

The distribution and structure of food bodies (pearl glands) in the Vitaceae

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122nd Annual Meeting Iowa Academy of Science, April 17, 2010

“Pearl Glands”



Vitis “Niagara”



Cyphostemma juttae

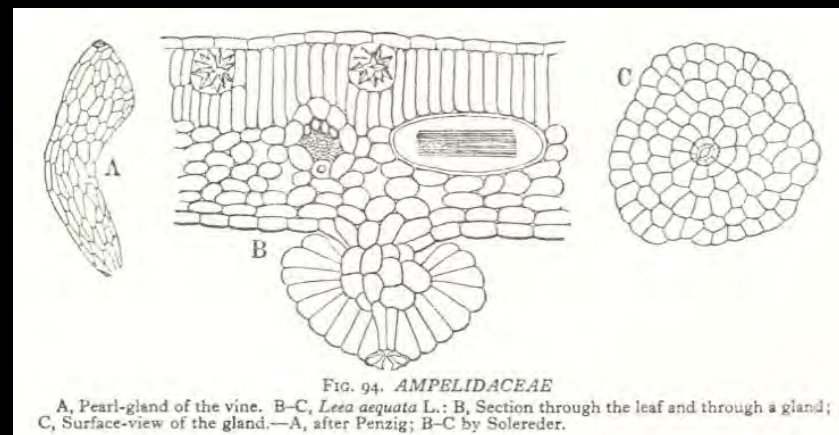


Ampelopsis humulifolia

“Pearl Glands”

Meyen (1837) – single or multicellular lustrous emergences on leaves and stems

Penzig (1878) – food bodies (no evidence)



Metcalf and Chalk, 1950, from Solereder, 1908

- Solereder (1908)
- large, usually spherical glandular hairs with short stalks
 - small epidermal cells, large polygonal internal cells
 - stoma usually opposite the stalk
 - rich in protein, fatty oils, sugars

CONCLUSION: significant as food bodies.

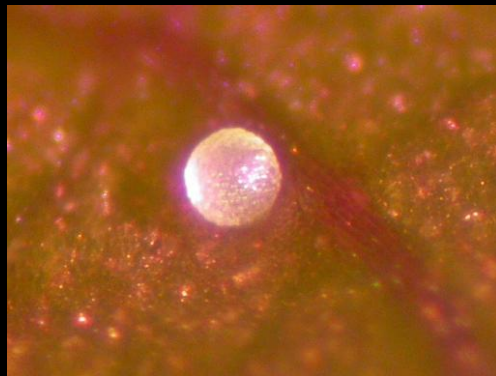
“Pearl Glands”

- Observed in several genera in the Vitaceae
- Position on plants appears random
- More common on vigorous vines in humid conditions
- No evidence that they secrete anything
- Wen (2007) Vitaceae
 - “commonly with multicellular, stalked, caducous spherical structures known as “pearl” glands.”

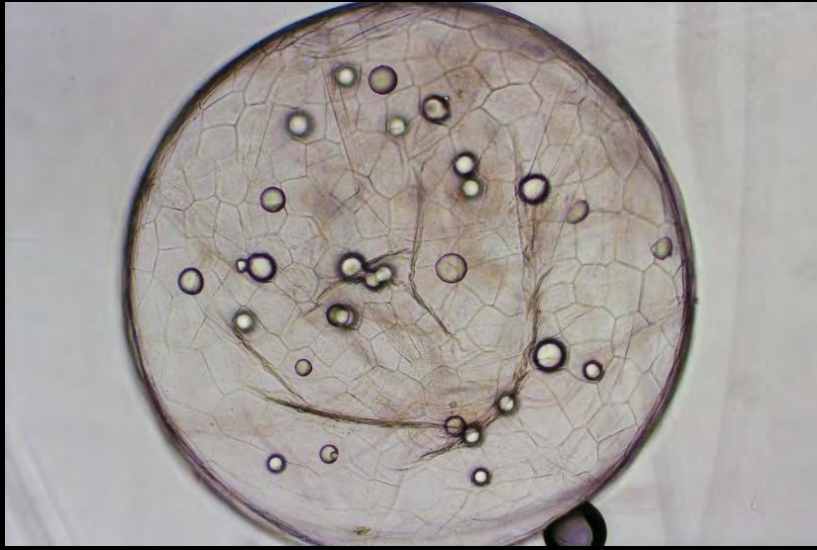
“Sap Pearls”

