Caddisfly Identification

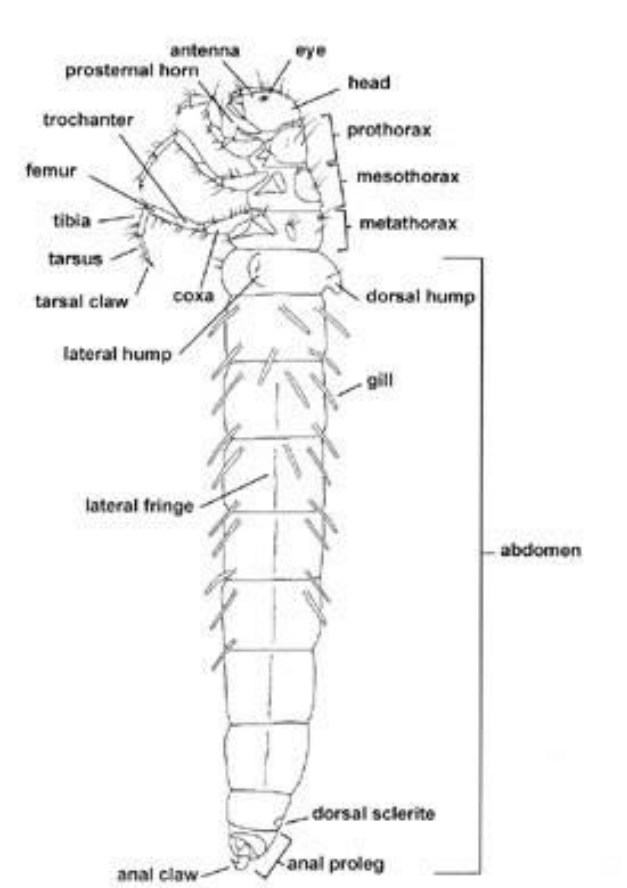
Caddisfly Basics

- Caddisflies are insects of the Order Trichoptera (hairy wing) and related to butterflies & moths, Order Lepidoptera (scaly wing).
- Life Cycle: Adults → Eggs → Larvae → Pupae → Adults. Most complete in one year but some take 2-3 years.
- All caddis produce silk from labial (lower lip) glands. This is used to spin a net. The net may be used as a scaffold to build a case, or to form a tunnel to live in and act as a fishing net. One family (Rhyacophilidae) are completely free-living but spin a net when ready to pupate.
- Caddisflies are sensitive to pollution, so are good indicators of water quality.

Family names end with the letters –idea.

Identification of Riverfly Groups

- Among the caddis families there are 3 such groups:
  - Cased cadis
  - Caseless with gills
  - Caseless without gills.
- These 3 groups are represented by 12 families.
- Over half the families can be identified with a hand lens.
- The diagram opposite shows a typical **cased** caddis.
- Great photos at http://lifeinfreshwater.net/caddisfly-larvae-trichoptera/#more-978



