Name: _____

Herpetology
Fall 2016
Exam 1

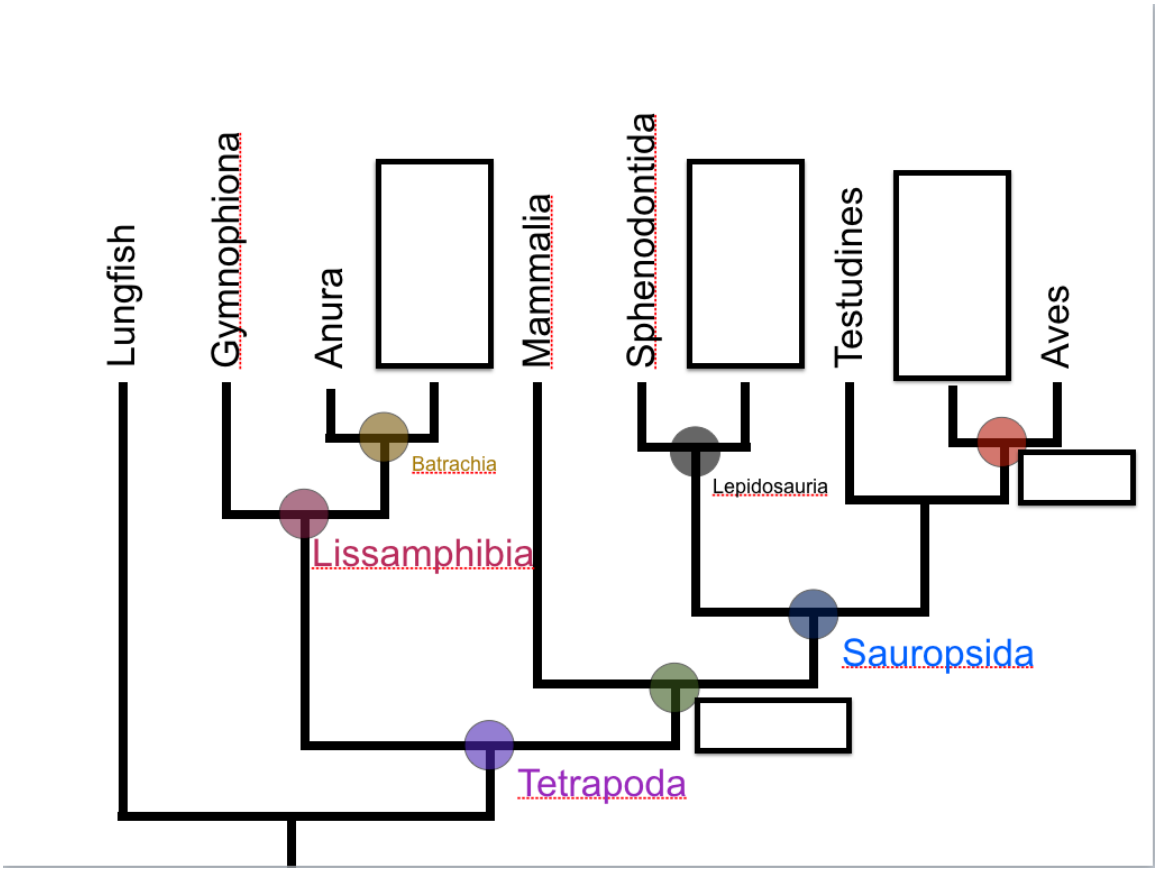
Question	Points	Score
1	20	_____
2	20	_____
3	20	_____
4	20	_____
5	20	_____
Total	100	_____

1. A. We can learn about tetrapod origins from the fossil record. Give one example of something we learn by looking at fossils of early tetrapods, and explain how the fossils give us this information (10 points).

B. We can learn about the evolution of tetrapods by studying developmental biology. Give one example of something we learn by looking at development, and explain how developmental patterns give us this information (10 points).

(20 points)

2. Fill in the missing names.



3. Herps face major challenges in dry environments. How do they manage to survive in extremely dry places like deserts? Make sure to list specific adaptations, and include examples that cover reptiles and amphibians.

4. This figure is from Portik and Blackburn 2016. On the next page, please write two paragraphs about this figure. In paragraph 1, tell me about all the colored dots in the figure. What are they? What do they mean? How are they calculated, in broad terms? In paragraph 2, give a short summary of what this figure is telling us about the evolution of frog reproductive modes.

