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Diversity of Pentatomid Bug Fauna in Semi-Arid Western Rajasthan

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ABSTRACT

The paper deals with the study of 15 species belonging to 13 genera under two subfamilies of family Pentatomidae in pearl millet and mungbean during *kharif*, 2022. 181 adults were identified into 15 species: *Acrosternum gramineum*, *Adria parvula*, *Bagrada hilaris*, *Carbula biguttata*, *Carbula socia*, *Dolycoris indicus*, *Eysarcoris ventralis*, *Eysarcoris* sp., *Erthesina acuminata*, *Halys serrigera*, *Piezodorus hybneri*, *Placosternum taurus*, *Sciocoris indicus*, *Eocanthecona furcellata* and *Andrallus spinidens.* The maximum relative abundance was observed for *Eysarcoris ventralis* (33.70%) followed by *Piezodorus hybneri* (20.99%). The minimum relative abundance was observed for *Carbula biguttata, Carbula socia*, *Eysarcoris* sp., *Erthesina acuminata,* and *Placosternum taurus* with the relative abundance of 0.55% each.

Keywords Subfamily, Relative abundance, Pentatomidae, Acrosternum, Genera, Species.

INTRODUCTION

The family Pentatomidae is one of the largest family within the suborder Heteroptera of the estimated 36,096 described species of Heteroptera, more than 4700 species belong to Pentatomidae (Panizzi *et al.* 2000). Pentatomidae family comprises around 4722 delineate species in 896 genera and 9 subfamilies in the world (Rider 2006), among which only four subfamilies of stink bugs are found in India viz., Asopinae, Pentatominae, Phyllocephalinae and Podopinae. In India, 382 species belonging to 150 genera are known and from south India 164 species belonging to 86 genera are known (Salini and Viraktamath 2015). The members of Pentatominae, Phyllocephalinae and Podopinae are phytophagous in nature; whereas, Asopinae are predaceous and feed upon a variety of insects such as Coleoptera, Lepidoptera, especially at larval stages, as well as on other small and soft bodied arthropods (Lefroy and Howlett 1909, Fletcher 1914, Kalshoven 1981). Pentatominae is the most diverse and abundant group, which alone constitutes more than 80% of the Pentatomidae known from India. Although Pentatomidae are typically thought as minor and occasional pests, on several occasions, they can attain pest status, especially when attacking economically important plant parts like developing grains and immature fruits of cultivated crops. The

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collective feeding habits of many of these species worsen the harm done to crops; therefore, it is important to record their diversity and proper identification. Correct identification of the species is important for better management of the phytophagous insect pests and also in the efficient utilization of predaceous species as biological control agents of destructive pests of agricultural importance.

MATERIALS AND METHODS

The specimens of pentatomid bugs were collected by hand picking and sweep netting methods from Agricultural Research Station, Mandor and College of Agriculture, Jodhpur during *kharif* 2022. With a view to estimate the diversity of pentatomid bugs, population data were taken from the different locations of Agricultural Research Station, Mandor and College of Agriculture, Jodhpur during *kharif* 2022 by the visual-count-technique at weekly intervals. Estimation of the relative population density from the different locations were made and expressed as a percentage. Suitable diversity indices were computed including the Shannon-Weiner and Simpson's diversity index.

The following mathematical analysis was done :

a) Relative density

$$\text{Relative density (RD \%)} = \frac{\text{Number of individual of species}}{\text{Total number of individual of all species}} \times 100$$

RESULTS AND DISCUSSION

The present study deals with the family Pentatomidae. A total of 15 species under 13 genera namely *Acrosternum gramineum*, *Adria parvula*, *Bagrada hilaris*, *Carbula biguttata*, *Carbula socia*, *Dolycoris indicus*, *Eysarcoris ventralis*, *Eysarcoris* sp., *Erthesina acuminata*, *Halys serrigera*, *Piezodorus hybneri, Placosternum taurus*, *Sciocoris indicus*, *Eocanthecona furcellata* and *Andrallus spinidens* were recorded from Agricultural Research Station, Mandor and College of Agriculture, Jodhpur during *kharif* 2022 (Table 1). Earlier, Salini and Viraktamath (2015) had described 164 species belonging to 86 genera of Pentatomidae family from south India. Similarly, various researchers had reported various genera under Pentatomidae from different regions of India viz., 24 species of pentatomids from Punjab (Kaur *et al.* 2012), 18 species of 16 genera belonging to 12 tribes of Pentatominae subfamily from in and around Pune, Maharashtra (Jadhav and Hegde 2018).

