

Ministry of Agriculture, Livestock and Irrigation

Department of Agriculture



**PESTS AND NATURAL ENEMIES POPULATION ABUNDANCE
OF MONSOON RICE IN CARTC**

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Introduction

Myanmar_

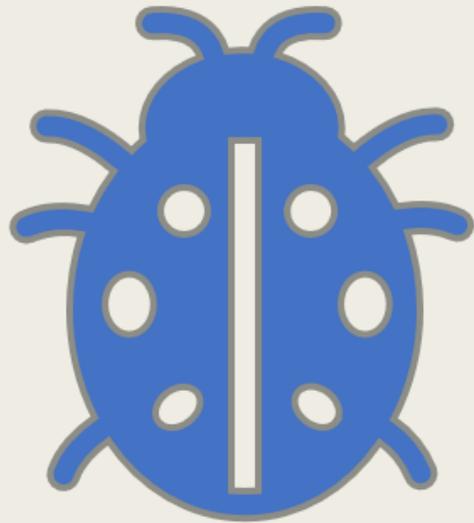
- Basically, rice based agricultural country
- Sown both monsoon and summer rice
- Insects pests, major constraints of yield reduction
- Infestation occur throughout growing season
- Weak information on ecological diversity of arthropods





In CARTC rice fields_

- mainly monoculture
- poor crops diversity
- Mostly limited used of chemical pesticides
- Conserve natural balance
- Access proper control practices



Objectives

- To determine population abundance of insect pests and natural enemies in CARTC monsoon rice fields
- To identify the insect pests and natural enemies on their morphological characters

Materials and Methods



- Study Area _ Central Agricultural Research and Training Center (CARTC) Fields
- Rice varieties _ Shwe Myanmar, Pyi Taw Yin, Shwe The Yin, Yadanar Toe, Shwe Wit Hmone, Shwe War Tun, Nanthar Khin, Shwe Na Thar PawSan II, IR-72, TN-1
- Time of Sowing _ July 2020 to October 2020
- Spacing _ 8 x 8 inches
- Experimental Design _ Randomized Complete Block Design
- Replication_ 3



- Recommended Cultural Practices were Done.
- Data Collection was started a week after transplanting with weekly interval.
- Collect all individuals via visual observation, sweep net, hand picking and photo documentation.

Data were analyzed following STAR program and means were separated by DMRT.

Relative abundance of insect pests and natural enemies was calculated using the following formula:

$$\text{Relative abundance (\%)} = \frac{\text{Total no. of each species}}{\text{Total no. of all species}} \times 100$$



Results and Discussion

Table 1. Collected insect pests and natural enemies form CARTC rice fields

Order	Common name	Scientific name	Family	Pests/Natural Enemies (NE)
Lepidoptera	Leaf folder	<i>Cnaphalocrocis mendinalis</i>	Pyralidae	Pest
	Yellow stemborer	<i>Scirpophaga incertulas</i>	Crambidae	Pest
	Hairy caterpillar	<i>Psalis pennatula</i>	Erebidae	Pest
	Armyworm	<i>Spodoptera mauritia</i>	Noctuidae	Pest
	Green horned caterpillar	<i>Melanitis leda</i>	Nymphalidae	Pest
Coleoptera	Hispa	<i>Dicladispa armigera</i>	Chrysomelidae	Pest
	Ladybird beetle	<i>Coccinella</i> sp.	Coccinellidae	NE
	Ground beetle	<i>Calosoma</i> sp.	Caribidae	NE
	Rove beetle	<i>Paederus dermatitis</i> , <i>Xylodromus</i> sp.	Staphylinidae	NE
	Red pumpkin beetle	<i>Aulocophora foveicollis</i>	Chrysomelidae	Pest
	Water scavenger beetle	<i>Hydrophilus triangularis</i>	Hydrophilidae	NE
	May beetle	<i>Phyllophaga</i> sp.	Scaravaeidae	Pest

