



SPECIES DIVERSITY OF FAMILY CRAMBIDAE (MOTH) IN VEERANGANA DURGAVATI WILDLIFE SANCTUARY, DAMOH (M.P.)

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ABSTRACT

The study based on the survey made at different localities in Veerangana Durgavati Wildlife Sanctuary, Damoh. During the study total thirty specimens of family Crambidae were collected with the help of light traps. This paper deals with the collection and identification of moths of family Crambidae (order Lepidoptera) which comprises 11 species of 11 genera and 2 subfamilies- Spilomelinae & Pyraustinae. Subfamily: Spilomelinae was the dominated sub family. The diversity indices for the family were also calculated. Shannon-Weiner Diversity (H') was 2.0395, whereas Simpson's diversity Index (D) was 0.1733 and dominance Index (1-D) was 0.8267. The species diversity is a very important parameter for functioning of an ecosystem, thus this is very important to protect moth fauna by protecting the natural habitat of the sanctuary.

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INTRODUCTION

The area of Veerangana Durgavati Wildlife Sanctuary is 24 sq. kms. The sanctuary lies between 23°30'9" & 24°35'N latitudes & between 79°51'0" & 79°51'13"E longitudes. The sanctuary possesses an entire ecosystem and therefore it is self-sufficient. All important wildlife species complete their different stages of life cycle within the sanctuary. It also includes entire range of ecological and geomorphological features typical of Deccan peninsula. Northern hilly micro region presently has a large section of teak plantation. The area is covered with open mixed jungle (Tiwari,2013).

Recent estimates report over 1,80,000 species of Order-Lepidoptera from all over the world (Zhang *et al.* 2019). Of which, over 11,300 species are recorded from India (Smetacek, 2011). Pyraloidea, the third largest superfamily of the order Lepidoptera following Noctuoidea and Geometroidea, are comprised two families Pyralidae and Crambidae. The group includes 137 genera and 16,000 species worldwide, with greatest richness in the tropics. Pyraloidea moths are ditrysian moths characterized by the following morphological features, paired tympanal chambers on second sternite, each with a tympanum and a conjunctiva and a basally scaled proboscis. The Crambidae is the larger family with just under approximately 10,000 described species worldwide.

The moths of this family are small to medium size and wingspan usually 10-35 mm. The proboscis basally scaled. Tympanal organs present at the base of abdomen ventrally and 'opened' anteriomedially. Praecinctorium is present, structure in the ears, which joins two tympanic membranes in the Crambidae, and is absent in Pyralidae. The subfamily Spilomelinae is represented by highest species among pyraloides. The moths are characterized by the absence of chaetosemata, a bilobed praecinctorium, projecting fornix tympani, pointed spinula, absence of a gnathos, and the female genitalia have no rhomboidal signum on the bursa copulatrix (Kumar, R., Mittal, V., Kumar, N. & Ramamurthy, V. V. 2013).

MATERIALS AND METHODS

During the Study thirty specimens of moth were collected from Veerangana Durgavati Wildlife Sanctuary, Damoh. The adults were collected in the field with the help of light traps during year 2009 to 2011. The collected insects were killed by using benzene vapor. For temporary storage in the collection field they were kept in the insect envelopes with labels and envelopes are kept in the ordinary cardboard boxes (Alfred, 2004). These were stretched, pinned, labeled, identified, preserved in the wooden collection boxes and deposited in the national repository of Zoological Survey of India, Jabalpur. The collected specimens were examined taxonomically and studied for diagnostic characters with the available literature (Hampson 1896; Bell & Scott 1937). The Collected specimens of moths were studied with the help of a Leica M205-A Stereo

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zoom microscope. Photographs were taken by Nikon cool picks L120 Camera. The current nomenclature used for species identification is according to the LEPINDEX (Beccaloni *et al.* 2003). Male genital characters were also used for identification of moths. The classification taken from Van Nieukerken *et al.* (2011).

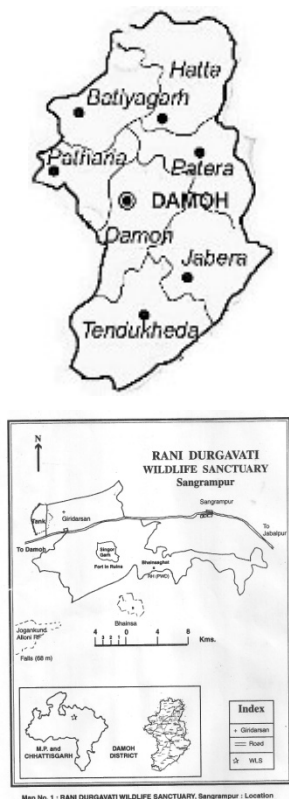


Figure 1 STUDY AREA: VDWS, DAMOH (Tiwari, 2003)

A diversity index takes into account the number of species present as well as the abundance of each species of Moth (Magurran, 1988). Diversity Indices, species richness and evenness, dominance of moth species were assessed for the study area and calculated by using Shannon-Wiener diversity index (1949) and Simpson Diversity index (1949).

