

Hymenoptera Classification and Required Families

- I. Suborder Symphyta
 - 1. Family Cimbicidae -
 - 2. Family Diprionidae - conifer sawflies
 - 3. Family Tenthredinidae - common sawflies
 - 4. Family Cephidae - stem sawflies
 - 5. Family Siricidae - horntails
- II. Suborder Apocrita
 - A. Superfamily Evanioidea
 - 1. Family Evaniidae - ensign wasps
 - B. Superfamily Ichneumonoidea
 - 1. Family Braconidae -
 - 2. Family Ichneumonidae -
 - C. Superfamily Chalcidoidea
 - 1. Family Chalcidae -
 - D. Superfamily Cynipoidea
 - 1. Family Cynipidae - gall wasps
 - E. Superfamily Proctotrupeoidea
 - 1. Family Pelecinidae -
 - F. Superfamily Chrysidoidea
 - 1. Family Chrysididae - cuckoo wasps
 - G. Superfamily Sphecoidea
 - 1. Family Sphecidae -
 - H. Superfamily Apoidea
 - 1. Family Colletidae - plasterer and yellow-faced bees
 - 2. Family Halictidae - sweat bees
 - 3. Family Andrenidae - andrenid bees
 - 4. Family Megachilidae - leafcutting bees
 - 5. Family Apidae - honey bees, bumble bees, & orchid bees
 - a. Subfamily Xylocopinae
 - b. Subfamily Apinae
 - I. Superfamily Tiphioidea
 - 1. Family Tiphidae -
 - 2. Family Mutillidae - velvet ants
 - J. Superfamily Pompiloidea
 - 1. Family Pompilidae - spider wasps
 - K. Superfamily Scoliidea
 - 1. Family Scolidae
 - L. Superfamily Vespoidea
 - 1. Family Vespidae - paper wasps, yellow jackets, hornets, mason wasps, potter wasps
 - M. Superfamily Formicoidea
 - 1. Family Formicidae - ants

HYMENOPTERA

Common Name: Sawflies, ants, wasps, and bees.

Etymology: Hymeno- = membrane; -ptera = wing.

Metamorphosis: Holometabolous; oviparous with parthenogenesis and polyembryony.

CHARACTERISTICS

Body: Small to very large; larvae usually legless with distinct head, rarely eruciform with legs and prolegs; pupae exarate, usually with a cocoon.

Head: Prominent, free, hypognathous.

Mouthparts: Variable; chewing to lapping or sucking.

Eyes: Compound eyes usually well-developed; commonly 3 dorsal ocelli, but lacking in some.

Antennae: Commonly long and filiform or geniculate with elbowed scape and distal segments clubbed.

Wings: Most with 2 pairs of membranous wings; hindwings smaller than forewings; forewing of many with a stigma; many wingless.

Legs: Tarsi usually 5-segmented; post tarsi with claws and pad.

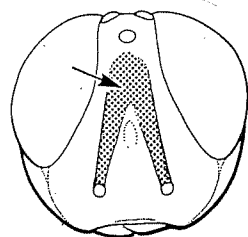
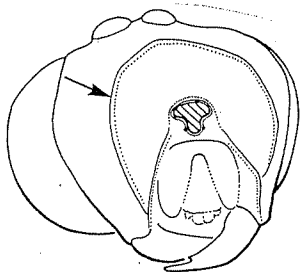
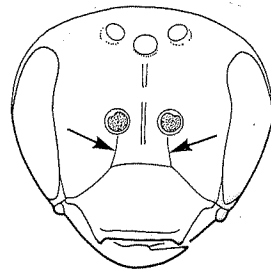
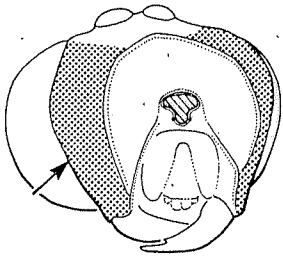
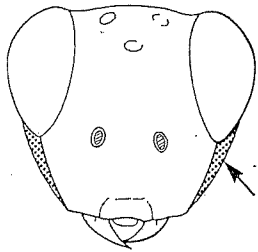
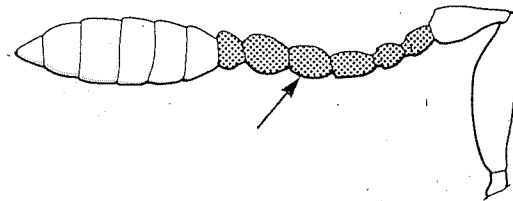
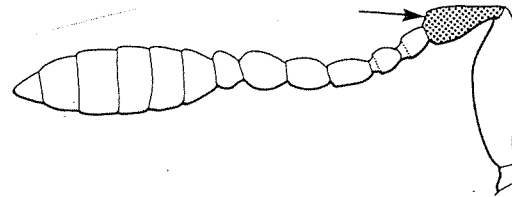
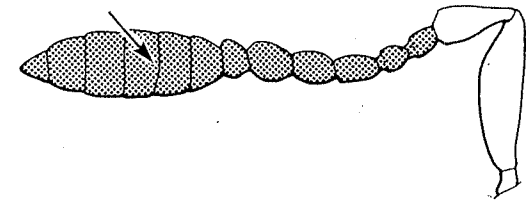
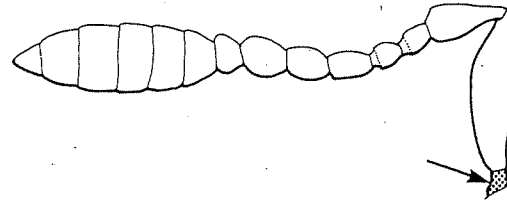
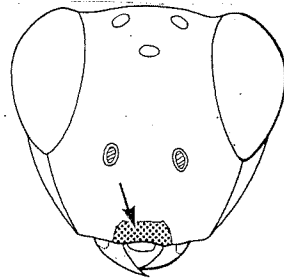
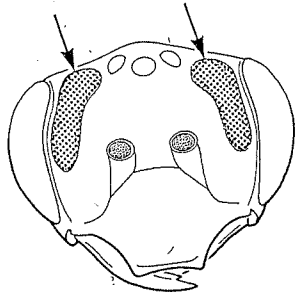
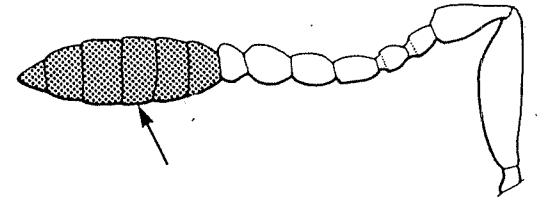
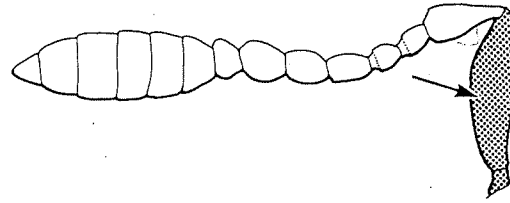
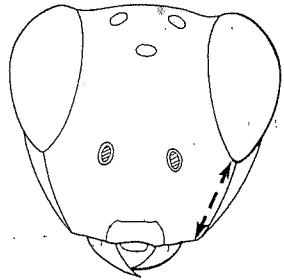
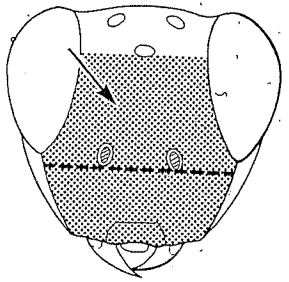
Abdomen: Cerci absent; in most, the first abdominal segment is fused to the thorax and is constricted posteriorly forming a petiole; females with ovipositor modified for piercing plant tissue, sawing, or stinging.

SUBORDERS

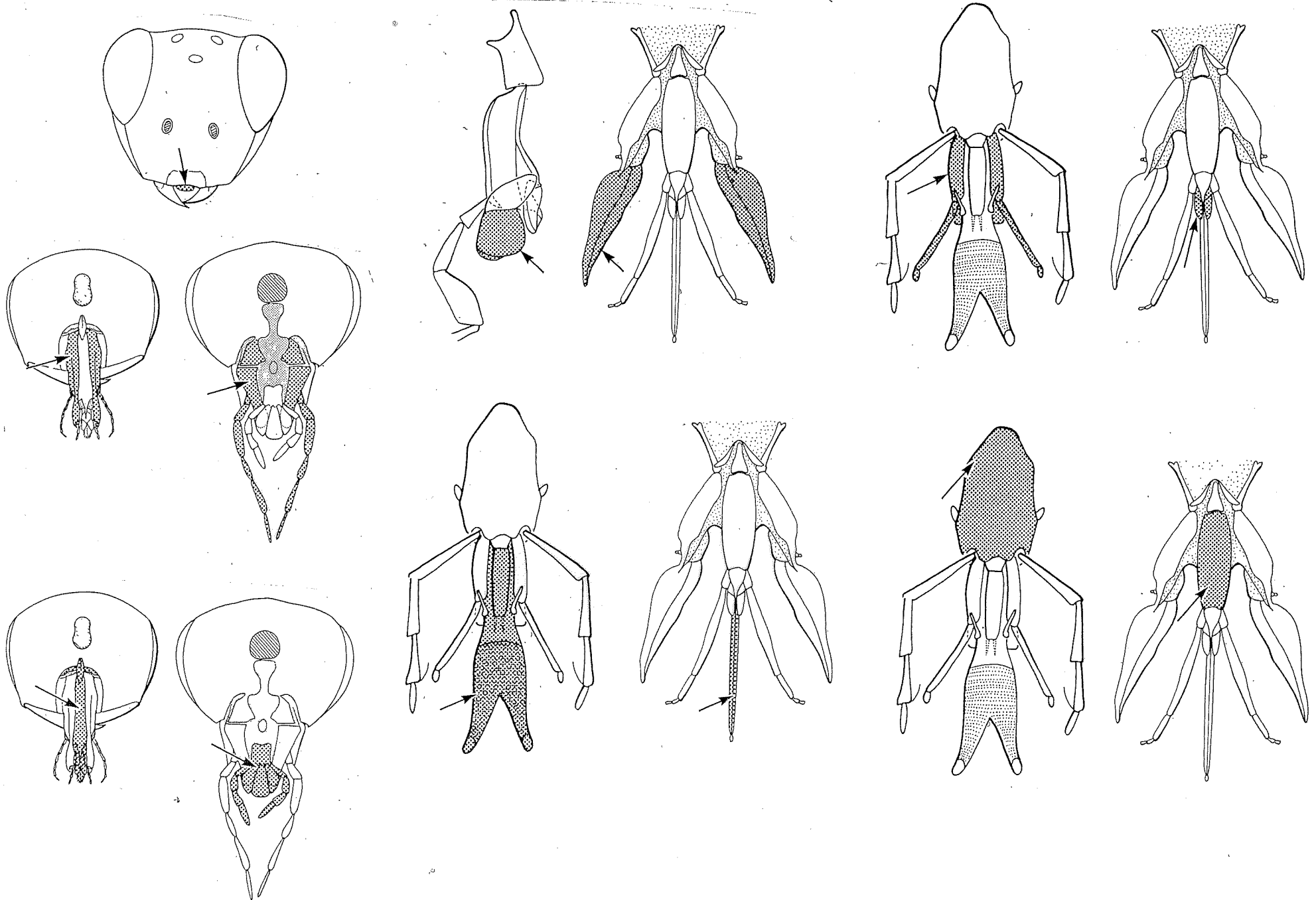
Symphyla: Phytophagous; external foliage feeders; abdomen broadly jointed to thorax; at least 3 basal cells in hindwing.

