



DIVERSITY OF HOUSEHOLD INSECT PESTS FROM JAMMU DISTRICT, J & K, INDIA

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ABSTRACT

The insects have been a great help to humans by performing certain vital activities like, Pollination, Scavenging, source of edible products, etc. In spite of serving human kind, some insects have become major pests of household commodities and have added to the economic losses incurred by man. These insects have targeted the food security and have become endemic in various parts of the world. Most of these insects have become worldwide in distribution and have managed to invade various habitats around human dwellings. The study of Household insects from Jammu district is first ever investigation done by the author during the year 2017-2018. From the present study, the author enlisted 41 Household insects belonging to 10 orders that have been enlisted in the form a checklist. Stored grain insects comprised of 16 insects belonging to 2 orders, Insect Vectors comprised of 11 insects, belonging to 4 orders while the General household insects comprised of 14 insects, belonging to 8 orders.

KEYWORDS: Stored Grain Insects, Vectors, General Nuisance Insects.

INTRODUCTION :

Man and insects are associated to each other through ages. The insects have served human beings by playing key roles like that of scavenging, producing edible products and the most important, Pollination. With about 4.1 million species on earth, phylum Arthropoda dominates the life on earth that makes about 80% of total life forms on the earth (Erwin, 1997). Apart from serving for mankind, they have become serious pests of various household commodities and lead to huge losses.

The yearly loss in USA accounts for about US\$ 20 million, which could have sufficed the daily need of many people in the world (Weaver and Petroff, 2004). In India, the estimated post-harvest loss of 12-16 million metric tonnes has been reported due to both Biotic and Abiotic factors (Sharon *et al.* 2014). The introduction of alien species due to trade and commerce has resulted in much complexity in non-native lands due to their uninterrupted flourishing (FAO-Statistics).

The insects as vectors of diseases have also put the human life in a grave threat. According to a report by WHO-2014, each year about 1 million people die due to Vector borne diseases, of which mosquito borne diseases remain at the top. Malaria is the most endemic disease around the globe that claims to take more than 600,000 lives annually. These vector borne diseases affect mostly the Poor nations of the world and lead to further economic burden. In India, Malaria led to about 1.06 million deaths in 2006 (Kalra *et al.* 1997) and dengue alone puts a risk on 2.5 million around 100 countries of the world. Recently Zika virus has laid its foundation in various parts of the world. Its first epidemic was recorded from Brazil (South America) in 2015, where it affected more than 1.5 million people (WHO-2014). In India, Zika Virus was recorded for the first time from Pune, Maharashtra in January 2017 (WHO-2017). The biggest Zika outbreak in India was

recorded from Western Rajasthan, where 80 People including 22 pregnant women were found Positive for Zika virus (Medical Xpress, 2018).

MATERIALS AND METHODS

Study Area

Jammu and Kashmir, the crown of India, is located between latitudes 32°15’ N & 37°5’ N and 72°35’ E & 80°20’ E, with Pakistan in the West, China in the East, and Punjab & Himachal Pradesh in the South. It is the Northern most region, which is situated, mostly, in the Himalayan Mountains. It has an average elevation of 327 m (1,073 ft.) (Fig. 1). The study area comprised of shops, godowns, warehouses, ditches, animal shelters, storehouses, kitchen and pantries.

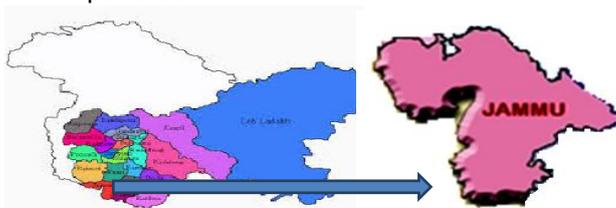


Fig. 1: Study Area (JAMMU DISTRICT)

Collection and Preservation

The insects were collected and preserved using standard Entomological techniques. The identification of the insects was done using valid sources.

RESULTS AND DISCUSSIONS

From the present study, **41 Household insects** were recorded, belonging to **10 Orders**. Stored grain insects comprised of **16 insects** belonging to **2 orders**, Insect Vectors comprised of **11 insects**, belonging to **4 orders** while the General household insects comprised of **14 insects**, belonging to **8 orders** that have been enlisted below (Table. 1 & Fig. 2):

