

# Supporting Figures

Article title: Diversification dynamics and evolutionary history of global biodiversity hotspot regions with no comparable analogue

Francis J. Nge<sup>1,2,4</sup>, Ed Biffin<sup>1,2</sup>, Kevin R. Thiele<sup>3</sup>, Michelle Waycott<sup>1,2</sup>

<sup>1</sup>School of Biological Sciences, Faculty of Science, The University of Adelaide, Adelaide, South Australia, 5005, Australia

<sup>2</sup>State Herbarium of South Australia, G.P.O. Box 1047, Adelaide, South Australia 5001

<sup>3</sup>School of Biological Sciences, University of Western Australia, 35 Stirling Hwy, Crawley (Perth), WA 6009, Australia

Author for correspondence: Francis Nge

<sup>4</sup>Corresponding author Email: francis.nge@adelaide.edu.au

## Supplementary Figures S3–S7

**Fig. S3** CoMET analyses summary results under the mass extinction survival probability threshold of 0.5: speciation and extinction rates over time (Ma), and their posterior probabilities, and mass extinction Bayes Factor and posterior probability. For the other extinction thresholds (0.2, 0.8) included in this study please refer to the full dataset repository.

**Fig. S4** BAMM 95% credible rate shift configurations for groups that showed a radiation shift, under different global sampling fraction regimes: 20%, 40%, 50%, 80%, 100%. F = probability; percentage of samples in posterior assigned to shift configurations.

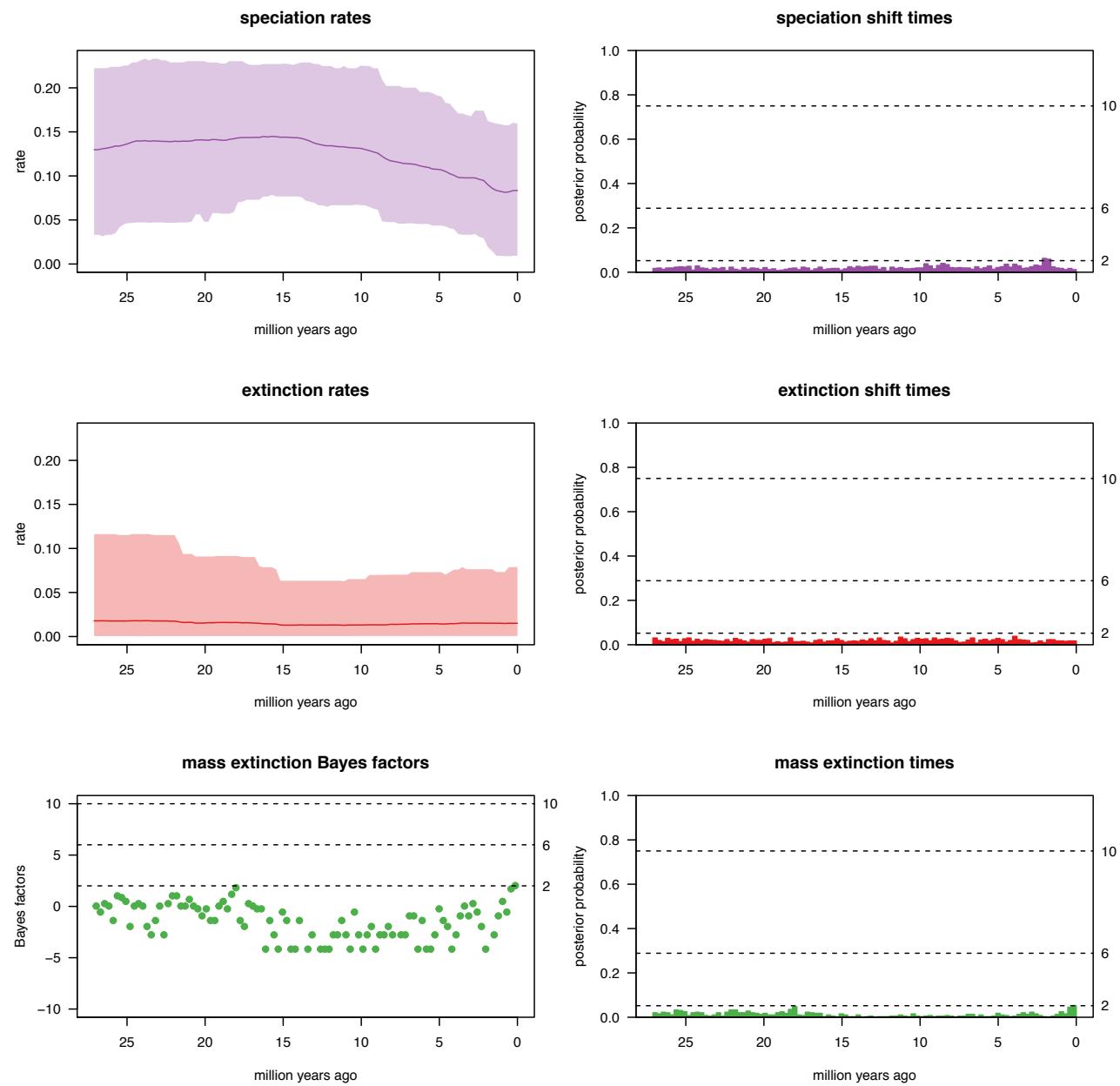
**Fig. S5** TreePar diversification through time plots and 2Ma sliced TreePar diversification through time plots.

**Fig. S6** Lineage-through-time plot visualised over actual phylogeny and 100 simulated LTTs under constant birth-death model.

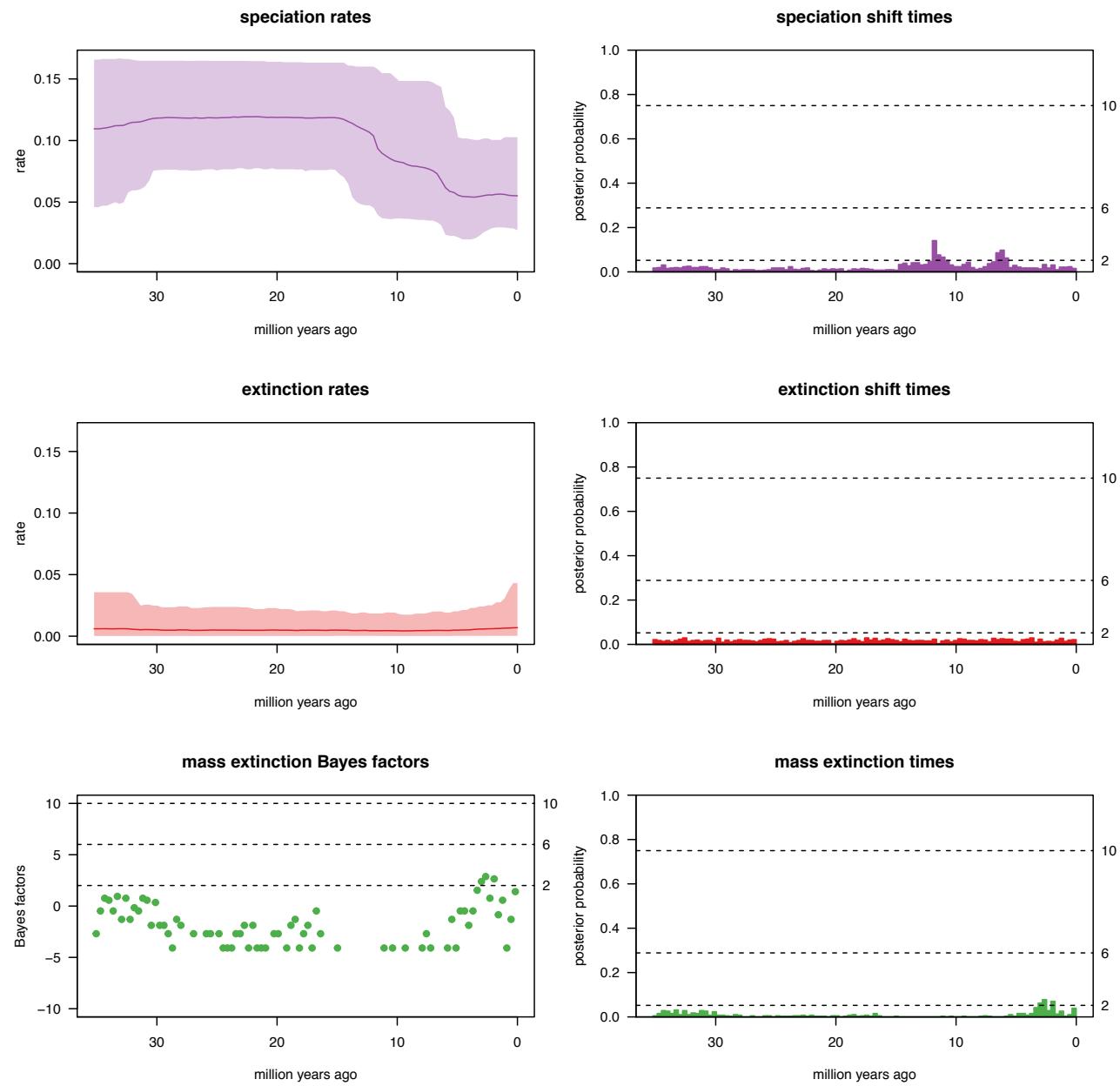
**Fig. S7** BAMM speciation rate towards the present (Ma) and distributions of speciation rates ( $\text{sp sp}^{-1}$   $\text{My}^{-1}$ ) derived from STRAPP.

**Fig. S3.** CoMET analyses summary results under the mass extinction survival probability threshold of 0.5: speciation and extinction rates over time (Ma), and their posterior probabilities, and mass extinction Bayes Factor and posterior probability for **a) Adenanthes** (Proteaceae).

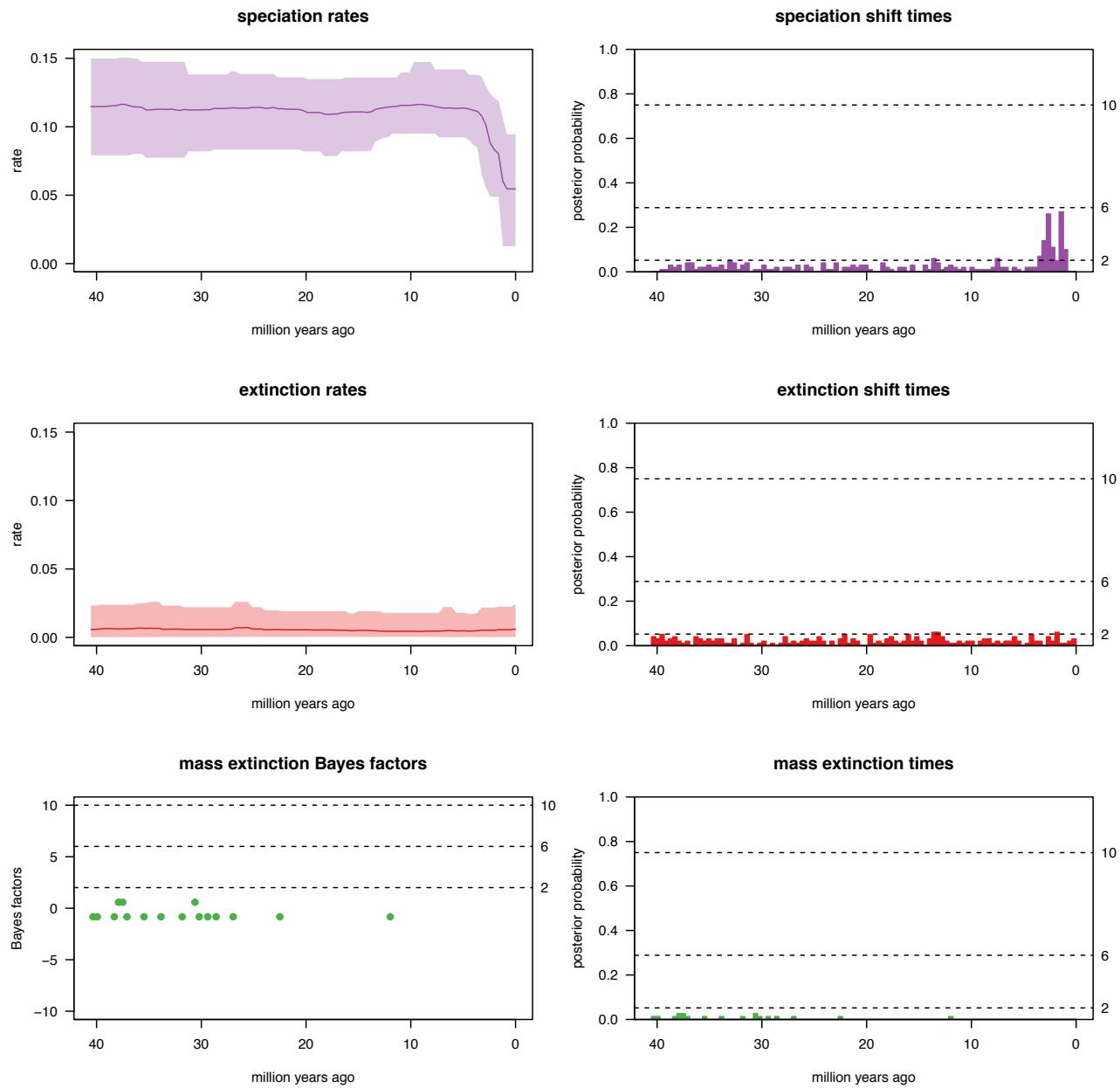
For the other thresholds (0.2, 0.8) included in this study please refer to the full dataset repository.



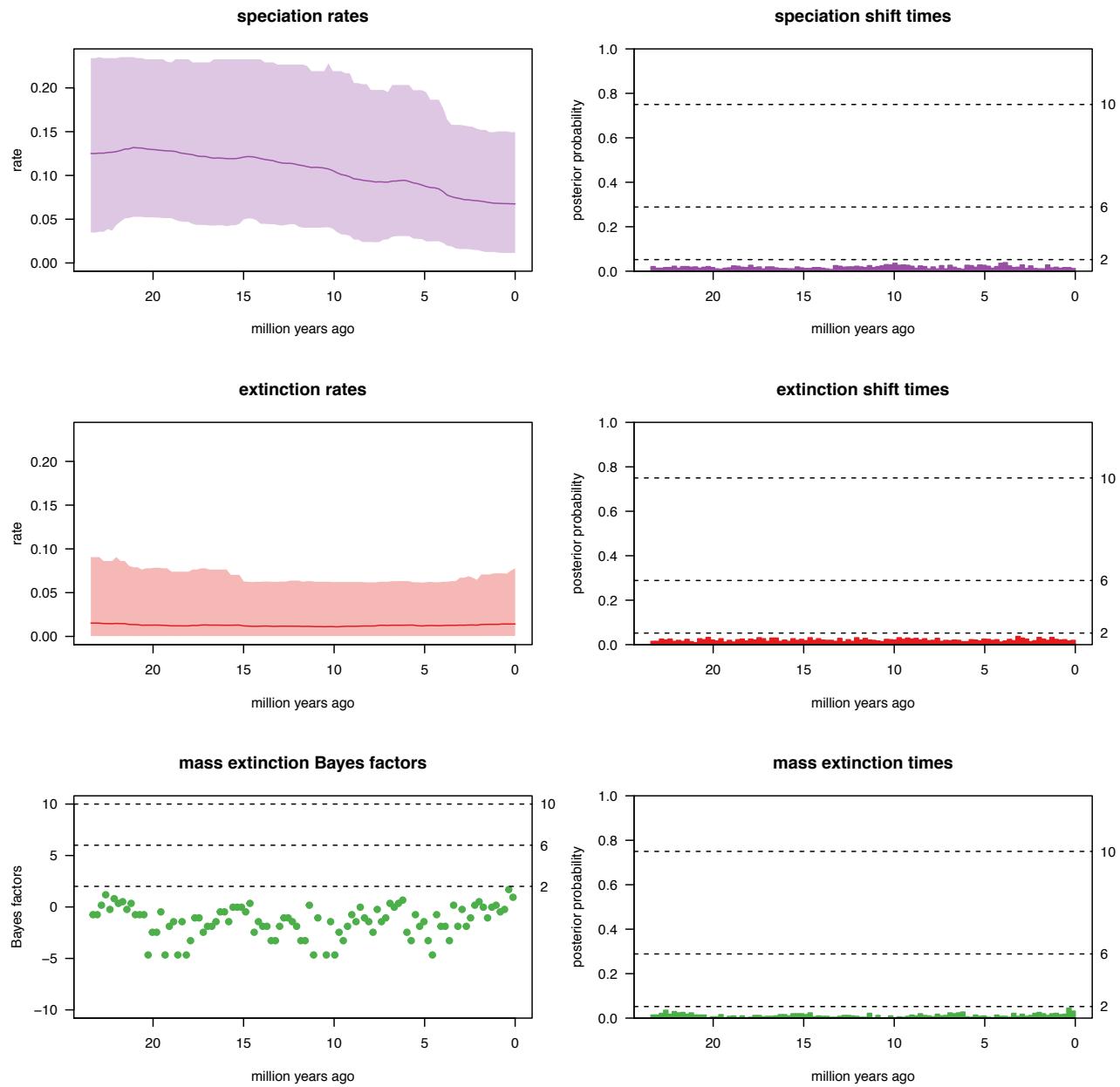
**Fig. S3b. *Calytrix* (Myrtaceae)**



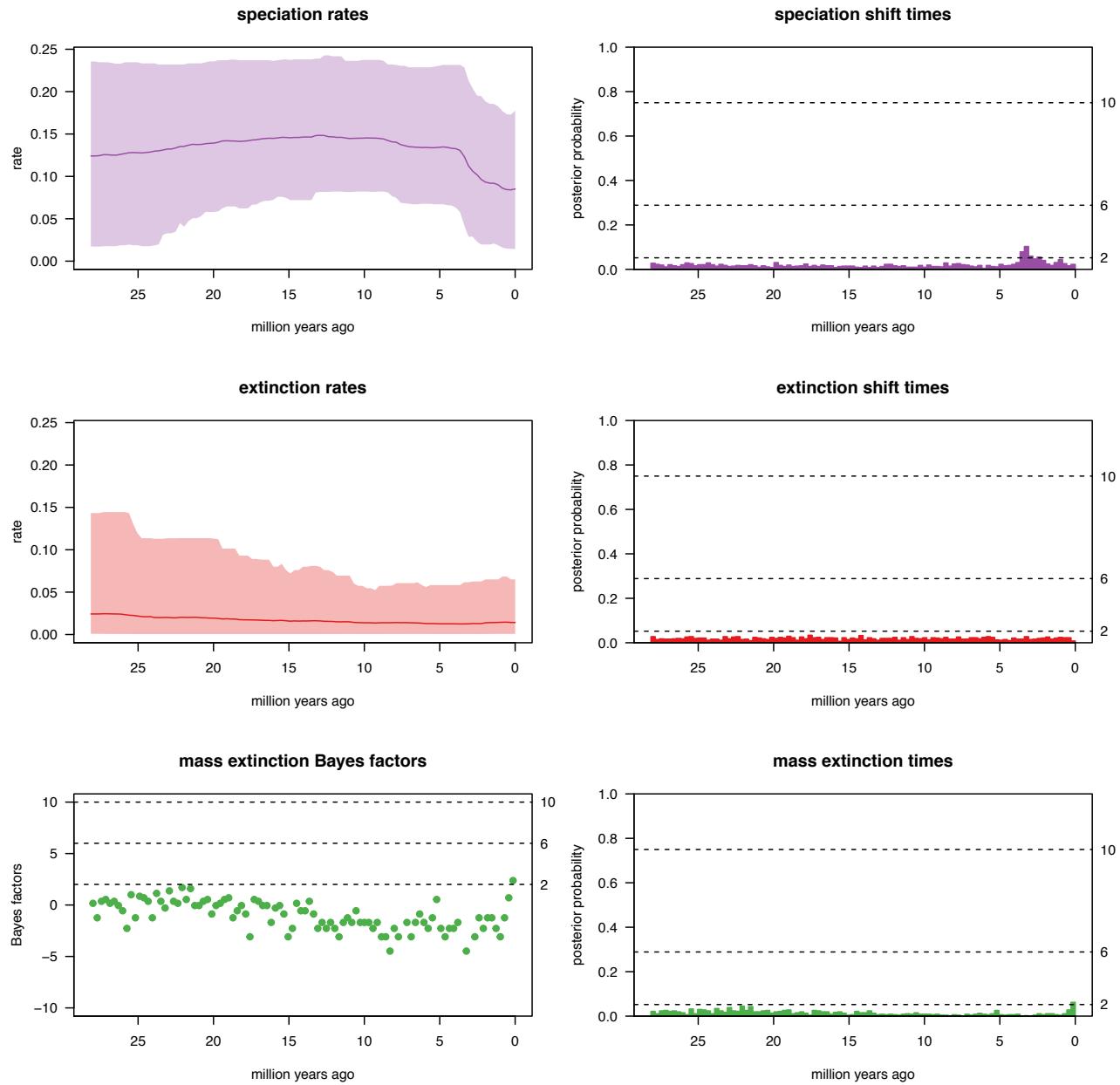
**Fig. S3c.** Pomaderreae (Rhamnaceae), under a 0.4 survival probability mass extinction threshold.



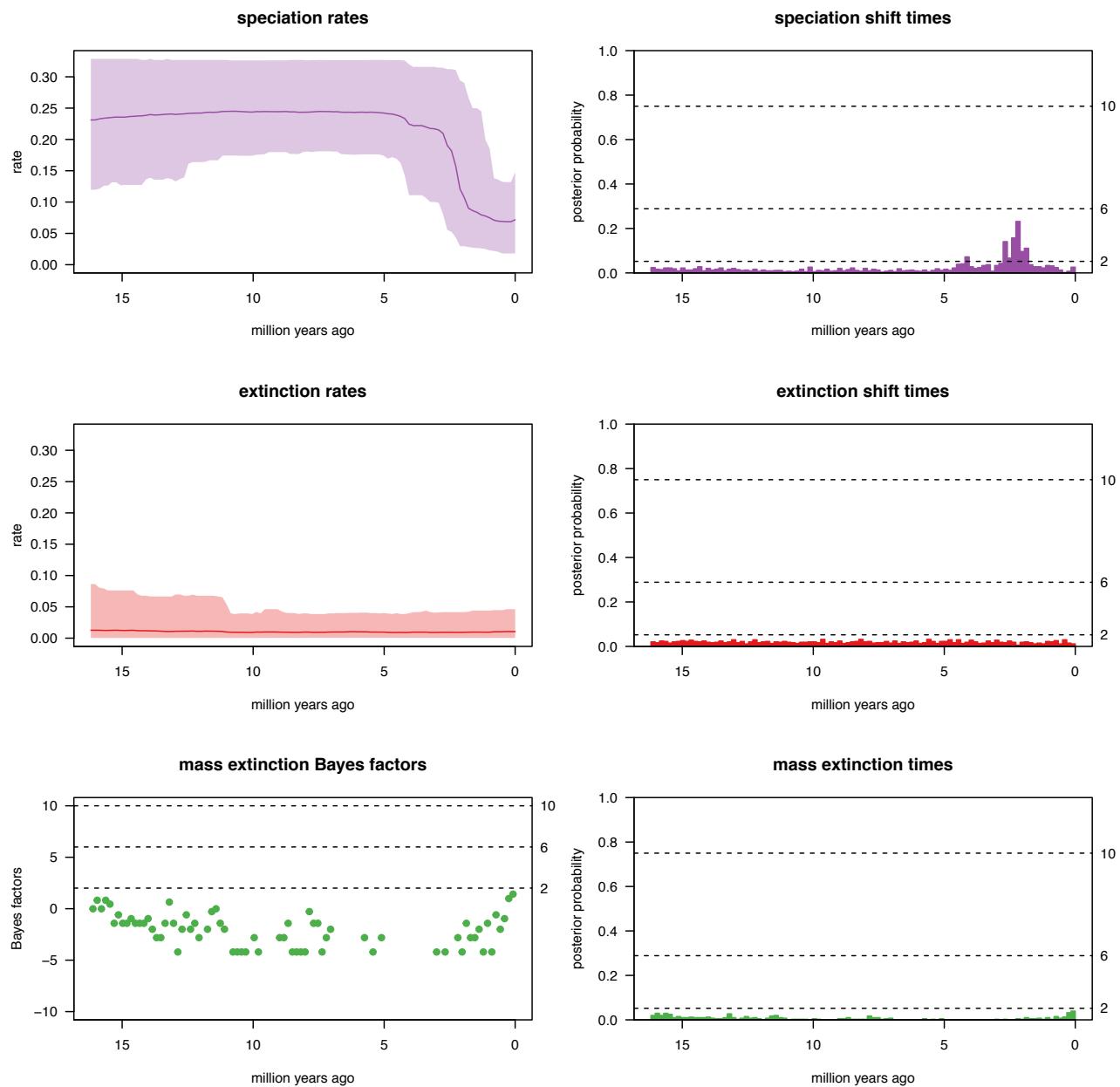
**Fig. S3d.** *Trymalium* (Rhamnaceae)



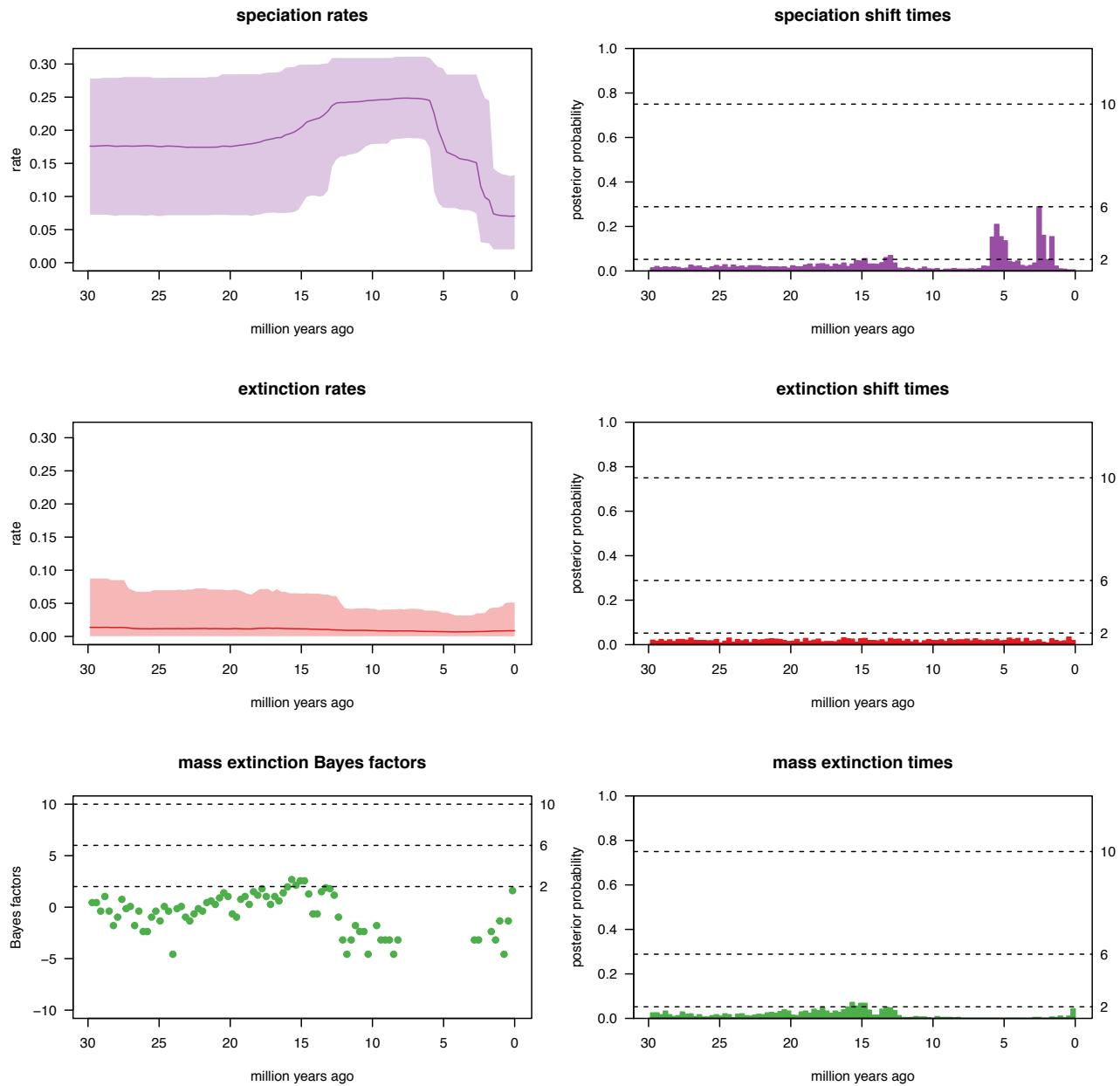
**Fig. S3e. *Stenanthesum* (Rhamnaceae)**



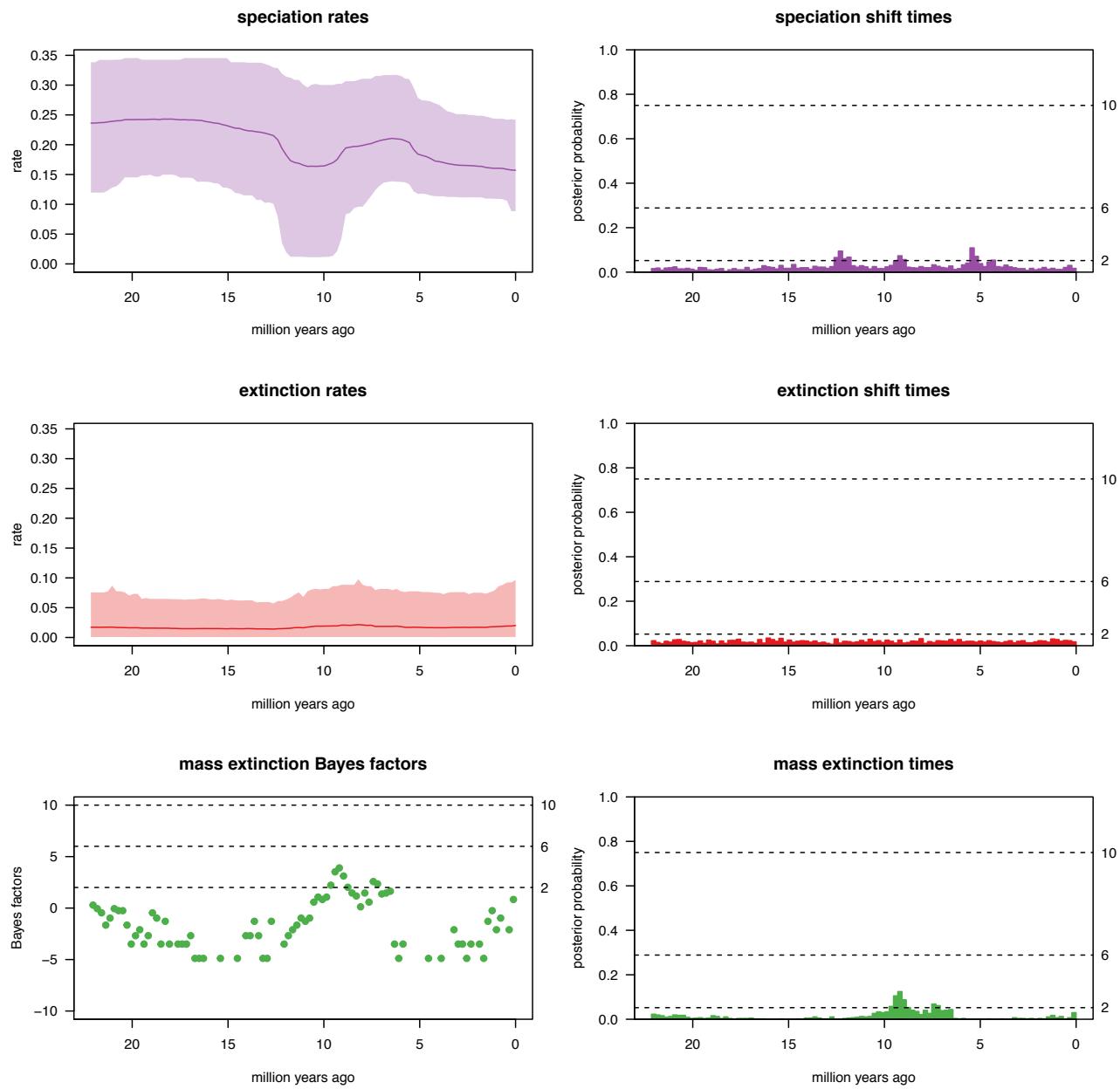
**Fig. S3f.** *Gastrolobolium* (Fabaceae)



