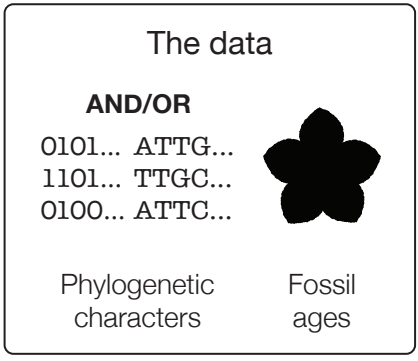

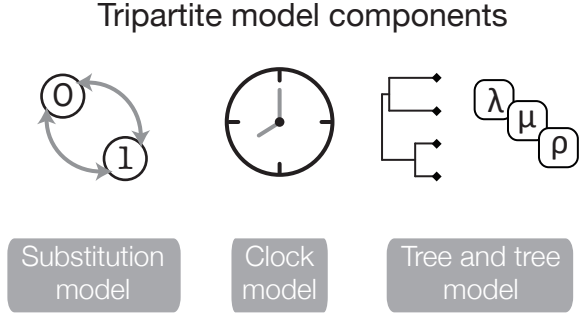

Bayes' theorem

$$P(\text{parameters} \mid \text{data, model}) = \frac{P(\text{data} \mid \text{parameters, model})\, P(\text{parameters} \mid \text{model})}{P(\text{data} \mid \text{model})}$$

likelihood · priors · posterior · marginal probability of the data

Putting everything together

$$P(\text{tree, parameters, model} \mid \text{data}) = \frac{P(\text{data} \mid \text{tree, parameters, model})\, P(\text{tree} \mid \text{parameters, model})\, P(\text{parameters})\, P(\text{model parameters})\, P(\text{model})\, P(\text{tree})}{P(\text{data})}$$

posterior · probability of the character data given everything else* · probability of the timetree given the tree model · priors on fossil ages · priors on model parameters · marginal probability of the data

*the tree, the parameters and the tripartite model