharif and rabi and summer season 12 blocks and 340 villages covered in Ambikapur during the year 2009-10. In Ambikapur district, *Cynodon dactylon* in rice and rice-fallow registered highest IVI during kharif and rabi seasons respectively. However, *Saccharum spontanium* during Kharif in rice and *Commelina benghalensis* in rice fallow during Rabi registered lowest IVI. In non-cropped area *Cynodon dactylon* during Kharif and Rabi both registered highest density/m², frequency, relative density, relative frequency and IVI.

Key words Survey, Blocks, Kharif, Rabi, Non-cropped, Garbage, IVI, *Cynodon dactylon*, *Saccharum spontanium*, *Commelina benghalensis*

In the year 2006-07 government of India has imported wheat from 11 countries and this imported wheat has been distributed in Chattisgarh also along with other 9 states (namely Tamil Nadu, Andhra Pradesh, Kerela, Karnataka, West Bengal, Maharashtra, Gujraat, Orissa and Madhya Pradesh) through public distribution system. Along with this wheat, seeds of weed species have also entered in our country, of which 5 weeds are of alien nature, namely, *Ambrosia trifida*, *Cenchrus tribuloides*, *Cyanoglossum officinale*, *Solanum carolinense* and *Viola arvensis*. Initial control of these alien weeds is of utmost importance to avoid their epidemic spread as has happened in case of *Parthenium hysterophorus*. The Convention on Biological Diversity held in 1992 in Rio de Janeiro (Article 8h) also emphasized the serious threat to native flora from exotic invasive weeds and urges the scientific community to take steps for their control and eradication (Rao and Kavitha 2012). With this view a surveillance programme had been initiated in 2008, so that, identification of 5 new suspected entries of alien weeds be done timely and strategies

be evolved to control these weeds at the initial period of spread in the state.

Ambikapur region has been heavily infested by different weed flora throughout the year. The cultivated area have serious weed problems which reduce the yield of the crops. The crops suffer heavily in early growth stage from the weeds. Critical period of crop weed-competition has been identified as 20-30 DAS. Type of crop and soil properties has greatest influence on the occurrence of weed species (Streibig *et al.*, 1984, Andreasen *et al.*, 1991). The infestation of weeds is significantly influenced by cropping pattern, weed control measures, moisture availability period and environmental factors (Saavendra *et al.*, 1980). Therefore, the knowledge of weed species occurrence in crops of the region is necessary to plan and execute a proper and economical weed management schedule.

MATERIAL AND METHOD

Initially, a grid map of Ambikapur districts was prepared to conduct an effective surveillance of 5 alien weeds and survey of prevalent weed flora of kharif, rabi and summer seasons in the district. 16 blocks and 340 villages (199 villages in kharif season and 141 villages in Rabi season) were covered during 2008-10 in Ambikapur district.

Fields of three farmers from each village were chosen for study. With each farmer, three locations viz. cropped area, non-cropped area and garbage area were considered the best places for conducting the survey, so that all types of weed species may be covered. At each point of survey, for taking weed observation through quadrat method, quadrat of 0.5 m (i.e. 0.25 sq.m. area) was used. This quadrat was dropped randomly at five different places in cropped area, non cropped area and garbage area. Total number of all types of weed species occurring in each quadrat was recorded. The weed species uprooted during the observation were dried at room temperature initially and finally

were dried in the oven and dry weight was recorded accordingly for each species of weeds surveyed at different locations. Accordingly, density of weed per sq.m.; dominance, frequency %, relative density, relative dominance, relative frequency and IVI (Importance Value Index) were calculated. Average values of relative weed density, relative frequency of individual weeds and Importance Value Index (IVI) were calculated by given formula:-

$$\text{Relative density} = \frac{\text{No. of individual species} \times 100}{\text{No. of total species}}$$

$$\text{Relative frequency} = \frac{\text{No. of individual species in each block} \times 100}{\text{Total no. of species in each block}}$$

$$\text{Relative dominance} = \frac{\text{Absolute dominance} \times 100}{(\text{Total no. of weed densities}) \times (\text{Total no. of dry weights})}$$