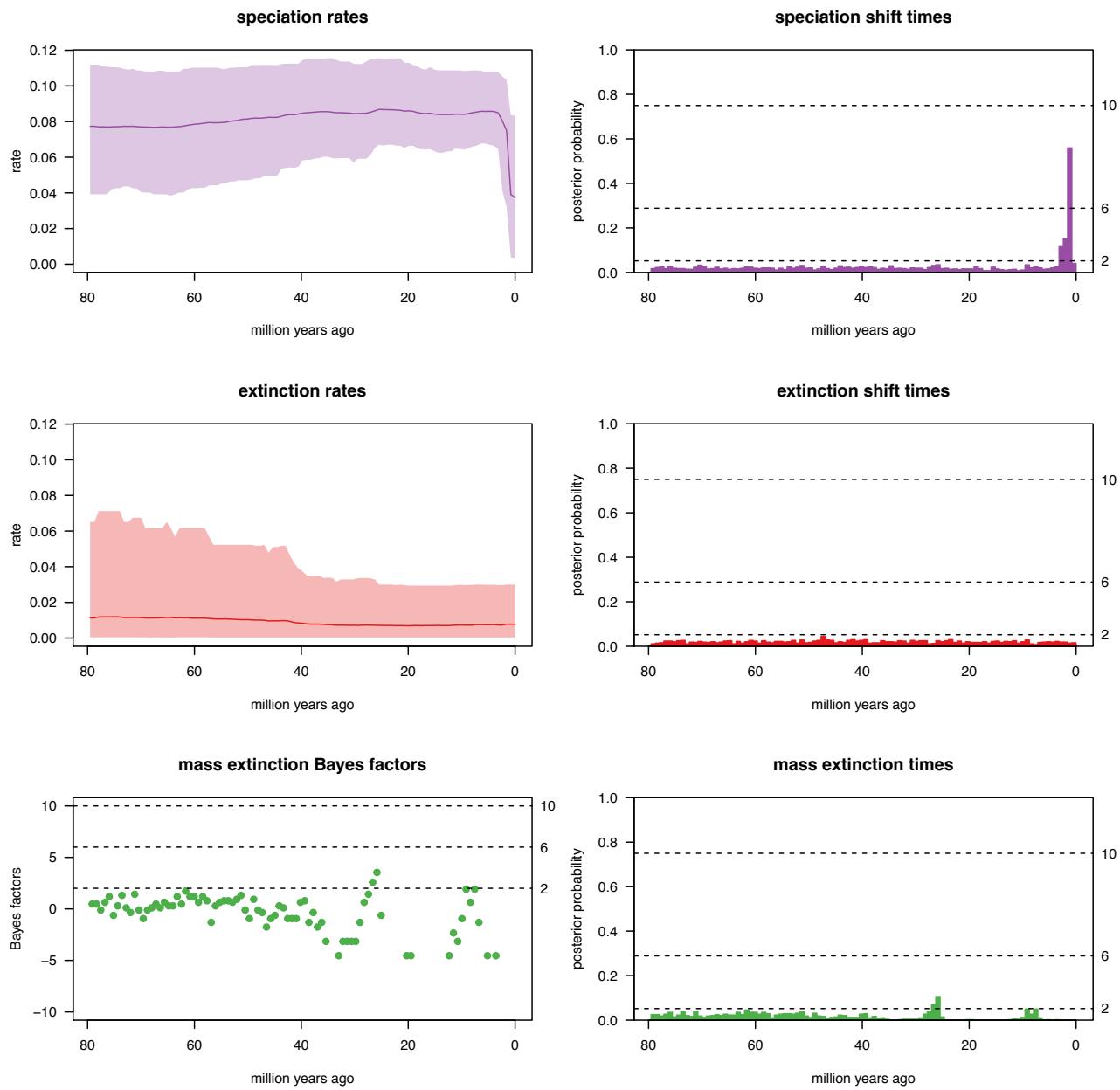
**Fig. S3g. *Daviesia* (Fabaceae)**



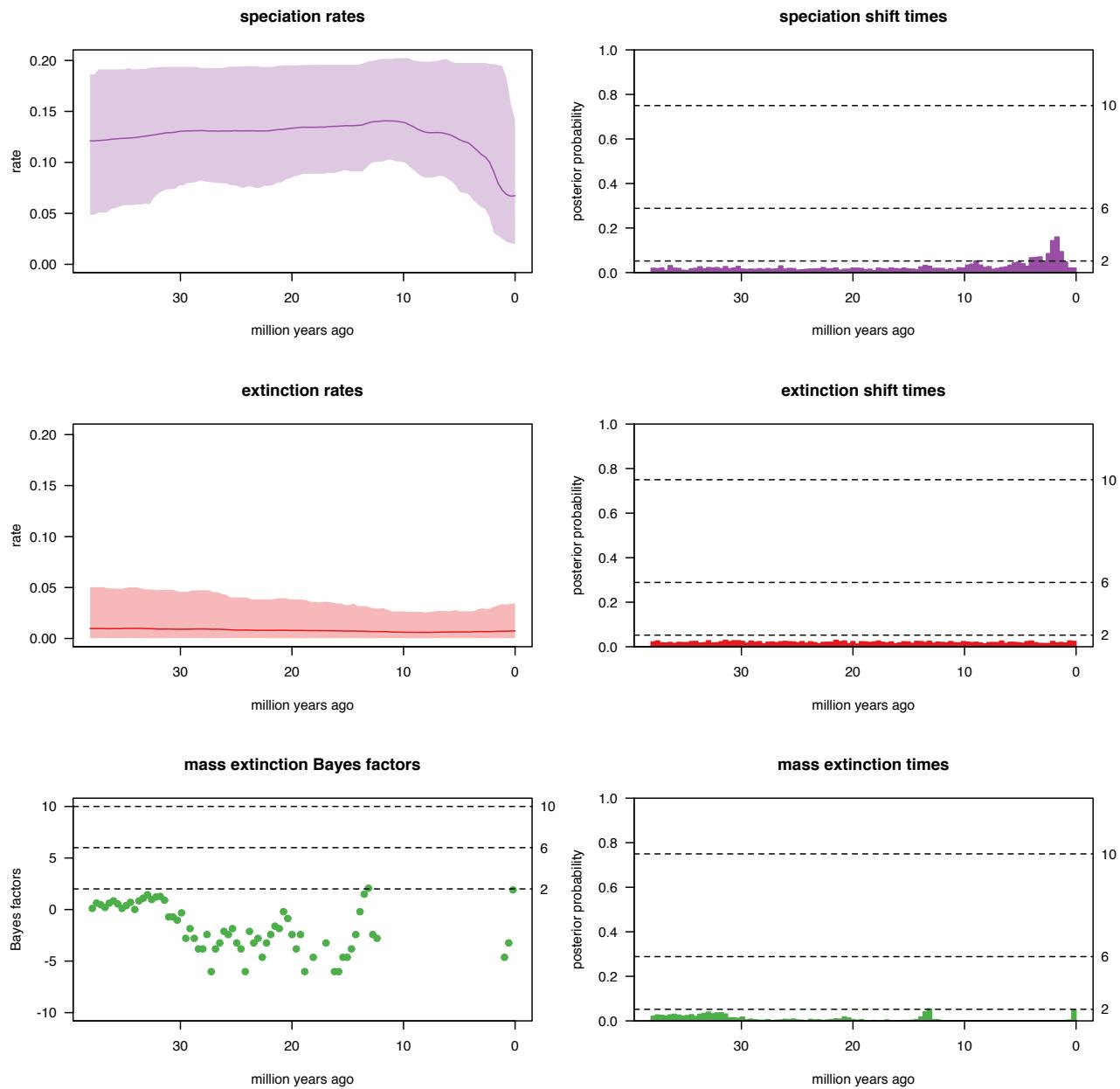
**Fig. S3h. *Pultenaea* (Fabaceae)**



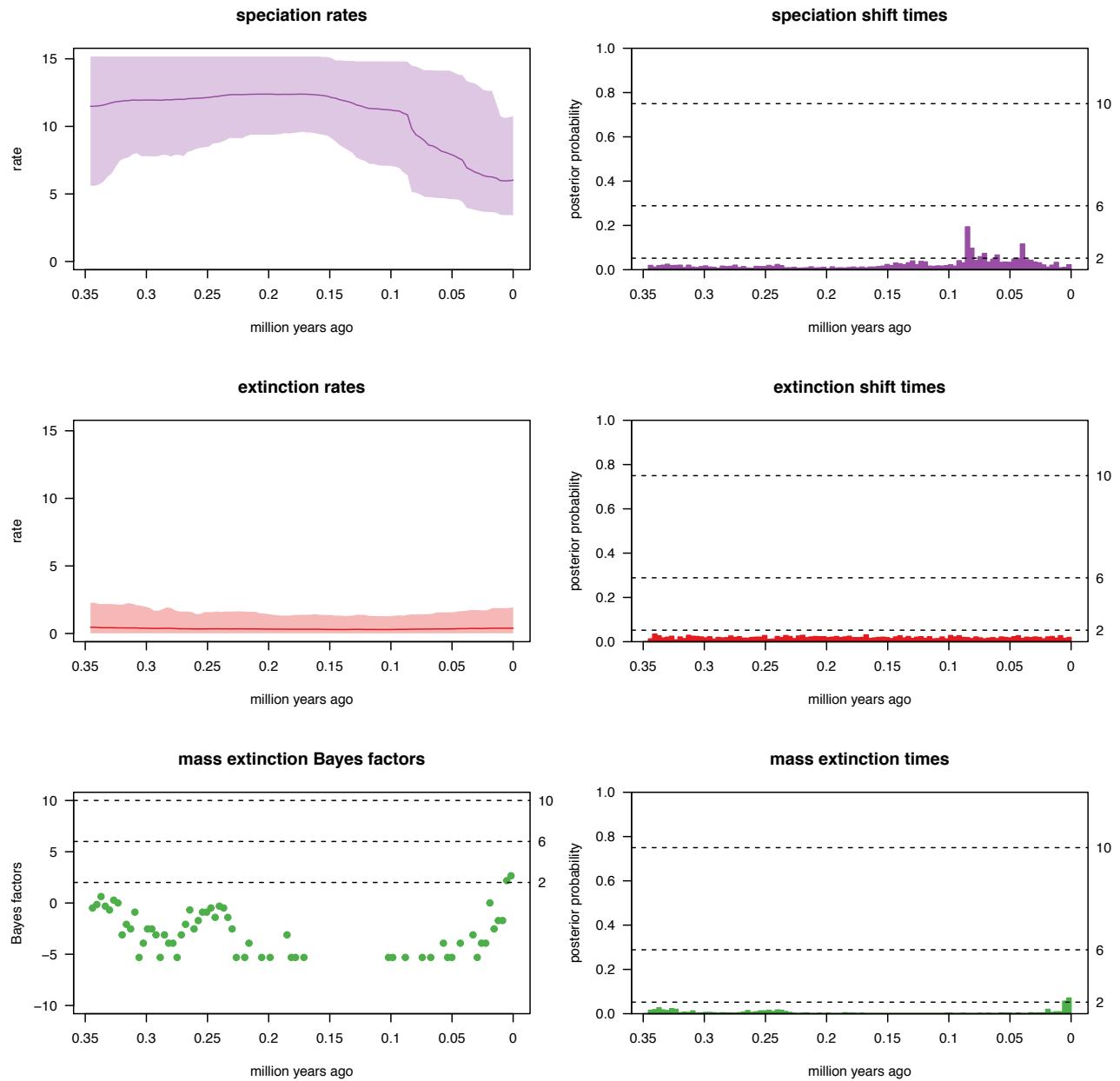
**Fig. S3i. Banksia (Proteaceae)**



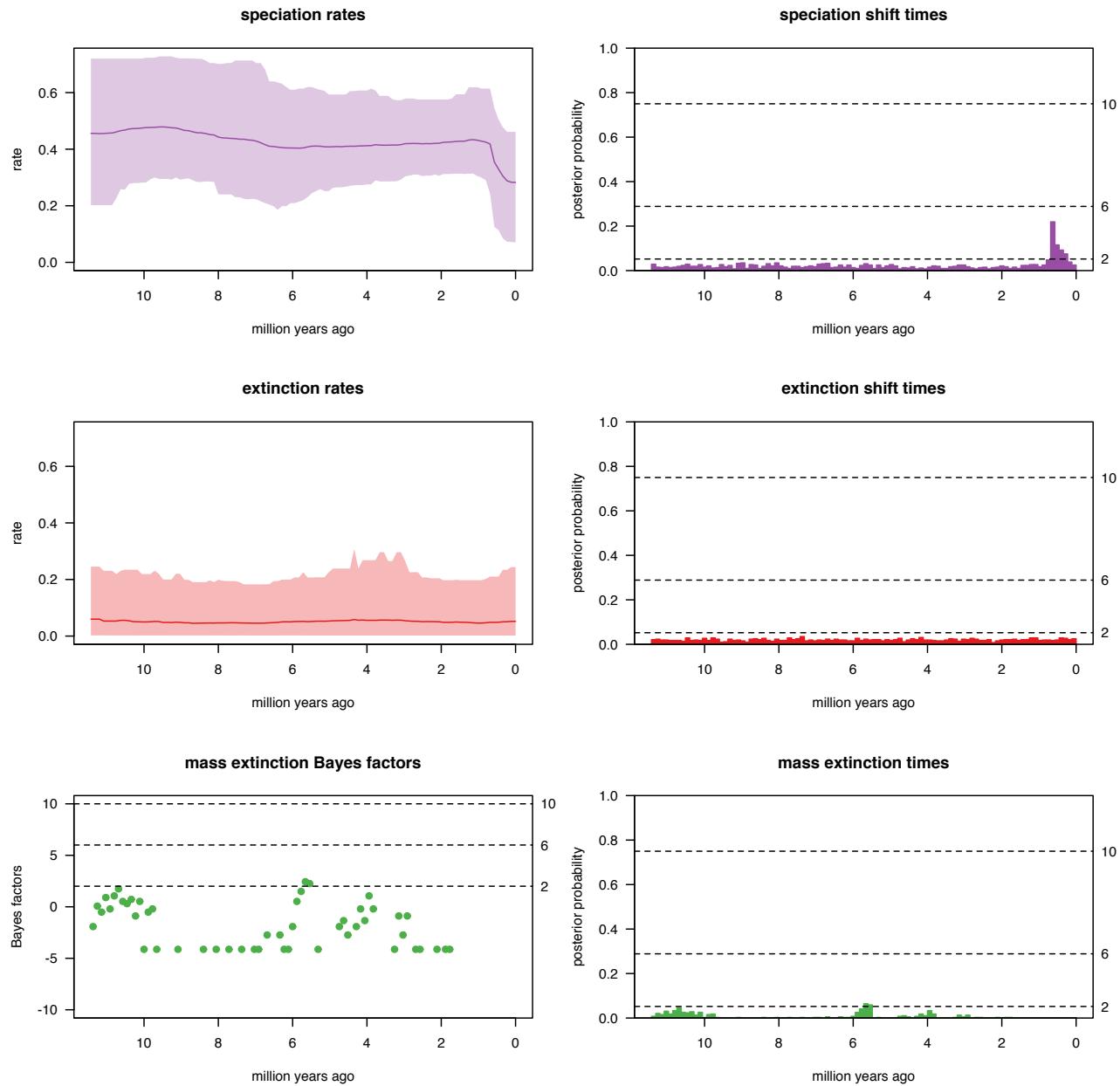
**Fig. S3j.** *Persoonia* (Proteaceae), under a 0.3 survival probability mass extinction threshold.



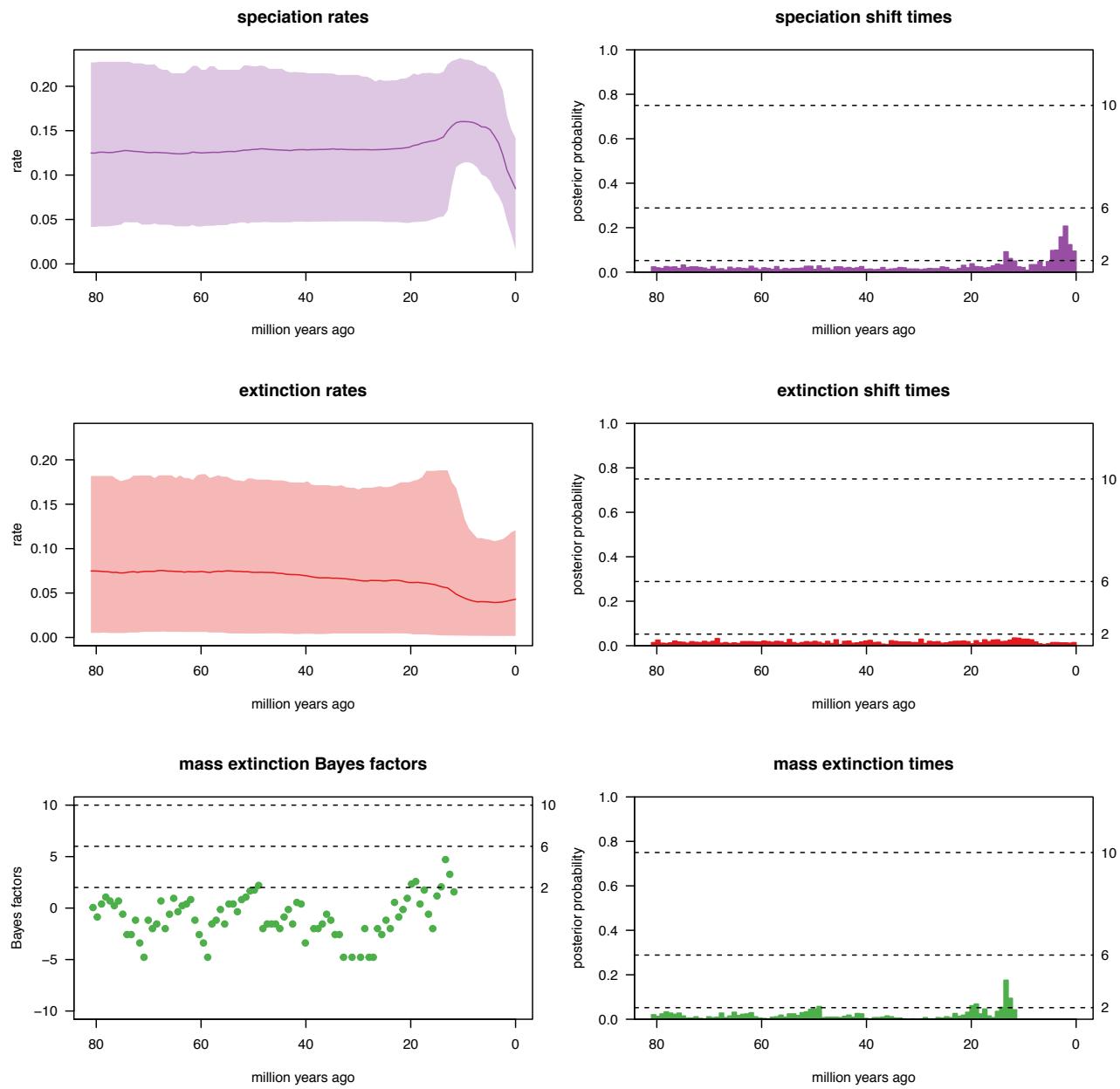
**Fig. S3k. *Hakea* (Proteaceae)**



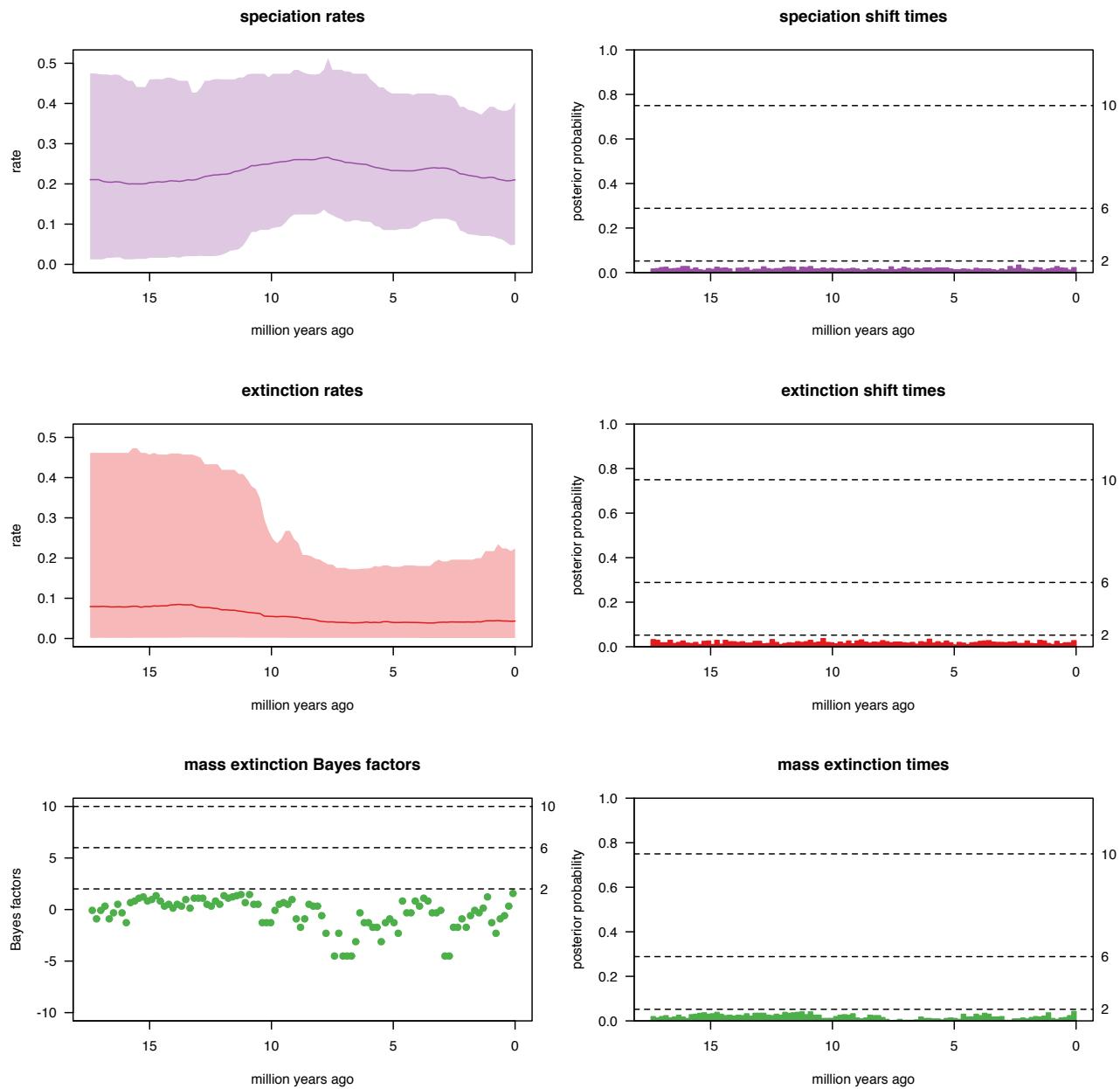
**Fig. S3I.** *Cassinia* & *Ozothamnus* (Asteraceae), under a 0.3 survival probability mass extinction threshold.



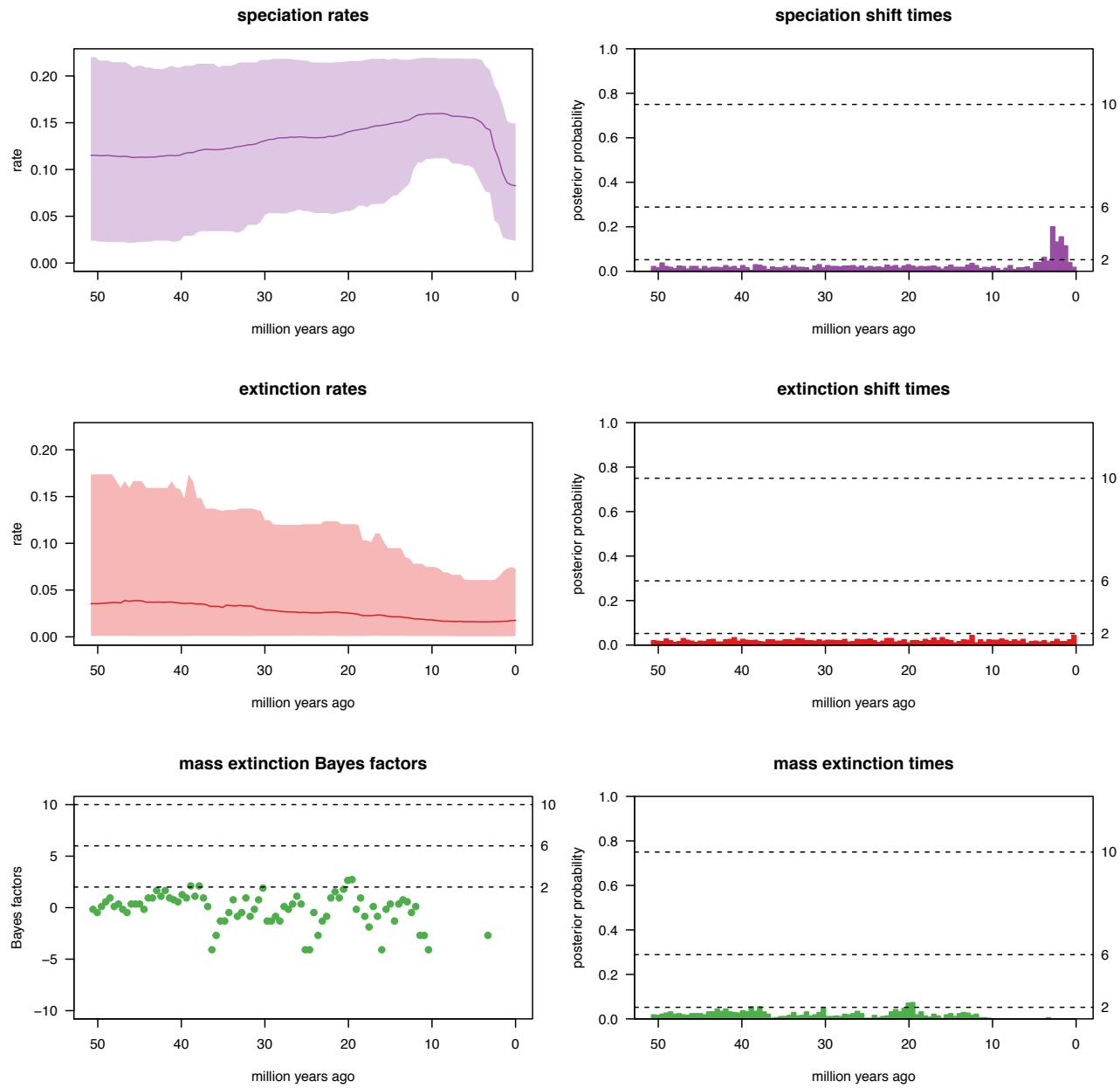
**Fig. S3m.** Haemodoraceae under a 0.2 survival probability mass extinction threshold.