Apocrita: Parasitic, predaceous; petiolated abdomen; 2 or fewer basal cells in hindwing.

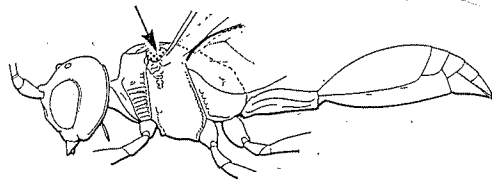
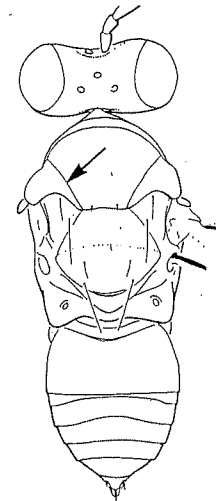
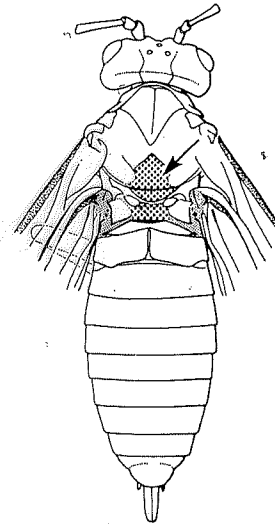
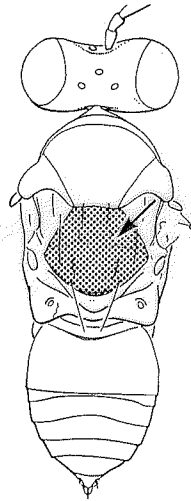
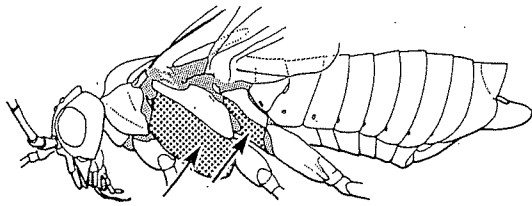
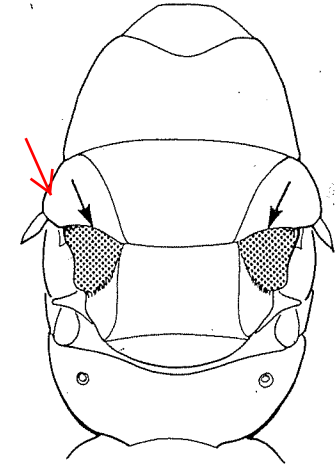
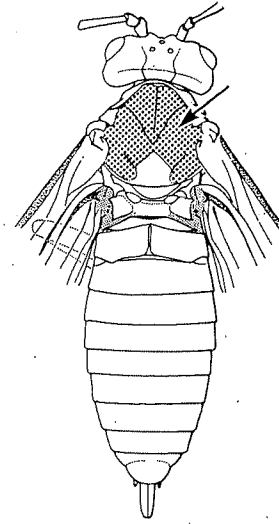
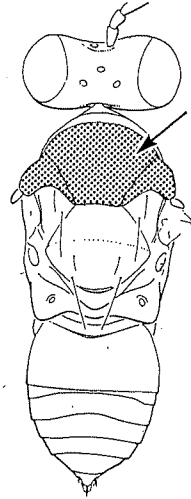
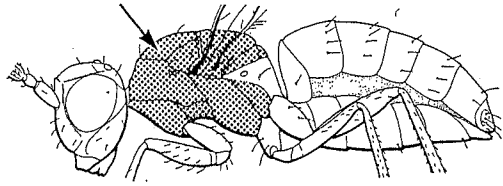
Head Characters



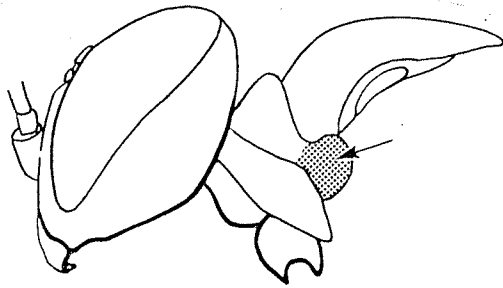
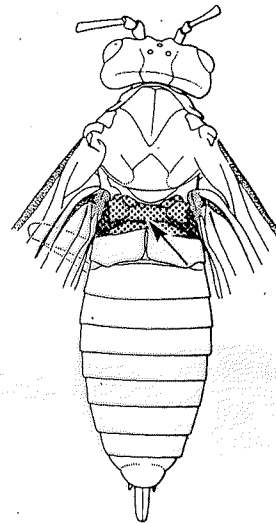
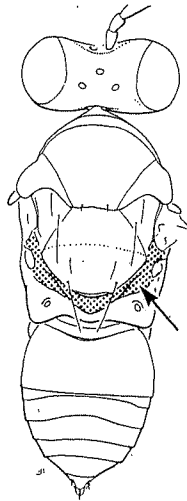
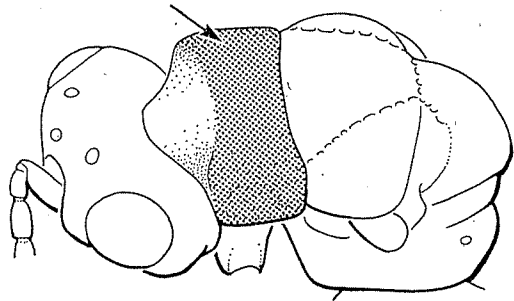
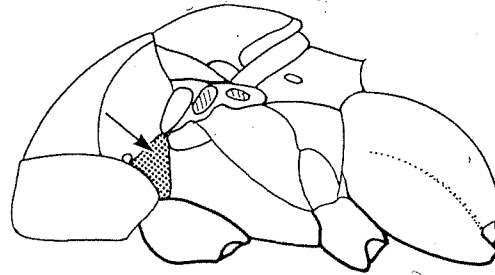
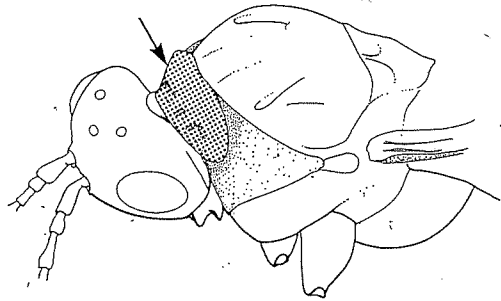
Mouthpart Characters



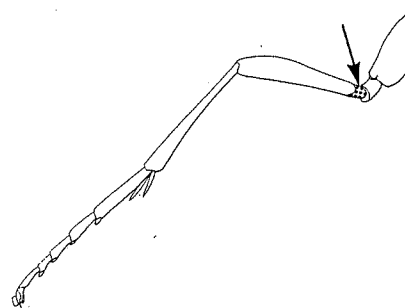
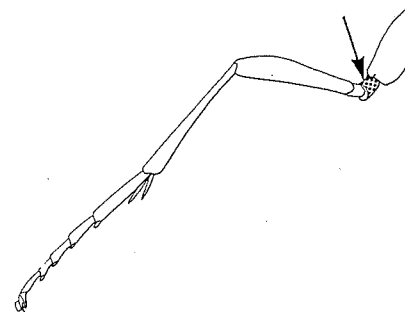
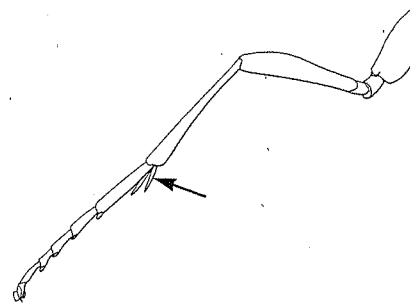
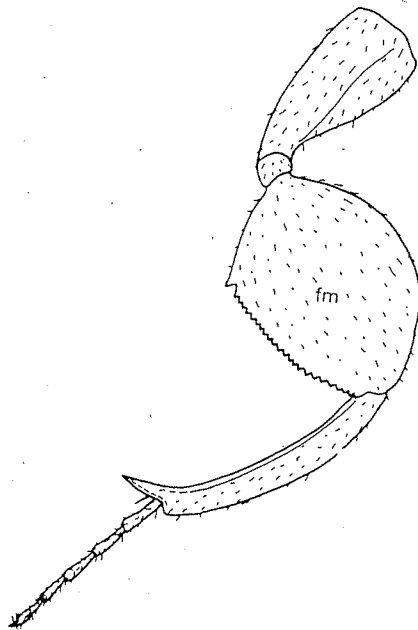
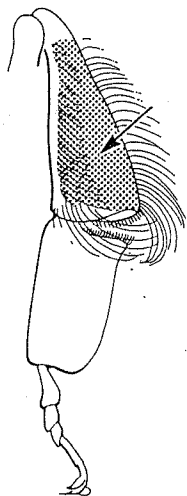
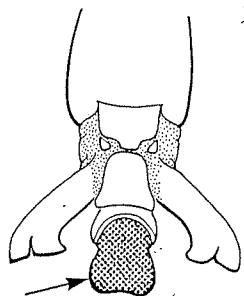
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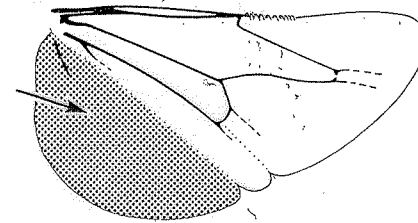
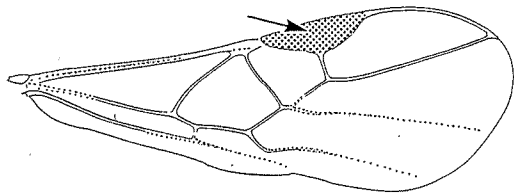
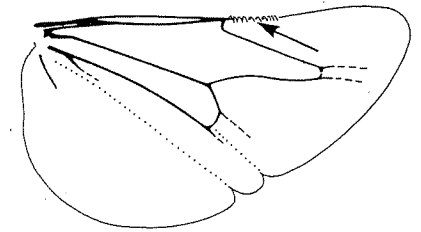
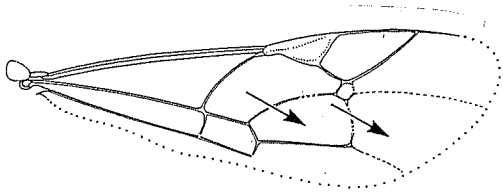
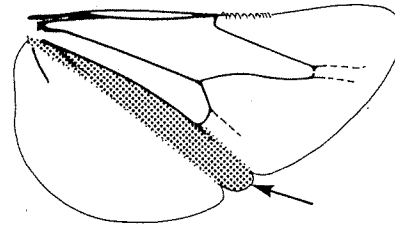
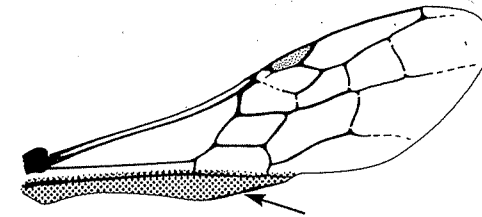
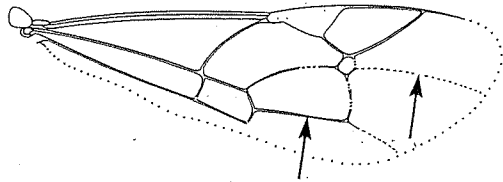
Thoracic Characters 2.