Order	Common name	Scientific name	Family	Pests/Natural Enemies (NE)
Orthoptera	Long horned grasshopper	<i>Conocephalus fasciatus</i> , <i>Oxya chinensis</i>	Tettigoniidae Acrididae	NE
	Short horned grasshopper	<i>Leptysma marginicollis</i>	Acrididae	Pest
	Field cricket	<i>Gryllus texensis</i>	Gryllidae	Pest
Odonata	Dragonfly	<i>Diplacodes nebulosa</i> <i>Brachythemis contaminata</i> <i>Neurothemistullia tullia</i>	Aeshnidae Gomphidae Libellulidae	NE
	Damselfly	<i>Chlorocypha</i> sp. <i>Ischnura elegans</i>	Chlorocyphidae Calopterygidae	NE
Diptera	Whorl maggot	<i>Hydrellia philippina</i>	Ephydriidae	Pest
Dermaptera	Earwigs	<i>Forficula auricularia</i>	Forficulidae	NE
Hemiptera	Whitefly	<i>Aleurocybotus occiduus</i>	Aleyrodidae	Pest
	Ear bug	<i>Leptocorisa oratoria</i>	Alydidae	Pest
	leaf hopper	<i>Nephotettix virescens</i>	Cicadellidae	Pest
	Brown planthopper	<i>Nilaparvata lugens</i>	Delphacidae	Pest
	Predatory bug	<i>Scolopostethus pictus</i>	Lygaeidae	NE
	Water bug	<i>Lethocercus indicus</i>	Belostomatidae	NE
	Predatory bug	<i>Phytocoris</i> sp.	Miridae	NE

Order	Common name	Scientific name	Family	Pests/Natural Enemies (NE)
Hymenoptera	Black ant	<i>Monomorium minimum</i>	Formicidae	Pest
	Red ant	<i>Solenopsis</i> sp.	Formicidae	Pest
	Ichneumonid wasp	<i>Xanthopimpla</i> sp.	Ichneumonidae	NE
	Trichogrammatid wasp	<i>Trichogramma</i> sp.	Trichogrammitidae	NE
	Chalcid wasp	<i>Aprostocetus</i> sp.	Chalcididae	NE
	Braconid wasp	<i>Bracon</i> sp.	Braconidae	NE

