RELATIVE DOMINANCE OF WEED FLORA IN WETLAND RICE ECOSYSTEM OF THIRUVANANTHAPURAM DISTRICT

Sajith Babu, D., Sansamma George and Nishan, M.A.

College of Agriculture, Vellayani, Thiruvananthapuram, Kerala – 695522

Abstract: The field survey on floral diversity and dominance was carried out to develop a database on the floral diversity and relative species dominance in wetland rice ecosystem of Thiruvananthapuram district during the first and second crop seasons, in both cultivated and fallow fields. The results revealed that in the cultivated fields during both seasons, the most prominent weed species among the three classes of weeds (grasses, sedges and broad leaved weeds) were *Isachne miliacea*, *Cyperus iria* and *Monochoria vaginalis* respectively. The relative dominance of the weeds in the fallows was found slightly different. While *Isachne miliacea* remained to be the dominant grass weed, the dominant sedge weed in the fallows was *Cyperus distans* during the first crop season while it was *Fimbristylis miliacea* during the second crop season. *Monochoria vaginalis* and *Ludwigia perennis* topped the list of broad leaved weeds in the rice fallows during first and second crop seasons respectively.

Keywords: Relative dominance, Weed flora, Wetland, Rice ecosystem, Rice fallow

INTRODUCTION

Weeds have been able to reproduce, survive and compete with the cultivated species of plants primarily due to its diversity and aggressivity. A thorough understanding of the ecological relationship between the crops and the distribution and prevalence of weed flora in a region is of great importance in planning the weed management strategies for the locality. Mapping of the weed profiles in space and time and relating dominant species shifts to changes in management practices and environmental factors in all rice growing areas are needed for sustained rice production (Auld and Kim, 1996).

In rice, the floristic composition, abundance and aggressivity are found to vary with agro-climatic situations, seasons and type of rice culture. Biodiversity in weeds occur as a result of differential survival mechanism of individual plant species. Heterogeneous weed populations exploit weakness in weed management strategies and adapt well to remain competitive with crop plants. This successful behavior in a weed population is the aggregate of diverse, individual plant behaviors and understanding this weed diversity in a field is essential for effective management of weeds (Rao, 2000). Suarez *et al.* (2001) found relationship between environment and weed vegetation and proposed that species composition may be used as an indicator of environment. The weed flora differs widely depending on the soil as well as environmental conditions and hence detailed information on the spectrum of weed flora is essential for the formulation of effective weed management strategies (Vidya *et al.*, 2004). With this background, an investigation was carried out to develop a database on the floral diversity and relative species dominance in wetland rice ecosystem of Thiruvananthapuram district.

MATERIAL AND METHODS

The field survey on floral diversity and dominance was carried out in rice fields of 30 panchayaths in Thiruvananthapuram district having more than 50 hectares of net sown area, covering all the four thaluks of the district *viz.*, Thiruvananthapuram, Chirayinkizhu, Neyyattinkara and Nedumangadu during the first and second crop seasons, in both cultivated and fallow fields. The design adopted was stratified multistage random sampling. Weed flora in wetland rice ecosystems were identified and quantified by census quadrate method using 0.5 X 0.5 m^2 quadrate. The quadrate was thrown at random by standing at the north - eastern corner of each field. The plants within the individual quadrate were collected and a total of 480 such bulk samples were taken both from the cultivated and fallow lands giving adequate representation to the area surveyed.

In the present study, the relative dominance of the weed flora was determined by working out the following vegetation analysis parameters proposed by Philips (1959). Importance Value was obtained by adding the relative density (Rd*)* and relative frequency (Rf) of a given species (Kent and Coker, 1992).

$$\text{Absolute density (Ad)} = \text{Total number of weeds of a given species m}^{-2}$$

$$\text{Relative density (Rd)} = \frac{\text{Absolute density of a species}}{\text{Total absolute densities of all the species}} \times 100$$

$$\text{Absolutefrequency Af} = \frac{\text{Number of quadrates in which a given species occurred}}{\text{Total number of quadrates used}} \times 100$$

$$\text{Relativefrequency Rf} = \frac{\text{Absolute frequency of a species}}{\text{Total of absolute frequencies of all the species}} \times 100$$

$$\text{Importance Value (IV)} = \text{Relative density (Rd)} + \text{Relative frequency (Rf)}$$

