# Species Diversity and Abundance of Reduviids (Insecta: Heteroptera: Reduviidae) from Selected Agricultural Fields of Rajapalayam Taluk, Virudhunagar District, Tamil Nadu

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**Abstract**: A survey on the status and distribution of the reduviid bugs was undertaken at different selected agricultural fields of Rajapalayam Taluk, Virudhunagar district during April 2018 to March 2019. In the present investigation, 16 species of reduviid bugs belonging to 4 sub-families were recorded of which 5 species were recorded from paddy fields, 11 species were recorded from both cotton and brinjal fields and 13 species were recorded from mango plantations. The Margalef index (R1), Menhinick index (R2), Simpson's index ( $\lambda$ ), Shannon's index (H'), Evenness indices and relative abundance were calculated. In the present study, the member of the sub-family Harpactorinae was most dominant and sub-family Ectrichodinae was less dominant. The minimum numbers of individuals reduviid bugs observed in paddy. Among the sixteen reduviids, *Rhynocoris fuscipes* population was higher in brinjal fields than that of other reduviid predators.

Keywords: Reduviid bug diversity, brinjal field, Margalef index, Simpson's index, Evenness index, Harpactorinae, Ectrichodinae.

#### 1. INTRODUCTION

The term "Biological diversity" or its short-term "Biodiversity" is a synonym for the variety and variability within species, between species of an ecosystem [1]. Worldwide food plants are damaged by more than 10,000 species of insects. Despite using various control methods the control of agriculture pests continues to be critical for farmers. The yield loss by insects reaches as high as 60-70% [2]. Reduviids are more resistant to chemical sprays than the coccinellids. Their adjustability to ecological factors and to the secondary effects of phytosanitary sprays makes heteropterans, especially Reduviids potentially good biological control agents. The species of the reduviid bugs of family Reduviidae under Order Heteroptera (Insecta: Reduviidae) is not only one of the most abundant groups but also showing significant economics and high scientific value. In the world, the family Reduviidae is documented with approximately 7000 species that come from 29 subfamilies [3]. They are present in all ecosystems and even the near human. Many species play an important role in the food chain of animals and plants, as well as the ecological balance [4].

# 2. MATERIALS AND METHODS 2.1 Study area

The reduviid bugs were collected from different agricultural fields (paddy (*Oryza sativa*), cotton (*Gossypium hirsutum*), brinjal (*Solanum melongena*) and mango plantation (*Mangifera indica*) in Rajapalayam Taluk, Virudhunagar district during the study period April 2018 to March 2019.



Fig 1: Map showing the study area

### 2.2 Collection and Identification of reduviid bugs

Reduviids collections were made every fortnight for a period of Twelve months from April 2018 to March 2019. They were collected from the microhabitats such as underneath boulders, bark, litter, crevices, plant leaves etc., by using forceps and hand picking method. All the collected insects were mounted by pins. The collected reduviids were identified using the standard key, Fauna of British India.

### 2.3. Diversity Analysis:

Raw data from the field were used to reveal species diversity by the biodiversity indices namely richness, Margalef index (R1), Menhinick index (R2), Simpson's index ( $\lambda$ ), Shannon's index (H'), Evenness indices and relative abundance were derived from data collected. PAST software was used to calculate the diversity indices.

### 3. RESULTS AND DISCUSSION

In the present investigation 16 species (Table 1) of reduviid bugs belonging to 4 sub-families of Order heteroptera were observed in various agricultural fields in Rajapalayam Taluk, Virudhunagar district (Fig. 1).

The 5 species were observed in paddy filed, 11 species were observed both in cotton field and brinjal field and 13 species were observed in mango plantations. The most occurrence of reduviid bugs (Table 2) in mango plantations followed by brinjal, cotton and paddy fields.

The paddy field species diversity indices followed by margalef index was 1.412, menhinick index was 1.213, Simpson's dominance index was 0.782, Shannon index was 1.564 and Pielou's evenness index was 0.9559.

The cotton field species diversity indices followed by margalef index was 2.119, menhinick index was 1.039, Simpson's dominance index was 0.8388, Shannon index was 2.07 and Pielou's evenness index was 0.7207.

The brinjal field species diversity indices followed by margalef index was 1.993, menhinick index was 0.8952, Simpson's dominance index was 0.8547, Shannon index was 2.112 and Pielou's evenness index was 0.7513.