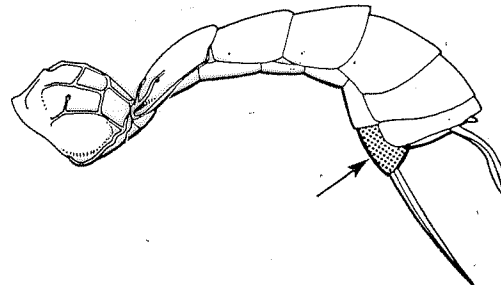
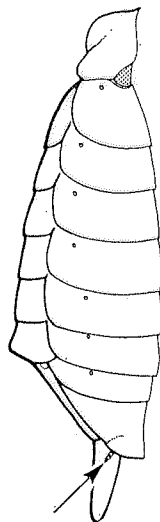
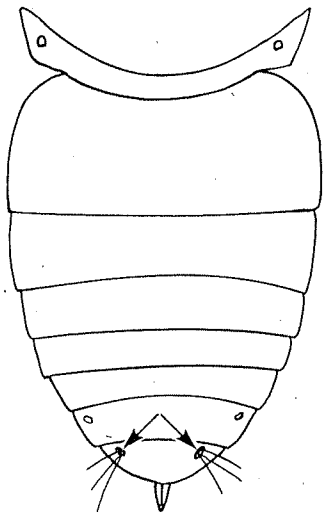
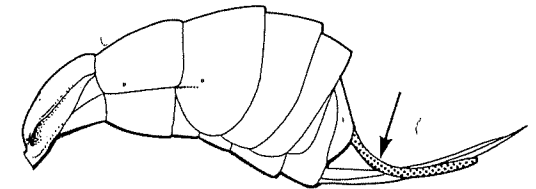
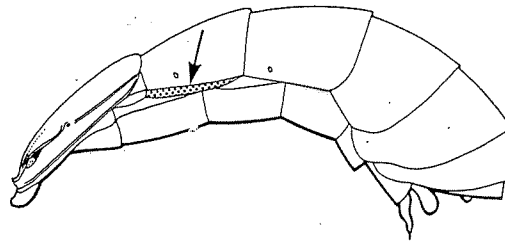
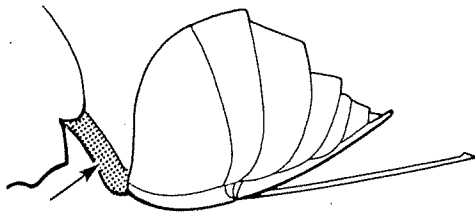
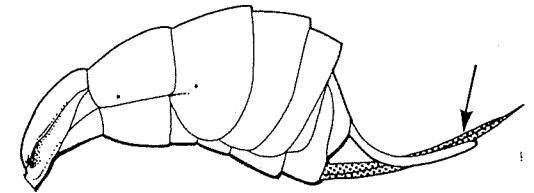
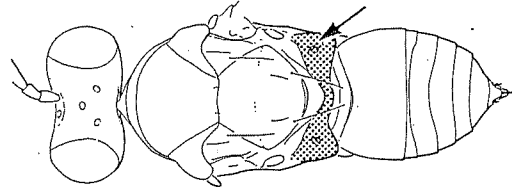
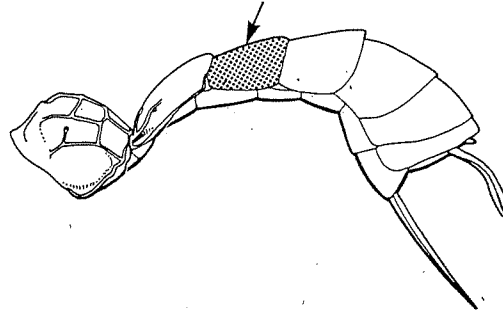
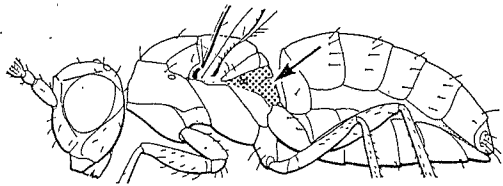
Leg Characters



Wing Characters



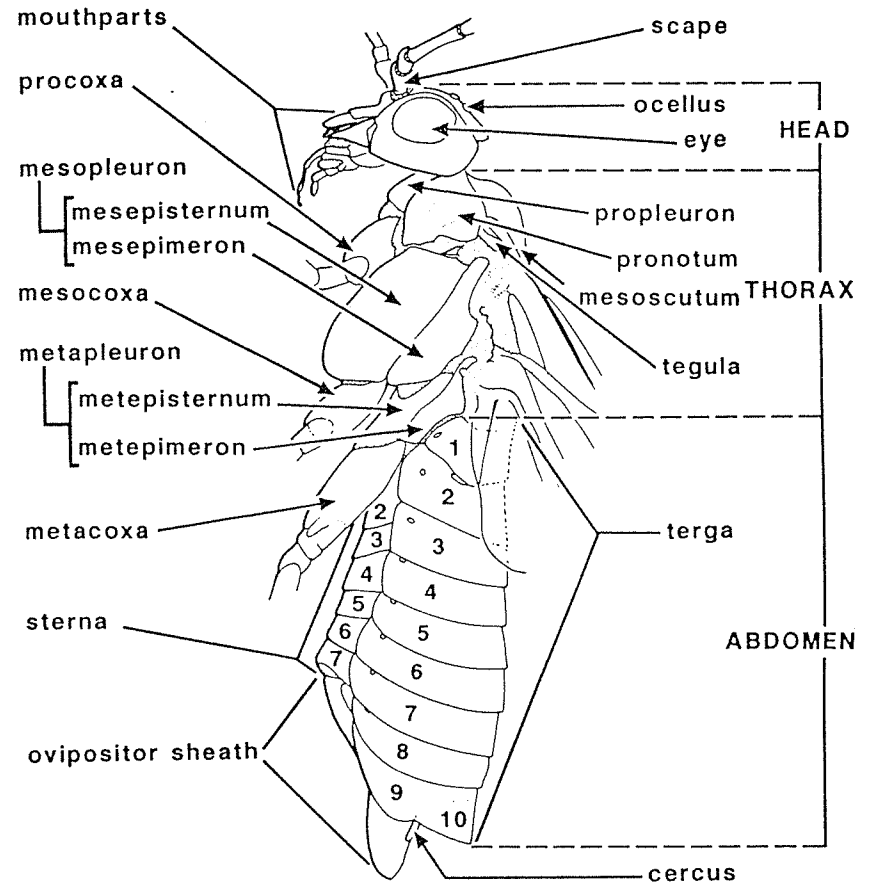
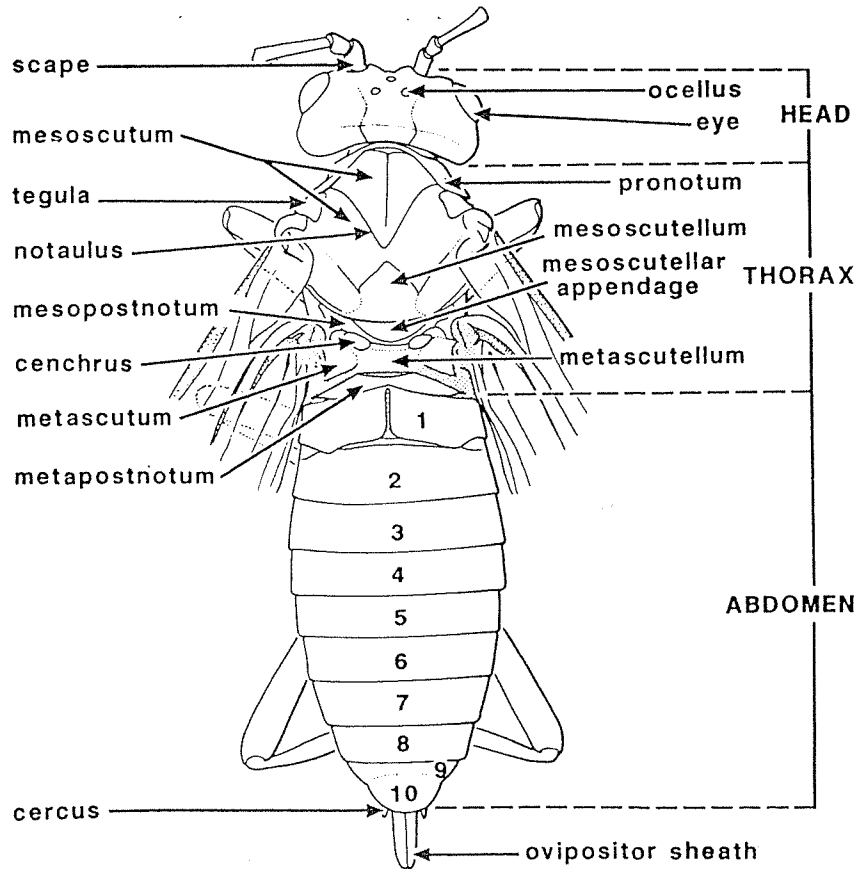
Abdominal Characters



