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H. R. WONG

INTERIM REPORT 1958-2

FOREST BIOLOGY LABORATORY

WINNIPEG, MANITOBA

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A B S T R A C T

This is the second part of a detailed morphological study of the larch sawfly Pristiphora erichsonii (Htg.). This part deals with the ultimate larval instar. Literature on the morphology of sawfly larvae is reviewed, and illustrations are presented to assist in describing the morphological structures.

FORWARD

This is the second of two interim reports on the morphology of the larch sawfly, *Pristiphora erichsonii* (Htg.). The first (Wong, 1958) covered the external morphology of the male and female adults. This report covers the external morphology of the ultimate larval instar. The external morphology of the larval stage is identical for both sexes, although the larva of the male generally is smaller than that of the female.

The photographic plates of the two reports are numbered consecutively with the view to amalgamation for a more comprehensive publication at a later date.

As indicated in the earlier report (Wong, 1958), this morphological study is part of a treatise that will lend to a better understanding of the taxonomy and phylogeny of the sawfly species within the genus *Pristiphora*. Because of the difficulty of identifying most species of sawflies, it is essential to be familiar with the structures of the adults and larvae. Once the gross characters of a representative species of *Pristiphora* are understood, the complex pattern of evolutionary trends should be more readily discerned. The taxonomy and phylogeny of the species in the genus will be the subject matter of the third and last report in this series of studies.

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1. INTRODUCTION

Evidence on the evolution of the genus *Pristiphora* should be sought not only in the adult but also in the larval form. Unfortunately, there is a dearth of information on the larval morphology of sawflies in literature. The most notable works on this subject are by Middleton (1921) on *Neodiprion lecontei* (Fitch), Bird (1927) on *Hoplocampa halcyon* (Nort.), Forsslund on *Lygaeonematus subarcticus* Forssl., Zocchi (1948) on *Micronematus abbreviatus* Htg., Rivard (1955) on *Cephalcia marginata* Middlekauff, Tokunaga et al on *Arge nigrinodosa* Motschulsky, and Ciampolini (1957) on *Taxonus agrorum* Faden.

A morphological study of the larch sawfly is undertaken, based on the following works: the comparative morphology of sawfly larvae, Yuasa (1922) and Lorenz and Kraus (1957); the terminology of the larval parts, Middleton (1921) and Yuasa (1922); the head of larval Hymenoptera, Short (1952); the anatomy of the head of tenthredinid larvae, Parker (1934); and the larval head of *Pachynematus*, DuPorte (1946).

2. THE HEAD

The larval head of *P. erichsonii* (Htg.) is hypognathous, like that of the adult; but unlike the adult, it is not of the open-head type. The occipital foramen is separated from the oral cavity or maxacava by the tentorial bar (Fig. 35, TBR). This condition resembles the maxapontal-head type of adult sawflies (Ross, 1937). The head is subglobose and somewhat circular in outline. It is reticulate and covered with setae, which are most numerous and longest on the ventral part of the head. The head has a large frontoparietal region (Fig. 34, FP) on the cephalic aspect. The ventral area of this region is partially divided by the vertical frontogenal sulci (Fig. 34, FGS) into three lobes. The median lobe is the frons (Fig. 34, F). It is lightly sclerotized ventrally, generally with 15 to 19 setae, in addition to a pair of elongate depressions for muscle attachment. The two lateral lobes, which possess the longest setae on the frontoparietal region, are the genae (Fig. 34, GE). The dorsal area of the frontoparietal region, or vertex (Fig. 34, VE), is divided by cleavage lines in the form of an inverted Y. The stem of the Y is the long sinuated coronal suture (Fig. 34, CS), which originates from the occipital foramen (Fig. 35, OCF) and runs along the mid-line of the vertex. The arms of the Y are the sinuated frontal suture (Fig. 34, FS). It extends obliquely laterad for a short distance and then ventrad towards the anterior mandibular articulation. The frontal suture marks the dorsal boundary of the frons. Lateral sulci (Fig. 35, LS), or vertical sulci, are present on the dorsal part of the vertex. These are situated on either side of the coronal suture, extending from the occipital foramen to the dorsal surface of the head. Internally, these sulci are marked by the lateral ridges (Fig. 37, LR). Paired dorsal and ventral depressions are evident for muscle attachments along the cleavage lines of the cranium. The paired, dorsal depressions are located on the dorsal end of the frontal suture on either side of the ventral end of the coronal suture. The paired, ventral depressions are near the bend of the frontal suture. Below the ventral pair of cranial depressions are situated the anterior tentorial pits (Fig. 34, ATP) on the frontogenal sulci. The frontogenal sulcus (Fig. 34, FGS) widens ventrally to the anterior mandibular articulation. This sulcus is marked internally by the frontogenal inflection (Fig. 37 FGI), which is associated dorsally with the anterior tentoral arm (Fig. 37, AT), and ventrally with the anterior mandibular articulation (Fig. 37, AMA). Along the ventral edge of the gena, between the mandibular articulations (Fig. 37, AMA and PMA) is the subgenal inflection (Fig. 37, SGI). This is united with the frontogenal inflection at the anterior mandibular articulation. The subgenal inflection is visible externally as a darkly pigmented area. The small clear subglobal eye (Fig. 34, E) or ocellara is situated on the lower side of the head dorsad of the antenna (Fig. 34, ANT). It is set in a darkly pigmented circular ring, the ocularium (Fig. 34, OU).

