

Agricultural Insect Pests in Lepidoptera (Moths, and Butterflies)

Size variables ,insects with two pairs of membranous wings ,lacking cross vein ,body , wings ,and all appendages clothed or covered with broad scales, mouth parts suctorial. Legs relatively small , metamorphosis complete .Moths can be easily distinguished from butter flies by having various of antennae but not knobbed., relatively large bodies , usually are night fliers, pupate in skin cocoons. On the other hand the butter flies have knobbed antennae, slender bodies, and daily fliers and have naked pupae.

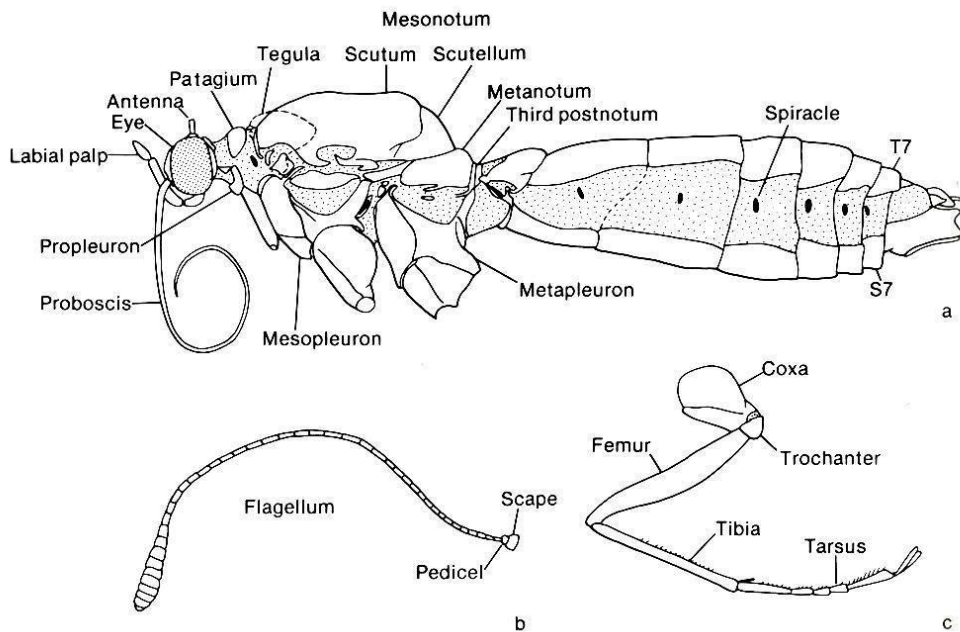


Figure I. Anatomy of Lepidoptera (*Danaus plexippus*, Nymphalidae, from Ehrlich, 1958): a, lateral view of body; b, antenna; c, mesothoracic leg; T, tergum; S, sternum. (Adapted from Daly, H.V. 1978)

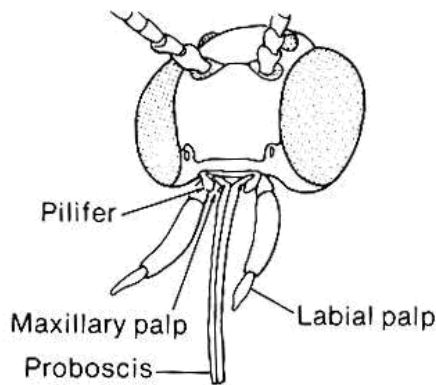


Figure 2 Mouthparts of Lepidoptera: head of moth, *Synanthedon*. (Adapted from Daly, H.V. et al. 1978)

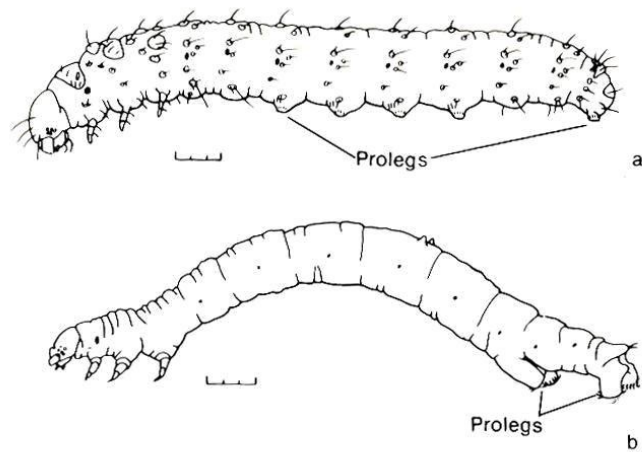


Figure 3. Larvae and pupae of Lepidoptera: a, larva of Hepialidae (*Hepialus*; scale equals 3 mm); b, larva of Geometridae (*Synaxis pallulata*; scale equals 3 mm) (From Daly, H.V. et al. 1978)