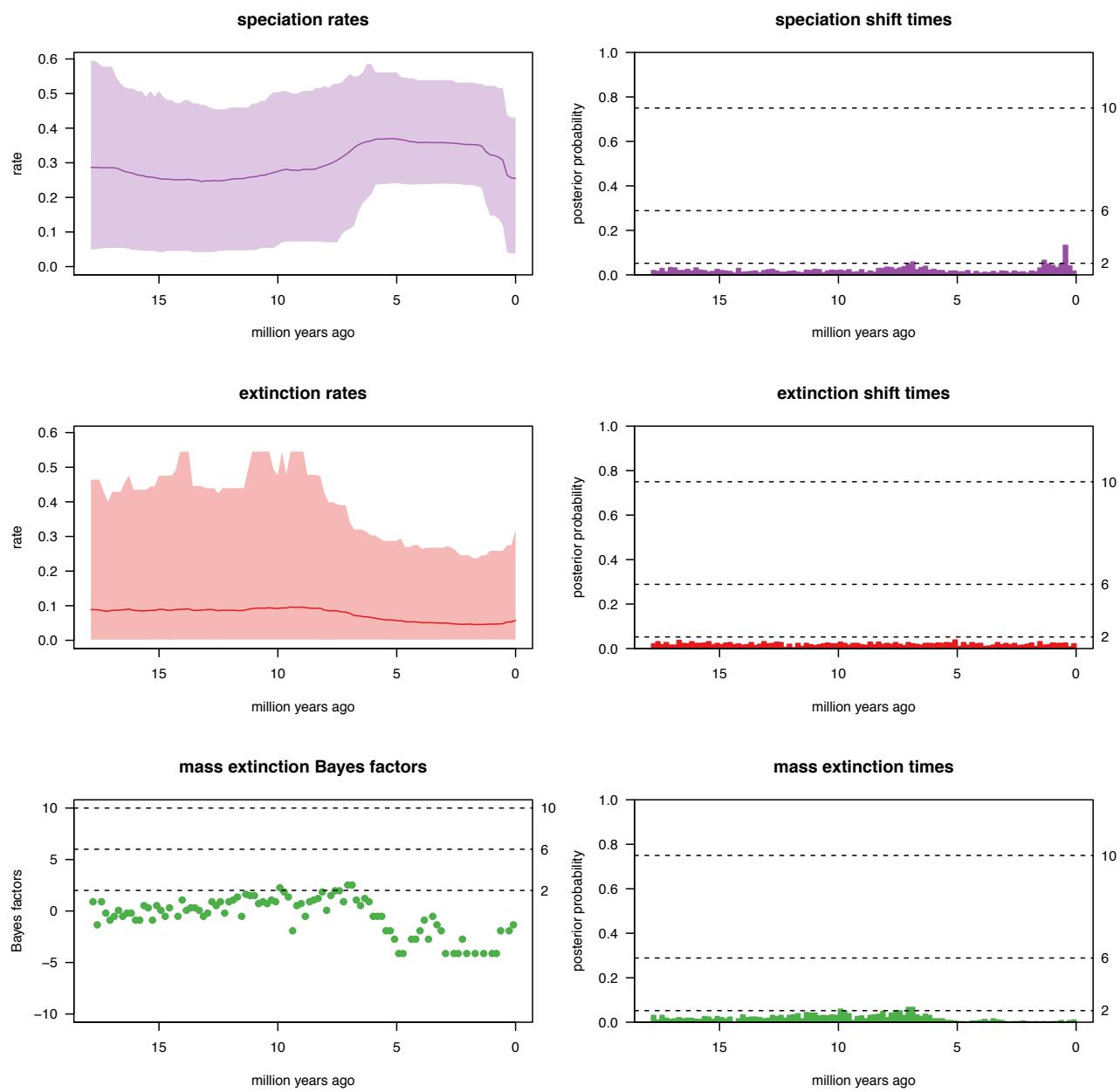
**Fig. S3n.** *Haemodorum* (Haemodoraceae)



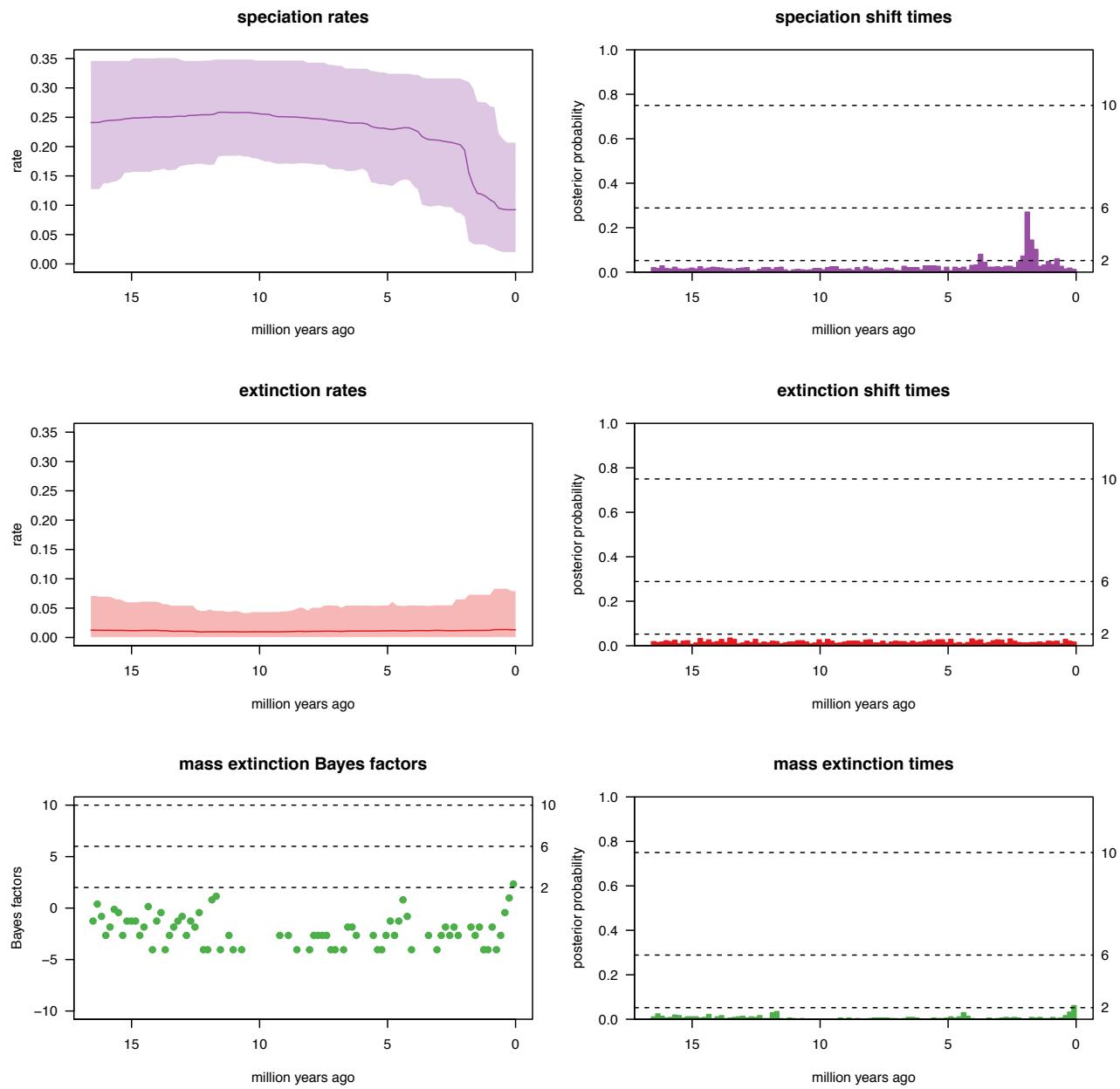
**Fig. S3o.** *Anigozanthos–Tribonanthes* clade (Haemodoraceae), under a 0.2 survival probability mass extinction threshold.



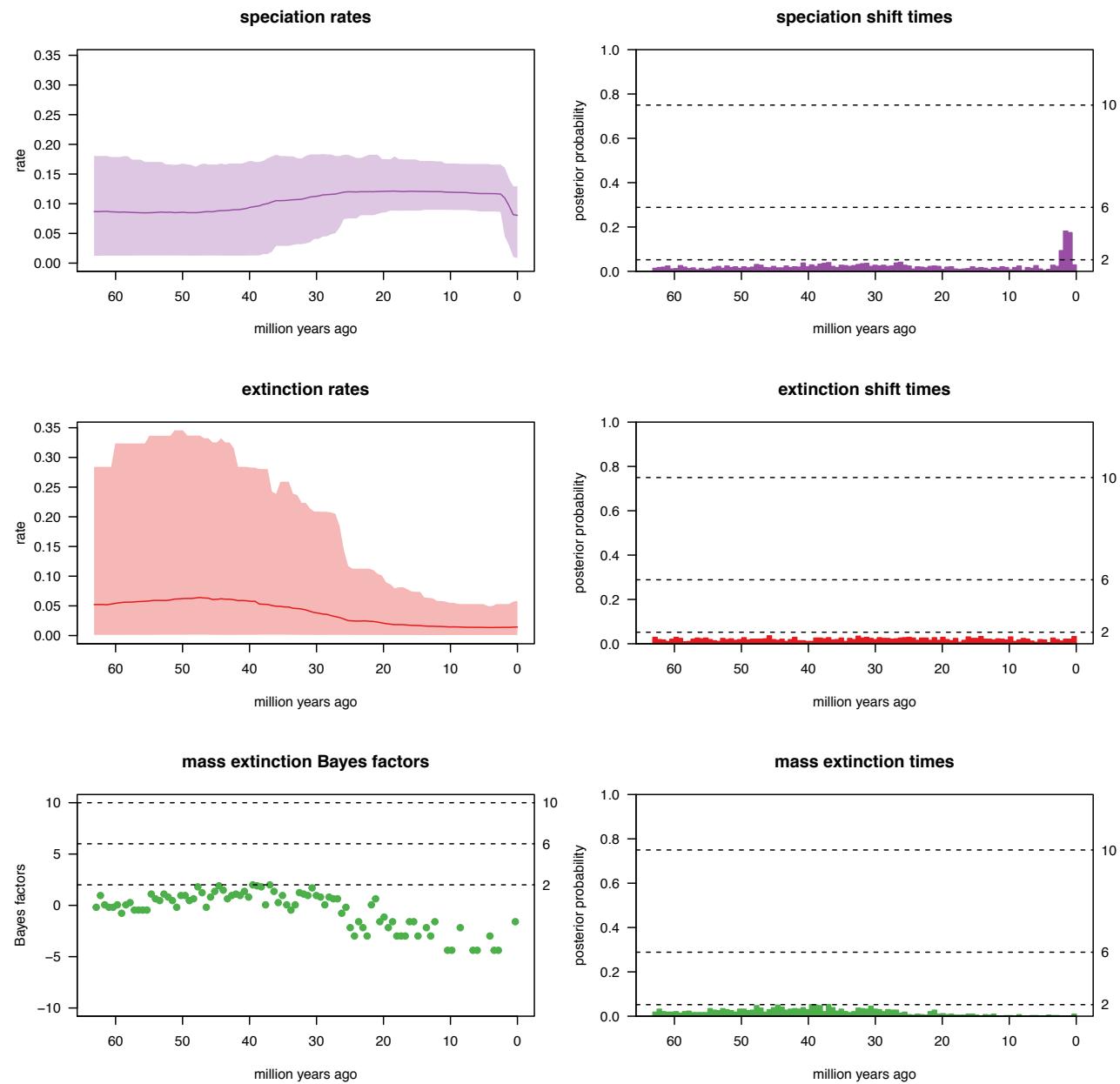
**Fig. S3p. *Dianella* (Asphodelaceae)**



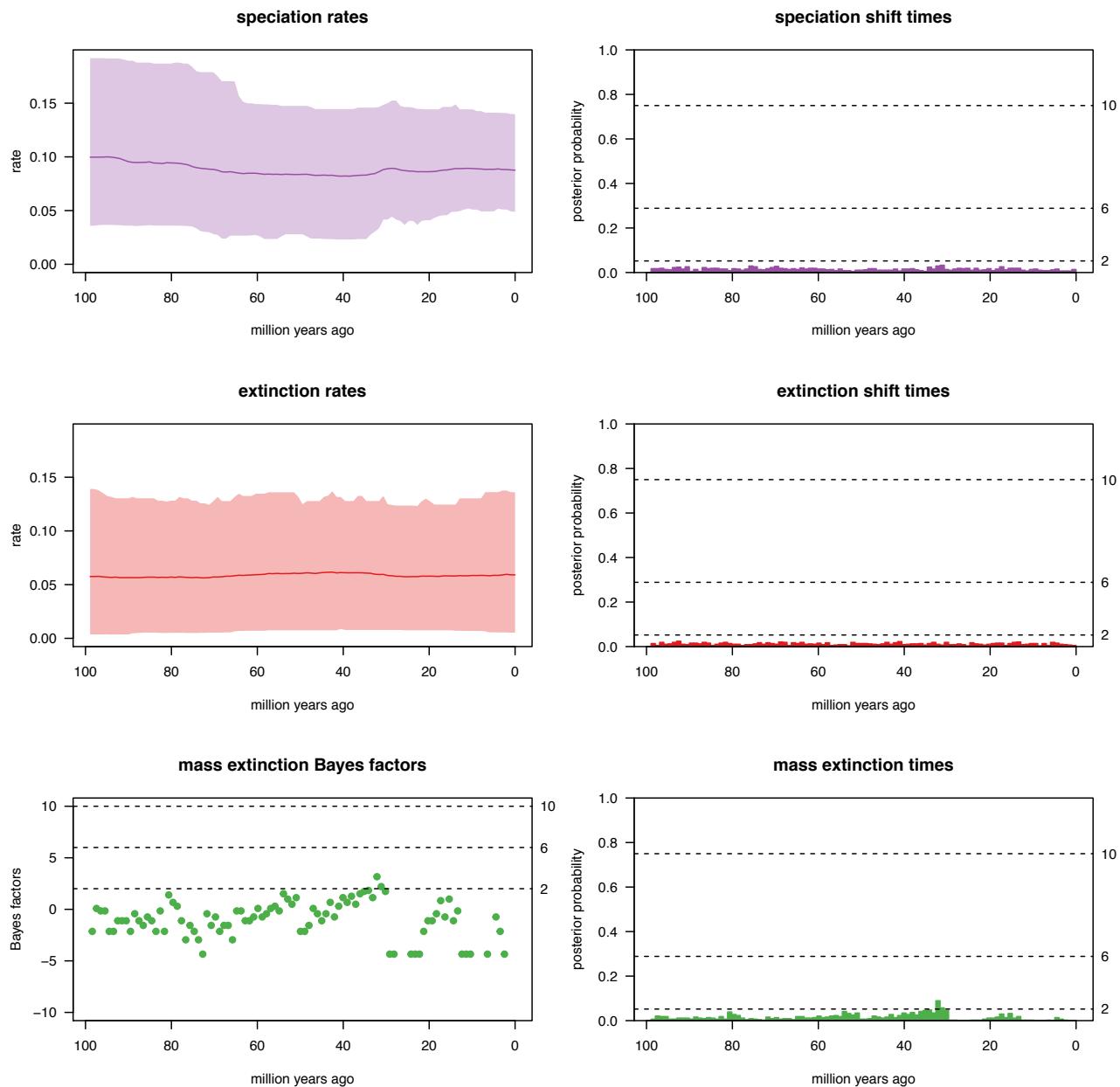
**Fig. S3q. *Prostanthera* (Lamiaceae)**



**Fig. S3r.** *Casuarina–Allocasuarina* (Casuarinaceae)

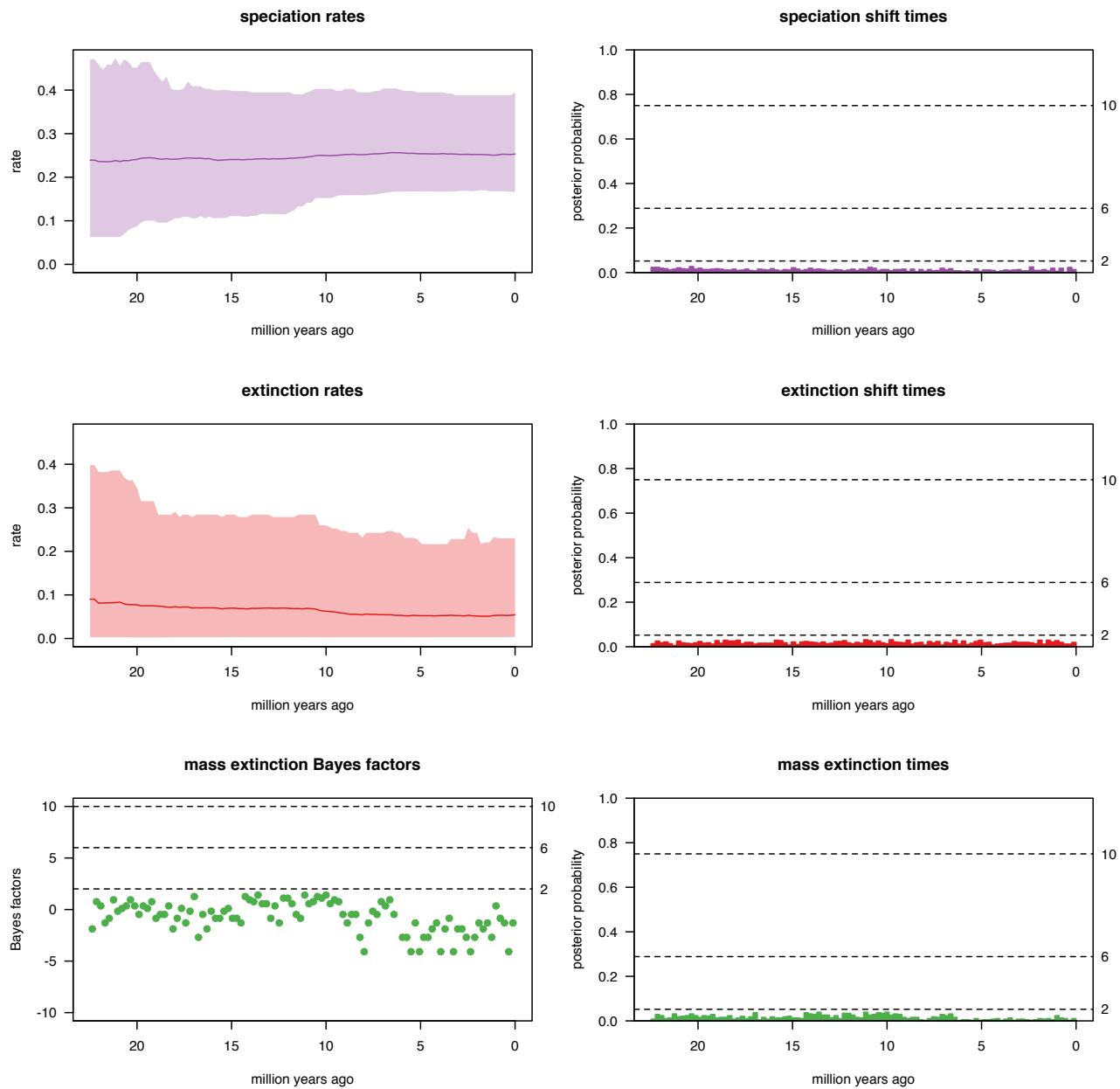


**Fig. S3s.** *Callitris*\* (Cupressaceae) under a 0.3 survival probability mass extinction threshold.

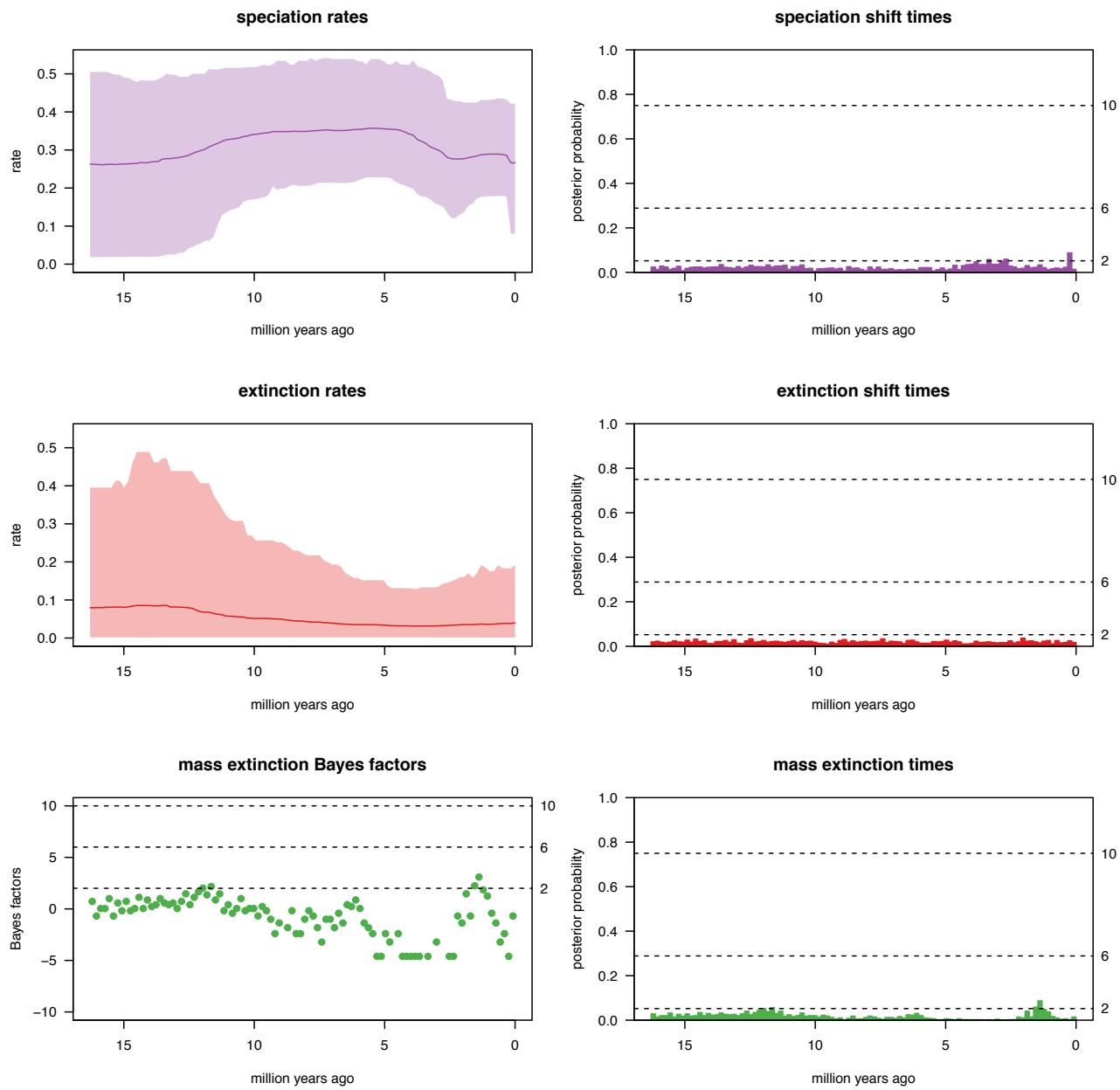


\*indicates a non-flowering gymnosperm group

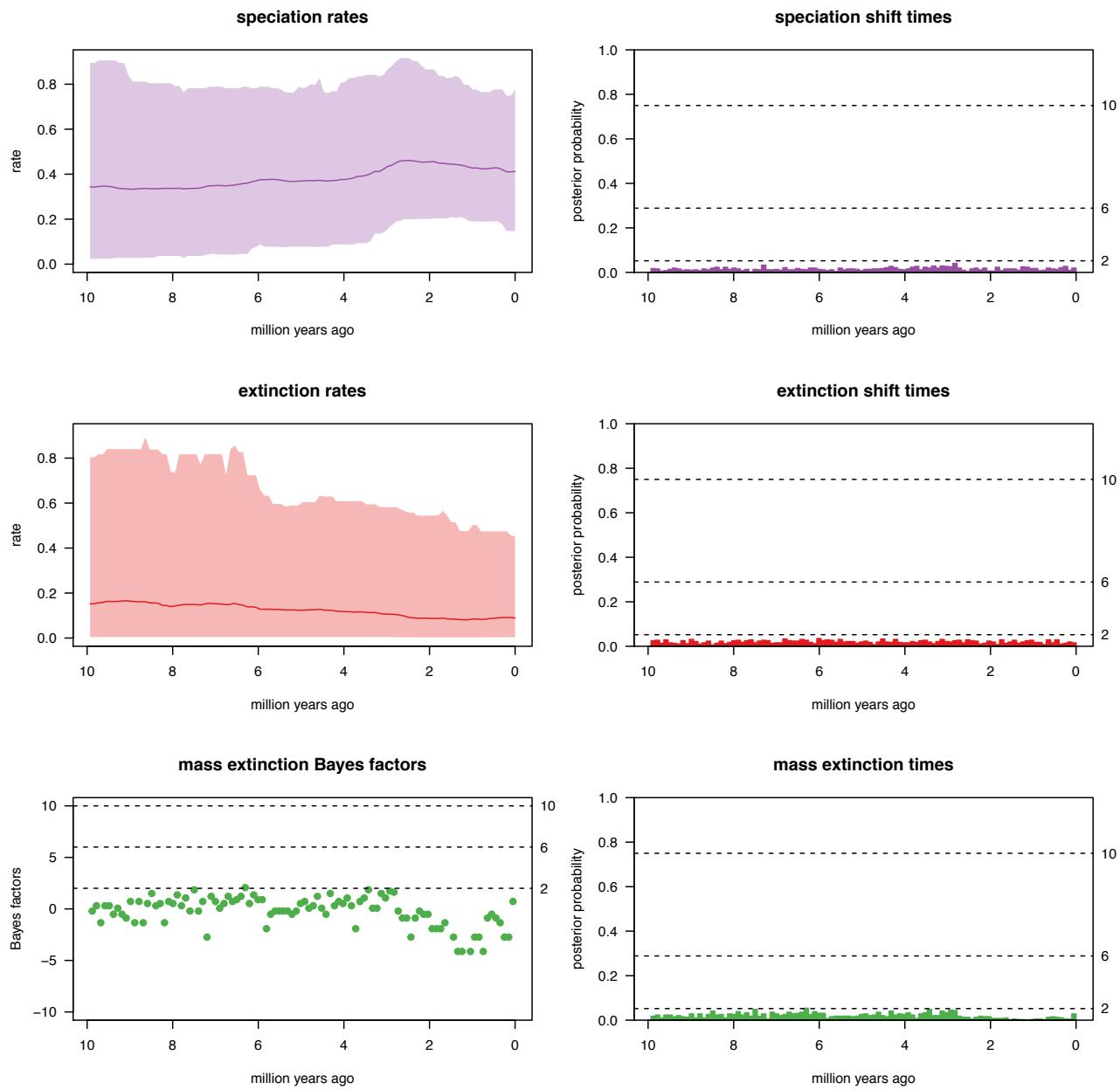
**Fig. S3t.** *Logania–Orianthera* (Loganiaceae)



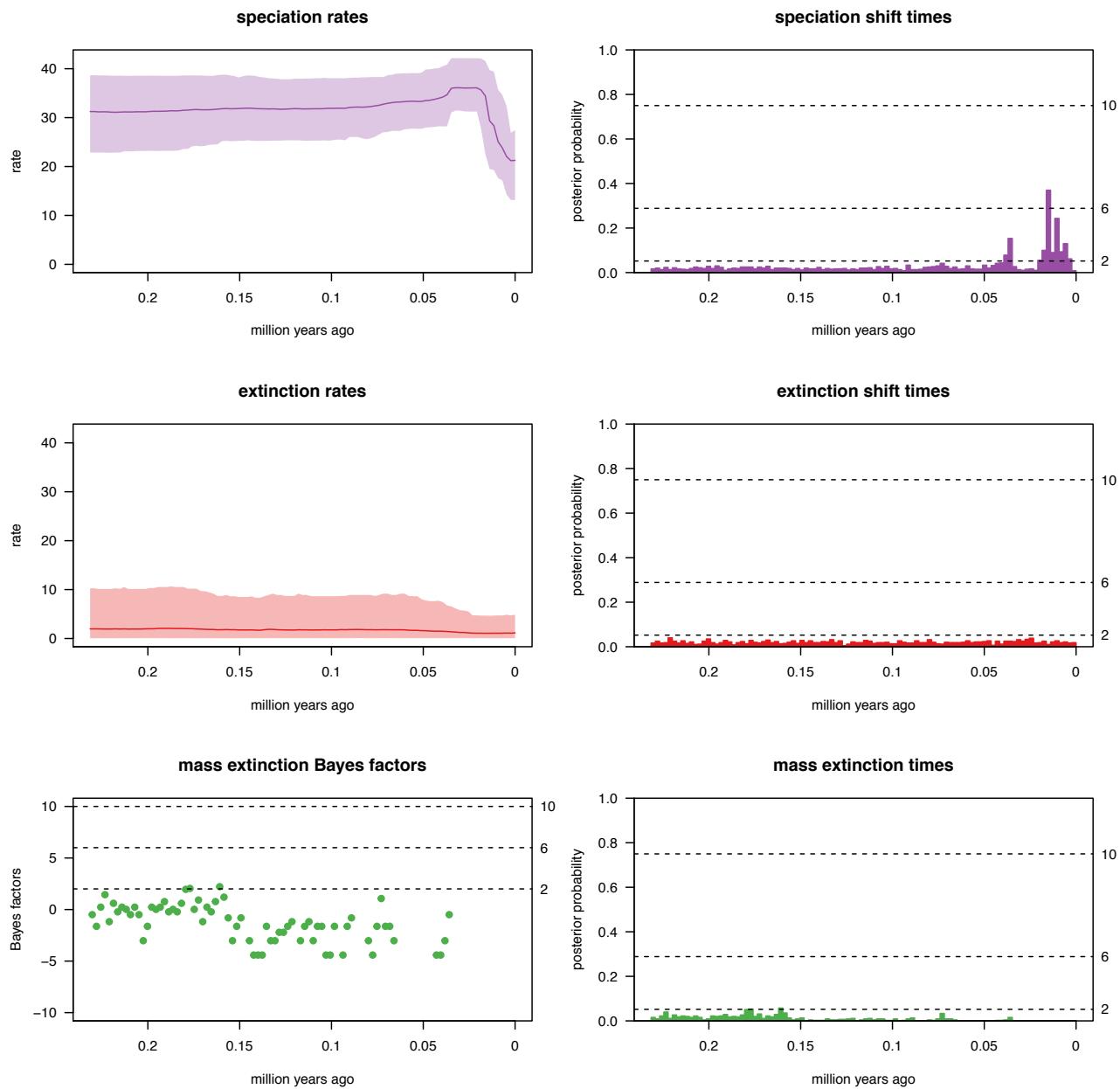
**Fig. S3u. *Zieria* (Rutaceae)**



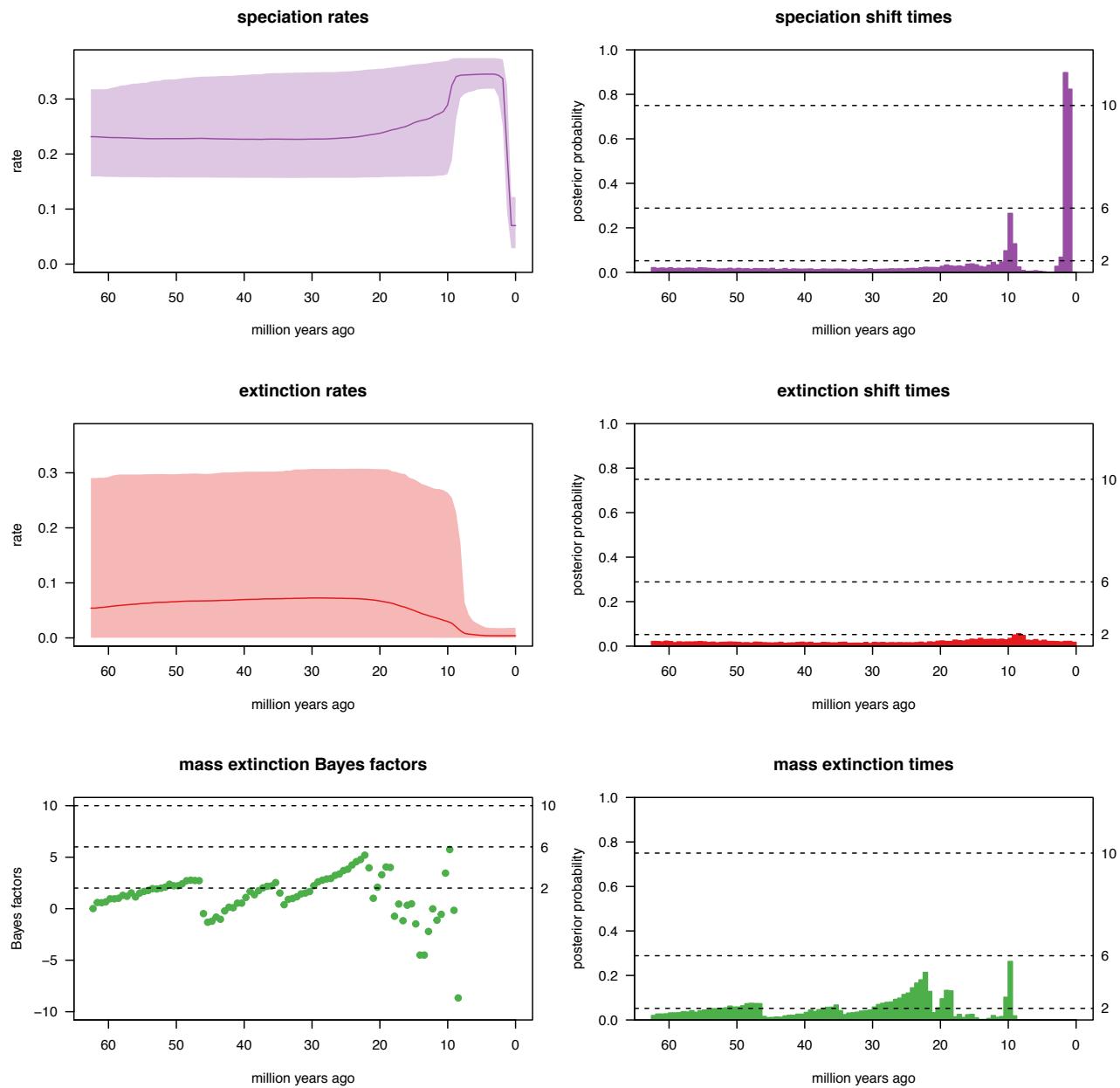
**Fig. S3v.** *Correa* (Rutaceae)



