1 **Evolutionary diversity is associated with wood productivity in Amazonian**

2 **forests**

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80   Higher levels of taxonomic and evolutionary diversity are expected to maximize

81   ecosystem function, yet their relative importance in driving variation in ecosystem

82   function at large scales in diverse forests is unknown. Using 90 inventory plots

83   across intact, lowland, *terra firme*, Amazonian forests and a new phylogeny including

84   526 angiosperm genera, we investigated the association between taxonomic and

85   evolutionary metrics of diversity and two key measures of ecosystem function -

86   aboveground wood productivity and biomass storage. While taxonomic and

87   phylogenetic diversity were not important predictors of variation in biomass, both

88   emerge as independent predictors of wood productivity. Amazon forests that contain

89   greater evolutionary diversity and a higher proportion of rare species have higher

90   productivity. Whilst climatic and edaphic variables are together the strongest

91   predictors of productivity, our results demonstrate that the evolutionary diversity of

92   tree species in diverse forest stands also influences productivity. As our models

93   accounted for wood density and tree size, they also suggest that additional,

94   unstudied, evolutionarily correlated traits have significant effects on ecosystem

95   function in tropical forests. Overall, our pan-Amazonian analysis shows that greater

96   phylogenetic diversity translates into higher levels of ecosystem function: tropical

97   forest communities with more distantly related taxa have greater wood productivity.

Main text

Higher levels of taxonomic and phylogenetic diversity play important and independent roles in determining ecosystem function[1–3]. In experimental studies of temperate grasslands, higher levels of taxonomic and evolutionary diversity are associated with greater biomass and productivity[2–4]. In particular, the structure of evolutionary diversity, measured by the variability in evolutionary history shared within a group of species, is often a better predictor of productivity than the number of species[2–4], consistent with the hypothesis that evolutionary dissimilarity is related to niche complementarity[1–5]. However, although the results of a range of biodiversity experiments[2–7] suggest that communities with distantly related lineages have greater carbon stocks and productivity, the effect of phylogenetic diversity on measures of ecosystem function remains controversial. Positive relationships are common, but not a rule, and negligible effects of evolutionary diversity on productivity and biomass have been reported in some cases[8,9]. Therefore, it is still unclear whether these relationships can be generalised, and the extent to which evolutionarily diverse communities maximize function is unknown, particularly at large scales relevant to conservation planning.

The total amount of phylogenetic diversity represented by species within a community may be valuable for understanding how diversity affects ecosystem function because these properties tend to reflect variation in the functional diversity of these communities. This is because evolutionary relationships can capture information about multiple traits[5,10–12], including those that are difficult to measure. For instance, in an experimental study of grassland communities, evolutionary diversity was a better predictor of productivity than some easily measured, or 'soft', functional traits (e.g. specific leaf area, seed weight and height), suggesting that

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123   unmeasured traits that are significantly related to phylogenetic relationships, such as

124   root architecture, root morphology, resource requirements or other critical functional

125   differences, could contribute to maximizing productivity[3]. Evolutionary diversity

126   metrics that encompass the full breadth of functional diversity may be more

127   informative about how much species contribute to ecosystem function, particularly in

128   hyperdiverse communities such as tropical forests where the links between soft

129   traits, such as specific leaf area and wood density[13,14], and ecosystem functions,

130   such as productivity, are typically weak[15].

131   The evolutionary diversity of a community can be measured in different ways to

132   reflect distinct aspects of biodiversity[11,16,17], and these metrics may all relate in

133   different ways to variation in functional traits, life-history strategies, and, as a result

134   ecosystem function[2,3,5,18]. Phylogenetic diversity (PD) is the sum of the total

135   evolutionary history, or amount of the tree of life present in a given community and is

136   quantified as the sum of the branch lengths, which are measured in units of time,

137   from a phylogeny that represents all species in a given community (total lineage

138   diversity)[16]. A second aspect of evolutionary diversity is the extent to which

139   communities are dominated by closely related species (neighbour lineage diversity),

140   which can be quantified by mean nearest taxon distance (MNTD)[11,12]. Finally,

141   another dimension of the evolutionary history of a community is whether it contains a

142   balanced proportion of the major lineages of organisms (basal lineage diversity)[19,20],

143   which can be represented by the mean phylogenetic distance (MPD) between all

144   pairs of species[11]. MPD is strongly affected by branch lengths at the deepest nodes

145   of the phylogeny and the relative abundance of major clades in the community[20]. All

146   of these metrics attain higher values in communities comprised of more distantly

147   related individuals.

148 Amazonian forests provide an ideal context for exploring the link between tree

149 diversity and ecosystem functioning because these forests include some of the most

150 species-rich ecosystems on earth[21] and contain a wide variety of angiosperm

151 lineages[20]. They also play a key role in regulating planetary biogeochemical cycles,

152 including fixing as much carbon annually as the human economy emits globally[22],

153 and storing an order of magnitude more[23]. Here, we construct **a** pan-Amazon

154 angiosperm phylogeny and use this in conjunction with data from 90 long-term

155 monitoring plots across Amazonia (Figure 1) to investigate the relationships between

156 tree diversity and ecosystem function. We investigate the role of taxonomic and

157 evolutionary diversity in promoting aboveground wood productivity (hereafter

158 productivity) and aboveground biomass (hereafter biomass).

159 Evolutionary diversity was estimated as total, neighbour and basal lineage diversity.

160 As these metrics show strong relationships with the total taxonomic richness of

161 communities[20,24], the effect of which we were also interested in estimating, we

162 calculated the degree to which communities show greater or less PD, MPD and

163 MNTD than expected given their richness (i.e. standardized phylogenetic diversity

164 metrics)[17]. Taxonomic richness and diversity were estimated as the sum of identified

165 genera per area, Shannon diversity, Simpson Index and Fisher's alpha. Because

166 taxonomic and standardized phylogenetic diversity metrics represent different

167 dimensions of biodiversity[17], with genus richness being decoupled from evolutionary

168 diversity (i.e. gains in richness are poor predictors of gains in phylogenetic

169 diversity)[24], we expect that they may have independent effects on ecosystem

170 function. Changes in taxonomic diversity influence the number of functionally distinct

171 lineages present in a community, which may influence ecosystem function via either

172 sampling effects or complementarity. As the degree of evolutionary relatedness

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173   among tropical tree species reflects similarity in their ability to process and store

174   carbon (i.e. closely related taxa have more similar wood density, potential tree size,

175   growth and mortality rates)[10], we expect that communities with greater evolutionary

176   diversity may maximize productivity and carbon storage due to complementarity in

177   resource use. As evolutionary diversity may summarize information about a wide

178   range of traits, species richness and composition in a single index[5], we hypothesize

179   that evolutionary diversity would be a stronger predictor of ecosystem function than

180   taxonomic measures of diversity[2].

181   As environmental factors[25,26], stand structure and mean functional composition

182   (number of stems, wood density and potential tree size)[15] are also associated with

183   both productivity and biomass, we account for variation in these factors in all our

184   analyses using available climate data[27], locally collected soil data[28] and stand

185   structural and functional characteristics[10,29]. We explore the effects of taxonomic and

186   evolutionary diversity metrics on ecosystem function using partial correlations, and in

187   linear models of productivity and biomass that account for the influence of climate,

188   soil, forest structure and functional composition, as these variables might obscure

189   any underlying effect of diversity on ecosystem function (see Methods for details).

190   We focus our results and discussion on the influence of standardized phylogenetic

191   diversity metrics[17,30] and on two common taxonomic metrics of diversity: taxon

192   richness and Simpson Index. Taxon richness was chosen because it is widely used

193   in comparative studies and Simpson Index because it was included in the best model

194   that explained the greatest variance in the data. Analyses incorporating Shannon

195   Index, Fisher's Alpha and raw phylogenetic diversity metrics gave broadly similar

196   results and are presented in the supplementary information. All the analyses were

197   conducted at the genus-level due to the resolution of the phylogeny.

Results

Individually, both taxonomic and evolutionary measures of diversity showed strong positive, bivariate relationships with productivity (Figure 2; Supplementary Table 3). Because climate, soil, forest structure, functional composition and spatial autocorrelation might obscure the underlying effect of diversity on wood productivity we also controlled for variation in these variables by including them as model covariates. Using linear models, we found that the best statistical model of productivity (based on AIC values) contained both evolutionary (sesMNTD) and taxonomic (Simpson index) measures of diversity (R^2 = 0.47; ΔAIC = -2.5 in relation to the model excluding both taxonomic and evolutionary diversity metrics; Figure 3; Table 1). This shows that these metrics reflect distinct aspects of diversity that are both important for understanding patterns of productivity (Supplementary Figure 10). Partial correlation analysis produced similar results to the model selection approach (Supplementary Table 4): sesMNTD (τ=0.15; p=0.044) and Simpson's index (τ=0.15; p=0.046) both showed significant partial correlations with productivity after accounting for other variables (Supplementary Table 4). In contrast, genus richness had no effect on productivity after accounting for environmental and structural factors, using either the model selection approach (p=0.51) or partial correlation analysis (p=0.57) (Table 1, full coefficients from the models are shown in Appendix 4).

Climatological and soil variables were also associated with variation in productivity (Figure 3; Supplementary Figure 4 and Supplementary Table 4). Mean annual temperature, climatic water deficit, soil total phosphorus, magnesium, and potassium were all associated with productivity[25] (Figure 3), with higher rates of wood growth typical of areas in the western Amazon with low water deficit and greater nutrient

223 availability (i.e. total phosphorus and magnesium). Although the standardized effect

224 size of some environmental variables, such as water deficit, was large, the effect

225 sizes of biodiversity variables in the best model were similar to some other individual

226 environmental variables commonly considered to control variation in productivity in

227 tropical forests, such as soil phosphorus concentrations (Figure 3; Supplementary

228 Table 4).

229 Bivariate correlations indicated significant negative associations between biomass

230 and all diversity metrics (Supplementary Figure 5; Supplementary Table 3).

231 However, biodiversity and biomass were almost completely unrelated after

232 accounting for variation in climate, soil, forest structure and mean functional

233 composition (Figure 3; Supplementary Table 5), in contrast to the positive, significant

234 biodiversity-productivity relationships (Supplementary Table 4). Instead, biomass

235 was largely determined by variation in wood density (Figure 3 and Supplementary

236 Figure 7; Supplementary Table 5). The model selection approach also suggested

237 that variation in temperature, stem density and magnesium concentration had a

238 small, significant effect on biomass (Figure 3; Appendix 4), but these results were

239 not supported by the partial correlation analysis (Supplementary Table 5).

240 **Discussion**

241 This study demonstrates that there is a positive, small and significant effect of both

242 taxonomic (Simpson Index) and evolutionary (sesMNTD) measures of diversity on

243 wood productivity, but not aboveground biomass, in tree communities across

244 lowland, *terra firme*, Amazonian forests, after accounting for the influence of

245 environmental factors, stand structural variables and spatial autocorrelation (Figures

246 2 and 3; Table 1; Supplementary Table 4). Although the effects of diversity on

247 productivity were small, the strength of these effects was similar to previous studies

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248   at small experimental scales in grassland ecosystems[2–4] and is comparable to the

249   effect of some environmental variables within this analysis, such as soil phosphorus

250   (Figure 3).

251   A range of mechanisms may underlie the significant relationships between neighbour

252   lineage diversity (sesMNTD), Simpson index and productivity (Figure 2, Table 1 and

253   Supplementary Table 4) including both sampling effects (i.e. the presence of

254   particular species with relevant functional traits within a community) and functional

255   complementarity. In general, the contribution of sesMNTD and Simpson index to

256   explaining variation in productivity, even after accounting for two major stand

257   structural attributes (wood density and tree size), suggests that among lineages,

258   there are additional functional characteristics that are related to phylogenetic

259   relationships among taxa that promote productivity within plots. Since the

260   evolutionary relationships among species tend to reflect their similarity in functional

261   traits[10,31,32] and because evolutionary diversity explicitly incorporates species

262   differences, the effect of sesMNTD on productivity is likely to be a result of increased

263   functional complementarity among lineages[1,2]. Higher values of the Simpson index,

264   which indicate a more even distribution of abundances among genera[33], may also

265   increase niche complementarity. Alternatively, the weak positive effects of sesMNTD

266   and Simpson index on productivity could be due to sampling effects, but this is

267   unlikely as tropical forests are sufficiently diverse at the 1 ha plot scale such that

268   sampling effects saturate; these diverse forests comprise taxa from the entire

269   phylogeny at this scale, and include genera that have both fast and slow

270   demographic traits[26]. Moreover, lineages that contribute disproportionately to the

271   diversity/productivity relationship[8] are scattered across the phylogeny and there is no

272   phylogenetic signal for the contribution of different lineages to the effect of Simpson

273 Index or sesMNTD on wood productivity (see Supplementary text and

274 Supplementary Figure 12). These results suggest that greater phylogenetic diversity

275 is not related to a higher probability of sampling functionally dominant lineages that

276 would in turn disproportionally contribute to the relationship between evolutionary

277 and taxonomic diversity, and productivity. Because of this, complementarity appears

278 to be the most likely mechanism to explain the positive biodiversity effects we

279 observe (see Supplementary Information for further analyses and discussion).

280 One potentially key unmeasured trait that may underlie an increase in functional

281 complementarity and productivity in more diverse communities is variation in canopy

282 structure. Canopy structure is a key determinant of productivity in temperate forests[34]

283 and experiments with young trees[35] demonstrate that mixtures of species with

284 complementary crown morphologies and branching patterns have denser

285 canopies[35–37], because species distribute their branches and leaves in

286 complementary height layers of the canopy. As a result, both light interception and

287 productivity are enhanced[36]. In Amazonian forests, there is a wide range of canopy

288 architecture among species and complementarity in crown shape may enable trees

289 to utilize canopy space more efficiently. For example, for 2457 trees in Madre de

290 Dios in the Peruvian Amazon[38,39] crown architecture varies widely among families

291 (Supplementary Figure 8). Differences in crown architecture among genera from

292 different families may enhance canopy space filling and resource uptake. There may

293 also be variation among communities in other unstudied, evolutionarily correlated

294 traits such as below ground resource allocation, tree height/diameter allometry,

295 hydraulic traits or functional groups (e.g. nitrogen/non-nitrogen fixers) that may affect

296 productivity.

297   The effect of sesMNTD and Simpson index on productivity could also reflect

298   pathogen dilution in more diverse communities. Host ranges of most tree pests and

299   pathogens show a clear phylogenetic signal, with co-occurring, closely related plant

300   lineages being more vulnerable to similar natural enemies than distant relatives[40,41].

301   A community with greater sesMNTD (i.e. comprising more distantly related lineages)

302   is therefore expected to be less susceptible to disease pressure[41], and thus needs

303   fewer resources invested in defence, which in turn allows faster growth rates[42]. In

304   tropical regions, where strong conspecific negative density dependence is observed,

305   individual trees tend to have lower performance (e.g. growth and survival) when

306   growing near closely related neighbours[43]. At the community level, a species may

307   therefore perform better in forests that contain fewer close relatives. Similar

308   arguments may also apply to communities with higher values of Simpson's index: a

309   greater proportion of rare species may reduce the probability of an individual tree

310   being attacked by species-specific pathogens and/or herbivores, and increase

311   community-level productivity.

312   The similar, but independent, effects of taxonomic and phylogenetic diversity for

313   explaining variation in productivity is contrary to our initial prediction. Perhaps both

314   variation in the relative abundance distribution among communities, best captured by

315   Simpson's index, and the functional distinctiveness of taxa, best captured by

316   sesMNTD, are important for determining the strength of functional complementarity

317   within communities. In contrast, a recent subtropical biodiversity experiment found

318   that phylogenetic diversity did not explain additional variation in rates of carbon

319   accumulation, compared to measures of taxonomic diversity[44]. However, both the

320   metrics of phylogenetic diversity and the overall level of diversity of the communities

321   in the experimental study differ from our pan-Amazon study. Understanding the

322 specific functional differences among genera within a community that contribute to

323 maximizing productivity in diverse tropical forests is an important area for further

324 research, to strengthen the links between causative mechanisms and the

325 correlations that we report here.