The frons is separated from the clypeus (Fig. 34, CL) by a wide shallow groove, the frontoclypeal sulcus (Fig. 34, FCS). This is heavily sclerotized, in sharp contrast to the lightly sclerotized ventral area of the frons and the clypeus. The frontoclypeal sulcus forms the internal frontoclypeal inflection (Fig. 37, FCI). DuPorte (1946) has indicated that in larva of Pachynematus, "there is a shallow open groove in the typical position of the frontoclypeal inflection which is apparently an obsolescent sulcus." The lightly sclerotized clypeus is wider than long, with the oblique sides converging toward the truncate distal margin. The four setae present on the clypeus are groupedin pairs on each side along the dorsal margin. Yuasa (1922) indicated the clypeus of the larva of P. erichsonii (Htg.) as possessing a postclypeus and a preclypeus. The postclypeus is here designated as the frontoclypeal sulcus, and the preclypeus as the clypeus. The labrum (Fig. 34, LA) is ventrad of the clypeus and separated from the latter by the clypeolabral suture. It is about twice as broad as long with rounded lateral sides and a median emargination on the distal margin. Four long setae are present on the labrum, two on each side of the small circular pits on the meson. The labrum (Fig. 36) is divided by a median and two lateral oblique depressions. These converge distally at the median emargination, defining a medium and two lateral areas. Parker (1934) defines the medium part as the prelabrum and the lateral parts as the true labrum. On the dorsolateral angle of the labrum is a pair of narrow sclerites, the tormae (Fig. 40, TOR) which are concealed by the clypeus. The inner surface (epipharynx, Fig. 40) is rugose, marked by long setae along the lateral, distal, and mesal areas. A narrow V-shaped sclerotized band is present on the meson, diverging from the distal margin.

The head is concave in cephalic view with the tentorial bar (Fig. 35, TBR) separating the occipital foramen from the oral cavity. The occipital foramen is surrounded dorsally and laterally by the postoccipital sulcus (Fig. 35, POS), which discloses a narrow crescent-shaped postocciput (Figs. 35, 37, PO). The postoccipital sulcus is indicated internally by the postoccipital ridge (Fig. 37, POR). The posterior tentorial pits (Fig. 35, PTP) are situated at the lower ends of the postoccipital sulcus and the lateral ends of the tentorial bar. Laterad of the postoccipital sulcus is a thickening and sclerotization of the cranial wall, marking the position of the occipital sulcus (Fig. 35, OCS). This structure separates the gena (Fig. 35, GE) from the postgena (Fig. 35, PG). Although it lacks the internal ridge that is characteristic of a sulcus, it is called occipital sulcus by Short (1952) because it can be homologized to a strengthening bar in the position of the occipital sulcus of orthopteroid insects. The hypostomal ridge (Fig. 37, HSR) marks externally a thickened and sclerotized area, the hypostoma (Fig. 35, HST), caudad of the mandibles.

2.1 The Tentorium

The tentorium is not as well developed as in the adult. The most conspicuous part is the tentorial bar (Fig. 35, TBR) extending across the back of the head. It is separated from the hypostoma (Fig. 35, HST) by a lightly sclerotized area. The posterior tentorial pits (Fig. 35, PTP) occur at the lower ends of the postoccipital sulcus. They mark the position of the posterior tentorial arms (Fig. 35, PT), which are invaginated mesally. A lightly sclerotized narrow area is present on the meson between the posterior tentorial arms. The anterior tentorial arms (Fig. 35, 37, AT) extend caudally from the anterior tentorial pits (Fig. 34, ATP) to the mesoventral area of the tentorial bar. Another lightly sclerotized area is present between the tentorial bar and the anterior tentorial arms. The dorsal tentorial arms (Fig. 35, 37, DT) arise from the anterior tentorial arms and extend cephalically and dorsally toward the cranial wall. Situated on the ventral margin of the tentorial bar is the paracoila (Fig. 35, PAC), which articulates with the maxilla.

