An Open Educational Resource for introductory / intermediate courses in eukaryotic biodiversity

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Abstract

Essential Biodiversity is an Open Educational Resource (OER) textbook in support of a one-semester lecture plus lab course in eukaryotic biodiversity at the 100/200 level. This free and adaptable resource describes the state of the field as of mid-2024 and surveys the four clades of eukaryotic "supergroups." It particularly emphasizes the diversity of major animal phyla and causes of infectious disease in humans and domestic animals. The text features up-to-date, streamlined, and intuitive cladograms constructed using evidence-based best practice methods, which help students avoid common pitfalls in interpreting trees. It includes detailed, accessible dissection figures and guides, with a wealth of original, Creative Commons-licensed, and public domain images facilitating functional anatomy interpretation. The laboratory components feature guided inquiry and active learning exercises, challenging students to integrate concepts as they examine specimens. The text is now in a second edition and has improved student access to high-quality academic materials at several universities and high schools.

Introduction

The accelerating adoption of Open Educational Resource (OER) texts has markedly improved student access to quality and reasonably up-to-date materials. While high-profile offerings like *Biology 2e* (OpenStax) increasingly serve as foundational texts for introductory biology, in-depth exploration of subdisciplines requires and awaits the development of dedicated OERs.

Essential Biodiversity fills the vacant niche of an OER surveying **eukaryotic biodiversity at the 100/200 level.** It was developed around a cladistic ("Tree of Life") framework, placing central importance on **interpreting the key adaptations, trends, and interdependencies of organisms in the context of their actual evolutionary history.** Students are encouraged to focus on the *hows* and *whys* of biodiversity, rather than memorizing a massive set of facts and terms.

Updated for 2024, *Essential Biodiversity* is a state-of-the-field text that is **freely available to download, use, and adapt (CC BY-SA 4.0).**

Accessible, Up-to-Date, Cladistic Approach

- Focused "Tree of Life" narrative and emphasis on shared-derived characters throughout text.
- Cladograms developed using **evidence-based best practices,** current as of mid-2024.

