

Agricultural insect pests
Order 1
Orthoptera

Derivation: [from the Greek ὀρθός *orthos* = "straight" and πτερόν *pteron* = "wing"]

Common names: (Grasshoppers, Locusts, Crickets, Mole Crickets, Katydid)

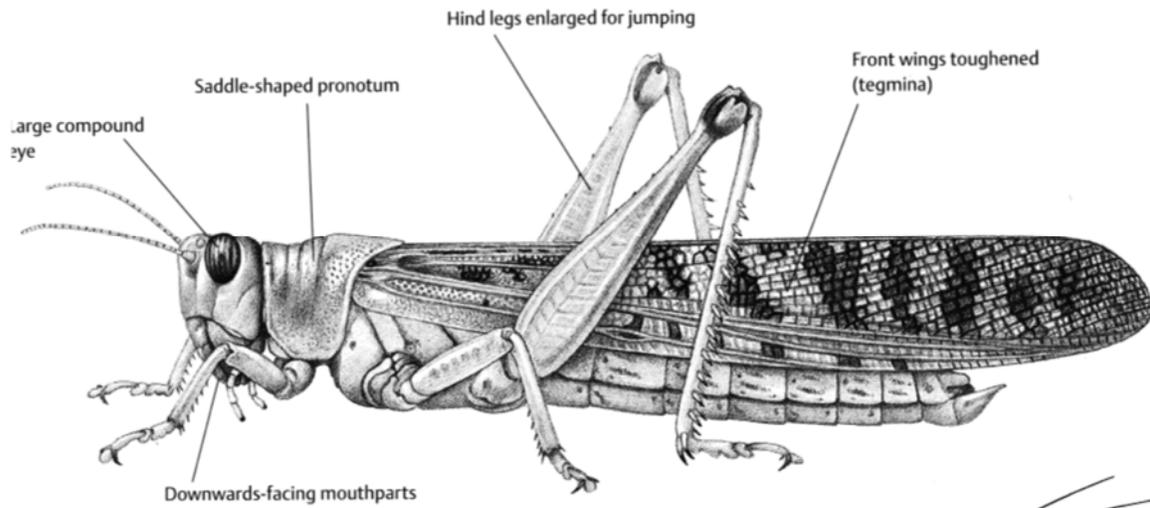
Metamorphosis: Incomplete (paurometabolous insects) - **Distribution:** Worldwide but mostly in warm regions
- **Number of families:** 28 in 2 suborder

The insects in the order have **incomplete metamorphosis**, **chewing mouthparts** and produce sound (known as a "**stridulation**") by rubbing their wings against legs, the wings or legs containing rows of corrugated bumps. The **tympanum** or **ear** is located on the **front tibia** in crickets, mole crickets, and katydids, OR at the base of the **first abdominal segment** in the grasshoppers and locusts. These insects use **vibrations** to locate other individuals.

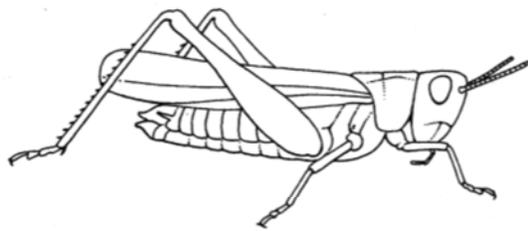
A few cannot jump and quite a few do not sing, but very many of the ones commonly encountered do both things quite well. Orthopterans can be found in just about every conceivable terrestrial habitat, even in caves or burrowing in soil, and some live permanently in association with ant nests.

Diagnostic characters:

- 1- *Usually medium to large-sized insects; winged, brachypterous or apterous*
- 2- *Mouthparts mandibulate (Chewing mouthparts)*
- 3- *Antennae are often conspicuous long, filiform and multi-segmented*
- 4- *Prothorax large and prominent*
- 5- *Hind legs usually enlarged and modified for jumping*
- 6- *Fore wings are generally long and narrow, forming more or less thickened tegmina*
- 7- *The hind wings are membranous, when at rest, are folded fan-like beneath the front wings.*
- 8- *Female generally with well-developed ovipositor which serve to place the eggs in the soil or into the tissues of leaves, stems of plants*
- 9- *Cerci usually short and almost invariably unsegmented*
- 10- *Specialized auditory 'tympanum' and stridulatory organs frequently developed*
- 11- *Metamorphosis incomplete (Paurometabolous insects)*



chistocerca gregaria — the Desert Locust



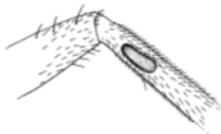
A grasshopper (Caelifera)



