Phylogenetic project

Close relatives of the Arctic fox (*Vulpes lagopus*) among canines

Species:

* Ingroup (within *Canidae*)
  1. *Vulpes lagopus* (arctic fox) (TARGET)
  2. *Vulpes vulpes* (red fox)
  3. *Vulpes ferrilata* (Tibetan sand fox)
  4. *Vulpes macrotis* (kit fox)
  5. *Urocyon cinereoargenteus* (gray fox)
  6. *Otocyon megalotis* (bat-eared fox)
  7. *Nyctereutes procyonoides* (raccoon dog)
  8. *Lycaon pictus* (African hunting dog)
  9. *Chrysocyon brachyurus* (maned wolf)
  10. *Cuon alpinus* (dhole)
  11. *Canis lupus lupus* (Eurasian wolf)
  12. *Canis aureus* (golden jackal)
* Outgroup (within *Caniformia*)
  1. *Ailurus fulgens* (lesser panda, red panda family)

Q1: Write down a few sentences on the selection of species and outgroup in your dataset. Which species did you choose and why? Explain how the species you picked you think would resolve the phylogenetic relationship the question posed.

The research question is “what other member of the family *Canidae* is closest related to the arctic fox (*Vulpes lagopus*)?” and therefore I have tried to select a few other *Vulpes* and a spread of other *Canidae* (see species list). The outgroup is the lesser panda (*Ailurus* fulgens) as both *Ailuridae* and *Canidae* families belong to the suborder *Caniformia*.

My expectation (based on the NCBI phylogenetic tree) is that one of the *Vulpes* will be closest related to artic fox while the rest of the species are further removed. Other morphologically fox-like species can be expected to be closer than the wolf-like ones. Out of the *Vulpes* species, I expect the red fox (*Vulpes vulpes*) to be the closest relative to the arctic fox as they share neighbouring habitats (i.e. live relatively close geographically) as well as many morphological traits.