Orders of insects

Bagan Klasifikasi Serangga

Phylum ARTHROPODA

Subphylum

Trilobita (fossil)

Mandibulata

Chelicerata

Kelas INSECTA

Arachnida

Subkelas

Apterygota

Exopterygota

Endopterygota

ordo

Pterygota

ordo

ordo

ordo

ordo

Procura

Diplura

Thysanura

Collembola

Ephemeroptera

Odonata

Orthoptera

Isoptera

Plecoptera

Dermaptera

Embioptera

Mallophaga

Anoplura

Thysanoptera

Hemiptera

Homoptera

Neuroptera

Coleoptera

Mecoptera

Trichoptera

Lepidoptera

Diptera

Siphonaptera

Hymenoptera
I. Subclass Apterygota = *wingless*

*ametabolous*: change little in form as they develop; just keep getting bigger

- Protura
- Diplura

*Thysanura: bristletails, silverfish*
*Collembola: springtails*
Common name: Diplurans
Class: Insecta
Order: Diplura
Ecological niche: Predators
Distinguishing characteristics: Small, eyeless arthropods with a pair of long, beaded antennae on the head and a pair of segmented sensory structures (cerci) at the rear.

Order Thysanura
silverfish, bristletails
- 3 tail-like appendages:
  - 2 cerci and 1 median caudal filament
- Chewing mouthparts

Lepismatidae
silverfish
- gray, ~12 mm long
- cool, damp environments
- inhabit buildings, feed on starchy substances incl. books, starched clothing and curtains, wallpaper paste, starchy vegetables
Common name: Springtails
Class: Insecta
Order: Collembola
Ecological niche: Scavengers

Distinguishing characteristics: A unique, tube-like structure, the collophore, is located ventrally on the first abdominal segment of most species. Springtails are named for the forked jumping organ (the furcula) found on their fourth abdominal segment.
Collembola  
springtails

- Minute; 0.25–6 mm
- Most species soil-dwelling or in leaf litter, under bark, in fungus: eat decaying vegetation, fungi, bacteria, pollen, algae
- *furcula* of surface-dwellers enables them to jump 75-100 mm when disturbed
- *colophore* used in water uptake
- Also inhabit surface of freshwater pools, along seashores, in ant or termite nests, on snow, on vegetation

II. Subclass Pterygota = winged
A. *hemimetabolous* orders

Ephemeroptera  
mayflies

- 2 pairs of *heavily veined* wings, held together above body
- 2-3 *caudal filaments*, inconspicuous bristlilike antennae
- pond/stream habitats
- adults: vestigial mouthparts, do not feed, live only 1-2 days
Common names & Synonyms

- The name "Odonata," created by a man named Fabricius in 1793, comes from Latin and means "toothed." The family name Libellula may have been derived from the Latin "libella" which means "booklet," and with some imagination, a resting dragonfly can look like a small booklet.
II. Subclass Pterygota

_paurometabolous orders_
**Isoptera**
(eye-SOP-ter-ra)
iso = equal
**termites**

- **Social insects** with caste system:
  - reproductives: 2 pairs of membranous wings
  - workers/soldiers: wingless
- Antlike in appearance, but are "wide-waisted", do not have elbows antennae, are soft-bodied and usually light-colored

A. reproductive adult
B. soldier (with enlarged defensive chemical gland)
C. worker
D. soldier
**Thysanoptera**

(Thigh-san-NOP-ter-ra)

-thysano = fringe

-thrips

- 2 pair of wings, fringed with hairs
- rasping-sucking mouthparts
- **Minute**, slender insects: 0.5-5 mm
- Short antennae

**Common name:** Thrips

**Class:** Insecta

**Order:** Thysanoptera

**Ecological niche:** Herbivores or predators

**Distinguishing characteristics:** All thrips have a distinctive spindle-shaped body with short antennae and short legs. When present, the wings are slender and rod-like with a dense fringe of long hairs. The name "Thysanoptera" means "fringed wings".
**Dermaptera** (der-MAP-ter-ruh)
derma = skin
earwigs

