

BCB 503: RevBayes Intro



Fourth session: Diversification

Orlando Schwery, 14. Sep. 2021, University of Idaho

Course Plan and Schedule

- 3:30pm Pacific, on Zoom
- 24. Aug.: Intro
- 31. Aug.: Trait Evolution
- 07. Sep.: Biogeography
- 14. Sep.: Diversification
- 21. Sep.: [Model Testing/Adequacy]
- 28. Sep.: [Hierarchical Models, FBD, ...?]

→ Absences: Recording, Remote, Add-On, ...

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Suggestion:

- Nothing next week
- Instead:
 - Think of questions
 - Think what you would REALLY like to get out of this workshop
 - Send them to me by the 21st
- Can be
 - Repetition
 - Advanced Version
 - New Topic

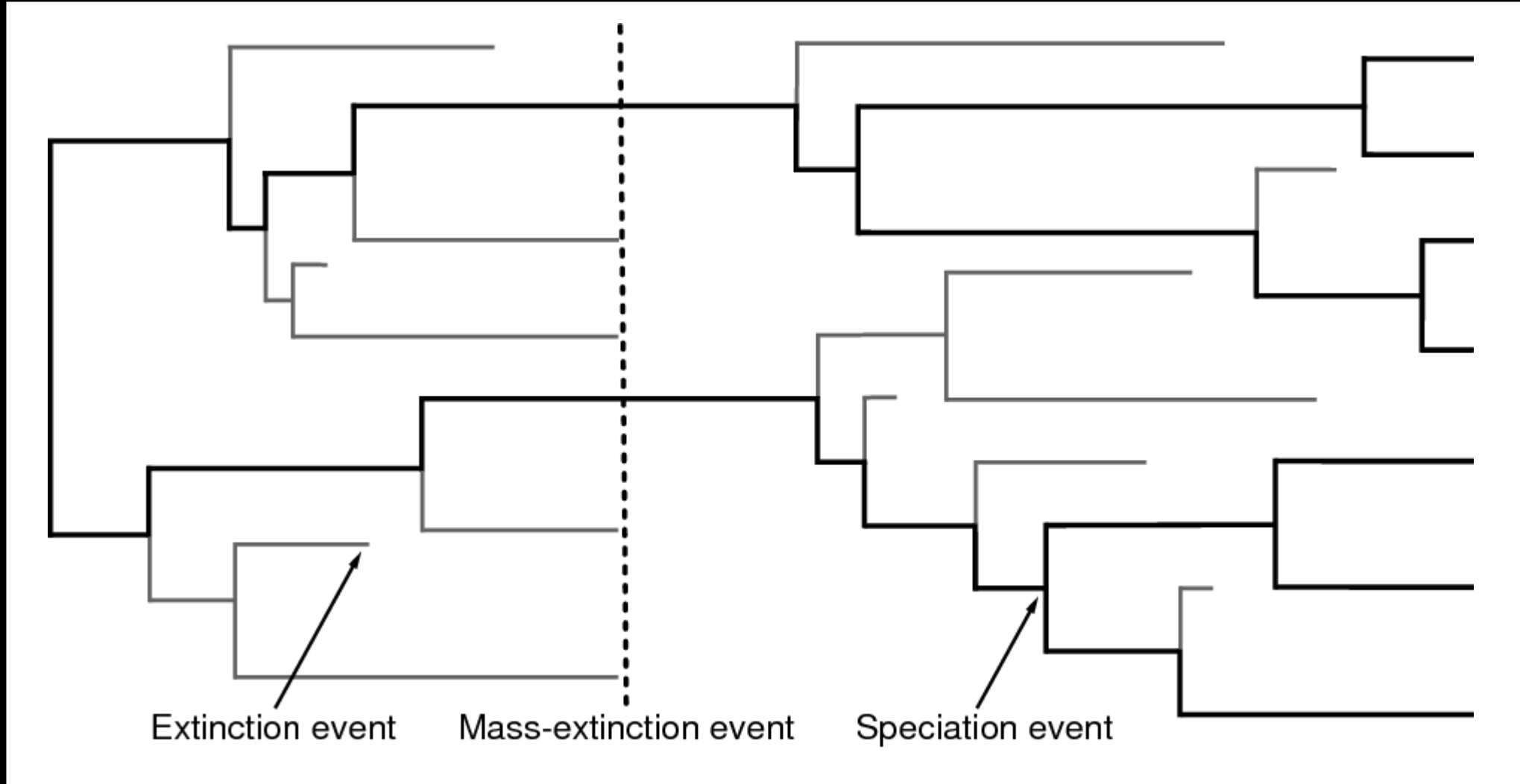
Diversification in RevBayes - Overview