2.2 The Appendages of the Head

The antennae are situated dorsad of the mandibles and ventrad of the eyes. Each is set in the oval antacoria (Fig. 38, ATA), and surrounded by the antennal suture (Fig. 38, AS) or antennaria. It consists of four segments and is subconical in shape. The first segment is minute with a small light coloured sensorium; the second and third segments are ring-like with two light coloured sensoria; and the fourth segment is mammillate.

The mandibles (Fig. 43) are stout, dicondylic sclerotized structures, each possessing a single lateral seta. The left and right mandibles are assymetrical in shape and size of the dentes.

The maxillae, labium, and hypopharynx are united to form a complex structure.

The maxillae occupy a lateral position in this complex and are covered with numerous sensoria and a few conspicuous setae. The proximal part of the maxilla is the cardo. This is divided into a subcardo (Fig. 42, SUC), which articulates with the paracoila (Fig. 35, PAC), and a slightly smaller triangular alacardo (Fig. 42, AL). On the lateral margin of the cardo is a triangular lobe called the cardinal lobe (Fig. 42, CDL) by Parker (1934). Distad of the alacardo is the stipes (Fig. 42, ST). On the caudal surface of the stipes are very narrow mesal and lateral sclerotized bands and a small sclerotized proximal area. The sclerotic bar thus formed may be called the stipital sclerite (Fig. 42, STS) by Short (1952). The stipital sclerite, according to Short (1952), is homologous with the sulcus and ridge of the stipes of orthopteroid insects. The stipes is separated laterally from the subgalea (Fig. 42, SG) by the lateral sclerotized band, which produces an internal ridge. A single conspicuous seta is present on the subgalea. At the distal end of the stipes is the palpifer (Figs. 39, 42, PFR) of Yuasa (1922) and Middleton (1921) with two conspicuous setae. The palpifer has a pointed lobe-like process (Fig. 42) on its mesal margin. Parker (1934) is of the opinion that the palpifer is the first segment of the maxillary palpus, which has been thrown out of position and deformed on one side by the constant pressure of the mandibles. Acceptance of this theory would mean that the maxillary palpus has five segments. Distad of the palpifer are four strongly sclerotized segments, which are generally considered as the maxillary palpus (Figs. 39, 42, MXP). The maxillary palpus is conical in shape. The lateral and mesal surfaces of the first and second segments (Figs. 41, 42, MXP) vary greatly in length. The second segment has one seta. Mesad of the maxillary palpus and distad of the subgalea is the strongly sclerotized, conically-shaped galea (Figs. 39, 42, GL) curving slightly mesodorsally. The lacinia (Figs. 39, 42, LC) is situated mesad of the galea and is compressed against the side of the hypopharynx (Fig. 42, HP). It is a flattened, sclerotized structure, with a row of about twelve long setae on its distal margin. This row of spine-like setae is referred to as the lacinial roster by Parker (1934).

The labium (Fig. 42, LU), which is situated between the maxillae, possesses a few scattered setae and several sensoria. It consists of the prementum, the postmentum, palpigers and the labial palpi. The prementum (Fig. 42, PRM) is a moveable heart-shaped structure, and is more heavily sclerotized than the postmentum (Fig. 42, PM). It bears the palpigers (Fig. 42, PGR), the 2-segmented labial palpi (Fig. 42, LP), and four conspicuous setae. The labial palpus is conical, with each segment strongly sclerotized. As in other sawfly larvae the glossae and paraglossae, or ligula, are fused with the hypopharynx (Fig. 42, HP) to form a median terminal lobe. At the apex of this lobe is the orifice of the silk press or sericos (Fig. 42, SLO). The postmentum is broadly adnate to the ventral wall of the head. The distal part of the postmentum is more sclerotized than the proximal part.

3. THE THORAX

The thorax, as well as the abdomen, is divided into primary segments; these segments are usually subdivided into annulets, lobes, areas, and folds. The subdivisions may be glabrous or setiferous. When setiferous they may be associated with one or more external openings of cutaneous glands, which are indicated by sessile sclerotized rings called glandubae. The location of the setae and shape of the glandubae are useful taxonomic characters.