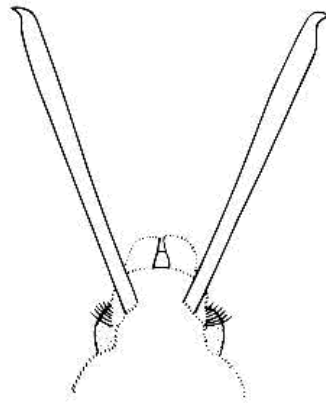


Figure 4. Taxonomic feature of Lepidoptera: antenna of Family Sphingidae (*Celerio*) (Adapted from Daly, H.V. et al. 1978)



Figure (5)

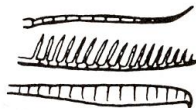


Figure (6)

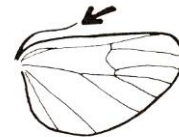


Figure (7)



Figure (8)

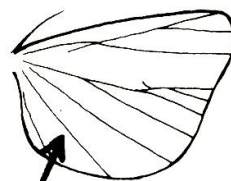


Figure (9)



Figure (10)



Figure (11)

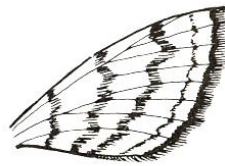


Figure (12)

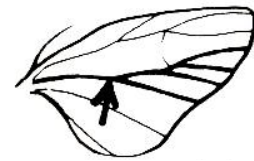











Figure (13)







Keys to the major economic families of Lepidoptera

- 1-- Antennae thread like and knobbed (Fig. 5) at tip, no frenulum ocelli absent. ----- 2
- Antennae of various forms (Fig. 6), but usually not knobbed, if antenna clubbed, then frenulum present (Fig. 7), ocelli often present ----- 3
- 2-- Small to medium sized ,white , yellow, orange wings often marked with black ----- Pieridae
- Small butter flies, metallic blue green, copper, brunze wings, some times with bright color, markings and / or tiny tail like (Fig. 8) ----- Lyceanidae.
- 3-- Hind wings with soft scales and small anal regions (Fig. 9), palpi not usually large and forming a snout-like projections ----- 4
- Hind wings with firm ,fine scales and ample anal regions, papli often large and forming snout—like projections (Fig. 10)----- Pyralidae
- 4-- Fore wings usually long, narrow and pointed, and wings usually short ,body stout and tapered at both ends. ----- Sphingidae
- Fore wings not long , not narrow ,and not pointed , hind wings often nearly as large as fore wings, body not usually tapering and not usually stout ----- 5
- 5-- Body slender , legs slender with few or no hairs, forewings marked with wavy pararell bands hind wings (Fig. 11) usually smaller than forewings-- ----- Geometridae
- Body robust, legs well developed, either very hairy or spiny, fore wings without wavy parallel bands ----- 6
- 6-- Fore wings brightly marked in contrasting colors, sometimes plain white or yellow , vein below discal cell in hind wing appears to be 4 branched (Fig. 12) ----- Arctiidae.
- Fore wings usually dull, grey or brown, vein below discal cell in hind wing often pears 3 branched (Fig. 13) , antennae usually thread like, leading edges (Fig. 14) of wings quite straight----- Noctuidae.

Representative families of lepidoptera.

<p><i>Pieris rapae</i> (Pieridae)</p>		
<p><i>Cosmolyce baeticus</i> (Lycaenidae) Pic: Lycaenidae</p>	 <p>© Paul Opler</p> <p>bsi.montana.edu</p>	
<p><i>Vanessa cardui</i> (Nymphalidae)</p>	 <p>nitro.biosci.arizona.edu</p>	
<p><i>Papilio demoleus</i> (Papilionidae)</p>	 <p>www.sydneynaturally.com.au</p>	

<p><i>Arenipses sabella</i> (Pyralidae)</p> <p>Pic: Some spesies of Pyralidae</p>	 <p>nitro.biosci.arizona.edu</p>	
<p><i>Euzophera osseatella</i> (Pyralidae)</p> <p>Pic: <i>Euzophera sp</i></p>	 <p>mothphotographersgroup.msstate.edu</p>	
<p><i>Paropta alnegro</i> (cossidae)</p> <p>Pic: Some spesies of Cossidae</p>	 <p>es.wikipedia.org</p>	
<p><i>Zeuzera pyrina</i>(cossidae)</p>	 <p>commons.wikimedia.org</p>	
<p><i>Heliothis armigera</i>(Noctuidae)</p>	 <p>www.nature-shetland.co.uk</p>	

<p><i>Agrotis ipsilon</i>(Noctuidae)</p>	 <p>Agrotis ipsilon [MONA 10663] AZ Pima Co 5800 ft. Bear Canyon Castroville, Santa Catalina Mts. MV lights. 5 May 2001. B. Walsh leg.</p>	
<p><i>Spodoptera exigua</i>(Noctuidae)</p>		
<p><i>Utetheisa pulchella</i> (Arctiidae)</p>		
<p><i>Hippotion celerio</i> (Sphingidae)</p>	 <p>Hippotion celerio (Linnaeus)</p>	
<p><i>Pectinophora gossypiella</i> (Gelechiidae)</p>		
<p><i>Phthorimaea operculella</i> (Gelechiidae)</p>		

nitro.biosci.arizona.edu

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