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Weed Distribution in Sugarcane Fields of Srikakulam District, A.P., India

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ABSTRACT

A survey of 60 random sugarcane fields of Srikakulam district Andhra Pradesh India was carried out in 2009-2011 to identify the weed species and their density, frequency, importance values (IV) and frequency classes of weeds. A total of 168 weed species belonging to 42 families and 130 genera were recorded. Poaceae is the largest representing 24 species, Asteraceae occupies the second position with 14 species followed by Euphorbiaceae (12), Amaranthaceae (11), Malvaceae (9), Cyperaceae (8), Fabaceae, Convolvulaceae and Commelinaceae (6) each; Cleomaceae, Cucurbitaceae, Molluginaceae and Rubiaceae (5) each; Asclepiadaceae and Lamiaceae (4) each; Portulacaceae, Solanaceae, Acanthaceae and Verbenaceae (3) each; and Sterculiaceae, Tiliaceae, Lythraceae, Aizoaceae, Boraginaceae and Aristolochiaceae (2) species each. The most frequent species were found as: Parthenium hysterophorus (90%), Cyperus rotundus (76.67%); Phyllanthus amarus and Tribulus terrestris (70%); Kyllinga nemoralis and Cleome viscosa (65%); Cynodon dactylon and Eragrostis ciliata (63.33%). The frequency classes under A category are 93 followed by 49 under B, 16 under C, 9 under D, single species under E. So that this results showing the heterogeneity of weed vegetation.

Keywords: Weeds, Distribution, Sugarcane fields, Srikakulam

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INTRODUCTION

Srikakulam the northern most part of Andhra Pradesh state lies along the East Coast of India. Srikakulam district is located within $18^{\circ} 5'$ to $19^{\circ} 12'$ N and $83^{\circ} 32'$ to $84^{\circ} 47'$ E and bounded by Orissa state on the North and Bay of Bengal in the East and South East and the Vizianagaram district in the West. Weeds are unwanted plants and possess a serious threat to crop production by reducing the yield losses ranging from 10 to 75 % in several crops. Weeds differ from other plants in being more adaptive and having peculiar characteristics that make them more competitive [1]. Generally crop fields are manmade ecosystem where the desired plants are grown by stakeholders but the weeds do come up and compete with crops mainly for space, sunlight, moisture, nutrients and hence reduce the crops yield [2]. The cultivated field of Srikakulam district is infested with a large number of weeds comprising heavy losses to the crop yields. It is pertinent to note that the presence of weeds in sugarcane crop implies major losses. Weed surveys are useful for determining the occurrence and importance of weed species in crop production systems [3]. Documenting the kinds of weed species and its relative distribution facilitates the establishment of priorities for research and extension services [4]. A survey was conducted in North Coastal Andhra Pradesh to highlight the distribution of different weed species in all fields [5]. However, no such reference exists on the weeds of sugarcane fields from Srikakulam district. Present study was taken up to collect the information on distribution of weeds of sugarcane fields from different areas of Srikakulam district for the first time.

MATERIAL AND METHODS

The exploration of the area under study includes the planned field trips to the various places for crop weed collection. The study was carried out during the period of 2009-2011. The random quadrat method was adopted for this study to note down the presence of the weed species in sugarcane field. After completing the weed collection from the crop fields the specimens were identified with the help of floras, Monographs 'Flora of British India' by Hooker [6] 'Flora of Presidency of Madras' by Gamble [7]; The grasses of Burma, Ceylon, India and Pakistan by Bor [8]; 'Flora of Andhra Pradesh' by [9]; and Weed flora of North Coastal Andhra Pradesh by [10] and other relevant literature.