RESULT AND DISCUSSION

The results revealed that *Isachne miliacea* was the most dominant grassy weed in cultivated and fallow rice fields during both first and second crop seasons (Table 1 & 4). Among the sedges *Cyperus iria* recorded the maximum dominance in cultivated rice fields (Table 2) while *Fimbristylis miliaceae* was most dominant in rice fallows all throughout (Table 5). Among broad leaved weeds (BLW), *Monochoria vaginalis* recorded the maximum absolute and relative densities during first crop season in cultivated rice fields. *Alternenthera sessilis* was the most frequent BLW while *Bacopa moneri* recorded the maximum importance value. During the second crop season *Monochoria vaginalis* was the most dominant weed in cultivated rice fields (Table 3). In the rice fallows *Monochoria vaginalis* recorded the maximum absolute and relative densities and was the most frequent weed in first crop season. In second crop season *Ludwigia perennis* recorded the maximum absolute and relative densities while *Ammania baccifera* was the most frequent in rice fallows. *Alternenthera sessilis* recorded the maximum importance value in first crop season while *Ammania baccifera* recorded the maximum importance value in second crop season in rice fallows. During both the seasons *Monochoria vaginalis* was the most abundant BLW in rice fallows(Table 6).

As mentioned earlier, *Isachne miliacea*, definitely was the most dominant weed species during both seasons as well as under both cultivated and fallow situations and their absolute density was much higher than that of all the other weeds. According to Gopinath and Jithendra Pandey (2004) *Echinochloa colona* and *E. crus-galli* were the dominant weeds in transplanted rice in India. Sasidharan *et al*. (1990) and Thresiamma *et al.* (1990) studied the weed diversity in rice ecosystem of Kuttanad, Kerala and observed the predominance of *Echinochloa* spp. However in the present study *Isachne miliacea*, recorded weed dominance indices much ahead of that recorded for all other weed species while among other classes of weeds, the dominance varied with season as well as agronomic practices. *Isachne miliacea*, with its perennial nature and mat forming growth habit (above and below ground) was predominating and suppressing all other weed species in the wetland rice ecosystem in the study area. Such deviation from the general species distribution is in conformity with the observations of Vidya *et al*. (2004) and Sasidharan *et al.* (1990) that the weed flora differs widely depending on the soil as well as environmental conditions

It could also be elucidated that while season as well as agronomic practices had significant influence on the relative dominance of sedges and broad leaved weeds, the growth of *Isachne miliacea* was not found much influenced by these factors. It was evident that the perennial weed adapted well and persisted under the diverse wetland ecosystems in the district from the results of other vegetative parameters. As expected, the absolute weed density values of the weeds recorded in the fallows was substantially higher than that in the cultivated fields which could be attributed to the undisturbed ecosystem prevailing in the rice fallows.

Isachne miliacea spreads through seeds as well as through stem bits making it one of the most troublesome weed even under better managed situations. The weed is resistant to the prevalent farmer's practice of hand pulling and its mat forming roots interfere with the movement of wheels of small implements like rotary weeder restricting their efficient use. As observed by Rao (2000) manual weeding is effective against annuals and biennials, but do not control perennials and is expensive in areas where labour is scarce. The selective herbicides available in the market at present are also not effective in controlling this noxious grass. Clements *et al.* (1994) observed that integrated weed management (IWM) strategies can increase species diversity, reducing dominance of specific noxious weeds in any agro – ecosystem. In the present crop- weed scenario also such an integration of good agricultural practices (GAP) alone can be recommended as a viable strategy to restrict and manage *Isachne miliacea*

Table 1. Absolute Density (Number . m^{-2}), Relative Density (%), Absolute Frequency (%), Relative Frequency (%) and Importance value of Grasses in the cultivated wetland ecosystem of Thiruvananthapuram district during the first and second crop seasons

