

CHAETOTAXICAL STUDY OF THORACIC SEGMENTS IN CASE OF IMMATURE SPODOPTERA MAURITIA

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Abstract

Chaetotaxy is the arrangement of macrochaetae (bristles) on the body surface of insects. It is very important for determining homology in morphological traits, as well as providing information about the phylogeny between taxa.

In case of Noctuide Lepidopteran Spodoptera mauritia thoracic body segments of last instar observe two ventral setae, two sub ventral setae, four dorsal setae, two subdorsal and two lateral setae while six microscopic setae. There are three punctures towards dorsal surface (XD_a, XD_b and XD_c).

Key Words- *Chaetotaxy, Homology, Phylogeny.*

INTRODUCTION

The Study of Chaetotaxy of Spodoptera mauritia is necessary to formulate a comprehensive account on external morphological features and to provide standard identification of larvae. The colour of Lepidoptera larvae infect is no guide to correct systematic identification, as it changes according to the environmental conditions and feeding habits. The importance of Chaetotaxy in correct identification of the larvae was recognized by entomologists.

Very little work on this line has been attempted in India except commendable work of Gardner (1938 - 1948). This investigation was undertaken and an attempt made to indentify and homologize the different series of setae, following the nomenclature of Dyer and Forbes.

Material and Method:

The adult Spodoptera mauritia moth were collected from Jermy type light trap and placed in glass chimney than transferred in raring cages. During Captivity the eggs laid by females were allowed to hatch under laboratory conditions. The caterpillars were reared in separate petridishes and were maintained on the host plant. The last instar stage of caterpillars were preserved in a mixture of DKAA (Dioxine, Kerosine, Acetic Acid, Absolute Alcohol) ; 1:1:2:7 for 8 hours in light and then preserved in 70% alcohol.

The exuviae of caterpillar treated with 10% KOH solution for 4 to 8 hours and then washed with distilled water. The Thorax region separated with the help of a sharp scalper under stereoscopic binocular microscope and mounted in Salmon's Poly vinyl alcohol lacto phenol medium. Mount prepare in the medium kept in oven at 4°C. The material dissected longitudinally along mid ventrally and then finally mounted in Salmon's Poly vinyl alcohol lacto phenol medium for the study of thoracic Chaetotaxy.

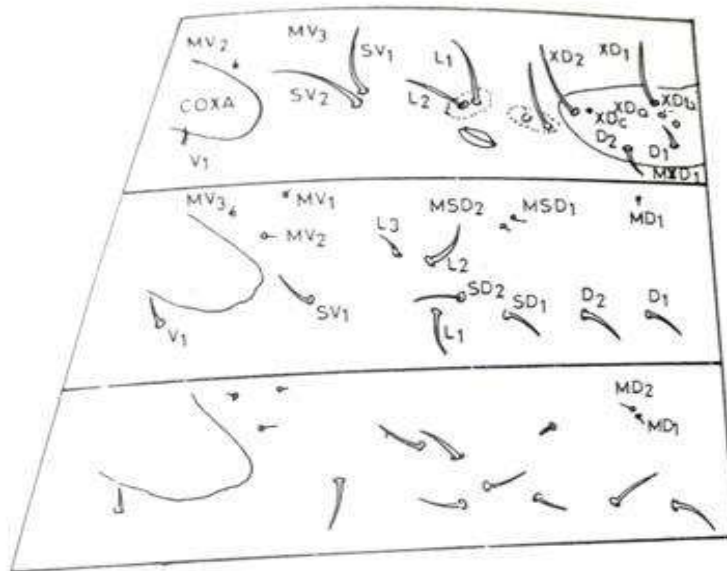
OBSERVATION: The Chaetotaxy of Thoracic body segments showed as –

PROTHORAX: The Prothoracic Shield studied with four setae, two of each XD and D groups (XD₁, XD₂, D₁ and D₂) XD₁ and XD₂ lie close to anterior margin of the shield and equal size, whereas D₁ and D₂ are smaller than the Setae of XD group. There are Three Punctures XD_a, XD_b, XD_c in the anterior half of the shield. The subdorsal group has two setae on Single pinaculum (SD₁ and SD₂). The presence of two Setae on Single Pinaculum just in front of the Spiracle and characterized the lateral group L₁ and L₂. The two Setae SV₁ and SV₂ are approximate equal in size and ventral in position. The single and small Seta posteroventral to Recoxa V₁ present on the ventral of the segment. Three microscopic Setae are present on the first thoracic segment in between D₁ and D₂. The microscopic Seta MXD₁ evident whereas two microscopic Setae MV₂ and MV₃ lie in front of the procoxa of the ventral.

MESOTHORAX: In this thoracic segment Setae setal groups on each half are characterized by nine tactile and sex microscopic setae. The dorsal group of setae is bisetosed with D₁ as the most dorsal seta. D₂ seta is ventral and equal to D₁. The subdorsal group is also bisetosed with Setae as D₁ and D₂. The Seta SD₁ is ventral to D₂ and at the same distance as between D₁ and D₂ is like SD₂ of first thoracic segment. The Seta SD₂ evident Ventral to SD₁ and in approximate line with D₁ and D₂. The lateral bears three setae L₁, L₂ and L₃. The seta L₁ lies lateral and slightly posterior to SD₂. The ventral group is represented by seta V₁ posteroventral to mesocoxa.

The microscopic setae are in three groups (MD, MSD and MV). The first group is unisetosed having a single seta MD₁, the second group has two setae MSD₁ and MSD₂ close to each other and situated in front of the Setae group SD, MSD₂ is slightly anteroventral to MSD₁, the remaining three setae of the ventral (MV₁, MV₂ and MV₃) are approximately equidistance from each other in triangular fashion in front of the mesocoxa.

METATHORAX: The Setae on the metathoracic region correspond in position as well as number to that of the mesothorax but having an additional seta MD₂, which is anterior and slightly smaller to the ventral of MD₁.



CHAETOTAXY OF THORAX REGION

Table: Distribution of Tactile and Microscopic Setae over the Thoracic Region of The Caterpillar of Spodoptera mauritia.

Tactile Setae		TH I	TH II	TH III
Dorsal Group	D1	1	1	1
	D2	1	1	1
	D3	1	-	-
	D4	1	-	-
Sub Dorsal Group	SD1	1*	1	1
	SD2	1	1*	1*
Lateral group	L1	1	1	1
	L2	1*	1	1
	L3		1	1
Sub Ventral group	SV1	1	1	1
	SV2	1	-	1
Ventral Group	V1	1	1	1
	V1		-	-
	Total	11	9	9
Microscopic Setae	MXD1	1	-	-
	MD1	-	1	1
	MD2	-	-	1
	MSD1	-	1	1
	MSD2	-	1	1
	MV1	-	1	1
	MV2	1	1	1
	MV3	1	1	1
	Total	3	6	7

*Thin, delicate and identical seta

RESULT AND DISCUSSION

The first thoracic segment of the caterpillar of Spodoptera mauritia is having a median dorsal sclerotized cervical shield with two prominent setae (XD₁, XD₂), two small setae (D₁ and D₂), one microscopic Seta (MXD₁) and 3 punctured (XD_a, XD_b, XD_c).

However Bhattacharjee and Gupta (1971) and Thakar and Srivastav (1983), described only tow punctures coded by XD₁ and XD₂ respectively in noctuidae.

Along with our study Gardner (1946-1948) , Bhattacharjee and Gupta (1971) are all in agreement with this Chaetotaxy study character of noctuidae.

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