Sugarcane (*Saccharum officinarum*) crop is a significant crop in Srikakulam district both in terms of acreage as well as productivity. Hence phytosociological studies were conducted in the crop fields. Typically sugarcane crop represents irrigated fields 'Viswamitra' variety (87A 298) of sugarcane crop with a duration of 10-12 months were selected for the phytosociological investigations. All the weeds encountered in the field sites of the above crop fields were carefully collected and identified. Random quadrat method was adopted for studying phytosociological attributes of weeds. In each field site, 20 quadrates of 100 cm^2 were laid down and hence a sum of 60 quadrates. Where taken for this study all the weeds from each quadrate were collected separately in polythene bags. All the plant species encountered in 60 quadrates were listed. Abundance, density and frequency and their relative values and Importance Value Index (IVI) were calculated by the following principles of [11-13].

$$\text{Frequency (\%)} = \frac{\text{Total number of quadrates in which the species occur}}{\text{Total number of quadrates studied}} \times 100$$

$$\text{Density} = \frac{\text{Total number of individuals of a species in all quadrates}}{\text{Total number of quadrates studied}}$$

$$\text{Abundance} = \frac{\text{Total number of individuals of a species in all quadrates}}{\text{Total number of quadrates in which the species occurred}}$$

$$\text{Relative frequency} = \frac{\text{Frequency of individuals of a species}}{\text{Total frequency of all species}} \times 100$$

$$\text{Relative density} = \frac{\text{Density of individuals of a species}}{\text{Total density of all species}} \times 100$$

$$\text{Relative abundance} = \frac{\text{Abundance of individuals of a species}}{\text{Total abundance of all species}} \times 100$$

$$\text{Importance Value Index} = \text{Relative density} + \text{Relative frequency} + \text{Relative abundance}$$

The frequency classes of weed species were determined based on Raunkiaer (1934), Accordingly there are 5 frequency classes, i.e. 'A' class with the species of frequency ranging from 1-20%; 'B' class 21-40%; 'C' class 41-60%; 'D' class 61-80% and 'E' class 81-100%. Further the weed community frequency patterns were compared with the normal frequency pattern of Raunkiaer (A>B>C>=D<E). Based on the frequency pattern of the community, the homogeneity and heterogeneity of the vegetation. If the values are high with respect to B, C and D, then the community is said to be heterogeneous where as higher values of E indicates the homogeneous nature.

RESULTS AND DISCUSSION

A total of 168 plant species, belonging to 130 genera and 42 families were identified as sugarcane crop land weeds in the Srikakulam district . Of these 168 weed species, 136 are dicots, 32 are monocots. These species are recorded exclusively from the sugarcane crop. The total weed families recorded in the present study are 42. Out of 42, 16 are monotypic, viz., representing only by one species these are Menispermaceae, Papaveraceae, Brassicaceae, Violaceae, Zygophyllaceae, Oxalidaceae, Balsaminaceae, Sapindaceae, Caesalpiniaceae,

Mimosaceae, Passifloraceae, Apiaceae, Cuscutaceae, Pedaliaceae, Nyctaginaceae and Chenopodiaceae. Poaceae is the largest representing 24 species, Asteraceae occupies the second position with 14 species followed by Euphorbiaceae (12), Amaranthaceae (11), Malvaceae (9), Cyperaceae (8), Fabaceae, Convolvulaceae and Commelinaceae (6) each Cleomaceae, Cucurbitaceae, Molluginaceae and Rubiaceae (5) each Asclepiadaceae and Lamiaceae (4) each Portulacaceae, Solanaceae, Acanthaceae and Verbenaceae (3) each and Sterculiaceae, Tiliaceae, Lythraceae, Aizoaceae, Boraginaceae and Aristolochiaceae (2) species each. The most frequent species were found as *Parthenium hysterophorus* (90%) *Cyperus rotundus* (76.67%); *Phyllanthus amarus* and *Tribulus terrestris* (70%); *Kyllinga nemoralis* and *Cleome viscosa* (65%); *Cynodon dactylon* and *Eragrostis ciliata* (63.33%); and *Trianthema portulacastrum* (68.33%).