The thorax is connected to the head by a cervical membrane or cervacoria. It is supported on each side by an oblique sclerotized cervical sclerite (Fig. 41, CSC). This sclerite has a cephalic articulation with the postocciput (Fig. 37, PO) and broadens caudally in front of the prehypopleurite (Fig. 41, PRH). The prehypopleurite has been referred to as the episternum-epimeron by Yuasa and eupleuron by Crampton.

The tergum of the thorax is designated as that part of the larva that lies dorsad of the spiracular and postspiracular areas. The prothoracic, mesothoracic, and metathoracic terga are distinct. The tergum of each primary segment is divided into four annulets (Fig. 41, ANN), designated as A, B, C, and D, but because of constriction and folding of annulet A, the prothoracic tergum appears to have only three annulets. The annulets of the mesothoracic and metathoracic terga show identical characteristics, viz., annulet A (Fig. 41, A) largest in size and bearing setae on the dorsal area; annulet B (Fig. 41, B) second largest and bearing setae and usually a glanduba on the dorsolateral area; annulet C (Fig. 41, C) equal to D in size, and bearing setae and glandubae on the dorsal and lateral areas; annulet D (Fig. 41, D) glabrous, bearing neither seta nor glanduba.

The thoracic pleuron is convex. The pleuron of each segment consists of four lobes and two areas. The lobes are the preepipleurite, the postepipleurite, the posthypopleurite, and the prehypopleurite. The preepipleurite (Fig. 41, PRE) is the large dorsocephalic lobe characterized by the presence of generally 8 to 14 setae and 2 or 3 glandubae; the postepipleurite (Fig. 41, PSE), which lies immediately caudad of the preepipleurite, is glabrous, bearing neither setae nor glandubae; the posthypopleurite (Fig. 41, PSH) is a setal-bearing lobe above the thoracic leg, usually with 3 to 5 setae in a small sclerotized area; the prehypopleurite (Fig. 41, PRH) is a sclerotized triangular lobe cephalad of the coxa (Fig. 41, CX), and bears generally 8 to 14 setae. The two areas of each thoracic segment are the spiracular area and the postspiracular area. The former area (Fig. 41, SAR) is identified by the position of the spiracle on the prothorax and the metathorax. The metathoracic spiracle (Fig. 41, SP_2) is smaller than that of the prothorax (Fig. 41, SP_1). The postspiracular area (Fig. 41, PSA) armed with setae and glandubae is ventrad of annulet C, and caudad of the spiracular area.

The sternum of each flattened thoracic segment (Fig. 45) is apparently divided into four folds. Five small sclerotized tubercles are present on the venter. These are located as follows: A median tubercle with 2 or 3 setae in front of the thoracic legs; a lateral glabrous pair between the thoracic legs; and a mesal pair with 3 or 4 setae between the median and lateral tubercles.

3.1 The Appendages of the Thorax

The thoracic legs are setiferous and more widely spaced from each other on the metathorax than on the meso- and prothorax. The 5-segmented leg is supported by the prehypopleurite (Fig. 41, PRH) and the posthypopleurite

(Fig. 41, PSH). The large subconical proximal segment is the coxa (Fig. 44, CX). An oblique suture (Fig. 44, SUT) extends from the strongly sclerotized angle next to the prehypopleurite to the laterodistal end of the coxa. A dark sclerotized ring-like thickening is also evident at the distal end of this segment. The mesal surface of the trochanter (Fig. 44, TR) is longer than the lateral surface. A dark sclerotized ring-like thickening is also evident at the proximal end of the trochanter. The cylindrical femur (Fig. 44, FM) has a dark ring-like thickening present on the distal end, and a femoral process (Fig. 44, FPS) at the distomesal end. The subcylindrical tibia (Fig. 44, TI) is tapered distally. It is subequal in length to the femur. The distal segment of the leg is the curved sclerotized tarsal claw (Fig. 44, TC), with a small subtooth on the ventral surface.