326 Both taxonomic and evolutionary diversity had no effect on aboveground biomass in

327 intact forests in Amazonia. These results are supported by a previous pan-tropical

328 study that used an overlapping dataset to investigate the role of taxonomic diversity

329 on biomass[26], and a recent study that investigated the role of evolutionary diversity

330 on biomass during forest succession and found that despite a positive effect of

331 phylogenetic diversity on biomass in early successional forests, there is no effect at

332 later stages of forest succession[45]. Not surprisingly, but contrary to the positive effect

333 of taxonomic and evolutionary diversity on productivity, biomass was strongly

334 determined by functional characteristics (Figure 3; Supplementary Table 5), with

335 variation in wood density being the most important variable in controlling patterns of

336 biomass in these forests[15,26,46]. To a much lesser extent and consistent with previous

337 findings[47], the number of stems had a marginal and positive effect on biomass

338 (Figure 3). These results corroborate a recent meta-analysis in tropical forests, which

339 found that stand structural (e.g. number of stems) and community mean functional

340 trait (e.g. wood density) variables are more important than taxonomic diversity for

341 predicting variation in biomass[48]. In general, as variation in stem mortality rates is a

342 better predictor of variation in stand biomass among plots than productivity[49] and

343 tree death is a highly stochastic process[50], any positive effect of tree diversity on

344 biomass through increased productivity is likely obscured by the impact of variation

345 in stem mortality rates among plots.

346 Overall, our results suggest that multiple facets of diversity have a small, positive

347 effect on present-day functioning of the world's largest tropical forest. In particular,

348 this study provides evidence that evolutionary diversity is weakly, but significantly,

349 related to ecosystem functioning at large scales in natural ecosystems. While

350 evolutionary diversity has previously been suggested as a factor to consider in the

351 identification of priority areas for conservation because of its role in enhancing

352 ecosystem function[2–5], this study provides quantitative evidence for this assertion in

353 tropical forests. Our results therefore indicate that there is a synergy between

354 preserving diverse forests that encompass greater evolutionary heritage, and

355 protecting ecosystem function.

356 **Methods**

357 **Tree community data**

358 To investigate the relationship between biodiversity and ecosystem functioning, we

359 estimated diversity, wood productivity and aboveground biomass using data from 90

360 long-term forest inventory plots in the Amazon and adjacent lowland forests from the

361 RAINFOR (Amazon Forest Inventory) network (Figure 1; Appendix 1). Data were

362 extracted from the ForestPlots.net database, which curates tree-by-tree records from

363 RAINFOR and other networks[51,52]. Plots were all 1 ha in size (except for two plots of

364 0.96 ha) and located in structurally intact and old-growth closed-canopy forest. Our

365 analyses were restricted to continuous lowland, *terra firme*, moist Amazonian forests,

366 - excluding plots in montane, swamp, seasonally dry and white-sand forests, and

367 savannas. The ecological characteristics that influence resource uptake and thus

368 underlie any potential relationship between ecosystem function and phylogenetic

369 diversity may differ widely among biomes with distinct evolutionary histories[53]. For

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370   example, clades restricted to areas outside moist forests may have evolved very

371   different unmeasured traits (e.g. higher root:shoot ratios to tolerate drought), which

372   could lead to different relationships between evolutionary diversity and ecosystem

373   function in comparisons across biomes. Restricting our analyses to a single biome

374   and therefore a relatively coherent pool of genera, with similar evolutionary histories

375   and proven ability to disperse and mix across Amazonia over geological

376   timescales[54], allowed us to limit the potentially confounding effect of large, cross-

377   biome differences in phylogenetic composition on the relationship between diversity

378   and ecosystem function.

379   Plots were established between 1975 and 2010 and monitored for an average 16.1

380   years in total (range 2.0 to 28.6 years), with regular recensuses. All trees and palms

381   with diameter at breast height (dbh) greater than 10 cm were included in the

382   analyses. In the dataset, all recorded species and genus names were checked and

383   standardized using the Taxonomic Name Resolution Service[55]. Across all plots

384   94.9% of stems were identified to the genus level, with a minimum of 70% identified

385   to genus per plot. We excluded all individuals not identified to genus-level (5.1%)

386   from biodiversity metric calculations.

387   **Phylogenetic tree**

388   To calculate metrics of evolutionary diversity, we constructed a large pan-Amazon

389   phylogeny, including 526 genera based on two chloroplast DNA gene regions: *rbcL*

390   and *matK*, following protocols from Gonzalez et al.[56]. Full details of the temporally

391   calibrated, ultrametric phylogeny construction can be found in the Supplementary

392   Material. Our analyses included only those genera where we have phylogenetic

393   data: 90.4% of the total number of genera in the plots, which encompass 98.0% of all

394   identified stems.

Biodiversity metrics

To represent the different aspects of biodiversity, we calculated ten genus-level diversity metrics, including taxonomic diversity indices and metrics that incorporate the evolutionary history within communities (Supplementary Table 1). Because different metrics can reflect similar dimensions of diversity[17] (Supplementary Figure 10) we present, in the main text, the results from five diversity metrics: (1) taxonomic richness, a common and widely used diversity metric, here evaluated as the sum of all identified genera in a given community; (2) Simpson index of diversity, a common diversity metric that incorporates genus abundance, representing the probability that two stems randomly selected from a community belong to different genera; (3) total lineage diversity, the standardized effect size of phylogenetic diversity (sesPD), estimated as the sum of all branch lengths including genera within a community[16], whilst controlling for the effect of genus richness; (4) neighbour lineage diversity, which is quantified as the standardized effect size of mean nearest taxon distance (sesMNTD), whilst controlling for the effect of genus richness, which is more sensitive to relatedness near to the tips of the phylogeny[11,12] and (5) basal lineage diversity, which is quantified by mean pairwise distance (sesMPD)[11,12], whilst also controlling for the effect of genus richness and reflects phylogenetic structure at the deepest nodes[20] (see Supplementary Information for results that include all metrics).

Because the null expectation for the evolutionary diversity metrics of communities (i.e. PD, MNTD and MPD) necessarily shows strong relationships with the total taxonomic richness of communities, we quantified their standardized values: the degree to which communities show greater (+) or less (-) PD, MNTD or MPD than expected given their genus richness. We calculated the standardised effect sizes, sesPD, sesMNTD and sesMPD by first generating a null expectation via randomly

420   shuffling genera tip labels in the phylogeny 999 times. The effect size was then

421   calculated as the difference between the observed and expected values, the latter

422   being the mean across randomizations, and dividing this difference by the standard

423   deviation of values across the randomisations. These standardized metrics represent

424   the residuals from the relationship between each evolutionary diversity metric and

425   genus richness within each plot and allow us to identify areas with high or low

426   evolutionary diversity whilst accounting for the effect of richness.

Wood productivity and aboveground biomass

427

428   Aboveground wood productivity was estimated as the rate of gain in biomass during

429   each census interval. Because longer census intervals increase the proportion of

430   productivity that cannot be directly detected due to trees growing and dying during

431   the census interval[57], productivity was corrected for varying census interval lengths.

432   Following the methodology developed by Talbot et al.[58] estimates of annualized

433   productivity per plot were computed as: i) the sum of tree growth alive in the first and

434   in the last censuses, ii) growth of trees that recruited during the census interval, iii)

435   estimates of unobserved growth of trees that died during the census interval and iv)

436   estimates of unobserved trees that both recruited and died between census periods.

437   Census-interval length is expected to affect the estimates of productivity, while plots

438   monitored over short total census lengths are more likely to be affected by stochastic

439   changes over time and measurement errors[59]. Productivity estimates were weighted

440   by the cubic root of census-interval length (details in Supplementary Information).

441   Aboveground biomass per stem was estimated using a pan-tropical, three parameter

442   equation $AGB = 0.0673 * (wd\ D^2\ H)^{0.976}$, from Chave et al.[60], where *wd* is the stem

443   wood density (in g.cm^3) from the Global Wood Density[29,61], *D* is the tree diameter (in

444   cm) at 1.3 m or above the buttress and *H* tree height (in m). Tree height was

445   estimated based on regional diameter-height Weibull equations[62]. Similar to

446   productivity, in order to reduce the influence of potential stochastic changes and due

447   to variation in census interval within plots, we estimated biomass per plot using a

448   weighted average across multiple censuses (details in Supplementary Information).

449   We extracted wood density from the Global Wood Density database[29,61].

Environmental variables

451 Because variation in both productivity and biomass in Amazonian forests is expected

452 to be mediated by soil and climate[25], we included environmental variables as

453 covariates in our models. For climate data, to avoid collinearity among explanatory

454 variables, we selected mean annual temperature (MAT ℃), extracted from the

455 WorldClim dataset at 30' (≈ 1km) resolution[27] and maximum climatic water deficit

456 (CWD), a measure of water stress, extracted from a global gridded layer[60]. For soil

457 data, we used average values for each plot, calculated at 0-30 cm depth, for soil

458 texture, total phosphorus (mg kg^{-1}), potassium, magnesium, calcium, and sodium

459 concentrations (mmol$_{eq}$ kg^{-1}) collated at ForestPlots.net and based on intensive soil

460 sampling from each RAINFOR plot that used standardised field and analytical

461 protocols[25,28]. Because silt, clay and sand content (%) are strongly correlated, soil

462 texture was expressed as the first two axes of a principal component analysis (PCA).

463 The first axis was negatively strongly related with sand content and the second

464 negatively with clay (Supplementary Table 2).

Stand structure variables

466 We also included descriptors of stand structure as covariates in our models,

467 including mean wood density, mean potential tree size and number of stems, all of

468 which have been shown to shape productivity and biomass in tropical tree

469 communities[15]. We extracted wood density data from the Global Wood Density

470 database[29,61] selecting data for Mexico, Central America and South America. The

471 data were matched to each stem in the plot data at the species-level, and in cases

472 where this information was unavailable, matched to the average of species values

473 for that genus. We then calculated the mean wood density value across all stems in

474 a plot. To estimate potential tree size, we used data from Coelho de Souza et al.[10]

475   spanning 577 single census plots from across Amazonia, for the potential size that

476   each genus could achieve. These values were assigned to each individual tree

477   based on its identity. We then derived mean potential tree size for each plot,

478   averaged across stems. The number of stems per plot was calculated as the

479   average number of individuals with dbh greater than 10 cm across multiple

480   censuses.

481   **Statistical analyses**

482   To investigate the strength of the relationship between each measure of ecosystem

483   functioning (i.e. productivity and biomass) and the set of diversity metrics in each

484   plot, we conducted: (1) bivariate Kendall's τ non-parametric correlation tests; (2)

485   generalised least squares modelling (GLS) and (3) Kendall's τ pairwise partial

486   correlation tests. For bivariate correlations, as testing the relationships for the range

487   of biodiversity metrics involved ten tests for each dependent variable, P-values were

488   adjusted for multiple comparisons using the false discovery rate[63] (Supplementary

489   Table 3).

490   Environmental variables also influence the diversity of an ecosystem[20,64] and its

491   ability to process and store carbon[25], and may therefore obscure relationships

492   between diversity and ecosystem functioning. In order to account for the effect of

493   multiple environmental variables we constructed generalised least square models

494   where ecosystem functioning was modelled as a function of metrics related to

495   diversity, climate, edaphic conditions, functional composition and structural variables.

496   To avoid multicollinearity amongst variables in the model, we confirmed that variance

497   inflation factors (VIFs) were less than five[65] for each explanatory variable. We

498   account for spatial autocorrelation in the GLS analyses by specifying a Gaussian

499   spatial autocorrelation structure, which is consistent with the shape of the

500 semivariograms for biomass and productivity across this network of plots[49]. We

501 created separate models for productivity, biomass and each diversity metric. For

502 each response variable (productivity and biomass), we generated a set of models

503 including all possible combinations of variables related to climate, soil, functional

504 composition and stand structure, and selected the best model (referred to as the

505 climate-soil-structure model) based on the Akaike Information Criterion (AIC). To

506 investigate the additional contribution that diversity made to explain variation in both

507 productivity and biomass, each single diversity metric was then added individually to

508 the climate-soil-structure model. We then compared the climate-soil-structure model

509 with models also including each single diversity metric: models with a difference in

510 AIC greater than 2 when compared to the climate-soil-structure model, indicate

511 models with improved support. Finally, we added pairs of diversity metrics,

512 representing both taxonomic and evolutionary diversity (Supplementary Figure 10)

513 into a single model to investigate whether a more complex model provides better

514 predictive ability over single diversity metric models. Phosphorous and cation

515 concentrations were log transformed prior to analysis. To allow comparisons of the

516 strength of significance of the explanatory variables, they were all standardised to a

517 mean of zero and a standard deviation of one.

518 We also examined the effect of the diversity metrics on wood productivity and

519 aboveground biomass using partial correlation analyses including the variables

520 selected in the best performing climate-soil-structure model. Partial correlation

521 analyses are used to determine the correlation between two variables while

522 eliminating the effect of potentially confounding variables[66].

523 Analyses were performed in the R Statistical software v3.1.1[67] using the vegan[68],

524 picante[69], BiomasaFP[70], nlme[71] and ppcor[66] packages.
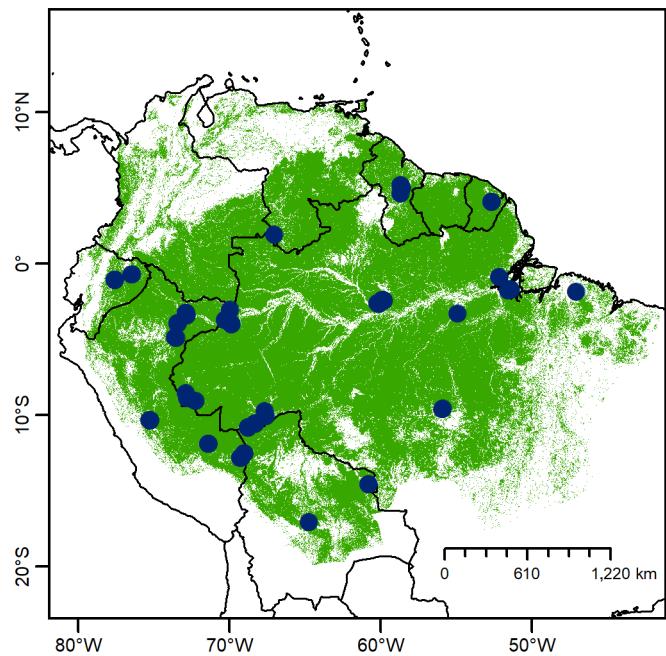
Figure 1. Location of 90 one-hectare permanent inventory plots shown on the forest cover map[72] produced from Global Land Cover[73]. Plots are all located in lowland moist forests on well-drained soils across the Amazon Basin (please see methods for details).