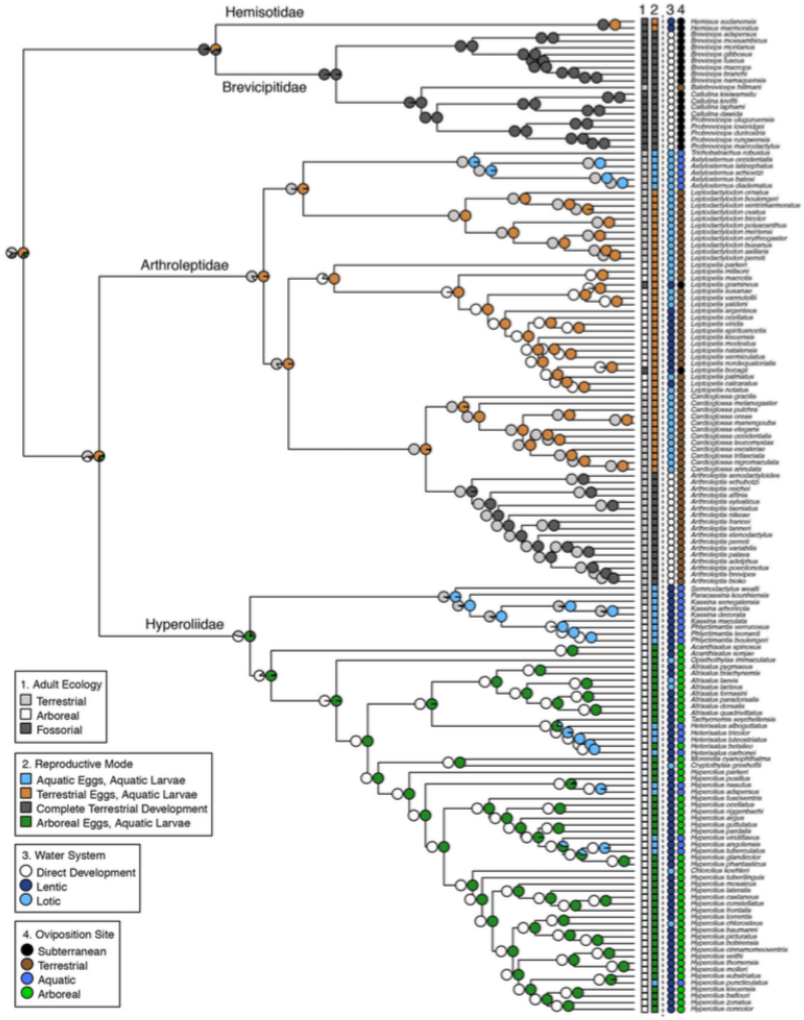
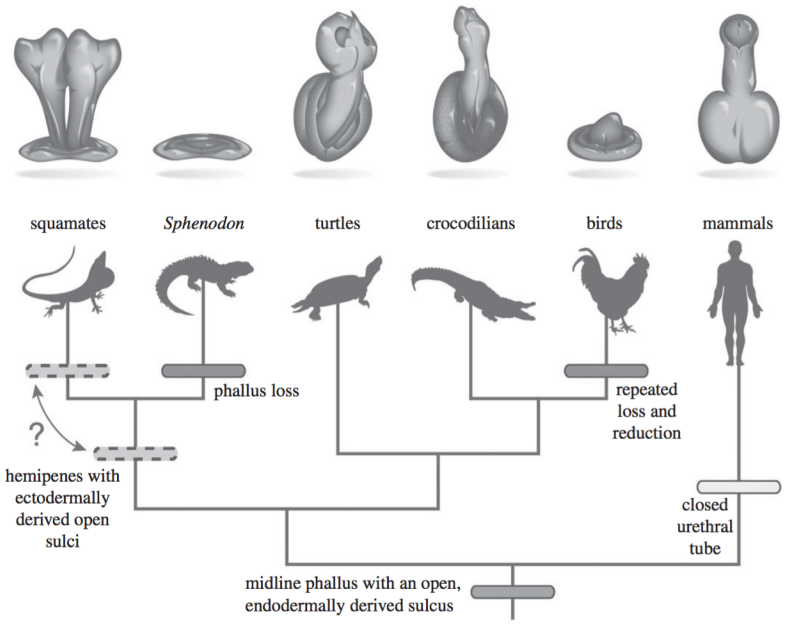


Figure 2. Mapping of ecological, habitat, and reproductive character states onto the expanded sampling time-calibrated phylogeny of Afrobatrachians. Boxes represent characters used for ancestral state reconstructions, with pie charts at nodes representing posterior probabilities of character states. Circles represent characters used for correlated evolution analyses. Numbers above boxes or circles match to character legends.

5. A. Using this figure from Sanger et al., describe the evolution of the phallus across amniotes.



rsbl.royalsocietypublishing.org Biol. Lett. 11: 20150694

Figure 2. A resolved hypothesis regarding the evolution of amniote external genitalia. Our observations suggest that the phallus evolved once and diversified among amniote lineages. We cannot determine if the lepidosaur ancestor possessed mature hemipenes, but the embryological programs that pattern the cloaca and hemipenes of extant squamates likely evolved before the divergence of Rhynchocephalia and Squamata. Phylogeny after Chiari *et al*. [24].

B. If you made a similar figure for amphibians, what patterns would it reveal?

Extra Credit: Is this thing more closely related to a whale, a T-rex, a chicken, or a alligator lizard?