



# INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 5, Issue 2)

Available online at: [www.ijariit.com](http://www.ijariit.com)

## Correlation between the water level and the growth of weeds in the paddy Field in Kannur District, Kerala

Prabhakaran P. V.

[prabharamanthali@gmail.com](mailto:prabharamanthali@gmail.com)

Sree Narayana College, Kannur, Kerala

Dr. Aravindan Tharemmal

[atharemmal@yahoo.com](mailto:atharemmal@yahoo.com)

Sree Narayana College, Kannur, Kerala

### ABSTRACT

*The presence of water in the field appears to inhibit the growth of weeds, which are largely terrestrial or semi-aquatic species. The lack of retention of water in the Midland Laterite Hillock Paddy Field (MLHPF) favoured the excess growth of weeds. But in the other two regions (that is FWPF and CPF), the weed growth was less because these regions were filled with water up to a certain extent during the southwest monsoon.*

**Keywords**— Weeds, Fresh Water Paddy Field (FWPF), Coastal Paddy Field (CPF), Midland Laterite Hillock Paddy Field (MLHPF)

### 1. INTRODUCTION

Paddy fields are the silent victims of the so called developmental boom in Kerala especially in Kannur district. The area under paddy cultivation in Kerala during the agricultural year 2011-12 was 2, 08,160 Hectare. It has decreased by 5027 Hectare (2%) than the previous year 2010-11. Kannur contributed 2.76% to the state total with rice cultivation spread over 5740 Hectare. On analyzing the area of the state for last 10 years, paddy cultivation was high during the agricultural year 2002-03 and the area was 3,10,521 Hectare. Paddy accounted to 7.82 % of the total cropped area in the state during 2011-12. (Agricultural Statistics 2011-2012, Department of Economics & Statistics, Thiruvananthapuram, Kerala State, February-2013).

The weeds of the paddy field proper were dominated by the monocot families of Poaceae and Cyperaceae while weeds in the field bunds were dominated by dicot families of Asteraceae and Euphorbiaceae. The weeds provide an alternate habitat to insects in particular. (Bambaradeniya et.al, 1998).

The sedge *Eleocharis dulcis* (Burm.f) Henschel (Cyperaceae) traps rice white stem borer *Scirpophaga innotata* (Walker) (Lepidoptera: Pyralidae) in Andamans. (Ranganath, Prasad. and Sheeba.2002).

The weed species that cause problems in rice vary with soil, planting methods, water management, fertility levels and weed control practices (Thomas and Abraham. 1998). Weeds compete with rice for various resources such as light, water, nutrients, space etc. and reduce the yield.

### 2. STUDY AREA

The insect pests of paddy, the natural enemy complex in the paddy field and the associated fauna and flora occurring in three different paddy ecosystems (fresh water, coastal and midland laterite hillock paddy ecosystem) of Kannur were surveyed for the entire crop period and classified into vegetative, reproductive and grain filling phases. Insect pests and birds were separately recorded for the three stages. The study was carried out in 3 different paddy field stations in Kannur district each having an area of approximately 0.5 hectare in extent.

Okra Vayal (Fresh Water Paddy Field) is located in the Cheruthazham Village at 12° 04' N and 75° 15' E, about 25 km north of Kannur town. The altitude of the Okra Vayal is about 10m above sea level.

MundapuramVayal (Coastal Paddy Field) is located in Cherukunnu Village at latitude 11°59'N and longitude 75°17'E about 17 km north of Kannur town. The altitude of the MundapuramVayal is about 3m above sea level. It is a coastal area.

*P. V. Prabhakaran, Tharemmal Aravindan; International Journal of Advance Research, Ideas and Innovations in Technology*  
 Madayippara (Midland Laterite Hillock Paddy Field) is located in the Madayi village, at latitude 12°03' N and longitude 75°15'E, about 21 km north of Kannur town, the district headquarters of Kannur district in Kerala. The altitude of the Madayippara ranges from a minimum of 40 m to a maximum of 47m above sea level.

### 3. OBJECTIVES OF THE STUDY

- Identification of the animals and plants that inhabit or visit the rice field during the cultivation cycle, which passes through three growth phases of rice viz Vegetative Growth Phase (VGP), Reproductive Phase (RP) and Grain Filling Stage (GFS).
- Study the entomofauna and their abundance with respect to their benefit as well as harmful effects on different paddy farming practices.
- Finding out the correlation between insect pests and predators during three growth phases of rice in different types of farming systems.
- Suggesting insect management measures in paddy farming systems of the study area.
- Study the impact of other fauna on paddy farming practices.
- Study the impact of other flora on paddy farming practices.

