

Field Identification of Freshwater Mussels

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Freshwater mussel taxonomy

- Four families in North America



- **Unionidae** = pearly mussels, naiads

- **Sphaeriidae** = fingernail clams



- **Corbiculidae** = Asian clam



- **Dreissenidea** = zebra mussel, quagga mussel



Freshwater mussel taxonomy

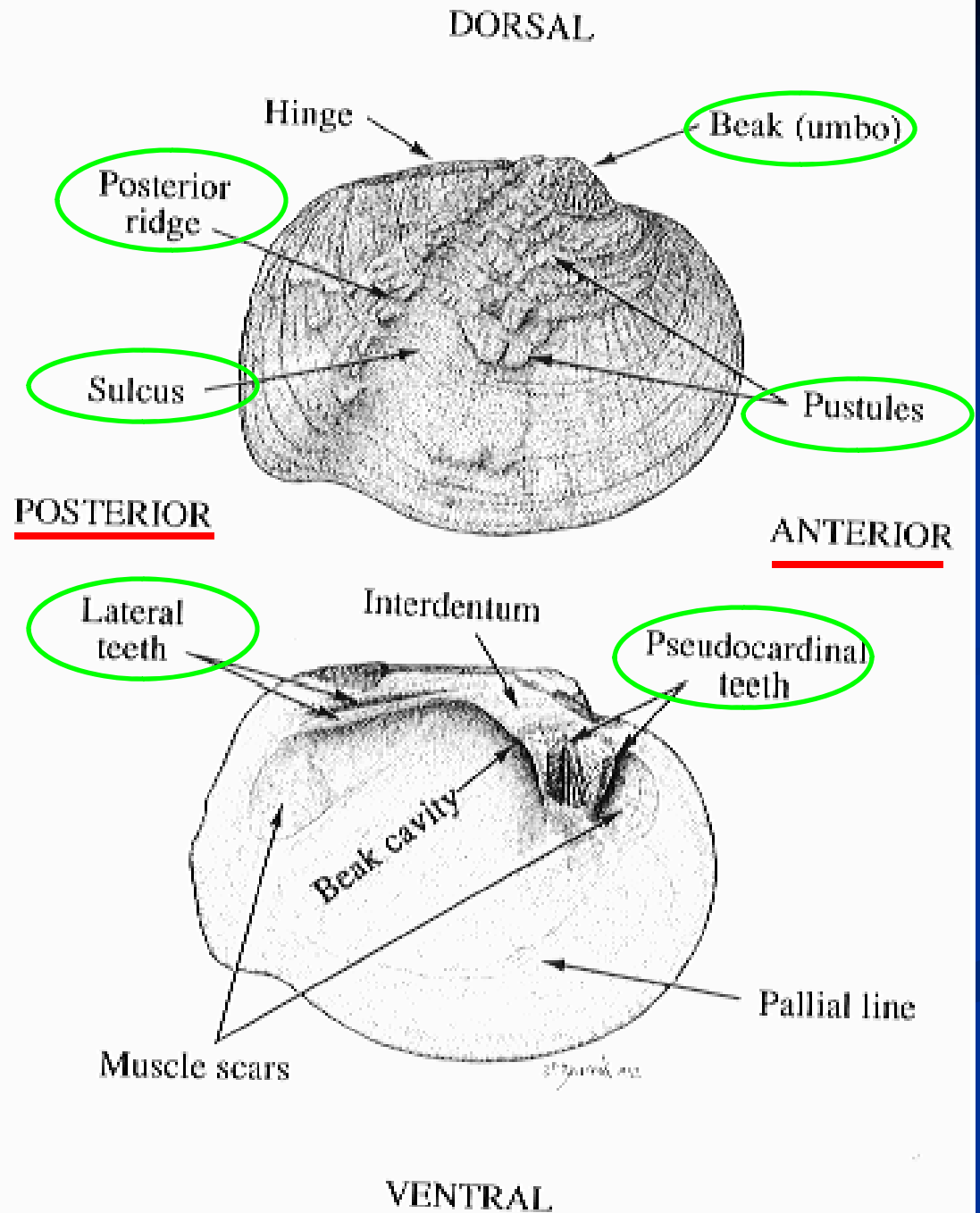
- **Taxonomy** is in flux...
 - Are *Lampsilis radiata* or *Pyganodon subgibbosa* real species?
- ...and **nomenclature** is a disaster
 - Pocketbook = *Lampsilis ventricosa* or *L. cardium*?
 - *Anodonta cygnea* has > 500 historically published synonyms
 - Don't get me started on **common names**...