Table 1: List of Household Insects from Jammu Region, J&K

A. STORED GRAIN INSECTS			
S.NO.	SPECIES NAME	ORDER	COMMON NAME
1.	<i>Tribolium castaneum</i> (Fig. 3)	Coleoptera	Rust Red Flour Beetle
2.	<i>Tribolium confusum</i> (Fig. 4)	Coleoptera	Confused Flour Beetle
3.	<i>Rhyzopertha dominica</i> (Fig. 5)	Coleoptera	Lesser Grain Borer
4.	<i>Oryzaephilus surinamensis</i> (Fig. 6)	Coleoptera	Saw-toothed Grain Beetle
5.	<i>Callosobruchus chinensis</i> (Fig. 7)	Coleoptera	Bean weevil
6.	<i>Callosobruchus maculatus</i> (Fig. 8)	Coleoptera	Cowpea weevil
7.	<i>Callosobruchus analis</i> (Fig. 9)	Coleoptera	Pea weevil
8.	<i>Lasioderma serricorne</i> (Fig. 10)	Coleoptera	Cigarette Beetle
9.	<i>Stegobium paniceum</i> (Fig. 11)	Coleoptera	Drugstore Beetle
10.	<i>Sitophilus oryzae</i> (Fig. 12)	Coleoptera	Rice weevil
11.	<i>Sitophilus zeamais</i> (Fig. 13)	Coleoptera	Maize weevil
12.	<i>Gibbium</i> sp.(Fig. 14)	Coleoptera	Spider Beetle
13.	<i>Cryptolestes ferrugineus</i> (Fig. 15)	Coleoptera	Flat Grain Beetle
14.	<i>Corcyra cephalonica</i> (Fig. 16)	Lepidoptera	Rice Moth
15.	<i>Plodia interpunctella</i> (Fig. 17)	Lepidoptera	Indian Meal Moth
16.	<i>Ephestia cautella</i> (Fig.18)	Lepidoptera	Almond Moth
B. INSECTS AS VECTORS OF HUMAN DISEASES			
17.	<i>Periplaneta americana</i> (Fig. 19)	Blattodea	American Cockroach
18.	<i>Blattella germanica</i> (Fig. 20)	Blattodea	German Cockroach
19.	<i>Blatta orientalis</i> (Fig. 21)	Blattodea	Oriental Cockroach

20.	<i>Musca domestica</i> (Fig. 22)	Diptera	House Fly
21.	<i>Calliphora</i> sp.(Fig. 23)	Diptera	Blow Fly
22.	<i>Sarcophaga</i> sp.(Fig. 24)	Diptera	Flesh Fly
23.	<i>Aedes albopictus</i> (Fig. 25)	Diptera	Asian Tiger Mosquito
24.	<i>Anopheles</i> sp.(Fig. 26)	Diptera	Malaria Mosquito
25.	<i>Culex</i> sp. (Fig. 27)	Diptera	Common House Mosquito
26.	<i>Cimex lectularius</i> (Fig. 28)	Hemiptera	Bed Bug
27.	<i>Pediculus humanus capitis</i> (Fig. 29)	Phthiraptera	Head Louse
C. GENERAL HOUSEHOLD INSECTS			
28.	<i>Lepisma saccharina</i> (Fig. 30)	Zygentoma	Silver Fish
29.	<i>Acheta domesticus</i> (Fig. 31)	Orthoptera	Oriental House Cricket
30.	<i>Gryllus sigillatus</i> (Fig. 32)	Orthoptera	Common House Cricket
31.	<i>Forficula</i> sp. (Fig. 33)	Dermaptera	Earwig
32.	<i>Drosophila melanogaster</i> (Fig. 34)	Diptera	Fruit Fly
33.	<i>Trichocera</i> sp.(Fig. 35)	Diptera	Crane Fly
34.	<i>Psychoda</i> sp.(Fig. 36)	Diptera	Drain Fly
35.	<i>Plecia nearctica</i> (Fig. 37)	Diptera	Love Bugs
36.	<i>Tinea pellionella</i> (Fig. 38)	Lepidoptera	Case-making Cloth Moth
37.	<i>Polistes</i> sp.(Fig. 39)	Hymenoptera	Yellow Paper Wasp
38.	<i>Solenopsis</i> sp.(Fig. 40)	Hymenoptera	Fire Ant
39.	<i>Camponotus compressus</i> (Fig. 41)	Hymenoptera	Black Carpenter Ant
40.	<i>Coptotermes formosanus</i> (Fig. 42)	Blattodea	Termite
41.	<i>Anthrenus verbasci</i> (Fig. 43)	Coleoptera	Carpet Beetle

