



## DNA Barcoding Applications – Zoology and Conservation

### Analysis Questions

- 1) Biodiversity can be defined as the profile of different living organisms that exist in a given location. In particular, the biodiversity of insects and invertebrate animals is astounding. For each of the following groups of organisms, give approximate estimations for how many species are currently known globally:
  - a. Ants: \_\_\_\_\_
  - b. Beetles: \_\_\_\_\_
  - c. Spiders: \_\_\_\_\_
  - d. Amphipods: \_\_\_\_\_
  - e. Mites: \_\_\_\_\_
  - f. Fish: \_\_\_\_\_
  - g. Reptiles: \_\_\_\_\_
  - h. Mammals: \_\_\_\_\_
  - i. Flowering Plants: \_\_\_\_\_
  
- 2) Identifying organisms, especially invertebrates, is not always an easy task. DNA barcoding can be a powerful tool to help identify particularly cryptic groups of species.
  - a. State three advantages of DNA barcoding over traditional taxonomy for species identification:
  
  
  - b. State three limitations of DNA barcoding for species identification:
  
- 3) One of the major goals of most zoological institutions is the preservation and conservation of sensitive or threatened species. Discuss at least two ways that DNA barcoding can be used to study threatened species in a *non-invasive* way.
  
  
- 4) The illegal wildlife trade is a multibillion-dollar black market industry, threatening species worldwide. You are a Fish and Wildlife Agent at an international airport, and intercept a package containing goods that you suspect are made from elephant ivory. Design an experiment using DNA barcoding that would help confirm the material is ivory and determine what elephant species it was derived from. Propose a *reasonable target gene* and *briefly describe* the steps of the process. Don't forget about controls! Assume you have whatever materials you think you need to carry out your experiment.