4. THE ABDOMEN

The abdomen tapers slightly caudally, and consists of ten segments. These show the same general characteristics as noted for the thoracic segments, with the tergum being annulated, the pleuron divided into lobes and areas, and the sternum divided into folds. Segments 2 to 7 are similar. Each has a convex dorsum with six annulets designated as A, B, C^1, C^2, C^3, and D dorsad of the spiracular line; a convex pleuron with three lobes and two areas ventrad of the spiracular line; a flattened venter divided into four folds, with a pair of fleshy, somewhat subconical prolegs (Fig. 47, PRL) or larvapods, and eversible ventral gland (Fig. 47, EGL). Each proleg generally bears one seta and one glanduba on the lateral surface. One or more setae and sessile glandubae (Fig. 47, SET, and GD) are present on the following annulets of these segments: annulet B (Fig. 47, B), setae on the dorsum; annulet C^1 (Fig. 47, C^1) generally with a single glanduba and three setae on the pleuron; and annulet C^2 (Fig. 47, C^2), setae and glandubae on the dorsum and pleuron. The pleuron of each segment has a narrow vertical spiracle (Fig. 47, SP) situated on the spiracular area (Fig. 47, SAR) at the lower extremity of annulet B. Caudad of the spiracular area, and ventrad of annulet C, is the setiferous postspiracular area (Fig. 47, PSA), which generally possesses a glanduba. Below the spiracular area is a dorsocephalic lobe, the preepipleurite (Fig. 47, PRE) with generally 6 to 7 setae. The lobe caudad and ventrad of the preepipleurite is the postepipleurite (Fig. 47, PSE) with generally 2 to 3 glandubae and 6 to 9 setae. The hypopleurite (Fig. 47, HYP) is the lobe ventrad of the postepipleurite and dorsad of the proleg. The second sternal fold of segments 2 to 7 generally has two setae (Fig. 46). The third sternal fold of these segments supports the prolegs. On the inner sides of the prolegs are frequently 9 to 12 setae and two glandubae. Eversible ventral glands are evident on the mesoventrum of segments 1 to 7 between the third and fourth sternal folds. These glands are situated behind the prolegs (Fig. 46, OEG), and when fully extended are roughly heart-shaped (Fig. 47, EGL).

Segment 1 resembles segments 2 to 7 in the distinct subdivisions of annulet C, and the presence of an eversible gland. It differs, however, from segments 2 to 7 in the absence of the prolegs. Segments 8 and 9 differ from the segments 2 to 7 by the absence of prolegs; the absence of an eversible gland; the presence of one or two setae on the dorsum of annulet A (Fig. 48, A); also, the subdivision of annulet C (Fig. 48, C) is not distinct. The absence of prolegs on the venter of segments 1, 8, and 9 are indicated by a slight transverse swelling, which generally possesses 9 to 12 setae and two glandubae on the third sternal fold of these segments. Segment 8 differs from segments 9 and 10 by the presence of a spiracle. The spiracle on segment 8 is the largest on the abdomen. A pair of prolegs (Fig. 48, PRL) or postpedes and the anus (Fig. 48, ANS) are evident on the ultimate or tenth segment. The dorsum of this segment is not divided into annulets, but possesses scattered setae and glandubae. This undivided dorsal area, called the epiproct (Fig. 48, EPI) or anal plate, has a short proximal subdorsal depression (Fig. 48, PSD). Two anal lobes are present at the caudal end of the larva. The setiferous lobe above the anus is the suranal lobe (Fig. 48, SRL), and the convex setiferous one below the anus is the subanal lobe (Fig. 48, SBL). Most of the setae on the subanal lobe are slightly stouter and longer than the ones on the suranal lobe. A narrow longitudinal lobe, which is somewhat triangular in shape is present in front of the anus, and caudad of the postepipleurite. Setae and glandubae are present on an elongate lobe dorsad and cephalad of the postpedes. This lobe appears to be the combined preepipleurite and postepipleurite of the typical abdominal segments. The sternum of the tenth segment is rather convex with no distinct folds. Setae and glandubae, however, are present on the tenth sternum around the cepahlic and lateral aspect of the proleg.

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PLATE VII

LARVA OF LARCH SAWFLY
Pristiphora erichsonii (Htg.)

Fig. 34.--Cephalic aspect of head

Fig. 35.--Caudoventral aspect of head

Fig. 36.--Cephalic aspect of labrum

Fig. 37.--Entolateral aspect of head

Fig. 38.--Lateral aspect of antenna

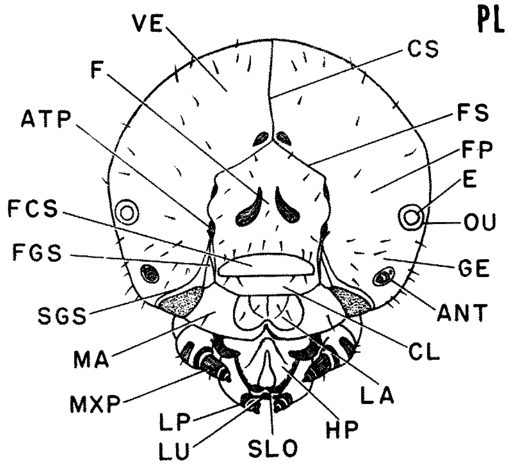
Fig. 39.--Cephalic aspect of right maxilla