- Introduction to Diversification Rate Estimation
- Simple Birth-Death Models
 - Simple Diversification Rate Estimation
- Time-Split Diversification Models
 - Episodic Diversification Rate Estimation
 - Diversification Rate Estimation with Missing Taxa
 - Environmental-dependent Speciation & Extinction Rates
- Fossilized Birth Death Models
 - Mass Extinction Estimation
 - Macroevolutionary Analysis of Stratigraphic Range Data

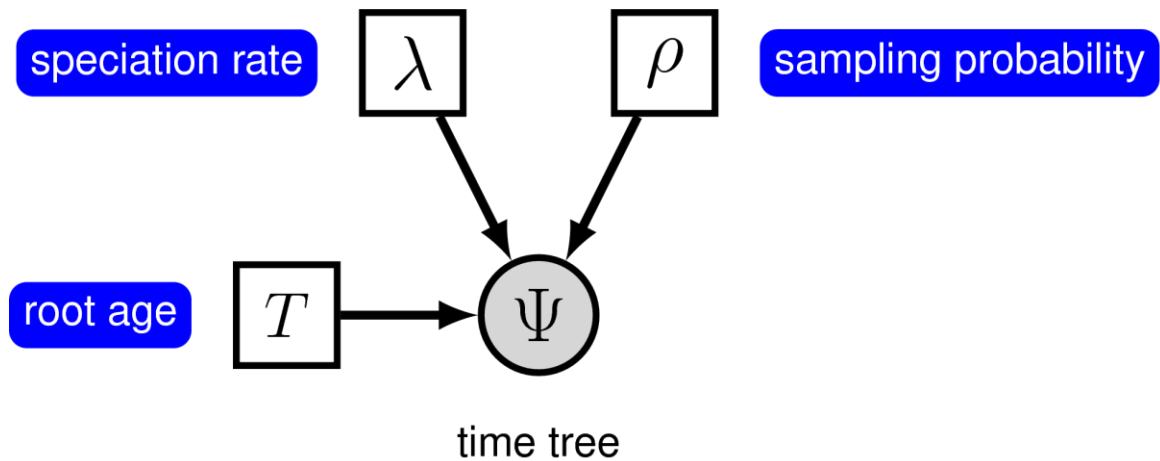
SSE in RevBayes - Overview

- Background on State-Dependent Diversification rate Estimation
- State-Dependent Diversification with BiSSE and MuSSE
- State-Dependent Diversification with HiSSE
- State-Dependent Diversification with HiSSE and ClaSSE
- Chromosome Evolution
- Branch-Specific Diversification Rate Estimation