Importance Value Index = Relative density + Relative frequency + Relative dominance

RESULT AND DISCUSSION

In Ambikapur district, A total number of 28 weed species in Rice, 17 weed species in Tomato, 23 weed species in Maize, 15 weed species in sugarcane, 12 weed species in Chilli, 04 weed species in Cabbage, 10 weed species in Bittergaurd, 10 weed species in Onion, 10 weed species in Brinjal, 03 weed species in Cauliflower, 07 weed species in Cowpea, 07 weed species in Spong guard, 09 weed species in Arhar, 27 weed species in Rice-fallow, 06 weed species in Blackgram and 05 weed species in Groundnut were identified during the survey in cropped area of Ambikapur district. *Cynodon dactylon* registered with highest density, dominance, frequency, relative density, relative frequency, relative dominance and IVI among the 28 weed species in rice. However, ecological parameters of weed *Saccharum spontanium* were found to be lowest amongst the 28 weed species in the rice crop of Ambikapur district during survey. Three dominant weed species with highest IVI in different crops of Ambikapur district during *Khariif* 09-10 are as follows:-

S.No.	Cropped Area	3 Dominant Weeds
1	Rice	<i>Cynodon dactylon</i> ; <i>Cyperus iria</i> ; <i>Echinochloa colona</i> ;
2	Tomato	<i>Partulaca oleracea</i> ; <i>Cassia tora</i> ; <i>Setaria glauca</i>
3	Maize	<i>Bracharia ramosa</i> ; <i>Cynodon dactylon</i> ; <i>Cyperus iria</i>
4	Sugarcane	<i>Cassia tora</i> ; <i>Spilanthus spp</i> ; <i>Chloris barbata</i>
5	Chilly	<i>Cyperus iria</i> ; <i>Cynodon dactylon</i> ; <i>Cassia tora</i>
6	Cabbage	<i>Digitaria sanguinalis</i> ; <i>Partulaca oleracea</i> ; <i>Anagallis arvensis</i>
7	Bittergaurd	<i>Digitaria sanguinalis</i> ; <i>Ageratum conyzoides</i> ; <i>Malvestrum spp</i> .
8	Onion	<i>Cynodon dactylon</i> ; <i>Cyperus iria</i> ; <i>Cuscuta chinensis</i>
9	Brinjal	<i>Ageratum conyzoides</i> ; <i>Cyperus iria</i> ; <i>Commelina benghalensis</i>
10	Cauliflower	<i>Digitaria sanguinalis</i> ; <i>Spilanthus spp</i> ; <i>Partulaca oleracea</i>
11	Cowpea	<i>Cynodon dactylon</i> ; <i>UK-4</i> ; <i>Cyperus iria</i>
12	Sponge guard	<i>Cynodon dactylon</i> ; <i>Corchorus olitorius</i> ; <i>Spilanthus spp</i>
13	Arhar	<i>Virvan</i> , <i>Cynodon dactylon</i> ; <i>Anagallis arvensis</i>
14	Rice-fallow	<i>Cynodon dactylon</i> ; <i>Chloris barbata</i> ; <i>Argemone maxicana</i>
15	Blackgram	<i>Cynodon dactylon</i> ; <i>Eragrotis amabilis</i> ; <i>Amaranthus spinosus</i>
16	Groundnut	<i>Cynodon dactylon</i> ; <i>Ageratum conyzoides</i> ; <i>Digitaria sanguinalis</i>

Ecological parameters of different weed species in cropped area (Rice) of different villages of Ambikapur district during *Kharif* 2009-10, IGKV, Chhattisgarh.

