

## Agricultural insect pests in Orthoptera (Grass hopper, Locust, Crickets)

Usually median or large sized insects, Head hypognathous types, winged, brachypterous, or apterous. Antennae almost filiform, chewing mouthpart, Hind leg usually enlarged and modified for jumping, coxae small and somewhat separated, . Tarsi 3 or 4 segments rarely with or fewer than 3 segments. Forewings tegmina, narrow and straight, cerci usually short and almost unregimented. Specialized auditory and stimulatory organ developed. Prothorax enlarged metamorphosis gradual.

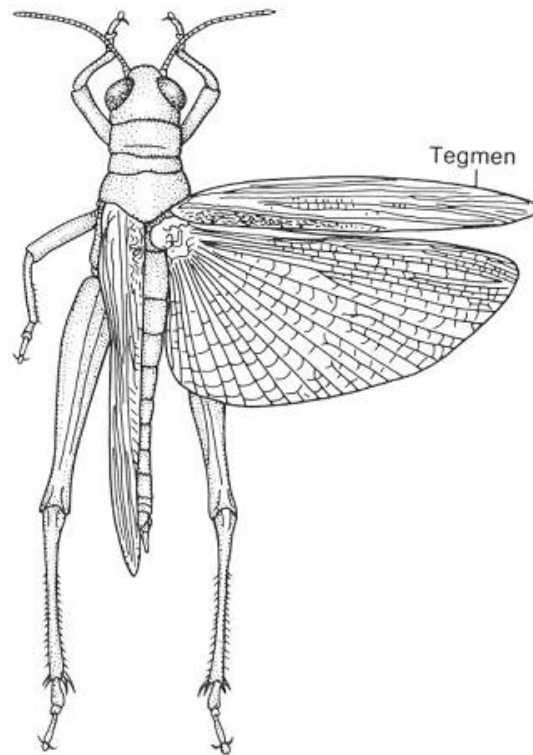


Figure 1 A grasshopper, *Melanoplus cinereus*, Acrididae, dorsal aspect

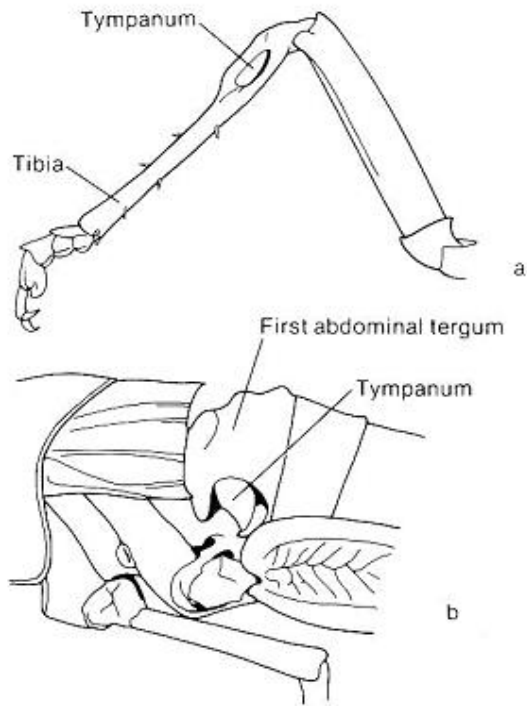


Figure 2 Auditory organs: a. Tettigoniidae (*Microcentrum californicum*); b. Acrididae (*Dissosteira carolina*).