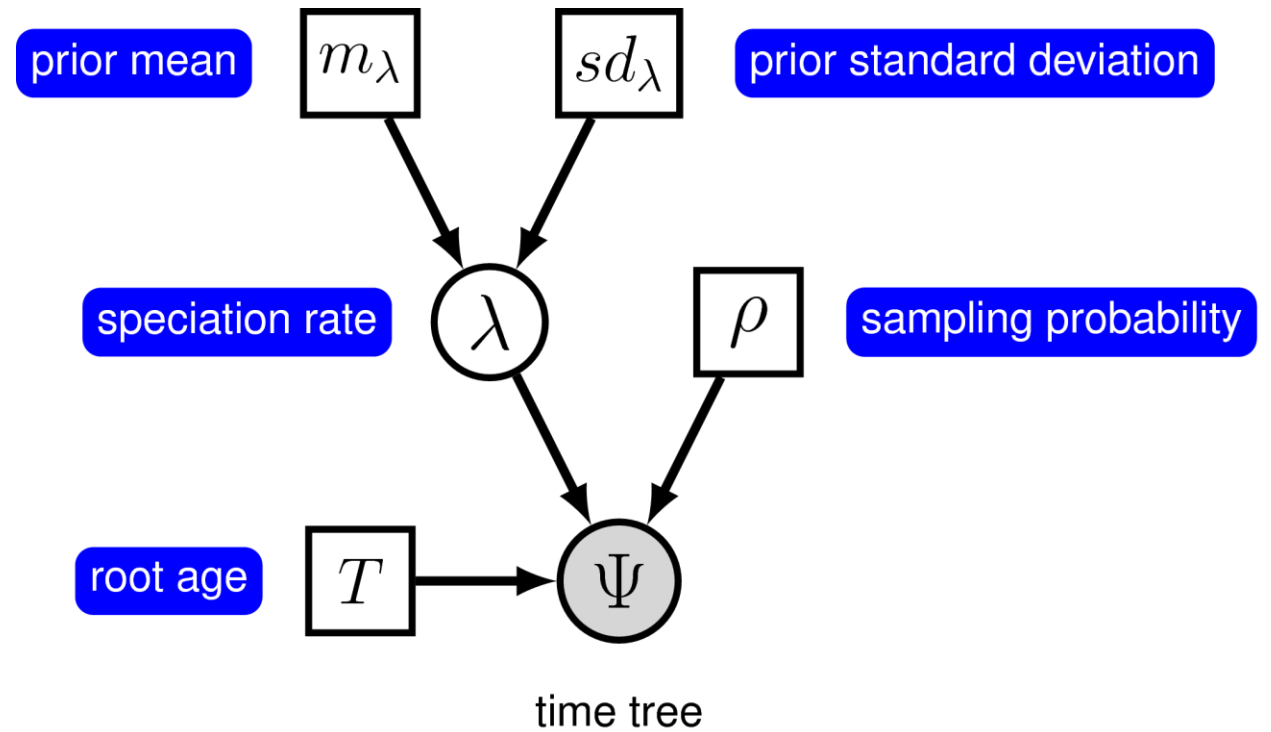
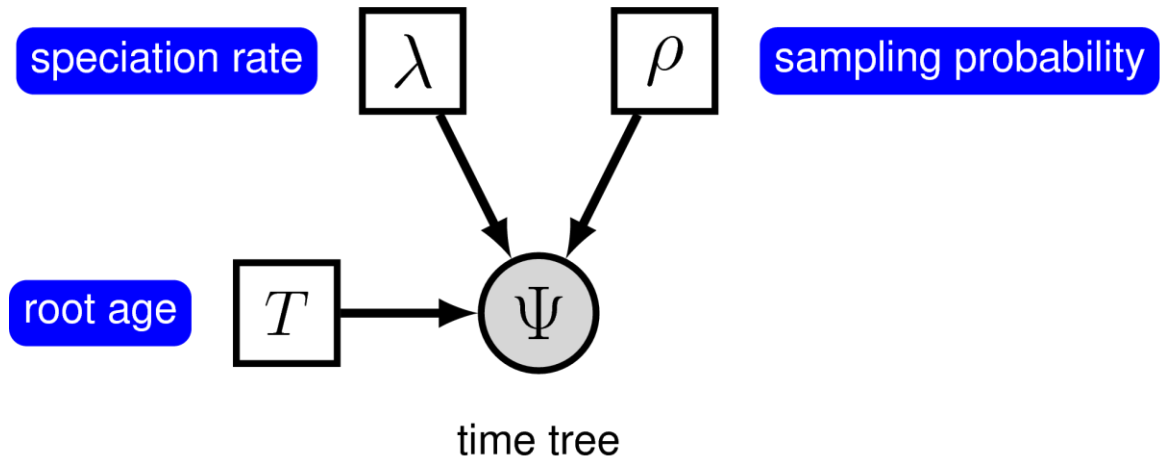
Birth Death Models



