

A Preliminary Survey on the Occurrence of Dipteran Blood Sucking Insects in Different Localities of District Bareilly (U.P)

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ABSTRACT

During a survey of blood sucking insects in the vicinity of district Bareilly between 2010-2011, 10 sites were visited. As many as 53 species of blood sucking insects belonging to 4 groups under 15 genera have been recorded. Of these, the mosquitoes shared highest number of species i.e., 36 species, followed by 11 species of Anoplura, and 4 species of louse flies (Pupipara) in succession. There was less number of bedbugs. Further, among mosquitoes, *Anopheles* was on the top and next to it there was *Aedes* and *Culex* in succession.

Keywords: *Aedes*, *Culex*, Parasites

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INTRODUCTION

There are about 30 insect orders, of which most important insect orders, considering vectors of diseases are Diptera, Heteroptera, Siphonoptera and Anoplura. Further, among these the Diptera, carries a tremendous public health importance because it harbours most medically important parasites, which transmit fatal and debilitating infections. Covell [1] published a monograph on the "Distribution of Anopheline mosquitoes in India and Ceylon" and mentioned occurrence of 6 species of *Anopheles* viz., *An. culicifacies*, *An. stephensi*, *An. subpictus*, *An. hyrcanus*, *An. barbirostris* and *An. fuliginosus* from Rohilkhand region in the United Provinces West. Earlier, Wattal *et al.* [2] while furnishing information about Culicines of Dehardun also mentioned about distribution of some mosquito species from Rohilkhand region. Ansari *et al.* [3] undertook a survey on the occurrence of mosquitoes of Bareilly district and collected 6 species of *Anopheles* including *An. culicifacies* a vector of Malaria. Some information is also available on general studies sucking lice [4], As per records of District Malaria Office, Bareilly, day by day the mosquito nuisance is increasing in the district.

Henceforth, based on the available literature it seems that the information on dipteran blood sucking insects in general and from Bareilly region in particular is in the scattered form. For the last decade the ecological balance of the district is upset because of various developmental activities, therefore, at this critical stage it is a must that what has been changed so far in the faunal diversity of blood sucking insects in the light of previous studies and what would have reasons for that change?

MATERIALS AND METHODS

The area selected for the present study is the Bareilly district covering 3 localities viz. Bareilly city, Faridpur and Baheri. A diverse climatic and topographical condition has been noticed in all the 3 locations. The general Entomological methods adopted for the collection of Blood sucking insects are-

- Collection from domestic animals: Various domestic animals were searched for the insects particularly the blood sucking ones. Chicken coops and pigeon coops were also searched for presence of insects.

- Collection of indoors and outdoors insects: Adults mosquitoes were collected inside animal's dwellings and their surroundings, tree trunks, shrubbery and inside house. The entomological methods as per WHO [5] guidelines were adopted for collecting mosquito specimens.

While collecting the insect specimens, detailed information related to sampling was also recorded such as date, place, type of collection, host, etc. Except for identification record all data were recorded on the spot. For identification each specimen was first examined for generic identification and thereafter upto

species level using standard Keys and Catalogues. In case any problem occurred while indentifying the insect specimens, the identification was confirmed from the subject experts.

The collected insect specimens were preserved in 70% alcohol for future studies. For preparing the permanent slide of the insect specimens, first of all the insect was kept in KOH solution for a desired duration depending upon the type/size of the insect and thereafter dehydration was done followed by clearing and mounting.

RESULTS AND DISCUSSION

Table 1: List of some dipteran, Blood sucking insects collected from different localities in district Bareilly during 2010-2011

