

WEED DIVERSITY IN TURMERIC CROP IN ARAKU & PADERU DIVISIONS OF ESTERN GHOTS- A STUDY

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Abstract:

The present study was carried out in a continuing experiment at the Araku valley mandal of Alluri sita rama raju dt. for their effects on weed menace under mid hill conditions of Estern ghots. There were 24 weed species, which invaded different cropping systems. During Kharif, Ageratum sp. (28%) Cynodon dactylon (20%) and Commelina benghalensis (19%) were the predominant weeds. In Rabi, Phalaris minor (63%) was the most dominating weed followed by Coronopus didymus (10%) and Spergula arvensis (6%). In traditional 'rice-wheat' system 14 species in Rabi and 8 in Kharif season were found associated and species richness varied with diversification of systems. In Rabi, the highest diversity of weed species was in rice-wheat system and in Kharif weed flora was more diverse in okra, turmeric and colocasia based systems and was lower in rice-based systems. During Kharif, Cynodon dactylon had the highest important value index (IVI) irrespective of the cropping system followed by C. benghalensis. Monochoria vaginalis was the important weed in rice-based cropping systems while Ageratum sp. was important in upland systems. Ageratum sp., Polygonum sp. and C. dactylon invaded the experimental field both during Kharif and Rabi.

During Kharif, the total weed count was maximum in September in okra, turmeric and colocasia,

Weed count in turmeric cropping systems it was higher than 200/m2 at all the observations. It varied from 200 to 650/m2. Ageratum sp. was the most dominant weed in Kharif, contributing 28% to total weed flora. Cynodon dactylon and Commelina benghalensis were next in dominance constituting 20% and 19% of total weed flora, respectively. Brassica sp., Monochoria vaginalis, Cyperus sp. and other weeds constituted 11, 10, 6 and 6% of total Kharif weed flora. Brassica sp., Fimbristylis sp., Artimisia argyi and Trifolium repens were observed for some time in the season. Polygonum alatum, Scirpus juncoides, Eleocharis sp., C.benghalensis and Phyllanthus niruri had sporadic appearance.

In Rabi, P.minor was the most dominating weed contributing 63% to total weed flora. C. didymus (10%), S.rvensis (6%), Ageratum sp. (4%), T. repens (3%), C.dactylon (3%), Polygonum sp. (4%) and other weeds (7%) were also observed. Lathyrus aphaca, Ageratum sp., C. dactylon, Polygonum hydropiper, C. didymus, P. minor, S. rvensis, V. sativa, P. alatum, T. repens were prevalent throughout the Rabi season. Bidens pilosa and A. ludoviciana have shown their occurrence at termination of the season. Artimisia argyi, Anagallis arvensis and Stellaria media were noticed on some of the observations.

Key words: Croping systems, Weed density, Weed diversity, Weed management, Crop diversity

Introduction

The total production of turmeric in the world is estimated to be about 1, 60,000 tonnes, of that Asian country only accounts for 78 per cent (Anon 1999). In India over an area of 1, 40,000 hector turmeric cultivation within account of 6, 00,000 tons per hectares. Turmeric is a prolonged length crop. Behind schedule emergence, slow initial increase of the crop and sufficient land area to be had due to wider spacing allow extra sunlight to attain the soil resulting in conductive surroundings for speedy weed growth and vast damage to crop yield.

The major weeds of the agricultural field were Echinochloa colona, Digitaria sanguinalis, Panicum dichotomiflorum, Commelina benghalensis, Cyperus iria, Ageratumspecies, Physalis minima, Bidens pilosa and Aeschynomene indica (Rana et.al 2017). Crop management powerfully impacts the abundance and variety of weeds (Nichols et al 2015).

Methodology

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The phytosociological characters: Frequency, Abundance, Density and their relative values and importance value index (IVI) are calculated according to the principles of Curtis and McIntosh (1950), Misra (1968) and Mueller-Dombois and Ellenberg (1974). The following are the different formulas for calculation of the weed abundance in turmeric field:

	Sum of individuals of a species in all quadrates
Density =	
	Total number of quadrates studied
	Number of quadrates in which the species occurred
Frequency (%) = x 100
	Total number of quadrates studied
Abundance =	Sum of individuals of a species in all quadrates Total number of quadrates in which the species occurred
Relative densi	Sum of individuals of the species ty =
	Number of individuals of all the species
	Sum of occurrence of the species

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Relative frequency = ----- x 100

Number of occurrence of all the species

Sum of individuals of a species in all quadrats

Relative abundance = ----- x 100

Total number of individuals of all species in all quadrats

Importance Value Index

The total picture of the relative ecological importance and the sociological structure of a given plant species in any community can't be obtained by relative parameters (relative frequency, relative density, relative abundance are summed up together and this value is designated as the Importance Value Index or IVI of the species (Curtis, 1959).