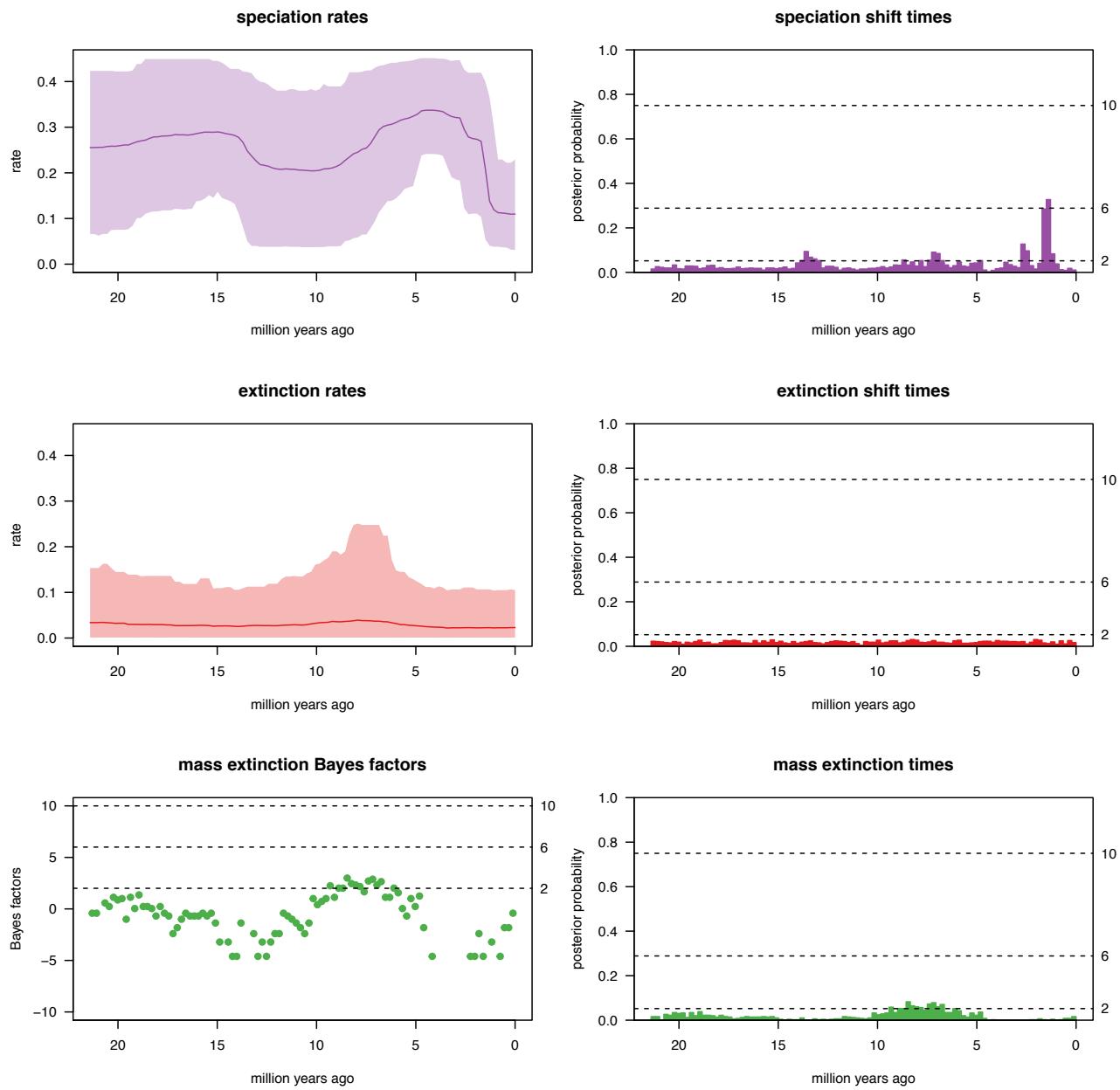
**Fig. S3w. *Acacia* (Fabaceae)**



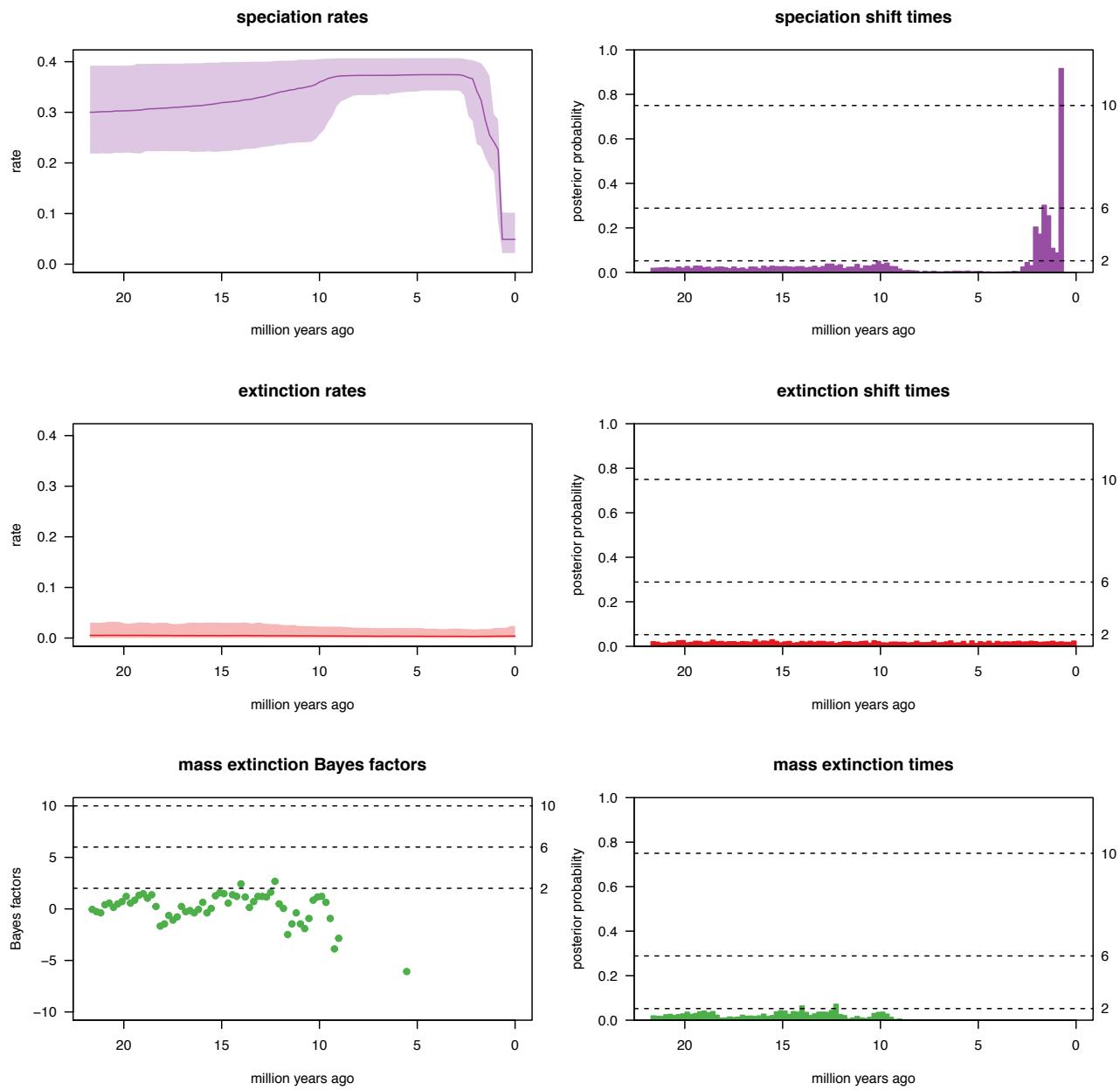
**Fig. S3x.** Eucalypts (Myrtaceae) under a 0.3 survival probability mass extinction threshold.



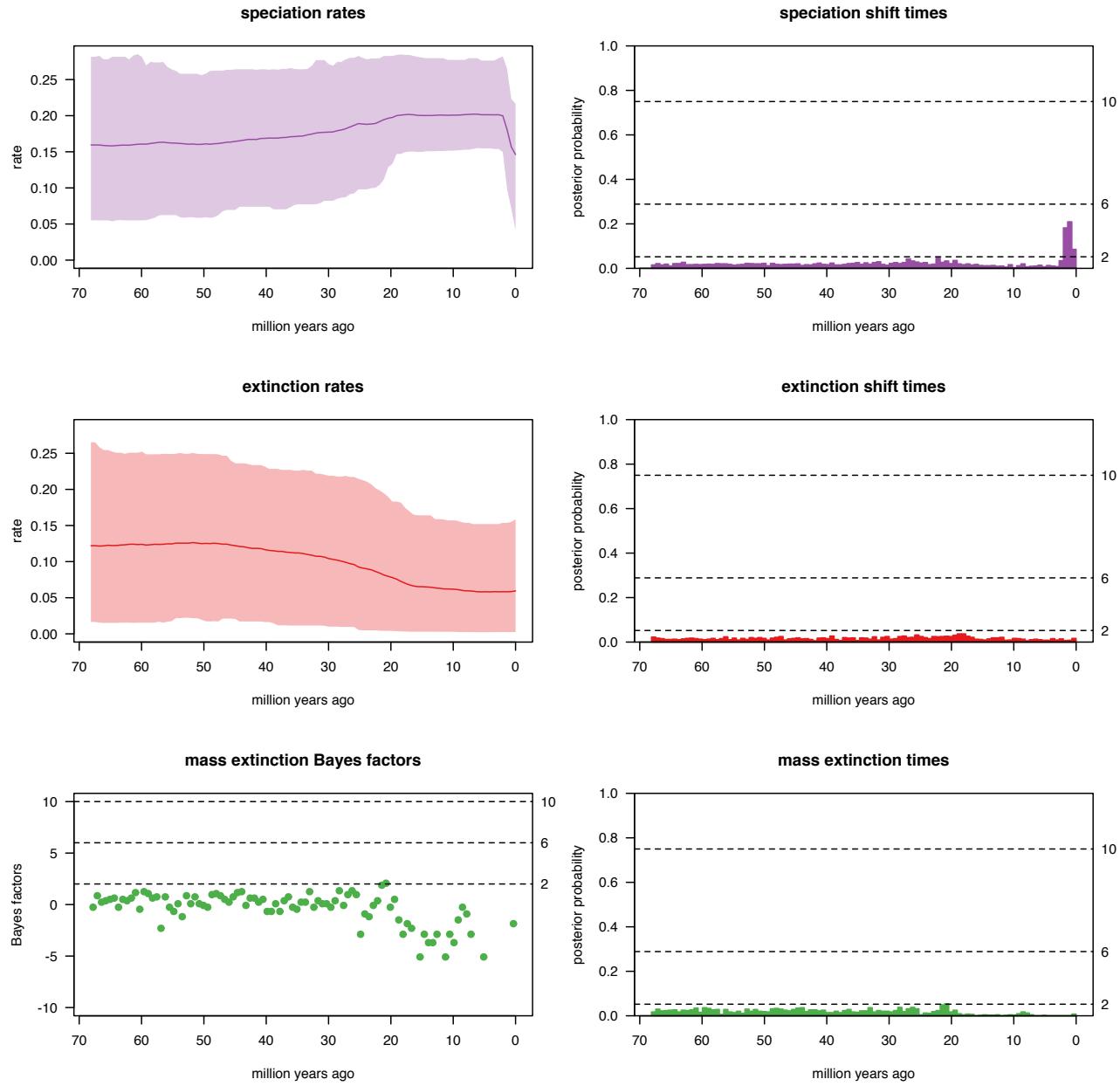
**Fig. S3y. *Corymbia* (Myrtaceae)**



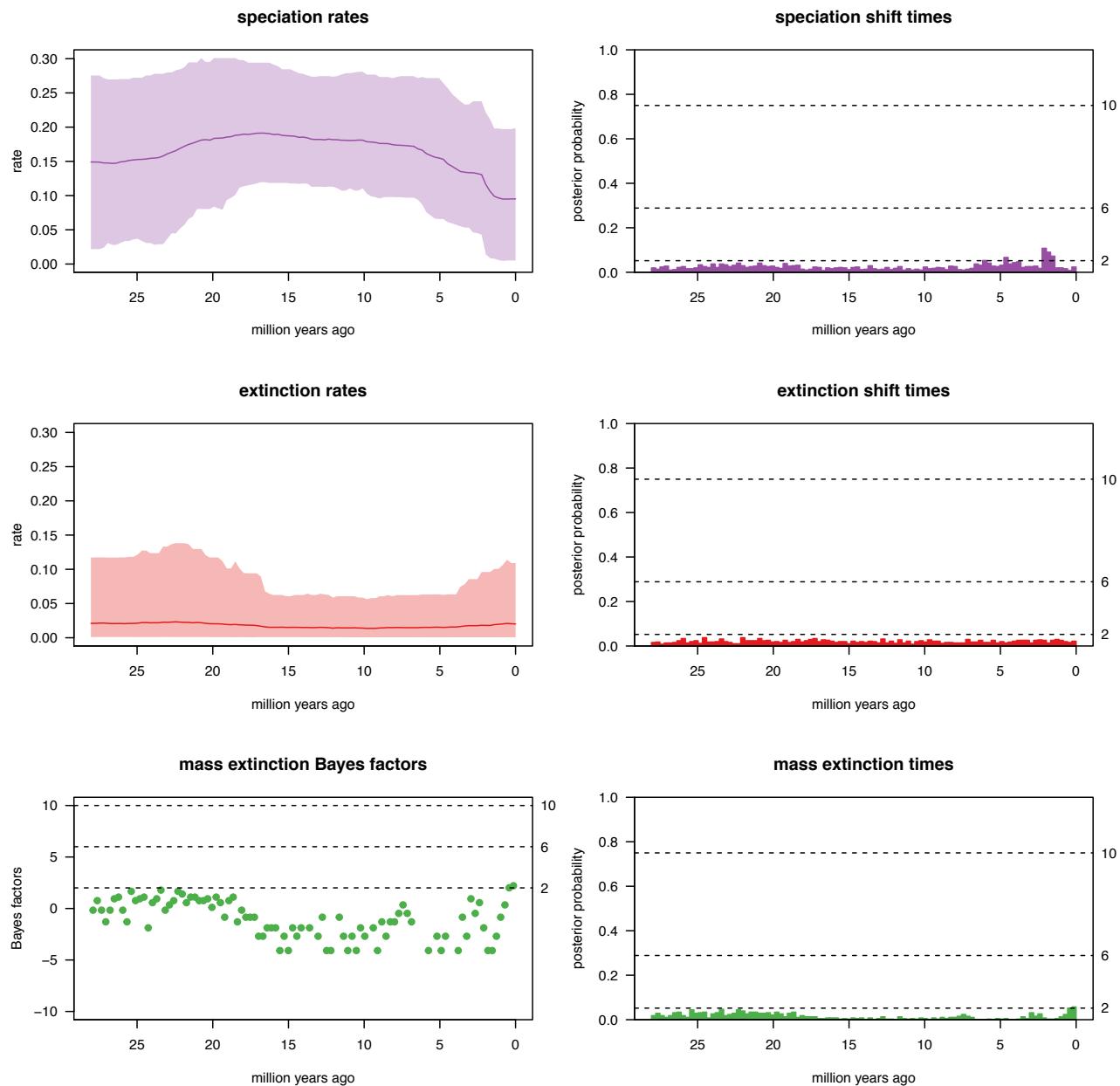
**Fig. S3y. *Eucalyptus* (Myrtaceae)**



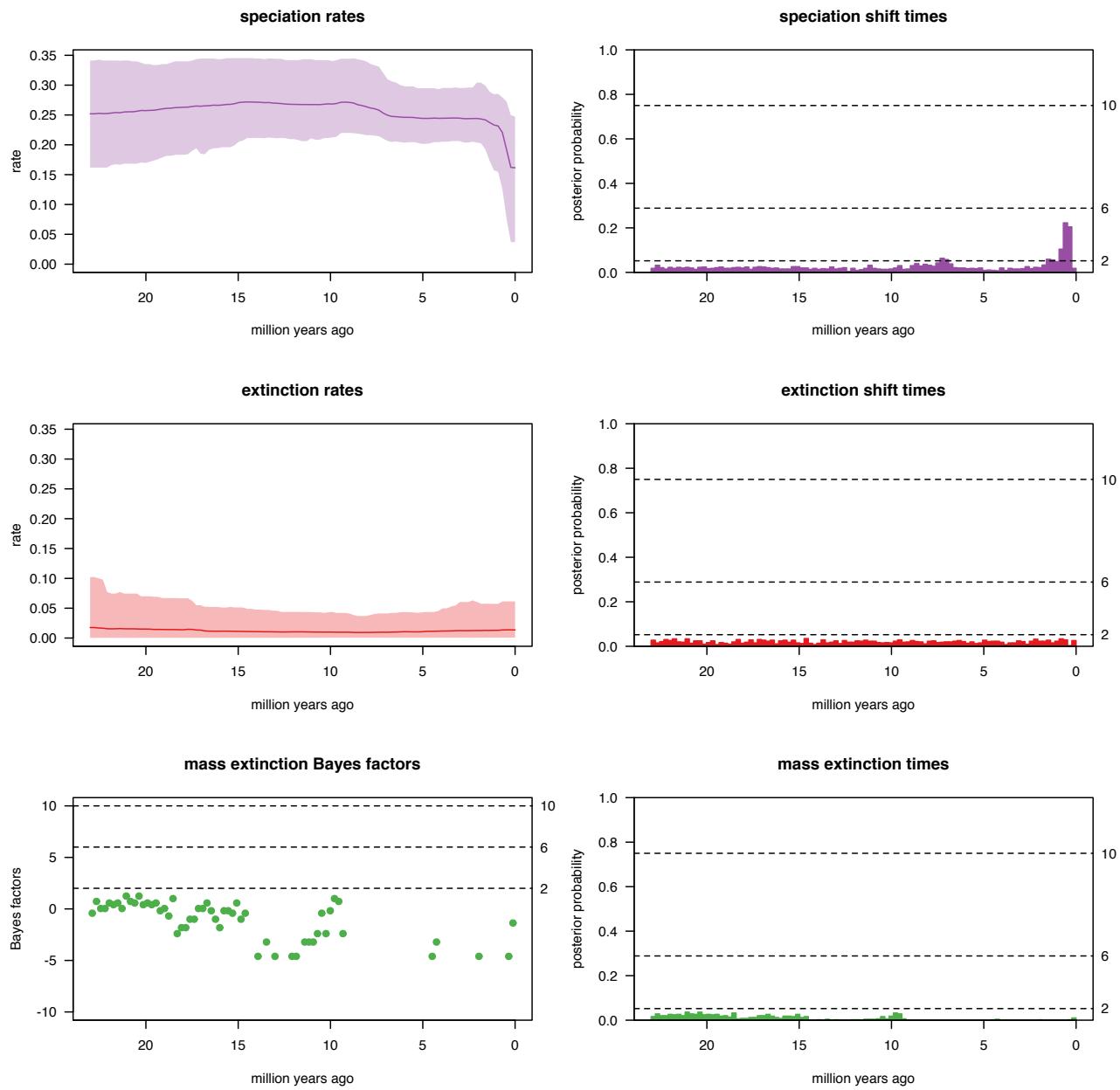
**Fig. S3z. Goodeniaceae**



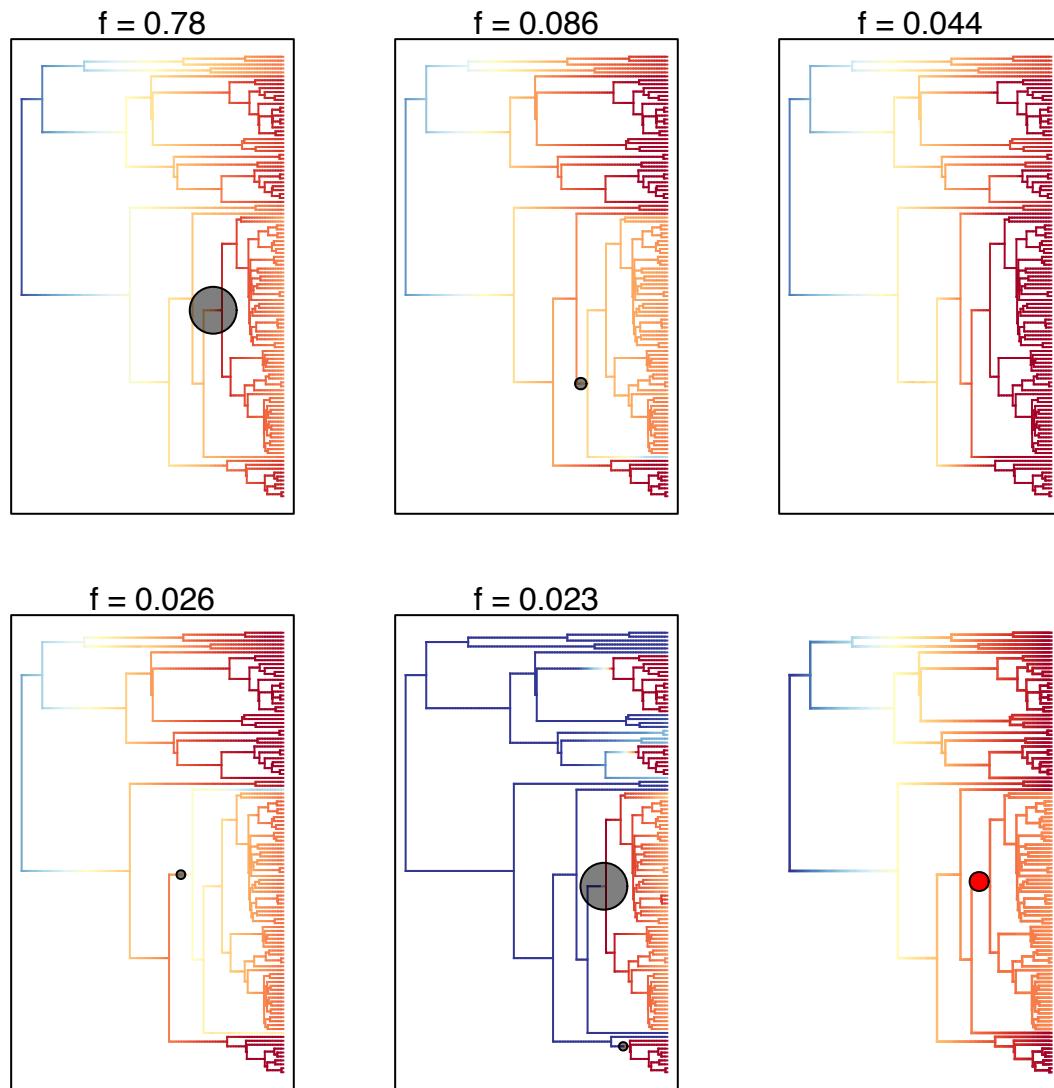
**Fig. S3aa.** *Dampiera* (Goodeniaceae)



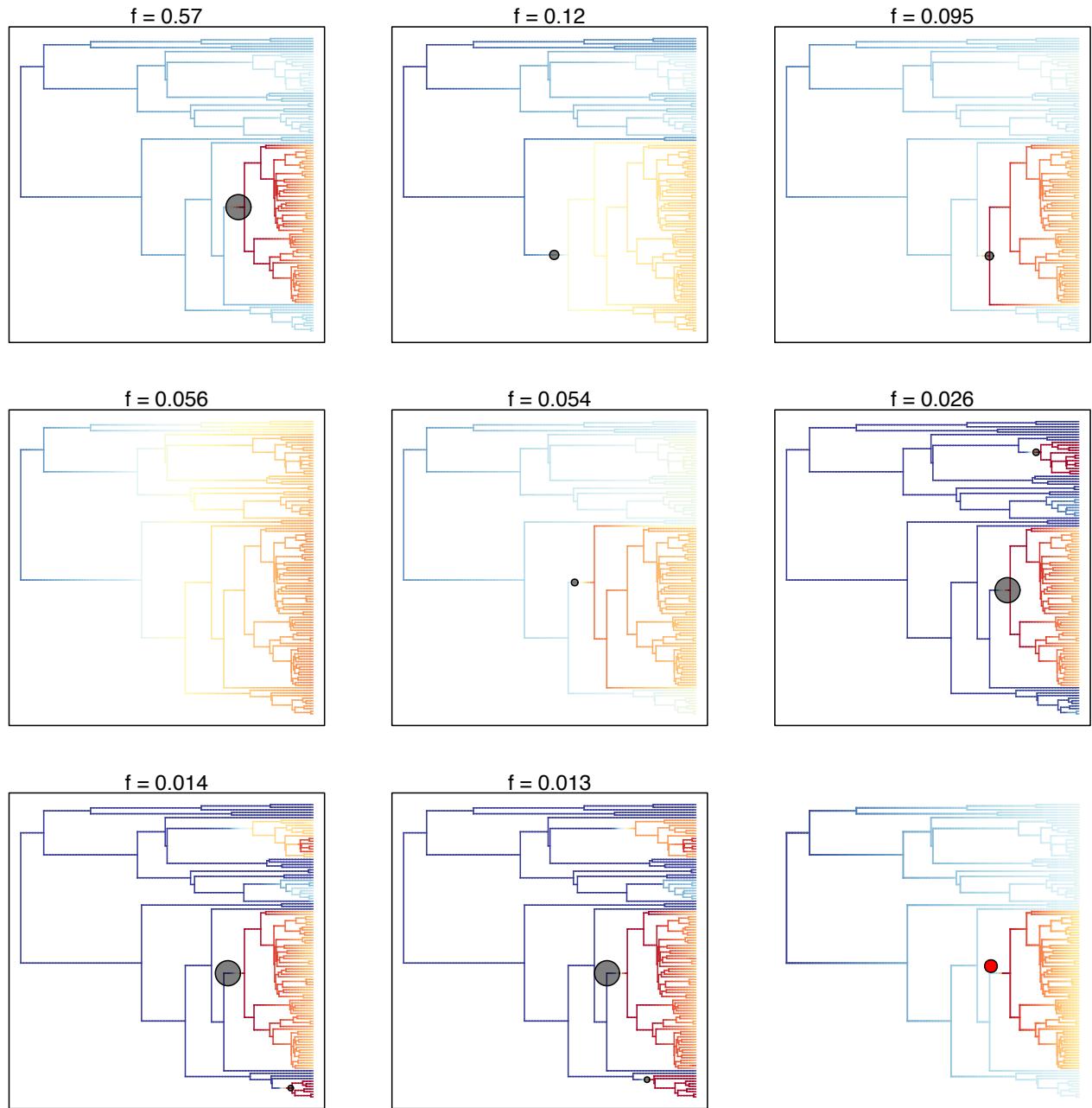
**Fig. S3bb.** Styracaceae (Ericaceae)



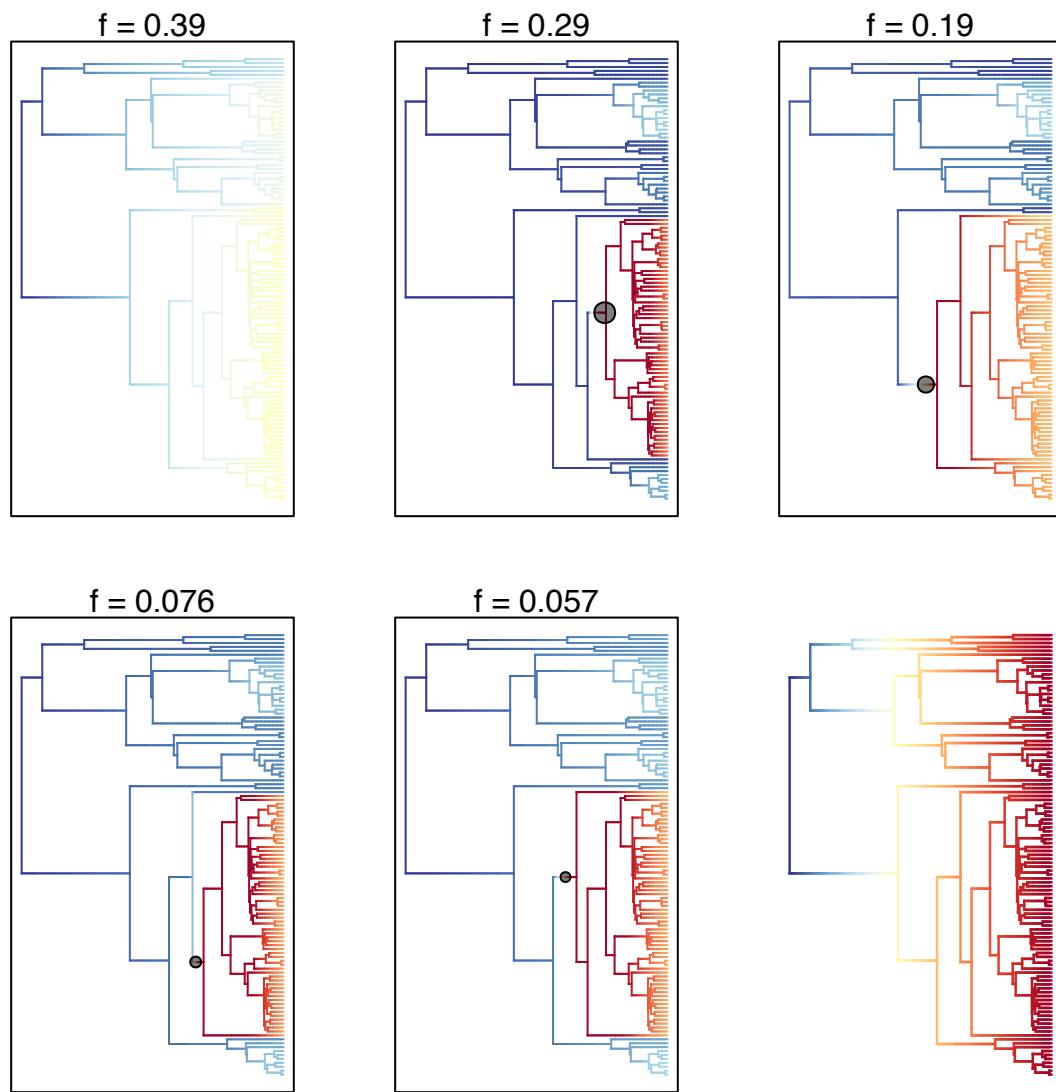
**Fig. S4a** BAMM 95% credible rate shift configurations for Haemodoraceae at 20% sampling fraction regime, and best rate shift configuration (bottom right). F = probability; percentage of samples in posterior assigned to shift configurations.