General Shell Anatomy

Periostracum = dark(ish) shell exterior

Nacre = pearly shell interior

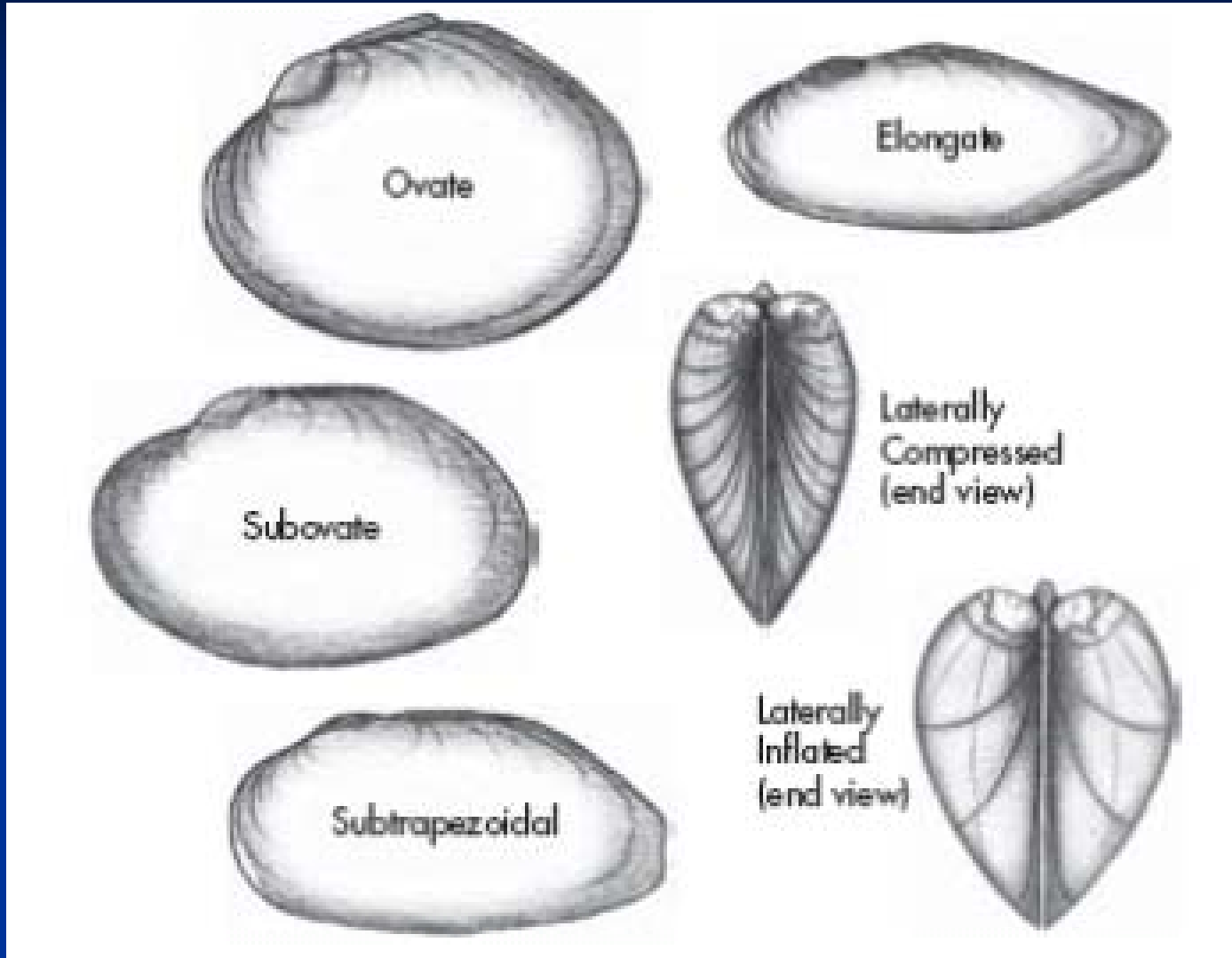
(Cummings & Mayer, 1992)



