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POPULATION FLUCTUATION OF GRASSHOPPER FAUNA IN A FIELD NEAR KAKDWIP, SUNDERBANS, WEST BENGAL

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INTRODUCTION

Kakdwip having 251.10. sq km area is one of the business towns and port of South 24 Parganas bordering by Sagar Island on west, Pathar Pratima in the east, Mathurapur in the north and south covered by Bay of Bengal. On the basis of salinity, Kakdwip is coming under medium saline zone. The rivers are the live matrix of deltaic complex, on which the unique spectrum of biological diversity is embedded. Saptamukhi, Hugli and Muriganga are the three rivers which flow near Kakdwip town.

Workers like Katiyar (1956), Uvarov (1967), Phipps (1970) and Parihar (1974) have studied the biology and ecology of some grasshoppers in India and abroad. Tandon and Khera (1978) presented a brief account of the climate, vegetation, habitat and seasonal abundance of the species belonging to 23 genera under 3 families from Arunachal Pradesh. According to them, the species varies in color during different seasons. Hazra *et. al* (1981) worked on the ecology of grasshoppers in a grassland and presented the impact of some physical factors. Bhowmik and Halder (1984) worked on ecology and seasonal abundance of Acridids. The present work is a part of long term bioecological study in a grassland ecosystem near Kakdwip.

MATERIALS AND METHODS

The grassfield is located near Centre of Brackish Water Aquaculture and is two Kms from Kakdwip, Sunderbans in the district of South 24 Parganas. Site area which was situated for the estimation of population of grasshoppers and their seasonal abundance was about 150m × 100m. The entire site was subdivided into 5 sq. m. sub-plots. The grasshoppers were collected by catch-count method (Andrewartha, 1970) by using standard net of conventional size of 36 cm in diameter.

Temperature and relative humidity data were also recorded at sampling time. The grassfield mainly comprised grasses like *Cynodon dactyln* Pers., *Dichanthium qnnulatum* (Forsk), *Digitaria marginata* Linn., *Chrysopogon aciculatus* Trin., *Eragrostis pilosa* Beauv, *E. brachyphylla* Beauv., *Digitaria royleana* Prain and *Arundinella* sp.

OBSERVATIONS AND RESULT

During the course of present studies, the total number of species observed were ten under nine genera and two families. When total population of all the species is considered, it is observed that the maximum population of all the species are associated with moderate temperature and relatively high atmospheric humidity i.e., 29° C and 94% respectively, seems to be suitable for these species. The maximum number of species were observed when the temperature and the relative humidity was 27° C and 93% respectively (Table-1, 2; Chart-1, 2)

The rise and fall in the population of different species appear independent to each other. Fluctuations occur due to choice of the host in relation to season. With the growth of rice crops and other vegetable crops, the individuals of different species migrate towards the rice and other vegetable fields from the nearby wild vegetations, in particular the adjoining grasses.