Parthenium hysterophorus and *Phyllanthus amarus* had highest density with 1.4 m⁻² each followed by *Cyperus rotundus* (1.23) *Chrozophora rottleri* (1.067) *Cynodon dactylon* (1.083) *Trianthema portulacastrum* (1.033) *Tribulus terrestris* (0.9), *Cleome viscosa* (0.850) and *Croton ban-plantianum* (0.750). *Bulbostylis barbata* and *Celosia argentea* had lowest density i.e. 0.017 of each and followed by *Conyza stricta*, *Cucumis melo*, *Cuscuta reflexa*, *Euphorbia hirta*, *Ipomoea hedirifolia*, *Ocimum basilicum*, *Pavonia zeylanica*, *Pennisetum polystachyon*, *Pergularia daemia*, *Rhynchosia minima*, *Sida rhombifolia*, *Solanum surattense*, *Spermacoce pusilla*, *Talinum portulacifolium* and *Wattakaka volubilis* (0.033) each. Abundance wise *Ocimum americanum* and *Tephrosia purpurea* (4.00) *Centella asiatica* and *Impatiens balsamina* (3.00) had highest values respectively.

Parthenium hysterophorus had highest IV value of 5.870 followed by *Phyllanthus amarus* (5.549) *Cyperus rotundus* (5.211) *Trianthema portulacastrum* (4.547) *Chrozophora rottleri* (4.427) *Tribulus terrestris* (4.219) *Cynodon dactylon* (4.606) *Cleome viscosa* (3.998) *Eragrostis gangetica* (3.577) and *Croton ban-plantianum* (3.536). The lowest IV value was found in *Bulbostylis barbata* and *Celosia argentea* (0.527), *Conyza stricta*, *Cucumis melo*, *Euphorbia hirta*, *Ipomoea hedirifolia*, *Ocimum basilicum*, *Pavonia zeylanica*, *Pennisetum polystachyon*, *Pergularia daemia*, *Rhynchosia minima*, *Solanum surattense*, *Spermacoce pusilla*, *Talinum portulacifolium* and *Wattakaka volubilis* (0.604) each. The frequency classes under A category are 93 followed by 49 under B, 16 under C, 9 under D, single species under E. So that this results showing the heterogeneity of weed vegetation.

The results obtained (regarding the taxonomy of weeds in srikakulam district) from this study has clearly established the fact that the weed diversity in this region is high and significant. A thorough perusal of literature pertaining to other weed floras of different regions of Andhra Pradesh and India in general has also revealed the high concentration of weeds in this study area when compared with other areas. Pullaiah (1997) reported a total of 715 weed species in Andhra Pradesh state. Prayaga Murty (2009) has reported 532 weed species in North Coastal districts of Andhra Pradesh and 78 species were reported exclusively from sugar cane fields of Visakhapatnam, similar which are to this area also. *Cyperus rotundus*, commonly called as the 'purplenut sedge', is one of the prominent weed of the present study. This weed is the native of India but has become cosmopolitan, spread over most of the tropic countries, and

is treated as the world's worst weed. [14] It is one of the weeds that appear immediately after sowing and may compete heavily with the crop plants for nutrients and water.