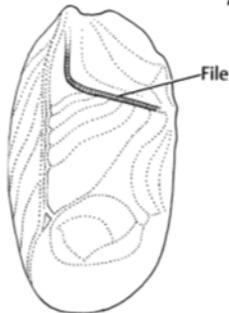
A cricket (Ensifera)



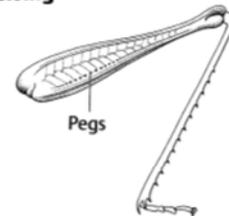
A female acridid ovipositing in soft ground



The hearing organ of the Ensifera located on the front tibia close to the knee joint.



The underside of the front wing of a gryllid showing the stridulatory file.

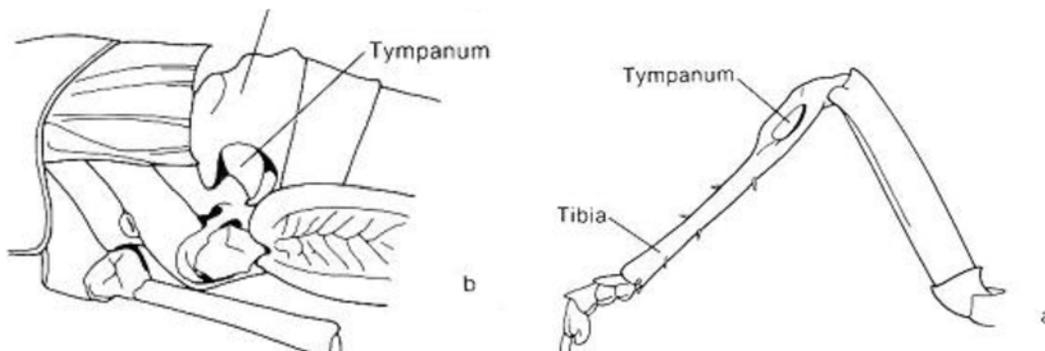
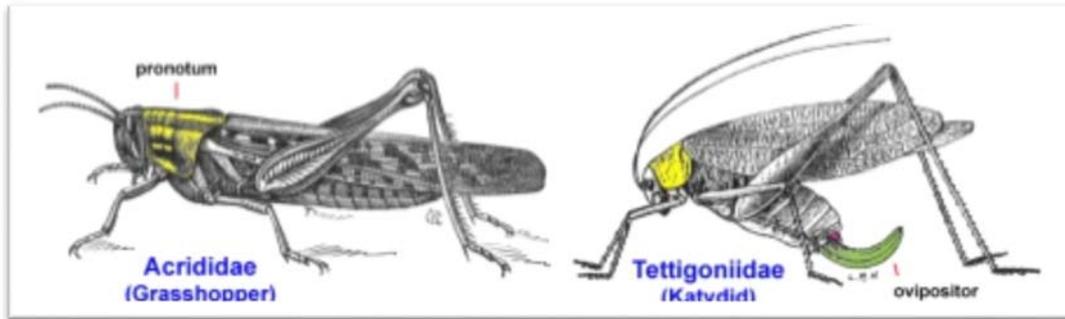


The inside of the hind leg of an acridid grasshopper showing the stridulatory pegs.

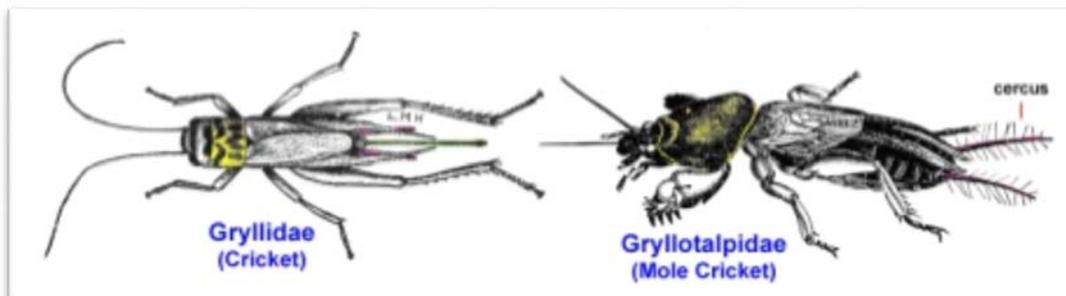
Orthoptera divided into two suborders, Caelifera and Ensifera