Sl. No	Scientific name	Ad		Rd		Af		Rf		IV	
		Ist crop	IInd crop	Ist crop	IInd crop	Ist crop	IInd crop	Ist crop	IInd crop	Ist crop	IInd crop
GRASSES											
1	*Isachne miliacea*	73.3	83.3	47.51	52.36	30.60	45.80	7.3	11.6	54.8	64.0
2	*Ischaemum indicum*	2.38	7.40	1.54	4.65	10.30	16.70	2.4	4.2	4.0	8.9
3	*Paspalam distichum*	4.68	1.03	3.03	0.65	8.10	3.80	1.9	1.0	5.3	3.2
4	*Brachiaria milliformis*	2.19	2.08	1.42	4.45	9.20	12.30	3.70	3.10	5.2	4.4
5	*Sporobolus diander*	2.12	1.36	1.37	0.85	5.60	5.20	1.3	1.3	4.9	1.7
6	*Echinochloa colona*	1.58	1.79	1.02	1.12	18.0	8.10	4.3	2.1	2.9	2.9
7	*Eleusine indica*	1.58	1.27	1.02	0.79	5.60	5.60	1.3	1.4	2.4	2.7
8	*Dactyloctenium aegyptium*	1.22	1.28	0.79	0.80	8.80	8.10	2.1	2.1	2.7	2.2
9	*Digitaria ciliaris*	0.93	1.55	0.60	0.97	7.50	6.70	1.8	1.7	2.3	2.2
10	*Sacciolepis interrupta*	0.92	1.11	0.60	0.70	5.20	4.40	1.2	1.1	1.8	1.8
11	*Ischaemum rugosum*	0.63	0.33	0.41	0.21	2.50	1.70	0.6	0.4	0.7	2.0
12	*Eragrostis uniloides*	0.46	0.32	0.30	0.20	3.80	3.10	0.9	0.8	1.2	1.0
13	*Hygrorhyza aristata*	0.38	0.36	0.25	0.23	3.80	2.90	0.9	0.7	1.2	0.9
14	*Eragrostis viscosa*	0.35	0.33	0.23	0.21	1.90	3.10	0.5	0.8	0.7	1.0
15	*Rottboellia exaltata*	0.52	0.03	0.34	0.02	1.70	0.40	0.4	0.1	1.0	0.6
16	*Oryza spontanea*	0.06	0.35	0.04	0.22	0.60	2.10	0.1	0.5	0.7	0.1
17	*Leersia hexandra*	0.26	2.00	0.17	1.26	1.90	2.90	0.5	0.7	0.1	0.7

Table 2. Absolute Density, Ad (Number . m^{-2}), Relative Density, Rd (%), Absolute Frequency, Af (%) and Relative Frequency, Rf (%)and Importance value, IV of Sedges in the cultivated wetland ecosystem of Thiruvananthapuram district during the first and second crop seasons

Sl. No.	Scientific name	Ad		Rd		Af		Rf		IV	
		Ist crop	IInd crop	Ist crop	IInd crop	Ist crop	IInd crop	Ist crop	IInd crop	Ist crop	IInd crop
1	*Cyperus iria*	9.35	9.22	6.05	5.80	43.3	41.0	9.75	9.6	16.3	16.1
2	*Fimbristylis miliacea*	3.08	4.05	1.99	2.54	10.4	10.4	2.5	2.6	5.3	4.6
3	*Cyperus distans*	4.13	2.89	2.67	1.82	10.8	11.0	2.6	2.8	5.3	4.4
4	*Cyperus difformis*	3.21	2.23	2.08	1.40	13.3	11.7	3.2	3.0	4.5	5.1
5	*Cyperus exaltatus*	1.39	1.80	0.90	1.13	8.1	9.8	2.9	1.8	4.2	2.5
6	*Schoenoplectus articulatus*	1.34	1.79	0.87	1.12	4.2	4.0	1.0	1.0	2.8	3.6
7	*Cyperus compressus*	1.97	1.06	1.28	0.67	12.3	7.1	2.9	1.8	2.5	2.7
8	*Cyperus pilosus*	1.11	1.16	0.72	0.73	7.5	7.7	1.8	2.0	2.2	2.6

9	Eleocharis dulcis	0.93	1.23	0.60	0.77	6.9	7.3	1.6	1.8	1.9	2.1
10	*Eriocaulon quinquangulare*	0.65	0.74	0.42	0.46	6.7	5.4	1.6	1.4	2.0	1.9
11	*Fuirena ciliata*	0.35	0.34	0.23	0.21	2.9	3.1	0.7	0.8	0.9	1.0
12	*Fimbristylis cymosa*	0.33	0.34	0.21	0.21	3.1	2.5	0.7	0.6	0.9	0.8