Sl. No.	Common name	Family	Genera	Species	Localities									
					L-1			L-2			L-3			
					1	2	3	4	5	6	7	8	9	10
1.	Mosquito	Culicidae	i) <i>Anopheles</i>	i) <i>An. gigas</i> Giles, 1901	+	+	+	-	-	-	-	-	-	-
				ii) <i>An. nigerrimus</i> Giles, 1901	-	-	-	-	-	+	+	-	-	-
				iii) <i>An. aconitus</i> Donitz, 1902	-	-	-	+	-	+	-	-	+	+
				iv) <i>An. annularis</i> Van der Wulp, 1884	+	-	+	+	+	-	-	+	+	+
				v) <i>An. culicifacies</i> Giles, 1901	+	+	-	+	+	+	+	+	+	+
				vi) <i>An. fluviatilis</i> James, 1902	-	-	+	+	+	+	+	+	+	+
				vii) <i>An. jeyporiensis</i> James, 1902	-	-	-	-	-	-	+	-	+	+
				viii) <i>An. maculatus</i> Theobald, 1901	+	-	+	+	+	+	+	+	+	+
				ix) <i>An. minimus</i> Theobald, 1901	-	-	-	-	-	+	-	-	+	+
				x) <i>An. pulcherrimus</i> Theobald, 1902	-	-	-	-	-	+	+	-	-	-
				xi) <i>An. splendidus</i> Koidzumi, 1920	-	-	-	-	+	+	+	+	-	-
				xii) <i>An. stephensi</i> Liston, 1901	-	-	+	+	+	+	-	+	+	+
				xiii) <i>An. subpictus</i> Grassi, 1899	+	-	+	+	-	+	-	+	+	-
				xiv) <i>An. vagus</i> Donitz, 1902	-	-	+	+	-	-	-	+	-	-
			ii) <i>Aedes</i>	i) <i>Ae. aegypti</i> Linnaeus, 1762	-	-	-	+	+	-	-	+	-	-
				ii) <i>Ae. albopictus</i> Theobald 1908	-	-	-	-	+	+	-	+	+	-
				iii) <i>Ae. albopictus</i> Skuse, 1894	-	-	-	-	-	+	+	-	-	+
				iv) <i>Ae. aurostratus greeni</i> Theobald, 1903	-	-	-	+	+	-	-	+	+	-
				v) <i>Ae. dissimilis</i> Leicester, 1908	+	-	-	+	+	-	+	-	-	+
				vi) <i>Ae. gilli</i> Barraud, 1924	-	+	-	+	-	-	-	+	+	-
				vii) <i>Ae. suffusus</i> Barraud, 1931	-	-	-	-	+	+	-	+	+	-
				viii) <i>Ae. thomsoni</i> Theobald 1905	-	-	-	+	+	+	-	-	-	+
				ix) <i>Ae. unilineatus</i> Theobald, 1906	-	-	-	+	-	-	+	+	-	-
				x) <i>Ae. vittatus</i> Bigot, 1861	-	-	-	-	-	+	-	-	-	-
				xi) <i>Ae. w-albus</i> Theobald, 1905	-	-	-	-	-	+	-	-	-	-
			iii) <i>Armigeres</i>	i) <i>Ar. durhami</i> Edwards, 1917	-	+	+	-	-	-	-	-	+	+
			iv) <i>Culex</i>	i) <i>Cx. brevipalpis</i> Giles, 1902	-	-	+	+	+	-	-	-	+	-
				ii) <i>Cx. pallidothorax</i> Theobald, 1905	-	-	-	-	-	+	+	+	-	-
				iii) <i>Cx. quinquefasciatus</i> Say, 1828	+	-	-	-	+	+	-	-	+	+
				iv) <i>Cx. mimeticus</i> Neo, 1899	+	-	+	+	-	-	+	+	+	+
				v) <i>Cx. mimulus</i> Edwards, 1915	-	+	+	-	-	-	-	-	-	-
				vi) <i>Cx. ramakrishnii</i> Wattal & Kalra, 1965	-	-	-	-	-	-	+	-	-	-
				vii) <i>Cx. raptor</i> Edwards, 1922	-	-	-	+	+	-	-	-	-	-
				viii) <i>Cx. vagans</i> Weidemann, 1828	-	-	-	-	-	-	+	+	+	+
				ix) <i>Cx. vishnu</i> Theobald, 1901	-	+	-	-	-	+	+	-	-	+
			v) <i>Uranotaenia</i>	<i>U. nivipleura</i> Leicester, 1908	-	-	+	-	-	-	-	-	-	-
2.	Anoplura (Lice)	Haematopinidae	i) <i>Haematopinus</i>	i) <i>H. tuberculatus</i> Burmeister, 1839	+	+	-	-	-	-	+	-	-	-
		Pediculidae	ii) <i>Pediculus</i>	i) <i>P. humanus</i> Linnaeus, 1758	-	-	-	-	+	-	-	+	+	+
		Linognathidae	iii) <i>Linognathus</i>	i) <i>L. africanus</i> Kellogg & Paine, 1911	-	-	-	-	-	+	-	-	+	-
		Polyplacidae	iv) <i>Polyplax</i>	ii) <i>L. vituli</i> Linnaeus, 1758	-	-	+	-	-	+	+	+	+	+
				i) <i>P. reclinata</i> Nitzsch, 1864	-	-	-	+	+	-	-	-	-	-
				ii) <i>P. spinulosa</i> Burmeister, 1839	-	-	-	+	-	-	-	+	-	-
				iii) <i>P. asiatica</i> Ferris, 1923	+	-	-	-	+	+	+	-	-	+
				iv) <i>P. stephensi</i> Christophers & Newstead, 1906	-	-	+	-	-	+	+	+	+	-
		Hoplopleuridae	v) <i>Hoplopleura</i>	i) <i>H. maniculata</i> Neumann, 1901	-	-	-	-	+	+	-	-	+	-
				ii) <i>H. pacifica</i> , Ewing, 1924	-	-	-	+	-	-	-	+	+	-
				iii) <i>H. ramgarh</i> Mishra <i>et al.</i> , 1972	+	-	-	-	+	-	+	-	-	+
3.	Pupipara (Louse flies)	Hippoboscidae	i) <i>Eucampsipoda</i>	i) <i>E. hyrtl</i> (Kolenati, 1856)	-	+	+	+	-	-	+	+	+	+
			ii) <i>Ornithoica</i>	i) <i>O. exilis</i> Walker, 1861	-	-	-	-	+	-	+	+	-	+
			iii) <i>Hippobosca</i>	i) <i>H. variegata</i> Megerle, 1803	-	-	-	+	+	-	+	+	-	+
			iv) <i>Lipoptena</i>	i) <i>L. capreoli</i> Rondani, 1878	-	-	+	-	+	+	-	-	+	+
4.	Bed bugs	Cimicidae	i) <i>Cimex</i>	i) <i>C. hemipterus</i> Fabricius	-	-	+	+	-	-	-	-	+	+
				ii) <i>C. lectularius</i> Linnaeus, 1758	+	+	-	-	+	-	+	+	+	-