530
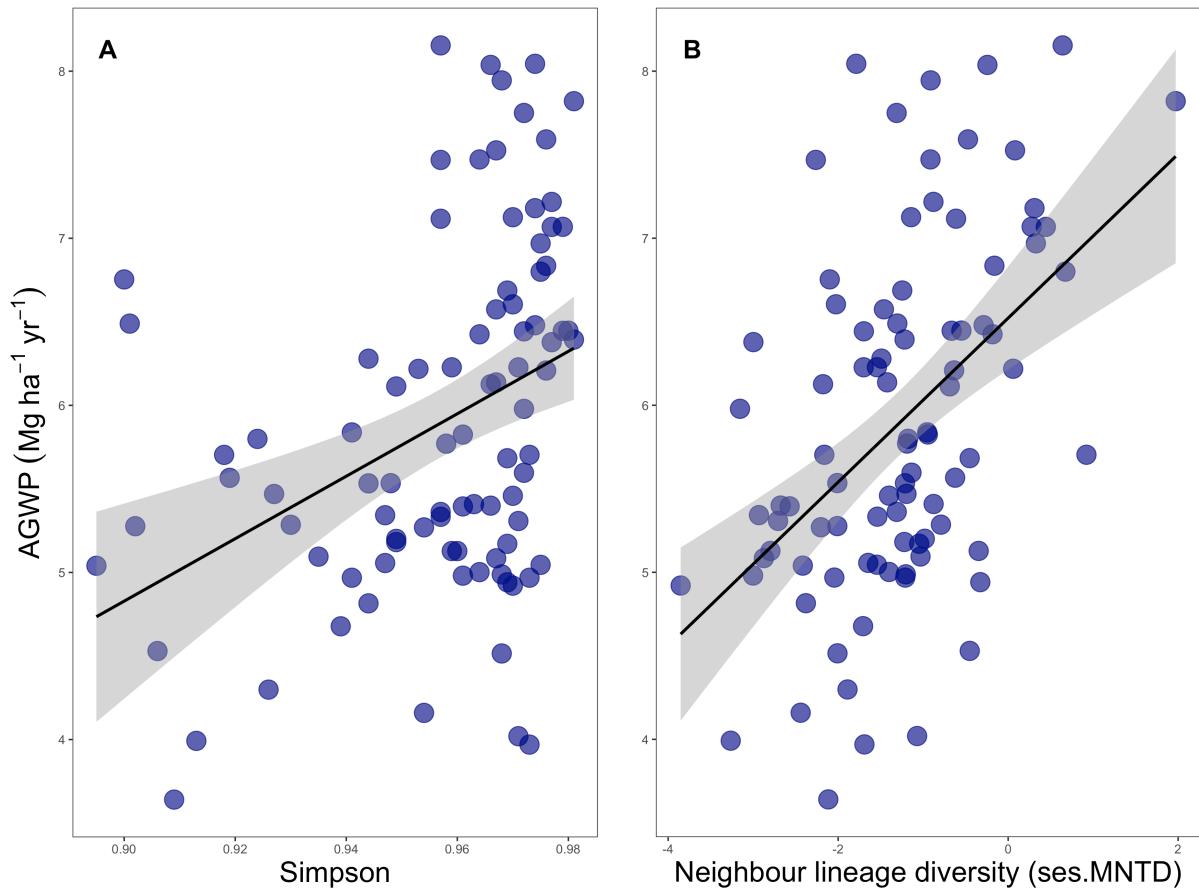
Figure 2. Bivariate relationships between aboveground wood productivity (AGWP) and the diversity variables included in the best performing model: A) Simpson Index and B) Neighbour lineage diversity from 90 single hectare plots across Amazonia. Shaded area represents 95% confidence interval. Relationships for the other taxonomic and phylogenetic diversity metrics are included in the Supplementary Information.
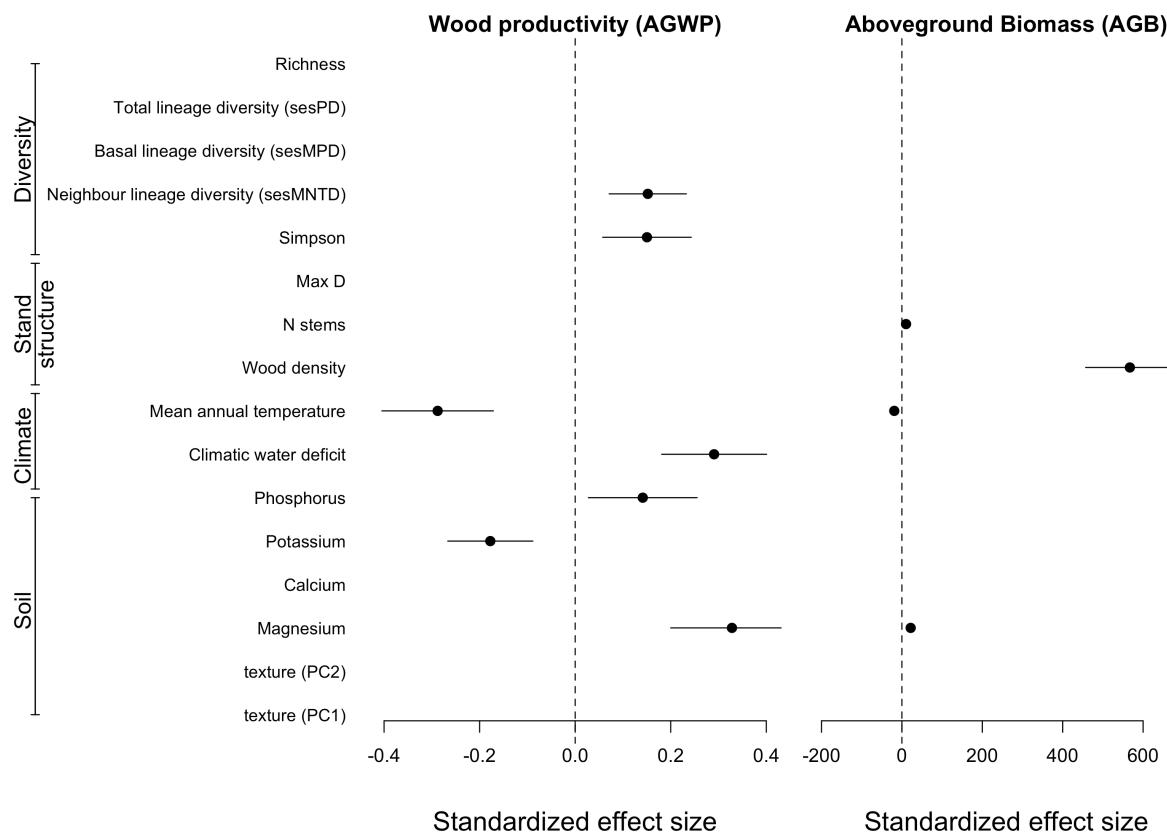
Figure 3. Standardised effect sizes for the best fit generalised least square model across plots for both aboveground wood productivity (AGWP) and aboveground biomass (AGB) as a function of diversity metrics, structural attributes, climate and soil variables selected based on the lowest AIC values and largest proportion of the variance explained (R^2). The best model for AGWP includes neighbour lineage diversity and Simpson index as biodiversity metrics, mean annual temperature, climatic water deficit, total phosphorus, magnesium and potassium. Greater productivity is found in plots with lower mean annual temperature, higher water availability and on soils with greater amounts of soil phosphorus, magnesium and lower amounts of potassium. The best model for AGB included wood density, number of stems, magnesium, and mean annual temperature. The relationship between AGB and WD is non-linear and in all AGB analyses, WD was specified with linear and quadratic terms, but for clarity, in the graph, effect size is shown only for

24

the quadratic term. For each variable in the model, dots represent the standardized effect size and lines one standard error. In some cases, error lines are unobserved due to very small standard errors. See Supplementary Figures 4 and 7 for detailed bivariate correlations and Appendix 4 for all the coefficients of the models.

Table 1. Results for generalised least square (GLS) models across 90, one ha plots for aboveground wood productivity (AGWP) and aboveground biomass (AGB) as a function of diversity metrics, structural and compositional attributes, climate, soil variables, and accounting for spatial autocorrelation (Gaussian correlation structure). The best models for both AGWP and AGB are highlighted in bold - full coefficients from the models shown in Appendix 4. Results are shown for the best-fit model, with lowest AIC values, incorporating environmental variables (climate and soil), functional attributes (mean wood density, potential tree size and number of stems), and spatial autocorrelation. Delta AIC values refer to the comparison between each model that includes the diversity variables and the climate-soil-structure model, which excludes diversity. For AGWP, the climate-soil-structure model includes mean annual temperature, climatic water deficit, total phosphorus, magnesium and potassium. For AGB, the climate-soil-structure model includes wood density, number of stems, magnesium, and mean annual temperature.

Model	AGWP			AGB		
	R^2	AIC	Δ AIC	R^2	AIC	ΔAIC
Climate-soil-structure model + sesMNTD + Simpson	**0.47**	**199.08**	**-2.51**	-	-	-
Climate-soil-structure model + sesMNTD	0.45	205.04	3.45	0.74	973.99	1.99
Climate-soil-structure model + Simpson	0.44	200.73	-0.86	0.74	973.78	1.78
Climate-soil-structure model + sesPD	0.46	201.13	-0.46	0.74	973.72	1.72
Climate-soil-structure model + sesMPD	0.44	203.57	4.48	0.74	973.97	1.97
Climate-soil-structure model + richness	0.44	203.12	1.53	0.74	971.03	-0.97
Climate-soil-structure model	0.44	201.59	0.00	**0.74**	**972.00**	**0**

Author contributions

F.C.S, T.R.B. and K.G.D. conceived the study, F.C.S, T.R.B., O.L.P. and K.G.D. designed the study. F.C.S., K.G.D. and T.R.B. produced the phylogeny; F.C.S. analyzed data and wrote the paper; all co-authors collected field data or data management. O.L.P., Y.M. and Jon Lloyd conceived the RAINFOR forest census plot network. K.G.D., O.L.P., R.T.P., D.N., M.J.P.S., E.A.-D., A.A., I.A., A.A., L.E.O.C.A., A.A.M., E.J.M.M.A., L.A, G.A.A.C., O.B., C.B., J.G.B., R.G.A.B., R.J.W.B., F.B., J.L.L.C.C., W.C., J.C., A.C., J.A.C., F.C.-V., A.L.C., P.B.C., A.D.F., T.R.F., D.R.G., E.G., R.C.G., M.G., R.H., N.H., E.N.H.C., E.J.-R., T.J.K., S.L., W.F.L., G.L.-G., T.E.L., Y.M., B.S.M., B.H.M., C.M., A.M.-M., D.A.N., P.N.V., M.C.P.-M., G.P., J.J.P.III., N.C.A.P., L.P., A.P., F.R., A.R., A.Rudas., R.P.S., N.S., M.S., J.S., J.Stropp., H.T.S., J.T., R.T.-C., R.K.U., R.V.V., I.C.V., S.A.V., V.A.V., R.J.Z. and T.R.B. commented and/or approved the manuscript.

602   **Competing financial interests.** The authors declare no competing financial
603   interests.

604   **Data availability.** The permanently archived data package of the plot-level diversity,
605   aboveground biomass, wood productivity and the genus-level phylogeny are
606   available from https://www.forestplots.net/pt/produtos.

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Supplementary Material: Evolutionary diversity is associated with wood productivity in Amazonian forests

Coelho de Souza et al.,

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Supplementary Information Table 1

Supplementary text: Phylogenetic hypothesis construction, including 1125 genera based on two portions of DNA chloroplast gene regions: *rbcL* and *matK*.

Supplementary text: Weighting of wood productivity and aboveground biomass according to total census length interval in order to remove patterns from the residuals.

Results and Discussion

Supplementary Information Figures 3 to 13

Supplementary Information Tables 2 to 6

Supplementary text: Relationship between tree diameter and crown radius.

Supplementary text: Examining the mechanisms underlying the effect of biodiversity on wood productivity.

Supplementary text: Potential for forest succession to drive observed patterns.

Other Supplementary material for this manuscript includes the following:

Supplementary Information Table 7: List of 90 long-term inventory plots compiled from RAINFOR network extracted from ForestPlots database, with their respective coordinates in Latitude and Longitude, census initial and final date and data contributors.

Supplementary Information Table 8**:** List of all 1125 genera present in the phylogeny with their respective Genbank Accession numbers and sequence source for rbcL and matK sequences where applicable.

Supplementary Information Table 9: List of fossil-derived calibrations from 86 nodes used to date the phylogeny, taxa used for calibration, minimum age used as offset, mean age and their respective source. Ages in Ma.

Supplementary Information Table 10**:** Full coefficients from models. Coefficients for all generalised least square models across 90 plots for both natural logarithm of aboveground wood productivity (AGWP) and natural logarithm of aboveground biomass (AGB) as a function of diversity metrics, functional and structural attributes, climate, soil variables and using a Gaussian spatial correlation structure.

Supplementary Information Figure 14: Phylogeny (based on *rbcL* and *matK* plastid gene) of 526 Amazonian tree genera with internal and terminal branches coloured according to their contribution to wood productivity (mean DFBETAS). DFBETAS were extracted from the regression of Simpson Index and Neighbour Lineage Diversity against wood productivity, while controlling for environmental variables (climate and soil), structural attributes (wood density, potential tree size and number of stems) and spatial auto correlation. a) DFBETAS for Simpson Index and B) Neighbor Lineage Diversity (sesMNTD). Branches were coloured using a continuous

colour gradient, colour codes indicate DFBETA values, from blue to red, indicating higher and lower DFBETA values respectively.

References

Material and Methods
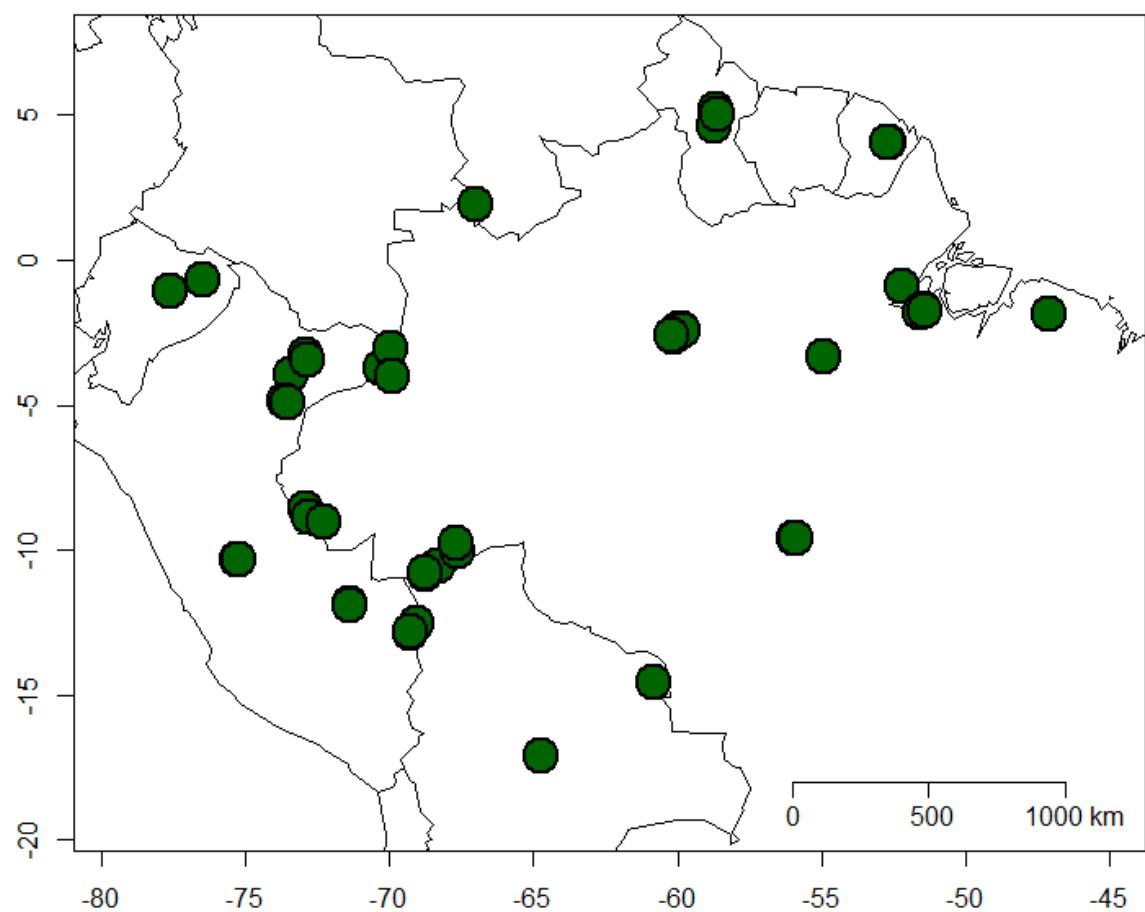
Supplementary Information Figure 1: Geographical distribution of 90, one-hectare permanent inventory plots analysed in this study. Plots are all located in lowland moist forests on well-drained soils across the Amazon Basin (please see methods for details).

Supplementary Information Table 1: Biodiversity metrics, their respective abbreviations, formulas and descriptions.

