In this Supplementary material we re-analyzed the data presented in the main text, calculating the mean arrival ages for Tyrannidae assemblages using the phylogenetic hypothesis proposed by Harvey *et al*. (2020). All the procedure used to calculate mean arrival ages for each assemblage followed exactly the procedures described in the main text in the Methods section.

Some minor data processing was done in order to format the occurrence matrix with the names of species in Harvey´s phylogenetic tree, these procedures include the substitution of some species names in occurrence matrix by their valid synonym used in Harvey´s tree and bind synonym species in occurrence matrix. All these analysis and data processing can be fully reproduced by running the R script contained in https://github.com/GabrielNakamura/MS\_Tyrannidae\_AgeAssemblage.

The mean arrival ages of assemblages presented similar patterns from that calculated using MCC tree obtained from Jetz *et al.* (2012) phylogenies, with some differences, for example, the lower mean arrival ages of assemblages surrounding Amazon and Atlantic forests biomes in South America. Amazon and Atlantic Forest remains the regions with the higher values of mean arrival ages (Figure SX). Furthermore, tropical region still present assemblages with higher arrival ages than the temperate regions (Accessed with ANOVA F = 2522.53, p value < 0.001).

![Uma imagem contendo Diagrama

Descrição gerada automaticamente]()

Figure SX: Mean values of arrival ages calculated for Tyrannidae assemblages using Harvey´s et al (2020) phylogenetic hypothesis.

Results

Ancestral range estimation indicated that BayArea+J was the best model to explain ancestral ranges of Tyrannidae species, since it had the best support in AIC analysis (63 AIC units better than the second-best model- BayArea, see Table 2).

Temperate assemblages tended to show lower phylogenetic diversity (negative SES.MPD) than tropical ones; highest SES.MPD values were found in Amazonia and Brazilian Atlantic Forest (Figure 3a). That trend was corroborated by ANOVA, which detected higher SES.MPD values in tropical assemblages when compared to temperate ones (Figure 4a; F = 1,542; P < 0.001).

Furthermore, the temperate region showed younger assemblages than the tropical region (Figure 3b). In the tropical region we noted that the oldest assemblages were located at tropical forests (Amazon and Atlantic forests ~ 15 Myr), whereas temperate regions hosted the youngest assemblages (~ 5 Myr). Moreover, we identified an area with intermediate ages separating South and North America (Figure 3b). Again, such trend was corroborated by ANOVA, which detected higher average ages in tropical assemblages in comparison to temperate ones (Figure 4b; F = 2,522; P < 0.001).

References

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