



Mayfly Families in North America

- ⇒ *Baetidae – Baetis, very fast swimmer fusiform in shape
- ⇒ *Heptageniidae – Stenonema, common flat mayfly
- ⇒ Metretopodidae – Siphloplecton
- ⇒ *Oligoneuridae – Isonychia, common filter-feeder
- ⇒ *Siphonuridae – Ameletus
- ⇒ *Leptophlebiidae – Paraleptophlebia, small streams
- ⇒ Behnigiidae – Dolania, infrequent in coastal plain rivers
- ⇒ *Ephemeridae – Hexagenia, common burrower

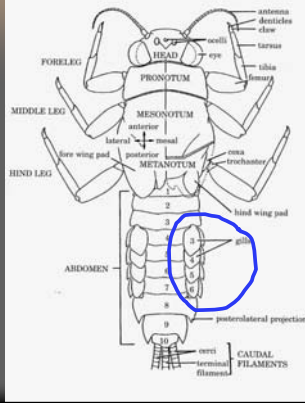
As of Brigham et. al. 1982 or Voshell 2003, *common families in piedmont and mountain streams

Mayflies (continued)

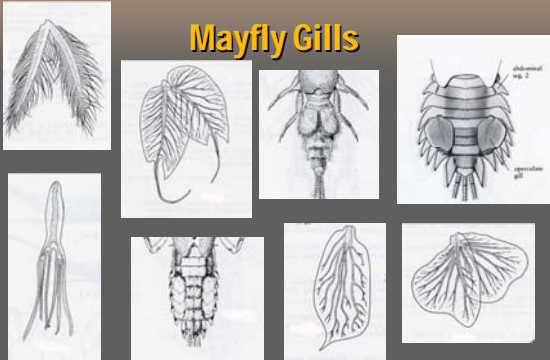
- ⇒ Palingeniidae – Pentagenia
- ⇒ Polymitarcyidae – Ephoron
- ⇒ Potamanthidae – Potamanthus
- ⇒ *Ephemerellidae – Ephemerella, mostly mountains
- ⇒ Tricorythidae – Tricorythodes
- ⇒ *Caenidae – Caenis, operculate gills
- ⇒ Neophemeridae – Neophemera
- ⇒ Baetiscidae – Baetisca, enlarged pronotum

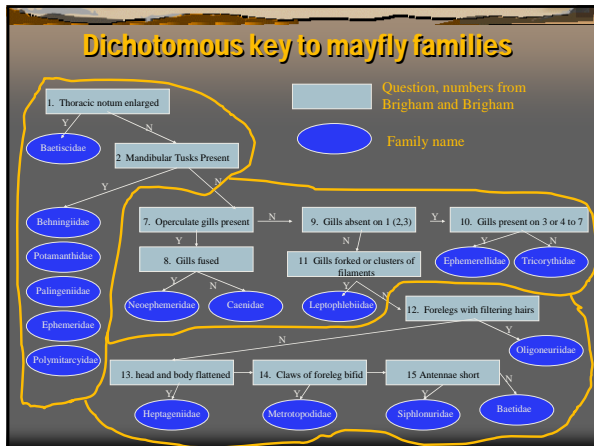
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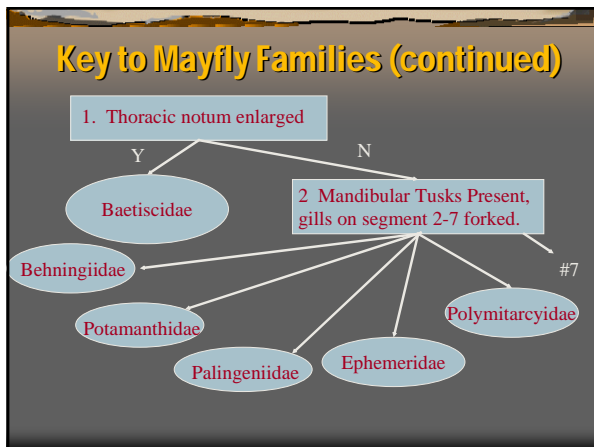
Basic Mayfly Morphology



Mayfly Gills







Key to families of mature mayfly nymphs of North America

⇒ 1. Thoracic notum enlarged to form a shield or carapace-like projection concealing abdominal gills.