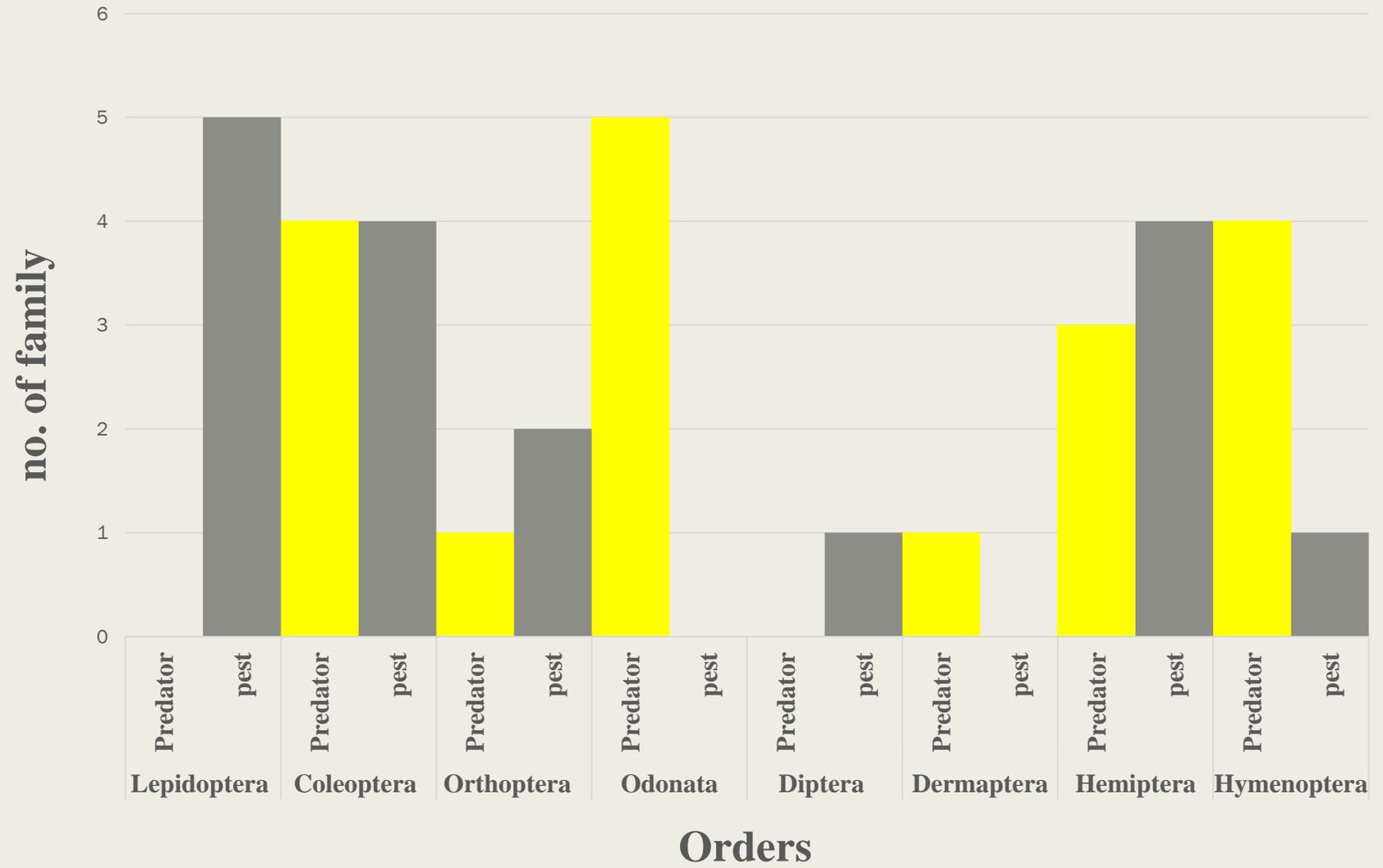


Figure 1. Collected Predators and Pests families

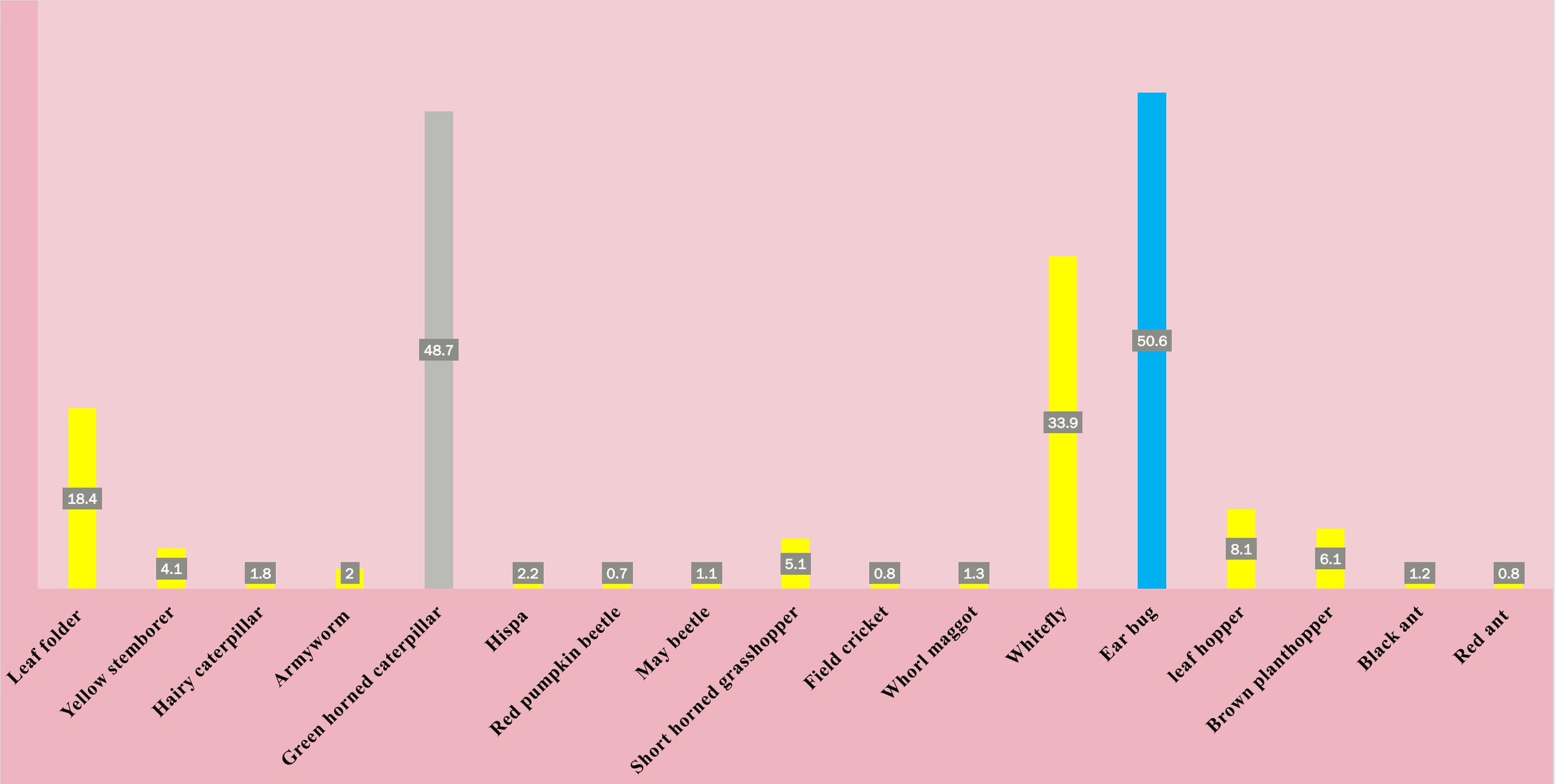


FIGURE 2. RELATIVE ABUNDANCE % OF INSECT PESTS SPECIES IN CARTC RICE FIELDS

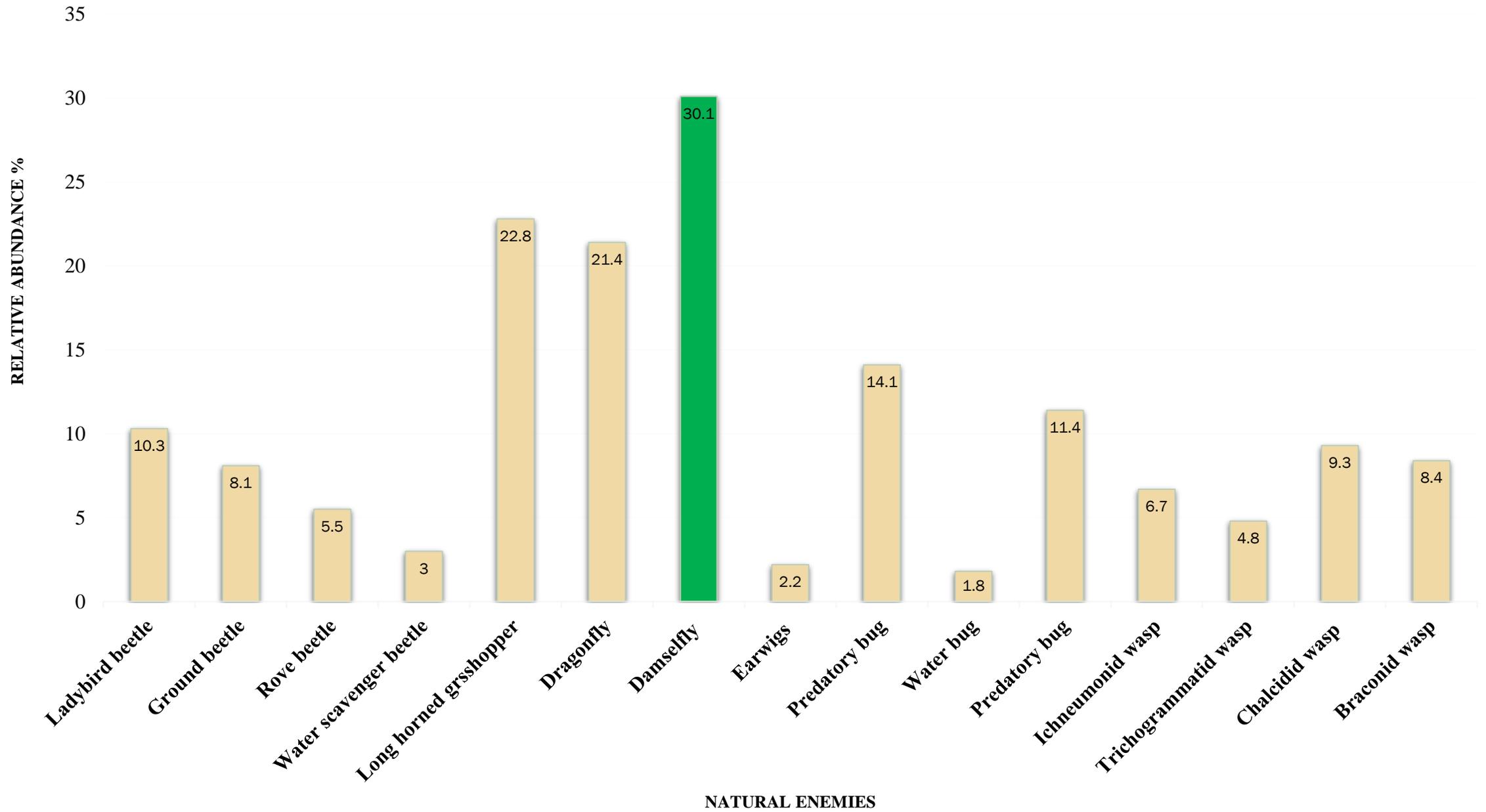


Figure 3. Relative abundance % of Natural Enemies in CARTC Rice Fields

Table 4. Population of pests and their natural enemies (common and abundance species) in different varieties of CARTC rice fields

