

Botany 400 – Plant Systematics
Potential questions for Exam 2

1. How have flavonoids been used in plant systematics?
2. How many times have mustard oils evolved in plants - bring in the molecular phylogenetic results (read Edger et al. paper)? What has spurred species diversification in Brassicales and butterflies that feed on them (read Edger et al. paper)?
3. What are the main defining features of the Caryophyllids? List at least two ways that Rosids can be differentiated from Asterids.
4. Fruit types are important field characters to identify plants to family. Listed below are pairs of fruit types that we have discussed in examining the Rosids. Clearly differentiate between each type in a pair.
drupe vs. nut; follicle vs. legume; silique vs. capsule; pepo vs. berry; aggregate vs. multiple; pome vs. drupe; achene vs. nut
5. Listed below are 3 sets of families/orders and field characters. Match the one best correct family/order to each field character. (A correct answer is one that is true for most members of the family.) [You would then have to match the required families or orders to the field characters - see other handouts and powerpoint that cover these required groups]
6. Given below are morphological data for 4 species (A, B, C, D) and an outgroup species. Four characters have been scored and the character states for each of the species are given. [You would then be asked to decide which tree is most parsimonious based on cladistics, and be able to identify derived and primitive character states]
7. What are the essential differences in the phylogenetic approaches of cladistics and phenetics?
8. Differentiate between "paraphyly" and "monophyly" and give an example that was talked about from plants that relates to this issue.
9. What is coevolution? Using the example of figs and their wasp pollinators and phylogenetic relationships, indicate how that system might be considered a good example of coevolution.
10. Describe how the catastrophic [quantum] model of speciation differs from the conventional (geographic) model of speciation.

11. Describe how the two types of geographical speciation (conventional vs. island) differ, and bring in the ideas of founder events, isolation, and genetic drift.
12. What are isolating mechanisms (give two examples) and why do biosystematists who utilize the "Biological Species Concept" study these mechanisms?
13. Are plant species so prone to hybridization that "species" are not really real (read Rieseberg paper)?
14. Describe and illustrate how an allopolyploid species can arise.
15. What are the steps required in the formation of a hybrid species through homoploid hybrid speciation (i.e., not involving chromosome number increase)?
16. Describe the main differences you would find between the floral characters of a bee- and a bird-pollinated plant.
17. How have pollination shifts in the African violet family spurred species diversification (read Serrano-Serrano paper)?