Useful Shell Characteristics

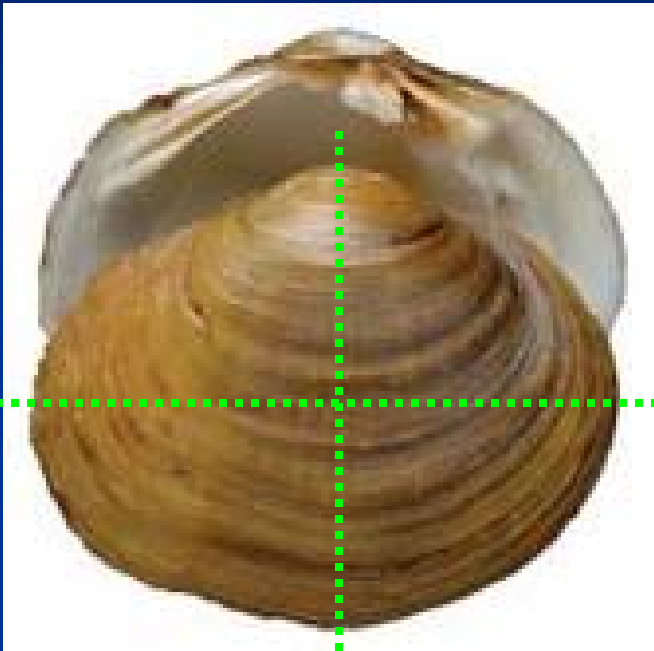
- General shell shape and symmetry
- Beak sculpture
- Pseudocardinal and lateral teeth
- Nacre
- Periostracum
- Pustules or ridges
- Sulcus
- Posterior “wing”
- Umbo position & prominence
- Shell thickness
- Growth lines
- Shell size

General Shell Shapes



(Connecticut DEP)