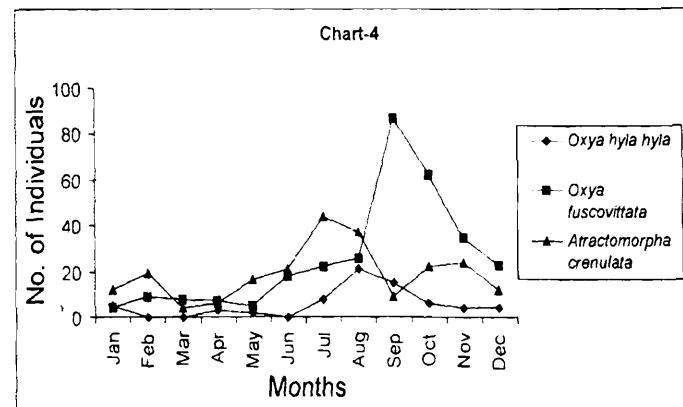
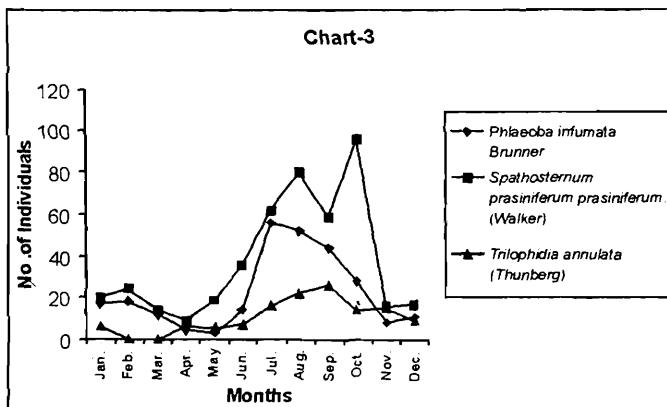
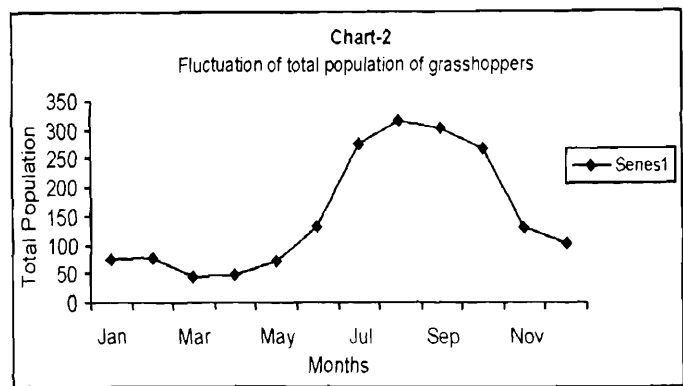
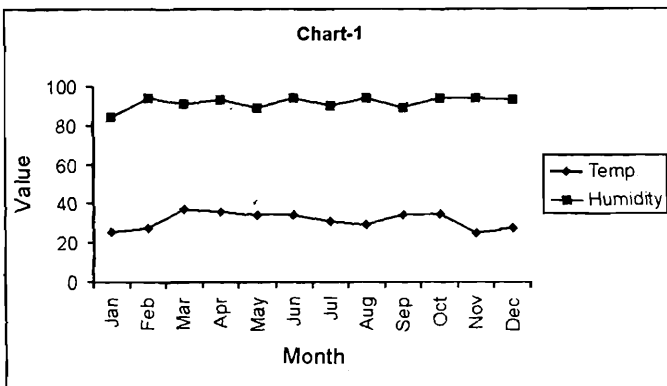
Maximum population of grasshoppers was observed during July to October (Chart-3,4,5) and their abundance may be related to the maximum vegetative growth of the grass species in the field during this period. This agrees with the findings of Dwivedi (1977), Tandon and Khera (1978) and Hazra (1984). The number of adults were lesser during June but increased very soon in the month of July. Consequently, the nymphs increased first and then became less in number.

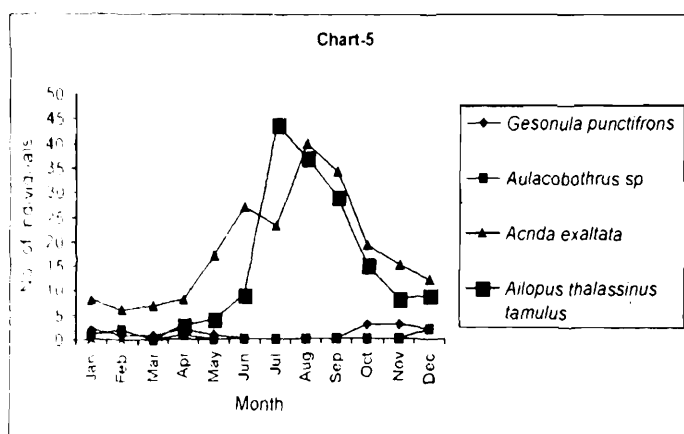
Table-1. Maximum temperature and relative humidity in different months during collections at Kakdwip.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature	25.5	27.6	37.3	36.0	34.0	34.4	30.8	29	34	34.6	25.1	27.6
Relative Humidity	84	94	91	93	89	94	90	94	89	94	94	93

Table-2. Monthly population fluctuations of predominant Acridid species.