HYMENOPTERA

External morphology

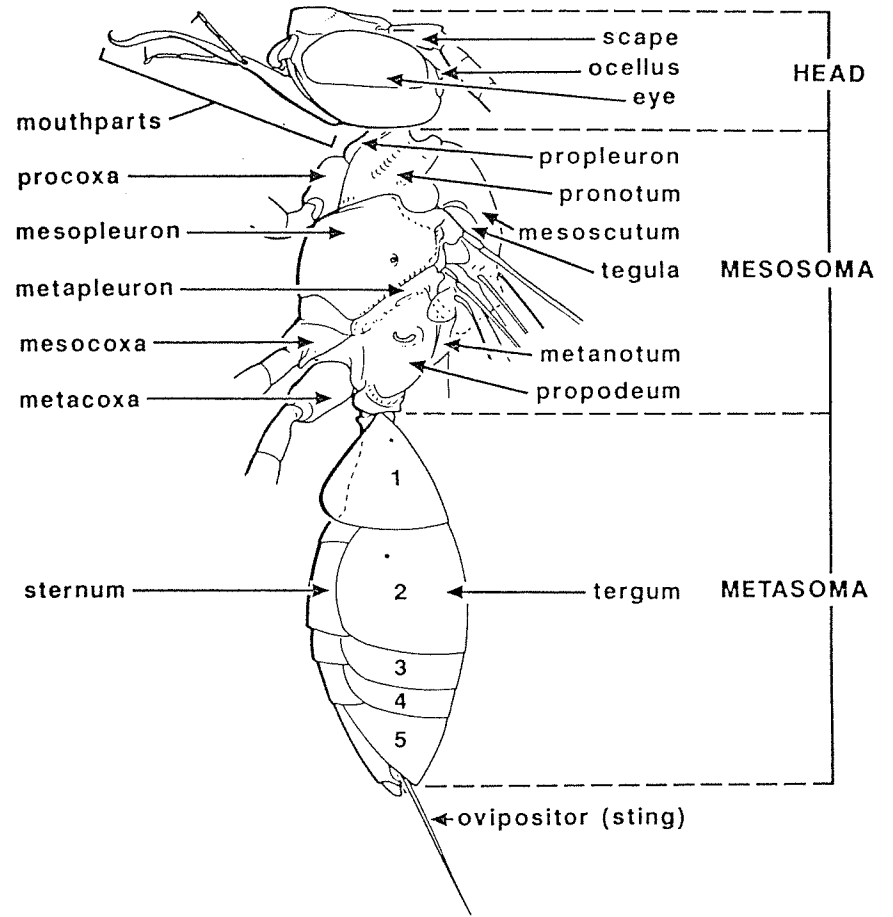
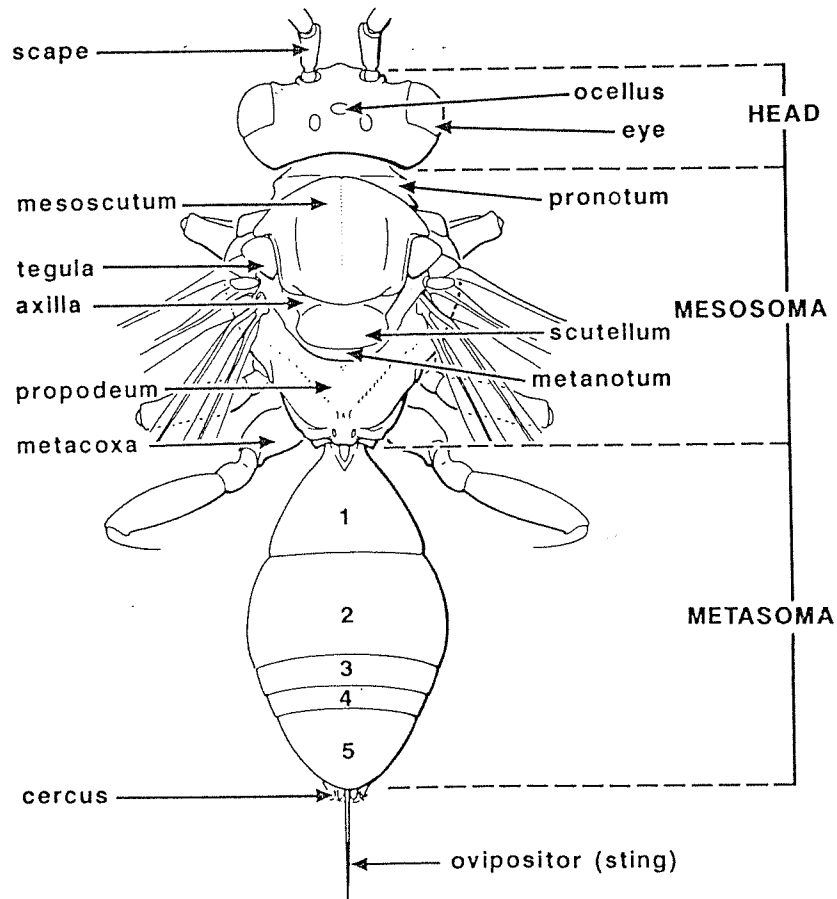
Identification characters



HYMENOPTERA

External morphology

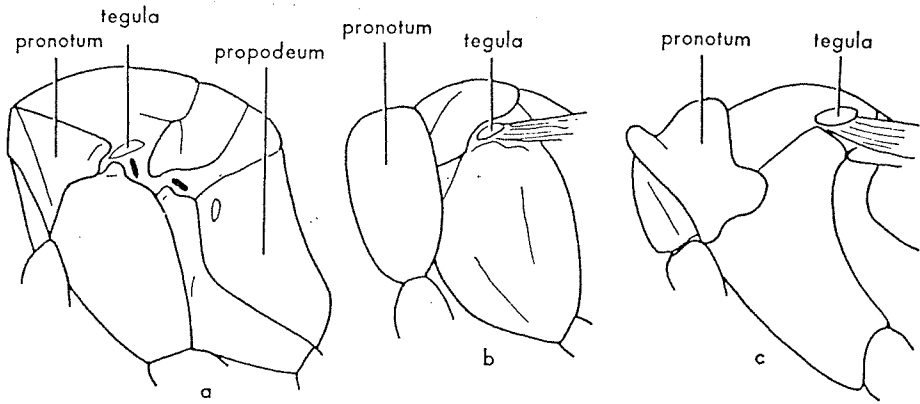
Identification characters



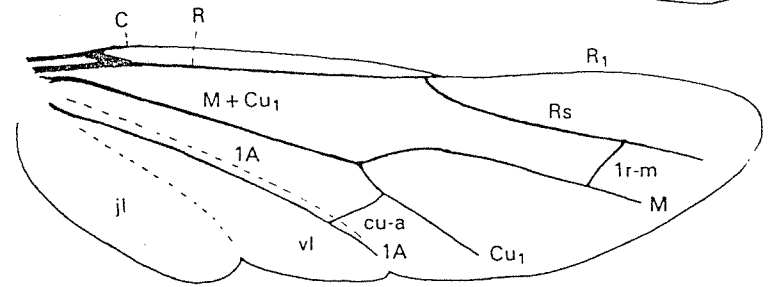
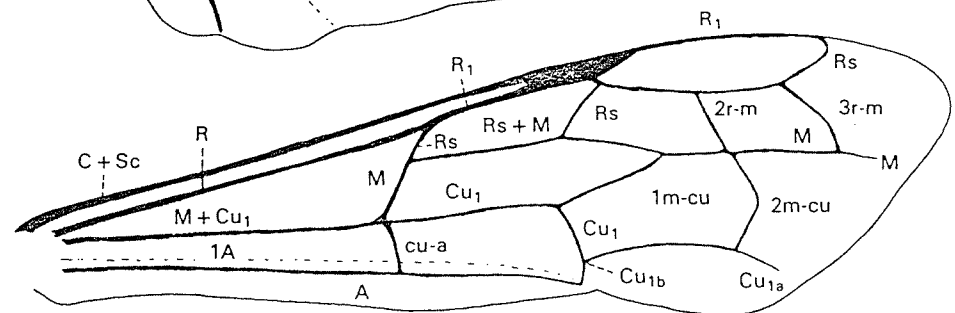
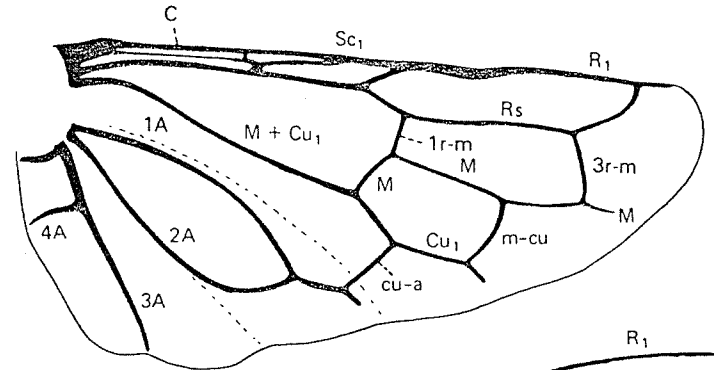
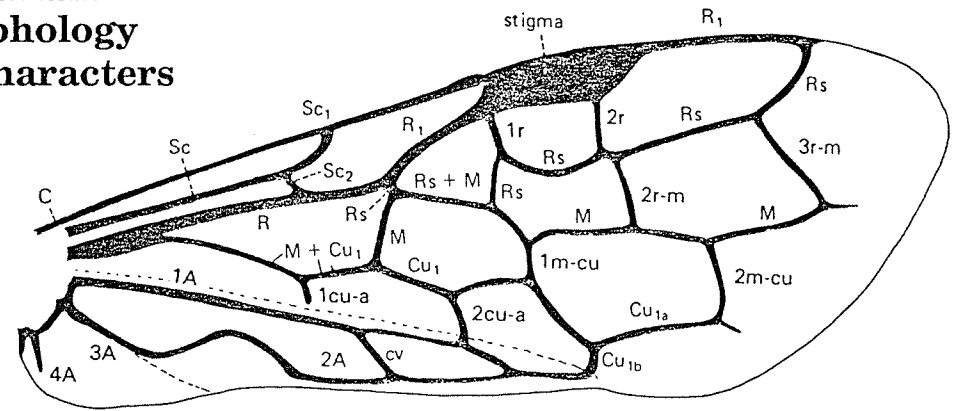
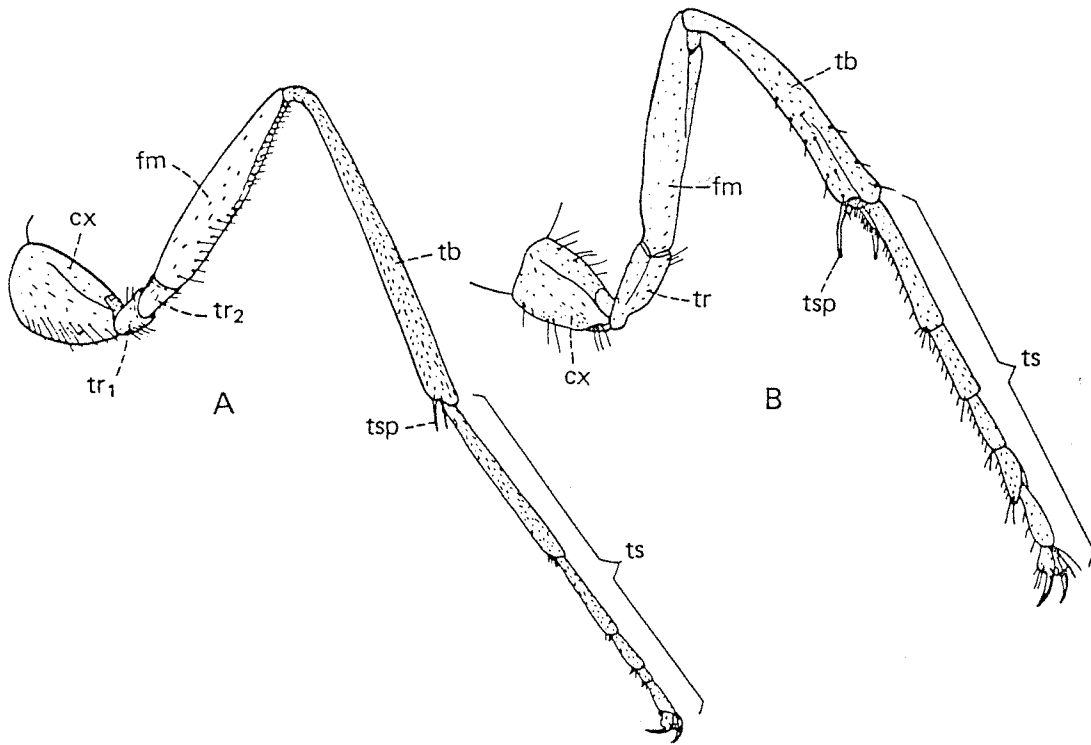
HYMENOPTERA