Sample cladogram for **Archaeplastida**.
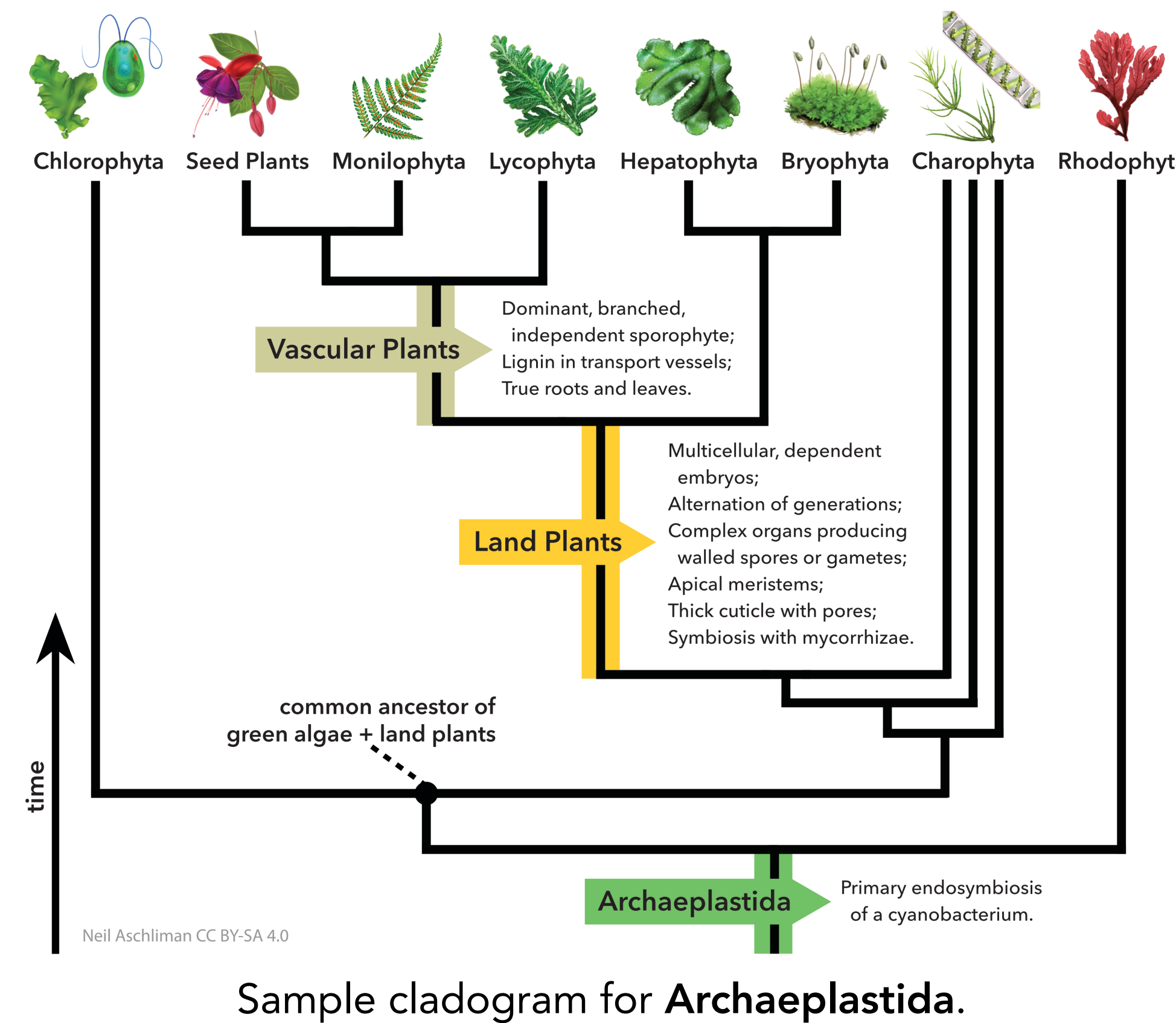
Active-Learning & Guided Labs
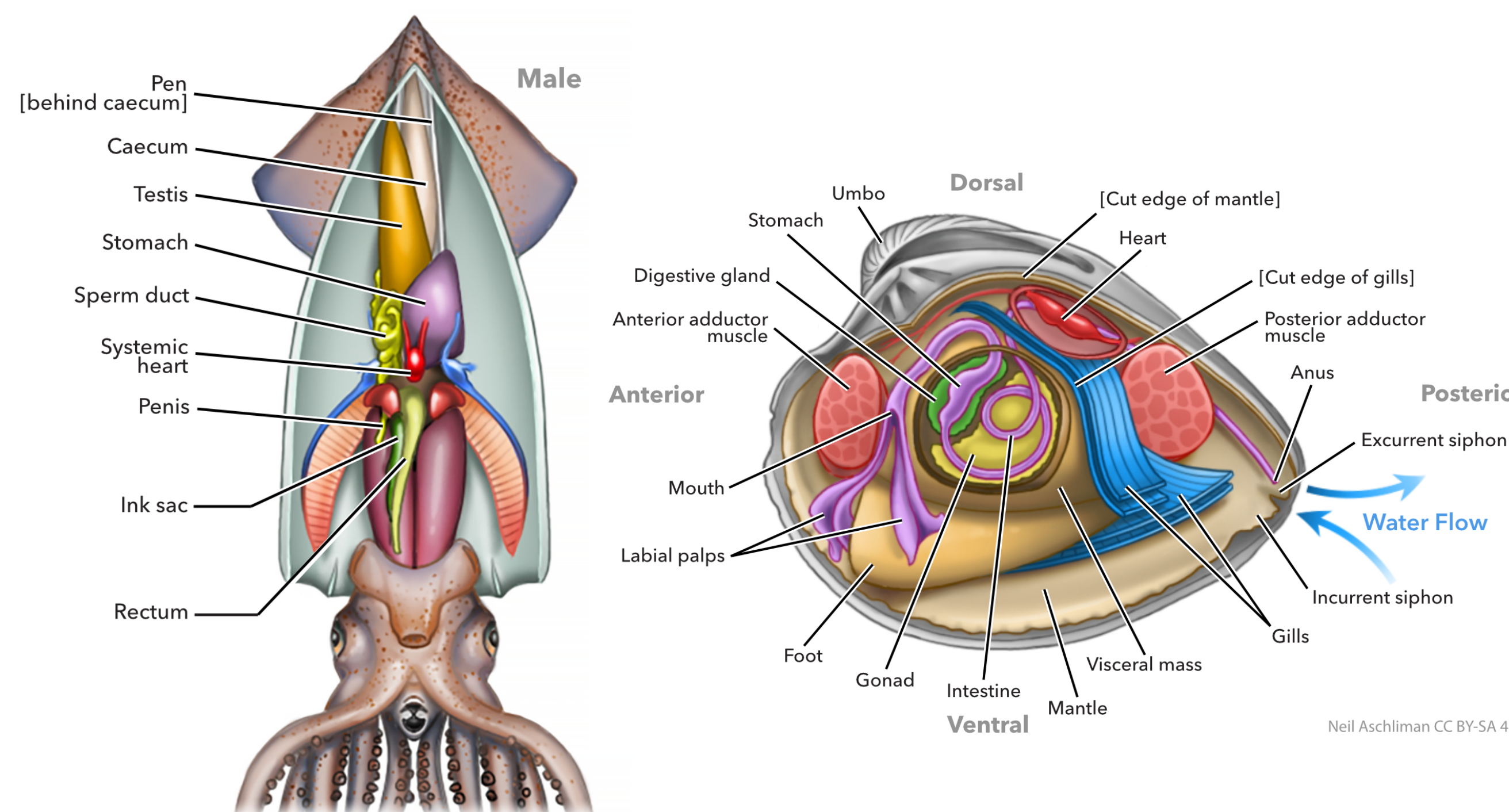
Sample illustrations for **Squid dissection** (left) and **Clam dissection** (right).

- **Comprehensive lab exercises:** guided explorations including dissection, microscopy, and observation of live specimens.
- A number of **original illustrations** facilitating dissections.
- As an OER, coverage of specimens can be modified to fit your home institution's collection.
- Activities with live specimens are IACUC-safe (no vertebrates or cephalopods).

Free Download & Call for Collaborators!

https://tinyurl.com/y32djr76

Download a free .pdf of *Essential Biodiversity 2.0* using the QR code or link above.

Actively seeking collaborators!

- Content reviewers
- OER publishing partners
- Educational field testers
- Future content development

If interested in collaborating or providing feedback on the text, please contact the author at **AschlimanNeilC@sau.edu** (contact information also included in the text).

Literature Cited

- [Extensive bibliography in textbook.]
- Neil Aschliman. 2024. *Essential Biodiversity, 2.0.* Open Educational Resource, CC BY-SA 4.0. 273 pp.

Acknowledgments