Diversity metric	Code	Formula	Description
Genus richness	GR	$GR = \sum_{i=1}^{n} G_i GR = \sum_{i=1}^{n} G_i$,where i is each individual genus	The total number of genera in a community – richness
Shannon	H'	$H' = \sum p_i \ln p_i H' = \sum p_i \ln p_i$, where p_i is the proportion of stems of genus i in the plot	Diversity index including both genus richness and abundance
Simpson index of diversity	S	$\lambda = 1 - \sum p_i^2$	Probability that two individuals randomly selected from community will belong to different genera
Fisher's α	α	$G = \alpha \ln(1 + {}^{N}/\alpha)$ $G = \alpha \ln(1 + {}^{N}/\alpha)$, where G is the number of genera per plot, N is the number of stems	Fisher's α: a constant derived from the log series distribution of taxa abundance
Phylogenetic diversity	PD	$PDss = \sum_{i}^{B} L_i PDss = \sum_{i}^{B} L_i$, where L_i is the branch length, B is the number of branches in a tree	Total branch lengths of the phylogeny representing all genera in a given community

Mean pairwise taxon distance	MPD	$mpd = \frac{\sum_i^n \sum_j^n d_{ij}}{n} mpd = \frac{\sum_i^n \sum_j^n d_{ij}}{n}$, where d_{ij} is the pd between genus I and n is the total number of ggener	Mean of all distances connecting the genera in a specific community
Mean nearest taxon distance	MNTD	$mntd = \frac{\sum_i^n \min d_{ij}}{n}$	Mean phylogenetic distance between each species and its closest relative per plot
Standardized phylogenetic diversity	ses.PD	Deviation of PD_{ss} from a null expectation	Standardized effect size of phylogenetic diversity in communities
Standardized mean pairwise taxon distance	ses.MPD	Deviation of mpd from a null expectation	Standardized effect size of mean pairwise distances in communities
Standardized mean nearest taxon distance	ses.MNTD	Deviation of $mntd$ from a null expectation	Standardized effect size of mean nearest taxon distances in communities

Phylogenetic hypothesis construction

We constructed the largest pan-Amazon phylogeny to date, including 1125 genera (i.e. 582 genera within our plot data and others 543 Neotropical genera) based on two portions of DNA chloroplast gene regions: *rbcL* and *matK* following protocols developed by Dexter and Chave[1]. These genes were chosen based on their universality, data availability, typical sequence quality, level of genus discrimination, sequencing costs and their recommendation as standard DNA barcodes in plants[2–4]. We generated 214 novel rbcL and 270 novel matK sequences from leaf fragments collected during extensive fieldwork. Further sequences were obtained from Genbank (http://www.ncbi.nlm.nih.gov). For 837 genera (74.4%) we had both *rbcL* and *matK* sequences and for 132 (11.7%) and 156 (13.9%) just *rbcL* and *matK* respectively. Sequences that were unavailable for one region were left as missing data. Preliminary phylogenetic analyses and basic local alignment enabled us to exclude sequences that were likely to represent taxonomic misidentifications. The details of DNA extraction, PCR, and DNA sequencing protocols can be found in Gonzalez *et al.*[5]. A list of sampled genera, their respective family, and Genbank accession number is available in Appendix 2.

Multiple sequence alignments, separately for each region, were conducted using MAFFT v.6.822[6] followed by manual adjustments in Mesquite (http://mesquiteproject.org)[7]. Prior to manual alignments, we removed all sites in which more than 99% of genera appears have missing data, which served to remove unalignable gaps in the alignment. Then, all *rbcL* and *matK* sequences were combined to generate a maximum likelihood tree using RAxML v.7.2.7 on the CIPRES Science Gateway (https://www.phylo.org/)[8]. A topological constraint specifying the major relationships among angiosperm orders was imposed based on

the Angiosperm Phylogeny Group[9]. A basal angiosperm *Nymphaea alba* (Nymphaeaceae) was specified as an outgroup and the initial tree was made ultrametric implementing the nonparametric rate smoothing method of Sanderson[10], implemented in the ape[11] package in the R Statistical environment[12]. This phylogeny was then used as a starting tree in subsequent analyses to simultaneously estimate tree topology and divergence times of taxa, a Bayesian Markov Chain Monte Carlo (MCMC) approach was conducted using BEAST v.1.8.2 on the CIPRES server. An uncorrelated lognormal (UCLN) relaxed molecular clock was implemented, and the tree prior was under a Birth-Death Incomplete Sampling model of speciation[13]. To calibrate the phylogenetic tree, 86 previously compiled fossil-based age constraints were implemented on nodes[14,15] (see Appendix 3 for a list of priors and their respective nodes). Nodes were constrained using a log-normal distribution with a mean value equal to the fossil age, a standard deviation of 2 and a hard constraint for a minimum age equal to 80% of the estimated fossil age. No constraints were placed on the root age of the tree. Using the maximum likelihood tree, preliminary runs of 10^6 generations were conducted to optimize operator settings before conducting the final runs.

We conducted three independent MCMC runs under the same estimation conditions for 70.2×10^5, 58.6×10^5 and 80.3×10^5 generations. In order to ensure stability, a burn-in of 10×10^5 and 20×10^5 generations for the first two and third runs respectively were excluded. After excluding the burn-in and combining the three independent runs using LogCombiner, we sampled 282 trees spaced evenly through the posterior to be used to generate a consensus tree using the all-compatible consensus option in the phyutility software[16]. Branch-lengths and divergence times

(node heights) were optimised on this tree as the mean values across the posterior distribution of trees in Treeannotator (http://beast.community/treeannotator).

Roughly 8% of genera in the plots, each typically represented by only a few individuals, were excluded from our analyses due to a lack of molecular data. Overall, our analyses included only genera where we have phylogenetic data: 90.4% of the total number of genera and 98.0% of all stems identified in the plot data.

Weighting by total census length

Total census length is expected to affect estimates of aboveground wood productivity (AGWP) and aboveground biomass (AGB), with plots monitored over short total census length being more likely to be affected due to stochastic changes over time and measurement errors. Overall, variance of the residuals was greater among plots monitored over shorter total census length and smaller for longer total census length (Figure S2). In order to reduce the influence of potential stochastic changes we explicitly tested for the effect of total monitoring period on wood productivity estimates, using a procedure developed by Lewis *et al.*[17]. Here we found that the cube root of total census length best removed patterns from the residuals (Figure S2), and so, to control for the observed variance in the residuals, we weighted AGWP by the cube root of the total census length. Aboveground biomass estimates were calculated by averaging values across multiple censuses. Because census interval varied within plots, mean values were weighted according to each census interval using a trapezoidal rule numerical integration. This method is simply a weighted average that allows more precise estimation of mean values when intervals are unequally spaced:

$$\int_a^b f(x)dx \approx \frac{1}{2}\frac{1}{b-a}\sum_{i=1}^{N-1}(AGB_{i+1} + AGB_i)(Yr_{i+1} - Yr_i)$$

where *N* is the number of census interval, *a* is the year of the first census and *b* the year when the plot was last monitored, AGB_i is the value of aboveground biomass at year *i*, Yr_i is the year of census monitoring.
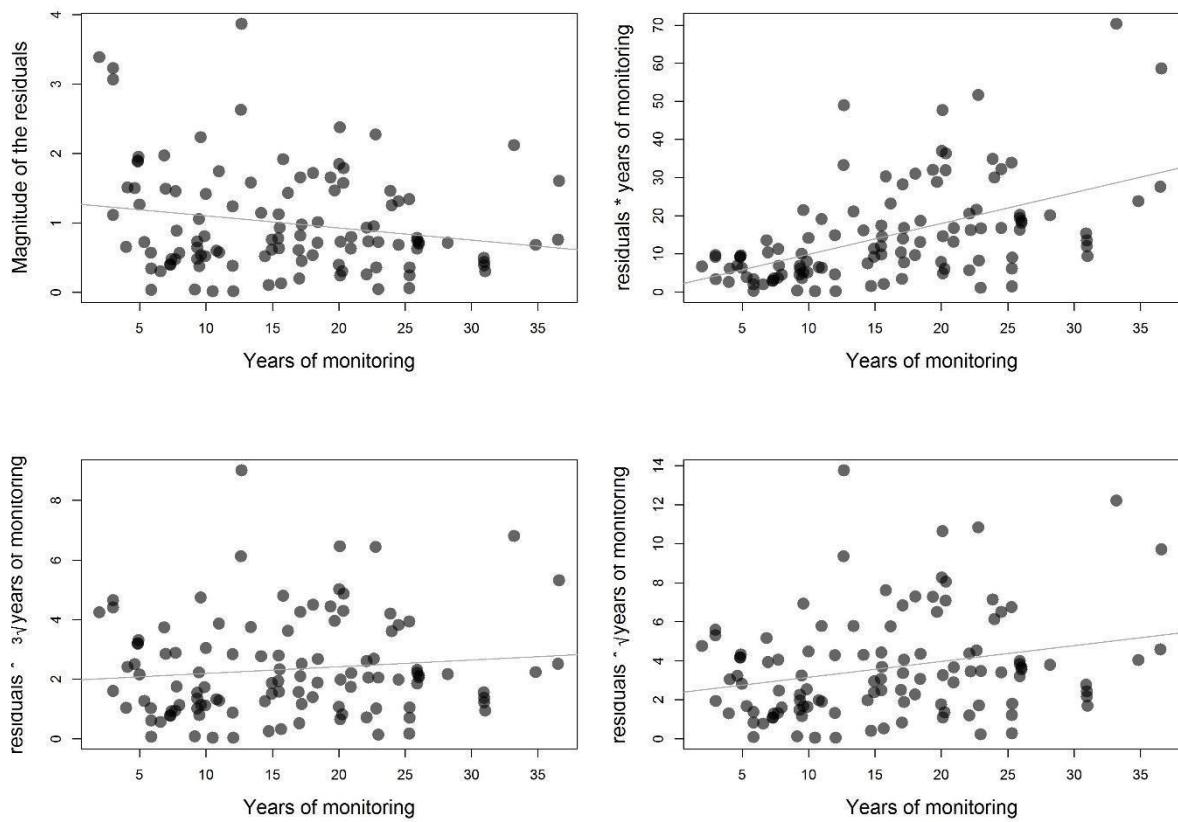
Supplementary Information Figure 2: Standardised residuals from wood productivity (AGWP) versus years of monitoring with different weights to remove patterns from the residuals, for 90 permanent inventory plots located in lowland moist forest across the Amazon Basin. Weights all plots: a) equally ($_{adj}R^2 = 0.02$ p = 0.04); b) by years of monitoring ($_{adj}R^2 = 0.26$ p <0.001); c) by the cube root of years of monitoring ($_{adj}R^2 = 0.003$ p =0.24) and d) by the square root of the years of monitoring ($_{adj}R^2 = 0.05$ p = 0.008).