Weeds	Density/m ²	Dominance	Frequency %	Relative density %	Relative frequency %	Relative dominance %	IVI
<i>Ageratum conyzoides</i>	0.02	0.02	0.36	0.23	0.23	0.01	0.46
<i>Alternanthera triandra</i>	0.10	0.07	1.31	0.95	0.85	0.02	1.82
<i>Astracantho longifolia</i>	0.05	0.05	0.83	0.45	0.54	0.01	1.01
<i>Commelina benghalensis</i>	0.22	0.24	2.86	2.12	1.86	0.07	4.05
<i>Commelina communis</i>	0.10	0.14	1.31	0.95	0.85	0.04	1.84
<i>Cynodon dactylon</i>	2.48	2.70	33.33	23.46	21.69	0.80	45.94
<i>Cyperus deformis</i>	0.03	0.04	0.48	0.32	0.31	0.01	0.64
<i>Cyperus iria</i>	1.88	1.73	29.76	17.78	19.36	0.51	37.66
<i>Cyperus rotundus</i>	1.39	0.88	21.90	13.15	14.25	0.26	27.66
<i>Dactyloctenium aegyptium</i>	0.01	0.02	0.24	0.14	0.15	0.00	0.29
<i>Digitaria sanguinalis</i>	0.32	0.36	3.33	3.02	2.17	0.11	5.29
<i>Echinochloa colona</i>	1.79	2.17	28.81	16.93	18.75	0.64	36.31
<i>Echinochloa crusgalli</i>	0.15	0.18	2.38	1.40	1.55	0.05	3.00
<i>Eleusine indica</i>	0.04	0.03	0.83	0.41	0.54	0.01	0.96
<i>Fimbristylis miliacea</i>	0.22	0.25	2.98	2.12	1.94	0.07	4.13
<i>Ischaemum rugosum</i>	0.20	0.28	1.31	1.85	0.85	0.08	2.78
<i>Leptochloa chinensis</i>	0.09	0.06	1.55	0.81	1.01	0.02	1.83
<i>Ludwigia hyssopifolia</i>	0.16	0.16	2.26	1.49	1.47	0.05	3.00
<i>Monochoria vaginalis</i>	0.07	0.09	1.07	0.63	0.70	0.03	1.36
<i>Saccharum spontanium</i>	0.01	0.01	0.12	0.09	0.08	0.00	0.17
<i>Setaria glauca</i>	0.22	0.27	2.02	2.07	1.32	0.08	3.47
<i>Spilanthus spp.</i>	0.09	0.16	1.19	0.81	0.77	0.05	1.63
<i>vanmirchi</i>	0.05	0.07	0.83	0.50	0.54	0.02	1.06

In Ambikapur district, during *Rabi* season, total 141 villages of 12 blocks were surveyed during the year (April'09 to September'10). A total number of 10 weed species in potato , 08 weed species in Tomato , 08 weed species in Brinjal , 20 weed species in wheat , 03 weed species in Sugarcane , 08 weed species in cabbage , 03 weed species in chilly , 05 weed species in cauliflower , 05 weed species in garlic , 03 weed species in Onion , 04 weed species in cowpea , 07 weed species in Linseed , 04 weed species in ginger and 22 weed species in rice-fallow were identified during the

survey in cropped area of Ambikapur district. *Cynodon dactylon* registered with highest density, dominance, frequency, relative density, relative frequency, relative dominance and IVI among the 22 weed species in rice-fallow. However, ecological parameters of weed *Commelina benghalensis* were found to be lowest amongst the 22 weed species in rice-fallow crop of Ambikapur district during survey. Three dominant weed species with highest IVI in different crops of Ambikapur district during *Rabi*'09-10 are as follows:-

