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Inventory of grasshopper fauna (Orthoptera) of western Patna, Bihar, India

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Abstract:- Random field survey of grasshopper fauna in the western part of Patna Bihar including both residential colony and agricultural field has provided a group of seven different varieties of species belonging to different taxonomic groups. Identification of the representatives of sampled specimen was done in the research laboratory of department of zoology, B.D College Patna with the help of available key furnished in IMM's text book of entomology Vol.II revised by Richardes (1998). The eight species recorded are- *Acrida exaltata* Walker (S.Family-Acridinae), *Phlaeoba infumata* Brunner (S.Family-Acridinae), *Neophlaeoba walayarensis* Usmani & Shafee, (S.Family-Acridinae), *Aiolopus simulatrix simulatrix* Walker (S.Family- Oedipodinae), *Aiolopus thalassinus thalassinus* Fabricius,(S.Family- Oedipodinae), *Aiolopus thalassinus tamulus* Fabricius,(S.Family- Oedipodinae), *Acrotylus hubertianus* Saussure (S.Family- Oedipodinae), *Acrotylus insubricus* Scopoli, (S.Family-Oedipodinae)

Key words: Grasshopper fauna, Orthoptera, Cealifera, Acridoidea, Inventory

INTRODUCTION

Surprisingly, order Orthoptera is one of the five largest orders of class Insect which has two suborders- Cealifera (commonly called short horned grasshoppers) and Ensifera (Long horned grasshoppers). Taxonomically, the suborder Cealifera carries more agriculture and economical importance, representatives of which are Locusts & Grasshoppers belonging to the superfamilies Acridoidea and Pyrgomorphoidea. Extended taxonomy of Acridoidea currently reflects the occurrence of eleven families under it while that of Pyrgomorphoidea, only one family. Vis-a-vis the families Acrididae & Pyrgomorphoidea belonging to these superfamilies exhibit wide distribution in India¹. Unfortunately these creatures (locusts & grasshoppers) cause significant damage to seedlings and

agriculture crops,² therefore regarded as Oligophagus with graminivorous, forbivorous and ambivorous or mixed feeders host preference³ (Mulkern 1967).

The present study is the fieldwork survey of some important grasshoppers commonly found in the climatic conditions of Patna district, Bihar with special preference of sampling in the western zone.

MATERIALS & METHODS

The author surveyed various areas of western Patna, both urban & adjoining rural agricultural fields such as- Patliputra colony, Ashiyana nagar, Danapur, Raja bazar, Neora, Phulwari sharif, Sadisopur etc. During the period 2016-2017. All out Search (AOS) method of sampling suggested by pioneer workers⁴ was observed for collecting the representatives of grasshoppers and locusts which were killed in benzene bottles. The AOS involved specially net sweeping and forcep & hand picking methods. The

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specimens were brought in the research Laboratory of department of zoology, B.D. College, Patna for their proper stretching, pinning and labelling after their proper identification. The taxonomic identification of the specimen upto species level has been done with the help of binocular stereozoom microscope. Collections of pinned specimens were kept in store boxes and cabinets for further studies on their morphological structures.

RESULTS & DISCUSSION

8 species of grasshopper have been recorded from different sampling zones of western Patna during the year 2016-17 (July-June) which belonged to 5 genera, 1 family, 1 superorder of Orthoptera. The specimens were collected from general residential dwellings, paddy feild and pulses crops of the locality of western Patna, Bihar (Table 1). Interestingly all the sampled species belong to one major taxonomic suborder Ceilifera, superfamily Acridoidia and family Acrididae. The genus *Aiolopus* showed relative abundance and dominance as it was represented by three species in the sampling whereas the next position was occupied by the genus *Acrotylus* represented by two species. The remaining genera *Acrida*, *Phlaeoba* & *Neophlaeoba* were represented by their single species. However, if the genus *Neophlaeoba* is considered as the synonym and elevation of the genus *Phlaeoba*, this will supersede the single genus *Acrida* in the present study.

Number of individuals of each genus counted in the feild at the sampling site were recorded in the species diversity table for futurte statistical analysis.