Results
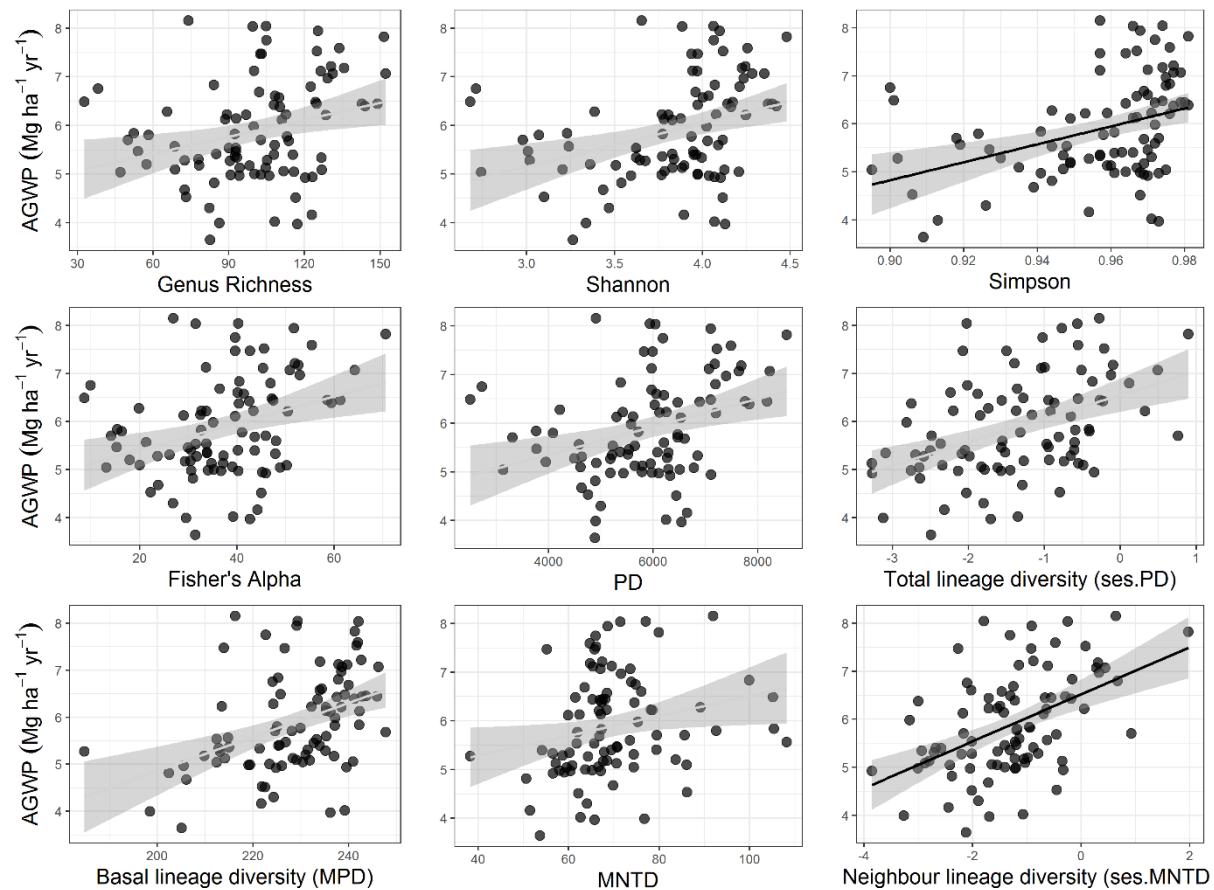
Supplementary Information Figure 3: Bivariate relationships between above ground woody productivity (AGWP) and different biodiversity metrics across 90, one ha inventory plots. Continuous black lines indicate diversity metrics included in the best model accounting for environment, stand structure variables, and spatial autocorrelation (Gaussian correlation structure). Dashed grey lines indicate significant bivariate correlation between AGWP and diversity metrics (Table S3). Significant correlations were assessed using Kendall's tau and P-values were corrected using a false-discovery rate (see methods for details).
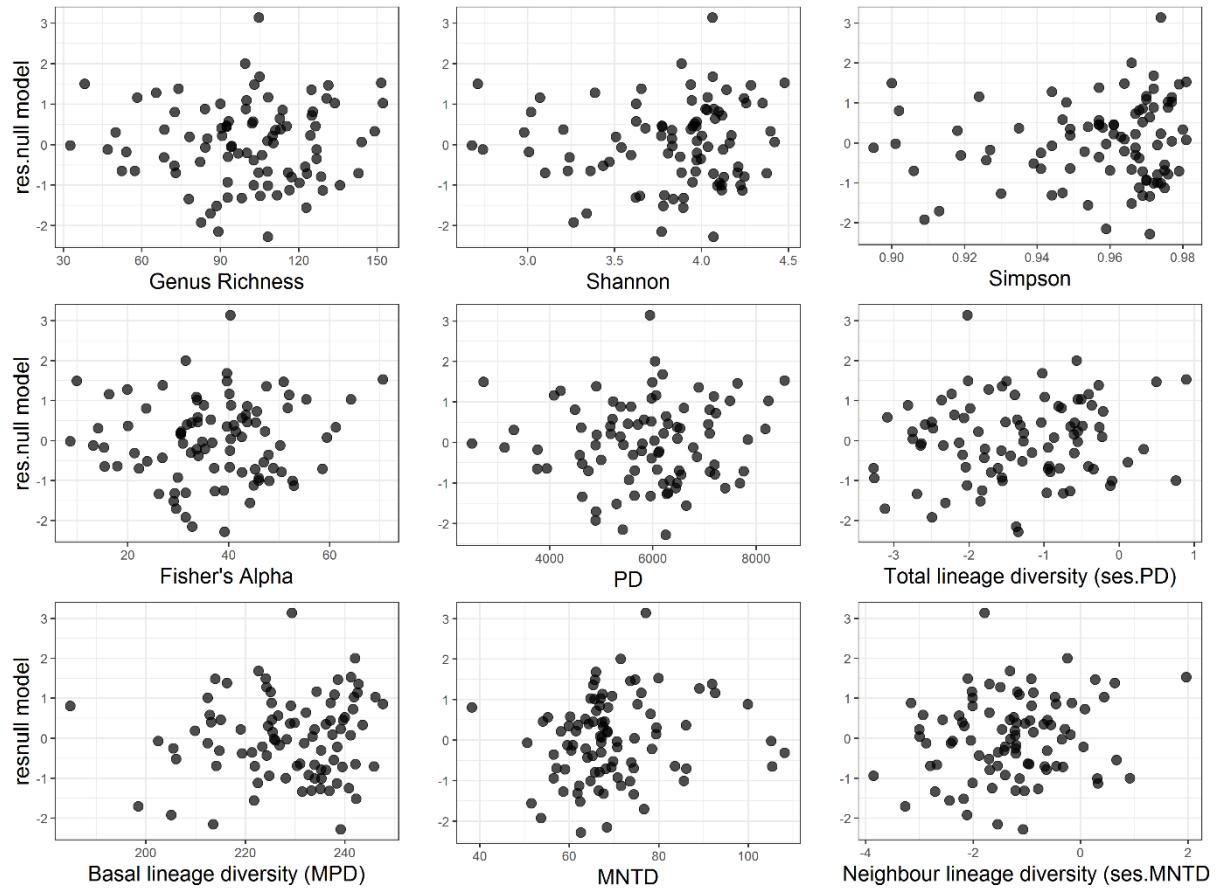
Supplementary Information Figure 4: Bivariate relationships between the normalized residual from the generalised least square null model for productivity (i.e. including climatological water deficit, mean annual temperature, magnesium, potassium and total phosphorus – see methods and Fig S5 for details) and different biodiversity metrics across 90, one ha inventory plots.
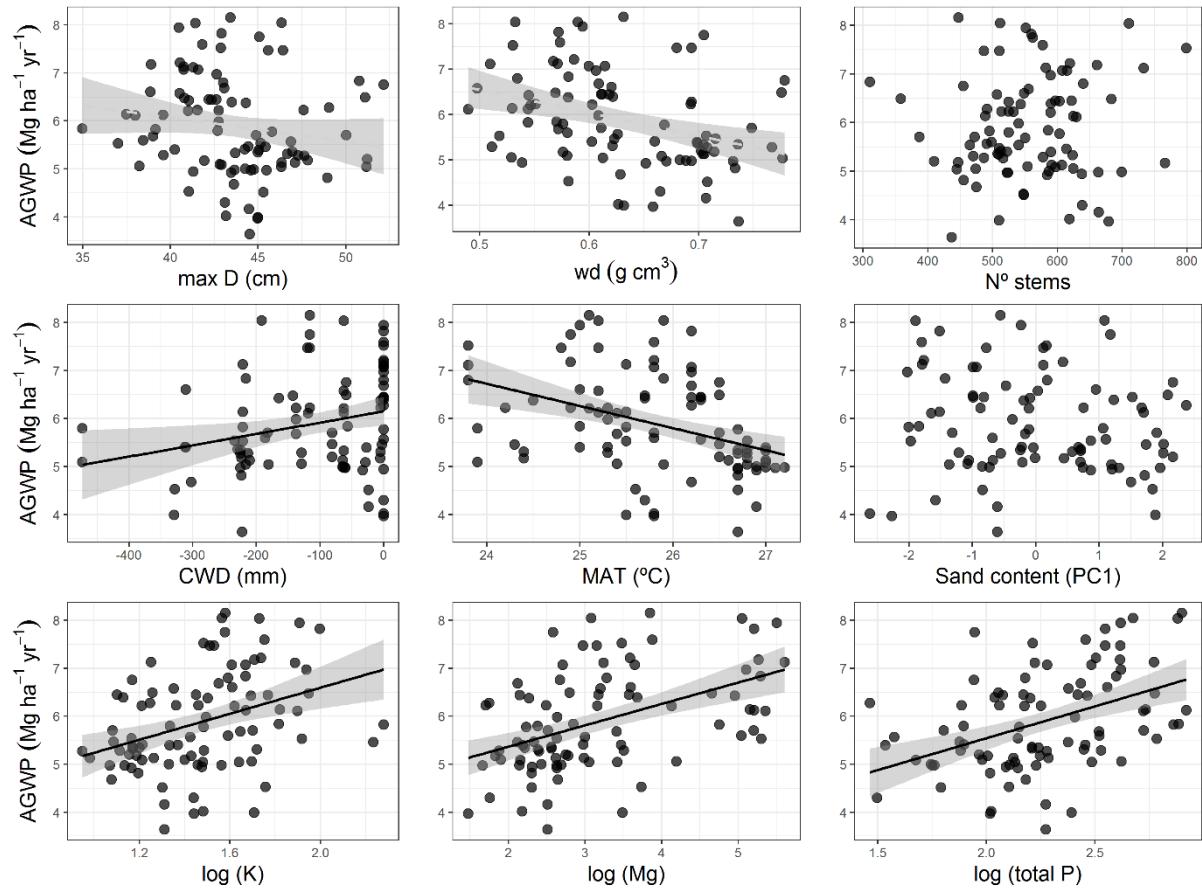
Supplementary Information Figure 5: Bivariate relationships between aboveground wood productivity (AGWP) and other variables in the generalized least square models (stand structure variables, climate, and soil variables) across 90, 1 ha plots. Stand structure variables: maximum size (Max D, as the 95th percentile of the distribution of trees diameter), mean wood density (wd) and number of stems. Climate: cumulative water deficit (CWD) and mean annual temperature (MAT). Soil texture represented by PC1 (sand content). Soil fertility by total phosphorus (log P), magnesium (log Mg) and potassium (log K). Continuous black lines indicate variables included in the best model accounting for spatial autocorrelation (Gaussian correlation structure). Dashed grey regression lines indicate significant bivariate relationships, significance was assessed using Kendall's tau and P-values were corrected using a false-discovery rate (see methods for details).
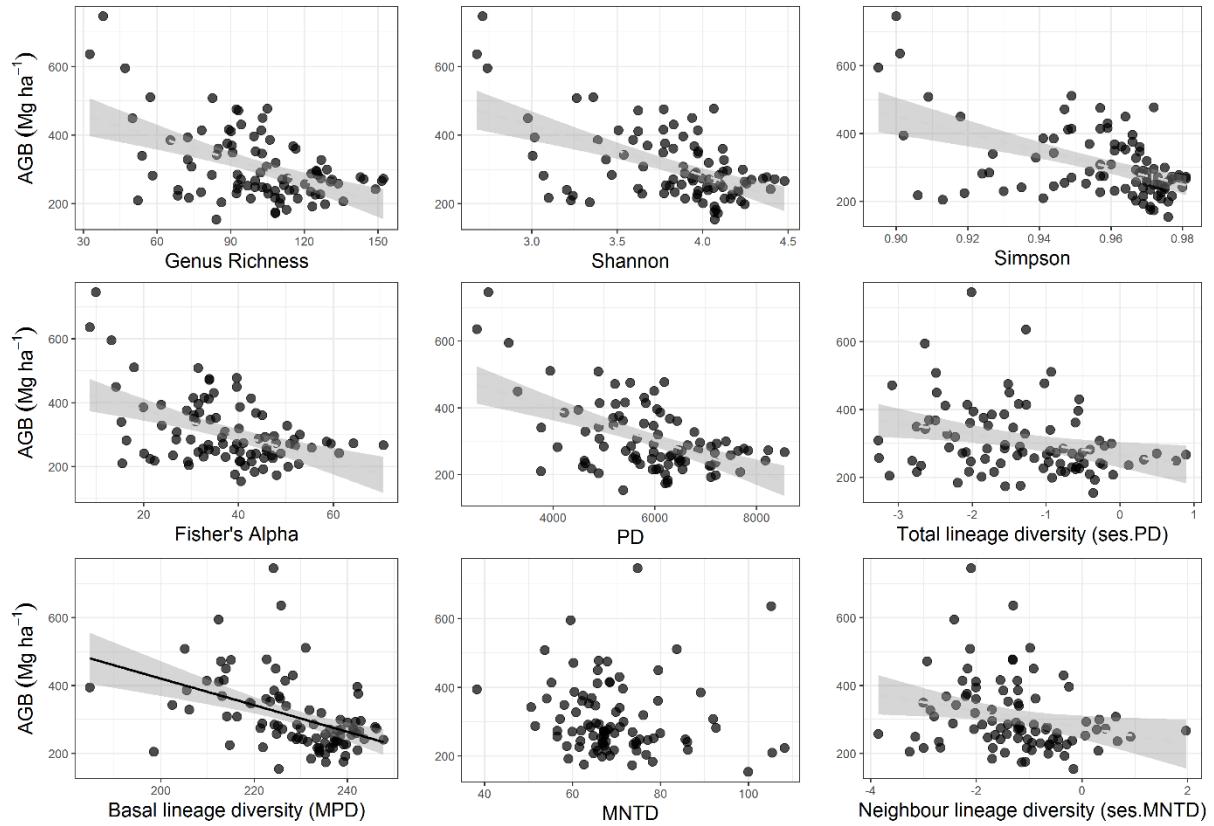
Supplementary Information Figure 6: Bivariate relationships between aboveground biomass (AGB) and different biodiversity metrics across 90, one ha inventory plots. Continuous black lines indicate significant relationships (p < 0.05) after accounting for environmental factors, stand structure variables and spatial autocorrelation. Dashed grey regression lines indicate significant bivariate relationships, significance was assessed using Kendall's tau and P-values were corrected using a false-discovery rate (see methods for details).
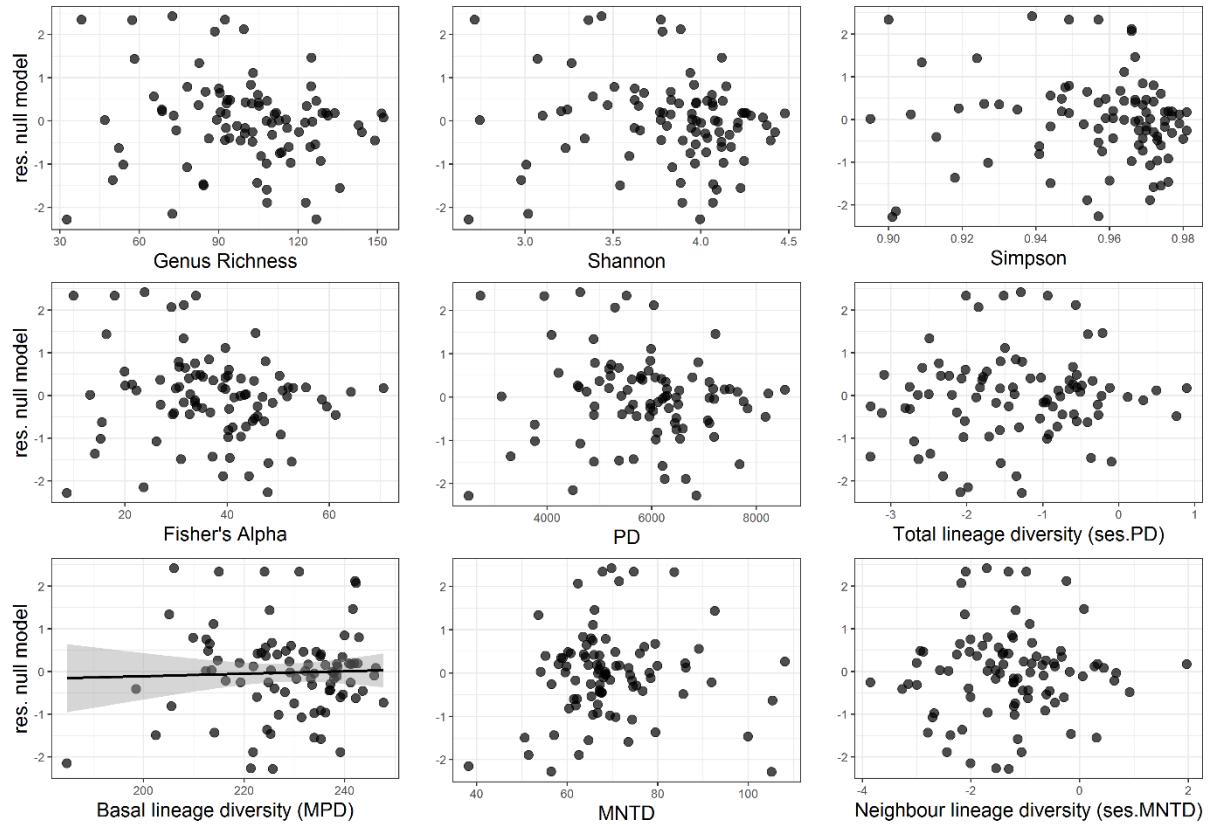
Supplementary Information Figure 7: Bivariate relationships between the normalized residual from the generalised least square null model (i.e. including wood density, number of stems and total exchangeable bases) and different biodiversity metrics across 90, one ha inventory plots. Continuous black lines indicate variables included in the best model accounting for spatial autocorrelation (Gaussian correlation structure).
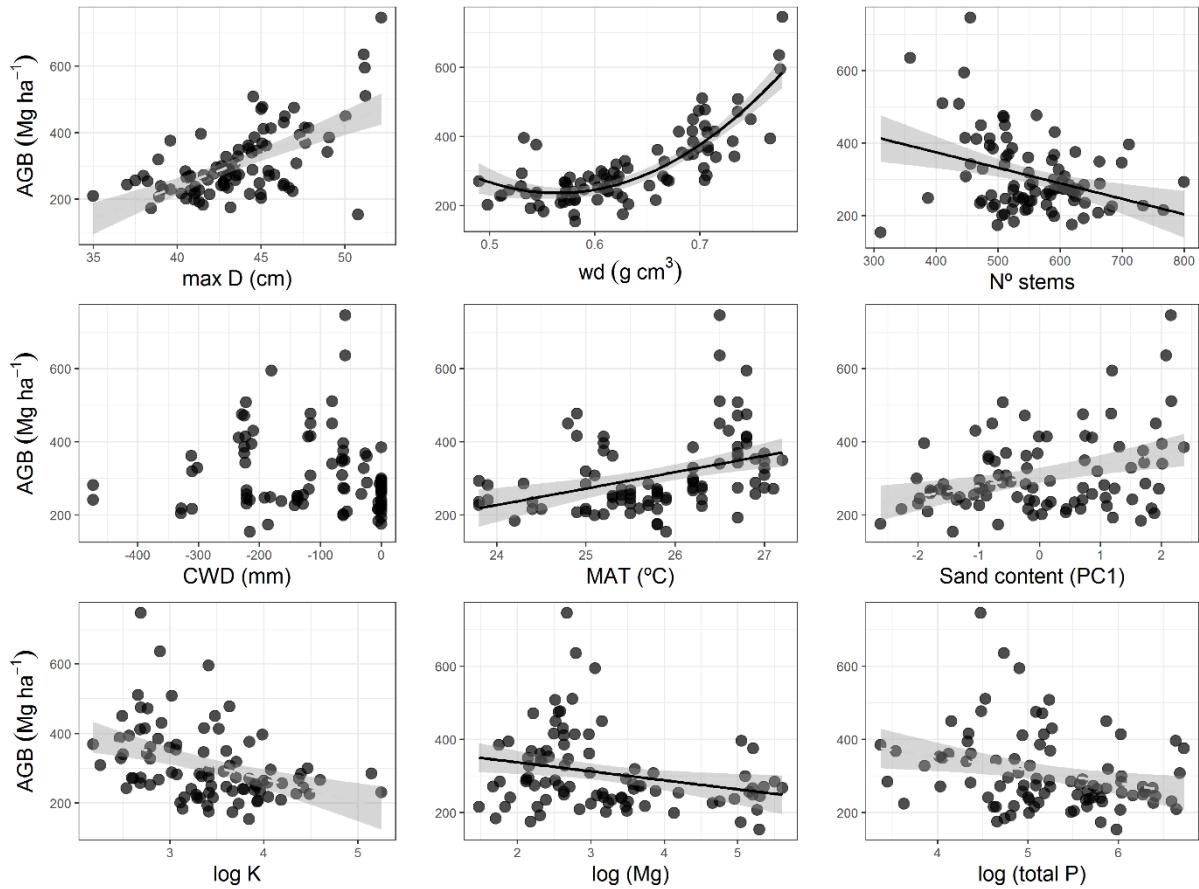
Supplementary Information Figure 8: Bivariate relationship between aboveground biomass (AGB) and other variables in the mixed model (stand structure variables, climate, and soil variables) across 90, one ha plots. Stand structure variables: maximum size (Max D, as the 95th percentile of the distribution of trees diameter), mean wood density (wd) and number of stems. Climate: cumulative water deficit (CWD) and mean annual temperature (MAT). Soil texture represented by PC1 (sand content) PC2 (clay content). Soil fertility: total phosphorus (log P), magnesium (log Mg) and potassium (log K). Continuous black lines indicate variables included in the best model accounting for spatial autocorrelation (Gaussian correlation structure). Dashed grey regression lines indicate significant bivariate relationships, significance was assessed using Kendall's tau and P-values were corrected using a false-discovery rate (see methods for details).