S.No.	Cropped Area	3 Dominant Weeds
1	Potata	<i>Cynodon dactylon</i> ; <i>Cyperus iria</i> ; <i>Amaranthus spinosus</i>
2	Tomato	<i>Ageratum conyzoides</i> ; <i>Spilanthes calva</i> ; <i>Argimone maxicana</i>
3	Brinjal	<i>Sunsunia (local name)</i> ; <i>Cynodon dactylon</i> ; <i>Argimone maxicana</i>
4	Wheat	<i>Cynodon dactylon</i> ; <i>Spilanthes calva</i> ; <i>Chenopodium album</i>
5	Sugarcane	<i>Eleusine indica</i> ; <i>Cyperus iria</i> ; <i>Chloris barbata</i>
6	Cabbage	<i>Sunsunia (local name)</i> ; UK-4; <i>Cyperus iria</i>
7	Chilly	<i>Ageratum conyzoides</i> ; <i>Chloris barbata</i> ; <i>Cynodon dactylon</i>
8	Cauliflower	<i>Amaranthus viridis</i> ; <i>Commelina communis</i> ; UK-3
9	Garlic	<i>Sunsunia (local name)</i> ; <i>Rumex dentatus</i> ; <i>Cynodon dactylon</i>
10	Onion	<i>Cyperus iria</i> ; <i>Cynodon dactylon</i> ; UK-3
11	Cowpea	<i>Cyperus iria</i> ; <i>Amaranthus spinosus</i> ; <i>Argimone maxicana</i>
12	Linseed	<i>Cynodon dactylon</i> ; UK-4; <i>Argimone maxicana</i>
13	Ginger	<i>Ageratum conyzoides</i> ; <i>Argimone maxicana</i> ; <i>Spilanthes calva</i>
14	Rice-Fallow	<i>Cynodon dactylon</i> ; <i>Cyperus iria</i> ; <i>Spilanthes calva</i>

Ecological parameters of different weed species in cropped area (Potato) of different villages of Ambikapur district during Kharif 2009-10, IGKV, Chhattisgarh.

Weeds	Density/m ²	Dominance	Frequency %	Relative density %	Relative frequency %	Relative dominance %	IVI
<i>Amaranthus spinosus</i>	0.69	1.35	14.29	12.24	14.29	1.72	28.25
<i>Anagallis arvensis</i>	0.46	0.54	8.57	8.16	8.57	0.69	17.43
<i>Argimone maxicana</i>	0.69	1.43	11.43	12.24	11.43	1.83	25.50
<i>Cynodon dactylon</i>	1.14	1.34	17.14	20.41	17.14	1.70	39.25
<i>Cyperus iria</i>	0.80	0.90	14.29	14.29	14.29	1.14	29.71
<i>Euphorbia geniculata</i>	0.11	0.12	2.86	2.04	2.86	0.16	5.06
<i>Parthenium hysterophorus</i>	0.11	0.22	2.86	2.04	2.86	0.29	5.18
<i>Spilanthes calva</i>	0.69	0.80	11.43	12.24	11.43	1.01	24.69

A total number of 53 weed species during Kharif season and 38 weed species during Rabi season were identified during the survey in non-cropped area of Ambikapur district. *Cynodon dactylon* during Kharif and Rabi both registered highest density/m², frequency, relative density, relative frequency and IVI. On the contrary, UK-3

during Kharif and *Alternanthera triandra* during Rabi had the lowest different ecological parameters of weed in the Ambikapur district during the survey. Three dominant weed species with highest IVI in non-cropped area of Ambikapur district during Kharif'09-10 and Rabi'09-10 are as follows:-

S.No.	Non-Cropped Area	3 Dominant Weeds
1	(Kharif'09-10)	<i>Cynodon dactylon</i> ; <i>Cassia tora</i> ; <i>Achyranthes aspera</i>
2	(Rabi'09-10)	<i>Cynodon dactylon</i> ; <i>Achyranthes aspera</i> ; <i>Chloris barbata</i>

Ecological parameters of different weed species in Non-cropped area of different villages of Ambikapur district during *Kharif* 2009-10, IGKV, Chhattisgarh.