- May 22, 2009 newsletter, Iowa Wine Growers Assn.
- Reports of “what looked like insect eggs”
- Internet search by ISU Extension came up with “sap pearls”, the result of seepage from stomata on the shoots.
- Not common, only some cultivars
- Lots of ants present

Cissus sicyoides (*C. verticillata*)

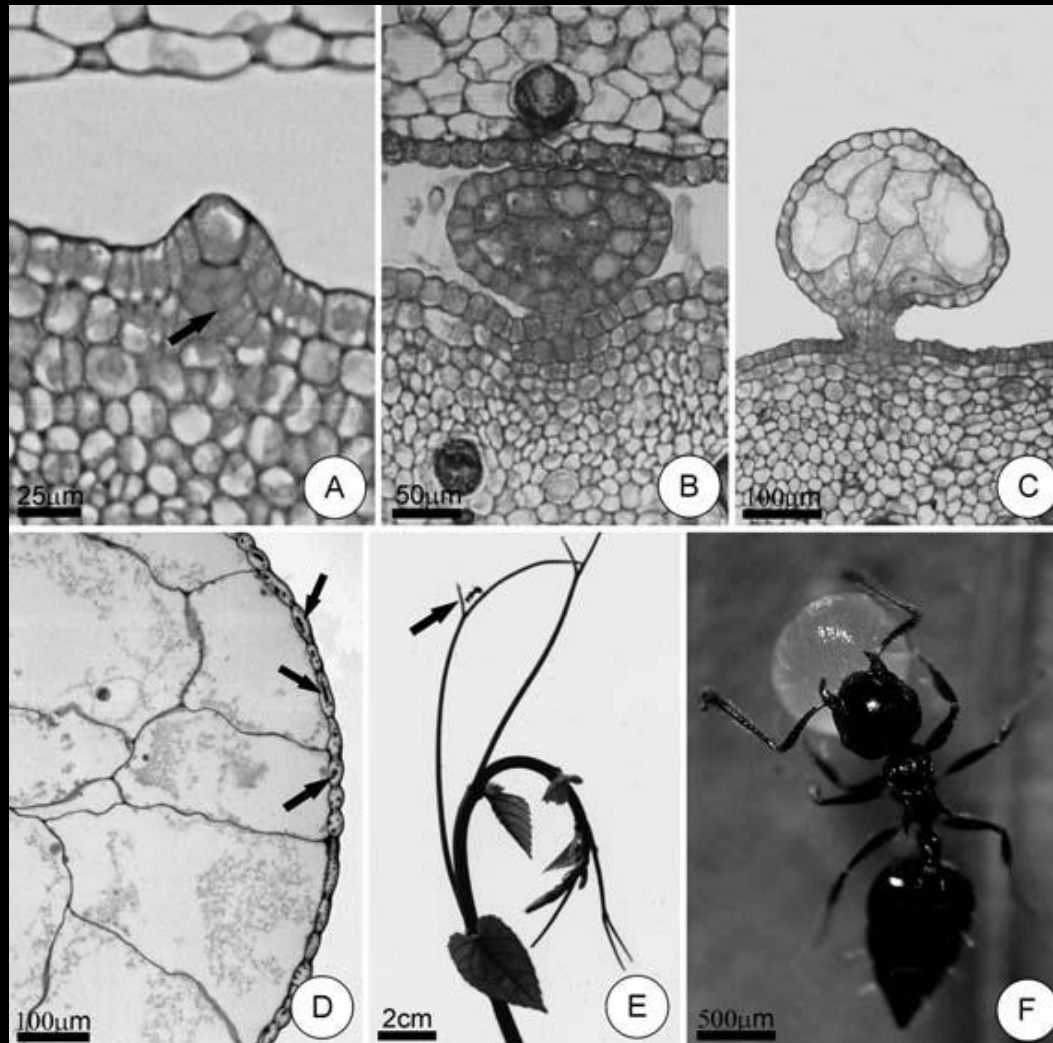


Cissus sicyoides (*C. verticillata*)

