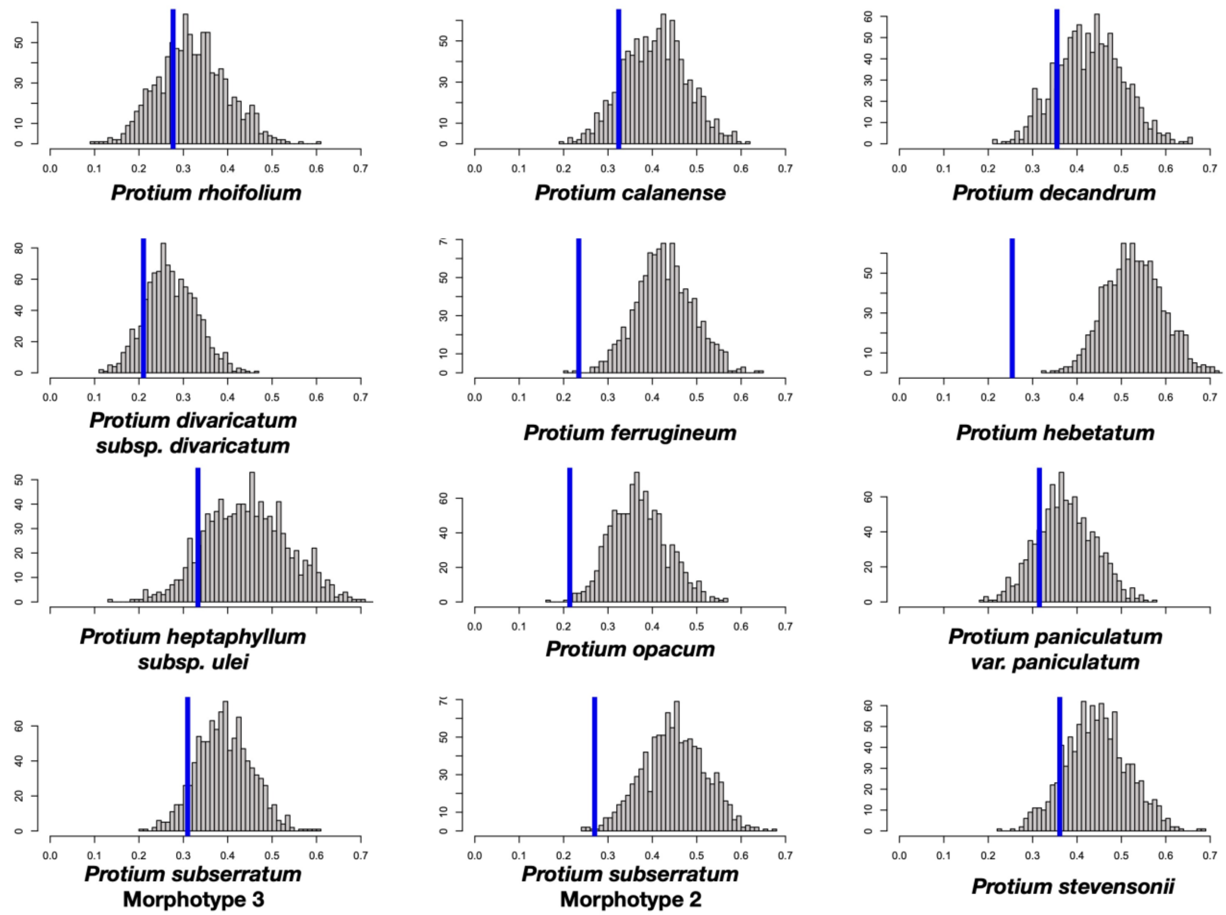

Figure S1: Statistical null distribution of phylogenetic-based beta diversity for the twelve focal *Protium* species. Values of phylogenetic beta diversity are presented using the Phylosor function. Here, larger values represent more phylogenetically similar communities sharing a higher fraction of branch lengths. The vertical blue line shows the observed phylogenetic beta diversity between Manaus and Iquitos for each species.

