

Study Guide for 3rd Midterm

1. What role does critical size play in the metamorphosis of the tobacco hornworm and in caste determination of *Pheidole* ants?
2. How does juvenile hormone regulate insect metamorphosis and/or caste development? What kind of extrinsic environmental factors affect the regulatory role of juvenile hormone?
3. Describe the differences between the solitary and migratory phases of migratory locusts. What kinds of environments do you suppose each phase is adapted to? Explain your answer.
4. Under what circumstances should the pupal stage of endopterygotes be eliminated or reduced? Why?
5. Describe two hypotheses that account for complex life cycles as seen in insects. What kind of data would you need to test between them?
6. Distinguish between intrasexual and intersexual selection. Give an insect example of each.
7. What is the paradox of the lek? Develop (describe) three hypotheses that solve the paradox. Be sure to discuss how you could distinguish between these hypotheses.
8. Explain what is meant by alternative mating strategies. Give an example from insects. Discuss two ways alternative-mating strategies could be maintained in a population.
9. Distinguish between cospeciation and coadaptation. Give an example of each. Can you get the occurrence of one without the other? Explain your answer.
10. Explain sister-group analysis of adaptive radiation. Use a specific example to illustrate your explanation.
11. What evidence is there that phytophagy is an evolutionary innovation that subsequently leads to an explosive adaptive radiation in insects?
12. Using an example, demonstrate how you could test for the presence of cospeciation (the presence of phylogenetic congruence).
13. What is the difference between Batesian and Mullerian mimicry? How might these forms of mimicry have evolved? Why does Mullerian mimicry lead to convergence selection and Batesian mimicry lead to direction selection on the participants?
14. Give four reasons why conspicuousness (aposomatic coloration) is advantageous for warning predator?
15. Outline three ways aposomatic coloration might have evolved from cryptic coloration.

16. What are the four kinds of data that forensic entomologists collect at a crime scene? What kinds of crimes can these sorts of data help solve?
17. What orders of insects are the most important provide forensic data from crime scenes.