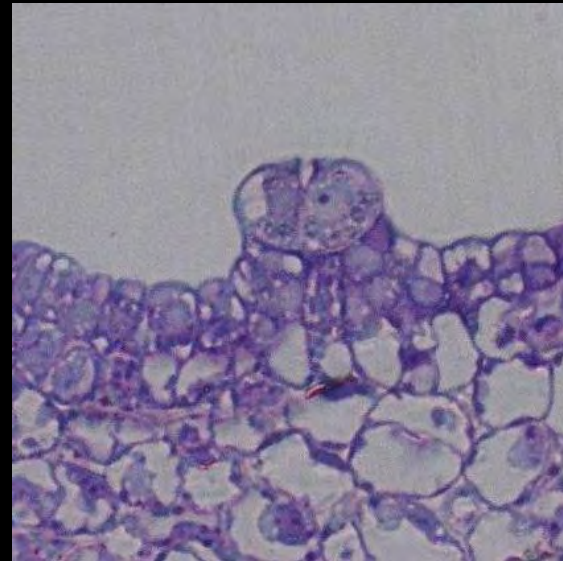
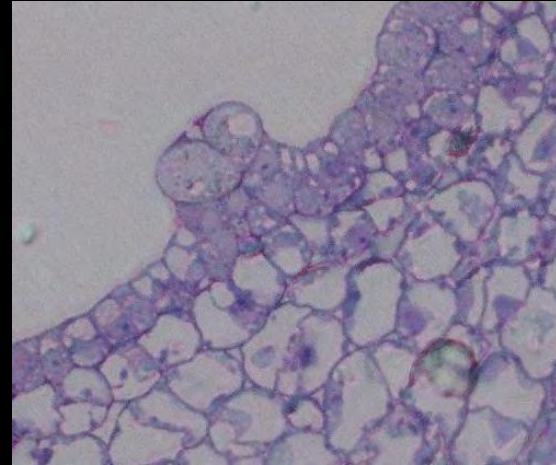


Similar in *C. quadrangularis*,
C. rhombifolia, *C. incisa*

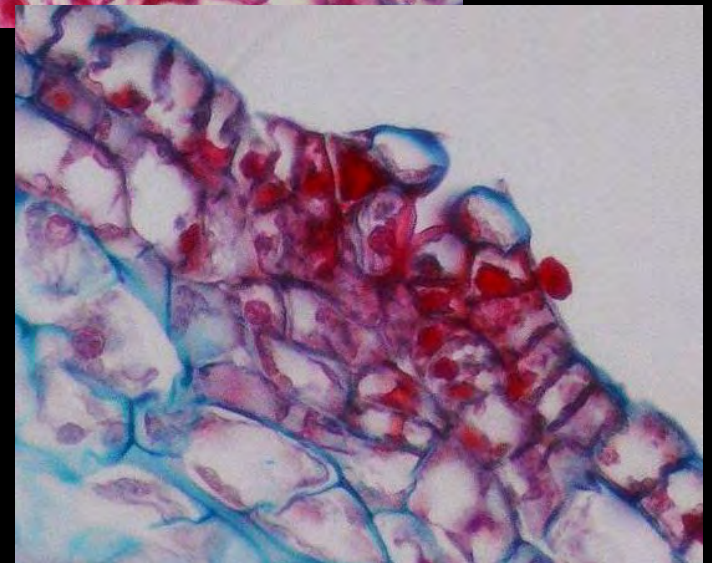
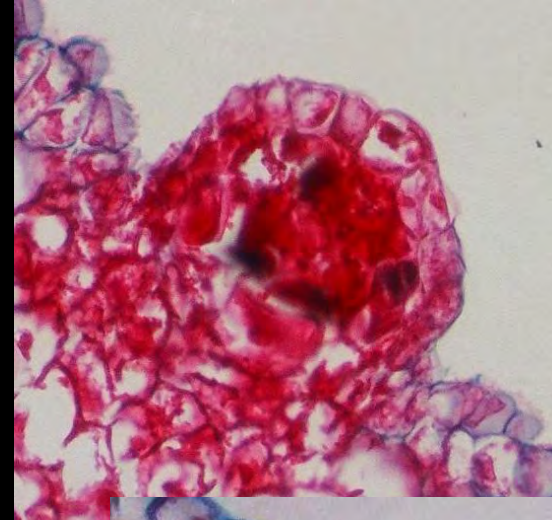
Cissus verticillata (*C. sicyoides*) Pearl Bodies