Family Baetiscidae

Mayfly family key continued



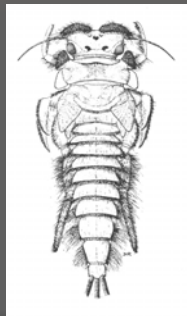
⇒ 2. Mandibular tusks usually present and projecting from the front of the head. The tusks are used to burrow into soft sediments. These 5 families also have forked gills on abdominal segments 2-7 which are also fringed. These taxa can be fairly large (2-3 inches).

Mayfly family key continued

- ⇒ Couplet 2 leads you to 5 potential families.
 - Behningiidae, very rare only Dolania in NC.
 - Potamanthidae, flatten appearance and only Potamanthus in US
 - Palingeniidae, found mostly in very large rivers not found in NC
 - Ephemeridae, much more common burrower
 - Polymitarcyidae, only Ephoron in E. North America

Behningiidae

- ⇒ Very Rare mayflies, the only specimen collected from sandy coastal plain rivers.
- ⇒ Dolania is the only genus and it's very easy to recognize by the dense spines on the head and pronotum.



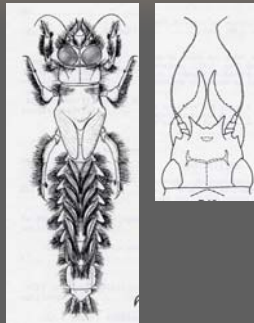
Potamanthidae



- ⇒ This family is also represented in the US by a single species – Potamanthus (8 species). Can be common in some streams in NC.
- ⇒ Somewhat flattened in appearance and more of a sprawler than a burrower, gills can be purple and are lateral on the abdomen.

Palingeniidae

- ⇒ Nymphs in this family (Pentagenia in NC) are found exclusively in very large rivers and can be difficult to collect. Very rare in NC.
- ⇒ Frontal process has 5 points and mandibular tusks are crenulated.



Ephemeridae

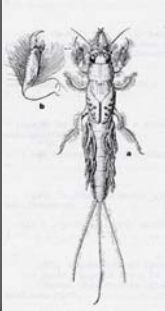
- ⇒ Very common burrowing mayflies, enormous swarms have been recorded.
- ⇒ Tusks are divergent at tip and usually upturned.

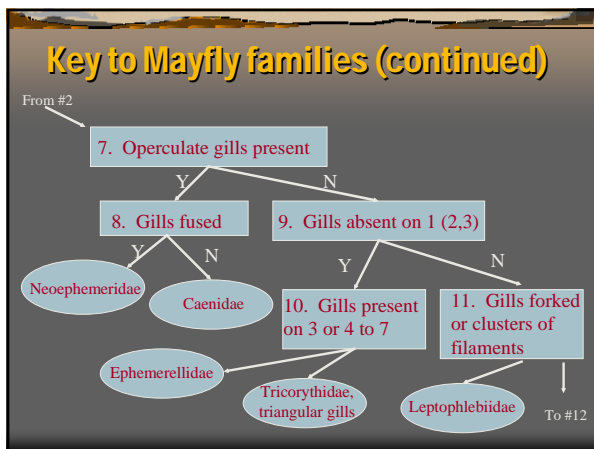




Polymitarcyidae

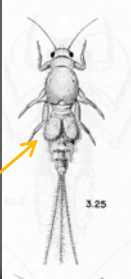
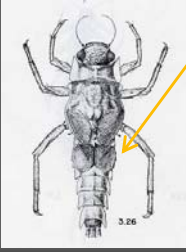
- There are only two eastern species of this family commonly found and only Ephoron leukon in NC
- Can be found burrowing in sand within rocky riffles in mountain and piedmont streams.
- Tusks converge apical and can be spiny.





