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SEASONAL OCCURRENCE OF INSECT PESTS OF AGRO FORESTRY HABITATS IN KASHMIR VALLEY BY ADOPTING LIGHT-TRAPPING TECHNIQUE

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ABSTRACT

The study carried out during March to November, 2003 on the seasonal occurrence of economically important insect pests of Kashmir Himalayan region using flourscent & yellow traps revealed presence of about 1955 insect individuals belonging to 32 species under 23 genera of 9 families. The insects belonged to four major orders *viz*. Coleoptera, Homoptera, Lepidoptera & Orthoptera. The insects were first noticed in the trap during first week of June that continued till third week of October.

Key words: Kashmir Himalayan region, Firurscent & Yellow traps seasonal occurrence, family, genera, order

The valley of Kashmir is very rich in diversity of agricultural, horticultural and forestry plantation. Different types of light-traps are being used world wide and are widely accepted to study the diversity of insect pests and their seasonal activity for deciding and employing appropriate pest management technique to manage their population below ETL. In Kashmir Himalayan region, so far no detailed work on insect light-trapping has been done. However, in this direction some studies have been carried out on insect pests damaging crops and economically important plants in Kashmir Himalayan region by Raina and Baghat 2005, Baghat and Raina, 2006. Earlier Deshraj and Dev (1993), Devi *et al.* (1994), Chandel *et al.* (1994) and Kumar and Kumar (2000), have studied in diversity, distribution and relative abundance of different insect pests by utilizing light trapping technique. Keeping in view the importance of light-trapping the present study have been undertaken to study the seasonal occurrence of economically important insect pests of Kashmir Himalayan region of paramount zoogeographical importance.

MATERIALS AND METHODS

The study was conducted during March to November 2003 at two different sites *viz*. Hazratbal Srinagar and Kashmir Golf Club Srinagar. Two kinds of light traps (Flourscent and Yellow) were used. Traps were made up of iron coated with paint and fabricated locally, possessed a central circular collecting funnel each having a cone shaped roof to prevent the entry of rain inside the traps.

The lamp in each trap was switched on at 7:00 pm and switched off at 5:30 am regularly. The trapped insects were either retained alive or killed by placing blocks of plaster of paris saturated with killing agents on the bottom of the trap. The chlorinated hydrocarbons *viz*. Tetracholoroetane and Tricholoroethylene were used as killing agents for the trapped insects. Observations were taken daily through out the experimental period. The collected insect material was kept in the Entomology section of P.G. Department of Zoology, University of Kashmir. Cumulative monthly data was compiled from the daily observations of different insect orders, families, genera and species trapped. The traps were placed about 3 feet above the ground level, adjacent to fields/cropping areas and forest zones.

RESULTS AND DISCUSSION

About 1955 insects were trapped belonging to 32 species under 23 genera, distributed over 09 families under 4 different insect orders *viz*. Coleoptera, Homoptera, Lepidoptera and Orthoptera. The order Coleoptera comprised (65.74%) of the overall catch, followed by Lepidoptera (27.87%), Homoptera (6.49%) and Orthoptera (0.15%) at both the study sites (Table-1). The dominant catch was detected through the fluorescent light trap operated at University Campus, Hazratbal, Srinagar comprising 56.87 per cent of the overall catch, where as

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Table 1: Total number of insect individuals pertaining to different insect orders, captured at different light-traps in Srinagar district from March to November 2003

Insect Order	Number of insect pest individuals captured		Total number of Genera	Total number of individuals captured	Number of Economically important families trapped	Pergentage of total insect orders		Total number insect spp. captured at site I and site II
	Site I	Site II				Site I	Site II	
Coleoptera	554	726	10	1280	03	28.53	37.13	16
Homoptera	36	91	01	127	01	1.84	4.65	01
Lepidoptera	222	323	11	545	04	11.35	16.52	14
Orthoptera	–	03	01	03	01	0.00	0.15	01
G. Total	812	1143	23	1955	09	39.43	56.87	32

Table 2: Various insect pest species of crops and economically important plants captured through two different types light-traps (fluorescent and yellow) with number of individuals in different months during March to November 2003