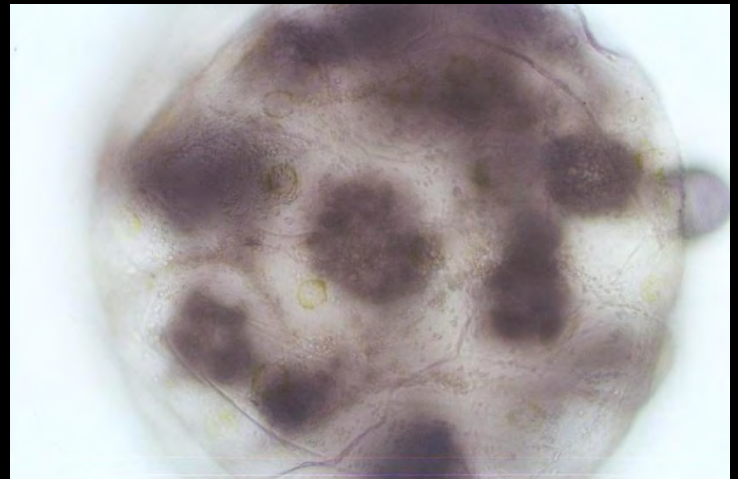
Vitis riparia



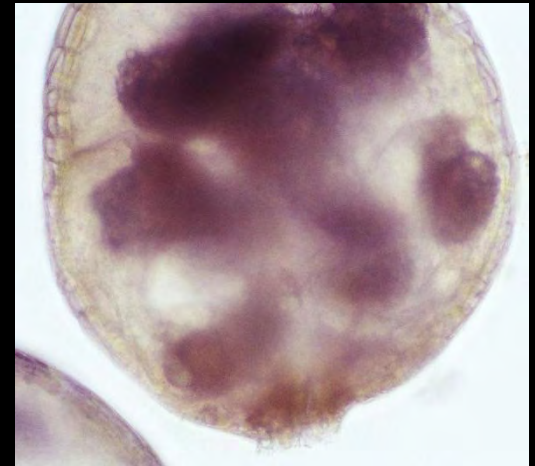
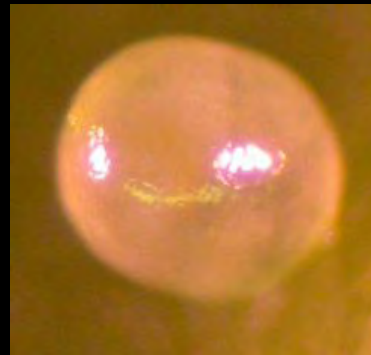
Ampelopsis brevipedunculata