Mayfly family key continued



7. Does your specimen have operculate (lid like)gills?



- Operculate gills fused along the midline? – Neophemeridae
- Operculate gills not fused along midline – Caenidae

Mayfly family key continued


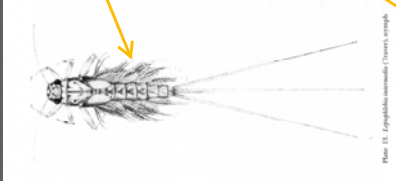
9. Does your specimen lack gills (or are very vestigial) on abdominal segment 1 and possibly 2 and/or 3?



- Lamellate (plate-like) gills on abdominal segments 3 or 4 to segment 7? – Ephemerellidae, very common mayfly
- Plate-like gills on 2 to 5 or 6; those on segment 2 are operculate? - Tricorythidae

Mayfly family key continued

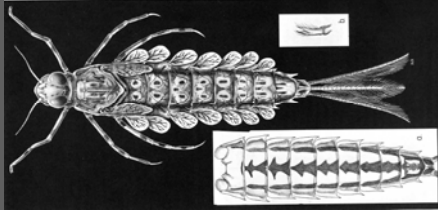
11. Are your specimens gills forked, in clusters of filaments or have double lamellae? – Leptophlebiidae



- We often find Paraleptophlebia in very small 1st order features.

Mayfly family key continued

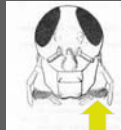
- 14. Claws of the foreleg are bifid, while those of the middle and hind legs are single? – Metretopodidae



- The most common genera of this family is *Siphloplecton* and is most often found among vegetation in large coastal plain rivers.

Mayfly family key continued

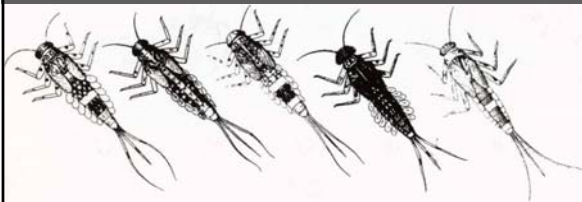
- 15. Is the antennae short (less than twice the width of the head)? – Siphonuridae



- 15. Is the antennae long? – Baetidae, very common



Baetidae are one of the most common mayfly families in North Carolina streams





Mayfly Feeding Types*

General Category	Feeding Mechanisms	Dominant Foods
Shredders	Chewer	Herbivore – living plant tissue
		Detritivore – decomposing tissue or CPOM.
Collectors	Filter or suspension feeder	Detritivore: decomposing fine particulate organic matter.
	Gatherer or Deposit feeder	
Scrapers	Herbivore	Feeds on periphyton or attached algae
Predators	Swallow or Engulfer	Carnivore – whole animals or parts.

* From Brigham, et. al., 1982

Biotic Index Values (RBP) and feeding types for Mayfly families

⇒ Baetiscidae	3.0	Scraper
⇒ Ephemeridae	4.0	Collector (gatherer)
⇒ Potomanthidae	4.0	Collector (gatherer)
⇒ Polymitarcyidae	2.0	Collector (gatherer)
⇒ Neophemeridae	2.0	Collector (gatherer)
⇒ Caenidae	7.0	Collector (gatherer)
⇒ Ephemerellidae	1.0	Collector (gatherer)

Biotic Index Values (RBP) and feeding types for Mayfly families (continued)

⇒ Tricorythidae	4.0	Collector (gatherer)
⇒ Leptophlebiidae	2.0	Shredder
⇒ Oligoneuridae	2.0	Collector (filterer)
⇒ Heptageniidae	4.0	Scraper
⇒ Metretopodidae	2.0	Predator
⇒ Siphonuridae	7.0	Scraper
⇒ Baetidae	4.0	Scraper

Practice mayfly Identification