Variety	Pests population (hand picking)				Natural enemies' population (hand picking)				LF= leaffolder GHC= green horned caterpillar WF= whitefly EB= earbug DAM= damselfly DRG= dragonfly LHG=long horned grasshopper PB=predatory bug
	LF	GHC	WF	EB	DAM	DRG	LHG	PB	
Shwe Myanmar	3b	16b	4b	10b	4b	2b	2b	0c	
Pyi Taw Yin	3b	8b	4b	12b	6a	4a	0c	0c	
Shwe The Yin	5b	11b	1c	27a	6a	4a	4a	3b	
Yadanar Toe	3b	11b	6a	11b	7a	2b	1b	5b	
Shwe Wit Hmone	7b	4c	4b	21a	5b	2b	1b	5b	
Shwe War Tun	1c	9b	6a	8b	4b	5a	1b	9ab	
Nanthar Khin	14a	12b	6a	22a	8a	1c	2b	12a	
Shwe Na Thar PawSan II	7b	21a	6a	8b	1c	1c	5a	11a	
IR-72	5b	14b	3b	24a	4b	1c	4a	4b	
TN-1	3b	5c	1c	11b	4b	2b	1b	3b	
Level of significance	-	-	-	-	-	-	-	NS	

In a column means accompanied by the same letter(s) are not significantly different at 5 % level by DMRT.