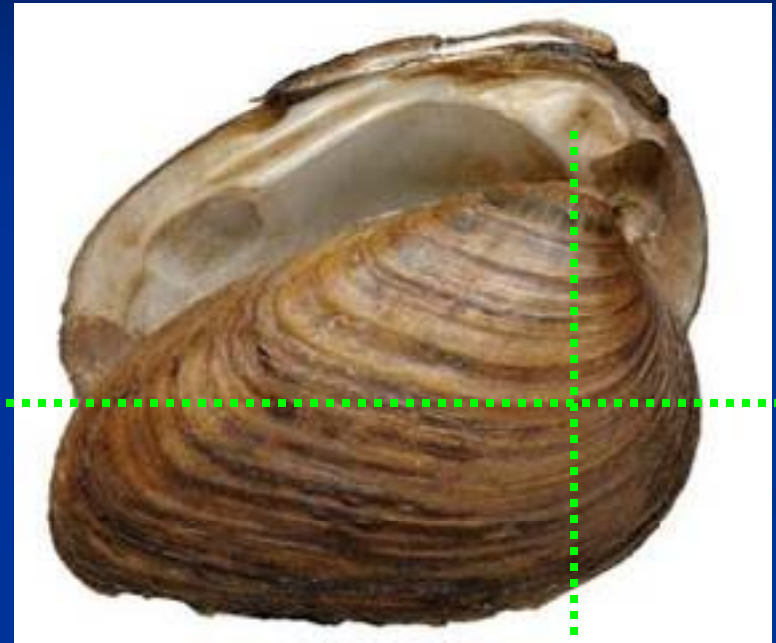
Shell Symmetry



Round Hickorynut

Obovaria subrotunda

Very symmetrical

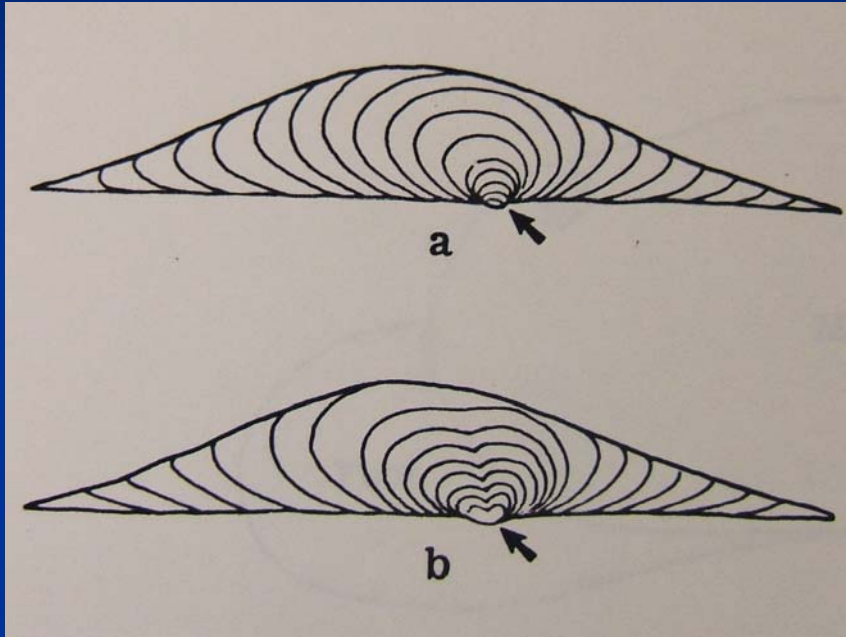


Clubshell

Pleurobema clava

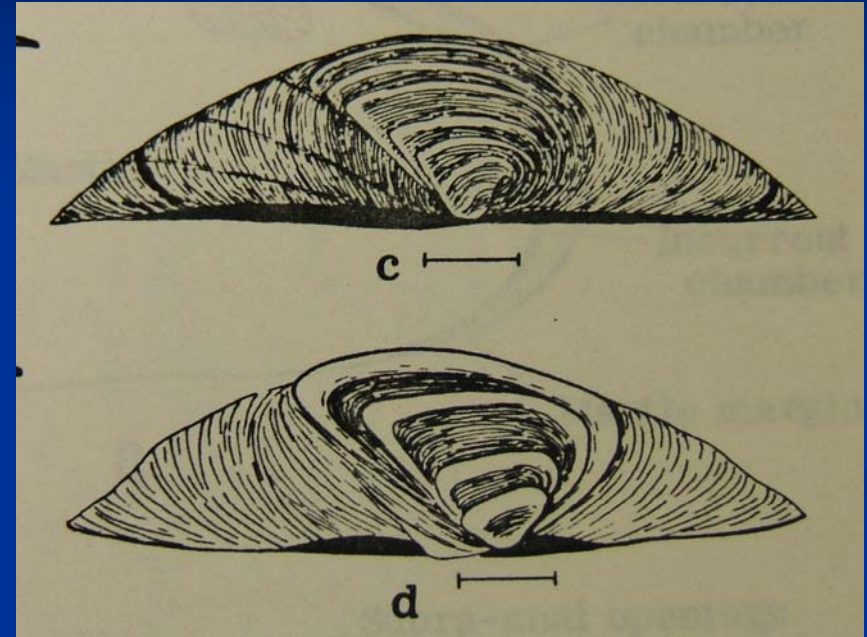
Very asymmetrical

Beak Sculpture



a. Single-looped

b. Double-looped



c. Fine major ridges

d. Coarse major ridges

(Burch, 1973)

Coarse, double-looped



Elktoe (= Ridged Wedge-Mussel)

Alasmidonta marginata

Pseudocardinal & lateral teeth

Pseudocardinal

Lateral



Purple wartyback

Common floater

“Lateral teeth heavy and strong; pseudocardinal teeth massive & serrate”

Toothless

Pseudocardinal & lateral teeth



Common floater

Toothless



**Strange floater =
Squawfoot**

**Pseudocardinal teeth
vestigial; swelling of the
hinge line**

Nacre color

Generally white or purple

Some species = 2nd color in beak cavity

Never rayed

Always lustrous in fresh shells



Wabash pigtoe



Spike

Nacre color: 2nd color in beak cavity

“suffusions
of yellow or
salmon”

white



Strange floater – *Strophitus undulatus*

Periostracum – color & rays



Pocketbook

Lampsilis ventricosa

Tan, with rays



Wabash pigtoe

Fusconaia flava

Dark brown, no/few rays

Pustules



Purple wartyback

*Cyclonaias
turburculata*



Threehorn wartyback

Obliquaria reflexa

Ridges



Fluted-shell

Lasmigona costata



Three-ridge

Amblema plicata

Sulcus (shallow furrow)