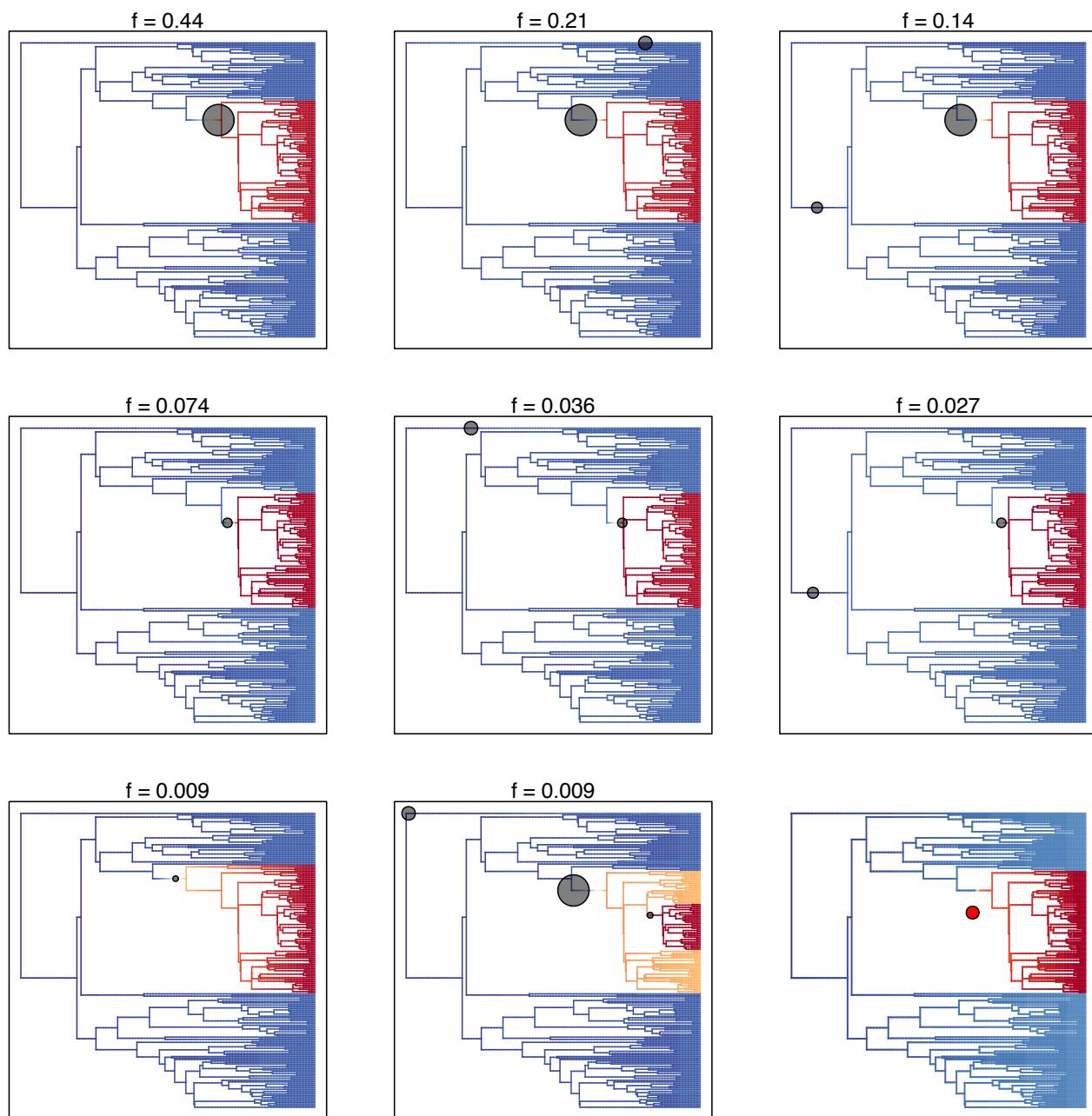
**Fig. S4b** BAMM 95% credible rate shift configurations for Haemodoraceae at 40% sampling fraction regime, and best rate shift configuration (bottom right). F = probability; percentage of samples in posterior assigned to shift configurations.



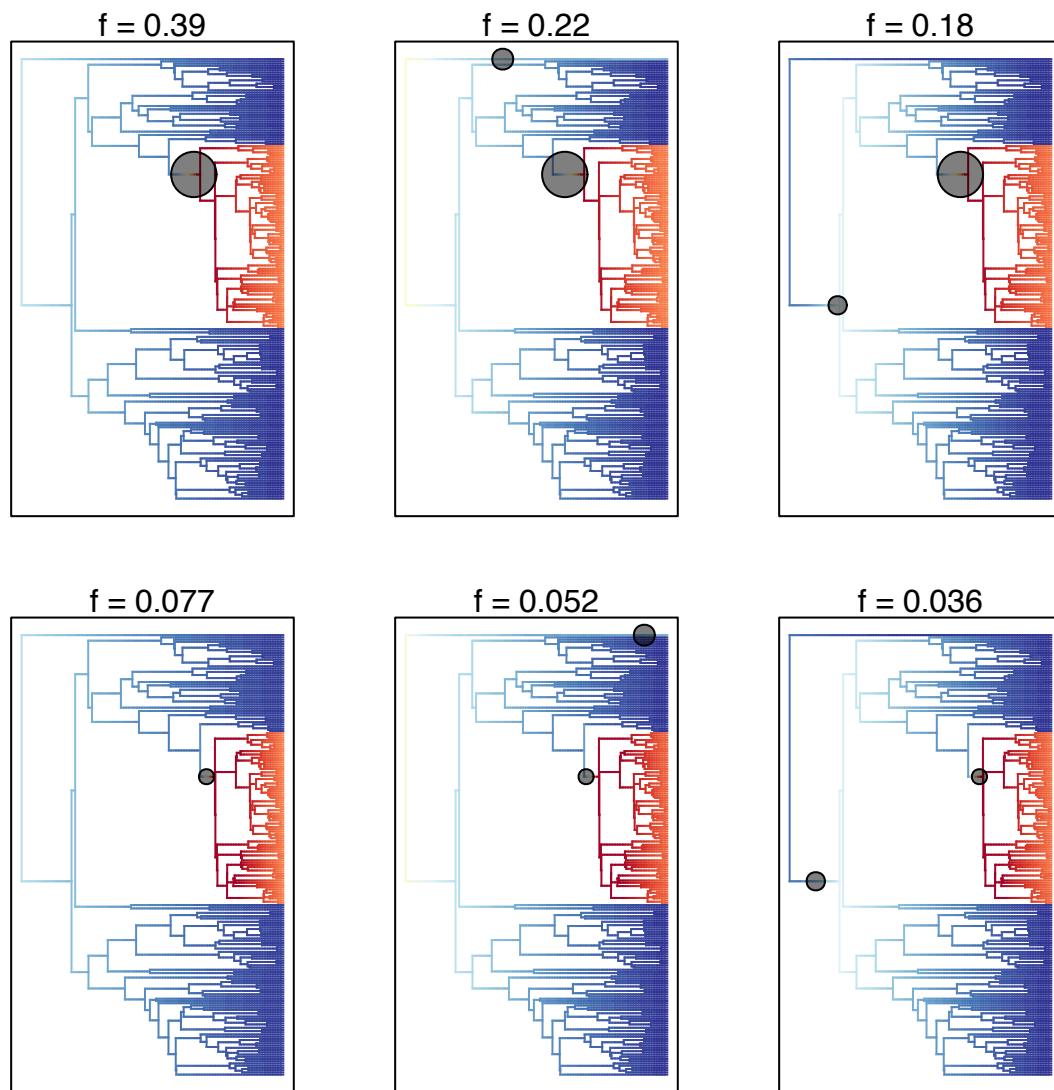
**Fig. S4c** BAMM 95% credible rate shift configurations for Haemodoraceae at 100% sampling fraction regime, and best rate shift configuration (bottom right). F = probability; percentage of samples in posterior assigned to shift configurations.



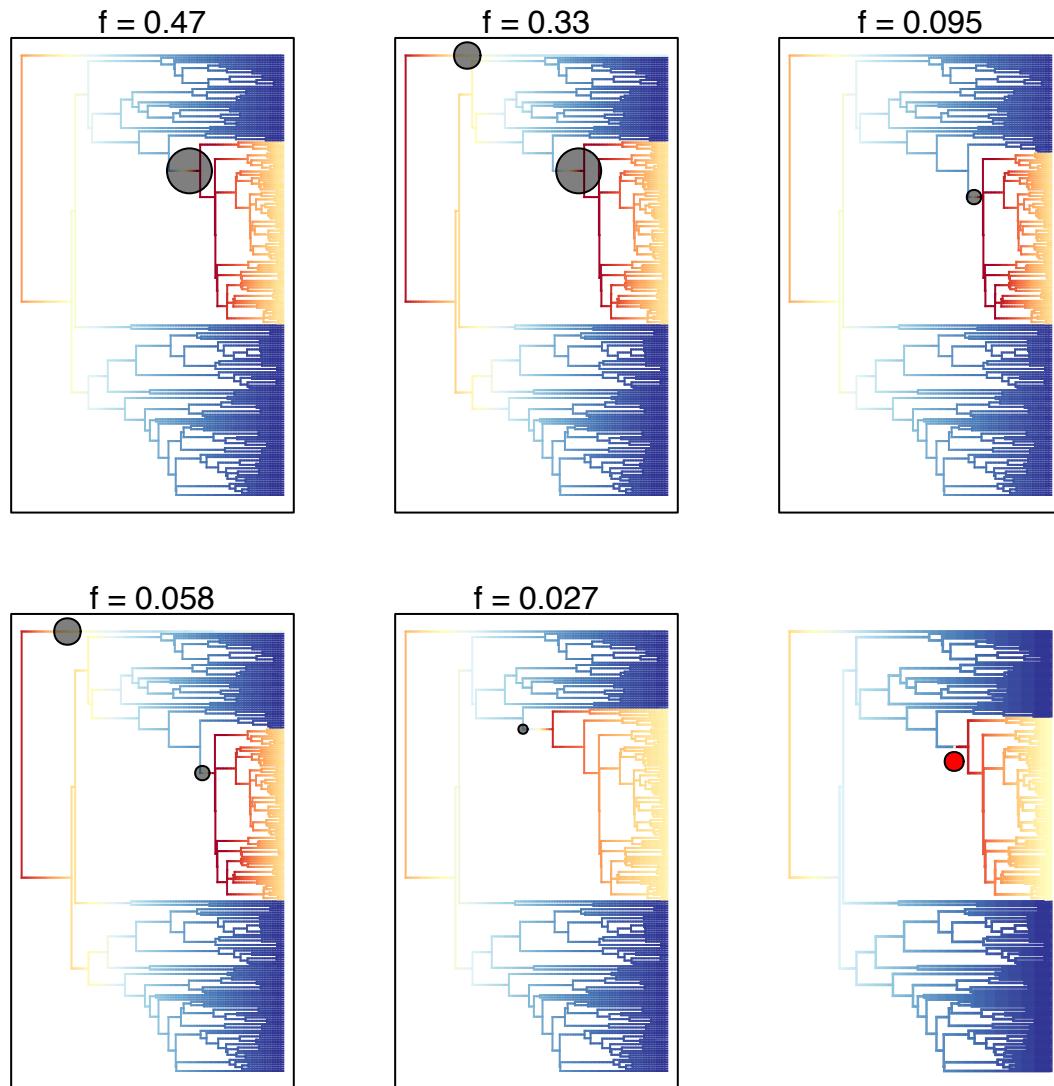
**Fig. S4d** BAMM 95% credible rate shift configurations for Rhamnaceae at 20% sampling fraction regime, and best rate shift configuration (bottom right). F = probability; percentage of samples in posterior assigned to shift configurations.



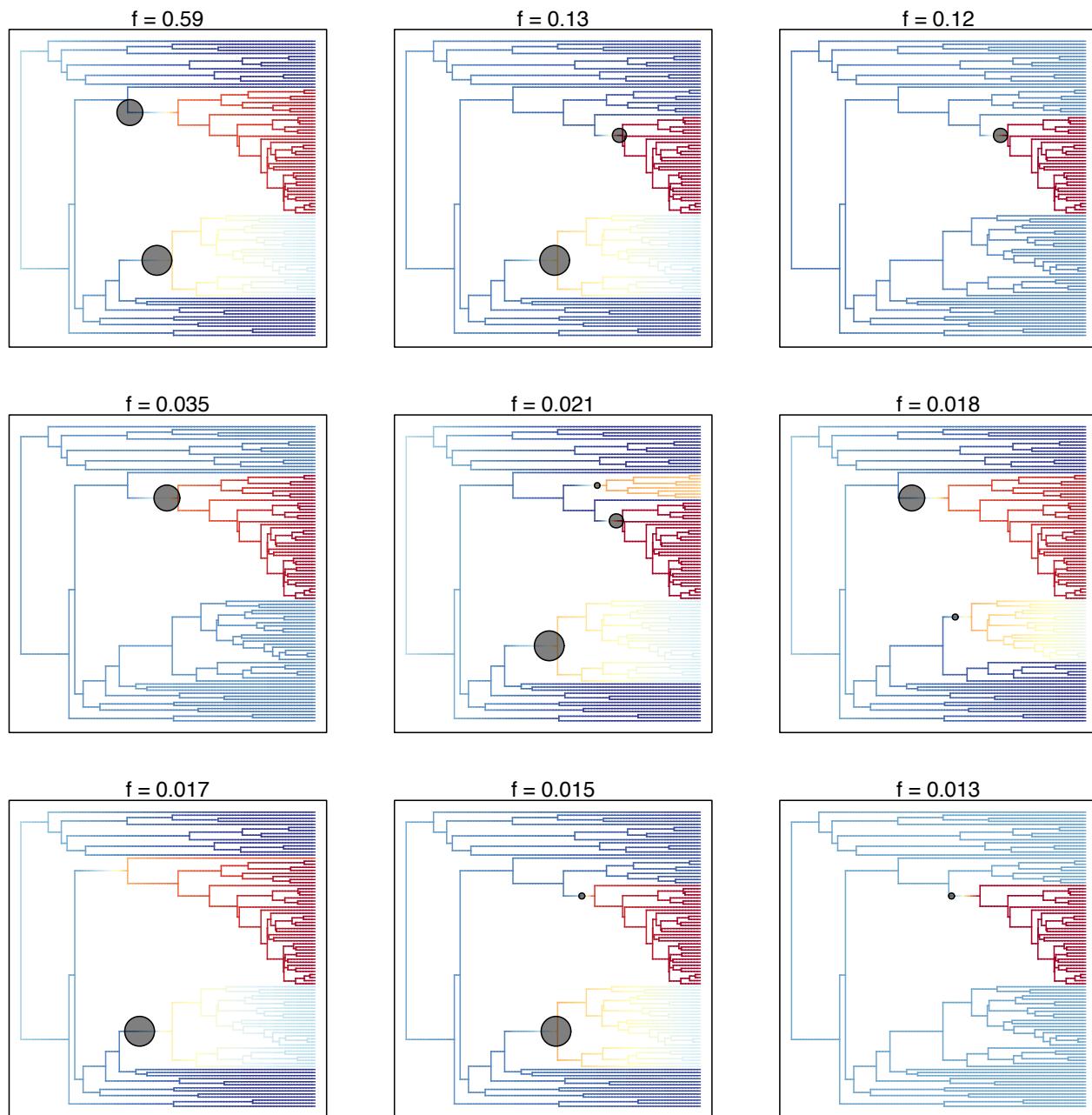
**Fig. S4e** BAMM 95% credible rate shift configurations for Rhamnaceae at 50% sampling fraction regime. F = probability; percentage of samples in posterior assigned to shift configurations.



**Fig. S4f** BAMM 95% credible rate shift configurations for Rhamnaceae at 100% sampling fraction regime, and best rate shift configuration (bottom right). F = probability; percentage of samples in posterior assigned to shift configurations.



**Fig. S4g** BAMM 95% credible rate shift configurations for *Cassinia–Ozothamnus* at 20% sampling fraction regime. F = probability; percentage of samples in posterior assigned to shift configurations.

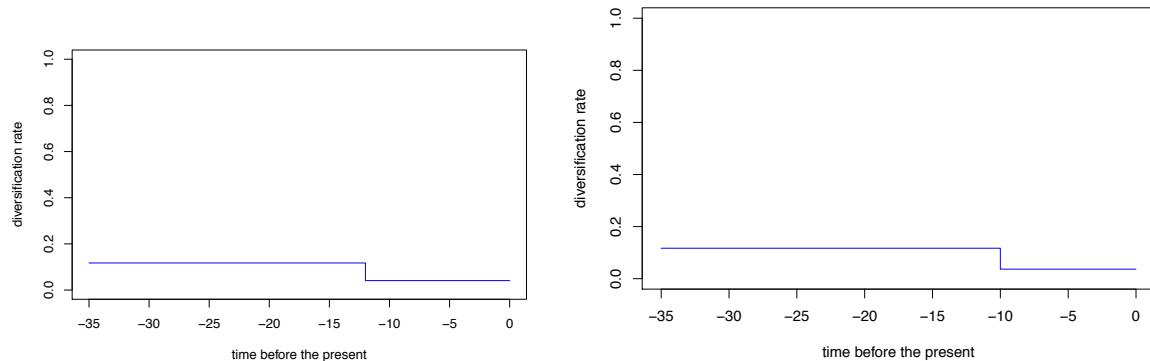


**Fig. S4h** BAMM 95% credible rate shift configurations for *Cassinia–Ozothamnus* at 50% sampling fraction regime, and best rate shift configuration (bottom right). F = probability; percentage of samples in posterior assigned to shift configurations.

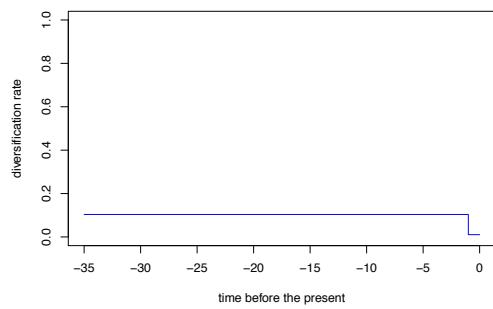
**Fig. S4i** BAMM 95% credible rate shift configurations for *Cassinia–Ozothamnus* at 80% sampling fraction regime, and best rate shift configuration (bottom right). F = probability; percentage of samples in posterior assigned to shift configurations.

**Fig. S4j** BAMM 95% credible rate shift configurations for *Cassinia–Ozothamnus* at 100% sampling fraction regime, and best rate shift configuration (bottom right). F = probability; percentage of samples in posterior assigned to shift configurations.

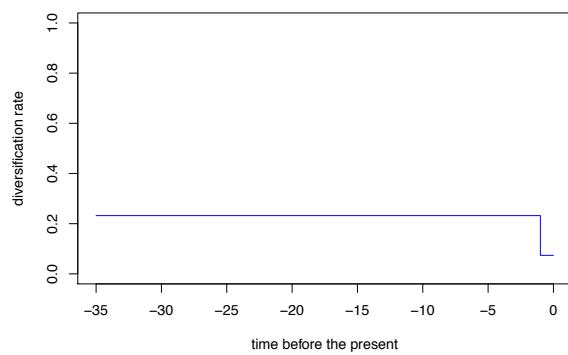
**Fig. S5.** TreePar diversification through time plots and 2Ma sliced TreePar diversification through time plots for **a) *Calytrix*** (Myrtaceae)



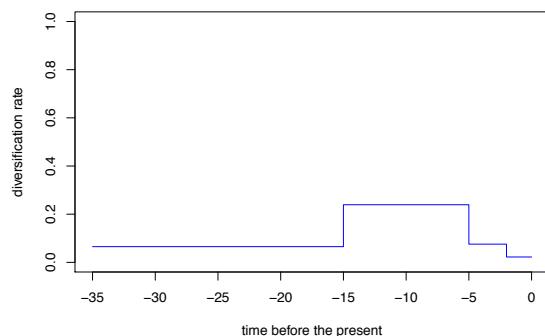
**Fig. S5b.** Pomaderreae (Rhamnaceae)



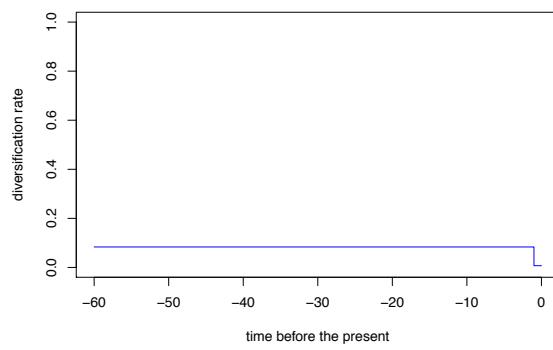
**Fig. S5c.** *Pomaderris* (Rhamnaceae)



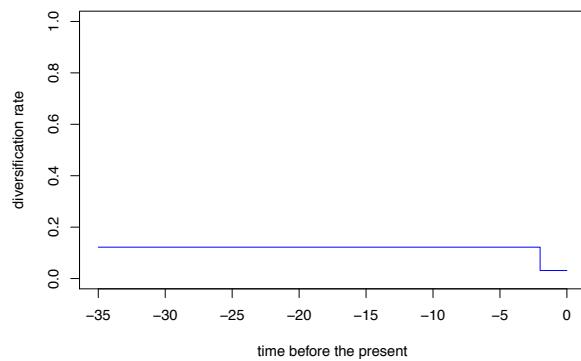
**Fig. S5d.** *Daviesia* (Fabaceae)



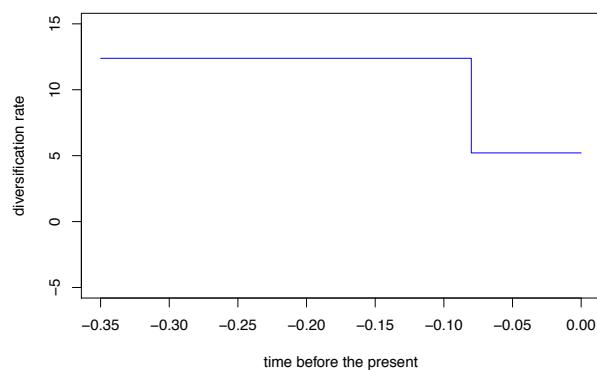
**Fig. S5e.** *Banksia* (Proteaceae)



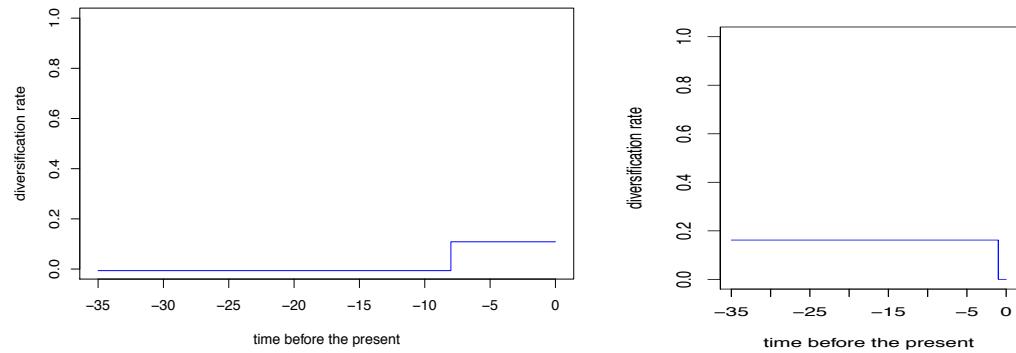
**Fig. S5f.** *Persoonia* (Proteaceae)



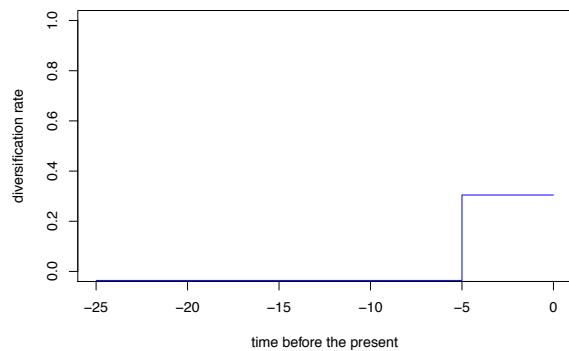
**Fig. S5g.** *Hakea* (Proteaceae)



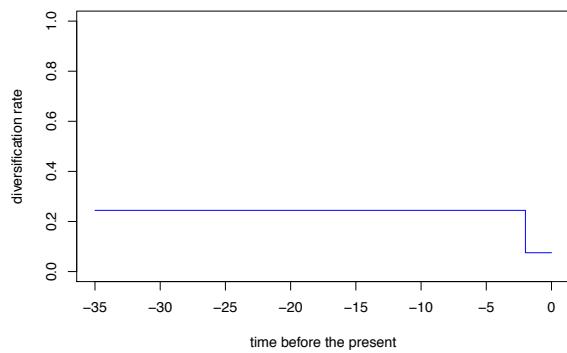
**Fig. S5h.** *Anigozanthos*–*Tribonanthes* clade (Haemodoraceae)



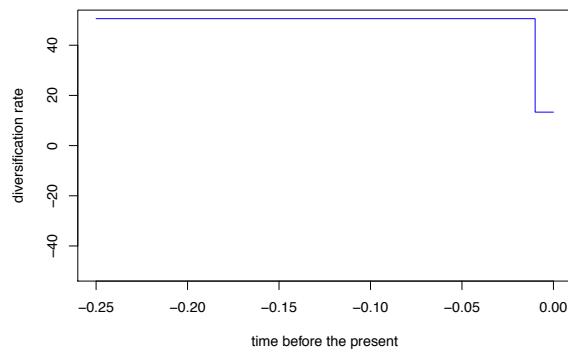
**Fig. S5i.** *Dianella* (Asphodelaceae)



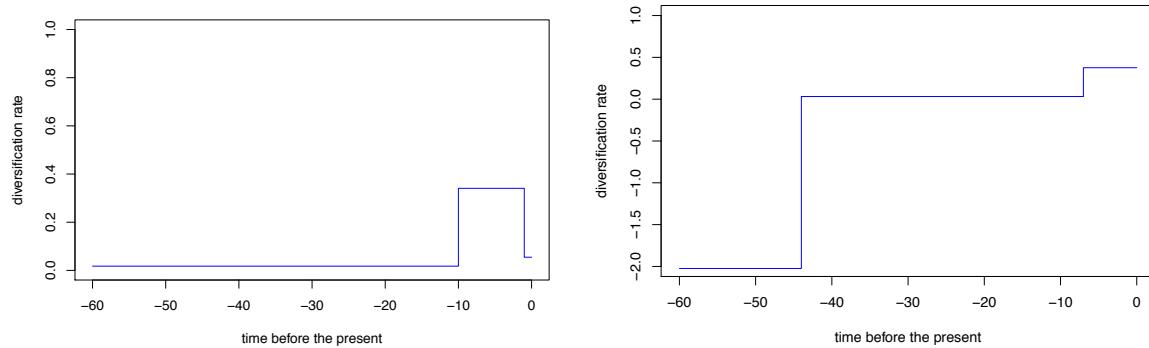
**Fig. S5j.** *Prostanthera* (Lamiaceae)



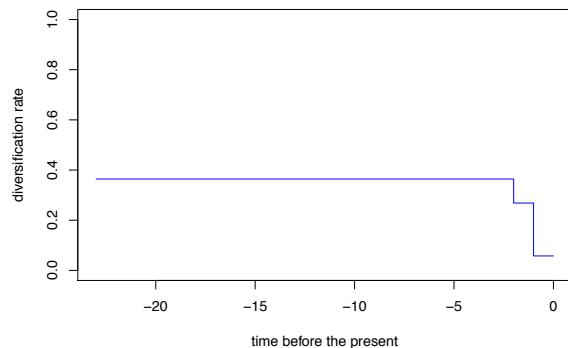
**Fig. S5k.** *Acacia* subtree2 (Fabaceae)



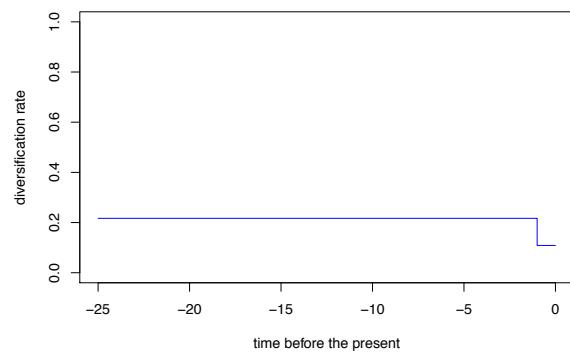
**Fig. S5l.** Eucalypts (Myrtaceae)



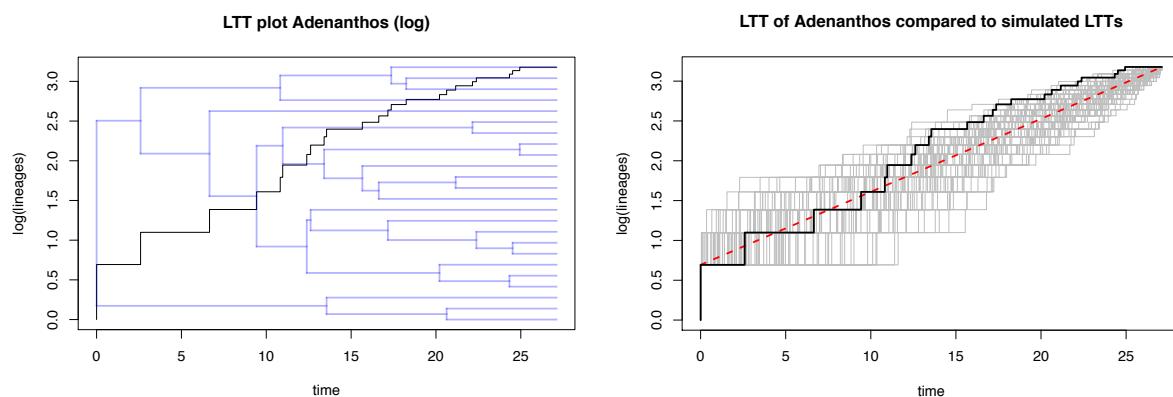
**Fig. S5m.** *Eucalyptus* (Myrtaceae)



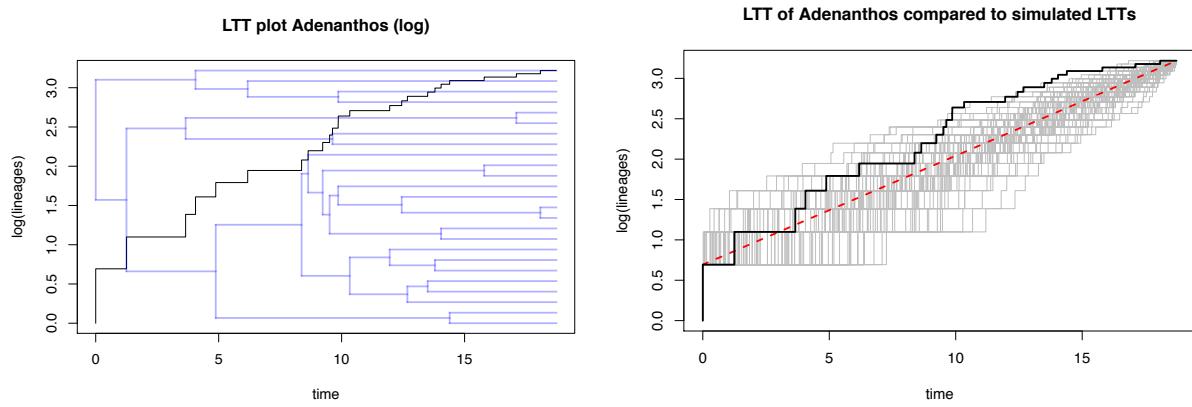
**Fig. S5n.** Styphelieae (Ericaceae)



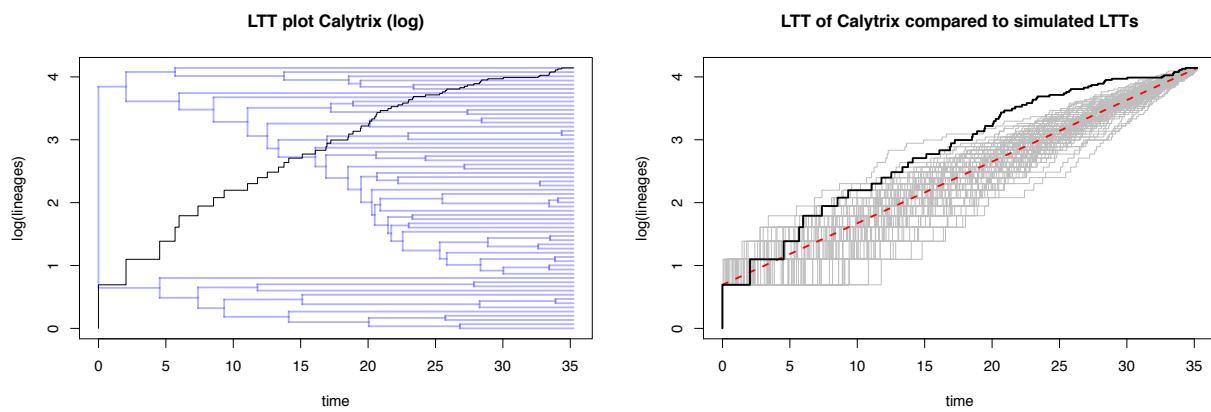
**Fig. S6.** Lineage-through-time plot visualised over actual phylogeny and 100 simulated LTTs under constant birth-death model for **a)** *Adenanthes* (ITS tree).