Table-1: Phytosociological attributes of weed species

S.No	Name of the Species	TOI	TNI	A	D	F	RA	RD	RF	IVI
1	<i>Abutilon hirtum</i>	9	9	1.000	0.150	15.000	0.450	0.302	0.391	1.144
2	<i>Abutilon indicum</i>	7	9	1.286	0.150	11.667	0.579	0.302	0.304	1.186
3	<i>Acalypha indica</i>	24	38	1.583	0.633	40.000	0.713	1.276	1.044	3.033
4	<i>Acalypha alnifolia</i>	16	16	1.000	0.267	26.667	0.450	0.537	0.696	1.683
5	<i>Acanthospermum hispidum</i>	31	34	1.097	0.567	51.667	0.494	1.142	1.348	2.984
6	<i>Achyranthes aspera</i>	21	28	1.333	0.467	35.000	0.600	0.940	0.913	2.454
7	<i>Aerva lanata</i>	36	41	1.139	0.683	60.000	0.513	1.377	1.566	3.456
8	<i>Ageratum conyzoides</i>	20	22	1.100	0.367	33.333	0.495	0.739	0.870	2.104
9	<i>Allmania nodiflora</i>	23	24	1.043	0.400	38.333	0.470	0.806	1.000	2.276
10	<i>Alternanthera pungens</i>	8	17	2.125	0.283	13.333	0.957	0.571	0.348	1.876
11	<i>Alternanthera sessilis</i>	11	13	1.182	0.217	18.333	0.532	0.437	0.478	1.447
12	<i>Alysicarpus monilifer</i>	32	44	1.375	0.733	53.333	0.619	1.478	1.392	3.489
13	<i>Amaranthus spinosus</i>	23	23	1.000	0.383	38.333	0.450	0.773	1.000	2.223
14	<i>Amaranthus viridis</i>	18	18	1.000	0.300	30.000	0.450	0.605	0.783	1.838
15	<i>Ammannia baccifera</i>	26	30	1.154	0.500	43.333	0.519	1.008	1.131	2.658
16	<i>Andrographis paniculata</i>	3	7	2.333	0.117	5.000	1.050	0.235	0.130	1.416
17	<i>Argemone mexicana</i>	12	23	1.917	0.383	20.000	0.863	0.773	0.522	2.157
18	<i>Aristolochia bracteolata</i>	4	9	2.250	0.150	6.667	1.013	0.302	0.174	1.489
19	<i>Aristolochia indica</i>	7	9	1.286	0.150	11.667	0.579	0.302	0.304	1.186
20	<i>Arundinella ciliaata</i>	11	24	2.182	0.400	18.333	0.982	0.806	0.478	2.267
21	<i>Arundinella pumila</i>	15	34	2.267	0.567	25.000	1.020	1.142	0.652	2.815
22	<i>Arundo donax</i>	18	18	1.000	0.300	30.000	0.450	0.605	0.783	1.838
23	<i>Atylosia scarabaeoides</i>	6	6	1.000	0.100	10.000	0.450	0.202	0.261	0.913
24	<i>Bacopa monnieri</i>	28	34	1.214	0.567	46.667	0.547	1.142	1.218	2.907
25	<i>Baliospermum montanum</i>	14	18	1.286	0.300	23.333	0.579	0.605	0.609	1.792
26	<i>Blepharis maderaspatensis</i>	33	38	1.152	0.633	55.000	0.518	1.276	1.435	3.230
27	<i>Blumea mollis</i>	2	3	1.500	0.050	3.333	0.675	0.101	0.087	0.863
28	<i>Boerhavia diffusa</i>	36	42	1.167	0.700	60.000	0.525	1.411	1.566	3.502
29	<i>Brachiaria distachya</i>	19	24	1.263	0.400	31.667	0.569	0.806	0.826	2.201
30	<i>Brachiaria ramosa</i>	34	42	1.235	0.700	56.667	0.556	1.411	1.479	3.446
31	<i>Brachiaria reptans</i>	26	30	1.154	0.500	43.333	0.519	1.008	1.131	2.658
32	<i>Bulbostylis barbata</i>	1	1	1.000	0.017	1.667	0.450	0.034	0.043	0.527
33	<i>Cardiospermum halicacabum</i>	8	8	1.000	0.133	13.333	0.450	0.269	0.348	1.067
34	<i>Cassia absus</i>	14	17	1.214	0.283	23.333	0.547	0.571	0.609	1.727