Weeds	Density/m ²	Dominance	Frequency %	Relative density %	Relative frequency %	Relative dominance %	IVI
<i>Abutilon indicum</i>	0.08	0.09	1.67	0.34	0.48	0.01	0.83
<i>Achanthospermum hispidum</i>	0.01	0.01	0.22	0.03	0.06	0.00	0.10
<i>Achyranthes aspera</i>	1.58	1.58	27.85	6.28	8.06	0.09	14.44
<i>Ageratum conyzoides</i>	1.06	1.50	17.45	4.24	5.05	0.09	9.38
<i>Alternanthera sessilis</i>	0.69	1.61	11.49	2.76	3.32	0.10	6.18
<i>Alternanthera triandra</i>	0.17	0.39	1.53	0.70	0.44	0.02	1.16
<i>Alysiacarpus monilifer</i>	0.54	0.51	8.00	2.15	2.31	0.03	4.49
<i>Amaranthus spinosus</i>	0.44	0.50	8.58	1.74	2.48	0.03	4.25
<i>Anagallis arvensis</i>	0.03	0.03	0.44	0.10	0.13	0.00	0.23
<i>Aphyranthus indicum</i>	0.01	0.01	0.15	0.03	0.04	0.00	0.08
<i>Astracantha longifolia</i>	0.03	0.03	0.65	0.12	0.19	0.00	0.31
<i>Blumea lacera</i>	0.11	0.14	1.96	0.45	0.57	0.01	1.03
<i>Boerharia diffusa</i>	0.17	0.20	2.69	0.67	0.78	0.01	1.46
<i>Cassia occidentalis</i>	0.01	0.02	0.29	0.06	0.08	0.00	0.14
<i>Cassia tora</i>	3.33	3.46	34.33	13.28	9.93	0.21	23.41
<i>Celosia argentea</i>	0.03	0.03	0.51	0.12	0.15	0.00	0.27
<i>Chitivan (Local name)</i>	0.01	0.01	0.15	0.02	0.04	0.00	0.07
<i>Chloris barbata</i>	0.37	0.42	5.09	1.47	1.47	0.02	2.97
<i>Commelina benghalensis</i>	0.43	0.47	8.15	1.70	2.36	0.03	4.09
<i>Corchorus olitorius</i>	0.33	0.31	6.33	1.33	1.83	0.02	3.18
<i>Cynodon dactylon</i>	6.96	7.59	66.18	27.75	19.14	0.45	47.34
<i>Cyperus iria</i>	0.03	0.03	0.51	0.12	0.15	0.00	0.27
<i>Cyperus rotundus</i>	1.01	0.67	16.73	4.04	4.84	0.04	8.91
<i>Dactyloctenium aegyptium</i>	0.25	0.23	4.00	0.99	1.16	0.01	2.16
<i>Digitaria sanguinalis</i>	0.88	0.76	12.80	3.51	3.70	0.05	7.26
<i>Eleusine indica</i>	0.23	0.27	3.71	0.93	1.07	0.02	2.02
<i>Euphorbia geneculata</i>	0.23	0.27	4.80	0.93	1.39	0.02	2.33
<i>Euphorbia hirta</i>	0.76	1.57	14.04	3.01	4.06	0.09	7.17
<i>Gompharina celosiodes</i>	0.39	0.55	7.56	1.57	2.19	0.03	3.79
<i>Hyptis suaveolens</i>	0.03	0.03	0.65	0.14	0.19	0.00	0.33
<i>Ischaemum rugosum</i>	0.09	0.05	1.67	0.35	0.48	0.00	0.83
<i>Lantana camara</i>	0.40	0.31	2.84	1.59	0.82	0.02	2.43
<i>Leptochloa chinensis</i>	0.67	1.59	9.60	2.67	2.78	0.09	5.54
<i>Ludwigia hyssopifolia</i>	0.01	0.02	0.36	0.06	0.11	0.00	0.16
<i>Ludwigia octovalvuis</i>	0.03	0.03	0.44	0.12	0.13	0.00	0.24
<i>Malvastrum spp.</i>	0.31	0.66	4.51	1.22	1.30	0.04	2.56
<i>Ocimum canum</i>	0.05	0.06	0.80	0.19	0.23	0.00	0.42