S. No.	Name of the insect/pest species trapped Order/family	Type of Trap	June	July	Aug.	Sep.	Oct.	Individual % catch
1.	**COLEOPTERA**							
a)	**Elateridae**							
i)	*Lacon modestus*	FLT	02	19	15	02	–	1.94
		YLT	–	17	11	–	–	1.43
ii)	*Lacon* sp.	FLT	–	13	29	09	–	2.64
		YLT	05	19	02	02	–	1.43
b)	**Cerambycidae**							
i)	*Aeolesthes sarta* (Solsky)	FLT	–	–	–	–	–	0.00
		YLT	02	–	–	–	–	0.10
ii)	*Macrotoma crenata* (Redt)	FLT	–	–	–	–	–	0.00
		YLT	–	01	–	–	–	0.05
c)	**Scarabaeidae**							
i)	*Adoretus cribratus* (white)	FLT	–	17	15	04	–	1.84
		YLT	–	10	04	01	–	0.76
ii)	*Adoretus* sp.	FLT	139	167	69	–	–	19.18
		YLT	126	140	23	–	–	14.78
iii)	*Aserica* spp.	FLT	01	19	21	–	–	2.09
		YLT	16	23	08	–	–	2.40
iv)	*Brahmina coriacea* (Hope)	FLT	–	–	–	–	–	0.00
		YLT	06	13	07	–	–	1.32
v)	*Brahmina conrata* (Blunch)	FLT	02	14	12	07	–	1.79
		YLT	–	19	10	04	–	1.68
vi)	*Brahmina* sp.	FLT	19	27	15	–	–	3.12
		YLT	15	17	01	–	–	1.68
vii)	*Heteronychus robustus* (Redt.)	FLT	–	02	02	01	–	0.25
		YLT	–	04	03	–	–	0.35
viii)	*Hilyotrogus holoserceus* (Hope)	FLT	15	21	13	–	–	2.50
		YLT	05	19	04	–	–	1.43
ix)	*Melolontha melolontha* (Hope)	FLT	05	12	07	05	–	1.48
		YLT	03	06	02	02	–	0.66
x)	*Oryctes nasicornis* (Hope)	FLT	01	01	–	–	–	0.10
		YLT	–	02	–	–	–	0.10
xi)	*Oryctes rhinoceros* (Linn.)	FLT	02	04	–	–	–	0.30
		YLT	–	–	–	–	–	0.00

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S. No.	Name of the insect/pest species trapped Order/family	Type of Trap	June	July	Aug.	Sep.	Oct.	Individual % catch
2.	**HOMOPTERA**							
	a) Cicadidae							
	i) *Pycna repanda*	FLT	–	–	27	55	09	4.65
		YLT	–	–	15	19	02	1.84
3.	**LEPIDOPTERA**							
	a) Arctiidae							
	i) *Callimorpha principalis* (Koll)	FLT	–	–	–	–	–	0.00
		YLT	–	01	02	–	–	0.15
	ii) *Lemyra* sp.	FLT	10	19	12	07	–	2.45
		YLT	03	08	05	02	–	0.92
	iii) *Spilosoma* sp.	FLT	–	09	07	04	–	1.02
		YLT	03	12	04	03	–	1.12
	iv) *Spilosoma erythrozone* (Koll.)	FLT	–	05	05	03	02	0.76
		YLT	–	04	06	02	01	0.66
	b) Geometridae							
	i) *Eummelea* sp.	FLT	–	01	–	–	–	0.05
		YLT	–	–	–	–	–	–
	c) Lymantriidae							
	i) *Euproctis xanthorrohoea* (Koll.)	FLT	–	22	33	04	–	3.01
		YLT	–	19	37	–	–	2.86
	d) Noctuidae							
	i) *Agrotis ipsilon* (Schiff.)	FLT	20	24	11	–	–	2.81
		YLT	12	10	05	–	–	1.38
	ii) *Agrotis* sp.	FLT	02	05	–	–	–	0.35
		YLT	-	-	–	–	–	–
	iii) *Hadena perdentata* (Schiff.)	FLT	–	24	11	07	–	2.14
		YLT	–	19	05	04	–	1.43
	iv) *Hermonossa* sp.	FLT	–	14	12	03	–	1.48
		YLT	–	–	–	–	–	–
	v) *Plusia orichalceae* (Moore)	FLT	06	05	05	–	–	0.81
		YLT	–	–	–	–	–	0.00
	vi) *Plusia* sp.	FLT	–	01	02	02	–	0.25
		YLT	–	–	02	06	–	0.40
	vii) *Prospalta* sp.	FLT	–	01	–	–	–	0.05
		YLT	–	–	–	–	–	–
	viii) *Helvicoverpa armigera* (Koll.)	FLT	–	10	25	05	–	2.09
		YLT	–	07	20	04	–	1.58
	ORTHOPTERA							
	Acrididae							
	i) *Acrida* sp.	FLT	–	03	–	–	–	0.15
		YLT	–	–	–	–	–	–