### 4. METHODS OF SAMPLING

The paddy field proper (including nursery) was sampled once every two weeks for five months. Sampling which began in the morning was carried out throughout the day. Weeds representative of the field proper were removed for identification on three occasions overall, with one sampling per phase.

### 5. RESULTS

Number of species of weeds was highest (13) in MLHPF (Region 3) and lowest (7) in FWPF (Region1). The number of species of weeds was 11 in CPF (Region 2). At the same time number of species of insect pests was lowest (14) in MLHPF (Region 3). This shows that weeds attract the insect pests of paddy and reduce the menace of these pests in the paddy field. Hence the number of insect pest species was lowest in MLHPF (Region 3).

The lack of retention of water in the Midland Laterite Hillock Paddy Field (MLHPF) during the south-west monsoon favoured the excess growth of weeds. But in the other two regions (that is FWPF and CPF), the weed growth was less because these regions were filled with water up to a certain extent during the south-west monsoon.

The weeds of the paddy field proper were dominated by the monocot families of Poaceae and Cyperaceae while weeds in the field bunds were dominated by dicot families of Asteraceae and Euphorbiaceae. The weeds provide an alternate habitat to insects in particular.

**Table 1: Total weeds in 3 regions**

S no.	Weeds in 3 regions	Family	CPF	FWPF	MLHPF
1.	<i>Hygrophila spinosa</i>	Acanthaceae	+	-	-
2.	Red amaranthus	Amaranthaceae	-	-	+
3.	Blumea sp	Asteraceae	-	-	+
4.	<i>Eupatorium odoratum</i>	Asteraceae	-	-	+
5.	<i>Eclipta alba</i>	Asteraceae	+	-	-
6.	<i>Heliotropium</i> sp	Boraginaceae	+	-	-
7.	<i>Gangrea madras patanensis</i>	Cantharidae	+	-	-
8.	<i>Cleome rutidospermum</i>	Cleomaceae	+	-	+
9.	Cucurbita sp	Cucurbitaceae	-	-	+
10.	Sedges	Cyperaceae	+	-	+
11.	<i>Eleocharis dulcis</i>	Cyperaceae	+	+	-
12.	<i>Phyllanthus amarus</i>	Euphorbiaceae	-	-	+
13.	<i>Euphorbia hirta</i>	Euphorbiaceae	-	-	+
14.	Wild pulse	Fabaceae	-	-	+
15.	<i>Mimosa pudica</i>	Fabaceae	-	-	+
16.	<i>Utricularia</i> sp	Lentibulariaceae	-	+	-
17.	<i>Marselia</i> sp	Marsileaceae	+	-	-
18.	<i>Nymphaea nouchouli</i>	Nymphaeaceae	-	+	-
19.	<i>Nymphaea stellata</i>	Nymphaeaceae	-	+	-
20.	<i>Ludwigia</i> sp	Onagraceae	-	-	+
21.	Grass	Poaceae	-	-	+
22.	<i>Eragrostis</i> sp	Poaceae	+	+	-
23.	<i>Cynodon dactylon</i>	Poaceae	+	-	-
24.	<i>Oryza rufipogon</i>	Poaceae	-	+	-
25.	<i>Monochoria vaginalis</i>	Pontederiaceae	+	-	-
26.	<i>Physalis minima</i>	Solanaceae	-	-	+
Total			11	7	13