35	<i>Celosia argentea</i>	1	1	1.000	0.017	1.667	0.450	0.034	0.043	0.527
36	<i>Centella asiatica</i>	3	9	3.000	0.150	5.000	1.350	0.302	0.130	1.783
37	<i>Chenopodium album</i>	12	25	2.083	0.417	20.000	0.938	0.840	0.522	2.299
38	<i>Chloris barbata</i>	12	18	1.500	0.300	20.000	0.675	0.605	0.522	1.802
39	<i>Chrozophora rottleri</i>	31	64	2.065	1.067	51.667	0.929	2.150	1.348	4.427
40	<i>Chrysopogon aciculatus</i>	12	14	1.167	0.233	20.000	0.525	0.470	0.522	1.517
41	<i>Citrullus colocynthis</i>	3	4	1.333	0.067	5.000	0.600	0.134	0.130	0.865
42	<i>Cleome aspera</i>	15	17	1.133	0.283	25.000	0.510	0.571	0.652	1.734
43	<i>Cleome chelidonii</i>	28	42	1.500	0.700	46.667	0.675	1.411	1.218	3.304
44	<i>Cleome gynandra</i>	9	10	1.111	0.167	15.000	0.500	0.336	0.391	1.228
45	<i>Cleome monophylla</i>	7	11	1.571	0.183	11.667	0.707	0.369	0.304	1.381
46	<i>Cleome viscosa</i>	39	51	1.308	0.850	65.000	0.589	1.713	1.696	3.998
47	<i>Coccinia grandis</i>	6	8	1.333	0.133	10.000	0.600	0.269	0.261	1.130
48	<i>Cocculus hirsutus</i>	17	20	1.176	0.333	28.333	0.530	0.672	0.739	1.941
49	<i>Commelina benghalensis</i>	14	15	1.071	0.250	23.333	0.482	0.504	0.609	1.595
50	<i>Commelina erecta</i>	15	16	1.067	0.267	25.000	0.480	0.537	0.652	1.670
51	<i>Commelina longifolia</i>	9	11	1.222	0.183	15.000	0.550	0.369	0.391	1.311
52	<i>Conyza stricta</i>	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
53	<i>Corallocarpus epigaeus</i>	18	22	1.222	0.367	30.000	0.550	0.739	0.783	2.072
54	<i>Corchorus capsularis</i>	24	32	1.333	0.533	40.000	0.600	1.075	1.044	2.719
55	<i>Crotalaria verrucosa</i>	9	16	1.778	0.267	15.000	0.800	0.537	0.391	1.729
56	<i>Croton ban-plandianum</i>	32	45	1.406	0.750	53.333	0.633	1.511	1.392	3.536
57	<i>Cucumis melo</i>	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
58	<i>Cucumis sativus</i>	28	36	1.286	0.600	46.667	0.579	1.209	1.218	3.006
59	<i>Cuscuta reflexa</i>	1	2	2.000	0.033	1.667	0.900	0.067	0.043	1.011
60	<i>Cyanotis arachnoidea</i>	2	3	1.500	0.050	3.333	0.675	0.101	0.087	0.863
61	<i>Cyanotis cristata</i>	21	26	1.238	0.433	35.000	0.557	0.873	0.913	2.344
62	<i>Cymbopogon flexuosus</i>	22	28	1.273	0.467	36.667	0.573	0.940	0.957	2.470
63	<i>Cynodon dactylon</i>	38	65	1.711	1.083	63.333	0.770	2.183	1.653	4.606
64	<i>Cyperus difformis</i>	11	21	1.909	0.350	18.333	0.859	0.705	0.478	2.043
65	<i>Cyperus diffusus</i>	13	23	1.769	0.383	21.667	0.796	0.773	0.565	2.134
66	<i>Cyperus pilosus</i>	15	24	1.600	0.400	25.000	0.720	0.806	0.652	2.179
67	<i>Cyperus rotundus</i>	46	74	1.609	1.233	76.667	0.724	2.486	2.001	5.211
68	<i>Dentella repens</i>	23	28	1.217	0.467	38.333	0.548	0.940	1.000	2.489
69	<i>Dichanthium annulatum</i>	21	24	1.143	0.400	35.000	0.514	0.806	0.913	2.234
70	<i>Digera muricata</i>	18	18	1.000	0.300	30.000	0.450	0.605	0.783	1.838
71	<i>Digitaria ciliaris</i>	22	26	1.182	0.433	36.667	0.532	0.873	0.957	2.362
72	<i>Dinebra retroflexa</i>	4	7	1.750	0.117	6.667	0.788	0.235	0.174	1.197
73	<i>Echinochloa crusgalli</i>	26	35	1.346	0.583	43.333	0.606	1.176	1.131	2.912