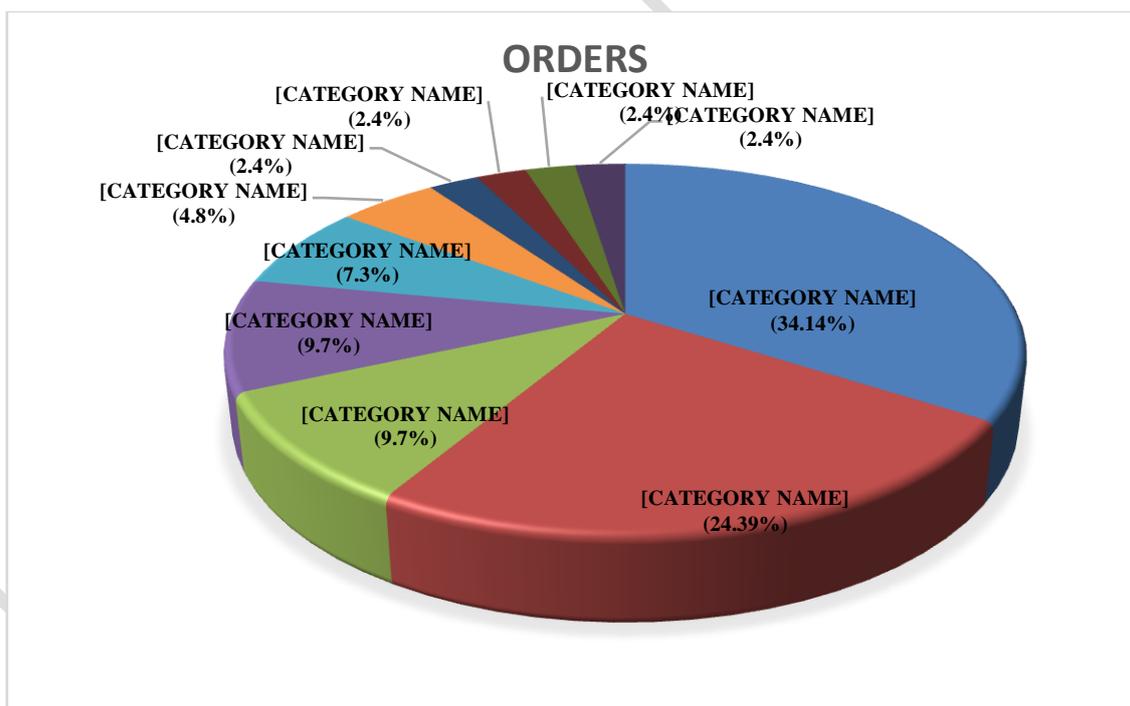


Fig. 2: Pie Chart showing the abundance of Household insects of different orders from Jammu district, during 2017-2018.

The Stored Grain Insects belonged to 2 main orders i.e. **Coleoptera** and **Lepidoptera**, which were in accordance with the findings by **Bhargava et al. 2007**, **Rees 2004** and **FAO statistics**. All the stored grain insect species caused considerable damage and left the grains unpalatable in the study area. Major damage was recorded from monsoons (June-August) that extended till the post monsoons (September-mid

November). Maximum damage was recorded on Wheat flour, Rice grains, Maize grains, refined flour and spices.

Total **11 insects as vectors of diseases** were recorded from the study area and they belonged to **4 orders**. The major insects as vectors belonged to the order **Diptera (6)**, of which, flies and mosquitoes shared equal numbers, i.e. 3 each. This result is in accordance with the reports of **(WHO-India, 2014)** that says most of the vector borne diseases are carried by mosquitoes, but flies also contribute in spreading deadly diseases like, Diphtheria, Dysentery, Typhoid, Tuberculosis, Leprosy, Intestinal Parasitism, Cholera **(Iqbal, et al. 2014)**, Myiasis **(Salveti, et al. 2012; Sukontason et al. 2014)**. Besides mosquitoes and flies, bedbugs, louses are also known to infect human beings and their presence was recorded, not only from the unhygienic areas but from the urban areas as well.

Total **14 general nuisance insects** were recorded from the study area belonging to **8 orders**. Their presence inside the house affects the social status of a person and creates inconvenience for those living around. These insects damage the household commodities like, *Lepisma saccharina* damages the books and other paper commodities, *Acheta domesticus* and *Gryllus sigillatus* annoy by making monotonous sounds and damaging clothes and paper items **(Atwal and Dhaliwal, 1999)**. *Coptotermes formosanus* damages the furniture and other wood items, *Camponotus* sp., though acts as scavengers, but dig holes deep inside the foundations and disrupt the architecture of the houses. *Drosophila melanogaster* feeds on all the fruits and leads to secondary infections like fungal infections. *Polistes* sp. and *Solenopsis* sp. are known to inflict painful stings and bites respectively that leads to redness and swelling of the targeted areas **(Prajaapati and Upadhyay, 2017; Briano et al. 2012)**. *Anthrenus verbasci* damages the clothes and woollen items that have been untouched since a significant period.

CONCLUSION

The insects have widened their habitats due to increased trade and commerce, and the insects that remained confined to a particular area are now, found all over the world. The global increase in the temperature of earth has also made conditions suitable for the insects to flourish and hence, these insects are found extended upto the hotter and the colder places like Antarctic as well. The present study is first ever documentation of household insects, from where **41 household insect pests**, belonging to **10 orders**, were recorded. The study was carried out with the aim of setting up of a baseline information for the common people and the authorities, about the household insects and the damage they incur on the economic status of the study area. This information would be quite useful for planning certain management practices against these insects as to minimise the loss. All these insects cause considerable loss to the stored commodities, besides a few being nuisance-causing insects. The common people encounter with these insects daily especially the homemakers but the knowledge about the infestations and proper storage techniques remain lacking. Hence, this study would be highly useful for homemakers to undergo management besides their conventional modes of storage and managements.

ACKNOWLEDGEMENT

The authors are grateful to Head of the Department, Zoology, University of Jammu for providing necessary facilities for carrying out the research.

Figures:



Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7



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