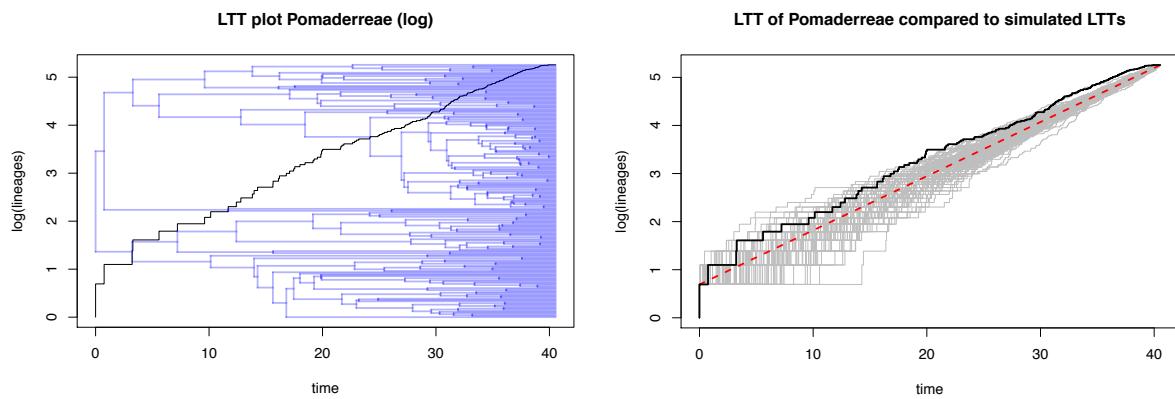
**Fig. S6b.** *Adenanthes* (Proteaceae) chloroplast tree



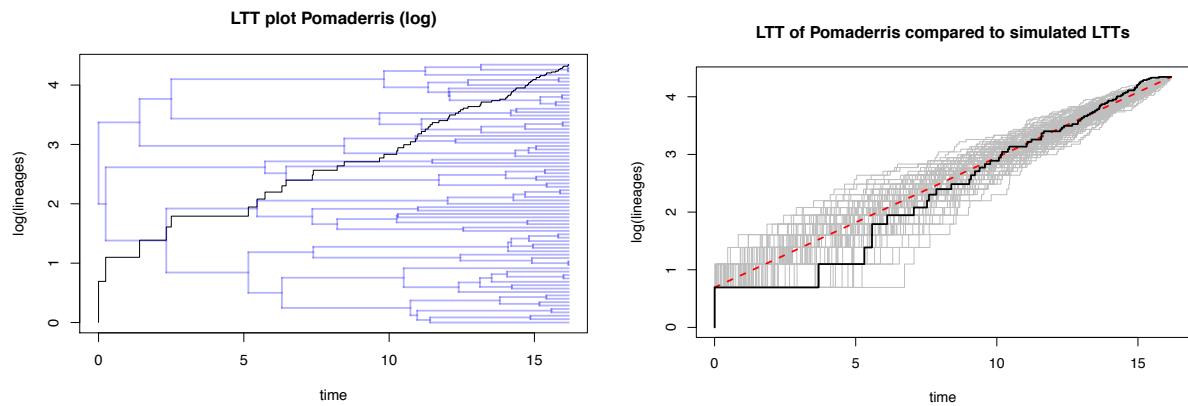
**Fig. S6c.** *Calytrix* (Myrtaceae)



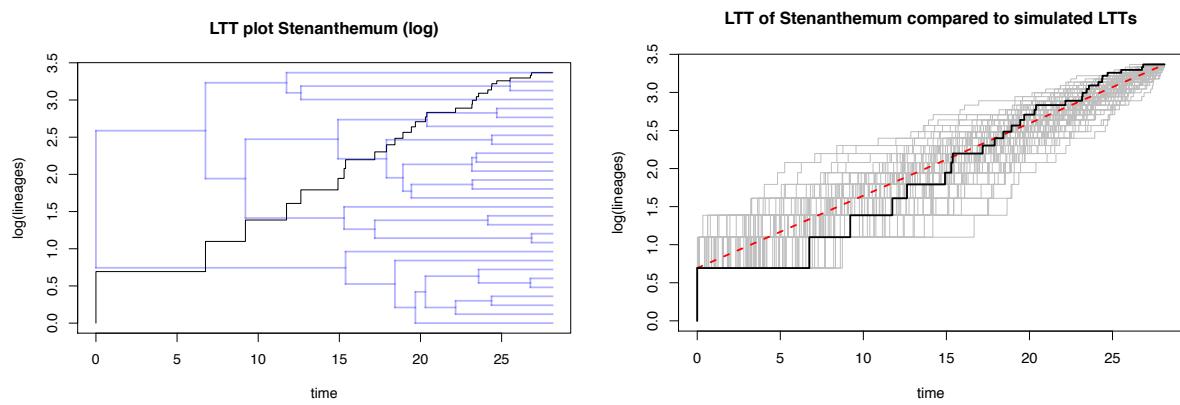
**Fig. S6d.** Pomaderreae (Rhamnaceae)



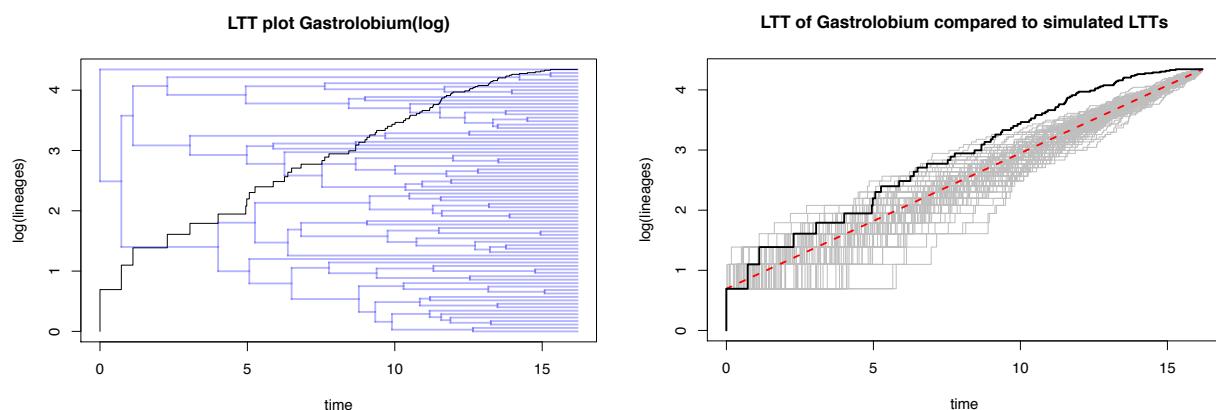
**Fig. S6e. *Pomaderris* (Rhamnaceae)**



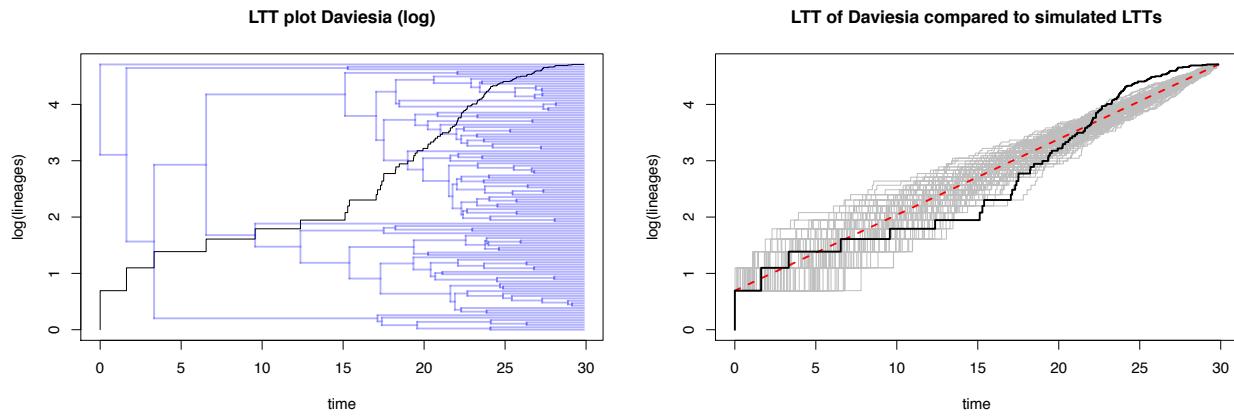
**Fig. S6f. *Stenanthemum* (Rhamnaceae)**



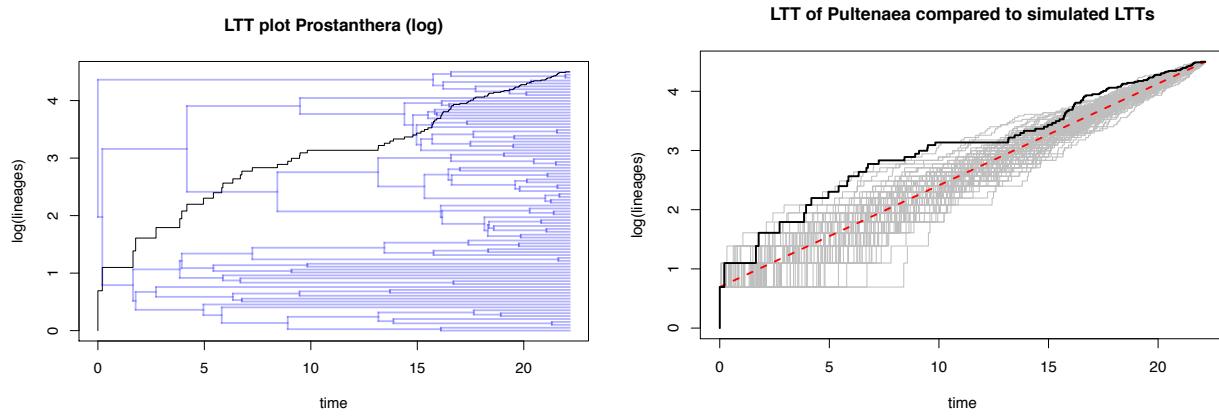
**Fig. S6g. *Gastrolobium* (Fabaceae)**



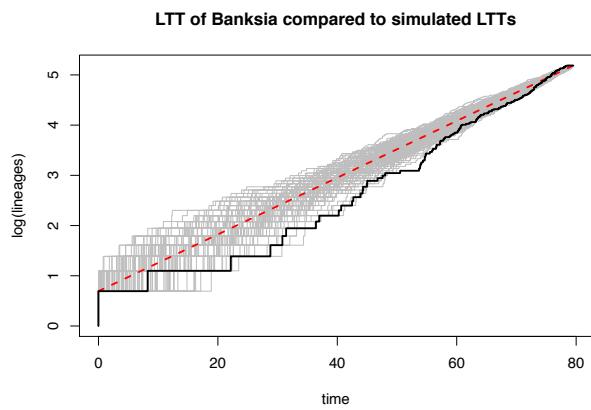
**Fig. S6h. *Daviesia* (Fabaceae)**



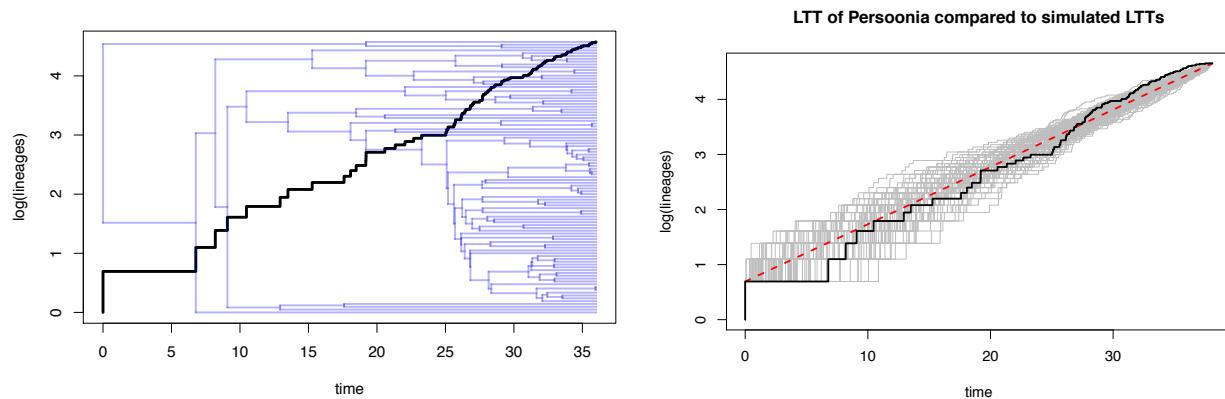
**Fig. S6i.** *Pultenaea* (Fabaceae)



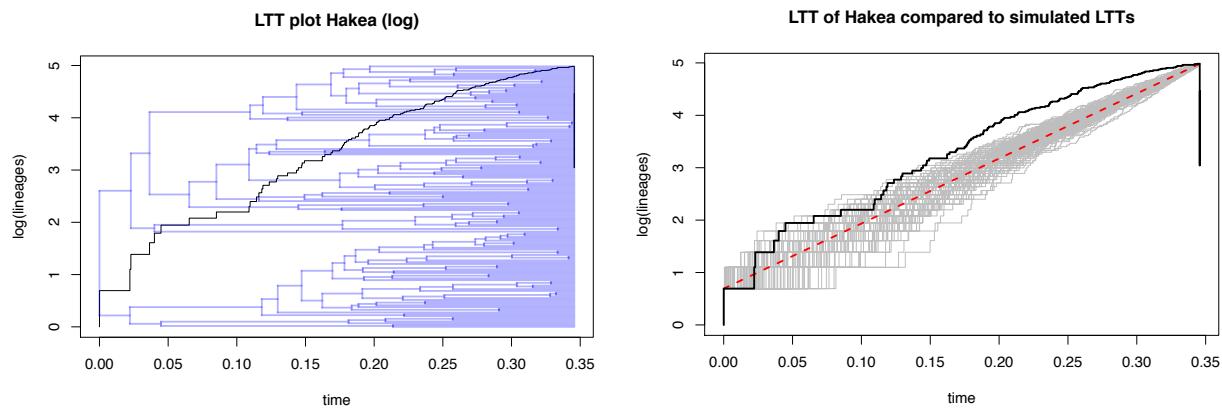
**Fig. S6j.** *Banksia* (Proteaceae)



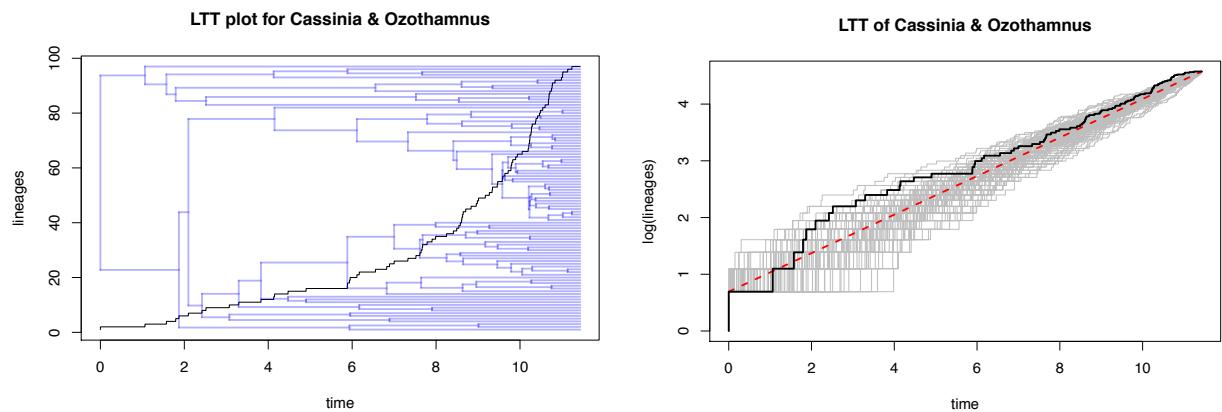
**Fig. S6k.** *Persoonia* (Proteaceae)



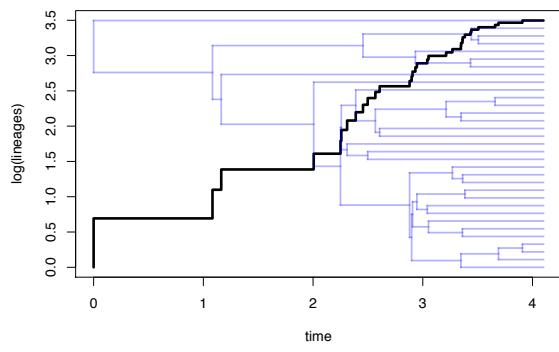
**Fig. S6l.** *Hakea* (Proteaceae)



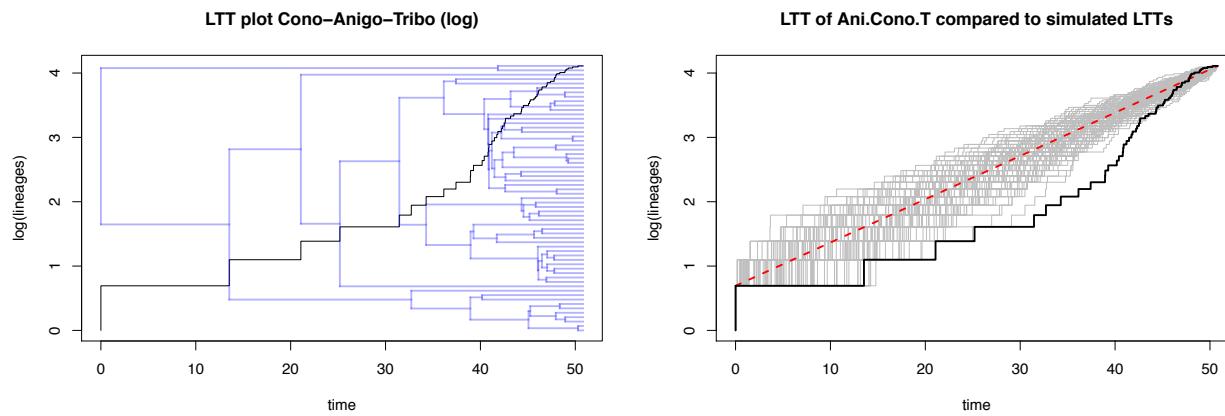
**Fig. S6m.** *Cassinia & Ozothamnus* (Asteraceae)



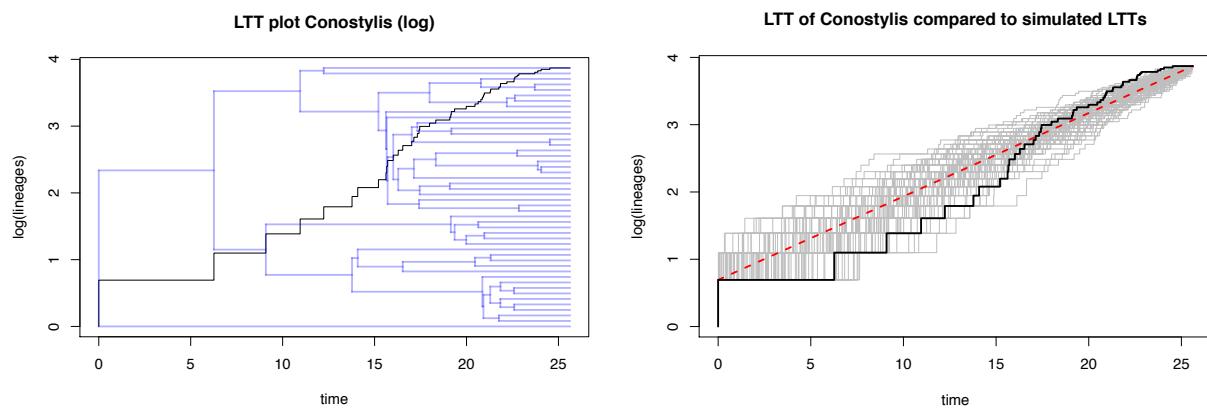
**Fig. S6n.** *Cassinia* (Asteraceae)



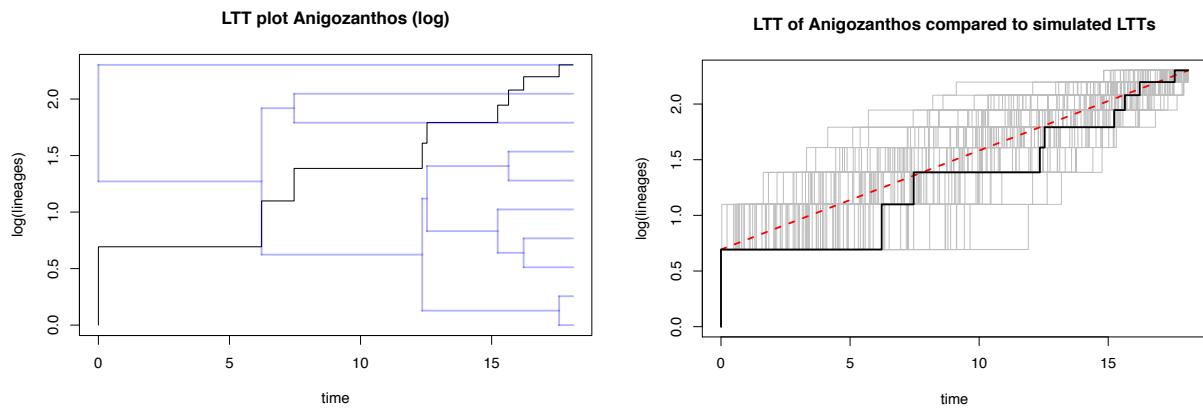
**Fig. S6o.** *Anigozanthos–Tribonanthes* clade (Haemodoraceae)



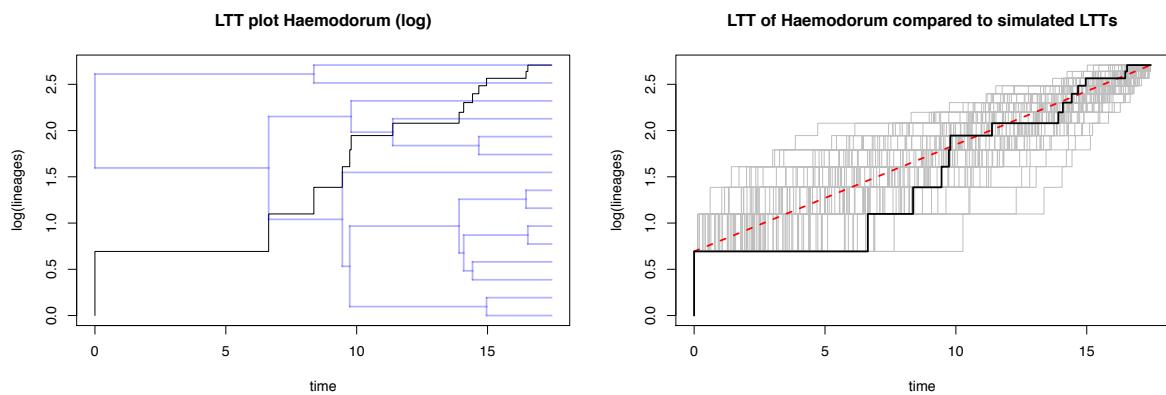
**Fig. S6p.** *Conostylis* (Haemodoraceae)



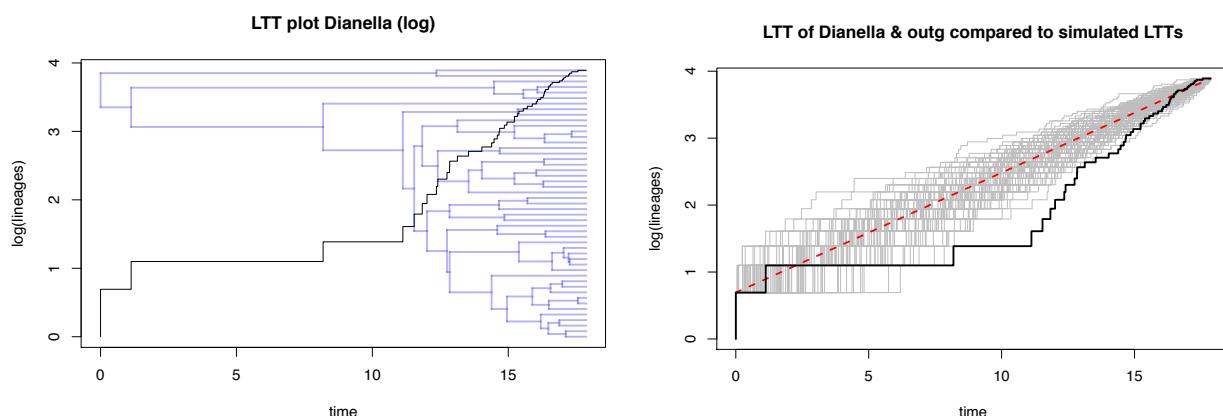
**Fig. S6q.** *Anigozanthos* (Haemodoraceae)



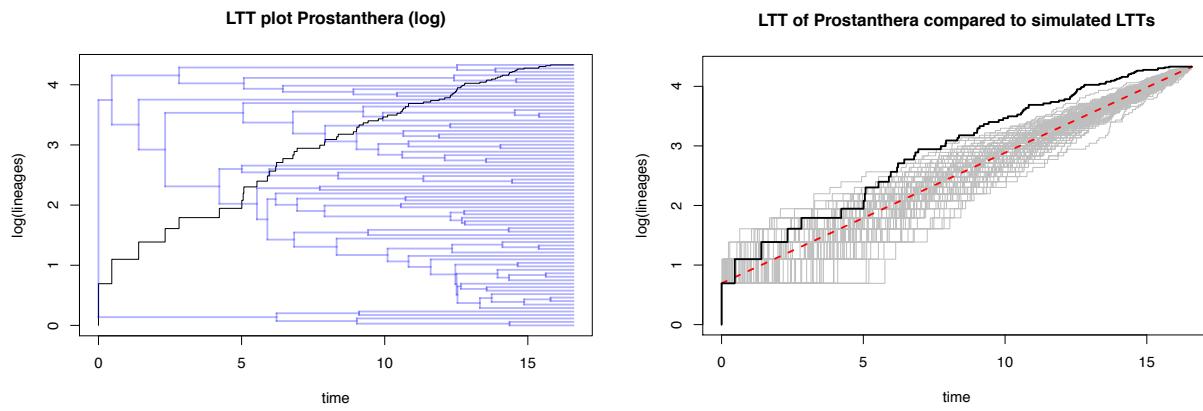
**Fig. S6r.** *Haemodorum* (Haemodoraceae)