- Cerci modified into **pinchers**.
- **Elongate, slender**, somewhat flattened bodies
- Front wings **short, leathery, and veinless**
- Hind wings membranous, rounded, with radiating veins; folded beneath front wings
- Tarsi 3-segmented

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**Ordo Dermaptera**

- **Forficulidae**
  - ![Forficulidae](image1)

- **Labiduridae**
  - ![Labiduridae](image2)

- **Labiidae**
  - ![Labiidae](image3)
**Orthoptera** (or-THOP-tər-ə)

*ortho* = straight  
*ptera* = wings

**Grasshoppers, Crickets, Katydid**

- 1st pair wings elongate and **leathery**
- **Filiform antennae**
- Well developed **ceri**
- **Long ovipositor** in females

**Common name**: Cockroaches, Waterbugs
**Class**: Insecta
**Order**: Blattodea
**Ecological niche**: Scavengers or omnivores
**Distinguishing characteristics**: Oval, somewhat flattened body that is well-adapted for running and squeezing into narrow openings; much of the head and thorax is covered and protected dorsally by a large plate of exoskeleton (the pronotum). Antennae are long and slender.
Mantodea
Family Mantidae
mantids
• all U.S. species are grouped in this one family

Hemiptera
(hem-MIP-ter-ra)
hemi = half
ture bugs
• front wing thickened and leathery at base, membranous at tip: hemelytron, wings at rest held flat over body
• piercing-sucking mouthparts: beak arising from front of head
• many have triangle shaped scutellum
• antennae ≤5 segments
Homoptera
(ho-MOP-ter-ra)
homo = alike
cicadas, hoppers, aphids, scales

- Piercing-sucking mouthparts: short beak arising under head
- Most: 2 pairs of membranous wings held roof-like over body
Psocoptera (so-COP-ter-ra)

*psoco = rub small

*booklice, barklice*

- Swollen clypeus, **face bulging**
- **Small**, most less than 5 mm
- Wings present or absent; if present, 2 pairs, held **rooflike** over body, **membranous**, front wings larger
- Fairly long antennae
Common name: Booklice, Barklice
Class: Insecta
Order: Psocoptera
Ecological niche: Scavengers
Distinguishing characteristics: Prominent head with bulging eyes, long slender antennae, and a relatively narrow neck-like prothorax; when present, the wings are membranous (two pairs) and usually held tent-like over the abdomen.

II. Subclass Pterygota = winged

holometabolous orders

- Larvae and adult differ greatly in body form & habits
- Pupal form intervenes between larva and adult
Lepidoptera (leh-pih-DOP-ter-ra)
lepido = scale
butterflies, skippers, moths

- Wings covered with scales (come off on our fingers as "dust")
- Sucking mouthparts: coiled proboscis
- Large compound eyes
Coleoptera
(ko-lee-OP-ter-ra)
coleo = sheath
beetles

- Front wings modified into hardened or leathery elytra, meeting in a straight line down the back and covering membranous hind wings
- Chewing mouthparts
- Very large and diverse order—40% of known insects!
• The **Rove Beetles** are a very large family with over 46,000 species worldwide, nearly 1,000 of which occur in Britain, ranging in size from 25mm (1 inch) to less than 1mm.
Hymenoptera
(hi-men-NOP-ter-ra)
hymeno = god of marriage
bees, ants, wasps

- Four **membranous** wings; hind wings smaller, have a row of hooks (= *hamuli*) for joining to front wings
- Chewing mouthparts, modified in many for lapping
- Ovipositor developed; sometimes modified into stinger
- Hard bodied, active insects, with well-developed compound eyes and often "thread-waisted"
Neuroptera
(neur-OP-ter-rah)
neuro = nerve
lacewings, antlions

- 4 membranous wings with many veins, incl. many cross veins at margin (costal area); usu. held rooflike over body; front and hind wings similar in shape and veination
- Chewing mouthparts
- Antennae long
- No cerci