The mango plantation species diversity indices followed by margalef index was 2.461, menhinick index was 1.136, Simpson's dominance index was 0.9171, Shannon index was 2.525 and Pielou's evenness index was 0.961(Table 3).

In the present study, the member of the sub-family Harpactorinae was most dominant and sub-family Ectrichodinae was less dominant. The maximum numbers of reduviid bugs were observed in brinjal field due to the majority of food. *Rhynocoris fuscipes* (37) was observed in more number which is also employed in biocontrol of insect pest in brinjal field.

Similarly, the vegetation in the Tilari forest of Chandgad Tahsil is very rich and related to the Dajipur reserved forest of Radhanagari. A total of 19 Indian species of assassin bugs under 13 genera and 7 subfamilies were recorded [5].

### Table 1: Showing different reduviid bugs in variuos selected agricultural fields in Rajapalayam taluk:

S. No	Sub	Species Name
	family	
1	Ectrichodinae	Ectrichodia crux
2	Ectrichodinae	Ectrychotes dispar Reuter
3	Harpactorinae	Rhynocoris marginatus (Fabricius)
4	Harpactorinae	Rhynocoris kumarii (Fabricius)
5	Harpactorinae	Rhynocoris longifrons (Stal)
6	Harpactorinae	Rhynocoris fuscipes (Fabricius)
7	Harpactorinae	Coranus spinscutis
8	Harpactorinae	Lophocephala guerini Laporte
9	peiratinae	Catamiarus brevipennis (Serville)
10	peiratinae	Ectomocoris quadriguttatus (Fabricius)
11	peiratinae	Ectomocoris tibialis
12	peiratinae	Ectomocoris cordiger
13	Reduviinae	Acanthaspis pedestris
14	Reduviinae	Acanthaspis siva Distant
15	Reduviinae	Acanthaspis flavipes Stal
16	Reduviinae	Acanthaspis quinquespinosa

### Table 2: Showing occurrence of reduviid bugs in agricultural fields of Rajapalayam Taluk:

S. No	Sub family	Species Name	(paddy (Oryza sativa)	Cotton (Gossypium hirsutum)	Brinjal, (Solanum melongena)	Mango plantation ( <i>Mangifera</i> <i>indica</i> )
1	Ectrichodinae	Ectrichodia crux	_	-	_	11
2	Ectrichodinae	Ectrychotes dispar Reuter	_	_	11	14
3	Harpactorinae	Rhynocoris marginatus (Fabricius)	4	33	21	8
4	Harpactorinae	Rhynocoris kumarii (Fabricius)	5	17	15	9
5	Harpactorinae	Rhynocoris longifrons (Stal)	-	19	13	7
6	Harpactorinae	Rhynocoris fuscipes (Fabricius)	3	10	37	5
7	Harpactorinae	Coranus spinscutis	2	8	6	_
8	Harpactorinae	Lophocephala guerini Laporte	-	_	-	13
9	peiratinae	Catamiarus brevipennis (Serville)	_	5	29	12
10	peiratinae	Ectomocoris quadriguttatus (Fabricius)	3	4	6	15
11	peiratinae	Ectomocoris tibialis	_	2	7	11
12	peiratinae	Ectomocoris cordiger	_	3	1	8
13	Reduviinae	Acanthaspis pedestris	_	4	_	_
14	Reduviinae	Acanthaspis siva Distant	_	_	_	10
15	Reduviinae	Acanthaspis flavipes Stal	_	7	_	8
16	Reduviinae	Acanthaspis quinquespinosa	-	_	5	_

Table 3:	Species	diversity	indices of	f reduviid	bugs from	Agricultural	fields in H	Rajapalayam	Taluk:
	-					0			

	Study site					
Sub-family	(paddy (Oryza sativa)	Cotton (Gossypium hirsutum)	Brinjal, (Solanum melongena)	Mango plantation ( <i>Mangifera</i> <i>indica</i> )		
Individuals	17	112	151	131		
Margalef index (R1)	1.412	2.119	1.993	2.461		
Menhinick index (R2)	1.213	1.039	0.8952	1.136		
Simpson's index $(\lambda)$	0.782	0.8388	0.8547	0.9171		
Shannon`s index (H`)	1.564	2.07	2.112	2.525		
Evenness	0.9559	0.7207	0.7513	0.961		
Relative abundance (%)	4.14	27.25	36.74	31.87		

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