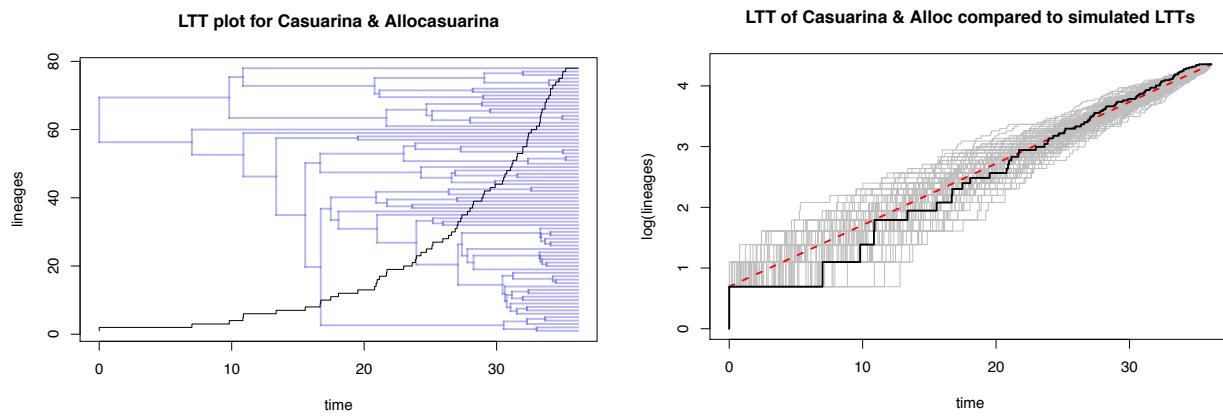
**Fig. S6s.** *Dianella* (Asphodelaceae)



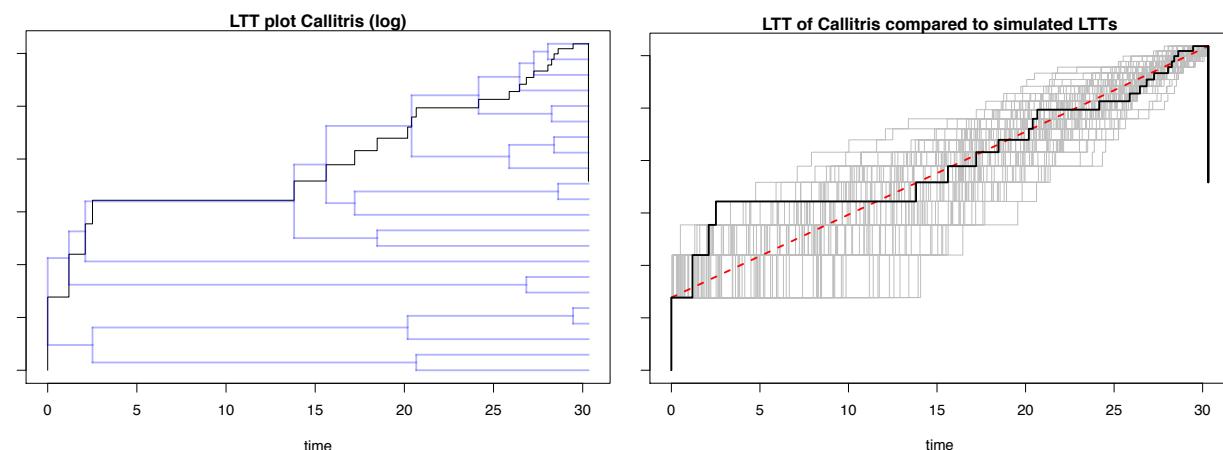
**Fig. S6t.** *Prostanthera* (Lamiaceae)



**Fig. S6u.** *Casuarina–Allocasuarina* (Casuarinaceae)

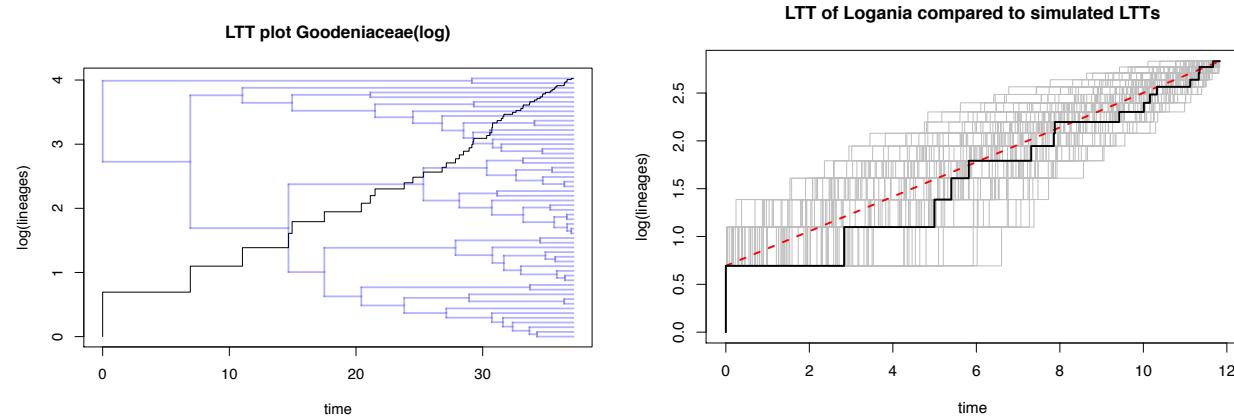


**Fig. S6v.** *Callitris*\* (Cupressaceae)

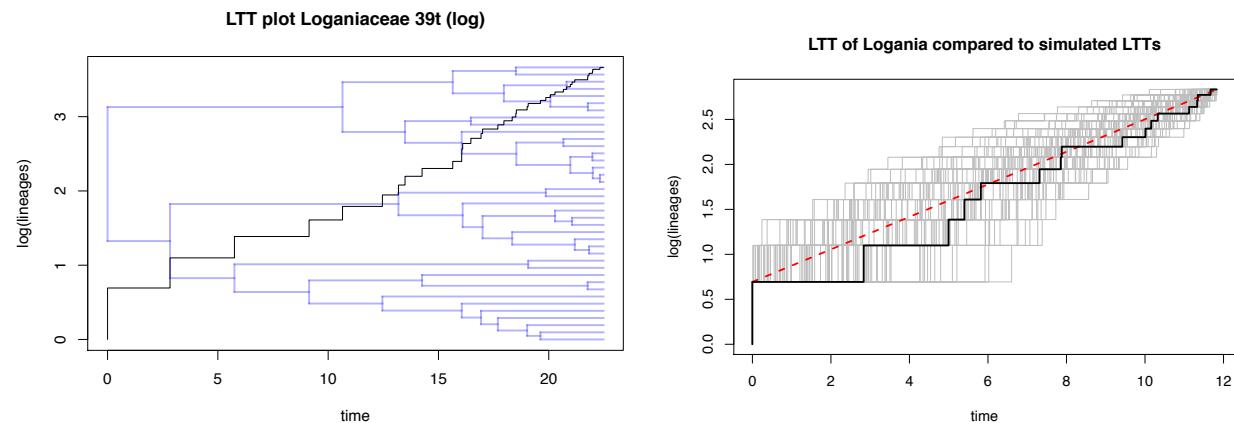


\*indicates a non-flowering gymnosperm group

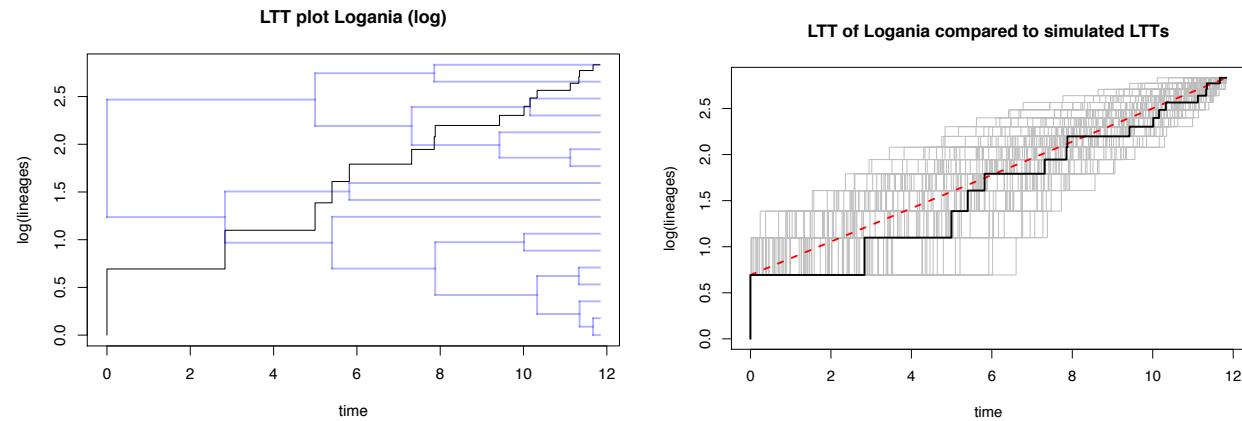
**Fig. S6w. Loganiaceae**



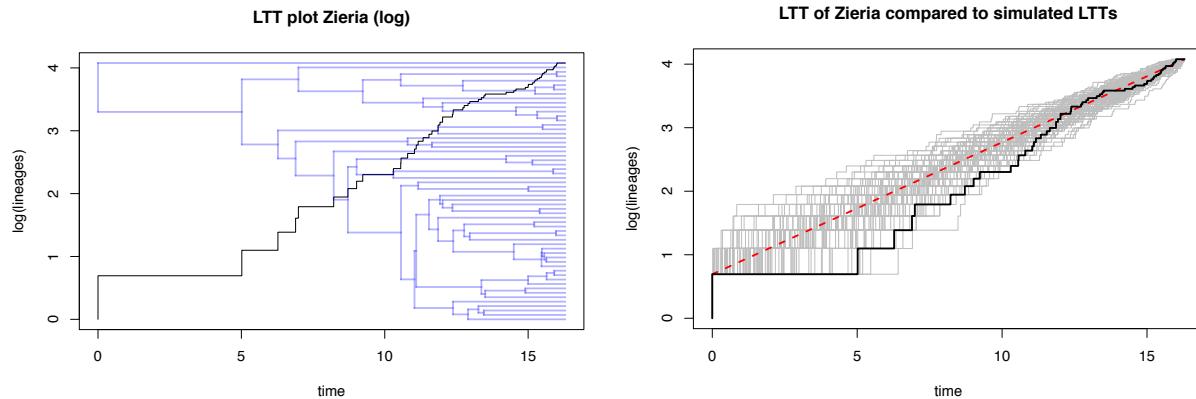
**Fig. S6x. *Logania*–*Orianthera* (Loganiaceae)**



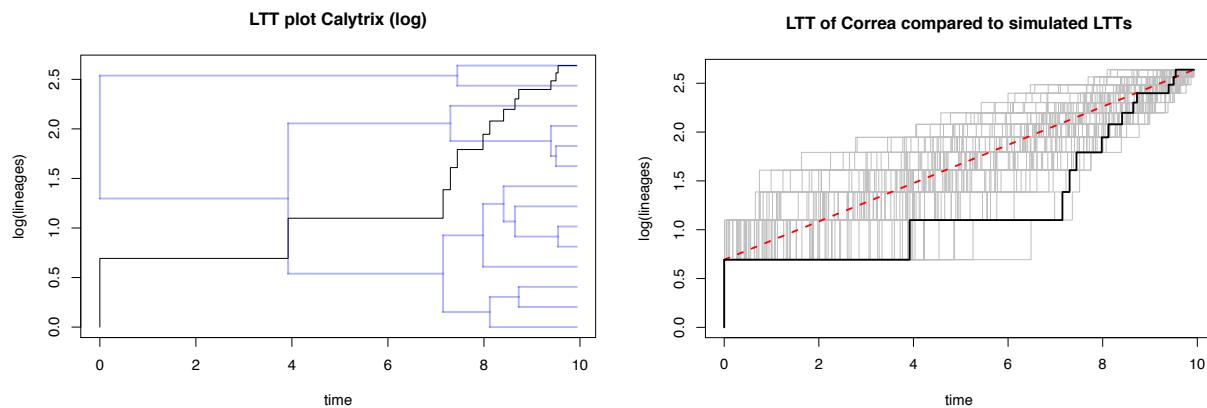
**Fig. S6y. *Orianthera* (Loganiaceae)**



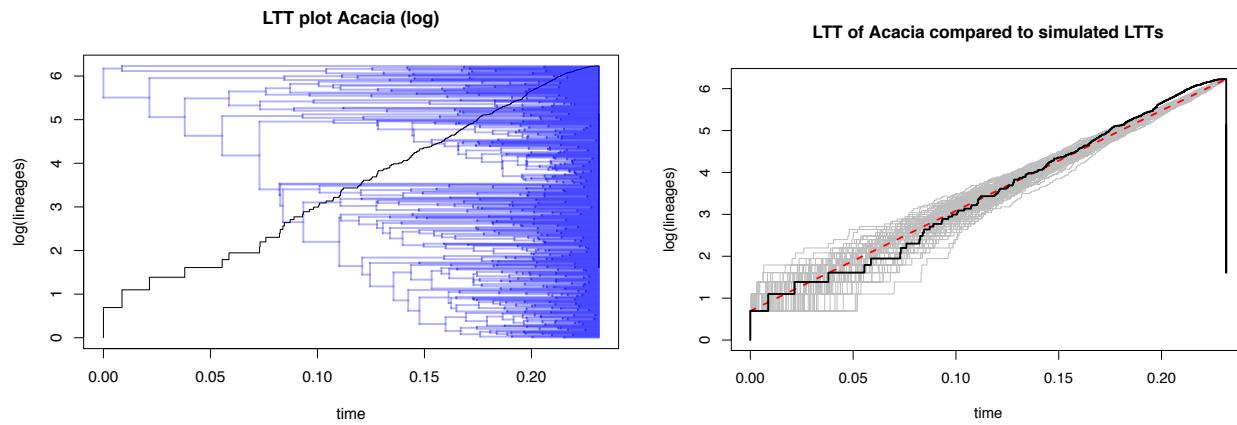
**Fig. S6z.** *Zieria* (Rutaceae)



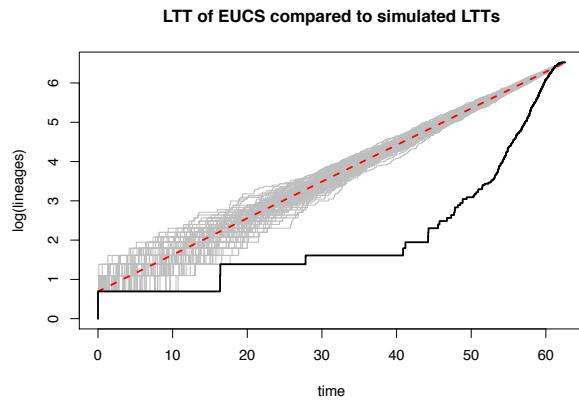
**Fig. S6aa.** *Correa* (Rutaceae)



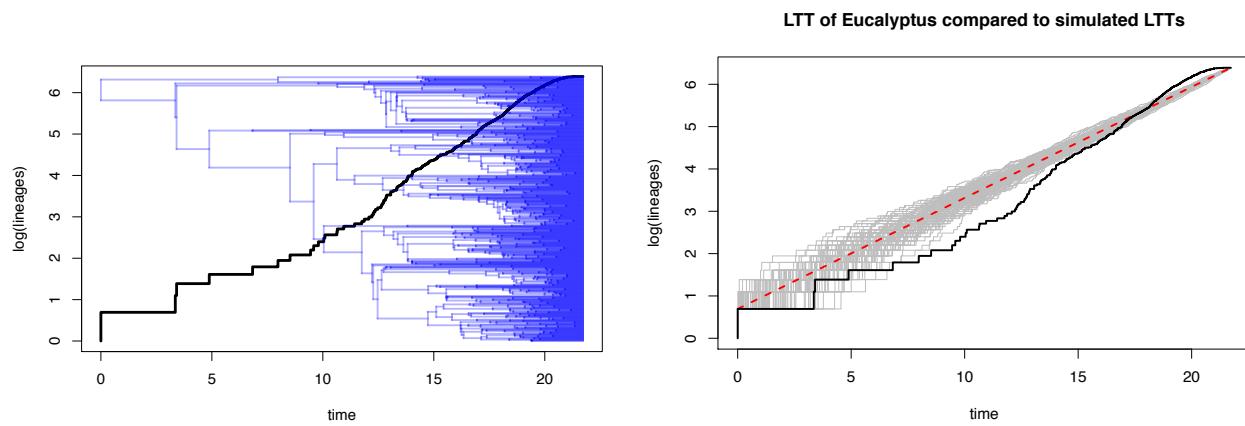
**Fig. S6bb.** *Acacia* (Fabaceae)



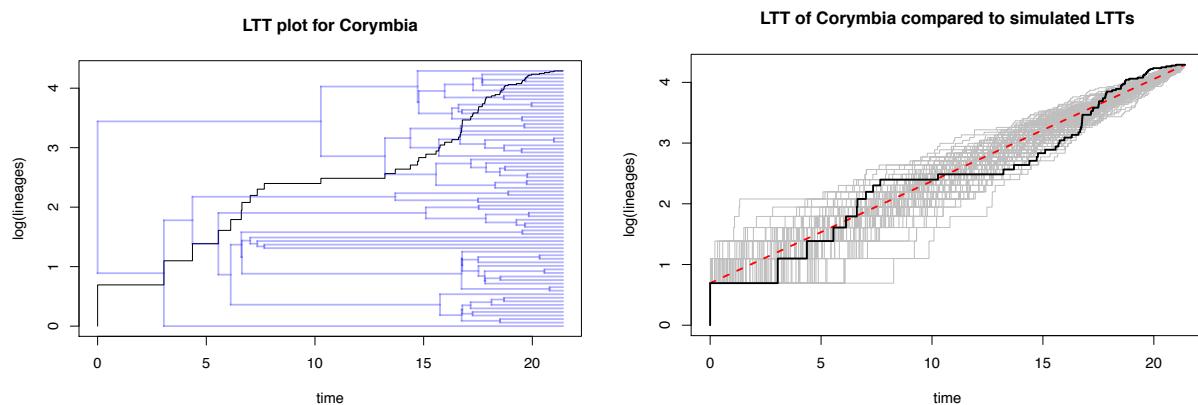
**Fig. S6cc.** Eucalypts (Myrtaceae)



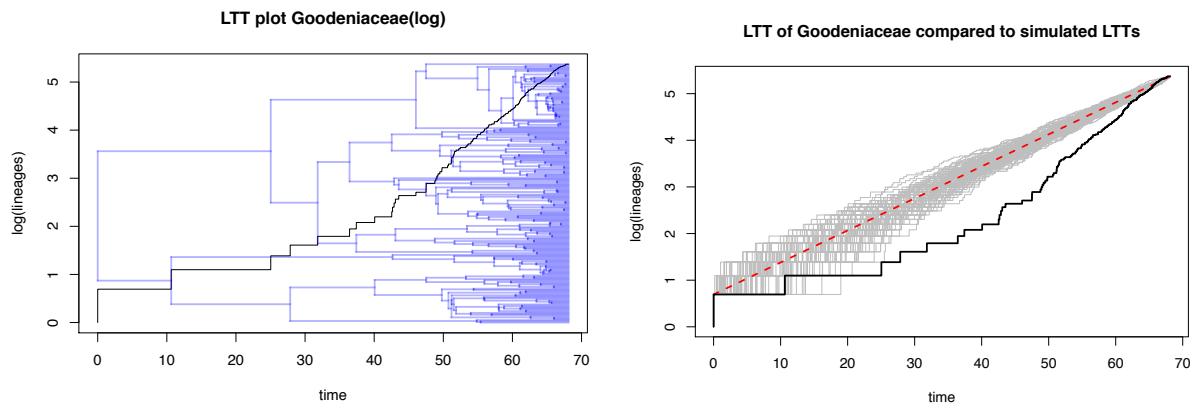
**Fig. S6dd.** *Eucalyptus* (Myrtaceae)



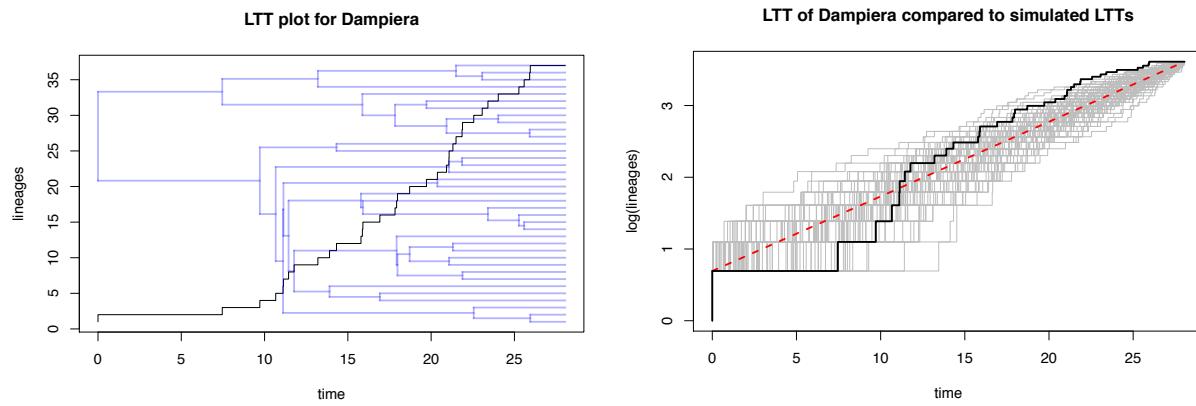
**Fig. S6ee.** *Corymbia* (Myrtaceae)



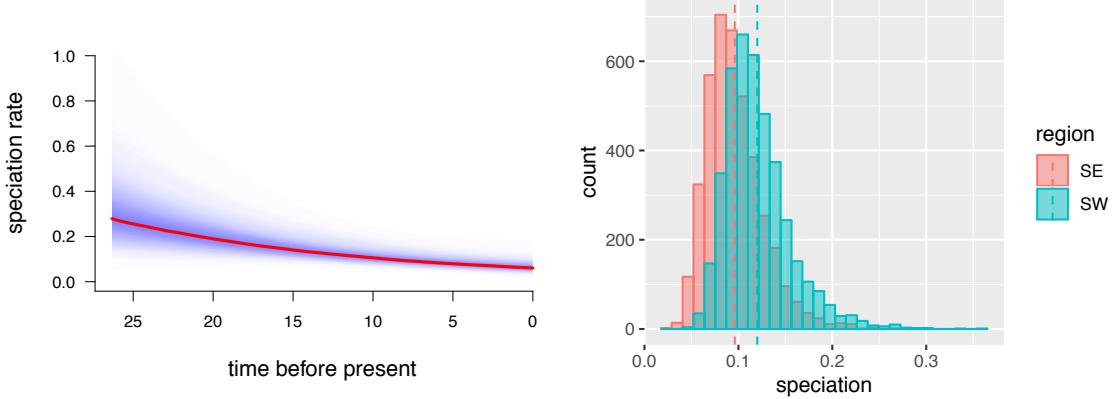
**Fig. S6ff.** Goodeniaceae



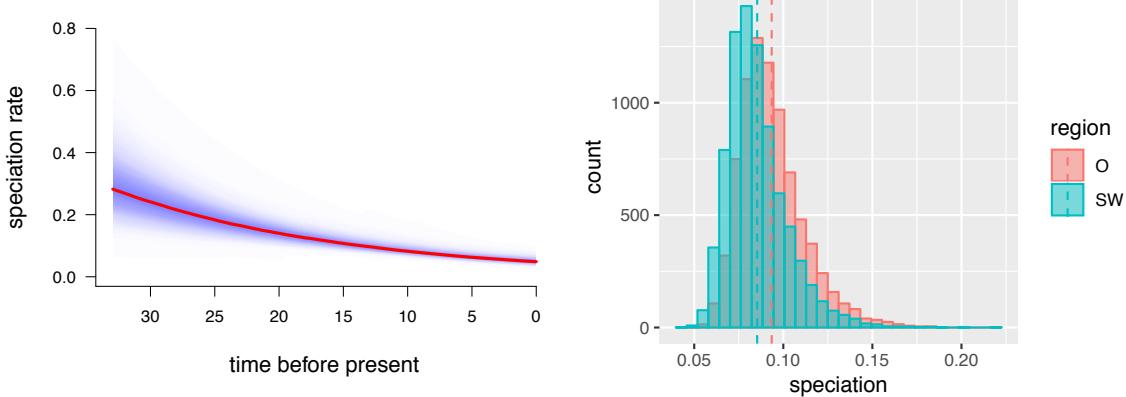
**Fig. S6gg.** *Dampiera* (Goodeniaceae)



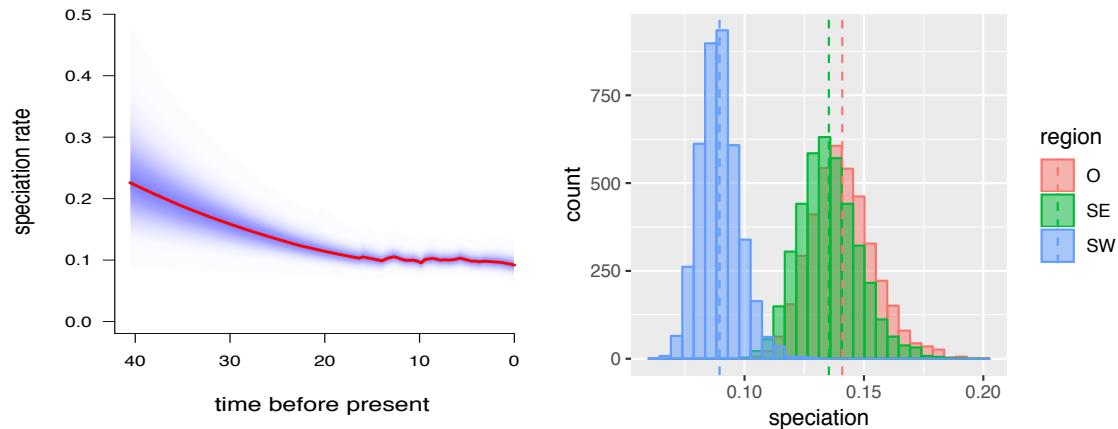
**Fig. S7.** BAMM speciation rate towards the present (Ma) and distributions of speciation rates ( $\text{sp sp}^{-1} \text{ My}^{-1}$ ) derived from STRAPP for a) *Adenantheros* (Proteaceae)



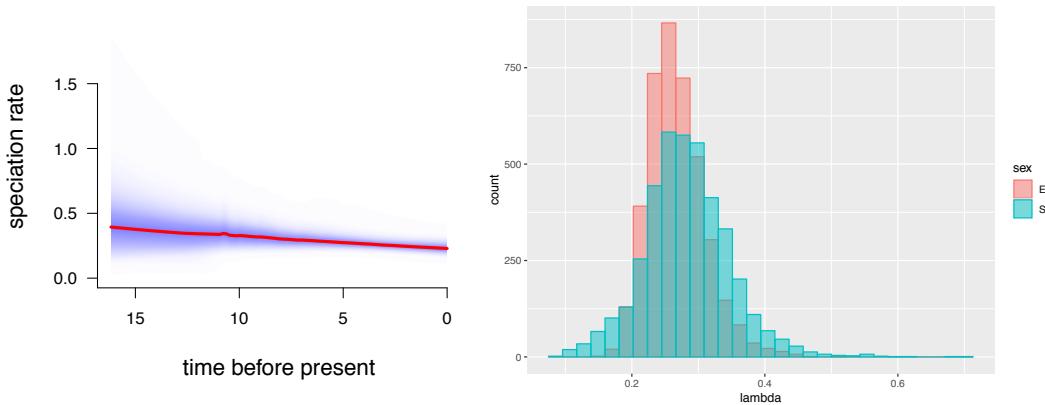
**Fig. S7b.** *Calytrix* (Myrtaceae)



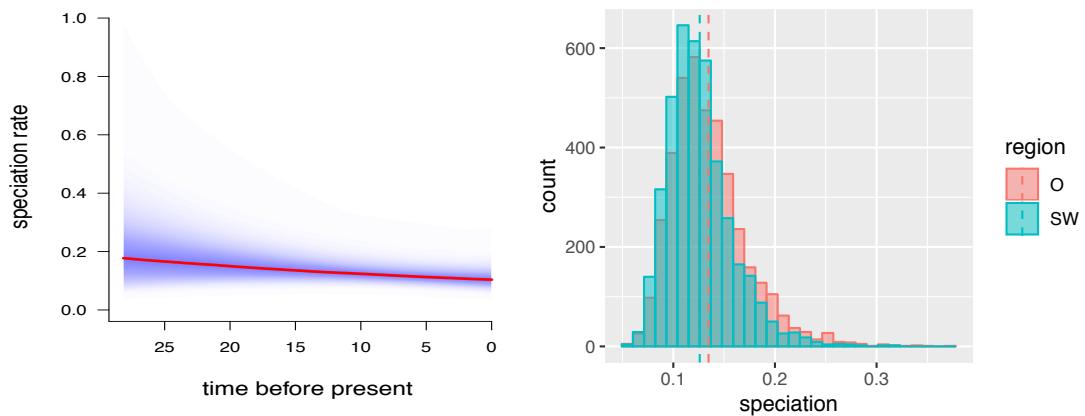
**Fig. S7c.** Pomaderreae (Rhamnaceae)



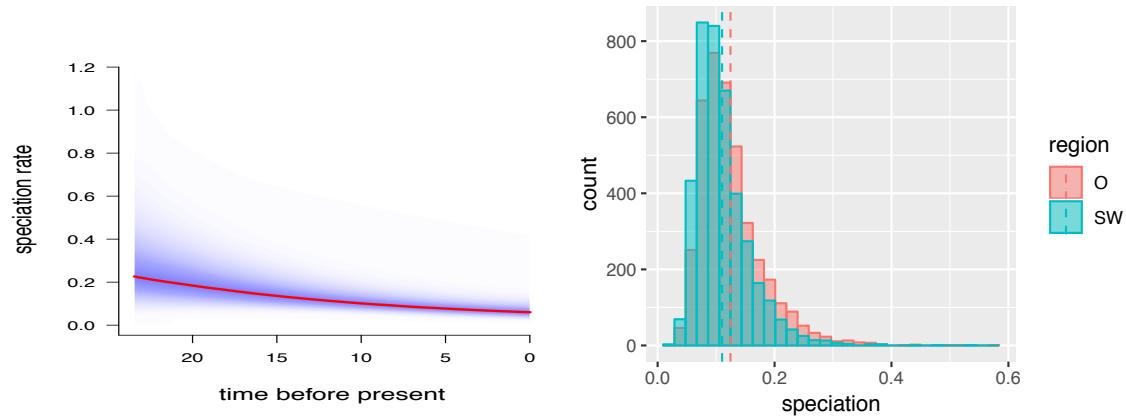
**Fig. S7d.** *Pomaderris* (Rhamnaceae)