The data of climatic conditions specially the environmental temperature, relative humidity and rainfall of the sampling locality during the period July,2016-June,2017 was obtained from the Patna meteriological department (Table 2) and it was found that there is a positive and direct corelation between the occurance of the species with rainfall, average temperature and relative humidity during the months of July, August and September. There was a gradual decline in the availability of the species and their individuals from October onwards which came to almost zero in high summer months of May & June. The observation is in accordance with the results of other workers devoted to the studies of survey, sampling and species diversity of insects in tropics.⁵⁻⁸



Acrida exaltata Walker
(S.Family-Acridinae)



Phlaeoba infumata Brunner
(S.Family-Acridinae)



Neophlaeoba walayarensis Usmani & Shafee
(S.Family-Acridinae)



Aiolopus simulatrix simulatrix Walker
(S.Family- Oedipodinae)

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Aiolopus thalassinus thalassinus Fabricius
(S.Family- Oedipodinae)



Acrotylus hubertianus Saussure
(S.Family- Oedipodinae)



Aiolopus thalassinus tamulus Fabricius
(S.Family- Oedipodinae)



Acrotylus insubricus Scopoli
(S.Family-Oedipodinae)

Table 1 – List of grasshopper species sampled by ‘AOS’ methods from different zones of western Patna, Bihar

Sample No.	Name of Sampling Zones	Common name of the specimen	Taxonomic groupings			Scientific name	Discoverer	Host
			Sub Order	Super Family	Family			
1.	Patliputra colony	Short horned paddy & pulse grasshopper	Cealifera	Acridoidea	Acrididae	<i>Acrida exaltata</i>	Walker	Paddy, grasses, pulses
2.	Ashiyana nagar	Short horned paddy grasshopper	Cealifera	Acridoidea	Acrididae	<i>Phlaeoba infumata</i>	Brunner	Paddy
3.	Danapur	Short horned paddy & wild plant grasshopper	Cealifera	Acridoidea	Acrididae	<i>Neophlaeoba walayarensis</i>	Usmani & Shafee	Paddy, wild plant
4.	Phulwari sharif	Short horned paddy & pulse grasshopper	Cealifera	Acridoidea	Acrididae	<i>Aiolopus simulatrix simulatrix</i>	Walker	Paddy, pulses
5.	Neora	Short horned wheat grasshopper	Cealifera	Acridoidea	Acrididae	<i>Aiolopus thalassinus thalassinus</i>	Fabricius	Paddy, wheat
6.	Raja bazar	Short horned paddy grasshopper	Cealifera	Acridoidea	Acrididae	<i>Aiolopus thalassinus tamulus</i>	Fabricius	Paddy
7.	Sadisipur	Short horned paddy grasshopper	Cealifera	Acridoidea	Acrididae	<i>Acrotylus hubertianus</i>	Saussure	Paddy
8.	Phulwari sharif	Short horned paddy grasshopper	Cealifera	Acridoidea	Acrididae	<i>Acrotylus insubricus</i>	Scopoli	Paddy

Table 2 Environmental temperature , relative humidity and rainfall of western Patna, Bihar

Sl.No	Name of the month	Temperature (°C)	Relative humidity (%)	Rainfall (mm)
1	July- 2016	29		220
2	August	15		260
3	September	28		170
4	October	26		70
5	November	22		10
6	December	17		---
7	January- 2017	16		10
8	February	19		---
9	March	25		10
10	April	30		---
11	May	31		40
12	June	31		120

CONCLUSION

82.35% species recoded from paddy followed by pigeon pea (23.52%), mung bean and lentil (8.82%), urd bean and chickpea (5.88%) respectively (Figure 4). Due to chewing type of mouthparts grasshoppers that tear away plant tissue commonly thought of as feeds on foliage, flowers, fruits, and stems also. This result clearly shows that the paddy fields are heavily infested by grasshoppers than pulses in Bihar and Jharkhand. Since there is heavy infestation shown in paddy and pulses fields of Bihar and Jharkhand hence may be considered as major pest. So, there arises a need to check these pests through conventional methods in order to increase the productivity of paddy and pulses of both states of India.

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