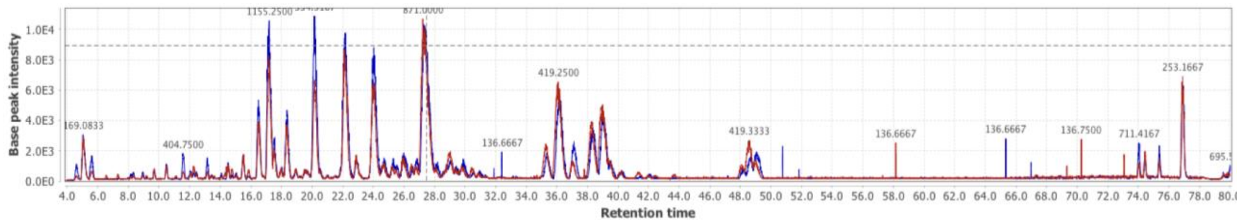

Figure S2: Example of the phenolic fraction chromatograms (base peak) from samples of *P. ferrugineum* from our two experimental sites (Manaus, Brazil; Iquitos, Peru). Samples here were run on a C18 column using a Water-Acetonitrile gradient in an Agilent LCMS. The blue represents a Manaus individual sample and the red line represents an Iquitos individual sample.

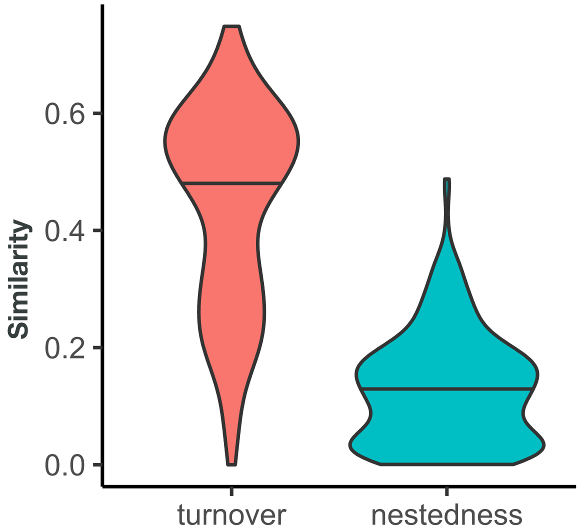

Figure S3: Decomposition of the nestedness and turnover components of the herbivore phylogenetic beta-diversity (phylosor) across our two sites. Here we use R package Betapart (Baselga A, Orme D, Villeger S, De Bortoli J, Leprieur F, Logez M (2022). _betapart: Partitioning Beta Diversity into Turnover and Nestedness Components) to break down the two components. The violin plot clearly shows that phylogenetic turnover and not phylogenetic nestedness is the main driver of the differences in phylogenetic beta diversity of herbivores between the two sites. Differences in herbivore composition for one site are not based on subsets of herbivore composition of the other site; they derive from completely different herbivore species that are found at one site or the other.

Table S1: *Protium* taxonomic changes. See Daly and Fine 2018, Daly 2019. For *Protium subserratum* morphotypes see Daly and Fine 2011.

Current accepted Taxonomic name	Taxonomic name from Salazar et al. (2018), Fine et al. 2014
Protium calanense Cuatrec.	*Protium calanense*
Protium decandrum (Aubl.) Marchand	*Protium decandrum*
Protium divaricatum Engl. subsp. *divaricatum* (Engl.) Daly	*Protim divaricatum divaricatum*
Protium ferrugineum (Engl.) Engl.	*Protium ferrugineum*
Protium hebetatum Daly	*Protium hebetatum*
Protium heptaphyllum (Aubl.) Marchand subsp. *ulei*	*Protium heptaphyllum heptaphyllum*
Protium opacum Swart.	*Protium opacum*
Protium paniculatum Engl. var. *paniculatum* (Engl.) Daly	*Protium paniculatum paniculatum*
Protium rhoifolium (Benth.) Byng & Christenh.	*Crepidospermum rhoifolium*
Protium stevensonii (Standl.) Daly	*Tetragastris panamensis*
Protium subserratum (Engl.) Engl. Morphotype 2	*Protium subserratum* morphotype 2
Protium subserratum (Engl.) Engl. Morphotype 3	*Protium subserratum* morphotype 1

Table S2: Results of the chemical similarity analysis using the Morisita chemical index. An index of 1 represent two chemically identical samples, a index of 0 represents two individuals with non-overlapping specialized chemistry (see attached Excel file).