Table 3. Absolute Density, Ad (Number . m^{-2}), Relative Density, Rd (%), Absolute Frequency, Af (%) and Relative Frequency, Rf (%)and Importance value, IV of BLW in the cultivated wetland ecosystem of Thiruvananthapuram district during the first and second crop seasons

Sl. No.	Scientific name	Ad		Rd		Af		Rf		IV	
		I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop
1	*Monochoria vaginalis*	6.00	4.11	3.88	2.58	25.8	22.8	5.2	7.0	9.1	9.6
2	*Dopatrium junceum*	3.07	3.35	1.99	2.10	7.1	7.5	1.7	1.9	6.1	5.4
3	*Ammania baccifera*	3.00	3.02	1.94	1.90	17.5	4.2	3.5	2.9	4.7	4.4
4	*Bacopa monnieri*	4.22	1.69	2.73	1.06	13.8	8.8	3.3	2.2	5.2	3.3
5	*Alternanthera sessilis*	1.74	2.33	1.13	1.46	15.2	11.5	3.6	2.9	5.0	3.2
6	*Commelina benghalensis*	2.48	1.30	1.61	0.82	14.4	9.4	3.4	2.4	3.7	4.0
7	*Salvinia molesta*	1.78	1.74	0.04	0.02	7.9	7.7	1.9	2.0	3.8	3.0
8	*Wedelia calendulacea*	1.92	0.93	1.24	0.58	7.9	7.7	1.2	0.9	3.1	3.1
9	*Alternanthera tenella*	1.53	1.28	0.99	0.80	7.9	6.9	2.8	1.2	3.4	2.3
10	*Commelina diffusa*	1.41	1.09	0.91	0.68	7.1	7.5	2.5	1.6	2.5	2.3
11	*Marsilea quadrifoliata*	1.02	1.21	0.66	0.76	5.0	6.5	1.2	1.6	1.9	2.4
12	*Desmodium heterophyllum*	0.99	0.89	0.64	0.56	7.9	6.9	1.9	1.7	2.4	1.5
13	*Limnophila repens*	0.37	0.69	0.24	0.43	2.7	4.8	0.6	1.2	0.8	1.6
14	*Lindernia pusilla*	0.53	0.38	0.34	0.24	2.5	2.7	0.2	0.5	0.9	0.9
15	*Rotala indica*	0.43	0.40	0.28	0.25	1.9	2.9	0.5	0.7	0.8	1.0
16	*Impatiens oppositifolia*	0.36	0.33	0.23	0.21	1.9	1.9	0.5	0.5	0.9	0.7
17	*Hydrolea zeylanica*	0.38	0.25	0.25	0.16	2.7	2.1	0.6	0.5	1.0	0.5
18	*Rotala macrandra*	0.21	0.41	0.14	0.26	1.5	1.7	0.4	0.4	0.7	0.7
19	*Limnophila heterophylla*	0.33	0.16	0.21	0.10	3.3	1.5	0.8	0.4	0.5	0.7
20	*Lindernia crustacea*	0.15	0.27	0.09	0.17	0.8	2.1	0.6	0.7	0.3	0.7
21	*Sphaeranthus indicus*	0.06	0.03	0.04	0.02	0.4	0.4	0.09	0.1	0.1	0.1

Table 4. Absolute Density, Ad (Number . m^{-2}), Relative Density, Rd (%), Absolute Frequency, Af (%) and Relative Frequency, Rf (%)and Importance value, IV of Grasses in the rice fallows of Thiruvananthapuram district during the first and second crop seasons

Sl. No.	Scientific name	Ad		Rd		Af		Rf		IV	
		I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop
1	*Isachne miliacea*	91.86	87.61	56.02	53.68	30.0	43.8	7.9	11.5	63.92	69.18
2	*Ischaemum indicum*	5.43	19.94	3.31	12.22	8.3	20.0	2.2	5.3	5.51	17.52