Crown architecture

Crown architecture is thought to be associated with wood productivity in temperate forests[18,19]. We investigated whether there were differences in the relationship between crown radius and tree diameter across distinct tree families. We used crown radius data for 2457 trees with diameter ≥ 10 cm, belonging to 52 different families[20,21]. We explored whether there were differences in tree architecture among families using ANCOVA. Variation among families was assessed by the interaction between family and tree diameter, with crown radius (Cr) as the dependent variable. The relationship between crown radius and tree diameter was further explored using a power relationship $Cr = aD^b Cr = aD^b$ [21]. We found that the allometric relationship between crown radius and diameter varied widely across families (Fig. S9). Different families showed significant differences in the slope and intercept of their allometric relationships (p < 0.001).
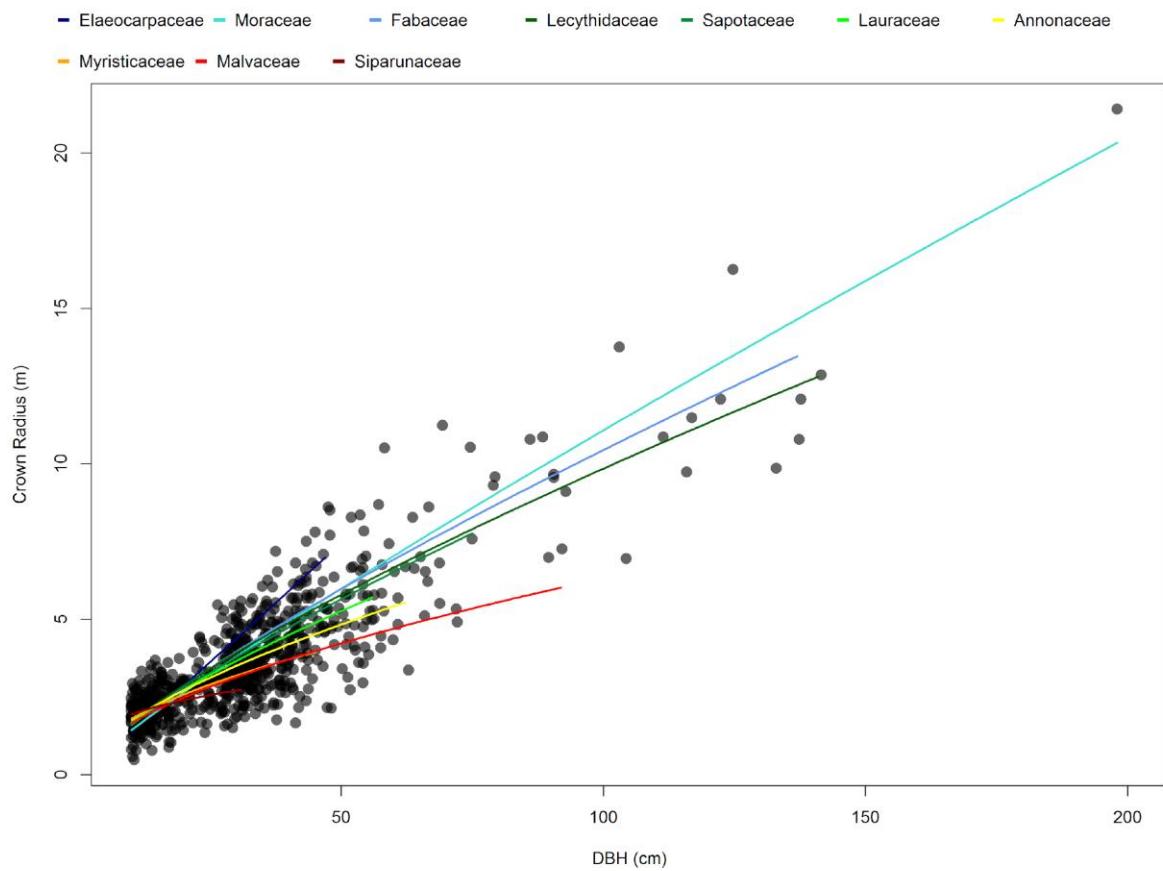
Supplementary Information Figure 9: Size-dependent relationships between crown radius and tree diameter across different families. Each family is represented by a different curve and the curve ends at the biggest individual measured for a particular family.

Supplementary Information Table 2: Results of Principal Component analyses of soil texture among 90 plots across Amazonia.

Soil content (%)	PC1	PC2
Clay	0.15	-0.84
Sand	-0.75	0.25
Silt	0.65	0.48

Supplementary Information Table 3: Kendall's tau for correlations between biodiversity metrics and predictor variables: aboveground wood productivity (AGWP) and aboveground biomass (AGB). Probabilities are given without (P) and with adjustment (P.adj) for multiple comparisons using a false discovery rate (see details in the methods section).

Diversity metrics		AGWP			AGB		
		Kendall's	p	p.adj	Kendall's	p	p.adj
Common diversity metrics	Genus richness	0.19	0.01	0.01	-0.24	0.00	0.00
	Shannon	0.25	0.00	0.00	-0.28	0.00	0.00
	Simpson index	0.28	0.00	0.00	-0.28	0.00	0.00
	Fisher's alpha	0.21	0.00	0.00	-0.23	0.00	0.00
Phylogenetic diversity metrics	PD	0.22	0.00	0.00	-0.26	0.00	0.00
	Total lineage diversity	0.30	0.00	0.00	-0.19	0.01	0.01
	Basal lineage diversity	0.34	0.00	0.00	-0.32	0.00	0.00
	sesMPD	0.17	0.02	0.02	-0.27	0.00	0.00
	MNTD	0.21	0.00	0.00	-0.14	0.05	0.06
	Neighbour lineage diversity	0.33	0.00	0.00	-0.20	0.00	0.01

Supplementary Information Table 4: Partial correlation and their statistical significance for each variable against wood productivity while accounting for variation in all other environmental variables, functional structure and diversity metrics selected in the best model.

	τ AGWP	p AGWP	τ CWD	p CWD	τ MAT	p MAT	τ logP	p logP	τ logK	p logK	τ logMg	p logMg	τ Simpson	p Simpson	τ sesMNTD	p sesMNTD
AGWP	1.00	0.000	0.17	0.02	-0.22	0.00	0.12	0.12	-0.01	0.85	0.16	0.03	0.15	0.05	0.15	0.04
CWD	0.17	0.025	1.00	0.00	0.03	0.69	-0.14	0.06	0.12	0.11	-0.18	0.02	0.29	0.00	0.12	0.10
MAT	-0.22	0.004	0.03	0.69	1.00	0.00	-0.08	0.27	-0.23	0.00	0.03	0.73	0.05	0.49	-0.09	0.22
logP	0.12	0.119	-0.14	0.06	-0.08	0.27	1.00	0.00	0.27	0.00	0.39	0.00	0.07	0.36	-0.03	0.67
logK	-0.01	0.847	0.12	0.11	-0.23	0.00	0.27	0.00	1.00	0.00	0.12	0.10	0.13	0.09	0.08	0.29
logMg	0.16	0.035	-0.18	0.02	0.03	0.73	0.39	0.00	0.12	0.10	1.00	0.00	0.03	0.71	0.24	0.00
Simpson	0.15	0.046	0.29	0.00	0.05	0.49	0.07	0.36	0.13	0.09	0.03	0.71	1.00	0.00	0.04	0.56
sesMNTD	0.15	0.044	0.12	0.10	-0.09	0.22	-0.03	0.67	0.08	0.29	0.24	0.00	0.04	0.56	1.00	0.00

Supplementary Information Table 5: Partial correlation and their statistical significance for each variable against aboveground biomass while accounting for variation in all other environmental variables and functional structure metric selected in the best model.

	τ AGB	p AGB	τ logMg	p logMg	τ MAT	p MAT	τ Nstems	p Nstems	τ WD	p WD
AGB	1.00	0.00	0.05	0.48	0.07	0.36	-0.04	0.58	0.45	< 0.001
logMg	0.05	0.48	1.00	0.00	-0.06	0.45	-0.11	0.12	-0.32	< 0.001
MAT	0.07	0.36	-0.06	0.45	1.00	0.00	0.03	0.66	0.33	< 0.001
Nstems	-0.04	0.58	-0.11	0.12	0.03	0.66	1.00	0.00	-0.23	0.00
WD	0.45	< 0.001	-0.32	< 0.001	0.33	< 0.001	-0.23	0.00	1.00	0.00
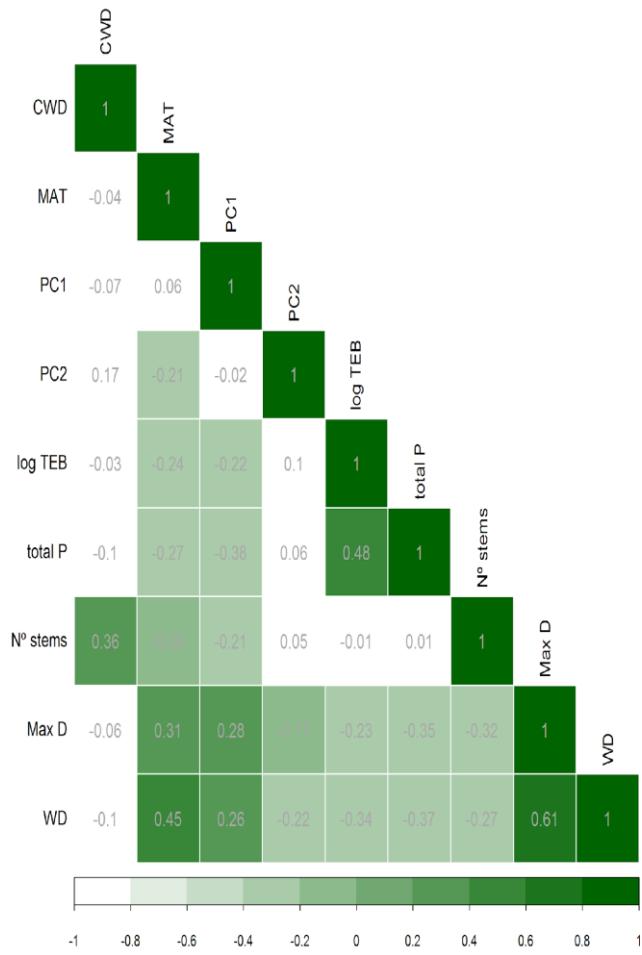
Supplementary Information Figure 10: Matrix of correlation coefficients from the predictors used to select the best null model. Significant correlations were assessed using Kendall's tau (τ shown in grey) and P-values were corrected using a false-discovery rate. Lack of correlation ($p \leq 0.05$) is shown by a white square.

Diversity metrics

Traditional and phylogenetic diversity metrics represent different aspects of biodiversity, reflected by three main axes of variation (Table S4 and Fig. S11). Common diversity metrics (i.e. richness, Shannon, Simpson and Fisher's Alpha) vary in similar ways, reflecting variation in species number and their respective abundances. Raw phylogenetic diversity (or PDss) correlates strongly with this first axis. In contrast, other aspects of phylogenetic diversity are reflected in two other dimensions of diversity[22]. The second axis identified the overall tree topology (ses.PD) and neighbour lineage diversity (MNTD and ses.MNTD), that represents how divergent the taxa in plots are close to the tips of the phylogeny. A third axis of variation showed patterns at deep phylogenetic nodes (MPD and ses.MPD), representing how divergent the taxa in plots are at deep nodes. Therefore, because taxonomic and evolutionary diversity metrics represent different facets of diversity, we expected that they may have independent effects on ecosystem function.

Supplementary Information Table 6. Results of Principal Component analyses of 10 diversity metrics in 90 plots across Amazonia.

Diversity metric	PC1	PC2	PC3
Genus richness	**-0.40**	0.19	-0.01
Shannon	**-0.40**	0.15	-0.20
Simpson Index	**-0.36**	0.10	-0.26
Fisher's alpha	**-0.39**	0.16	-0.11
PD	**-0.41**	0.10	-0.04
sesPD (Total lineage diversity)	-0.20	**-0.55**	-0.11
MNTD	0.09	**-0.51**	-0.27
sesMNTD (Neighbour lineage diversity)	-0.21	**-0.51**	-0.20
MPD	-0.30	-0.24	**0.32**
sesMPD (Basal lineage diversity)	-0.22	-0.17	**0.81**
% Variance explained	55.2	22.16	9.4
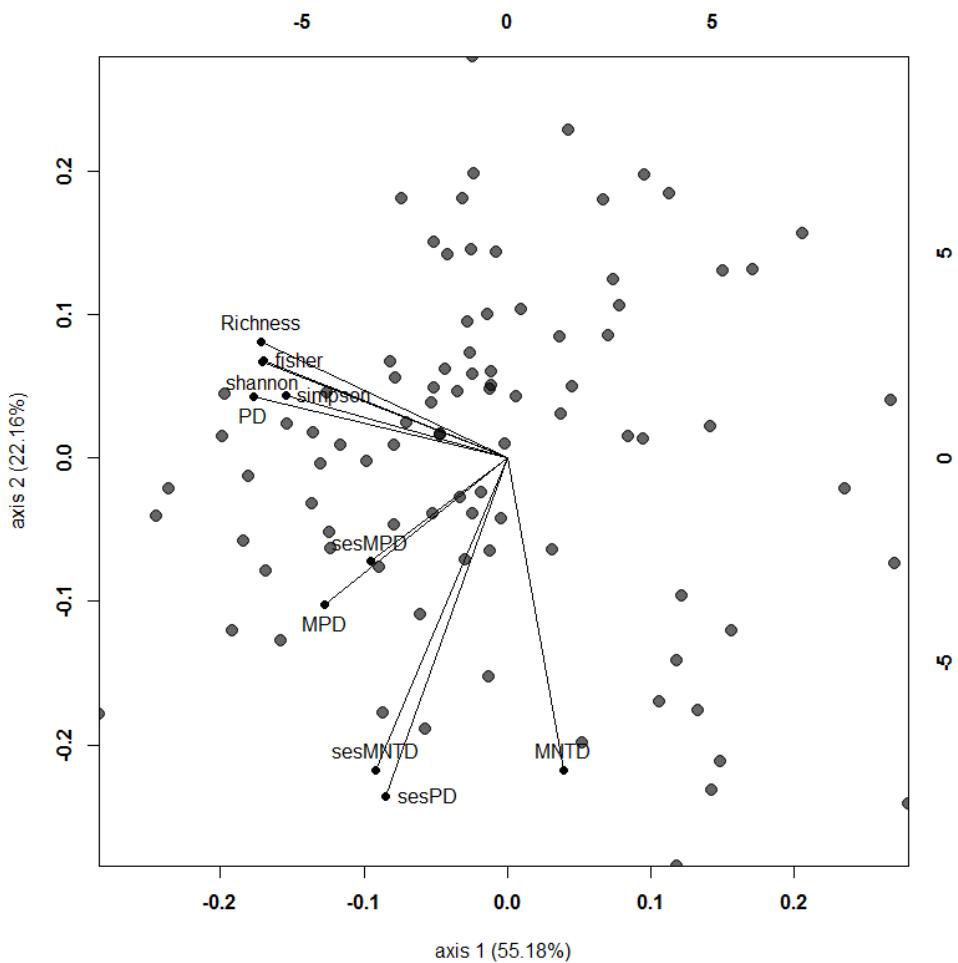
Supplementary Information Figure 11: First two axes of Principal Component Analyses (PCA) of ten diversity metrics, including four traditional measurements: Genus richness, Fisher's Alpha, Shannon and Simpson indexes, and also six phylogenetic diversity metrics: Phylogenetic diversity sensu stricto (PD), total lineage diversity (sesPD), Mean pairwise taxon distance (MPD), basal lineage diversity (sesMPD), Mean Nearest taxon distance (MNTD) and Neighbour lineage diversity (sesMNTD).