External morphology

Identification characters



Forms of the pronotum in Apocrita

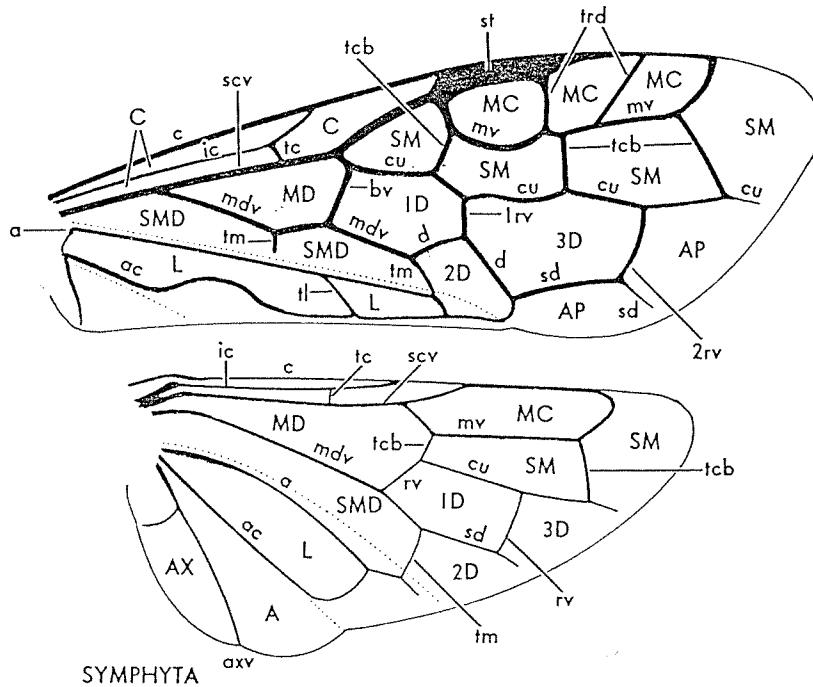


HYMENOPTERA

External morphology

Identification characters

Characters of the Superfamilies of Apocrita



Character	Ichneumonoidea	Chalcidoidea	Cynipoidea	Evanoidea	Pelecinoidea	Proctotrupoidea	Bethylloidea	Scolioidea	Vespoidea	Sphecoidea	Apoidea
Pronotum ¹	a	b	a	a	a	a	a,b	a,b	a	c	c
Ovipositor ¹	a	a ⁴	a	a	b	b	b	b	b	b	b
Sting	no ⁴	no	no	no	no	no	yes ⁴	yes ⁴	yes	yes	yes ⁴
No. of hind trochanter segments	2	2	1 ⁴	2	1	1-2	1 ⁴	1	1	1	1
Antennae ²	T	E	T	T	T	E,T	T ⁴	T ⁴	T	T	T
No. of antennal segments	16+ ⁴	5-13	13-16	13-14	14	7-15	10+	12-13	12-13	12-13	12-13
Venation ³	N ⁴	R	R	N	R	N,R	N,R	N ⁴	N	N	N

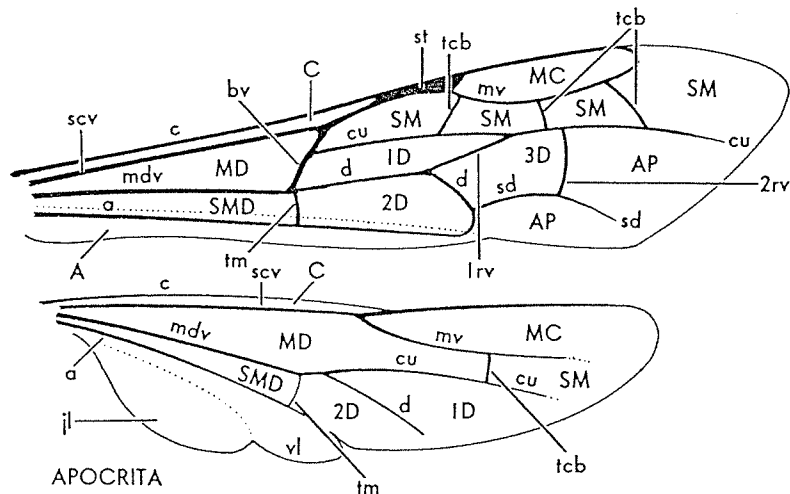
¹ Letters refer to the types illustrated above.

² E, elbowed; T, not elbowed (usually threadlike).

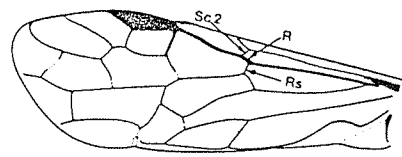
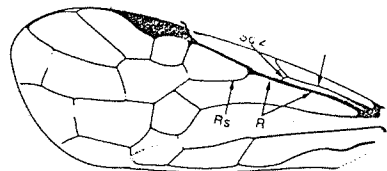
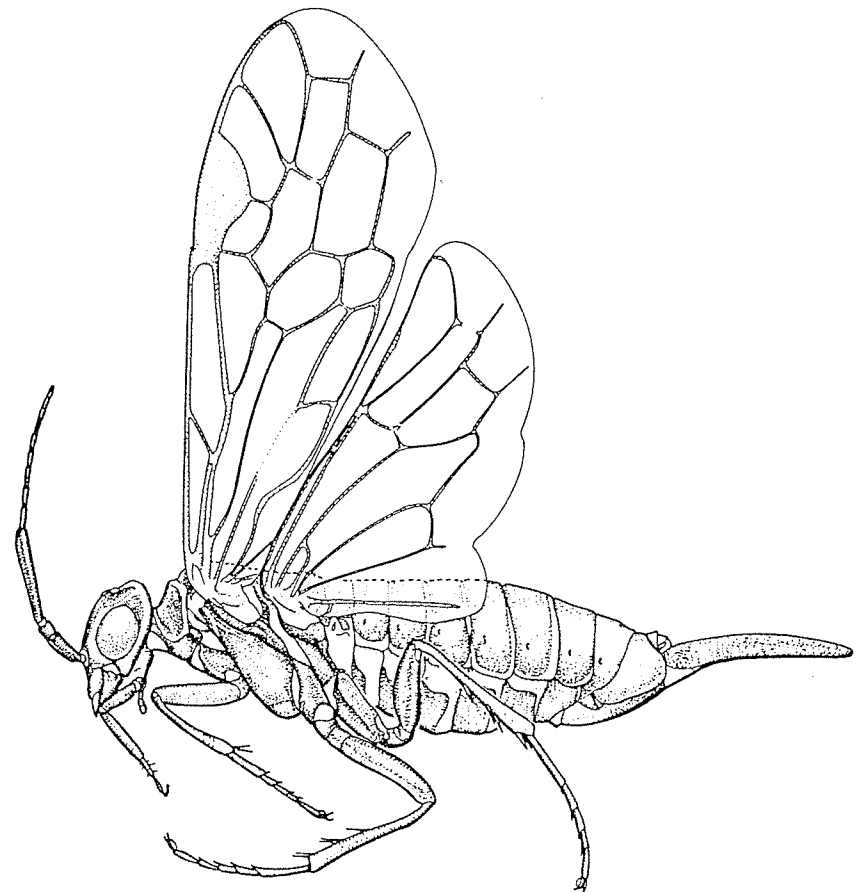
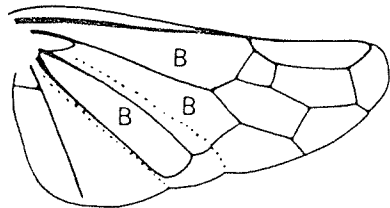
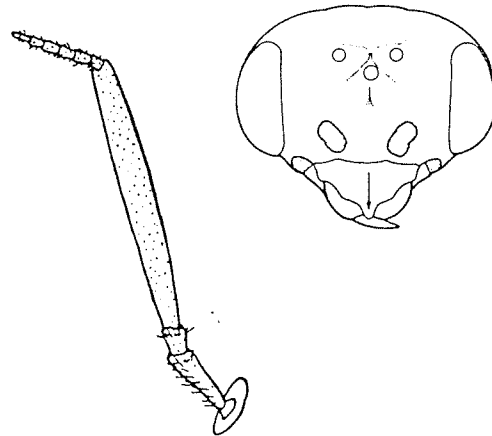
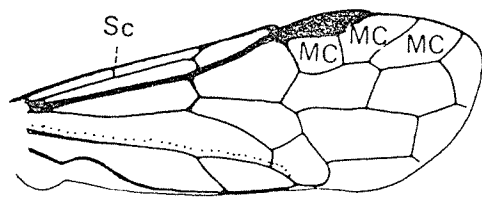
³ N, normal; R, reduced.

⁴ Exceptions occur.

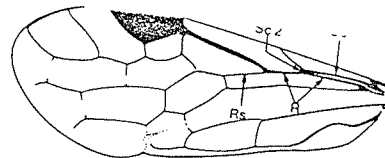
Wing venational terminology in Hymenoptera. VEINS: *a*, anal; *ac*, accessory; *axv*, axillary; *bv*, basal; *c*, costal; *cu*, cubital; *d*, discoidal; *ic*, intercostal; *mdv*, median; *mv*, marginal; *rv*, recurrent; *scv*, subcostal; *sd*, subdiscoidal; *st*, stigma; *tc*, transverse costal; *tcb*, transverse cubitals; *tl*, transverse lanceolate; *tm*, transverse median; *trd*, transverse marginal. CELLS: *A*, anal; *AP*, apical; *AX*, axillary; *C*, costal; *D*, discoidal; *L*, lanceolate; *MC*, marginal; *MD*, median; *SM*, submarginal; *SMD*, submedian. The basal cells in the hind wing of Symphyta are *MD*, *SMD*, and *L*, and those in Apocrita are *MD* and *SMD*. Lobes in the hind wing: *jl*, jugal; *vl*, vannal.