**Table 2: Insect pest species in 3 Regions**

S no.	Insect pest species	Scientific name	CPF	FWPF	MLHPF
1.	Rice leaf roller	<i>Cnaphalocrocis medinalis</i>	+	+	+
2.	Rice stem borer	<i>Scirpophaga incertulas</i>	+	-	-
3.	Rice case worm	<i>Nymphula depunctalis</i>	+	-	-
4.	Green horned Caterpillar	<i>Melanitis leda ismene</i>	+	+	+
5.	Rice skipper	<i>Pelopidas Mathias</i>	+	-	-
6.	Green hairy caterpillar	<i>Rivula basalis</i>	+	+	-
7.	Rice bug	<i>Leptocorisa acuta</i>	+	+	+
8.	Rice hispa	<i>Dicladisa armigera</i>	+	-	+
9.	Rice leptispa	<i>Leptispa pygmaea</i>	+	+	-
10.	Gregarious blue Beetle	<i>Haltica cyanea</i>	+	-	-
11.	Spotted Leaf beetle	<i>Oides affinis</i>	+	+	+
12.	Pumpkin Beetle	<i>Aulacophora lewisi</i>	+	-	+
13.	Rice grass hopper	<i>Hthar isroglyphus banian</i>	+	+	+
14.	Grass hopper		+	-	+
15.	Mole cricket	<i>Gryllotalpa africana</i>	+	+	-
16.	Rice root weevil	<i>Echinacea oryzae</i>	+	-	-
17.	White rice leaf Hopper	<i>Cicadella spectra</i>	+	+	+
18.	Striped bug	<i>Tetroda histeroides</i>	+	-	-
19.	Red-spotted ear head bug	<i>Menida histrio</i>	+	+	+
20.	Pentatomid bug		+	-	-
21.	Rice seedling fly	<i>Atherigona exigua</i>	+	+	+
22.	Whorl maggot	<i>Hydrellia sp</i>	+	-	-
23.	Gall midge	<i>Orseolia oryzae</i>	+	-	-
24.	Brown Plant Hopper	<i>Nilaparvata lugens</i>	+	-	-
25.	Awl Butterfly (Skipper)		-	-	+
26.	Rice mealy bug	<i>Heterococcus rehi</i>	-	-	+
27.	Long horned grass Hopper	<i>Conocephalus pallidus</i>	+	+	-
28.	Rice swift butterfly	<i>Borbo cinnara</i>	-	+	+
29.	Yellow hairy cater pillar	<i>Psalis pennatula</i>	-	+	-
30.	Green grass hopper	<i>Attractomorpha crenulata</i>	-	+	-
31.	Bush hopper	<i>Ampittia discorides</i>	-	+	-
32.	Green Leaf hopper	<i>Nephotettix nigropictus</i>	-	+	-
33.	White backed rice plant hopper	<i>Sogatella furcifera</i>	-	+	-
Total			25	18	14

CPF=Coastal Paddy Field; FWPF= Fresh Water Paddy Field; MLHPF=Midland Laterite Hillock Paddy Field.  
 + = present, - = absent.

**Table 3: Number of species of weeds and pests of paddy in different paddy regions**

Paddy regions	No of species of Weeds	No of species of Pests of Paddy
CPF	11	25
FWPF	7	18
MLHPF	13	14

CPF=Coastal Paddy Field; FWPF= Fresh Water Paddy Field; MLHPF=Midland Laterite Hillock Paddy Field.

## 6. DISCUSSION

Weeds attract the insect pests of paddy and reduce the menace of these pests in the study area. A similar trend of decrease in the number of insect pest species was also found by Bambaradeniya et.al, 1998.

The sedge *Eleocharis Dulcis* (Burm.f) Henschel (Cyperaceae) traps rice white stem borer *Scirpophaga innotata* (Walker) (Lepidoptera: Pyralidae) in Andamans. (Ranganath, Prasad. and Sheeba.2002).

The presence of water in the field appears to inhibit the growth of weeds, which are largely terrestrial or semi-aquatic species. (Bambaradeniya et.al, 1998).

The lack of retention of water in the hillock paddy field (MLHPF) during south-west monsoon favoured the excess growth of weeds. The weed growth was less in other paddy Fields (that is FWPF and CPF) because these regions were filled with water up to a certain extent during the south-west monsoon. This observation was in conformity with Bambaradeniya et.al, 1998.

The weed species that cause problems in rice vary with soil, planting methods, water management, fertility levels and weed control practices (Thomas and Abraham. 1998). Weeds compete with rice for various resources such as light, water, nutrients, space etc. and reduce the yield.

## **7. ACKNOWLEDGEMENTS**

We convey our special acknowledgement to the Principal and Management of S. N. College, Kannur for their support during the study. We are obliged to all the staff, Department of Zoology, S. N. College for their help and encouragement.

Our sincere thanks are also due to agriculturists, paddy cultivators and all our friends for their help and co-operation at various stages of the study.

## **8. REFERENCES**

- [1] Agricultural Statistics 2011-2012, 2013. Department of Economics and Statistics, Govt of Kerala, Thiruvananthapuram, p.9.
- [2] Bambaradeniya C.N.B, Fonseka.K.T and Ambagahawatte.C.L, 1998. A preliminary study of fauna and flora of a rice field in Kandy, Sri Lanka. Cey.J. Sci. (Bio. Sci.) Vol. 25.
- [3] Ranganath.H.R, Prasad.G.S and Sheeba.2002. The sedge *Eleocharis Dulcis* (Burm.f) Henschel (Cyperaceae) traps rice white stem borer *Scirpophaga innotata* (Walker) (Lepidoptera: Pyralidae) in Andamans. Curr.Sci.83 (4) pp.371-372.
- [4] Thomas. C.G and Abraham, CT 1998. Common weeds of rice ecosystem in Kerala and the management. Kerala Agricultural University, Thrissur.