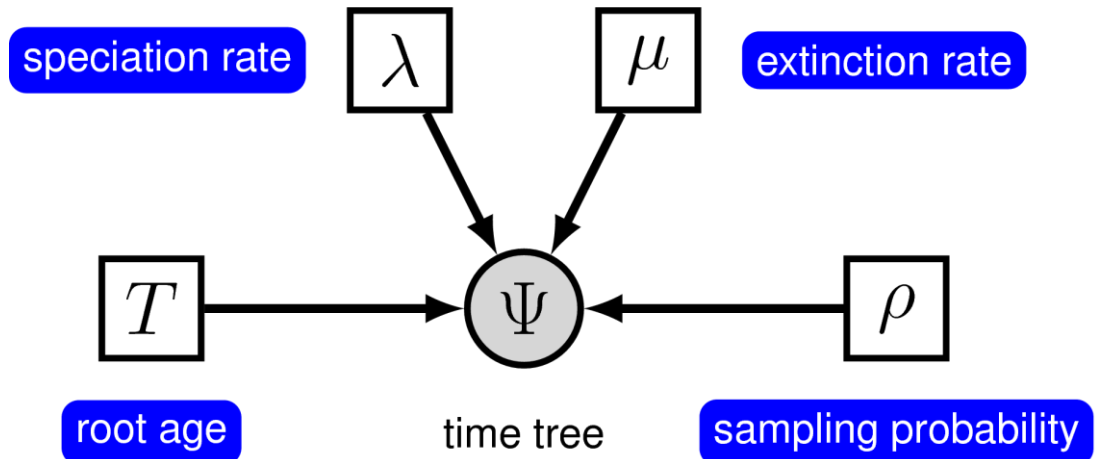
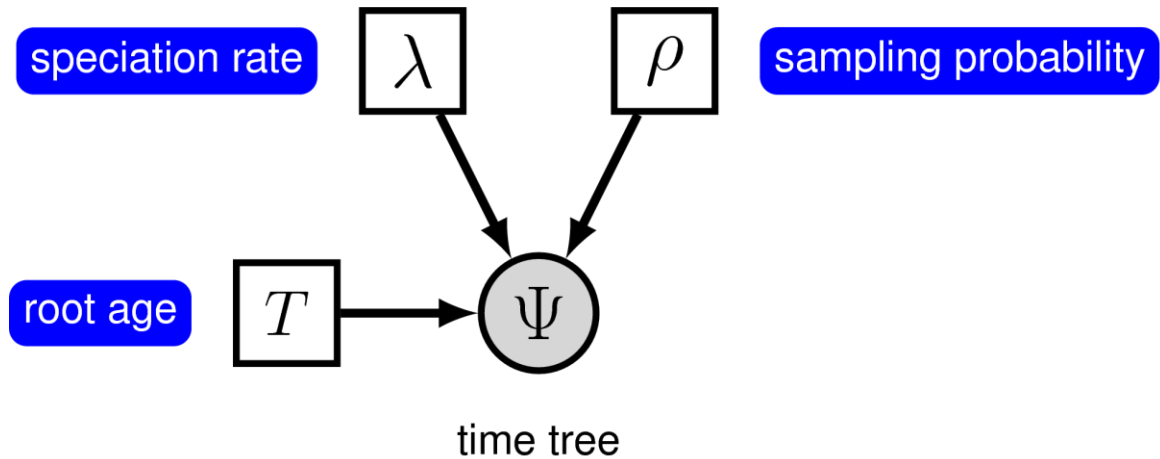
Birth Death Models – Yule