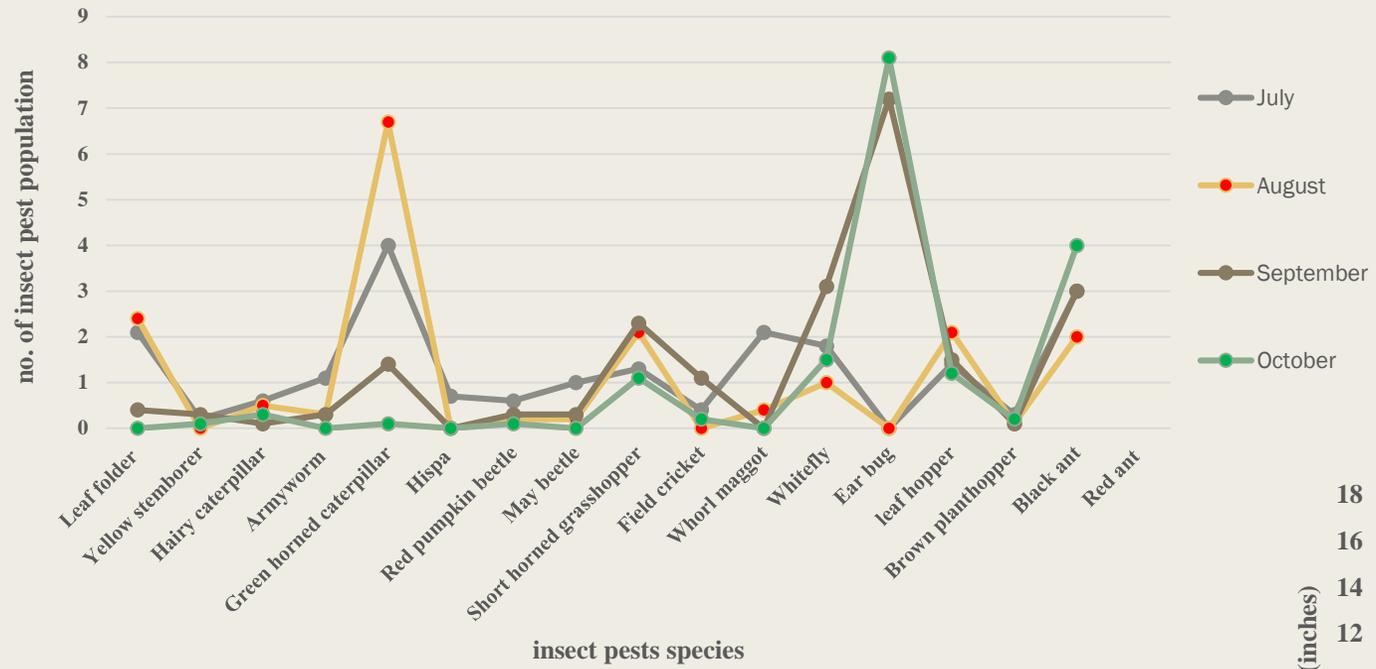


Figure 4. Population abundance of insect pests during growing season

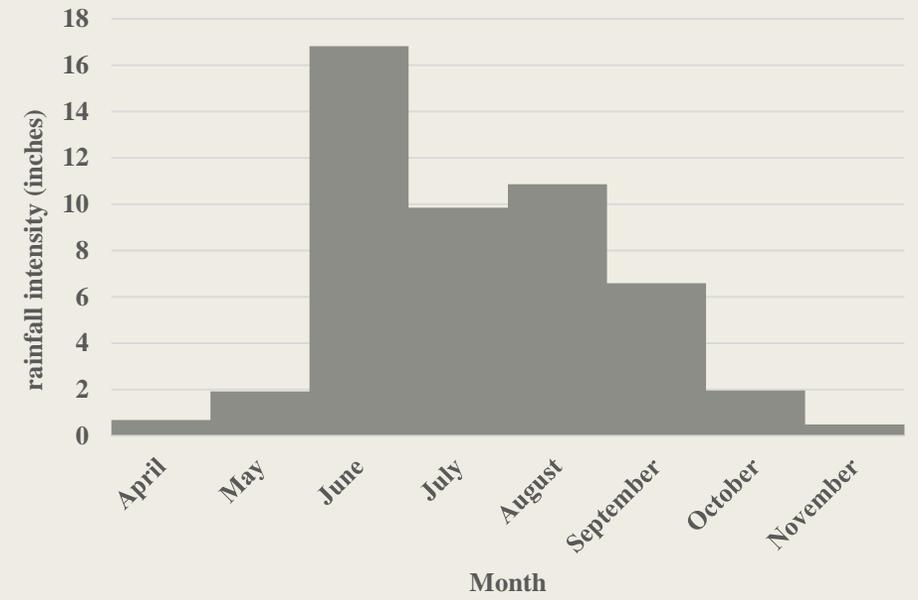


Figure 5. Rainfall intensity (inches) of monsoon rice growing season at CARTC

General Discussion

- Total of 8 major insect orders are collected
- 17 pest species and 15 natural enemies populations are identified and recorded
- Population abundance of pests and natural enemies in CARTC rice fields is not highly significant differences
- Lepidoptera and Hemiptera – high pest population
- Odonata and Hymenoptera _ high natural enemies population
- Most species occurred in vegetative growth
- Ear bug population became high in flowering stage
- Pest occurrence among ten rice varieties were not significant

Conclusion

From the present study it may be concluded that_

among natural enemies, the predaceous insect damselfly, dragonfly and predatory bug were more abundant in CARTC rice fields.

Therefore, it might be possible to conserve the natural enemies of insect pests and eventually to enhance the natural biological control of insect pests by cultivating rice and with no use of insecticides in CARTC fields.

THANK YOU