Supplementary discussion: Examining the mechanisms underlying the effect of biodiversity on wood productivity

Our results show a significant effect of both taxonomic (Simpson Index) and evolutionary diversity (Neighbour lineage diversity; sesMNTD) on wood productivity. These findings are robust even after accounting for potentially confounding environmental variables (climate and soil), functional attributes (mean wood density, potential tree size and number of stems), and spatial autocorrelation. Two different possible mechanisms have been proposed to explain such effects of biodiversity on wood productivity: the selection effect and niche complementarity. The selection effect states that the presence of particular highly productive species can modify ecosystem processes, and that these key species are more likely to be found in communities with higher species richness. The key point is that due to pure sampling, the increase in species numbers increases the probability to have particularly high-performing species in a community[23,24]. Experiments examining the effect of biodiversity on ecosystem function provide some support for the operation of selection effects. For example, across 111 experiments that manipulated species richness to investigate how diversity affects biomass, Cardinale *et al.*[25] found that on average more diverse communities tended to maximize ecosystem function. Higher biomass stocks were found in more diverse communities that were more likely to be dominated by the most productive species, providing consistent evidence for the selection effect. Alternatively, niche complementarity assumes that diverse groups of species have a greater variety of functional traits and can better utilize available resources, which increases ecosystem function[26]. Thus, in more diverse communities, species complementarity in their use of resources means that ecosystem functions such as the production of biomass are more efficient than in

less diverse communities. Variation in crown architecture among species (e.g. height, crown width and shape) has been proposed as a mechanism by which niche complementarity operates, with increased productivity due to a more efficient use of space[18,19,27,28]. These mechanisms are also likely to occur in tropical forests: species with different crown architectures distribute their branches and leaves in complementary height layers of the canopy, leading to denser and more packed canopies, which in turn allows higher light interception and may promote productivity. Complementarity could also occur due to variation in other unmeasured and evolutionary correlated traits such as above- and below-ground allocation ratios, tree height/diameter allometry, hydraulic traits, nutrient resource use or functional groups (e.g. nitrogen/non-nitrogen fixers). We explored the importance of the selection effect in this analysis in two ways - firstly, through drawing on a previously published analysis examining the potential for selection effects to lead to a positive relationship between species richness and biomass, which applied a resampling approach to a dataset that overlaps with that used in this study[29], and secondly, through exploring whether the strength of the diversity/productivity relationship that we find here alters when excluding the highest performing lineages, following Davies et al.[30].

Firstly, using an overlapping forest plot dataset from Amazonia, Sullivan et al.[29] investigated the probability that a given community includes functionally dominant species, defined on the basis of maximum size, as species richness increases. Overall, Sullivan et al.[29] found that the probability of sampling functionally dominant tree species increases with species richness and importantly saturates by the lower values of species richness that are typically found in one hectare plots[29]. For example, at a scale of one hectare, 99.7% of randomly assembled forest plots contained at least one tree species with potentially large size (i.e. defined as tree

species that can attain diameter $\geq$ 70 cm). Similar results were also found for wood density as a functional characteristic: the probability of sampling species with high wood density (wd $\geq$ 0.8 g.cm^{-3}) quickly saturates with species richness (see Sullivan *et al.*[29]; SI Figs 5 - 10). Although the thresholds for functionally dominant species with potentially large sizes (diameter $\geq$ 70 cm) and with high wood density (wd $\geq$ 0.8 g.cm^{-3}) were arbitrary, the authors showed that their results are insensitive to the threshold established: the probability of sampling high functioning species saturates at spatial scales once plots reach one hectare in size. These findings are consistent with the idea that the typical 1 ha size of forest plots used in this study, which can contain up to 300 species of trees $\geq$10 cm diameter[31], is large enough and sufficiently diverse for selection effects to saturate.

To further explore the potential role of a sampling effect as the underlying mechanism in the biodiversity-productivity relationship we report here, we followed and developed the approach of Davies *et al.*[30]. This approach allowed us to identify the importance of sampling high-performing lineages for generating the positive correlation between phylogenetic diversity and productivity. First, we fitted the regression for both taxonomic diversity (Simpson Index) and Neighbour lineage diversity against wood productivity, whilst also accounting for environmental factors, functional traits and spatial autocorrelation (i.e. as in the main analysis). We then calculated the statistical leverage (DFBETA *sensu*, Davies *et al.*[30]) of each forest plot on this relationship. Next, for each plot, we identified the branches in the phylogeny that are within the community sub-tree, and assigned to each of those branches a weight equal to their respective DFBETA (i.e. separately, for both Simpson Index and Neighbour lineage diversity). Fourthly, using data for every community we calculated a weighted average of the DFBETA values for each single branch. We

then mapped these weighted DFBETA values onto each branch of the phylogenetic tree (please see Davies *et al.*[30] for detailed methods). Finally, we investigated the extent of phylogenetic signal (PS) for the DFBETA values of terminal branches (i.e. for genera values). PS is defined as the tendency of closely related lineages to be more similar than would be expected by chance. We assessed phylogenetic signal for the DFBETAs on our phylogeny using both Blomberg's K-value[32] and Lambda[33]. Both K and Lambda values significantly greater than 0 indicate phylogenetic signal. i.e. a tendency of closely related genera to have more similar DFBETAs than expected by chance, with groups of closely related lineages contributing disproportionately to wood productivity. In contrast, non-significant *K* or Lambda values indicate absence of phylogenetic signal: there is no correlation between taxa relatedness and their contribution to overall productivity (DFBETAs values).

We found that a relatively small number of lineages contribute disproportionately to generating the positive relationship between diversity and wood productivity (Fig S12 a-b). Importantly, these few genera that contribute disproportionately with either high or low values of DFBETA values are scattered across the phylogeny (Fig S13 a-b). This pattern strongly contrasts with the pattern observed by Davies *et al.*[30] for a temperate ecosystem, where a single clade (Fabaceae) was an obvious outlier for driving the correlation between productivity and evolutionary diversity. Here, using both Bloomberg's k-value[32] and Lambda[33], we show that there is no phylogenetic signal in DFBETA values, either calculated for Simpson's Index (K= 0.2, p= 0.20; Lambda = 0.00006, p=1) or Neighbour lineage diversity (K= 0.13, p= 0.84; Lambda = 0.006, p= 0.86). This result is important because it suggests that increasing phylogenetic diversity does not increase the probability of sampling lineages that have a disproportionate effect on the relationship between evolutionary diversity and

productivity i.e. our overall finding is not due to sampling effects. This contrasts with the temperate system studied by Davies *et al.*[30] where sampling Fabaceae within a set of communities has a strong effect on detecting the relationship between evolutionary diversity and productivity.

Overall, although testing the mechanisms that underlies the biodiversity-productivity relationship remains difficult in comparative ecological studies, these two lines of evidence suggest that the positive relationship between diversity and wood productivity is not linked to a sampling effect: 1) the 1 ha scale of this study is sufficient to sample species with a broad range of ecologies in these ecosystems 2) lineages that contribute disproportionately to the relationship are scattered across the phylogeny and there is no phylogenetic signal for lineage contributions to the effects of Simpson Index or Neighbour lineage diversity on productivity.
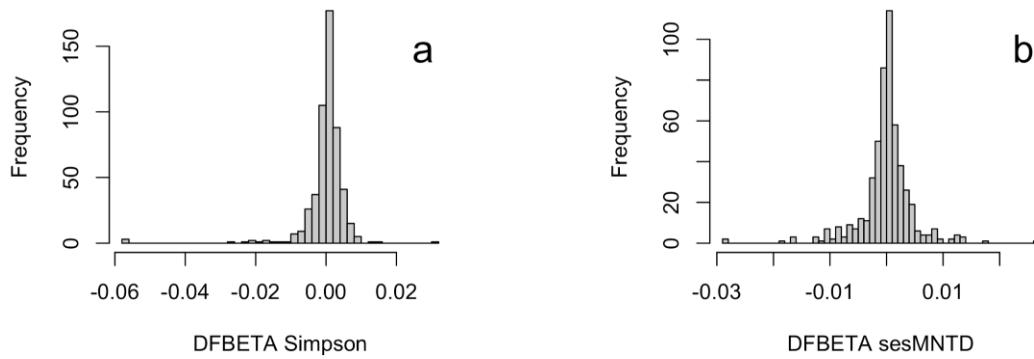
Supplementary Information Figure 12: Histogram of each phylogenetic branch contribution (mean DFBETAS) to the regression of Simpson Index and Neighbour Lineage Diversity against wood productivity, while controlling for environmental variables (climate and soil), structural attributes (wood density, potential tree size and number of stems) and spatial auto correlation. a) DFBETAS for Simpson Index and B) Neighbour Lineage Diversity (sesMNTD).
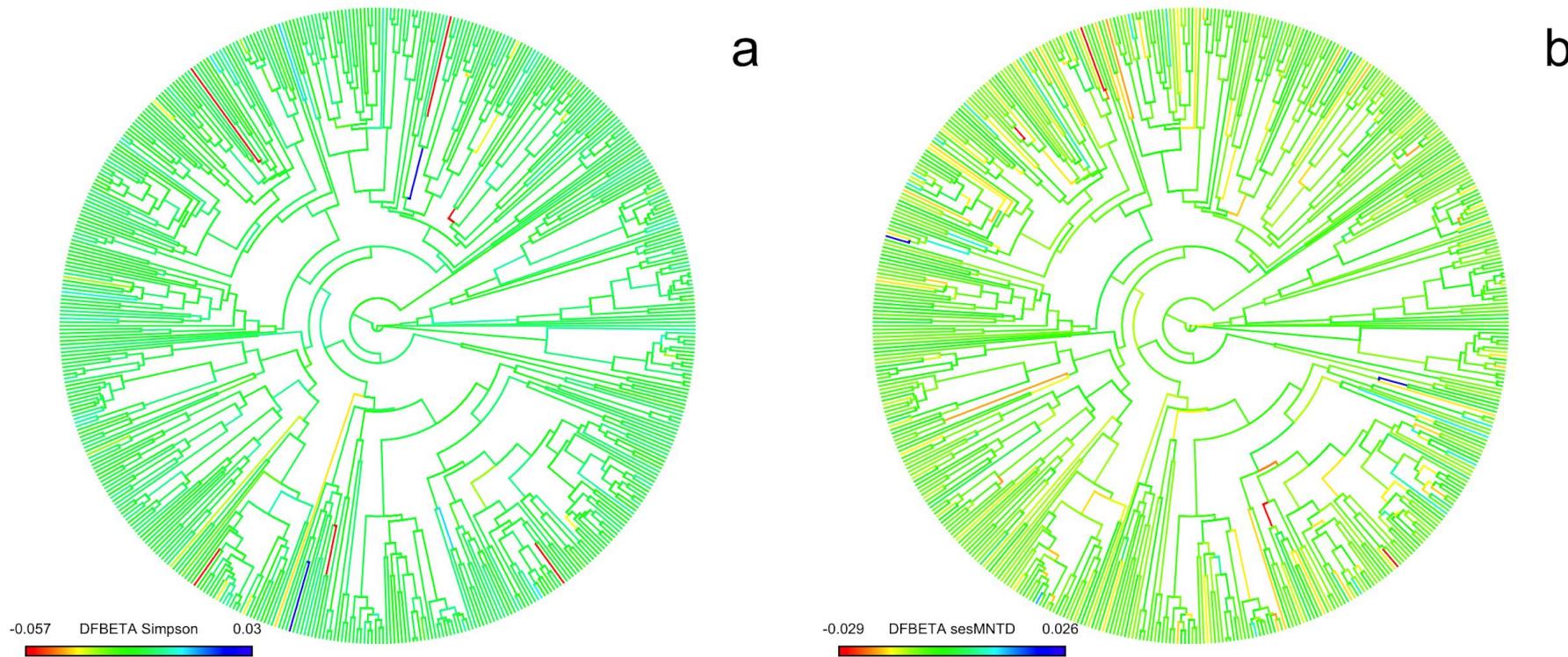
Supplementary Information Figure 13: Phylogeny (based on *rbcL* and *matK* plastid gene) of 526 Amazonian tree genera with internal and terminal branches coloured according to their contribution to wood productivity (mean DFBETAS). DFBETAS were extracted from the regression of Simpson Index and Neighbour Lineage Diversity against wood productivity, while controlling for environmental variables (climate and soil), structural attributes (wood density, potential tree size and number of stems) and spatial auto correlation. a) DFBETAS for Simpson Index and B). Neighbor Lineage Diversity (sesMNTD). Branches were coloured using a continuous colour gradient, colour codes indicate DFBETA values, from blue to red, indicating higher and lower DFBETA values respectively. Phylogenies for both Simpson Index and Neighbour lineage diversity with all tips labelled are available in the pdf Appendix 5.

Potential for forest succession to drive observed patterns

Anthropogenic disturbance or natural treefall gaps increase light availability, promote the recruitment of fast growing tree species and, hence, increase ecosystem productivity in early sucessional spots. In fact, productivity is generally greater in early successional gaps than in surrounding closed canopy. However, two factors are important to consider when thinking about whether or not forest succession does relate to the small, positive and significant effect of diversity on wood productivity. First, although recent forest gaps might gain greater amounts of biomass in comparison to nearby full-grown patches, natural gaps are an integral part of the system at a 1 ha plots scale. Small-scale tree fall gaps are part of a natural disturbance regime and all forest plots have experienced it. A key point here is the size of inventory forest plots relative to the size of gaps. While small forest plots would be more likely affected by disturbances, the typical 1 ha size forest plot used in this study is large enough to dilute the effect of gap dynamics. Our standard 1 ha inventory plots include a shifting mosaic of patches (i.e. opened gaps, areas under recovery and mature forests) that contain a mixture of both pioneer and shade tolerant species and does not bias our result.

Although across the Amazon basin there is geographical variability in the abundance of species with functional traits related to this trade-off between pioneer and shade tolerant species, and some plots are more dynamic than others[34,35], these broad scales patterns are not driven by forest succession and gap opening. For example, Western Amazon forests tend to be more dynamic, and have a greater proportion of lower wood density species, in contrast to forests of the Guiana Shield[34,36], which have greater abundance of high wood density species. As explained above, these differences are not associated with forest succession *per se*, but with different overarching forest dynamic regimes in different regions (i.e. different mortality and recruitment rates in these regions), which is due to differing underlying environmental factors.

Secondly, all forest plots were established in mature old-growth forests across Amazonia, without any apparent evidence of recent, large-scale disturbance. If forest plots studied here were undergoing succession, we would expect recovery towards species with high wood density trees. However, recent studies have shown that

there are no temporal trends in community wood density in RAINFOR plots, supporting that these forests are not under a cryptic, late successional process[37,38].

Supplementary Information Table 7: List of all plots included in this analysis with geographic coordinates, plot size, start and end dates, and the main researchers for each plot.

Plot Code	Country	Latitude	Longitude	Initial Census Date	Final Census Date	Data contributors
AGP-01	COLOMBIA	-3.7	-70.3	1992.2	2011.9	Alvaro Cogollo Pacheco, Eliana Jimenez-Rojas, Adriana Prieto, Agustín Rudas, Oliver Phillips, Jon Lloyd, Adriana Prieto
AGP-02	COLOMBIA	-3.7	-70.3	1991.9	2011.9	Alvaro Cogollo Pacheco, Eliana Jimenez-Rojas, Adriana Prieto, Agustín Rudas, Oliver Phillips, Jon Lloyd, Adriana Prieto
ALF-01	BRAZIL	-9.6	-55.9	2002.4	2013.4	Denise Sasaki, Beatriz Marimon, Ted Feldpausch, Carlos Quesada, Ricardo Keichi Umetsu, Ben Hur Marimon Junior, Beatriz Marimon, Jon Lloyd, Oliver Phillips
ALF-02	BRAZIL	-9.6	-55.9	2008.4	2013.4	Denise Sasaki, Beatriz Marimon, Ricardo Keichi Umetsu, Ben Hur Marimon Junior, Ted Feldpausch, Oliver Phillips, Jon Lloyd
ALP-01	PERU	-3.9	-73.4	1990.9	2011.2	Timothy Baker, Javier Silva Espejo, Roel Brienen, Abel Monteagudo-Mendoza, Rodolfo Vasquez Martinez, Oliver Phillips, Yadvinder Malhi
ALP-02	PERU	-4	-73.4	1990.9	2011.2	Abel Monteagudo-Mendoza, Isau Huamantupa-Chuquimaco, Timothy Baker, Roel Brienen, Rodolfo Vasquez Martinez, Oliver Phillips
ALP-30	PERU	-4	-73.4	2001.3	2011.2	Isau Huamantupa-Chuquimaco, Timothy Baker, Javier Silva Espejo, Roel Brienen, Abel Monteagudo-Mendoza, Oliver Phillips, Rodolfo Vasquez Martinez, Yadvinder Malhi
BDF-03	BRAZIL	-2.4	-59.9	1981.1	2009.3	Ana Andrade, Susan Laurance, José Luís C. Camargo, William Laurance, Thomas Lovejoy , Oliver Phillips
BDF-09	BRAZIL	-2.4	-59.8	1987.0	2007.0	Ana Andrade, Susan Laurance, José Luís C. Camargo, William Laurance, Thomas Lovejoy, Oliver Phillips
BDF-13	BRAZIL	-2.4	-59.9	1985.9	2009.9	Ana Andrade, Susan Laurance, José Luís C. Camargo, William Laurance, Thomas Lovejoy, Oliver Phillips
BNT-01	BRAZIL	-2.6	-60.2	1986.5	2012.5	Niro Higuchi, Ted Feldpausch
BNT-02	BRAZIL	-2.6	-60.2	1986.5	2012.5	Niro Higuchi, Ted Feldpausch
BNT-04	BRAZIL	-2.6	-60.2	1986.5	2011.5	Niro Higuchi, Ted Feldpausch
BOG-01	ECUADOR	-0.7	-76.5	1995.7	2011.5	Timothy Baker, Abel Monteagudo-Mendoza, Roel Brienen, Nigel Pitman, David Neill, Tony Di Fiore, Jon Lloyd, Oliver Phillips