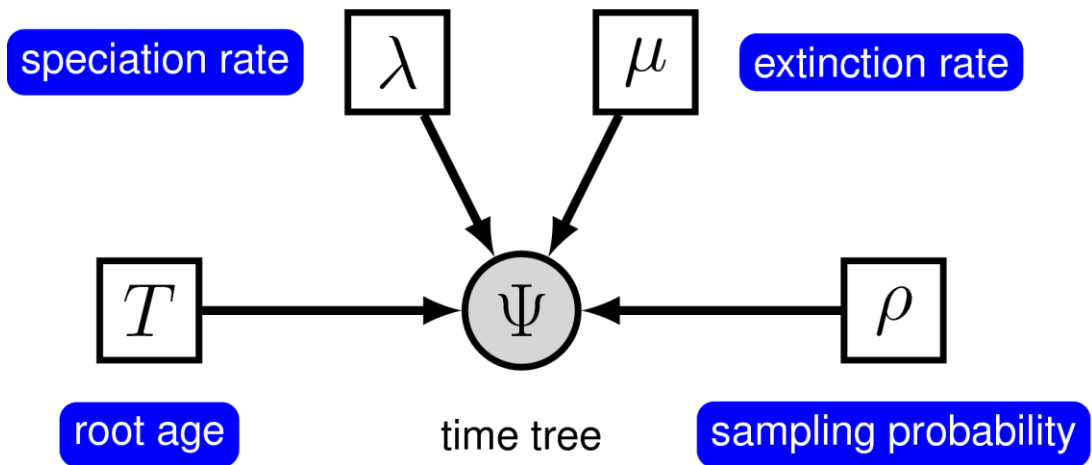
Birth Death Models – Yule



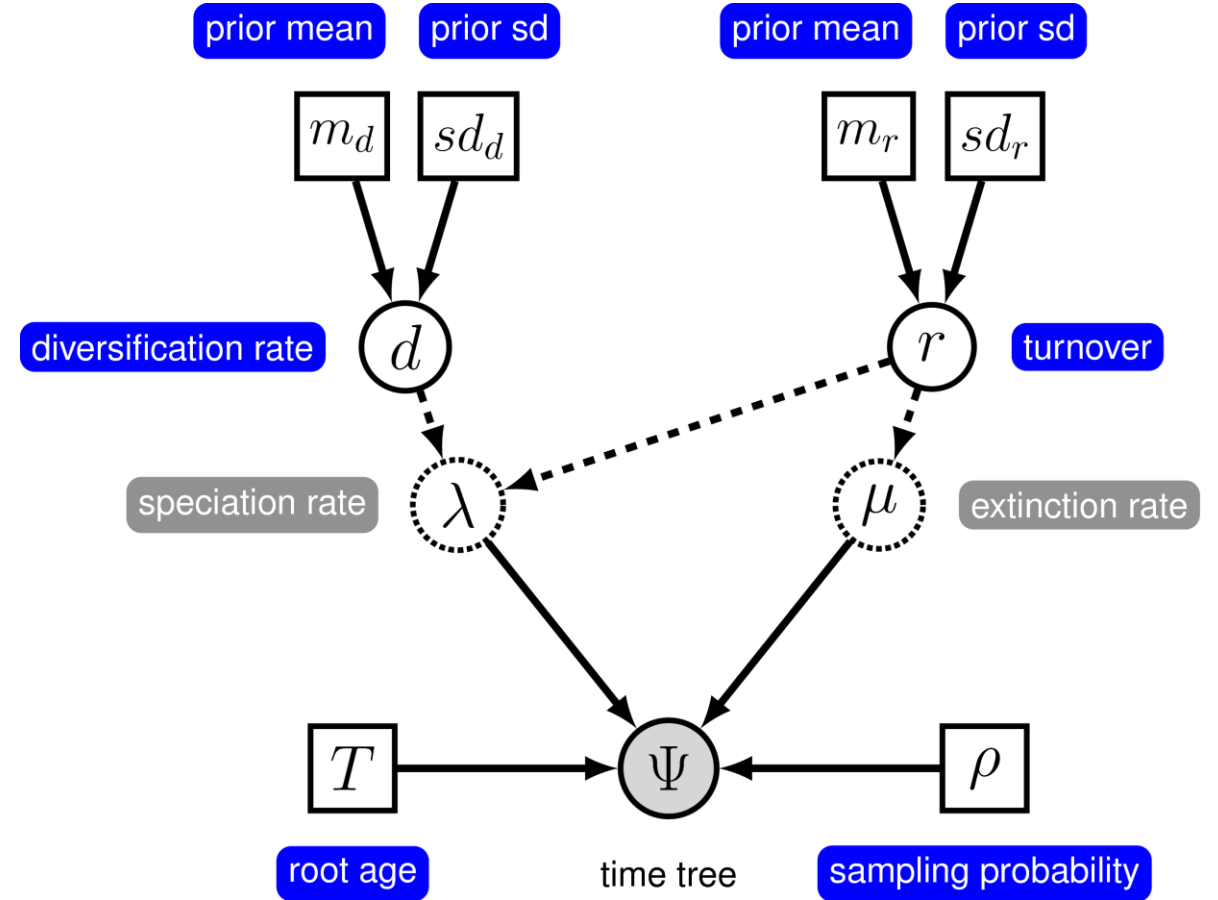
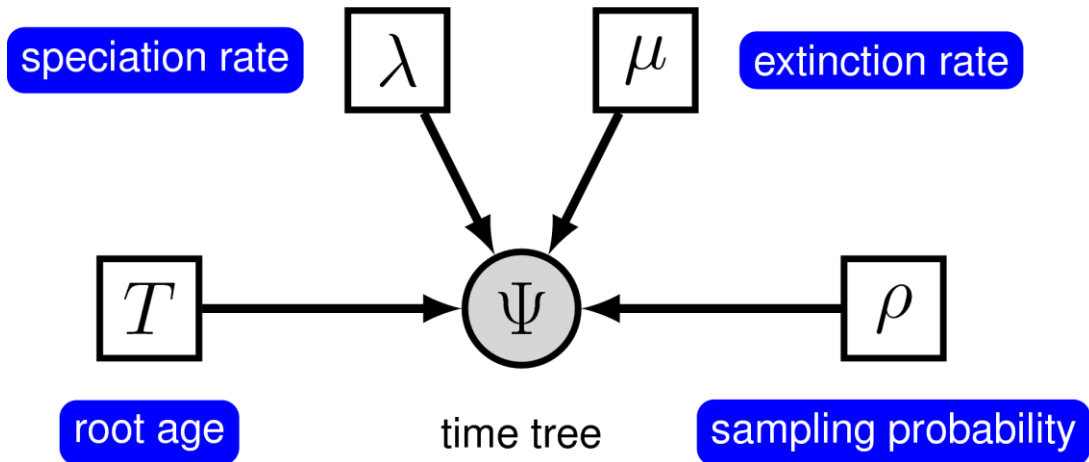
Birth Death Models – Yule vs. BD