HYMENOPTERA: Symphyta
Superfamily Megalodontoidea
Family Xyelidae
Xyelid sawflies

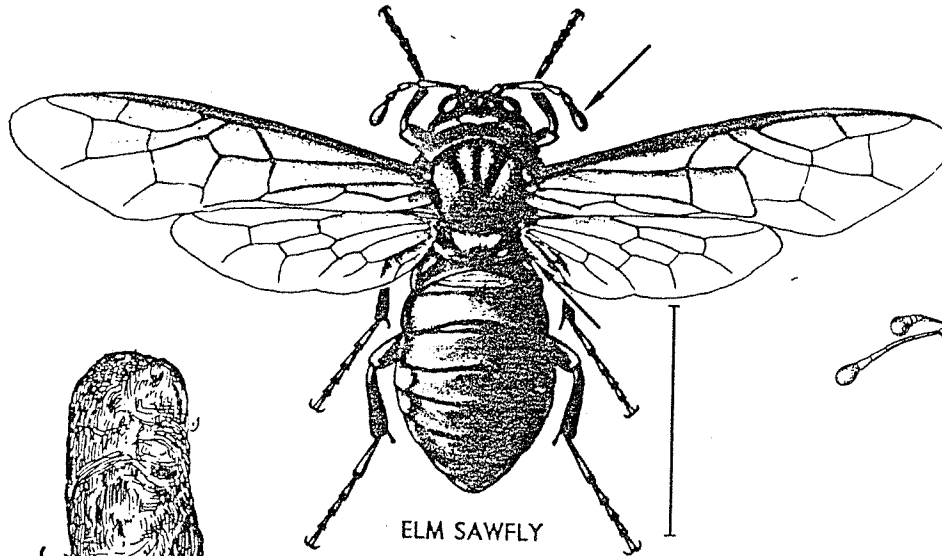
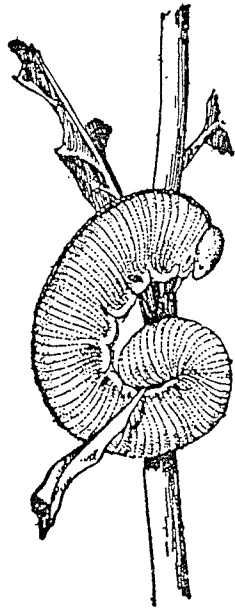


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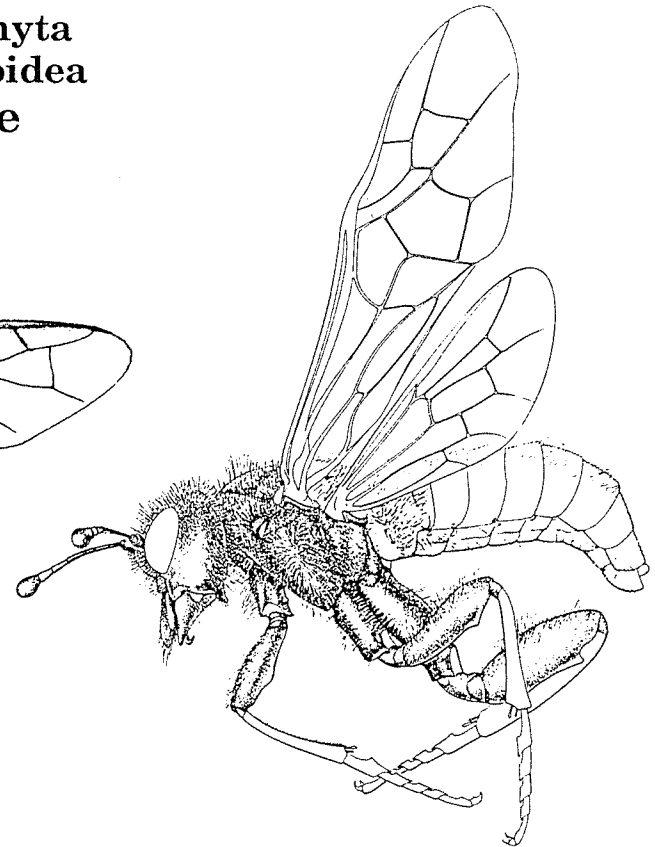


Xyelidae: Xyela

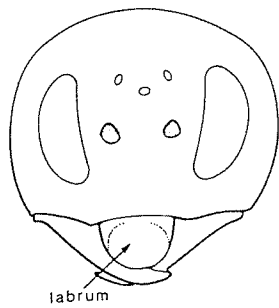
HYMENOPTERA: Symphyta
 Superfamily Tenthredinoidea
 Family Cimbicidae
 Cimbicid sawflies



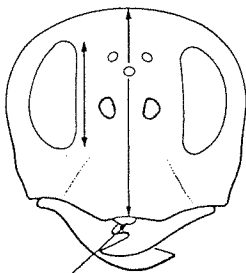
ELM SAWFLY



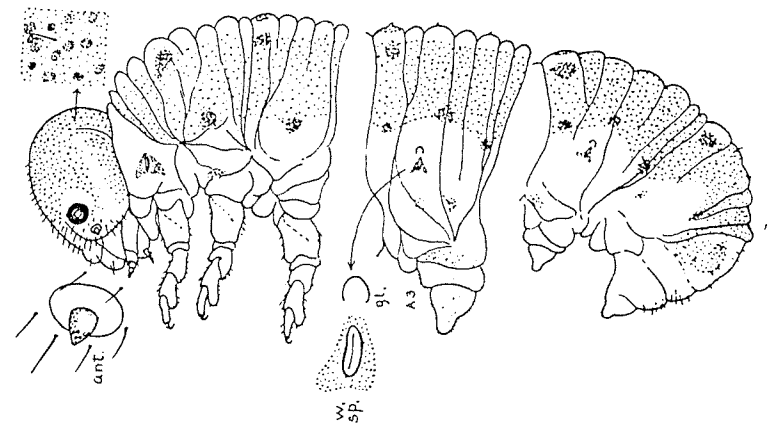
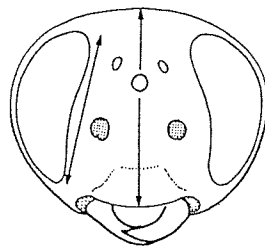
Cimbicidae: *Trichiosoma*



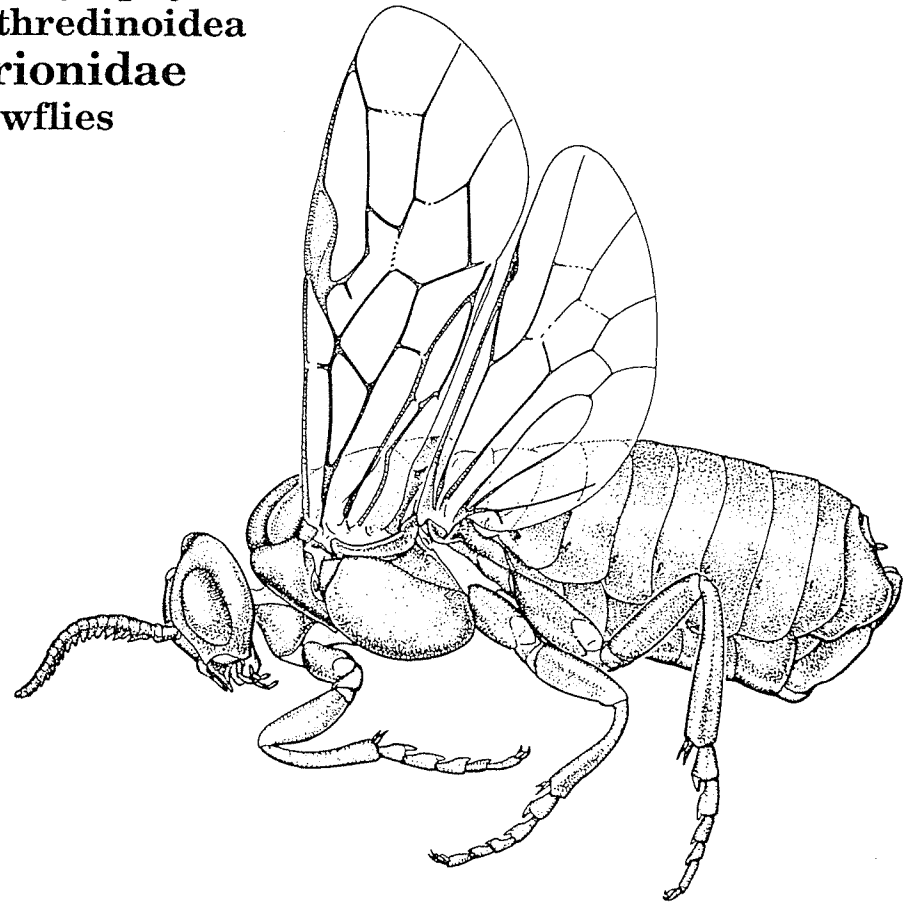
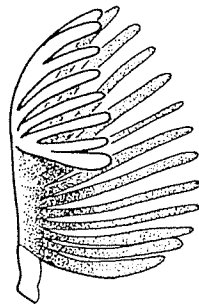
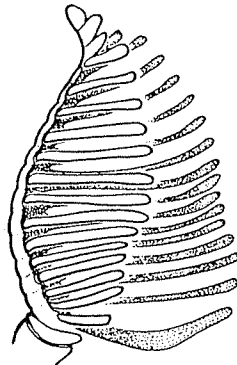
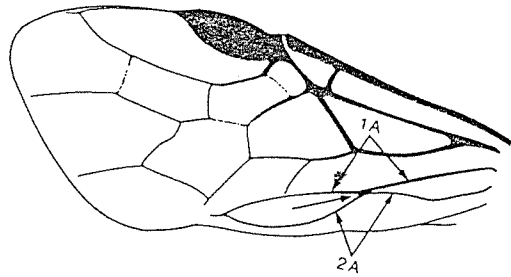
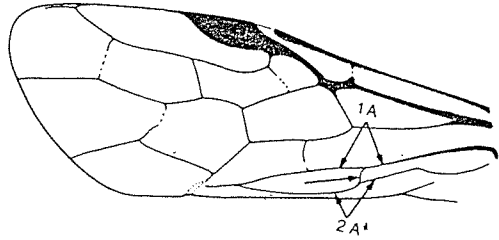
labrum