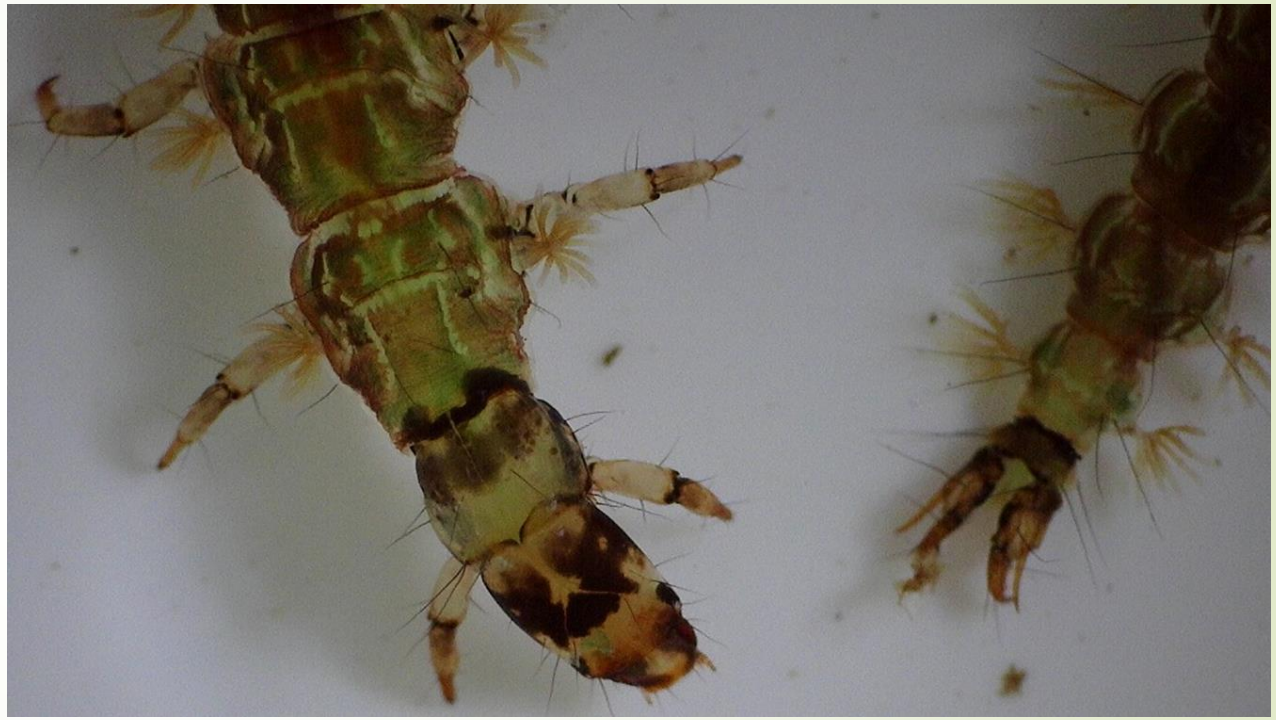
Lateral view of a Trichopteran Larva

- Important features to identify to family…
  - Thorax: which dorsal segments have hard plates.
  - Leg length: short & long hind legs.
  - Abdomen: presence, shape & arrangement of gills.
  - Anal prolegs & claw: size, shape and sclerotization.
- The following slides identify some families with a few 'Easy hits…' for a few genera and an occasional species.

Group: Caseless Caddis with gills

Identification (1)

- Prothorax **only** has hard plate (sclerotised).
- Tufted gills on side of abdomen and last two thoracic segments.
- → Rhyacophilidae
- Easy hit…
  - *Rhyacophila dorsalis* shown opposite.
  - *Rhyacophila munda* has single filaments on 2nd & 3rd thoracic gills.

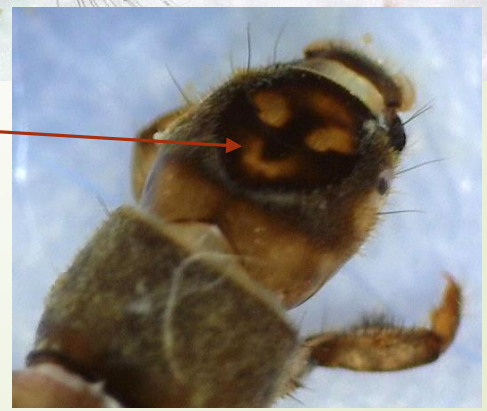


All gills have at least 4 filaments. Head and pronotum with dark band; this obscures spots due to muscle attachments.

Group: Caseless Caddis with gills

Identification (2)

- All 3 thoracic segments have hard plates (sclerotised).
- Tufted gills on **underside** of abdomen.
- Anal prolegs have terminal brush of long bristles.
- → Hydropsychidae
- Easy hits…
  - Brown head with yellow markings, genus *Hydropsyche*
  - Gills missing from 7th abdominal segment → *H. siltalia*



Group: Caseless Caddis no gills

Identification (1)

- 1st thoracic segment **only** hard.
- Anal proleg: basal segment (membranous) **equal** to distal segment (sclerotised).
- Femur (thigh) with **many** long bristles → Polycentropodidae.

Identification (2)

- 1st thoracic segment **only** hard.
- Anal proleg: basal segment (membranous) **indistinct**, distal segment (sclerotised) is long.
- Femora (thigh) with **few** long bristles → Psychomiidae.