Weeds	Density/m ²	Dominance	Frequency %	Relative density %	Relative frequency %	Relative dominance %	IVI
<i>Parthenium hysterophorus</i>	0.78	0.81	13.96	3.11	4.04	0.05	7.19
<i>Phyllanthus amarus</i>	0.01	0.01	0.15	0.03	0.04	0.00	0.08
<i>Physalis minima</i>	0.06	0.07	1.38	0.24	0.40	0.00	0.65
<i>Saccharum spontanium</i>	0.10	0.12	1.67	0.41	0.48	0.01	0.90
<i>Setaria glauca</i>	0.86	0.98	13.67	3.41	3.95	0.06	7.42
<i>Solanum nigrum</i>	0.14	0.16	2.55	0.54	0.74	0.01	1.29
<i>Sonchus aspar</i>	0.01	0.01	0.15	0.02	0.04	0.00	0.07
<i>Spilanthus spp.</i>	0.01	0.03	0.15	0.03	0.04	0.00	0.08
<i>Tephrosia purpuria</i>	0.24	0.29	4.29	0.96	1.24	0.02	2.22
<i>Vernonea cinera</i>	0.20	0.21	3.56	0.81	1.03	0.01	1.86
<i>virivan (Local name)</i>	0.03	0.03	0.44	0.10	0.13	0.00	0.23
<i>Xanthium strumarium</i>	0.65	0.38	10.62	2.57	3.07	0.02	5.67
<i>Zizyphus spp.</i>	0.16	0.32	3.13	0.63	0.90	0.02	1.55

A total number of 54 weed species during *Kharif* season (Table 235) and 45 weed species during *Rabi* season (Table 236) were identified during the survey in the garbage area of Ambikapur district. *Cynodon dactylon* during *Kharif* and *Cynodon dactylon* during *Rabi* registered highest density/m², frequency, relative density, relative

frequency and IVI. On the contrary, *Astrocantha longifolia* during *Kharif* and *Zizyphus spp.* during *Rabi* had the lowest different ecological parameters of weed in the Ambikapur district during the survey. Three dominant weed species with highest IVI in garbage area of Ambikapur district during *Kharif*'09-10 and *Rabi*'09-10 are as follows:-

S.No.	Garbage Area	3 Dominant Weeds
1	(<i>Kharif</i> '09-10)	<i>Cynodon dactylon</i> ; <i>Cassia tora</i> ; <i>Achyranthes aspera</i>
2	(<i>Rabi</i> '09-10)	<i>Cynodon dactylon</i> ; <i>Achyranthes aspera</i> ; <i>Ageratum conyzoides</i>

Ecological parameters of different weed species in Garbage area of different villages of Ambikapur district during *Kharif* 2009-10, IGKV, Chhattisgarh.

Weeds	Density/m ²	Dominance	Frequency %	Relative density %	Relative frequency %	Relative dominance %	IVI
<i>Abutilon indicum</i>	0.01	0.01	0.22	0.05	0.07	0.00	0.13
<i>Achanthospermum hispidum</i>	0.05	0.06	0.87	0.22	0.29	0.00	0.52
<i>Achyranthes aspera</i>	1.47	2.07	25.24	6.63	8.34	0.13	15.10
<i>Ageratum conyzoides</i>	1.07	1.56	16.36	4.82	5.40	0.10	10.32
<i>Alternanthera sessilis</i>	0.70	0.93	11.93	3.16	3.94	0.06	7.16
<i>Alysiacarpus monilifer</i>	0.68	0.64	10.47	3.06	3.46	0.04	6.56
<i>Amaranthus spinosus</i>	0.63	0.72	12.00	2.86	3.96	0.05	6.87
<i>Anagallis arvensis</i>	0.01	0.01	0.15	0.04	0.05	0.00	0.09
<i>Astracantha longifolia</i>	0.00	0.00	0.07	0.01	0.02	0.00	0.04
<i>Birivan (Local name)</i>	0.02	0.04	0.36	0.09	0.12	0.00	0.21