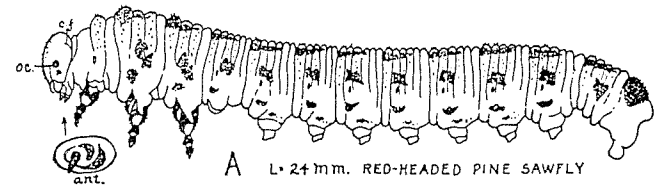
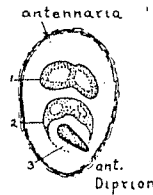
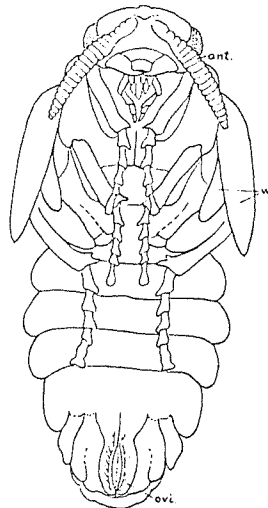
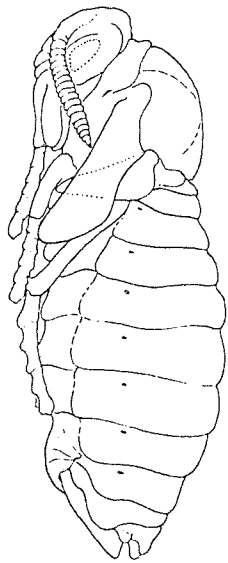
labrum



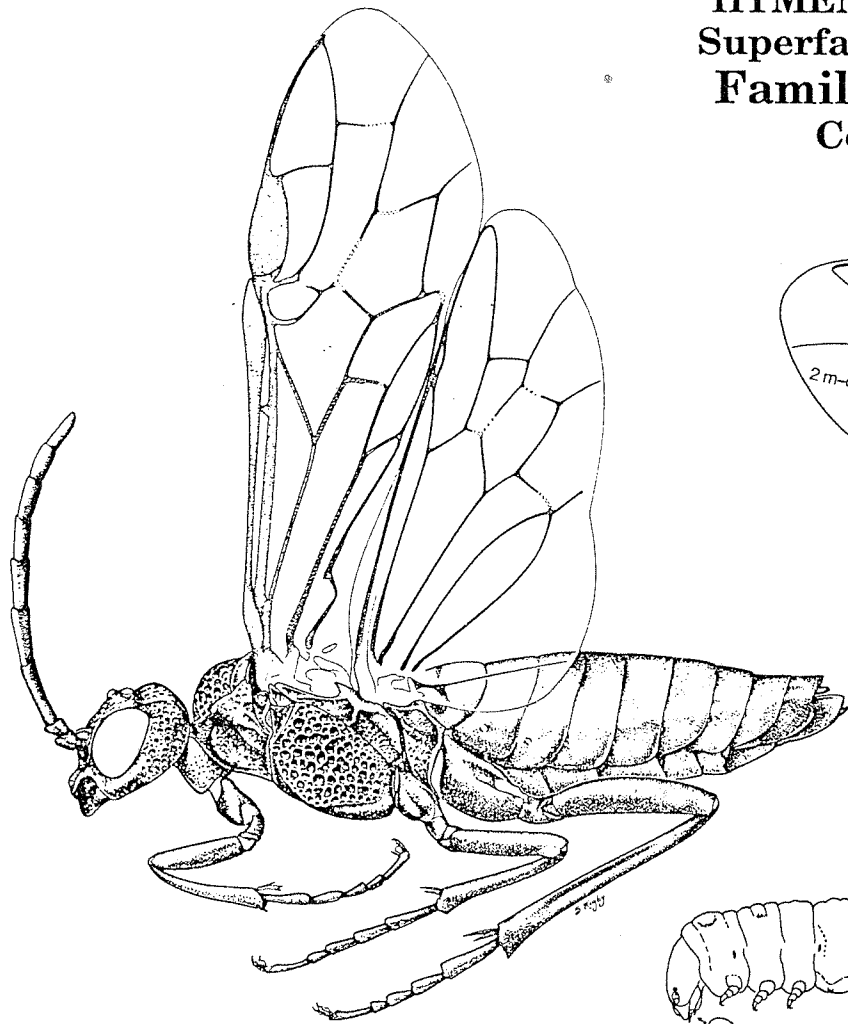
HYMENOPTERA: Symphyta
Superfamily Tenthredinoidea
Family Diprionidae
Conifer sawflies



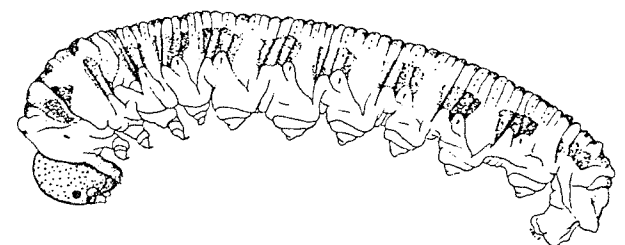
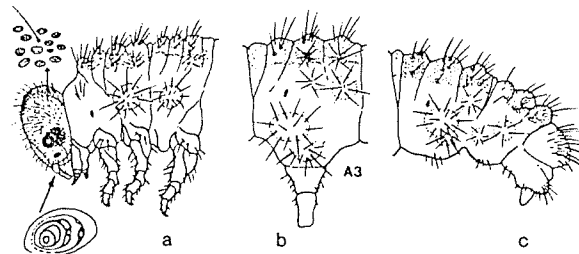
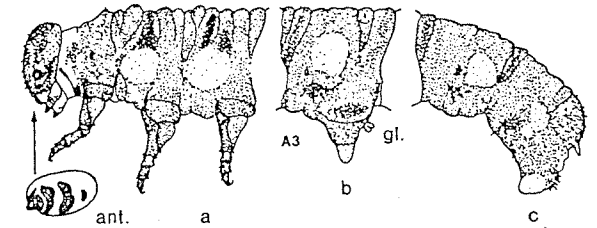
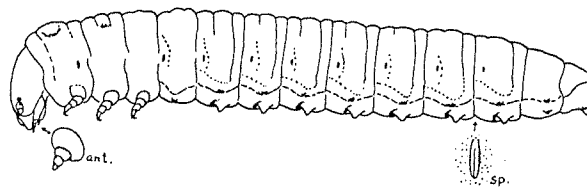
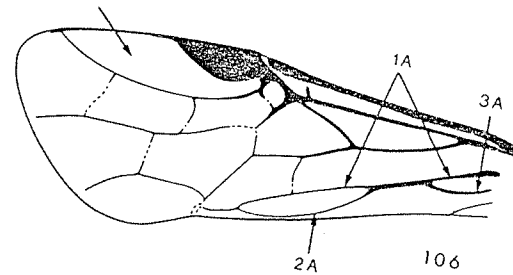
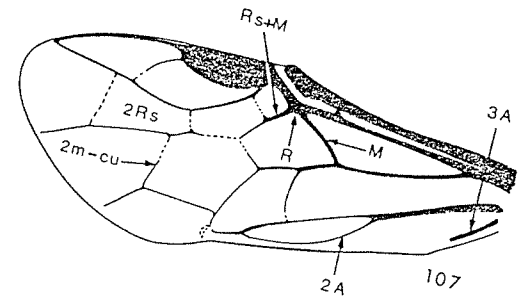
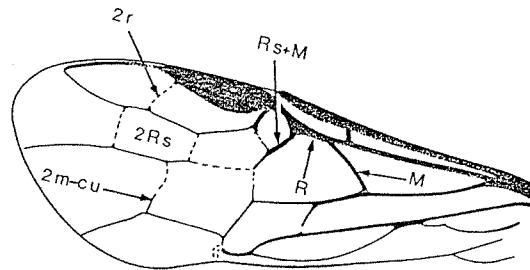
Diprionidae: *Neodiprion*



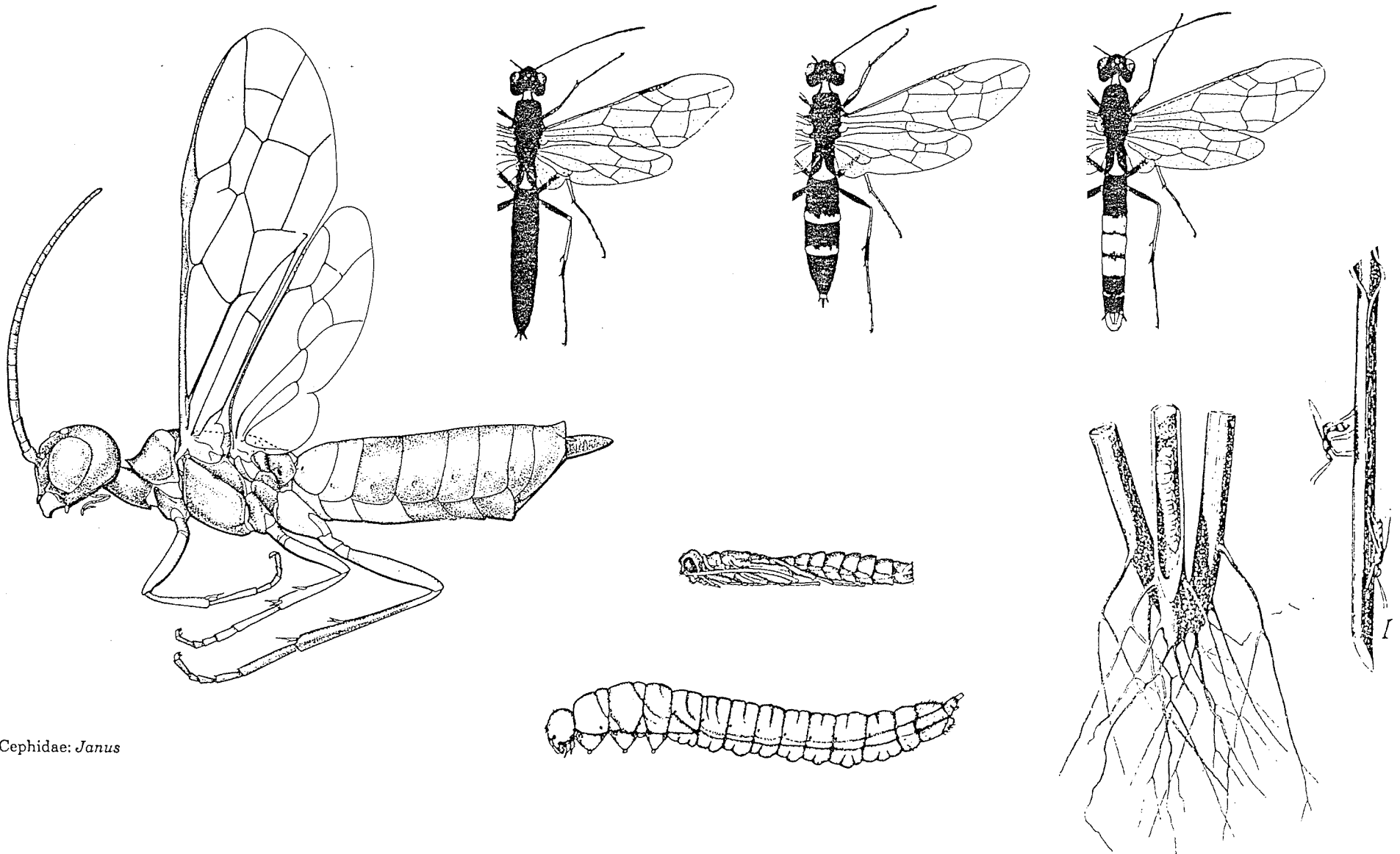
HYMENOPTERA: Symphyta
 Superfamily Tenthredinoidea
 Family Tenthredinidae
 Common sawflies