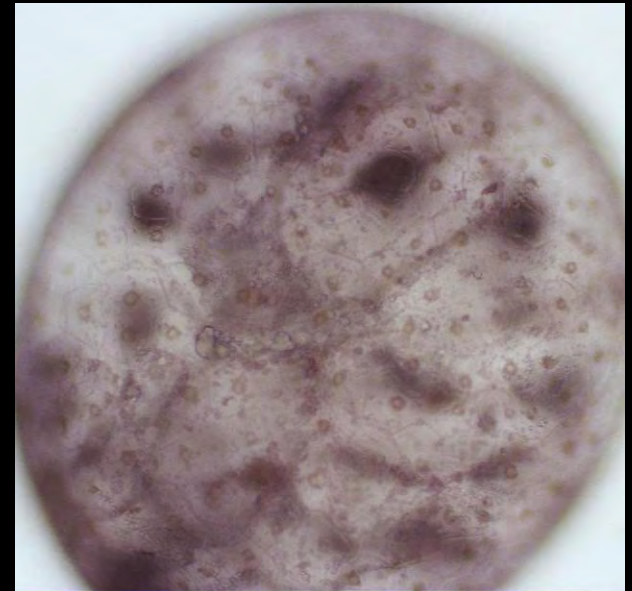
Cyphostemma simulans



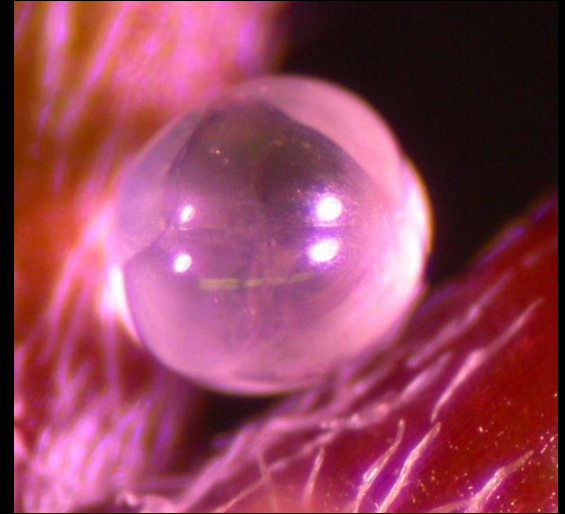
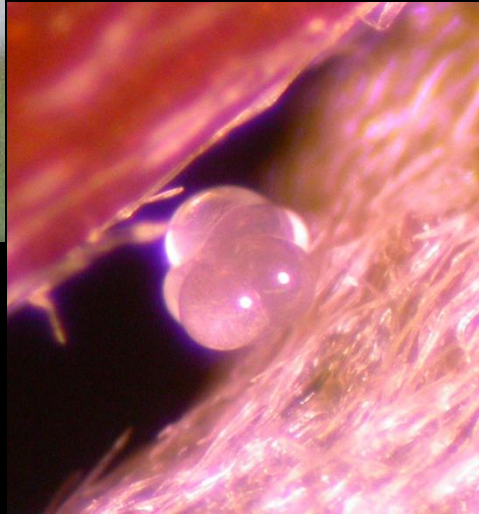
Cyphostemma juttae



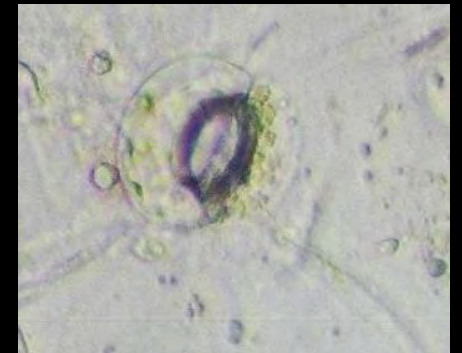
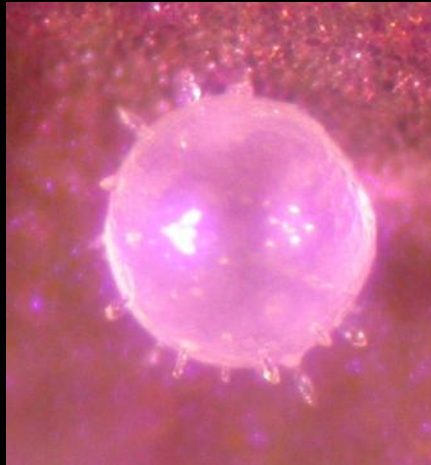
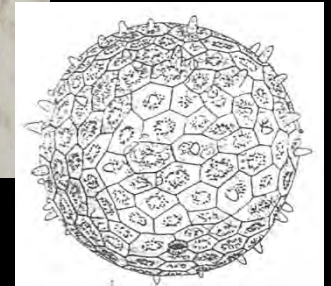
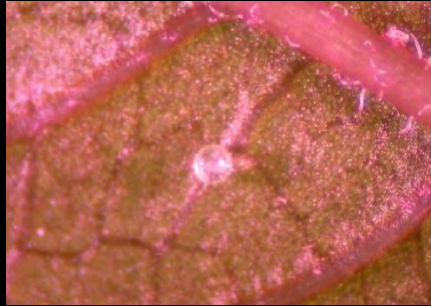
Cyphostemma bainesii



Rhoicissus digitata



Cayratia japonica (“*Vitis japonica*”)