Weeds	Density/ m ²	Dominance	Frequency %	Relative density %	Relative frequency %	Relative dominance %	IVI
<i>Blumea lacera</i>	0.07	0.08	1.16	0.30	0.38	0.01	0.69
<i>Boerharia diffusa</i>	0.19	0.23	2.91	0.85	0.96	0.01	1.83
<i>Bracharia romosa</i>	0.04	0.07	0.36	0.17	0.12	0.00	0.30
<i>Cassia occidentalis</i>	0.01	0.02	0.15	0.07	0.05	0.00	0.11
<i>Cassia tora</i>	2.68	2.97	27.56	12.08	9.10	0.19	21.37
<i>Celosia argentea</i>	0.05	0.06	0.87	0.24	0.29	0.00	0.53
<i>Chitivan (Local name)</i>	0.01	0.01	0.22	0.05	0.07	0.00	0.13
<i>Chloris barbata</i>	0.37	0.42	4.00	1.65	1.32	0.03	3.00
<i>Commelina bangalensis</i>	1.19	1.29	17.75	5.36	5.86	0.08	11.30
<i>Corchorus olitorius</i>	0.34	0.35	5.67	1.52	1.87	0.02	3.42
<i>Cynodon dactylon</i>	6.28	7.85	58.91	28.35	19.46	0.50	48.30
<i>Cyperus iria</i>	0.09	0.13	1.53	0.42	0.50	0.01	0.93
<i>Cyperus rotundus</i>	0.62	0.63	11.42	2.80	3.77	0.04	6.61
<i>Dactyloctenium aegyptium</i>	0.13	0.16	0.95	0.60	0.31	0.01	0.93
<i>Digitaria sanguinalis</i>	0.22	0.26	3.13	1.01	1.03	0.02	2.06
<i>Eleusine indica</i>	0.13	0.14	1.67	0.56	0.55	0.01	1.13
<i>Euphorbia geneculata</i>	0.15	0.17	2.47	0.66	0.82	0.01	1.48
<i>Euphorbia hirta</i>	0.84	1.00	15.78	3.81	5.21	0.06	9.08
<i>Gompharina celosiodes</i>	0.38	0.45	7.27	1.71	2.40	0.03	4.14
<i>Hyptis suaveolens</i>	0.05	0.05	0.80	0.21	0.26	0.00	0.48
<i>Ipomea cornia</i>	0.02	0.02	0.36	0.08	0.12	0.00	0.20
<i>Ischaemum rugosum</i>	0.05	0.03	0.73	0.21	0.24	0.00	0.45
<i>Lantana camara</i>	0.01	0.02	0.15	0.04	0.05	0.00	0.09
<i>Leptochloa chinensis</i>	0.17	0.40	2.33	0.76	0.77	0.03	1.56
<i>Ludwigia</i>	0.02	0.02	0.36	0.08	0.12	0.00	0.20
<i>Malvastrum spp.</i>	0.19	0.41	2.04	0.87	0.67	0.03	1.57
<i>Ocimum canum</i>	0.08	0.09	1.60	0.34	0.53	0.01	0.88
<i>Parthenium hysterophorus</i>	0.58	0.92	8.87	2.63	2.93	0.06	5.62
<i>Phyllanthus amarus</i>	0.03	0.03	0.51	0.13	0.17	0.00	0.30
<i>Phyllanthus niruni</i>	0.01	0.01	0.29	0.07	0.10	0.00	0.16
<i>Physalis minima</i>	0.06	0.07	1.16	0.26	0.38	0.00	0.65
<i>Saccharum spontanium</i>	0.04	0.05	0.80	0.18	0.26	0.00	0.45
<i>Setaria glauca</i>	0.97	1.10	14.98	4.36	4.95	0.07	9.38
<i>Sida acuta</i>	0.00	0.00	0.07	0.01	0.02	0.00	0.04
<i>Sida cornifolia</i>	0.03	0.06	0.51	0.12	0.17	0.00	0.29
<i>Solanum nigrum</i>	0.12	0.15	2.47	0.55	0.82	0.01	1.38
<i>Spilanthus spp.</i>	0.03	0.07	0.51	0.12	0.17	0.00	0.29

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