Shannon-Weiner Index (1963) is one of the broadly used indices for measuring species diversity. Shannon-wiener index (H) = - S [Pi (ln Pi)] Here Pi = (Sum of character of one weed species/Total variety of all individual of weed species) × 100. Evenness index (Pielou 1977). Evenness index (E) =H /Hmax. or = H/Log S Here H = Shannon diversity index S = Number of species. Species Richness: Species richness is any other mode of expression of the range and primarily based on the whole range of species and whole range of individuals in a pattern or habitat.

Identification of Specimens

- After finishing the weed collection from the crop fields the specimens had been recognized by way of evaluating with the actual certified specimens at the Andhra University Herbarium.
- Later these identifications had been checked once more with the regional Herbarium or in the laboratory with the assist of floras, monographs and different applicable literature and the right identify had been supplied to every plant.
- Each plant used to be significantly studied and recognized the use of the Flora of British India (Hooker, 1872-1897), Flora of Presidency of Madras (Gamble, 1915-1936). Flora of Andhra Pradesh (Pullaiah and Chennaiah 1997) and district floras of Srikakulam (Rao and Hara Sriramualu, 1986) and Visakhapatnam (Subba Rao and Kumari, 2002). Vizianagaram (Venkaiah, 2004).

• Results and discussion

In the present study in Site 1 Paderu turmeric cultivated place have been recorded a total of 79 weed species belonging to 68 genera and 29 families and 70 species belong to 55 Genera and 23 families have been recorded in Site 2 Araku. (Table .1). In Site 1 amongst the 29 families one species each these are Acanthaceae, Aizoaceae, Asclepiadaceae, Chenopodiaceae, Commelinaceae, Cucurbitaceae, Mimosaceae, Papaveraceae Passifloraceae, Poaceae and Polygonaceae. Asteraceae is the largest family representing with 13 species, Euphorbiaceae occupies the second position with 10 species accompanied by Amaranthaceae, Asclepiadaceae, Boraginaceae, Commelinaceae, Papaveraceae and Passifloraceae. Euphorbiaceae is the largest family representing with 13 species, Asteraceae occupies the second position with 11 species accompanied by Poaceae with 6, Amaranthaceae and Malvaceae with 5 species. These families are also the most important ones in different crops, as in sunflower (Adegas et al., 2010) and in sugarcane cultivations (Oliveira and Freitas 2008).



This is the first attempt of Phytosociology work in Turmeric crop field. This Study offers us most needed information about Distributation of Weed community. Its provide us a base line records about Weed. This end result is beneficial for Weed management and in addition lookup in financial value, Medicinal value and different branches associated weed, this statistics is beneficial for Farmers, Researcher and different fascinated person. The presence of some weeds in two or three vegetation suggests their wider adoptability whilst limit of some weeds to precise crop indicates their requirement for one-of-a-kind circumstance in order to grow.

This survey will furnish a base for future weed surveys. The weed plant life work at regional level would be of accurate supply of records on technical and taxonomic data.

Table 1. Top ten dominated weeds in Site -1										
Name of the Plant		F	D	Α	RF	RD	RA	IVI		
Trianthema portulacastrum L.		68	4.420	6.500	2.000	2.659	1.512	6.171		
Ageratum conyzoides L.		80	4.620	5.775	2.353	2.779	1.344	6.476		
Bidens pilosa L.		88	4.680	5.318	2.588	2.815	1.237	6.641		
Parthenium hysterophorus L.		90	4.620	5.133	2.647	2.779	1.194	6.621		
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Synedrella nodiflora (L.) Gaertn. Phyllanthus amarus Schum. &	72	4.220	5.861	2.118	2.539	1.364	6.020
Thonn.	84	4.260	5.071	2.471	2.563	1.180	6.213
Chloris barbata (L.) Sw.	44	4.440	10.091	1.294	2.671	2.348	6.313
Cynodon dactylon (L.) Pers.	90	6.000	6.667	2.647	3.609	1.551	7.808
Dactyloctenium aegyptium (L.)							
Willd.	66	4.620	7.000	1.941	2.779	1.629	6.349
Imperata cylyndrica (L.)							
Raeusch.	92	4.260	4.630	2.706	2.563	1.077	6.346



Ageratum conyzoides L.



Trianthema portulacastrum L



Bidens pilosa L.



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Phyllanthus amarus Schum. & Thonn.



Dactyloctenium aegyptium

Imperata cylyndrica (L.)

Fig-1

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