Fig. 40.--Caudal aspect of labrum

ABBREVIATIONS

AMA	anterior mandibular articulation
ANT	antenna
AS	antennal suture
AT	anterior tentorial arm
ATA	antacoria
ATP	anterior tentorial pit
CL	clypeus
CS	coronal suture
CSC	cervical sclerite
DT	dorsal tentorial arm
E	eye
F	frons
FCI	frontoclypeal inflection
FCS	frontoclypeal sulcus
FGI	frontogenal inflection
FGS	frontogenal sulcus
FP	frontoparietal region
FS	frontal suture
GE	gena
GL	galea
HP	hypopharynx
HSR	hypostomal ridge
HST	hypostoma
LA	labrum
LC	lacinia
LP	labial palpus
LR	lateral ridge
LS	lateral sulcus
LU	labium
MA	mandible
MXP	maxillary palpus
OCF	occipital foramen
OCS	occipital sulcus
OU	ocularium
PAC	paracoila
PFR	palpifer
PG	postgena
PMA	posterior mandibular articulation
PO	postocciput
POR	postoccipital ridge
POS	postoccipital sulcus
PT	posterior tentorial arm
PTP	posterior tentorial pit
SGI	subgenal inflection
SGS	subgenal sulcus
SLO	orifice of silk press
TBR	tentorial bar
TOR	torma
VE	vertex

PLATE VII



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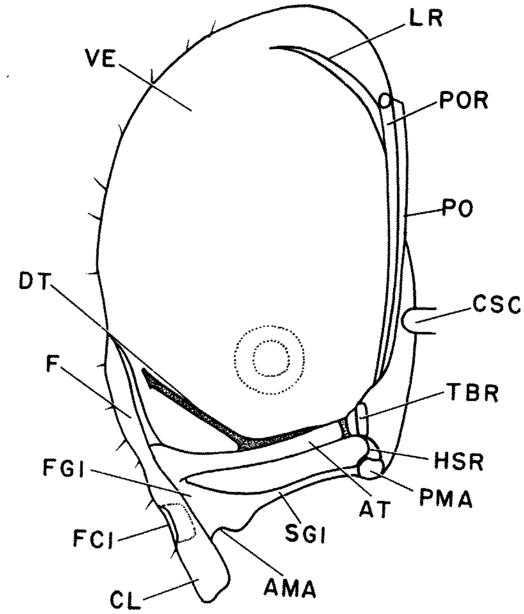

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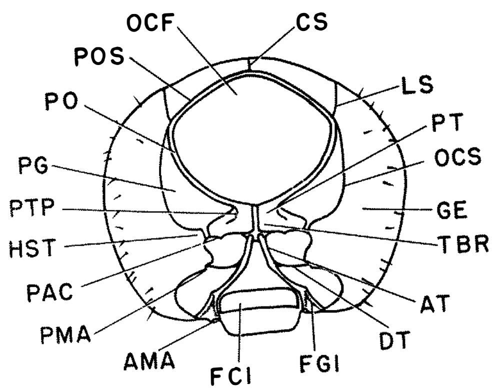

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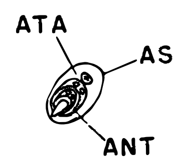

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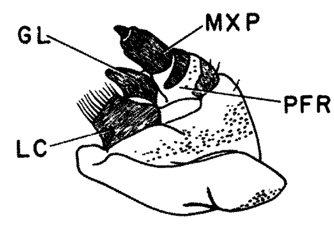

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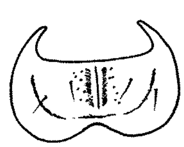

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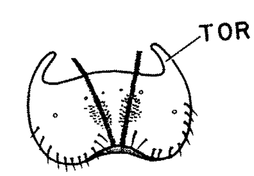


40

0·5 mm.

PLATE VIII

LARVA OF LARCH SAWFLY
<u>Pristiphora</u> <u>erichsonii</u> (Htg.)