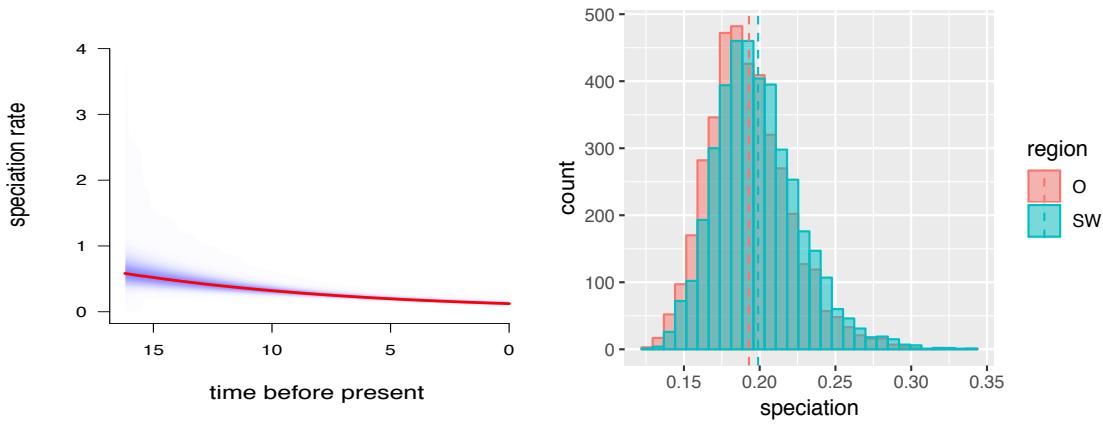
**Fig. S7e.** *Stenanthemum* (Rhamnaceae)



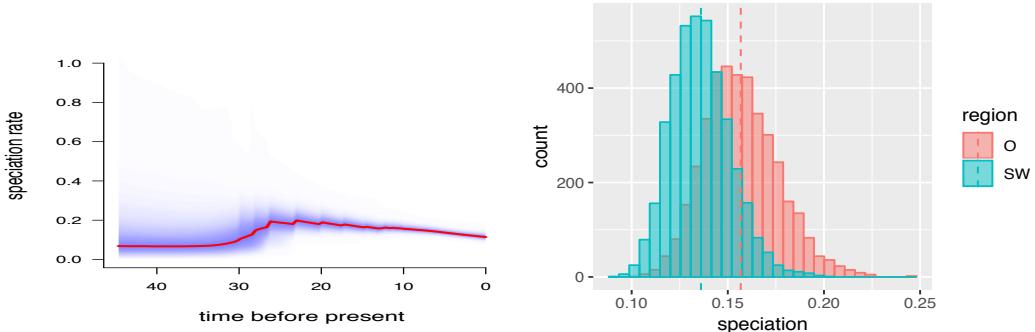
**Fig. S7f.** *Trymalium* (Rhamnaceae)



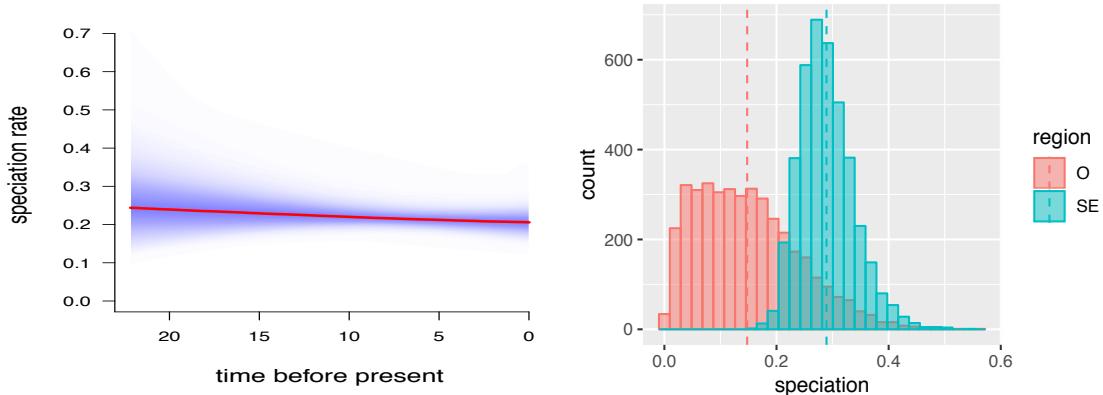
**Fig. S7g.** *Gastrolobium* (Fabaceae)



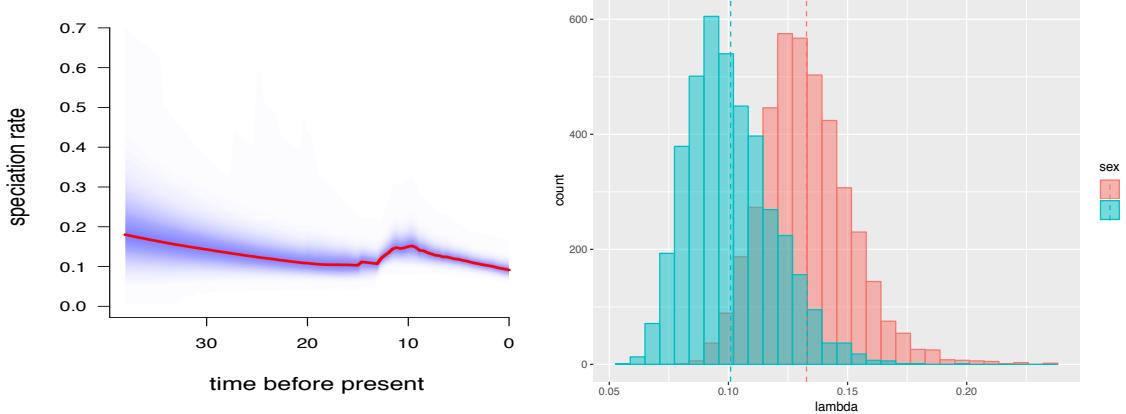
**Fig. S7h.** *Daviesia* (Fabaceae)



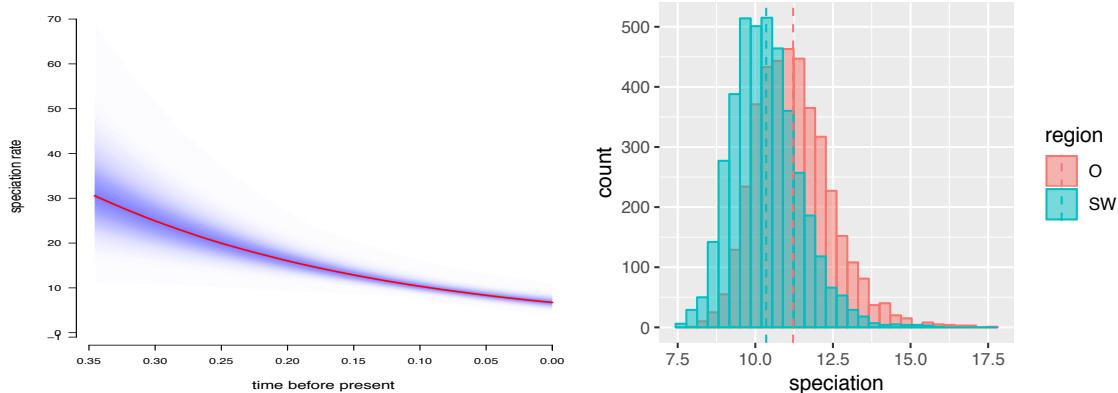
**Fig. S7i.** *Pultenaea* (Fabaceae)



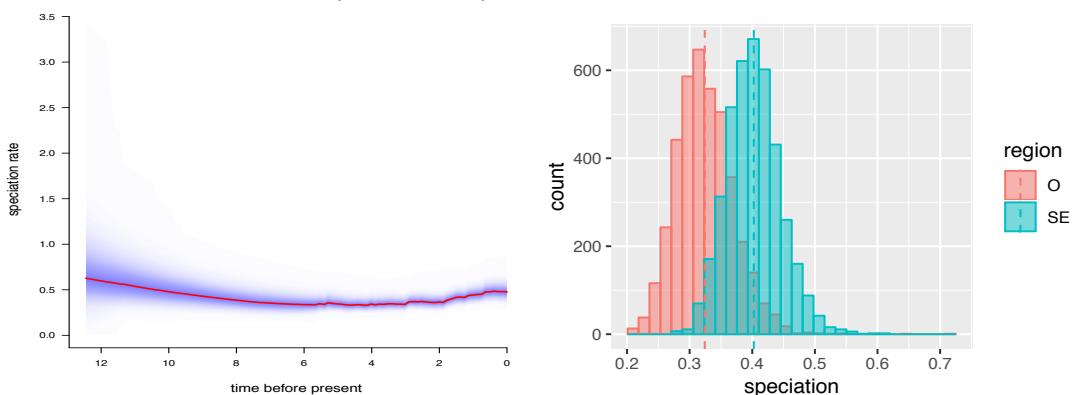
**Fig. S7j.** *Persoonia* (Proteaceae)



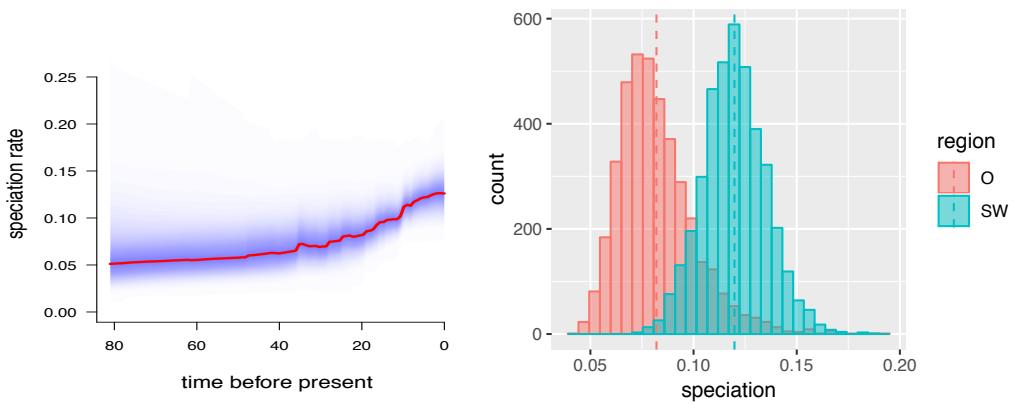
**Fig. S7k. *Hakea* (Proteaceae)**



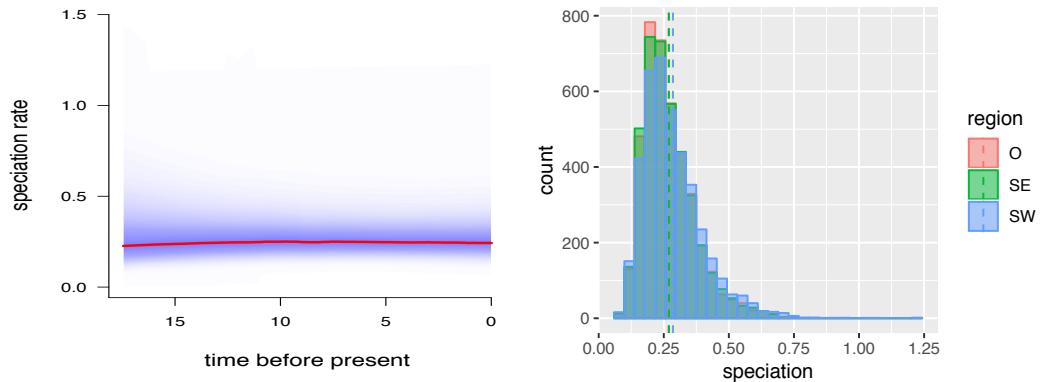
**Fig. S7l. *Cassinia* & *Ozothamnus* (Asteraceae)**



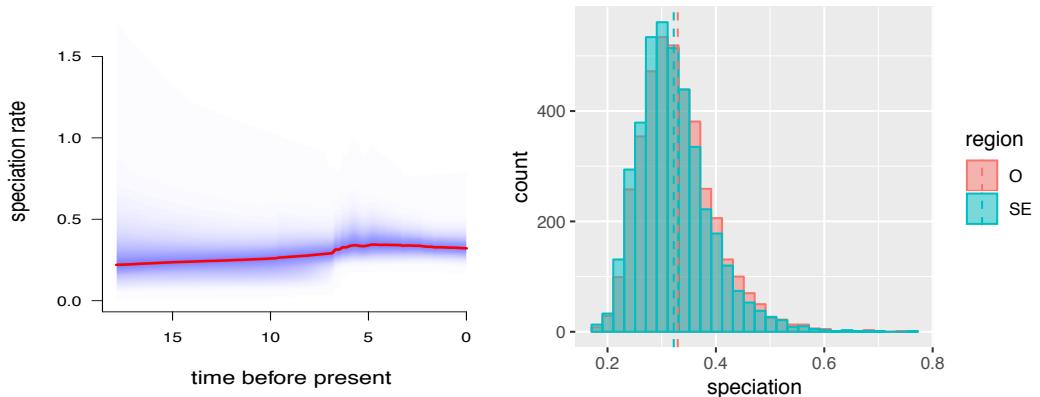
**Fig. S7m. Haemodoraceae**



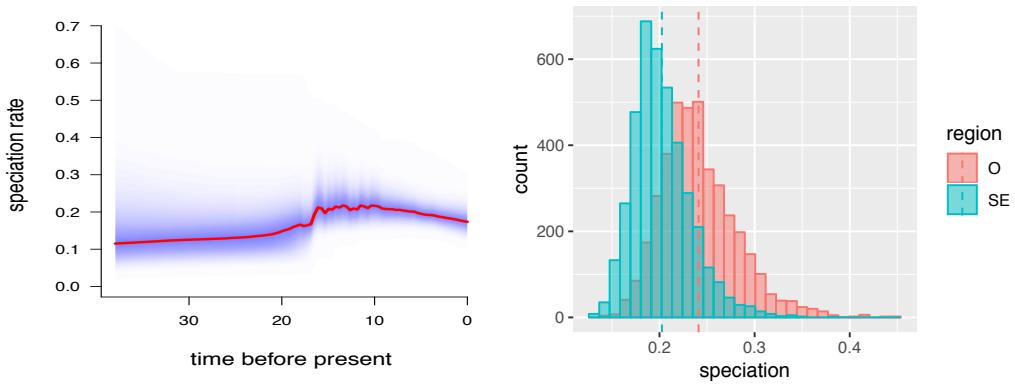
**Fig. S7n.** *Haemodorum* (Haemodoraceae)



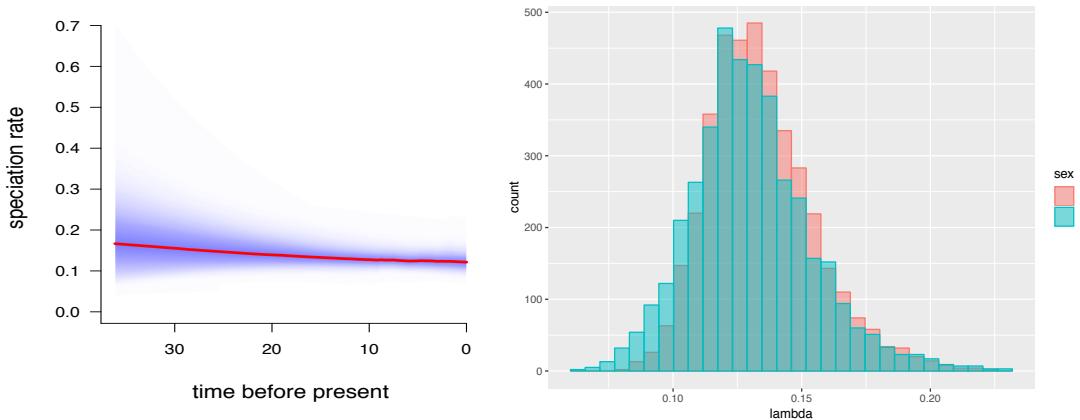
**Fig. S7o.** *Dianella* (Asphodelaceae)



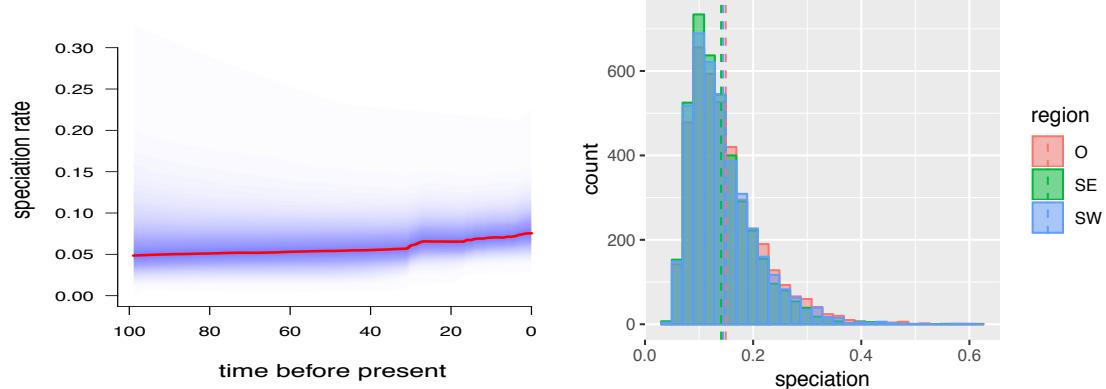
**Fig. S7p.** *Prostanthera* (Lamiaceae)



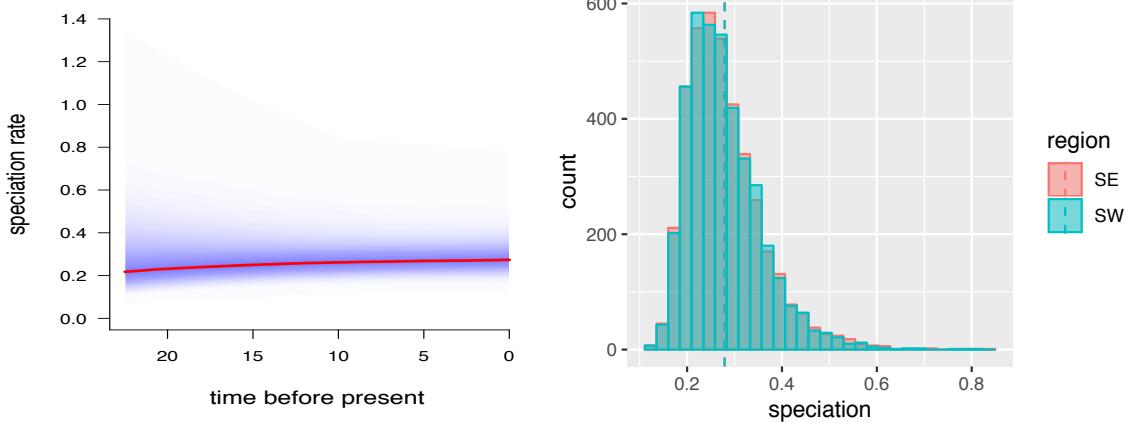
**Fig. S7q.** *Casuarina–Allocasuarina* (Casuarinaceae)



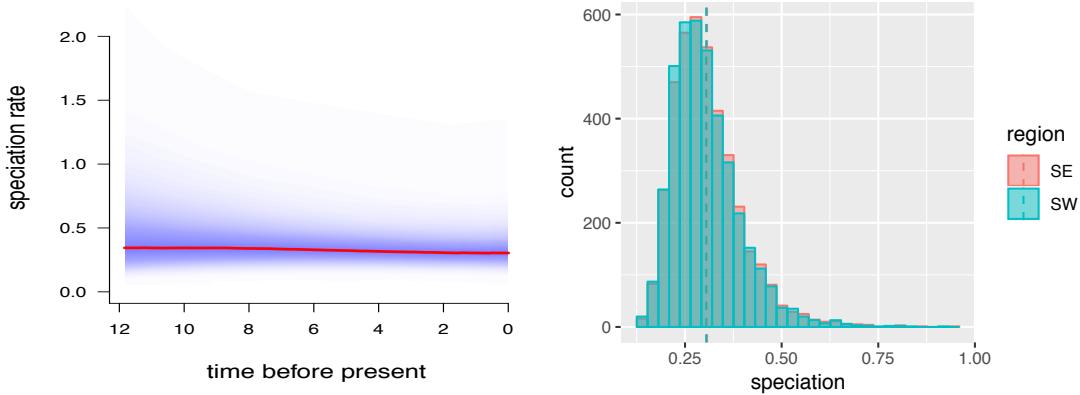
**Fig. S7r.** *Callitris\** (Cupressaceae)



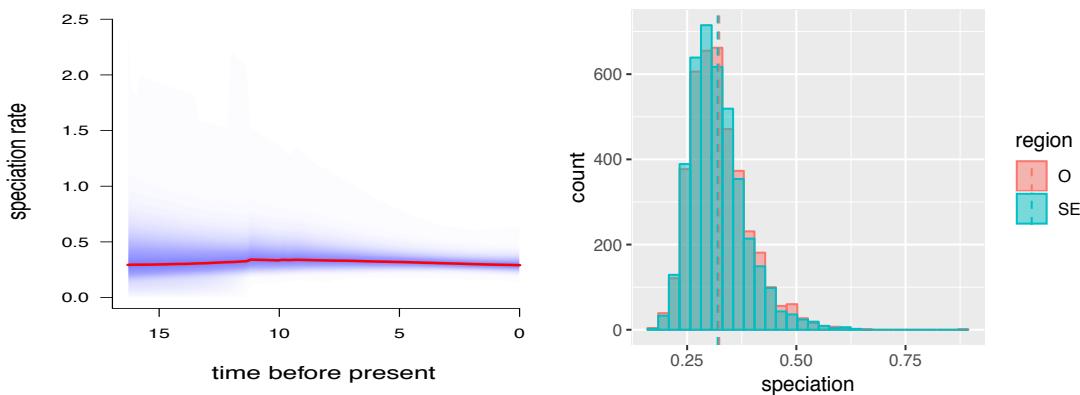
**Fig. S7s.** *Logania–Orianthera* (Loganiaceae)



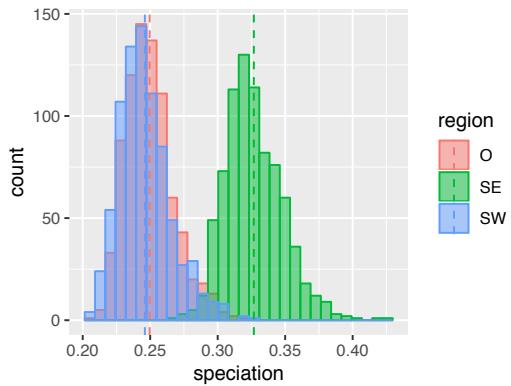
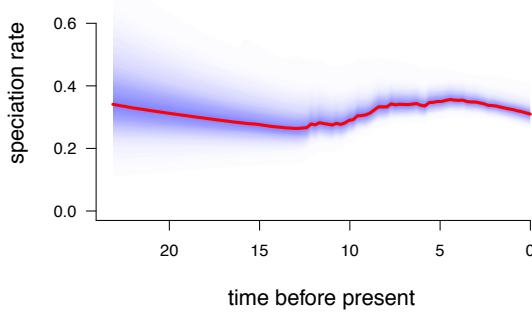
**Fig. S7t.** *Orianthera* (Loganiaceae)



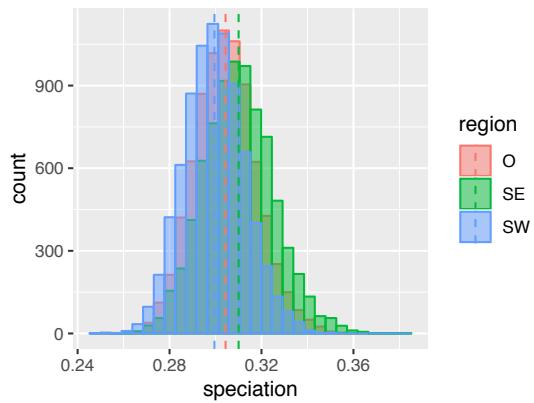
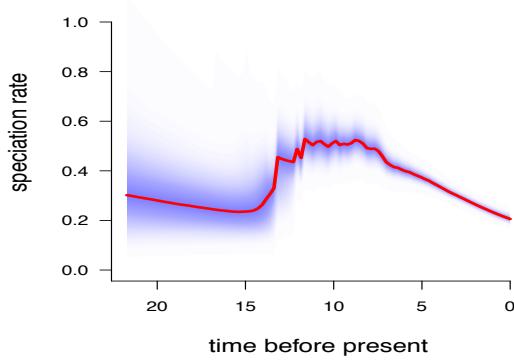
**Fig. S7u.** *Zieria* (Rutaceae)



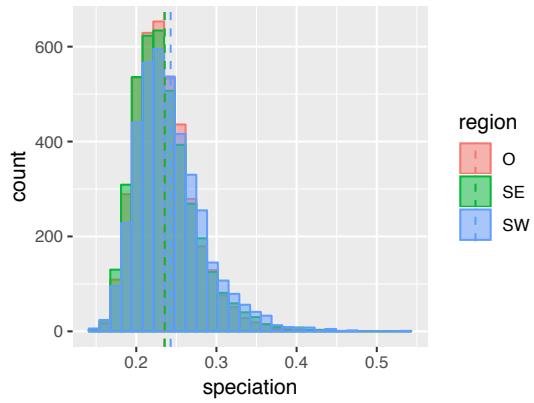
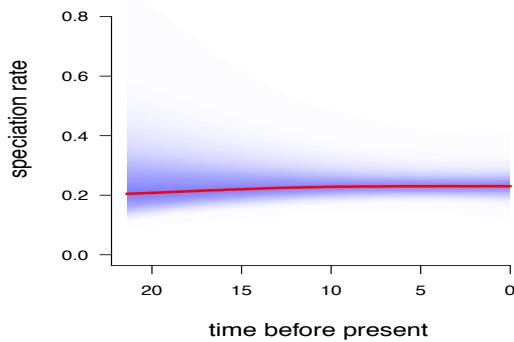
**Fig. S7v.** *Acacia* (Fabaceae)



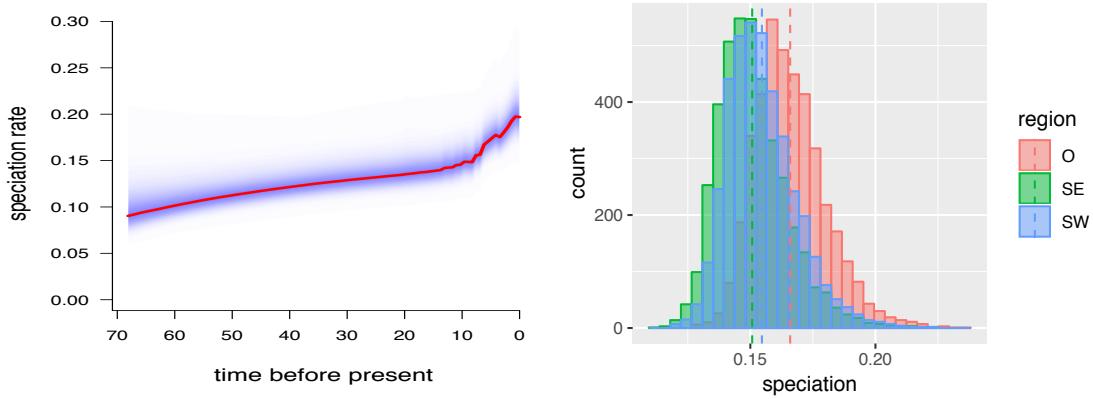
**Fig. S7w.** *Eucalyptus* (Myrtaceae)



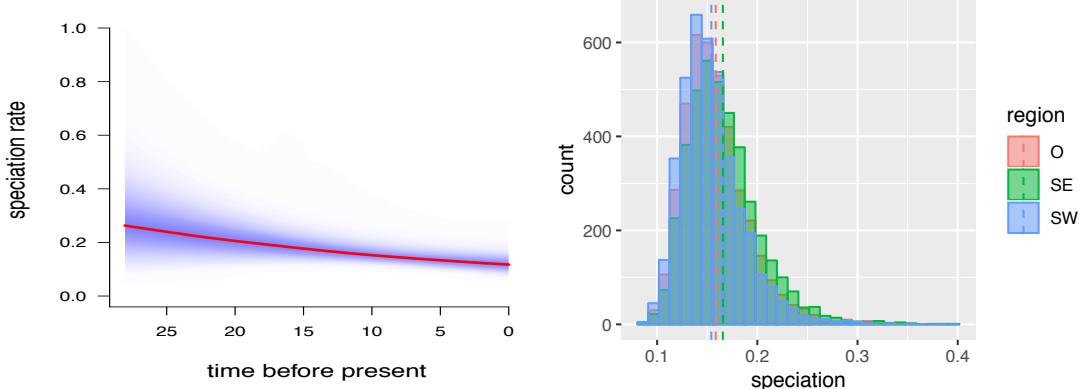
**Fig. S7x.** *Corymbia* (Myrtaceae)



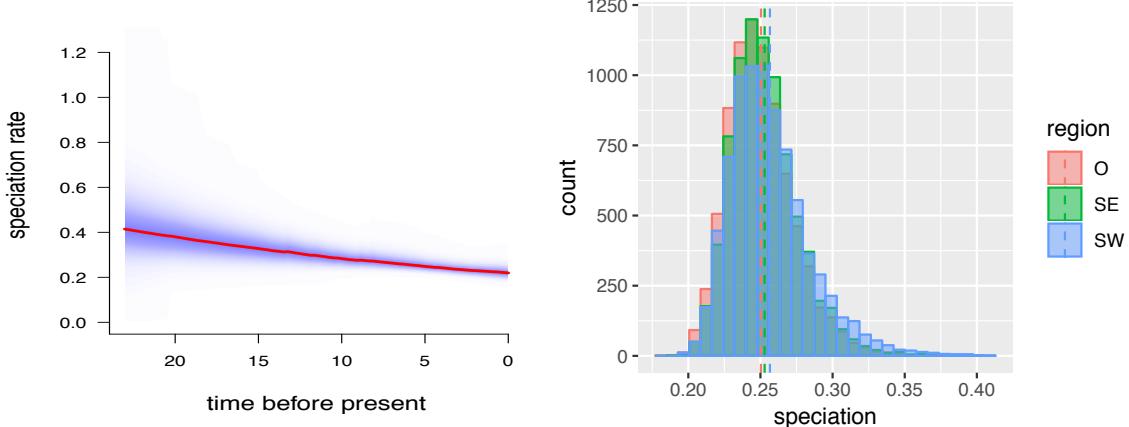
**Fig. S7y.** Goodeniaceae



**Fig. S7z.** *Dampiera* (Goodeniaceae)



**Fig. S7aa.** *Stypheliae* (Ericaceae)



**Fig. S7bb.** *Banksia* (Proteaceae)

