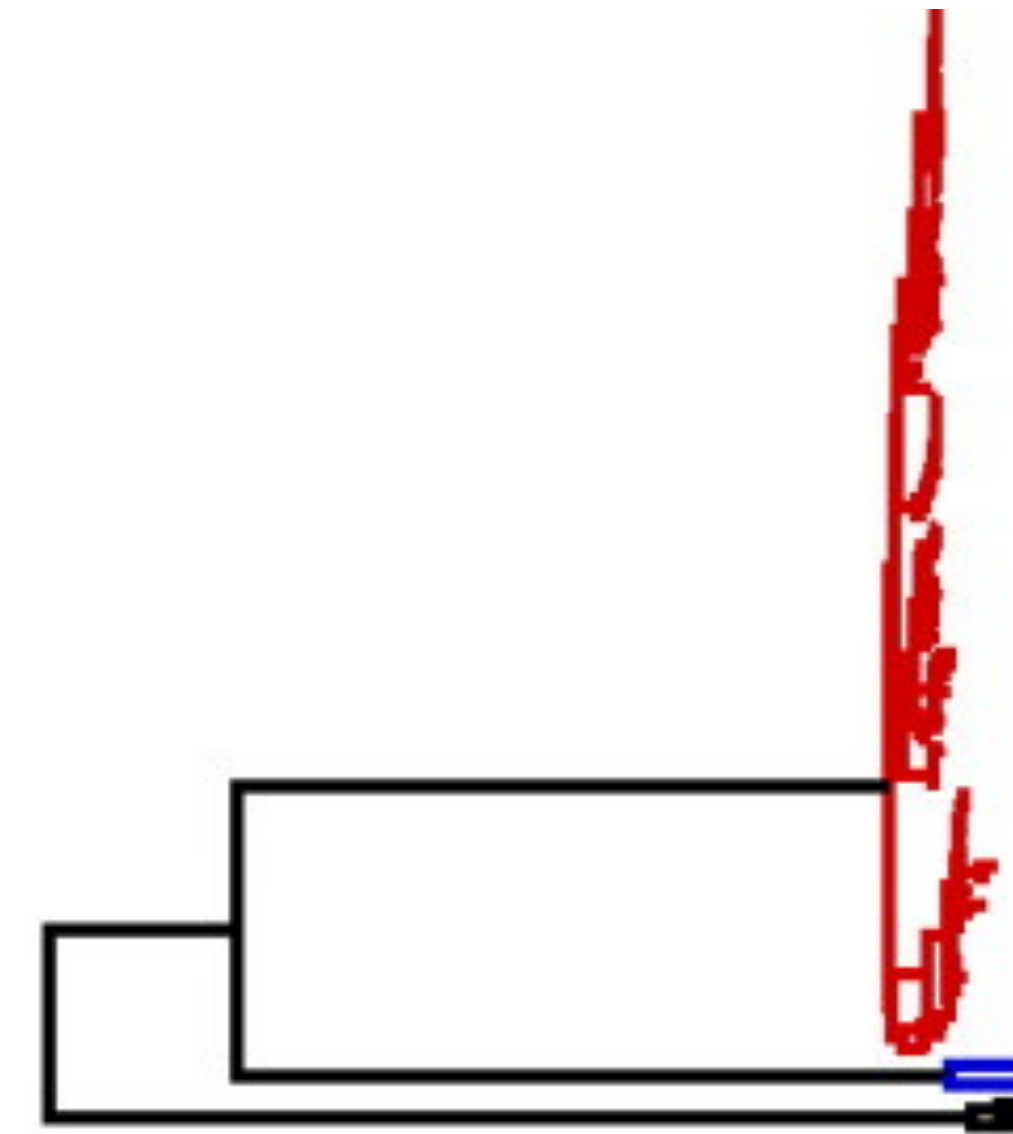
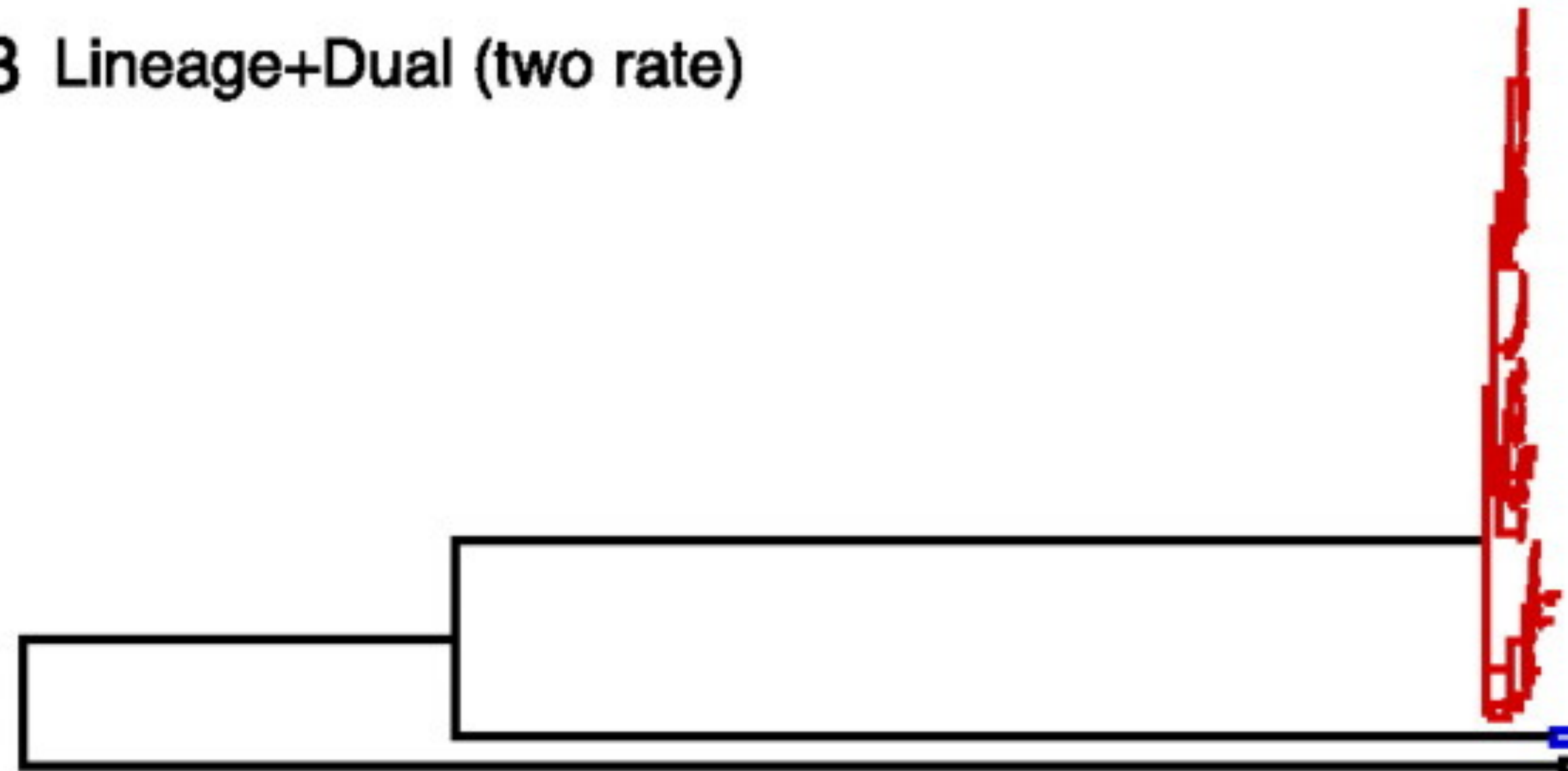


- Using models that do not vary selection pressure across lineages yields a patently false “*too young*” estimate for the origin of **measles** (about 600 years ago)
- This estimate is refuted by clear historical records which suggest that measles is at least 1,500-5,000 years old
 - *This includes a treatise by a Persian physician Rhazes about **differential diagnosis of measles and smallpox** published circa 600 AD.*
- Same patterns found for corona-viruses, ebola, avian influenza and herpesvirus

A GTR + Γ_4



B Lineage+Dual (two rate)



0.2 substitutions per site

Questions about the previous material?



We covered the aBSREL method, which detects episodes of selection across branches in a phylogeny.