Tenthredinidae: *Dolerus*

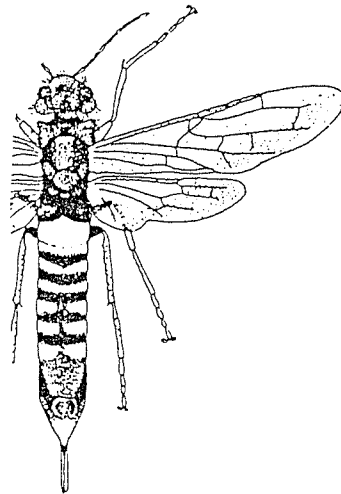
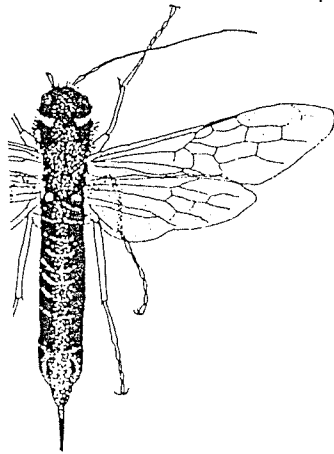
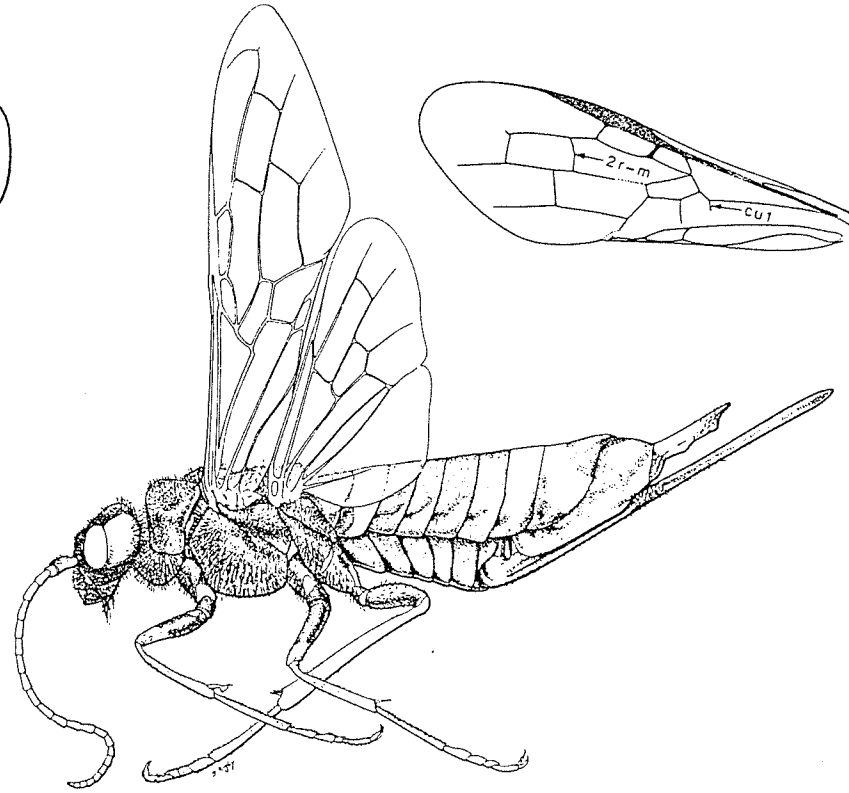
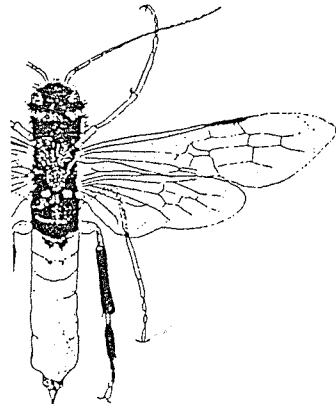
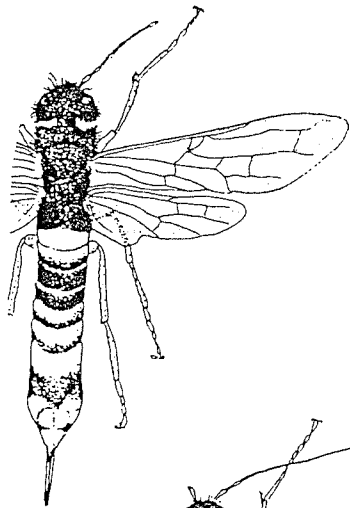
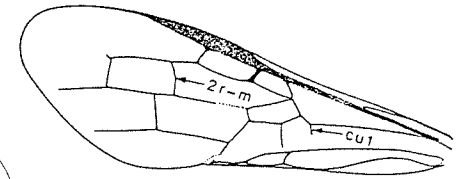
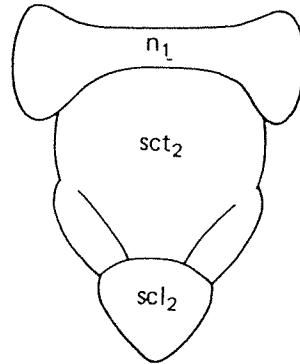
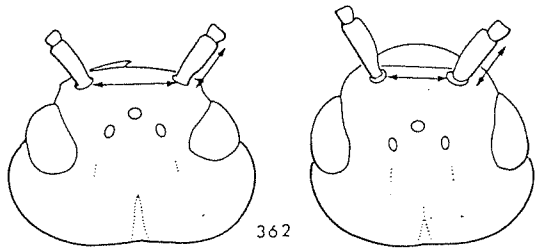


HYMENOPTERA: Symphyta
Superfamily Cephoidea
Family Cephidae
Stem sawflies

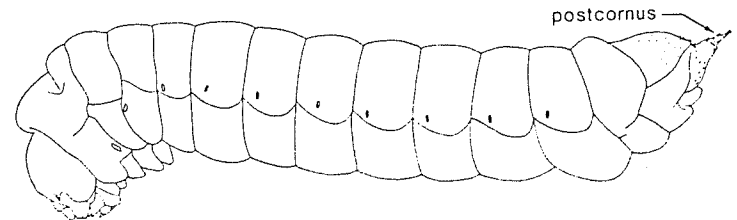


Cephidae: *Janus*

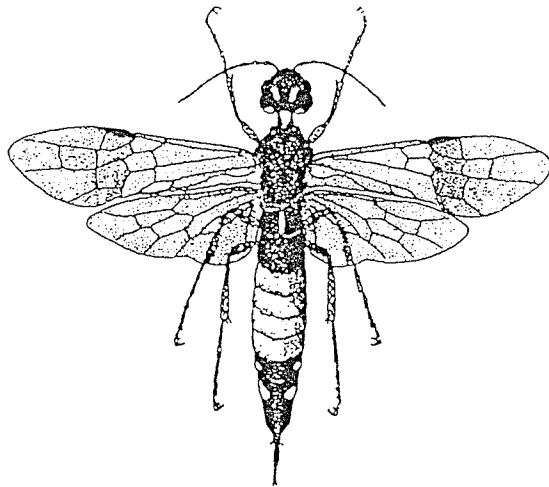
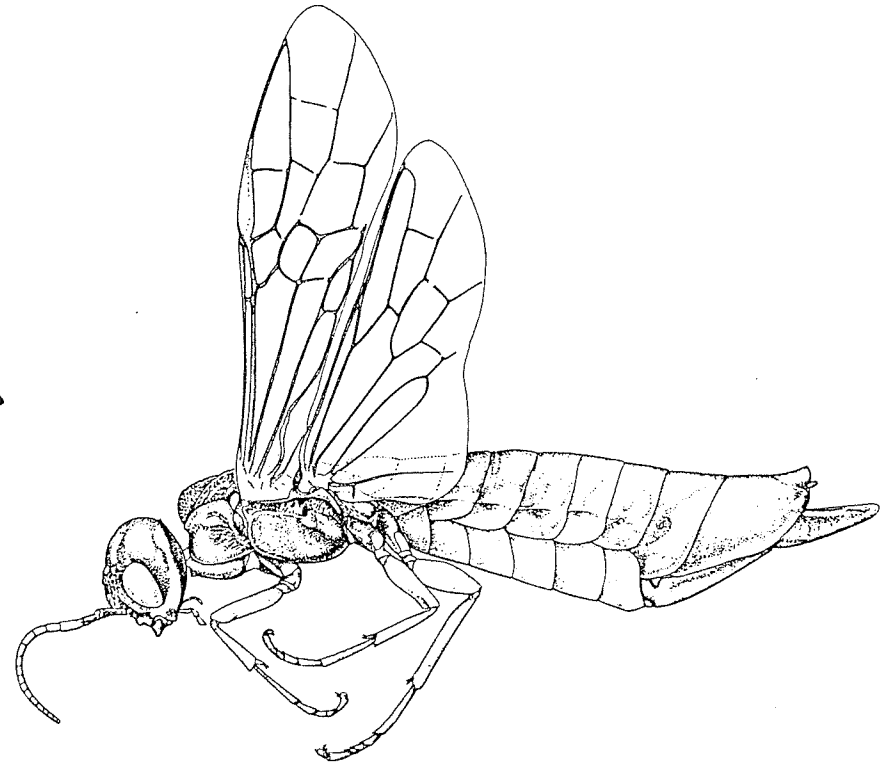
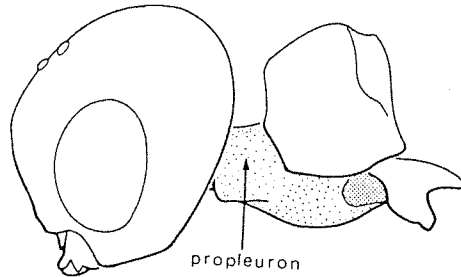
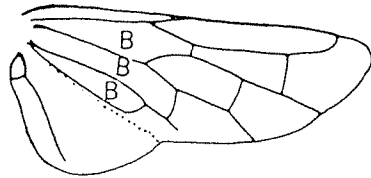
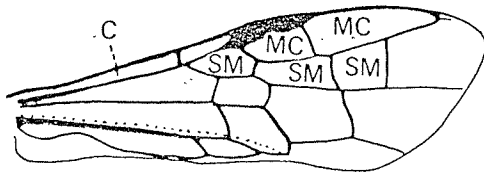
HYMENOPTERA: Symphyta
Superfamily Siricoidea
Family Siricidae
Horntails



Siricidae: *Urocerus*



HYMENOPTERA: Symphyta
Superfamily Siricoidea
Family Xiphydriidae
Wood wasps



Xiphydriidae: *Xiphydria*