Key to the suborders and studied families

1. Antennae shorter, with less than 30 segments; tympanal organ when present at base of abdomen (**Suborder Caelifera**) 2
 - Antennae about as long as or longer than body, many-segmented; tympanal organs when present on fore tibia (**Suborder Ensifera**) 3



2. Pronotum with longitudinal median elevated line, and three transverse grooves; fore wing narrow with apical margins straight **Acrididae**
 - Pronotum without longitudinal median elevated line, with and two transverse grooves; fore wing with apical margin curved **Pyrgomorphidae**
3. Tarsi 4-segmented (at least mid and hind legs) (**Tettigonoidea**) **Tettigoniidae**
 - Tarsi 3-segmented (**Grylloidea**) 4
4. Front legs strongly fossorial, with tibiae expanded and digitate; ovipositor vestigial **Gryllotalpidae**
 - Front legs not markedly fossorial, with simple tibiae; ovipositor elongate **Gryllidae**



Suborder Caelifera (Short-horned grasshoppers & Locusts)

1. *Antennae are shorter than body*
2. *Tarsi with 3 or fewer segments*
3. *Tympana, if present, are found on the sides of the first abdominal segment*
4. *Cerci and ovipositor short and robust*
5. *Stridulatory apparatus varied or absent, but typically femero-alary*

Family Acrididae (Short-horned grasshoppers)	
<p><i>Schistocerca gregaria</i> (The desert locust) Nymphs and adults feed on all plants, even wild ones, causing extensive damage to all fields that fall on them if they exist in large numbers.</p>	
<p><i>Anacridium aegyptium</i> (the Egyptian grasshopper) The damage caused by this species is negligible if it is compared with the desert locust.</p>	
<p><i>Euprepocnemis plorans</i> (the lamenting grasshopper) Nymphs and adults feed mainly on grasses, cotton, alfalfa, Maize (corn) and sedges</p>	

Acrotylus insubricus

(The red wing
grasshopper)

They feed on small
herbs in rocky
valleys and
sometimes on algae



Sphingonotus savignyi

(The Skylark Sand
Grasshopper)



Aiolopus thalassinus

(The rice
Grasshopper)

It feeds on rice,
wheat and alfalfa



**Family Pyrgomorphidae
(Short-horned grasshoppers)**

*Poecilocerus
bufonius
vittatus*
(الجراد المحلي)

They are found in
desert valleys and
feed on plants in
these valleys



Suborder Ensifera (Long-horned grasshoppers, crickets & mole crickets)

1. *Antennae about as long as body, with many segments.*
2. *Tarsi 3- or 4-segmented.*
3. *Tympana, if present, are located in the upper end of front tibia.*
4. *Stridulatory organs, when present, usually tegminal.*
5. *Ovipositor more or less elongate, either sword-shaped or cylindrical.*

**Family Tettigonidae
(Long-horned grasshoppers)**

Ruspolia nitidula
(Large cone-head grasshopper)

It feeds on grassy plants grains (maize,
sorghum, and rice), grasses



**Family Gryllidae
(Cricket)**

Gryllus bimaculatus

(The black Cricket with 2 spots)

Adults and nymphs feed on young cotton leaves, alfalfa, corn, potatoes, and tomatoes, causing large holes in them. Furniture fabrics are destroyed in homes, and they feed on dead insects, eggs, larvae, and pupa of the cotton-leaf worm, and the larvae of the army worm



Acheta domesticus
(The domestic Cricket)

As in previous species



**Family Gryllotalpidae
(Mole Crickets)**

Gryllotalpa gryllotalpa
(Mole Cricket)

يقرض الحفار جذور النباتات الصغيرة (القطن والطماطم والبطاطس والنباتات البقولية والقرعية وبعض محاصيل الخضراوات الأخرى) وسوقها تحت سطح الأرض مباشرة. كما يتغذى على درنات البطاطس و البطاطا وعلى بذور الطماطم وغيرها.