FLT = Flourescent Light Trap

YLT = Yellow Light Trap

Table 3: Individual insect catch different light traps during 2003

Type of Trap	June	July	August	September	October	November
FLT	224	459	348	118	12	0.00
YLT	194	372	176	49	03	0.00
	% Catch	**% Catch**	**% Catch**	**% Catch**	**% Catch**	**% Catch**
FLT	11.45	23.47	17.80	6.03	0.61	0.00
YLT	9.92	19.02	9.00	2.50	0.15	0.00

Table 4: Meteorological data (Temp; and Rainfall) pertaining to Srinagar, District of Kashmir Province during March to November 2003

Weather parameters	Months								
	March	April	May	June	July	August	September	October	November
Avg. Max. temp. (°C)	13.7	21.0	22.2	30.1	30.9	28.6	26.9	23.0	19.5
Avg. Min. temp. (°C)	3.7	8.6	9.1	14.9	18.9	17.1	13.60	5.1	1.8
Avg. Rainfall (mm)	05	11	08	03	06	05	07	0.2	1.0

the Yellow Light trap, operated at Kashmir Golf Club, Srinagar comprise, (39.43%) of the overall catch. This indicates that the Fluorescent light source is more attractive than Yellow light (Table-1). The dominant families of insect pests trapped in decreasing order of dominance was as Scarabaeidae (1132), Noctuidae (290), Elateridae (145), Arctiidae (139), Cicadidae (127), Lymantriidae (115), Cerambycidae (3), Acrididae (3), Geometridae (1), (Table-2). The predominant species recorded during the course of investigations was *Adoretus* sp. (19.18% and 14.78%) with its peak activity in the month of July at both the study sites.

The insects were first noticed in the trap during the first week of June and continued till third week of October. There existed a definite relationship between catches in the trap and temperature and humidity (Table-4). The study revealed the abundance of insect pests in the trap and temperature and humidity (Table-4). The study revealed the abundance of insect pests in summer season (90.69%) followed by autumn (9.30%). During the month of July, the activity of insect pests was in peak, with individual catch being dominant at both the study sites (23.47 and 19.02) respectively (Table-3), thereafter during the month of September (8.54%) maximum number of insect pests were attracted to light-traps. In spring season no insects were detected at both the study sites.

REFERENCES

Baghat, R. C. and Raina, R. H. (2006). Report on the insects collected through light traps from agricultural and horticultural plants from (Pahalgam Jammu and Kashmir) *Journal of Insect Science,* **19**: 37-42.

Chandel, R. S., Gupta, P. R. and Chander, R. (1994). Diversity of scarabaeidae beetles in mid-hills of Himachal Pradesh. *Himachal Journal of Agricultural Science,* **20**: 98-101.

Deshraj, Kashyap, N.P. and Nirmala Devi (1993). Monitoring diamond moth, *Plutella maculipennis*. *Journal of Entomological Research,* **4**: 275-278.

Devi, N., Raj, D. and Kashyap, N.P. (1994). Relative abundance of some white-grub beetles. *Journal of Entomological Research,* **12**: 139-142.

Kumar, Jitender and Kumar, J. (2000). Comparative performance of different traps for monitoring population of *Plutella xylostella* (L.) and *Helicoverpa armigera* (Hubner) in Kullu Valley Himachal Pradesh. *Pest Management and Economic Zoology,* **6**: 181-184.

Raina, R.H. and Bhagat, R.C. (2005): Light trapping study of insects damaging agricultural and forestry importance in Srinagar Kashmir Valley. *Bulletin of Agriculture Science*, **3**: 49-53.