Fig. 41.--Lateral aspect of head and thorax

Fig. 42.--Caudal aspect of mouth parts

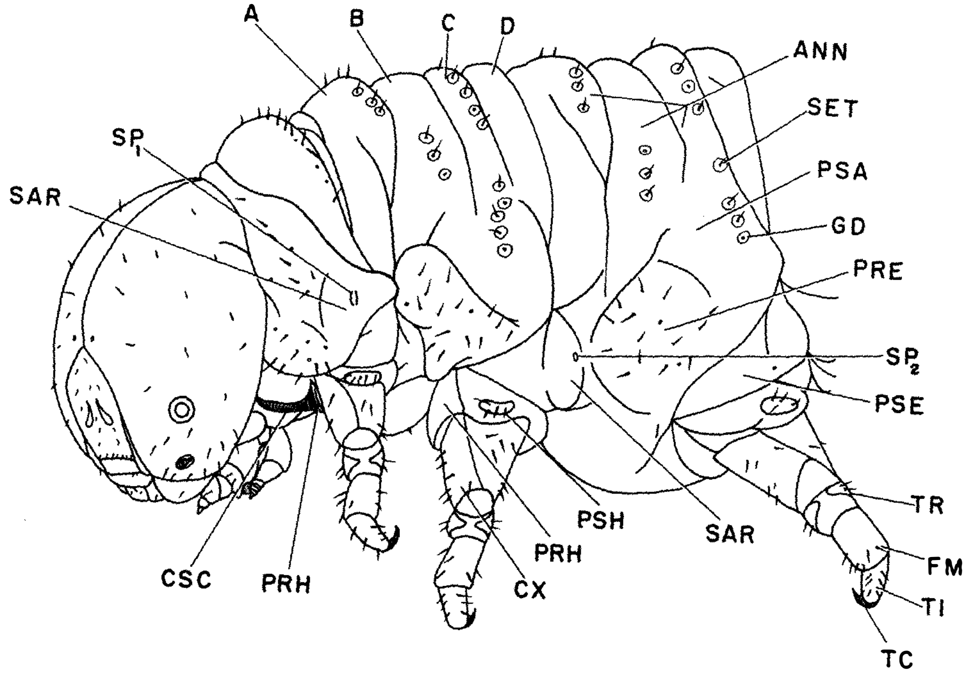
Fig. 43.--Cephalic aspect of left and right mandibles

Fig. 44.--Cephalic aspect of left metathoracic leg

ABBREVIATIONS

AL	alacardo	PRE	preepipleurite
ANN	annulets	PRH	prehypopleurite
CDL	cardinal lobe	PRM	prementum
CSC	cervical sclerite	PSA	postspiracular area
CX	coxa	PSE	postepipleurite
FM	femur	PSH	posthypopleurite
FPS	femoral process	SAR	spiracular area
GD	glanduba	SET	seta
GL	galea	SG	subgalea
HP	hypopharynx	SLO	orifice of silk press
LC	lacinia	SP	thoracic spiracle
LP	labial palpus	ST	stipes
LU	labium	STS	stipital sclerite
MUP	muscle apodeme	SUC	subcardo
MXP	maxillary palpus	SUT	suture
PFR	palpifer	TC	tarsal claw
PGR	palpiger	TI	tibia
PM	postmentum	TR	trochanter

PLATE VIII



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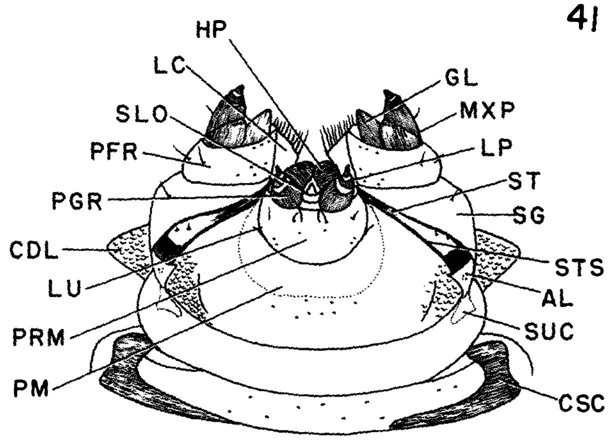

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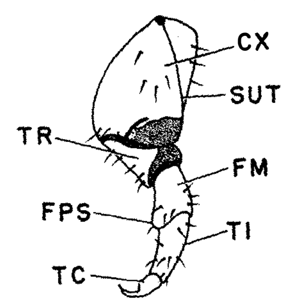

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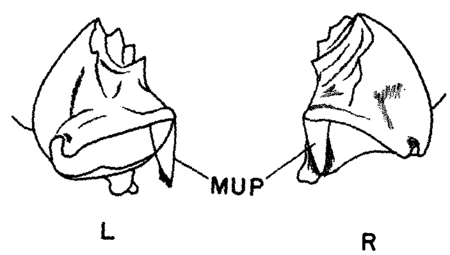

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PLATE IX

LARVA OF LARCH SAWFLY
Pristiphora erichsonii (Htg.)