74	<i>Eclipta prostrata</i>	9	11	1.222	0.183	15.000	0.550	0.369	0.391	1.311
75	<i>Eragrostis ciliata</i>	38	38	1.000	0.633	63.333	0.450	1.276	1.653	3.379
76	<i>Eragrostis gangetica</i>	37	43	1.162	0.717	61.667	0.523	1.444	1.609	3.577
77	<i>Eragrostis riparia</i>	6	8	1.333	0.133	10.000	0.600	0.269	0.261	1.130
78	<i>Euphorbia hirta</i>	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
79	<i>Euphorbia indica</i>	16	16	1.000	0.267	26.667	0.450	0.537	0.696	1.683
80	<i>Evolvulus alsinoides</i>	14	14	1.000	0.233	23.333	0.450	0.470	0.609	1.529
81	<i>Evolvulus nummularius</i>	13	13	1.000	0.217	21.667	0.450	0.437	0.565	1.452
82	<i>Fimbristylis cymosa</i>	9	9	1.000	0.150	15.000	0.450	0.302	0.391	1.144
83	<i>Gisekia pharnaceoides</i>	8	8	1.000	0.133	13.333	0.450	0.269	0.348	1.067
84	<i>Glinus lotoides</i>	7	8	1.143	0.133	11.667	0.514	0.269	0.304	1.088
85	<i>Glinus oppositifolius</i>	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
86	<i>Glycine wightii</i>	2	3	1.500	0.050	3.333	0.675	0.101	0.087	0.863
87	<i>Gomphrena celosioides</i>	8	10	1.250	0.167	13.333	0.563	0.336	0.348	1.247
88	<i>Grangea maderaspatana</i>	19	19	1.000	0.317	31.667	0.450	0.638	0.826	1.915
89	<i>Hedyotis corymbosa</i>	21	21	1.000	0.350	35.000	0.450	0.705	0.913	2.069
90	<i>Heliotropium indicum</i>	13	16	1.231	0.267	21.667	0.554	0.537	0.565	1.657
91	<i>Hemidesmus indicus</i>	4	6	1.500	0.100	6.667	0.675	0.202	0.174	1.051
92	<i>Hybanthus enneaspermus</i>	11	13	1.182	0.217	18.333	0.532	0.437	0.478	1.447
93	<i>Impatiens balsamina</i>	1	3	3.000	0.050	1.667	1.350	0.101	0.043	1.495
94	<i>Imperata cylindrica</i>	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
95	<i>Ipomoea hedirifolia</i>	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
96	<i>Kyllinga nemoralis</i>	39	39	1.000	0.650	65.000	0.450	1.310	1.696	3.456
97	<i>Lagascea mollis</i>	23	23	1.000	0.383	38.333	0.450	0.773	1.000	2.223
98	<i>Lantana indica</i>	6	6	1.000	0.100	10.000	0.450	0.202	0.261	0.913
99	<i>Leucas aspera</i>	12	13	1.083	0.217	20.000	0.488	0.437	0.522	1.446
100	<i>Leucas cephalotes</i>	12	15	1.250	0.250	20.000	0.563	0.504	0.522	1.588
101	<i>Lindernia antipoda</i>	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
102	<i>Malvastrum coromandelianum</i>	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
103	<i>Melochia corchorifolia</i>	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
104	<i>Merremia gangetica</i>	10	10	1.000	0.167	16.667	0.450	0.336	0.435	1.221
105	<i>Merremia hederacea</i>	6	8	1.333	0.133	10.000	0.600	0.269	0.261	1.130
106	<i>Merremia tridentata</i>	21	21	1.000	0.350	35.000	0.450	0.705	0.913	2.069
107	<i>Micrococca mercurialis</i>	16	16	1.000	0.267	26.667	0.450	0.537	0.696	1.683
108	<i>Mimosa pudica</i>	6	9	1.500	0.150	10.000	0.675	0.302	0.261	1.238
109	<i>Mollugo nudicaulis</i>	13	23	1.769	0.383	21.667	0.796	0.773	0.565	2.134
110	<i>Mollugo pentaphylla</i>	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
111	<i>Ocimum americanum</i>	3	12	4.000	0.200	5.000	1.801	0.403	0.130	2.334
112	<i>Ocimum basilicum</i>	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604