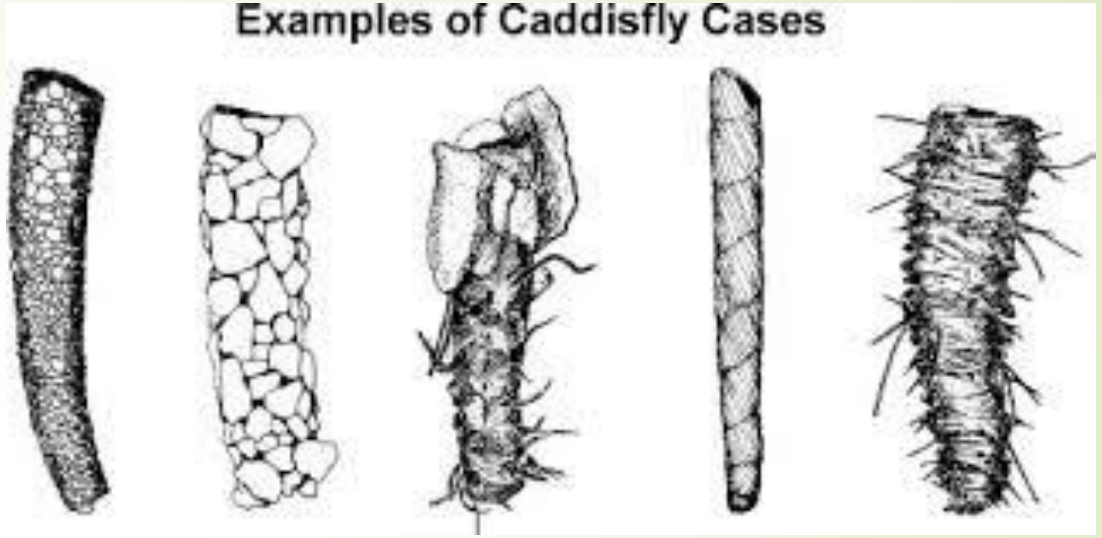
Group: Caseless Caddis no gills

Identification (3)

- Labrum (upper lip) white & membranous, brush-like front to lip.
- Head is elongate & narrow; orange (body tends to be pale/white)
- Pronotum similar in colour to head except for black posterior margin → Philopotamidae.

Group:
Cased Caddis

- Caddis use many materials for their cases besides silk.
  - Sand grains, stone, shell pieces
  - Grass, twigs, wood, live plant parts, seeds or whole snails
  - Mixtures occur and material types may be changed as the case is added to.
- Most cases are tubular, some have hoods, but others are flattened. Many cases are curved and may narrow toward the end.
- Cases found firmly attached to a substrate contain(ed) a pupa.



Group:
Cased Caddis

Identification (1)

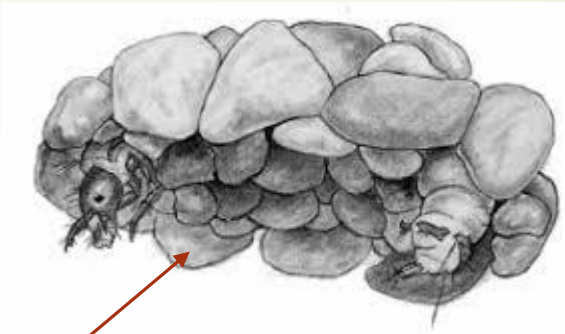
- Long-legged: hind legs much longer than middle legs.
  - → Leptoceridae → Athripsodes aterrimus.
  - → *Beraeodes minutus* (one of 4 species of Beraeidae)
- Short-legged: hind legs approximately equal to middle legs.
- Short-legged caddis usually need a key even to ID families. See next slide…

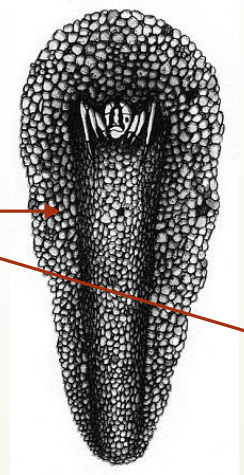
Athripsodes aterrimus

Group:
Cased Caddis

Identification (2)

- Case of inorganic material
  - Case of humped pebbles. Often in large aggregations on stones → Glossosomatidae.
  - Case with a few very large stones attached to sides → Goeridae.
  - Top side of case extended giving flatish appearance from above → Molannidae.