RESULT AND DISCUSSION

Rani Durgavati Wildlife Sanctuary has a rich diversity of moths which influenced by their climate and vegetation. The main flora of the sanctuary is Saja, Lendia, Biza Tinsa, Haldu, Kasai, Palas, Bahera, Semmal etc. Harsingar, Dudhi, Karonda, Kanker, Phetra, Bhandar, Dhawa common grasses met are Kusal doob, Khas and Oran, Makor, Keoti, Ail guner, Mahul are the common climbers found here. Teak plants are mostly found in the sanctuary. Flora take part a great role in diversity of Moth flora. Survey-cum-collection works on Crambid moths in Veerangana Durgavati Wildlife Sanctuary, Damoh (M.P.) was undertaken from 2009 to 2011. The surveys led to the collection of thirty specimens of the family Crambidae from the following areas- Tilgula patrolling, Giridarshan, Danital, Sangrampur, Koda kalam, Nidan kund, Forest rest house & Bhainsaghat. It comprises 11 species which comes under 11 genera and 2 subfamilies. The number of species differs in different areas of the sanctuary. The greatest number of species is registered in the Bhainsaghat & Tilgula patrolling. The Bhainsaghat forest forms the eastern part of the sanctuary and have uninterrupted lush green forest down in the valley,

which provides ideal home for the moth fauna of the Sanctuary, and the lowest numbers of moths were found at Nidan Kund area.(Fig.2) *Conogethes punctiferalis* Guenee was the most abundant species. (Table: 1)

A diversity index is a quantitative measure which reflects how many different species are there in a community and which can take into account the phylogenetic relations between the individuals distributed among those types like richness and evenness. Species richness of a dataset is the number of different species in the corresponding species list of the area. Richness is a very simple measure of diversity, so it has been a popular diversity index in ecology. Species richness was $n=11$ for the sanctuary. The Shannon- Weiner diversity index which specifies the comparative occurrence of many moth species; was used to associate species abundance and relative richness amongst different species (Whittaker, 1977). As the value of Shannon-Weiner Diversity Index estimated was near to 2.0395 which specifies that the number of individuals of all species were evenly distributed in the sanctuary. Simpson's Diversity index is a calculation of types which takes into records both richness and evenness. It has been a useful tool to understand the biodiversity across study area. The value of this index is 0.1733. As Simpson diversity index has swifited convergence to limit diversity value for minor sample size, therefore, is principally suitable for rapidly evaluating areas of conservation (Lande *et al.* 2000). Dominance Index (1-D) was 0.8267 which indicates that high dominance of the species and low diversity. This work is an attempt to describe the crambid moth diversity of Veerangana Durgavati wildlife sanctuary. A lot of further work is necessary in this area and further collections are necessary for getting a detailed periodic estimate of the faunal diversity of moths in this sanctuary.

Table 1 Different species of Family Crambidae.

S. No.	Superfamily	Family	Subfamily	Name of the Species
		Crambidae	Spilomelinae	
1	Pyraloidea	Latreille, 1810	Guenee, 1854	<i>Agathodes ostentalis</i> Geyer, 1837
2				<i>Botyodes asialis</i> Guenee, 1854
3				<i>Cydalima conchylalis</i> Guenee, 1854
4				<i>Glyphodes bicolor</i> Swainson, [1821]
5				<i>Maruca vitrata</i> Fabricius, 1787
6				<i>Pygospila tyres</i> Cramer, 1780
7				<i>Sameodes cancellalis</i> Zeller, 1852
8				<i>Spoladia recurvalis</i> Fabricius, 1775
9				<i>Tyspanodes linealis</i> Moore, 1867
			Pyraustinae	
10			Meyrick, 1890	<i>Conogethes punctiferalis</i> Guenee, 1854
11				<i>Euclasta defamatalis</i> Walker, F., 1859

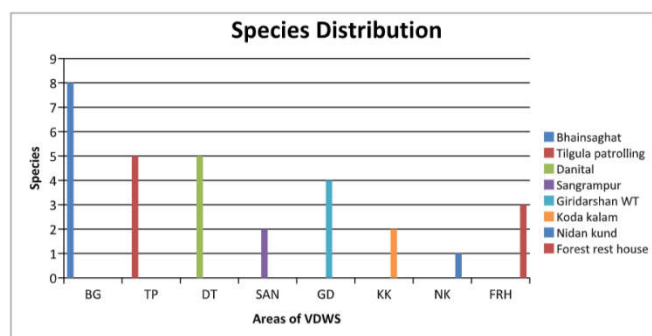


Figure 2 Graph showing Species distribution among different areas of VDWS, (M.P.)

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