In all, 3225 specimens of blood sucking insects belonging to 53 species under 15 genera were captured and identified. The list (Table 1) includes all the 53 species of blood sucking insects. The diversity of

mosquito in terms of number of species under the five genera was comparatively more than the other groups of blood sucking insects. The Anoplurans were on the next rank followed by louse flies (Pupipara) in succession. There was less population of bed bugs. Relating to locality- wise occurrence of the collected blood sucking insect diversity, the L-2 contributed the maximum abundance in terms of insect species. It was followed by L-3 and L-1 in succession. Further, out of 53 species reported from all the three zones, 43 species were reported from L-2 and next to it 42 species were reported from L-3 while only 25 species were recorded from L-1

The findings of present study are close to Ansari *et al.*, [4] who recorded 6 species of Anopheles but in our study 14 species of Anopheles have been recorded. further, the present findings are closed to Rao *et al.* [6] in recording 4 species of Pupipara and 2 species of Cimex from Garhwal Himalaya. Because of the paucity of literature it is difficult to compare the results of the present study with the earlier ones. The possible explanation about the locality wise occurrence of the insect species has been drawn based on the environmental features. There are certain species of insects viz., *gigas* and *Haematopinus tuberculatus* which are exclusively confined to the mountainous areas.

The following 15 species of insects viz., *Anopheles annularis*, *An. culicifacies*, *An. maculatus*, *An. subpictus*, *Aedes dissimilis*, *Ae. gilli*, *Armigeres durhami*, *Culex quinquefasciatus*, *Cx. mimeticus*, *Cx. vishnui*, *Polyplax asiatica*, *Hoplopleura ramgarh*, *Eucampsipoda hyrtlii*, and *Cimex lectularius* have been found to occur in all the localities. This is due to the fact that all of these have adapted to the prevailing conditions of the environment and availability of the chosen host. More diversity in L-2 can be explained on the basis of suitable conditions required for the growth and diversity of the immature forms of the insect because for each insect a particular range of temperature is required for developing in the young form.

Conclusively it can be mentioned that there are certain insect which can survive very well in the environment under the optimal condition if there is a fluctuation in the prevailing conditions, either the insects move to a place where it can survive well or otherwise diversity is reduced. Generally, occurrence of a particular insect to a particular spots is either ecologic specific or host specific.

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