Mapleleaf

Quadrula quadrula

Posterior “wing”



White heelsplitter

Lasmigona complanta



Pink papershell

Leptodea laevissima

Umbo position – “Fusco-bemas”



Wabash pigtoe

Fusconaia flava

Closer to center

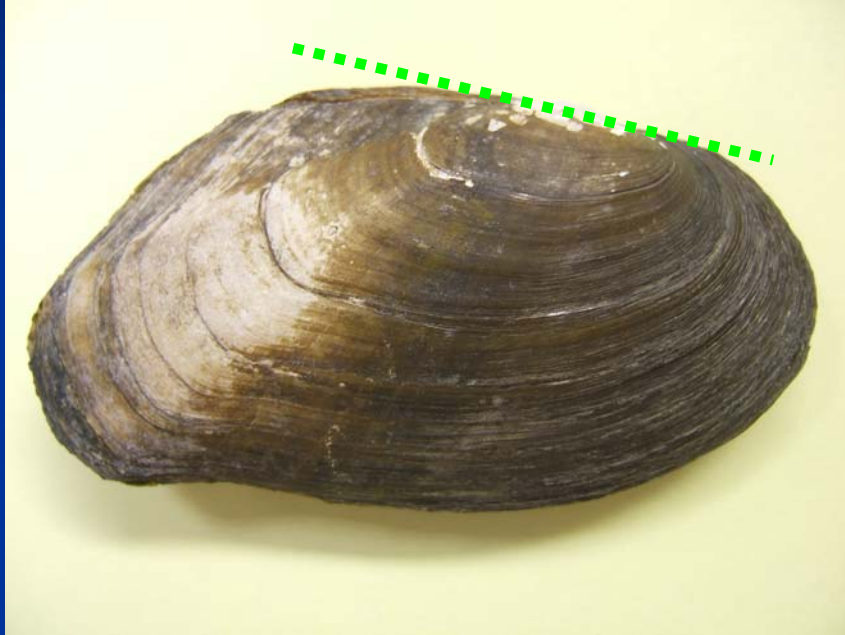


Round pigtoe

Pleurobema coccineum

Near anterior margin

Umbo prominence



Brook heelsplitter

Lasmigona compressa

Equal with hinge line



Elktoe

Alasmidonta marginata

Above hinge line

Shell thickness



Common floater

Pyganodon grandis



Mucket

Actinonaias ligamentina
(= *carinata*)

Growth line prominence



Wabash pigtoe – *Fusconaia flava*

Shell size (of mature specimens)



Black sandshell...Slippershell...dime

An aside: Age of dead shells

- Shell taphonomy
- “**Fresh dead**” = nacre lustrous, periostracum intact, sharp edges
- “**Long(er) dead**” = nacre chalky, periostracum flaking off or missing, rounded edges, calcium loss, hinge ligament missing

Paleo malacology

Soil core, from an old oxbow lake...500 to 1,000 years old



Keys to Mussel ID

- Practice, practice, practice
- Have a **shell collection**
- **“Gestalt”** ...a pattern of physical phenomena so integrated as to form a functional unit with properties not derivable by summation of its parts
 - a.k.a. **“gut feeling”** or **“Zen malacology”**

First thing in the field...

- **Collect dead shells from:**
 - Riffles
 - Point bars
 - Muskrat middens
- Hint on species present
- Local variation in shell morphology

Good luck!!



Round pigtoe – *Pleurobema sintoxia*

Mussel Monitoring by Volunteers

Pros

- Mussels are an important part of the aquatic community

Cons

- Need **permit** to collect; even shells
- A challenge to **ID**
- **Presence** tells you a **little** about **WQ**
- **Absence** doesn't tell you much; **WQ?**
Hydrology? Host fish?

One option, used by Friends of the Rouge

- Volunteers **photograph** mussels and shells found during bug surveys
- Volunteer coordinator does the **IDs**
- **“Significant” finds** (rare species, large beds) confirmed by volunteer coordinator, who has a scientific collector’s permit