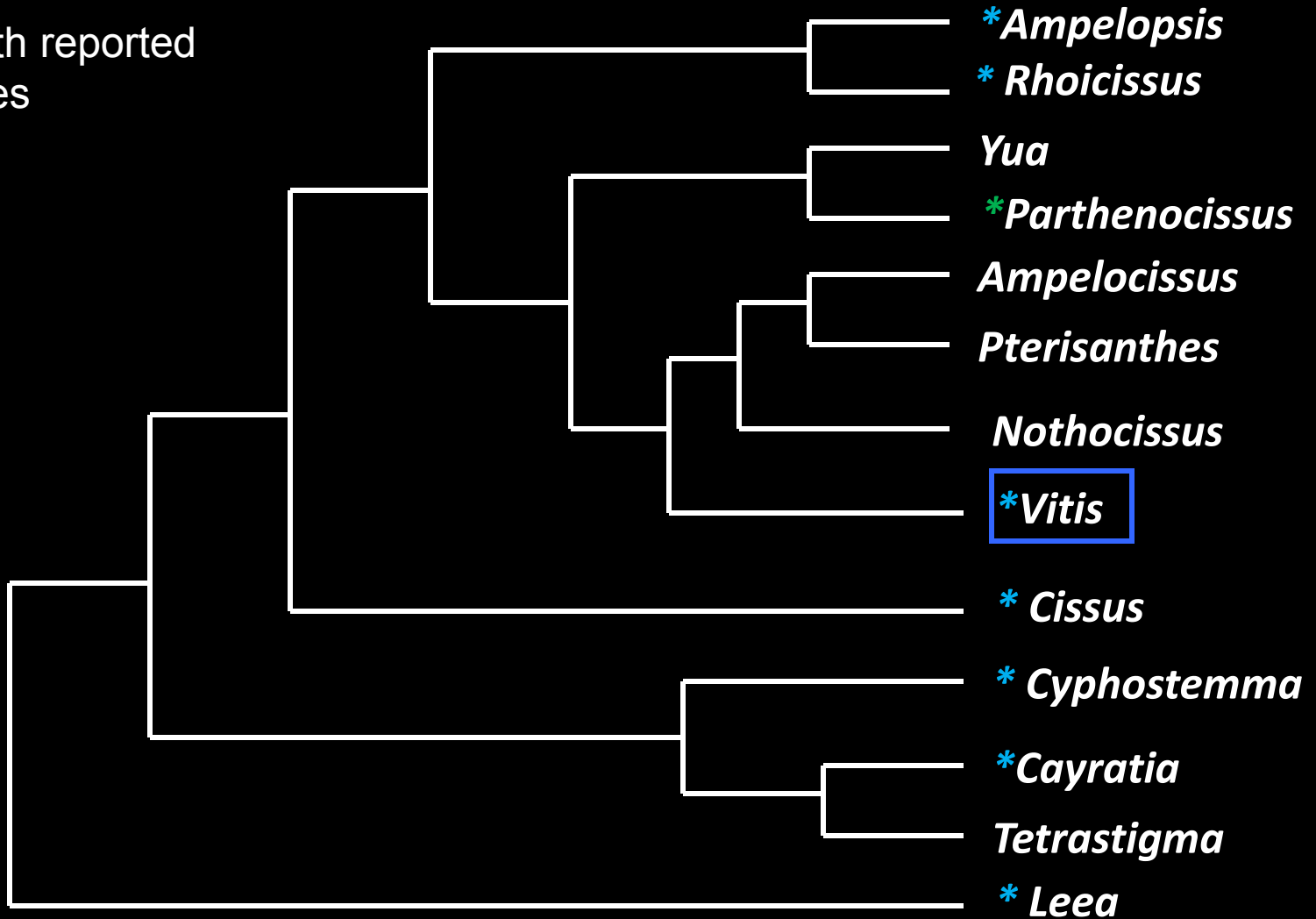
Walter (1921) – unique to this species

Vitis “Niagara”



Vitaceae Relationships

Genera with reported
pearl bodies



Conclusions

- Pearl bodies are likely present on all Vitaceae
- The German anatomists were right about the basics
- The relationship between stomata and pearl bodies needs further investigation
- They may be food bodies for ants (they love oils), but this needs to be better investigated
- If they have systematic significance it's subtle

Acknowledgements

- UNI:Greenhouse staff: Ron Camarata, Billie Hemmer, Stephanie Witte
- Students in vineyard and greenhouse: Mike Maddox, Jim Uthe, Madhav Nepal, John Holding, Lee Trebbien, Erin Gitchell, Robin Flattery
- U of Guelph: Usher Posluszny and lab
- U of Toronto: Nancy Dengler and lab
- Funding: Carver Foundation, UNI College of Natural Sciences, Iowa Grape and Wine Development Commission, Prem Sahai Distinguished Professorship
- NSF
- NSERC (Canada)