113	<i>Oplismenus burmannii</i>	15	15	1.000	0.250	25.000	0.450	0.504	0.652	1.606
114	<i>Oxalis corniculata</i>	23	23	1.000	0.383	38.333	0.450	0.773	1.000	2.223
115	<i>Panicum repens</i>	6	6	1.000	0.100	10.000	0.450	0.202	0.261	0.913
116	<i>Parthenium hysterophorus</i>	54	84	1.556	1.400	90.000	0.700	2.821	2.349	5.870
117	<i>Paspalidium flavidum</i>	15	15	1.000	0.250	25.000	0.450	0.504	0.652	1.606
118	<i>Passiflora foetida</i>	8	8	1.000	0.133	13.333	0.450	0.269	0.348	1.067
119	<i>Pavonia zeylanica</i>	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
120	<i>Pedaliium murex</i>	14	14	1.000	0.233	23.333	0.450	0.470	0.609	1.529
121	<i>Pennisetum polystachyon</i>	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
122	<i>Pergularia daemia</i>	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
123	<i>Perotis indica</i>	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
124	<i>Phyla nodiflora</i>	21	27	1.286	0.450	35.000	0.579	0.907	0.913	2.399
125	<i>Phyllanthus amarus</i>	42	84	2.000	1.400	70.000	0.900	2.821	1.827	5.549
126	<i>Phyllanthus debilis</i>	14	14	1.000	0.233	23.333	0.450	0.470	0.609	1.529
127	<i>Phyllanthus maderaspatensis</i>	25	25	1.000	0.417	41.667	0.450	0.840	1.087	2.377
128	<i>Physalis minima</i>	4	4	1.000	0.067	6.667	0.450	0.134	0.174	0.758
129	<i>Portulaca oleracea</i>	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
130	<i>Portulaca quadrifida</i>	23	23	1.000	0.383	38.333	0.450	0.773	1.000	2.223
131	<i>Pupalia lappacea</i>	6	8	1.333	0.133	10.000	0.600	0.269	0.261	1.130
132	<i>Pycneus pumilus</i>	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
133	<i>Rhynchosia minima</i>	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
134	<i>Rorippa indica</i>	9	9	1.000	0.150	15.000	0.450	0.302	0.391	1.144
135	<i>Rotala rotundifolia</i>	8	8	1.000	0.133	13.333	0.450	0.269	0.348	1.067
136	<i>Ruellia tuberosa</i>	8	12	1.500	0.200	13.333	0.675	0.403	0.348	1.426
137	<i>Scoparia dulcis</i>	9	15	1.667	0.250	15.000	0.750	0.504	0.391	1.646
138	<i>Sebastiania chamaelea</i>	12	12	1.000	0.200	20.000	0.450	0.403	0.522	1.375
139	<i>Setaria pumila</i>	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
140	<i>Sida acuta</i>	11	24	2.182	0.400	18.333	0.982	0.806	0.478	2.267
141	<i>Sida cordata</i>	9	16	1.778	0.267	15.000	0.800	0.537	0.391	1.729
142	<i>Sida cordifolia</i>	5	5	1.000	0.083	8.333	0.450	0.168	0.217	0.836
143	<i>Sida rhombifolia</i>	1	2	2.000	0.033	1.667	0.900	0.067	0.043	1.011
144	<i>Solanum nigrum</i>	6	6	1.000	0.100	10.000	0.450	0.202	0.261	0.913
145	<i>Solanum surattense</i>	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
146	<i>Spermacoce hispida</i>	16	16	1.000	0.267	26.667	0.450	0.537	0.696	1.683
147	<i>Spermacoce articularis</i>	9	10	1.111	0.167	15.000	0.500	0.336	0.391	1.228
148	<i>Spermacoce pusilla</i>	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
149	<i>Sphaeranthus indicus</i>	15	15	1.000	0.250	25.000	0.450	0.504	0.652	1.606
150	<i>Spilanthes calva</i>	6	6	1.000	0.100	10.000	0.450	0.202	0.261	0.913
151	<i>Stachytarpheta jamaicensis</i>	8	8	1.000	0.133	13.333	0.450	0.269	0.348	1.067