Fig. 45.--Ventral aspect of mesothoracic segment

Fig. 46.--Ventral aspect of third abdominal segment

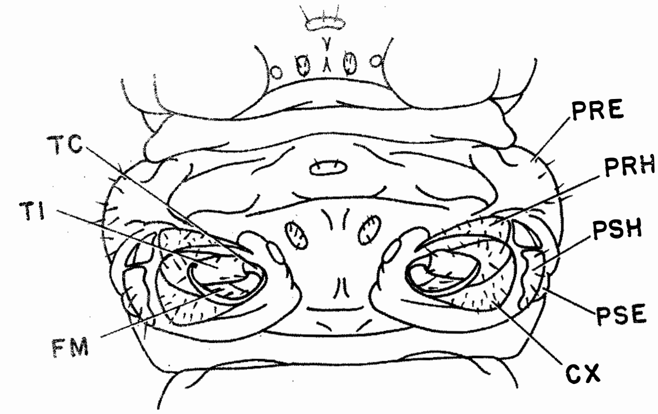
Fig. 47.--Lateral aspect of third abdominal segment

Fig. 48.--Lateral aspect of terminal abdominal segment

ABBREVIATIONS

ANS	anus
CX	coxa
EGL	eversible gland
EPI	epiproct
FM	femur
GD	glanduba
HYP	hypopleurite
OEG	orifice of eversible gland
PRE	preepipleurite
PRH	prehypopleurite
PRL	proleg
PSA	postspiracular area
PSD	proximal subdorsal depression
PSE	postepipleurite
PSH	posthypopleurite
SAR	spiracular area
SBL	subanal lobe
SET	seta
Sp	abdominal spiracle
SRL	suranal lobe
TC	tarsal claw
TI	tibia

PLATE IX



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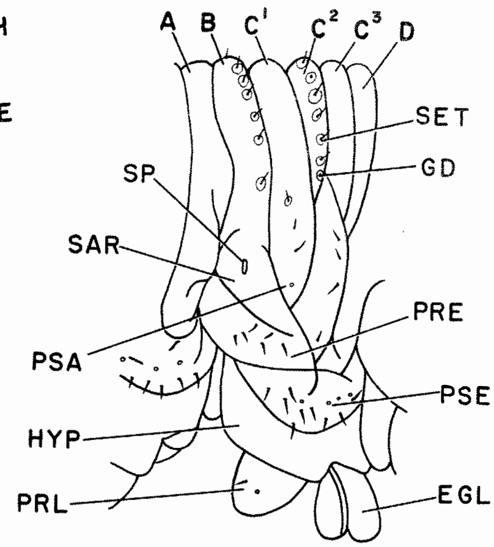

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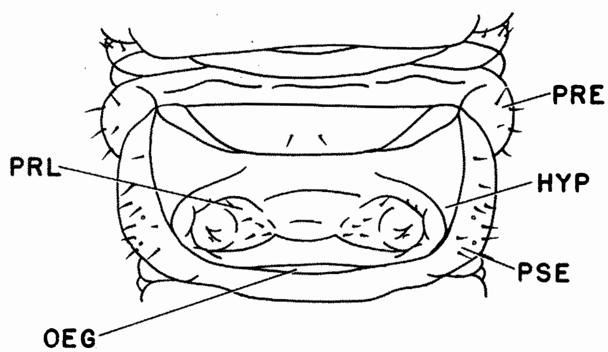

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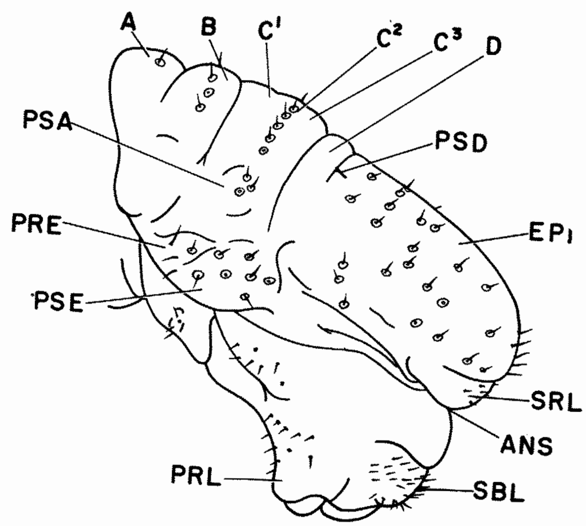

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