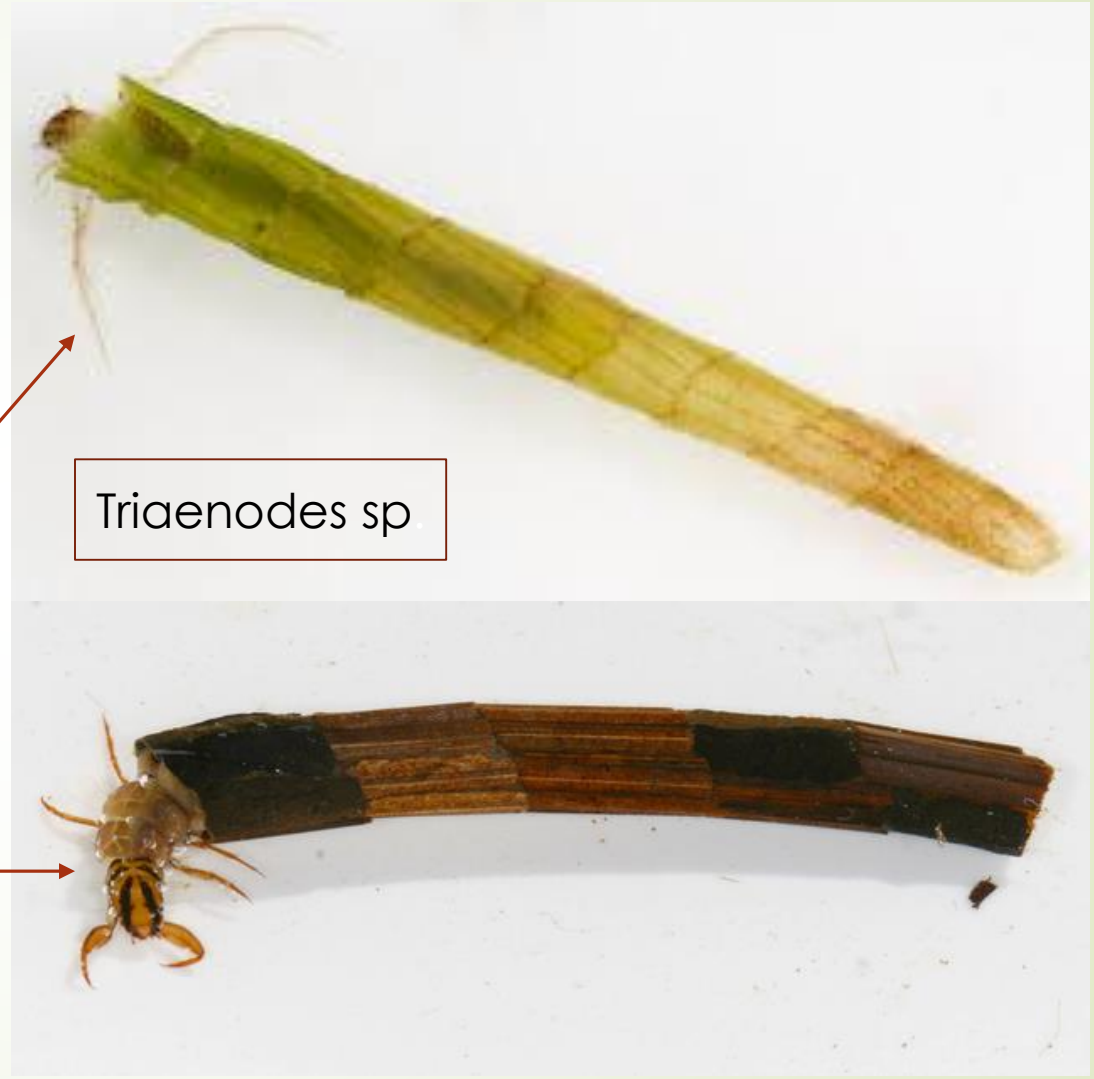




Group:
Cased Caddis

Identification (3)

- Case of plant material arranged in a spiral.
  - Log-legged type → Leptoceridae.
    - Slender case, usually cut from green leaf pieces. Moves with distinct rowing action → *Triaenodes* or *Ylodes*.
  - Larva short-legged. Distinct black bands on head & pronotum → Phryganeidae.
    - Also species with 3 black bands on head.



Group:
Cased Caddis

Identification (4)

- Case made of flat discs of leaves (brown) → Limnephilidae.
  - Case is triangular in cross-section.
    - Head uniform brown, larva uses dark-coloured dead leaves. Found in swamps under trees →*Phacopteryx* sp.
  - Larva sandwiched between cut leaves. Found in flowing water (moderate to fast) → *Potamophylax sp.*
- Case with pieces laid at 90° to length→ *Limnephilus* sp.

Group:
Cased Caddis

Identification (5)

- Mixed materials: sand grains, plant pieces, or shells.
  - Log-legged type → some Leptoceridae.
    - Small case, larva only 6-12mm long. Body pattern as shown → *Mystacides sp*.
  - Case starts with sand grains. By last instar plant fragments placed in a square cross-section → Lepidostomatidae.
  - Many Limnephilidae use mixed materials but a key is essential to identification.

Group:
Cased Caddis

Identification (6)

- Characteristically shaped fine cases. Larvae to 6mm → Hydroptilidae.
  - Case made with very fine sand grains. Lakes, rivers & streams → *Hydroptila* sp.
  - Caddis in a 'bottle'. Case transparent but coated in fine particles → *Oxyethira* sp.