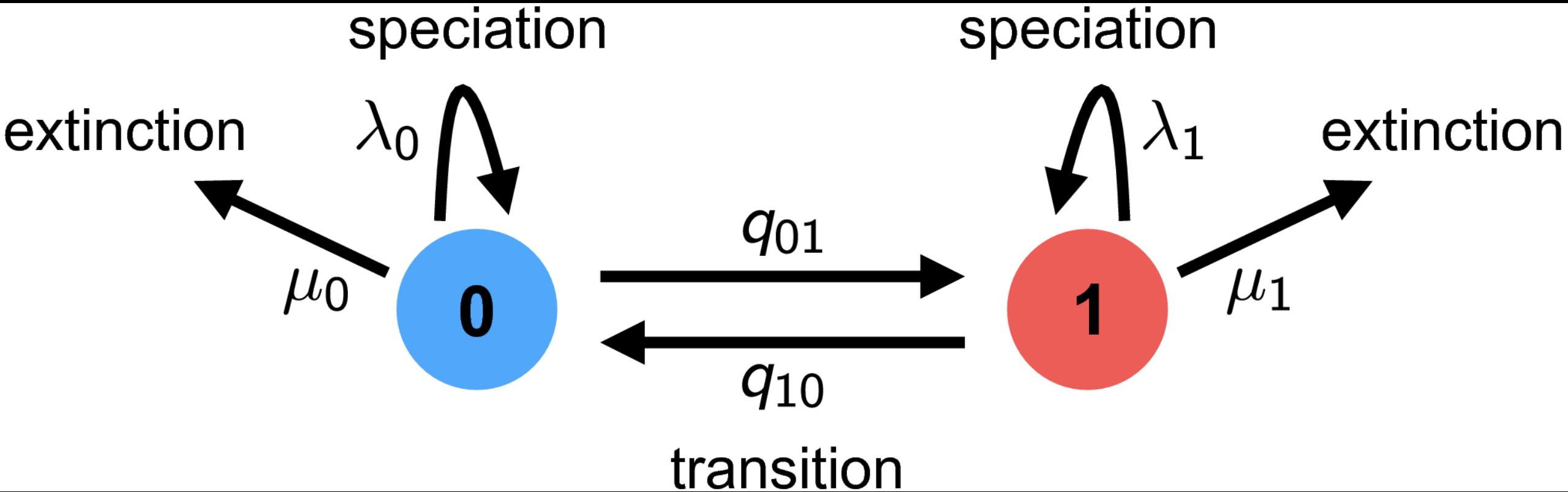
Birth Death Models – BD



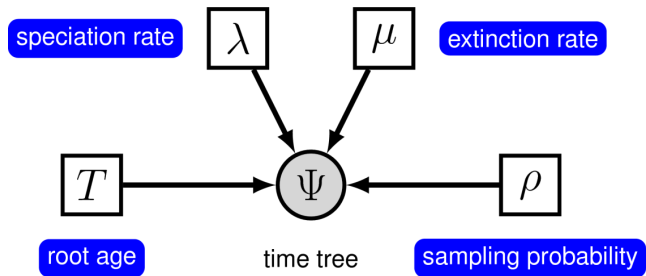
Birth Death Models – BD



Binary State Speciation & Extinction

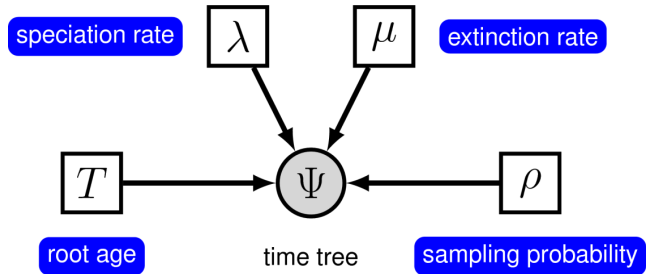


Binary State Speciation & Extinction

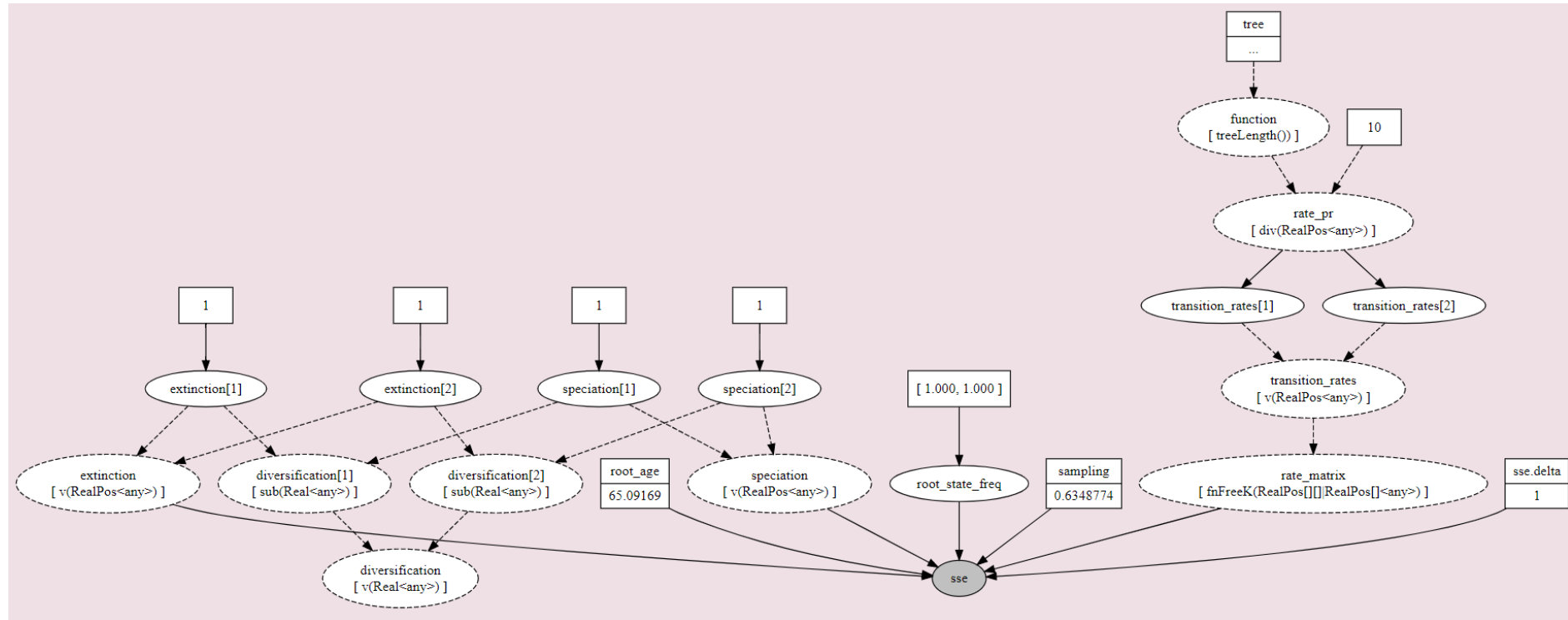


Parameter	Interpretation
Ψ	Phylogenetic tree with divergence times
T	Root age
q_{01}	Rate of transitions from 0 to 1
q_{10}	Rate of transitions from 1 to 0
λ_0	Speciation rate for state 0
μ_0	Extinction rate for state 0
λ_1	Speciation rate for state 1
μ_1	Extinction rate for state 1

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Multiple State Speciation & Extinction