152	Striga asiatica	2	5	2.500	0.083	3.333	1.125	0.168	0.087	1.380
153	Synedrella nodiflora	14	14	1.000	0.233	23.333	0.450	0.470	0.609	1.529
154	Talinum portulacifolium	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
155	Tephrosia purpurea	2	8	4.000	0.133	3.333	1.801	0.269	0.087	2.156
156	Tonningia axillaries	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
157	Trianthema portulacastrum	41	62	1.512	1.033	68.333	0.681	2.082	1.783	4.547
158	Tribulus terrestris	42	54	1.286	0.900	70.000	0.579	1.814	1.827	4.219
159	Trichodesma indicum	14	14	1.000	0.233	23.333	0.450	0.470	0.609	1.529
160	Tridax procumbens	25	43	1.720	0.717	41.667	0.774	1.444	1.087	3.306
161	Triumfetta rhomboidea	4	4	1.000	0.067	6.667	0.450	0.134	0.174	0.758
162	Tylophora indica	3	3	1.000	0.050	5.000	0.450	0.101	0.130	0.681
163	Urena lobata	23	28	1.217	0.467	38.333	0.548	0.940	1.000	2.489
164	Vernonia cinerea	22	36	1.636	0.600	36.667	0.737	1.209	0.957	2.903
165	Waltheria indica	3	7	2.333	0.117	5.000	1.050	0.235	0.130	1.416
166	Wattakaka volubilis	2	2	1.000	0.033	3.333	0.450	0.067	0.087	0.604
167	Xanthium strumarium	9	12	1.333	0.200	15.000	0.600	0.403	0.391	1.395
168	Zaleya decandra	8	16	2.000	0.267	13.333	0.900	0.537	0.348	1.786
				222.16	49.62	3831.67				

TOI: Total Occurrence of Individuals.

TNI: Total Number of Individuals

A = Abundance

D = Density

F = Frequency

RA = Relative Abundance

RD = Relative Density

RF = Relative Frequency

IVI = Important Value Index

CONCLUSION

In the present study the selected crop field of sugarcane has been well explored covering all the area of Srikakulam district. The investigator hopes that weed flora work at regional level covering the Srikakulam district would be of good source of information of technical and taxonomic data to the academic institutes and research organizations. Further this data may be useful for the Pharmaceutical and Agricultural sciences. This may be a valuable contribution for the general advancement towards the development of weed eradication and to increase the yield of crops in this area. Sugarcane has a prolonged growing season varying from 10-12months, thus effective and timely control of weeds is an important component of its management.

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