3	*Paspalam distichum*	7.84	1.27	4.78	0.78	8.5	4.4	2.2	1.2	6.98	1.98
4	*Sporobolus diander*	1.73	1.58	0.60	0.97	7.3	5.4	1.9	1.4	4.02	2.79
5	*Sacciolepis interrupta*	2.63	0.54	1.60	0.33	5.4	4.0	1.4	1.1	3.03	2.62
6	*Eleusine indica*	0.83	1.87	0.51	1.15	4.8	4.8	1.3	1.3	2.50	2.37
7	*Panicum repens*	1.62	0.93	0.99	0.57	3.5	4.0	0.9	1.1	2.47	2.32
8	*Dactyloctenium aegyptium*	1.36	1.18	0.83	0.72	8.5	7.1	2.2	1.9	2.32	2.46
9	*Brachiaria milliformis*	1.35	1.12	0.82	0.69	12.3	8.1	3.2	2.1	3.0	1.43
10	*Digitaria ciliaris*	1.10	0.84	0.67	0.52	6.9	6.9	1.8	1.8	1.81	2.45
11	*Echinochloa colona*	0.69	1.08	0.42	0.66	7.1	6.9	1.9	1.8	1.89	1.67
12	*Eragrostis tef*	0.64	0.97	0.39	0.59	4.8	4.8	1.1	0.9	1.49	1.49
13	*Eragrostis unioloides*	0.50	0.66	0.30	0.40	2.1	2.7	0.8	1.3	1.10	1.70
14	*Ischaemum rugosum*	0.42	0.46	0.26	0.28	2.7	2.1	0.7	0.6	0.96	0.88
15	*Eragrostis viscosa*	0.30	0.48	0.18	0.29	2.1	2.7	0.6	0.7	0.78	0.99
16	*Leersia hexandra*	0.20	0.28	0.12	0.17	1.5	2.1	0.4	0.6	0.57	1.09
17	*Hygrorhyza aristata*	0.11	0.33	0.07	0.20	1.9	2.7	0.5	0.8	0.52	0.77
18	*Oryza spontanea*	0.18	0.20	0.11	0.12	0.6	1.5	0.2	0.4	0.31	0.52
19	*Rottboellia exaltata*	0.32	0.01	0.19	0.01	1.3	0.2	0.3	0.05	0.49	0.06

Table 5. Absolute Density, Ad (Number . m^{-2}), Relative Density, Rd (%), Absolute Frequency, Af (%) and Relative Frequency, Rf (%)and Importance value, IV of Sedges in the rice fallows of Thiruvananthapuram district during the first and second crop seasons

Sl. No.	Scientific name	Ad		Rd		Af		Rf		IV	
		I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop	I^{st} crop	II^{nd} crop
1	*Fimbristylis miliacea*	2.63	4.06	1.60	2.49	10.8	10.4	2.8	2.7	4.40	5.19
2	*Cyperus distans*	3.05	2.13	1.86	1.31	11.5	10.4	3.0	2.7	4.86	4.01
3	*Cyperus iria*	2.44	1.78	1.49	1.09	11.7	11.0	3.1	2.9	4.59	3.99
4	*Cyperus difformis*	2.41	1.75	1.47	1.07	12.3	10.2	3.2	2.7	4.67	3.77
5	*Cyperus compressus*	1.75	0.93	1.07	0.57	11.0	5.8	2.9	1.5	3.18	3.23
6	*Chara gymnopitys*	1.12	1.19	0.68	0.73	9.6	9.4	2.5	2.5	3.97	2.07
7	*Cyperus pilosus*	0.83	0.95	0.51	0.58	5.8	7.1	1.5	1.9	2.88	2.47
8	*Cyperus exaltatus*	0.79	0.97	0.48	0.59	8.3	7.3	2.2	1.9	2.68	2.49
9	*Eleocharis dulcis*	0.63	0.93	0.38	0.57	9.6	7.1	2.5	1.9	2.01	2.48
10	*Cyperus haspan*	0.25	0.80	0.15	0.49	5.4	7.3	1.4	1.9	1.55	2.39
11	*Eriocaulon quinquangulare*	0.56	0.45	0.34	0.28	5.0	4.4	1.3	1.2	1.64	1.48
12	*Fimbristylis cymosa*	0.23	0.69	0.14	0.42	2.3	2.9	0.6	0.8	0.74	1.22
13	*Fuirena ciliata*	0.40	0.46	0.24	0.28	2.5	2.7	0.7	0.7	0.91	1.05
14	*Schoenoplectus articulatus*	0.32	0.48	0.19	0.29	2.3	2.3	0.6	0.6	0.94	0.98

