Eco. Env. & Cons. 30 (1) : 2024; pp. (178-180)
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ISSN 0971–765X

DOI No.: http://doi.org/10.53550/EEC.2024.v30i01.034

Phytosociological study of weed flora in garden land ecosystem in Madagadipet, Puducherry, India

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(Received 18 March, 2023; Accepted 9 July, 2023)

ABSTRACT

Phytosociological study was carried out to estimate the dominant of weed flora in garden land eco-system under varying climatic conditions. The survey was conducted at Sri Manakula Vinayagar Engineering College, experimental farm, Department of Agronomy, Madagadipet during 2023. *Trianthem aprotulacastrum*, *Dactylenoium aegyptium*, *Phyllanthus niruri*, *Cleome viscosa*, *Physalis minima* were the most densed weeds. Importance Value Index (IVI) computed for individual weed species at Madagadipet indicated that *Trianthem aprotulocastrum* was the predominant weed species with highest relative density of 32.9, relative frequency of 16 per cent and importance value Index (IVI)of 71.56. All other weed species were low in IVI and also rare in their occurrence with lesser frequency.

Key words: *Phytosociological, Weed survey, Garden land ecosystems, RF, R.Do, RD and IVI.*

Inrtoduction

Weed in general cause 45 per cent annual loss in Agricultural production and their competitive ability and aggressiveness increase with resource availability like nutrients and soil moisture. The growth habit and mode of propagation of the weed pose treatments problem in is control (Alhassan *et al*., 2015). The present thrust in weed research is the study the biology of weeds and to formulate integrated management practices by combining chemical and cultural methods which are efficient, economical and eco-friendly. Enormous seeds and tubers production and adaption to disperse with to help of various agents, *viz*., animals, and water help the weeds to avoid several of the control options when attempted in dependently (Chikoye *et al*., 2004). Hence, a comprehensive study was taken up to bring out to distribution pattern of weeds, competitive ability and to efficiency of integrated management practices to the tackle of weed menace.

Methodology

Phytosociological survey was taken up in non cropped areas to asses the weed infestation during 2023 in Madagadipet (Puducherry) India. Observations were recorded from 10 quadrats of the size 0.5x0.5m and importance value index (IVI) was computed for all the individual species following the formula suggested by Mishra (2016).

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Absolute Density (AD)

$$AD = \frac{\text{Total number of individual of a species}}{\text{Total number quadrants studies}} \times 100$$

Relative Density (RD)

$$RD = \frac{\text{Total number of individual of a species in all the quadrants}}{\text{Total number of individual of all the species in all quadrants}} \times 100$$

Absolute Frequency (AF)

$$AF = \frac{\text{Number of quadrant in which a species occurred}}{\text{Total number of quadrant studied}} \times 100$$

Relative Frequency (AF)

$$RF = \frac{\text{Absolute value of a species}}{\text{Sum of absolute frequency value of all species}} \times 100$$

Abundance (A)

$$A = \frac{\text{Total number of individual of a species in all the quadrants}}{\text{Total number of quadrants in which the species occurred}} \times 100$$

Relative Dominance (R.Do)

$$R.DO = \frac{\text{Abundance of a species}}{\text{Total of abundance of all species}} \times 100$$

Importance Value Index (IVI)

IVI =Relative frequency + Relative density + Relative dominance

Summed Dominance Ratio (SDR)

$$SDR = \frac{IVI}{2}$$

Results and Discussion

Distribution of weed flora

A total of 11 weed species were identified in the garden land field. Grasses, Sedges and Broad leaved weeds are identified in the garden land ecosystem and present in the Table 1.

Relative Frequency

The relative frequency (RF) computed for individual weed species in 2023 at Madagadipet exhibited that *Trianthem aprotulacastrum* was the predominant species with highest relative frequency (RF) of 16.00 per cent. *Phyllanthusniruri* found to be next in merit. *Euphorbia hirta* and *Mollungoverticillata* were the species registered the least values of relative frequency (Table 2).

Table 1. Weed floras

Habit	Scientific name
Grasses	*Dactylenoiumaegyptium,*
	Eragrostisamabilis
Broad leaved weeds	*Pyhsalis minima*
	Trianthemaprotulacastrum
	Cleome viscosa
	Pyllanthusniruri
	Acalypha indica
	Phyllanthusmadraspatensis
	Commelinabengalensis
	Euphorbia hirta
	Mollungaverticillata

Relative Dominance

Based on the result reviled the relative dominance (RD) of individual weed species in 2023 at Madagadipet the *Trianthema protulacastrum* was the predominant weed species with highest relative dominance (RD) of 22.6 per cent, *Dactylenoium aegyptium* was found to be next in merit with the value of 21.79. *Mollunga verticillate* and *Euphorbia hirta* were the species registered the least value of relative dominance (Table 2).

Relative Density

The relative density (R.D) computed for individual weed species in 2023 at Madagadipet indicated that *Trianthem aprotulacastrum* was the predominant weed species with registered the highest relative density (R.Do) of 32.9 per cent, *Dactylenoium aegyptium* was found to be next merit in 2023 (Table 2).

Importance Value Index (IVI)

The IVI computed for individual weed species at Madagadipet exhibited that *Trianthema protulacastrum* was predominant weed species with highest importance value index IVI of 71.56 per cent. *Euphorbia hirta* was the species registered the least value of importance value index (IVI) of 8.11 per cent in 2023. (Table 2).

The result identified the important species of weeds, sedges and grasses associated with garden ecosystem. IVI computed for individual weed species in 2023 at Madagadipet, Sri Manakula

Table 2. Phytosociological attributes of weeds at gardenland ecosystem

Weed	Q1	Q2	Q3	Q4	Species occur	Total	AD	RD	AF	RF	A	R.Do	IVI	SDR
Acalyphaindica	2	0	1	0	2	3	0.75	3.29	50	8	1.5	4.53	15.82	7.91
Commelinabengalensis	0	2	0	0	1	2	0.5	2.19	25	4	2.0	6.04	12.23	6.11
Cleome viscosa	3	6	0	0	2	9	2.25	9.89	50	8	4.5	13.59	31.48	15.74
Dactylenoiumaegyptium	3	8	0	4	3	15	3.75	16.48	75	12	5.0	15.10	43.58	21.79
Eragotisamabilis	2	0	0	5	2	7	1.75	7.69	50	8	5.5	10.57	26.26	13.13
Euphorbia hirta	1	0	0	0	1	1	0.25	1.09	25	4	1.0	3.02	8.11	4.05
Mollungavirticilia	0	1	0	0	1	1	0.25	1.09	25	4	1.0	3.02	8.11	4.05
Phyllanthusniruri	3	3	3	3	4	12	3.0	13.18	100	16	3.0	9.06	38.24	19.12
Phyllanthusmadraspatensis	1	0	0	2	2	3	0.75	3.29	50	8	1.5	4.53	15.82	7.91
Physalis minima	0	4	2	2	3	8	2.0	8.79	75	12	2.6	7.85	28.64	14.32
Trianthemaa portulacastrum	1	4	10	15	4	30	7.5	32.9	100	16	7.5	22.60	71.56	35.78
Total	-	-	-	-	-	91.0	22.75	99.88	625	100	33.1	99.88	291.74	149.91

Vinayagar Engineering College, School of Agricultural Sciences, farm indicated that *Trianthem aprotulacastrum* was the predominant weed species in garden land ecosystem. Effective weed management methods in the study area should be the strategy on the effective control of weeds in the garden land ecosystem. Our results will help in effective weed management programs in garden land cultivation (Table 2).

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