A total of 181 specimens of pentatomid bugs were collected from Agricultural Research Station, Mandor and College of Agriculture, Jodhpur during *kharif* 2022. The family Pentatomidae was represented by 2 subfamilies: Asopinae with 14 specimens and Pentatominae with 167 specimens. The study revealed the occurrence of a total of 15 species, grouped into 13 genera, of which, 13 species grouped under 11 genera and 8 tribes were in the phytophagous subfamily Pentatominae, which was dominant, while, 2 species belonged to 2 genera under 1 tribe in the predatory bug subfamily Asopinae (Table 1).

The pentatomid fauna of Agricultural Research Station, Mandor and College of Agriculture, Jodhpur comprised of 15 species with the total of 181 specimens collected through various collection methods. The fauna includes *Acrosternum gramineum*, *Adria parvula*, *Bagrada hilaris*, *Carbula biguttata*, *Carbula socia, Dolycoris indicus, Eysarcoris ventralis*, *Eysarcoris* sp., *Erthesina acuminata, Halys serrigera*,

Table 1. Categorization of the pentatomid fauna recorded from pearl millet and mungbean.

Family	Subfamily	Genus	Species
Pentatomidae	1 Asopinae	*Andrallus*	*spinidens*
		Eocanthecona	*furcellata*
	2 Pentatominae	*Acrosternum*	*graminum*
		Adria	*parvula*
		Bagrada	*hilaris*
		Carbula	*socia*
		Carbula	*biguttata*
		Dolycoris	*indicus*
		Erthesina	*acuminata*
		Eysarcoris	*ventralis*
		Eysarcoris	sp.
		Halys	*serrigera*
		Piezodorus	*hybneri*
		Placosternum	*taurus*
		Sciocoris	*indicus*

Table 2. Total collection of pentatomid bugs on pearl millet and mungbean.

Sl. No.	Name of species	No. of specimen	Relative abundance (%)
1	*Acrosternum gramineum*	23	12.70
2	*Adria parvula*	18	9.94
3	*Andrallus spinidens*	2	1.10
4	*Bagrada hilaris*	8	4.41
5	*Carbula biguttata*	1	0.55
6	*Carbula socia*	1	0.55
7	*Dolycoris indicus*	6	3.31
8	*Eocanthecona furcellata*	16	8.84
9	*Eysarcoris ventralis*	61	33.70
10	*Eysarcoris* sp.	1	0.55
11	*Erthesina acuminata*	1	0.55
12	*Halys serrigera*	2	1.10
13	*Piezodorus hybneri*	38	20.99
14	*Placosternum taurus*	1	0.55
15	*Sciocoris indicus*	2	1.10
	Total	**181**	

Piezodorus hybneri, Placosternum taurus, Sciocoris indicus, Eocanthecona furcellata and *Andrallus spinidens*. From the Table 2, it is evident that relative abundance of *Eysarcoris ventralis* (33.70%) was found to be the maximum followed by *Piezodorus hybneri* (20.99%), *Acrosternum gramineum* (12.70%) and *Adria parvula* (9.94%), *Eocanthecona furcellata* (8.83%), *Bagrada hilaris* (4.41%), *Dolycoris indicus* (3.31%), *Sciocoris indicus* (1.10%), *Andrallus spinidens* (1.10%) and *Halys serrigera* (1.10%). The minimum relative abundance was observed for *Carbula biguttata, Carbula socia, Eysarcoris* sp., *Erthesina acuminata*, and *Placosternum taurus* with the relative abundance of 0.55% each.

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