Name of the species	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
<i>Phlaeoba infumata</i> Brunner	17	18	12	4	3	14	56	52	44	28	8	11
<i>Spathosternum prasiniferum prasiniferum</i> (Walker)	20	24	14	9	19	36	62	80	59	96	16	17
<i>Trilophidia annulata</i> (Thunberg)	6	–	–	6	5	7	16	22	26	14	15	9
<i>Oxya hyla hyla</i> Serville	5	–	–	3	2	–	8	21	15	6	4	5
<i>Oxya fuscovittata</i> (Marschall)	4	9	8	7	5	18	22	26	87	62	35	23
<i>Atractomorpha crenulata</i> (Fabr.)	12	19	4	6	16	21	44	37	9	22	24	12
<i>Gesonula punctifrons</i> (Stål)	2	1	1	2	1	–	–	–	–	3	3	2
<i>Aulacobothrus</i> sp.	1	2	–	1	–	–	–	–	–	–	–	2
<i>Acrida exaltata</i> (walker)	8	6	7	8	17	27	23	40	34	19	15	12
<i>Ailopus thalassinus tamulus</i> (Fabr.)	–	–	–	3	4	9	44	37	29	15	8	9
Total	75	79	46	49	72	132	275	315	303	265	128	102





Interspecific fluctuation : Five species viz., *Phlaeoba infumata* Brunner, *Spathosternum prasiniferum prasiniferum* (Walker), *Oxya fuscovittata* (Marschall), *Atractomorpha crenulata* (Fabr.) and *Acrida exaltata* (Walker) were predominant throughout the year and such a year round occurrence with different nymphal stages suggests of polyvoltine cycle in these species as reported earlier by Uvarov (1977). The lowest frequency was found in two species i.e., *Gesonula punctifrons* (Stål) and *Aulacobothrus* species.

The population of *Phlaeoba infumata* Brunner was found very low during April (1.4%) and May (1.12%), whereas, the species showed two clear peaks during the monsoon period i.e., in the months of July (20.97%) and August (19.47%). The population of *Spathosternum prasiniferum prasiniferum* (Walker) was found maximum in the month of October (postmonsoon period) when the maximum temperature was 34.6° C and relative humidity was 94%. The species *Trilophidia annulata* (Thunberg) was found absent during February and March, whereas the species, *Oxya hyla hyla* Serville was found absent during February, March and June, however their population show increase in the monsoon period (August and September). The population of *Oxya fuscovittata* (Marschall) was less in the months of January (1.30%) and May (1.63%) and showed the highest peak in the month of September (28.43%). The peak abundance of *Atractomorpha crenulata* (Fabr.) was occurred during July (19.46%) and August (16.37%) and this falls suddenly in the month of September (3.98%) and again rise in the month of October and November. The species, *Gesonula punctifrons* (Stål) and *Aulacobothrus* species, were found absent during June, July, August, September, and March, May, June,

July, August, September, October and November respectively. Out of ten species, the lowest population was observed in *Aulacobothrus* species. The species, *Acrida exaltata* (Walker) showed maximum peak during monsoon period (July) and with minimum fluctuation from January to April. *Ailopus thalassinus tamulus* (Fabr.) was not found during January to March, whereas, after June the population of species becomes suddenly high in the monsoon period. Therefore, different species have different temperature tolerance range.

The temperature showed direct influence on the population structure of grasshoppers but failed to show any significant correlation in this field. This is in perfect agreement with the findings of Hazra (1984) according to whom temperature alone is of little importance in governing the abundance and distribution pattern of grasshoppers. The relative humidity content of the surface soil was positively correlated with the grasshoppers population. In the monsoon months, higher content of relative humidity enhanced the growth rate of vegetation. This observation also agrees with that of Hazra (1984).

It may be concluded from the present study that the vegetation in conjunction with other physical factors considered this study collectively influence the population fluctuation of grasshoppers at Kakdwip.

SUMMARY

Population fluctuation of ten species of nine genera under two families of short horned grasshoppers were studied in a grassland at Centre of Brackish Water Aquaculture which is two kms from Kakdwip town, Sunderbans in the district of South 24 Parganas. Monthwise analysis shows that the maximum population was during monsoon period and minimum was during pre-monsoon period. The impact of temperature and humidity was also studied on the population fluctuation of short horned grasshoppers.

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