15	*Fimbristylis monostachya*	0.34	0.40	0.21	0.25	10.8	10.4	0.7	0.8	0.79	0.89
16	*Scirpus grossus*	0.49	0.50	0.29	0.31	4.0	4.6	1.1	1.2	1.39	1.51

Table 6. Absolute Density, Ad (Number . m^{-2}), Relative Density, Rd (%), Absolute Frequency, Af (%) and Relative Frequency, Rf (%)and Importance value, IV of Broad leaved weeds in the rice fallows of Thiruvananthapuram district during the first and second crop seasons

Sl. No.	Scientific name	Ad		Rd		Af		Rf		IV	
		Ist crop	IInd crop	Ist crop	IInd crop	Ist crop	IInd crop	Ist crop	IInd crop	Ist crop	IInd crop
1	*Ammania baccifera*	3.52	2.02	2.15	1.24	15.6	13.1	4.1	3.4	6.25	4.64
2	*Monochoria vaginalis*	2.30	1.92	1.40	1.18	10.6	10.0	2.8	2.6	5.25	3.63
3	*Commelina diffusa*	2.47	1.36	1.51	0.83	10.8	6.5	2.8	1.7	4.20	3.78
4	*Ludwigia perennis*	1.54	2.22	0.94	1.36	6.5	12.5	1.7	3.3	4.70	3.10
5	*Bacopa monnieri*	1.96	1.30	1.20	0.80	13.1	8.8	3.5	2.3	4.01	3.61
6	*Limnophila heterophylla*	2.22	0.90	1.35	0.55	8.3	4.2	2.2	1.1	2.64	4.66
7	*Alternanthera sessilis*	1.72	1.36	1.05	0.83	10.8	6.5	4.2	2.8	4.31	2.53
8	*Desmodium heterophyllum*.	1.13	1.82	0.69	1.12	7.3	9.0	1.9	2.4	2.59	3.52
9	*Dopatrium junceum*	1.13	1.76	0.69	1.08	5.8	7.5	1.5	2.0	2.88	2.45
10	*Commelina benghalensis*	1.50	1.33	0.91	0.81	11.7	10.6	3.1	2.8	2.19	3.08
11	*Impatiens oppositifolia*	1.86	0.61	1.13	0.37	2.1	2.9	0.6	0.8	3.55	1.65
12	*Marsilea quadrifoliata*	0.80	0.92	0.49	0.56	4.2	6.0	1.1	1.6	1.94	2.56
13	*Wedelia calendulacea*	0.99	0.69	0.60	0.42	4.8	4.0	1.3	1.4	1.59	2.16
14	*Alternanthera tenella*	0.78	0.73	0.48	0.45	9.0	7.5	2.4	2.0	1.90	1.82
15	*Salvinia molesta*	0.72	0.75	0.44	0.46	5.6	5.0	1.5	2.1	1.73	1.17
16	*Limnophila repens*	0.53	0.77	0.32	0.47	1.9	5.8	0.5	1.5	0.82	1.97
17	*Rotala macrandra*	0.63	0.55	0.38	0.34	2.5	2.3	0.7	0.6	1.08	0.94
18	*Hydrolea zeylanica*	0.15	0.72	0.09	0.44	1.7	2.3	0.4	0.6	0.67	1.22
19	*Rotala indica*	0.28	0.53	0.17	0.32	1.9	3.5	0.5	0.9	0.49	1.28
20	*Sphaeranthus indicus*	0.02	0.20	0.01	0.12	0.2	0.6	0.05	0.1	0.49	1.04
21	*Lindernia pusilla*.	0.03	0.11	0.09	0.38	0.6	1.0	0.2	0.3	0.22	0.37
22	*Lindernia crustacea*	0.03	0.11	0.02	0.07	1.5	3.5	0.4	0.9	0.06	0.14

CONCLUSION

The results of the present study revealed substantial floral diversity in wetland rice ecosystem of Thiruvananthapuram district. It was also evident that the relative dominance differed substantially with season and management practices adopted in the field.It must be mentioned that the predominance of *Isachne miliacea* specifically in the southern tracts of the state, warrants more detailed studies on the ecological requirements and preferences of the weed.

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