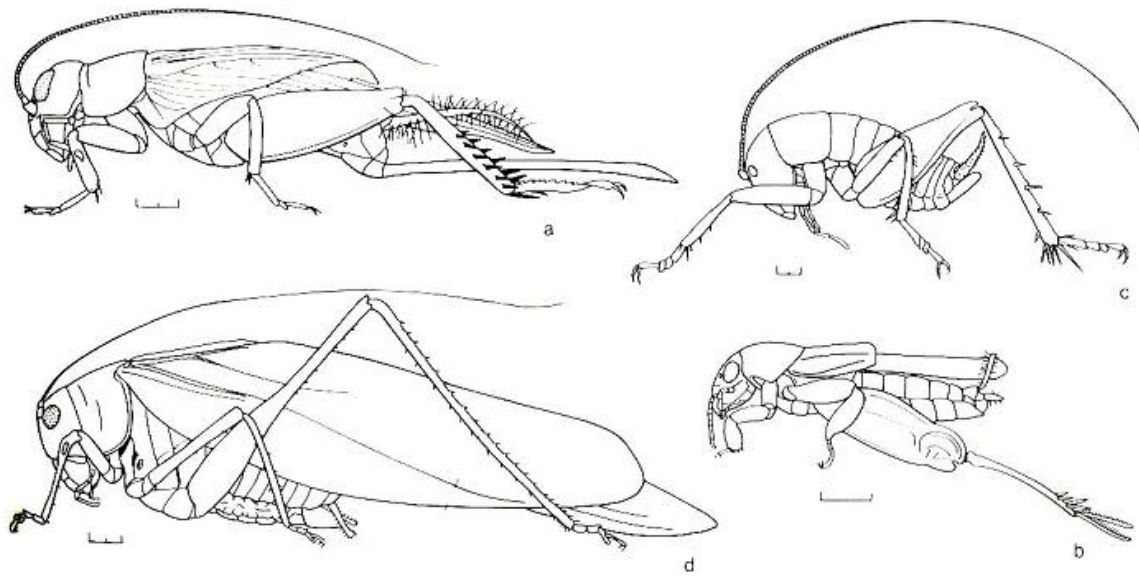


Figure 3 Representative Orthoptera: a. Gryllidae (*Acheta assimilis*, female); b. Tridactylidae (*Tridactylus minutus*); c. Gryllacrididae (*Ceuthophilus californicus*); d. Tettigoniidae (*Microcentrum californicum*, male) (Adapted from Daly, H.V. et al. 1978)

**Key to the suborder**

- 1--Antennae about as long as longer than body, many segmented, tympanal organs when present, on fore tibiae -----S. O. Ensifera
- Antennae shorter, with than 30 segments, Tympanal organs when present at base of abdomen -----S. O. Caelifera

**Sub-order:--Ensifera.  
(Long Horned Insects)**



Key to the super families.


- 1-- Tarsi 4--jointed, at least on middle and hind legs--Tittigonoidea
- Tarsi 3-jointed -----Grylloidea

**Superfamily: -- Grylloidea**

Key to the families

- Fore legs adapted for digging, ovipositor vestigial ---Gryllotalpidae
- Fore legs normal, ovipositor elongate -----Gryllidae

<p>Fam. Gryllotalpidae. <i>Gryllotalpa gryllotalpa</i></p>	 <p><a href="http://www.alkherat.com">www.alkherat.com</a></p>	
<p>Fam. Gryllidae</p>		
<p><i>Liogryllus bimaculatus</i>  <i>Gryllus bimaculatus</i></p>	 <p><a href="http://species.wikimedia.org">species.wikimedia.org</a></p>	

<i>Gryllus domesticus</i>	 <p data-bbox="625 499 781 527"><a href="http://www.apus.ru">www.apus.ru</a></p>	
---------------------------	---	--


**Sub Order . Caelifera  
(Short horned)**

Represented in S .A. by one superfamil named acridoidea in which tarsi usually 3--jointed.

Key to the families

1-- With median dorsal elevated line on the pronotum, 3 transverse groove on the Pronotum ,fore wing narrow and margins straight ----- . Acrididae.

---With out dorsal elevated line on the pronotum, 2 transverse grooves on the pronotum, fore wings with apical margin curved. -----Pyrgomorphidae .

Fam. Pyrgomorphidae.		
<i>Poekilocerus vittatus</i>	 <p data-bbox="613 1585 998 1648"><a href="http://upload.wikimedia.org/wikipedia/commons/thumb">upload.wikimedia.org/wikipedia/commons/thumb</a></p>	
Fam. Acrididae		

*Schistocerca gregaria*



[www.le.ac.uk](http://www.le.ac.uk)

*Anacridium aegyptium*



[www.afblum.be](http://www.afblum.be)

*Euprepocnemis  
plorans*



[species.wikimedia.org](http://species.wikimedia.org)

*Heteracris littoralis*





[www.biologie.uni-osnabrueck.de](http://www.biologie.uni-osnabrueck.de)

*Aiolopus thalassinus*



[commons.wikimedia.org](http://commons.wikimedia.org)

<i>Acrotylus insubricus</i>	 <p data-bbox="613 472 998 504"><a href="http://www.biologie.uni-osnabrueck.de">www.biologie.uni-osnabrueck.de</a></p>	
<i>Sphingonotus savignyi</i>	 <p data-bbox="613 766 998 798"><a href="http://www.biologie.uni-osnabrueck.de">www.biologie.uni-osnabrueck.de</a></p>	

## References

- Daly, H.V., J.T. Doyen, P.Q. Ehrlich. (1978) Introduction to Insect Biology and Diversity. McGraw-Hill. New York.
- Borror, D.J., D.M. DeLong, and C.A. Triplehorn, (1981) An Introduction to The Study of Insects. 5<sup>th</sup> ed. Saunders. Philadelphia
- Pfadt, R.E., (1985) Fundamentals of Applied Entomology. 4<sup>th</sup> Ed. McMillan Publishing Company. New York.

