

Botany 422 – Biogeography – Exam 2 study sheet

I. Optional: Read text for chapters covering material that is new to you (these in order of how topics presented):

Chapter 4: Distribution of Single Species [pp. 65- 71; 77-84]

Chapter 10: Geography of Diversification [pp. 327-348; 358-366]

Chapter 7: Speciation and Extinction [pp. 177-207]

Chapter 10: The Geography of Diversification [pp. 380-386]

Chapter 8, Intraspecific Variation and the Ecotype Concept [pp. 148-171]

Chapter 2: The History of Biogeography [pp. 13-26]

Chapter 8: The Changing Earth [pp.227-261]

Chapter 11: Reconstructing the History of Lineages [pp. 389-404]

Chapter 12: Reconstructing the History of Biotas [pp. 421-450]

Chapter 11: Reconstructing the History of Lineages [pp. 404-408]

Chapter 12: Reconstructing the History of Biotas [pp. 450-457]

II. Floristic Biogeography

Know the main kinds of distribution patterns

What are various kinds of endemics?

What does provincialism mean?

What is the general “area” pattern (allopatric vs. sympatric) seen in closely related vs. distantly related species?

What are the four main floristic hierarchical levels and how are they generally delimited?

Floristic kingdoms: what are they and where are they located?

How do floristic kingdoms and faunistic provinces compare and contrast?

III. Evolution

Understand the historical setting in biogeography both from the perspective of geological and biological evolution

Evidence for evolution; know how biogeography contributes towards the formulation of evolutionary theory

Anagenesis vs. cladogenesis: what is the difference?

What is an ecotype? Why is it important in biogeography? What is a cline? *Read chapter 8 from Briggs and Walter*

Know the basic steps in allopatric speciation; how is the "island" type of allopatric speciation different?

How do allopolyploid species form?

IV. Historical Biogeography

Know the main players and what they contributed or believed concerning earth history and/or organism history (Linnaeus, Buffon, von Humboldt, de Candolle, Darwin, Wallace, Hooker, Cain, Wegener, Rosen&Nelson&Platnick)

Dispersalism vs. vicariance: is this a black and white issue? Be able to defend your answer. *Read Stace in handouts*

Center of origin idea; how is this idea still around today?

Filters, corridors, and sweepstakes routes: what are they and give an example?

Evidence for continental drift (sea floor spreading + plate tectonics)

Know basics (!) of systematics/phylogenetics (cladistics)

What is different in the way phylogenetic and cladistic biogeography work and in their assumptions? What are the steps in phylogenetic or cladistic biogeography? What are some problems with these approaches? *Note: this kind of question and/or work problem will be part of the take home exam portion.*

V. Relationships of Floras

How does knowledge of “clocks” as well as of “continents” and “clades” help in answering questions of vicariance vs. dispersal?

Relate continental drift and other geological phenomena to the relationships of floras in temperate and tropical southern hemisphere continents.

Is vicariance or dispersal or both important in explaining the disjunct patterns of the southern hemisphere? Between Southern Hemisphere temperate vs. tropical floras? Between South American and African mammals?

What is the boreotropics hypothesis?

Is there a Wallace line? If so, what evidence is there for it (from animals, from plants)? Why would there be such a line?

What is known about the "ArctoTertiary" Flora? Why are these peculiar disjunct patterns seen today? What does recent molecular systematic studies suggest about the formation of these disjunct patterns? *Read article by Donoghue and Smith (2004)*

VI. Phylogeography – April 1, Monday, lecture material will NOT be on the 2nd exam

VII. Greenhouse Tour!

Take it!