lab6_questions_and_maj_answers

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Chosen Question:
Are salamanders more closely related to frogs than to lizards?

Q1: Question 1: Write down a few sentences on the selection of species and outgroup in your dataset. Which species did you choose and why?

Choice of species for each group

Observation 1: What we label as 'salamanders' are all species in the order 'Caudata'.

Observation 2: What we know as frogs, are grouped into the order 'Anura' which also includes toads as well. I've chosen to focus solely on "frog" species for simplicity.

Observations 3: What we label as 'lizards' is quite a wide and diverse set of species all within the order 'Squamata'. In this order we have among others: geckos, iguanas, chameleons and others as well ("source": https://en.wikipedia.org/wiki/Lizard)

I chose to include around 6-7 species for each of the above three organism groups. I felt that this number struck a good balance between having enough species to account for the diversity with each group and having a manageable dataset. As advised, I tried to include a variety of different families as good as possible to cover each group.

ps:

from the table below, I noticed that frogs and salamanders are in the same class Amphibia which means that the true results of the project question have kind of already been spoiled. In, this case, I now view the goal of the project being to come to the same conclusion based on my own gathered limited data...

	Frogs	**Lizards**	**Salamanders**
Kingdom	Metazoa	Metazoa	Metazoa
Phylum	Chordata	Chordata	Chordata
Class	Amphibia	Lepidosauria	Amphibia
Order	Anura	Squamata	Caudata

Out-group strategy and my initial misstake: My first choice of out-group was Primates(+ orangutangs). Unfortunately, only after having gathered all mitochondria and *cytB* files did I find out that this can be quite problematic because I could be dealing with a group that actually isn't an outgrip. [idea here being that the mammalian branch bifurcating after the reptile/amphibian bifurcation]. Once noting this, I opted for "sharks" as a proper outgroup and made sure this was a proper choice via taxonomy browser and reading on the evolutionary history of large animals on earth. Currently my belief is that sharks make for a close enough 'outgroup' such that multiple alignment of their mitchoondiral and *cytB* sequences are "doable" with our three focus groups while at the same time being a proper outgroup.

Just for the fun of it and out of curiosity I chose to include my 'primates' sequences and incorporate them in the project. I don't believe currently that this will result in any negative influence on the original project question. We'll have to see in the next lab.

Below are all the chosen species for each group and their respective NCBI links to their mitochondrial genomes.

Frogs

Pelophylax cretensis (Greek marsh frog)
https://www.ncbi.nlm.nih.gov/genome/34644?
genome_assembly_id=213159

Rana amurensis https://www.ncbi.nlm.nih.gov/genome/44799?
genome_assembly_id=274791

Xenopus borealis https://www.ncbi.nlm.nih.gov/genome/15225?
genome_assembly_id=46277

Rana temporaria (common frog)
https://www.ncbi.nlm.nih.gov/genome/81559?
genome_assembly_id=578335

Amolops ricketti https://www.ncbi.nlm.nih.gov/genome/31731?
genome_assembly_id=55840

Salamanders

Necturus beyeri (Gulf Coast waterdog)
https://www.ncbi.nlm.nih.gov/genome/24110?
genome_assembly_id=50239

Ambystoma texanum (smallmouth salamander)
https://www.ncbi.nlm.nih.gov/genome/9562?
genome_assembly_id=38958

Andrias japonicus (Japanese giant salamander)
https://www.ncbi.nlm.nih.gov/genome/7695?
genome_assembly_id=37673

Batrachoseps nigriventris (black-bellied slender salamander)
https://www.ncbi.nlm.nih.gov/genome/41039?
genome_assembly_id=256257

Hynobius leechii (Gensan salamander)
https://www.ncbi.nlm.nih.gov/genome/7924?
genome_assembly_id=37754

Triturus carnifex https://www.ncbi.nlm.nih.gov/genome/10402?
genome_assembly_id=39471

Lizards (Geckos, chameleons dragons)

Lacerta agilis (Sand lizard)
https://www.ncbi.nlm.nih.gov/genome/18390?
genome_assembly_id=753158

Scincella modesta https://www.ncbi.nlm.nih.gov/genome/91947?
genome_assembly_id=905567

Plestiodon elegans https://www.ncbi.nlm.nih.gov/genome/33617?
genome_assembly_id=206478

Iguana iguana (Common green iguana)
https://www.ncbi.nlm.nih.gov/genome/16671?
genome_assembly_id=46243

Leiocephalus personatus (Haitian curlytail lizard) "
https://www.ncbi.nlm.nih.gov/genome/9049?
genome_assembly_id=38597

Podarcis muralis (Common wall lizard)
https://www.ncbi.nlm.nih.gov/genome/8765?
genome_assembly_id=467760

Gekko japonicus https://www.ncbi.nlm.nih.gov/genome/40475?
genome_assembly_id=258716

Outgroup 1: Sharks

Carcharhinus obscurus (dusky shark)
https://www.ncbi.nlm.nih.gov/genome/17134?
genome_assembly_id=46556

Carcharias taurus (sand tiger shark) https://
www.ncbi.nlm.nih.gov/genome/24297?genome_assembly_id=53486

Cetorhinus maximus (Basking shark)
https://www.ncbi.nlm.nih.gov/genome/24001?
genome_assembly_id=49511

Triaenodon obesus https://www.ncbi.nlm.nih.gov/genome/36016?
genome_assembly_id=218431

Orectolobus japonicus (Japanese wobbegong)
https://www.ncbi.nlm.nih.gov/genome/22445?
genome_assembly_id=47336

Outgroup 2: Primates

Pongo pygmaeus (Bornean orangutan)
https://www.ncbi.nlm.nih.gov/genome/10714?
genome_assembly_id=39613

Pan troglodytes (chimpanzee)
https://www.ncbi.nlm.nih.gov/genome/202?
genome_assembly_id=380228

Gorilla gorilla gorilla (western lowland gorilla)
https://www.ncbi.nlm.nih.gov/genome/2156?
genome_assembly_id=291477