Plot Code	Country	Latitude	Longitude	Initial Census Date	Final Census Date	Data contributors
BOG-02	ECUADOR	-0.7	-76.5	1995.4	2011.5	Abel Monteagudo-Mendoza, Timothy Baker, Roel Brienen, Nigel Pitman, David Neill, Jon Lloyd, Oliver Phillips
CAX-01	BRAZIL	-1.7	-51.5	1994.5	2010.0	Antonio S. Lima, Samuel Almeida, Oliver Phillips, Timothy Baker, Oliver Phillips, Yadvinder Malhi
CAX-02	BRAZIL	-1.7	-51.5	1995.5	2010.0	Antonio S. Lima, Samuel Almeida, Oliver Phillips, Timothy Baker, Oliver Phillips, Yadvinder Malhi
CAX-06	BRAZIL	-1.7	-51.5	2004.6	2010.0	Antonio S. Lima, Everton Almeida, Luiz Aragão, Samuel Almeida, Lola da Costa, Oliver Phillips, Yadvinder Malh
CPP-01	BRAZIL	-1.8	-47.1	1997.5	2000.5	Ima Cellia Guimaraes Vieira, Oliver Phillips
CUZ-01	PERU	-12.5	-69.1	1989.4	2014.7	Timothy Baker, Abel Monteagudo-Mendoza, Joey Talbot, Oliver Phillips, Rodolfo Vasquez Martinez, Percy Nuñez Vargas, Alwyn Gentry
CUZ-02	PERU	-12.5	-69.1	1989.4	2014.7	Timothy Baker, Abel Monteagudo-Mendoza, Joey Talbot, Rodolfo Vasquez Martinez, Percy Nuñez Vargas, Oliver Phillips, Alwyn Gentry
CUZ-03	PERU	-12.5	-69.1	1989.4	2014.7	Percy Nuñez Vargas, Timothy Baker, Abel Monteagudo-Mendoza, Joey Talbot, Oliver Phillips, Rodolfo Vasquez Martinez, Alwyn Gentry
CUZ-04	PERU	-12.5	-69.1	1989.4	2014.7	Timothy Baker, Abel Monteagudo-Mendoza, Oliver Phillips, Rodolfo Vasquez Martinez, Percy Nuñez Vargas, Alwyn Gentry
DOI-01	BRAZIL	-10.6	-68.3	1991.3	2011.5	Timothy Baker, Ted Feldpausch, Wendeson Castro, Marcos Silveira, Jon Lloyd, Oliver Phillips
DOI-02	BRAZIL	-10.5	-68.3	1999.4	2011.5	Ted Feldpausch, Timothy Baker, Wendeson Castro, Marcos Silveira, Oliver Phillips, Jon Lloyd
FEC-01	BRAZIL	-10.1	-67.6	2000.9	2011.5	Alejandro Araujo-Murakami, Wendeson Castro, Ted Feldpausch, Foster Brown, Plinio B. Camargo, Simone A. Vieira, Marcos Silveira, Oliver Phillips
FMH-01	GUYANA	5.2	-58.7	1993.8	2012.2	Abel Monteagudo-Mendoza, Ted Feldpausch, Hans ter Steege, Eric Arets, Bert van Ulft, Olaf Banki, Roderick Zagt, James Singh, Roel Brienen, Oliver Phillips
FMH-02	GUYANA	5.2	-58.7	1993.8	2012.2	Abel Monteagudo-Mendoza, Ted Feldpausch, Roel Brienen, Roderick Zagt, Hans ter Steege, James Singh, Oliver Phillips
IWO-22	GUYANA	4.6	-58.7	2002.9	2012.2	Abel Monteagudo-Mendoza, Olaf Banki, Roel Brienen, Sara Price, Raquel Thomas, Oliver Phillips, Roel Brienen

Plot Code	Country	Latitude	Longitude	Initial Census Date	Final Census Date	Data contributors
JAC-01	BRAZIL	-2.6	-60.2	1996.5	2011.5	Adriano Nogueira Lima, Niro Higuchi, Ted Feldpausch
JAC-02	BRAZIL	-2.6	-60.2	1996.5	2011.5	Adriano Nogueira Lima, Niro Higuchi, Ted Feldpausch
JAS-02	ECUADOR	-1.1	-77.6	1987.6	2011.5	Abel Monteagudo-Mendoza, Timothy Baker, Roel Brienen, David Neill, Jon Lloyd, Oliver Phillips
JAS-03	ECUADOR	-1.1	-77.6	1988.9	2011.5	Abel Monteagudo-Mendoza, Timothy Baker, Roel Brienen, David Neill, Jon Lloyd, Oliver Phillips
JAS-04	ECUADOR	-1.1	-77.6	1994.4	2011.5	Abel Monteagudo-Mendoza, Roel Brienen, Timothy Baker, David Neill, Jon Lloyd, Oliver Phillips
JEN-11	PERU	-4.9	-73.6	2005.2	2014.9	Abel Monteagudo-Mendoza, José Reyna Huaymacari, Roel Brienen, Jhon del Aguila Pasquel, Eurídice Honorio Coronado, Timothy Baker, Oliver Phillips
JEN-13	PERU	-4.9	-73.5	2007.3	2015.2	Abel Monteagudo-Mendoza, Ximena Tagle Casapia, Roel Brienen, Jhon del Aguila Pasquel, Timothy Baker, Oliver Phillips, Eurídice Honorio Coronado
JRI-01	BRAZIL	-0.9	-52.2	1985.5	1996.5	Natalino Silva, Oliver Phillips
LFB-01	BOLIVIA	-14.6	-60.8	1993.6	2013.5	Edgar Guzman, Abel Monteagudo-Mendoza, Laura Jessica Viscarra, Gloria Gutierrez, Rebeca Sibler, Mario Saldias, Victor Rojas, Ted Feldpausch, Alejandro Araujo-Murakami, Roel Brienen, Timothy Killeen, Luzmila Arroyo, Oliver Phillips, Jon Lloyd
LFB-02	BOLIVIA	-14.6	-60.8	1993.6	2013.5	Abel Monteagudo-Mendoza, Victor Rojas, Gloria Gutierrez, Rebeca Sibler, Laura Jessica Viscarra, Ted Feldpausch, Roel Brienen, Alejandro Araujo-Murakami, Timothy Killeen, Luzmila Arroyo, Oliver Phillips, Jon Lloyd
LOR-01	COLOMBIA	-3.1	-70	1992.5	2011.9	Esteban Álvarez Dávila, Sandra Patiño, Agustín Rudas, Adriana Prieto, Jon Lloyd, Oliver Phillips
MIN-01	BRAZIL	-8.6	-72.9	1996.5	2011.4	Ted Feldpausch, Marcos Silveira, Oliver Phillips
MNU-03	PERU	-11.9	-71.4	1991.7	2012.6	Abel Monteagudo-Mendoza, Adolfo Julian Kapeshi, Roel Brienen, Fernando Cornejo Valverde, John Terborgh, Percy Nuñez Vargas, Oliver Phillips, John Terborgh, Roel Brienen
MNU-04	PERU	-11.9	-71.4	1991.7	2012.6	Abel Monteagudo-Mendoza, John Terborgh, Percy Nuñez Vargas, Fernando Cornejo Valverde, Oliver Phillips, Roel Brienen
MNU-05	PERU	-11.9	-71.4	1989.8	2012.6	Abel Monteagudo-Mendoza, Fernando Cornejo Valverde, Roel Brienen, John Terborgh, Percy Nuñez Vargas, Oliver Phillips

Plot Code	Country	Latitude	Longitude	Initial Census Date	Final Census Date	Data contributors
MNU-06	PERU	-11.9	-71.4	1989.8	2012.6	Abel Monteagudo-Mendoza, Roel Brienen, Fernando Cornejo Valverde, John Terborgh, Percy Nuñez Vargas, Oliver Phillips
MTH-01	BRAZIL	-8.9	-72.8	1996.4	2011.4	Ted Feldpausch, Timothy Baker, Marcos Silveira, Oliver Phillips, Jon Lloyd
NOU-02	FRENCH GUIANA	4.1	-52.7	1994.9	2012.9	Bernard Riera, Christopher Baraloto, Julien Engel, Pascal Petronelli, Desmo Betian, Abel Monteagudo-Mendoza, Maxime Réjou-Méchain, Jean Olivier, Ted Feldpausch, Lilian Blanc, Sophie Fauset, Desmo Betian, Wemo Betian, Pierre Charles-Dominique, Jérôme Chave, Oliver Phillips
NOU-06	FRENCH GUIANA	4.1	-52.7	1992.8	2012.9	Desmo Betian, Bernard Riera, Christopher Baraloto, Pascal Petronelli, Julien Engel, Wemo Betian, Jean Olivier, Ted Feldpausch, Lilian Blanc, Abel Monteagudo-Mendoza, Sophie Fauset, Maxime Réjou-Méchain, Desmo Betian, Jérôme Chave, Oliver Phillips, Pierre Charles-Dominique
NOU-12	FRENCH GUIANA	4.1	-52.7	1992.6	2012.9	Pascal Petronelli, Julien Engel, Christopher Baraloto, Desmo Betian, Peter van de Meer, Wemo Betian, Ted Feldpausch, Lilian Blanc, Abel Monteagudo-Mendoza, Maxime Réjou-Méchain, Sophie Fauset, Michel Baisie, Pétrus Naisso, Vincent Bezard, Jérôme Chave, Desmo Betian, Frans Bongers, Oliver Phillips
NOU-17	FRENCH GUIANA	4.1	-52.7	1992.5	2012.9	Julien Engel, Christopher Baraloto, Pascal Petronelli, Desmo Betian, Lilian Blanc, Abel Monteagudo-Mendoza, Wemo Betian, Ted Feldpausch, Michel Baisie, Vincent Bezard, Sophie Fauset, Maxime Réjou-Méchain, Peter van de Meer, Pétrus Naisso, Jérôme Chave, Oliver Phillips, Frans Bongers
NOU-21	FRENCH GUIANA	4.1	-52.7	1992.6	2012.9	Christopher Baraloto, Julien Engel, Pascal Petronelli, Desmo Betian, Lilian Blanc, Abel Monteagudo-Mendoza, Peter van de Meer, Wemo Betian, Pétrus Naisso, Vincent Bezard, Sophie Fauset, Jérôme Chave, Ted Feldpausch, Michel Baisie, Maxime Réjou-Méchain, Oliver Phillips, Jérôme Chave, Frans Bongers
PNY-03	PERU	-10.3	-75.3	2004.8	2011.8	Abel Monteagudo-Mendoza, Rodolfo Vasquez Martinez, Oliver Phillips
PNY-04	PERU	-10.3	-75.3	2007.5	2011.8	Rodolfo Vasquez Martinez, Abel Monteagudo-Mendoza, Oliver Phillips
PNY-05	PERU	-10.4	-75.2	2008.2	2011.8	Abel Monteagudo-Mendoza, Rodolfo Vasquez Martinez, Oliver Phillips
PNY-06	PERU	-10.4	-75.3	2008.2	2011.8	Nadir Pallqui Camacho, Abel Monteagudo-Mendoza, Rodolfo Vasquez Martinez, Oliver Phillips
PNY-07	PERU	-10.3	-75.3	2008.2	2011.8	Abel Monteagudo-Mendoza, Rodolfo Vasquez Martinez, Oliver Phillips

Plot Code	Country	Latitude	Longitude	Initial Census Date	Final Census Date	Data contributors
POR-01	BRAZIL	-10.8	-68.8	1991.4	2011.4	Timothy Baker, Carlos Quesada, Ted Feldpausch, Juliana Stropp, Wendeson Castro, Marcos Silveira, Jon Lloyd, Oliver Phillips
POR-02	BRAZIL	-10.8	-68.8	1991.4	2011.5	Alejandro Araujo-Murakami, Timothy Baker, Wendeson Castro, Ted Feldpausch, Marcos Silveira, Jon Lloyd, OliverPhillips
RFH-01	BRAZIL	-9.8	-67.7	2004.3	2011.5	Ted Feldpausch, Marcos Silveira, Foster Brown, Oliver Phillips, Jon Lloyd
RST-01	BRAZIL	-9	-72.3	1995.4	2011.4	Ted Feldpausch, Marcos Silveira, Timothy Baker, Jorcely Barroso, Oliver Phillips
SCR-05	VENEZUELA	1.9	-67	1975.6	2012.1	Gerardo A. Aymard C., Pedro Maquirino, Franklin Molina, Timothy Baker, Sandra Patiño, Jon Lloyd, Oliver Phillips
SCT-01	BOLIVIA	-17.1	-64.8	2001.8	2011.7	Alexander Parada Gutierrez, Roel Brienen, Casimiro Mendoza, Luzmila Arroyo, Oliver Phillips
SUC-01	PERU	-3.3	-72.9	1992.1	2015.5	Ximena Tagle Casapia, Gabriel Hidalgo Pizango,Timothy Baker, Nallaret Davila Cardozo, Abel Monteagudo-Mendoza, Roel Brienen, Jhon del Aguila Pasquel, Freddy Ramirez Arevalo, John Pipoly, Rodolfo Vasquez Martinez, Oliver Phillips, Eurídice Honorio Coronado
SUC-02	PERU	-3.2	-72.9	1992.1	2015.5	Ximena Tagle Casapia, Gabriel Hidalgo Pizango, Roel Brienen, Freddy Ramirez Arevalo, Jhon del Aguila Pasquel, Abel Monteagudo-Mendoza, Nallaret Davila Cardozo, Timothy Baker, Rodolfo Vasquez Martinez, Oliver Phillips, Eurídice Honorio Coronado, John Pipoly
SUC-04	PERU	-3.3	-72.9	2001.2	2015.5	Gabriel Hidalgo Pizango, Ximena Tagle Casapia, Nallaret Davila Cardozo, Jhon del Aguila Pasquel, Abel Monteagudo-Mendoza, Timothy Baker, Roel Brienen, Oliver Phillips, Rodolfo Vasquez Martinez, Eurídice Honorio Coronado
SUC-05	PERU	-3.3	-72.9	2001.1	2015.5	Ximena Tagle Casapia, Gabriel Hidalgo Pizango, Abel Monteagudo-Mendoza, Nallaret Davila Cardozo, Jhon del Aguila Pasquel, Roel Brienen,Timothy Baker, Oliver Phillips, Rodolfo Vasquez Martinez, Eurídice Honorio Coronado
TAM-01	PERU	-12.8	-69.3	1983.8	2014.7	Percy Nuñez Vargas, Barbara Vicenti, Timothy Baker, Ted Feldpausch, Abel Monteagudo-Mendoza, Joey Talbot, Oliver Phillips, Rodolfo Vasquez Martinez, Alwyn Gentry, Terry Erwin

Plot Code	Country	Latitude	Longitude	Initial Census Date	Final Census Date	Data contributors
TAM-02	PERU	-12.8	-69.3	1979.9	2014.7	Percy Nuñez Vargas, Timothy Baker, Ted Feldpausch, Abel Monteagudo-Mendoza, Joey Talbot, Alwyn Gentry, Rodolfo Vasquez Martinez, Oliver Phillips, Terry Erwin, G. Hartshorn, E. Armas
TAM-05	PERU	-12.8	-69.3	1983.7	2014.7	Victor Chama Moscoso, Barbara Vicenti, Timothy Baker, Javier Silva Espejo, Joey Talbot, Oliver Phillips, Rodolfo Vasquez Martinez, Abel Monteagudo-Mendoza, Alwyn Gentry, Yadvinder Malhi
TAM-06	PERU	-12.8	-69.3	1983.7	2014.7	Victor Chama Moscoso, Gabriela Lopez-Gonzalez, Abel Monteagudo-Mendoza, Timothy Baker, Barbara Vicenti, Javier Silva Espejo, Joey Talbot, Alwyn Gentry, Oliver Phillips, Rodolfo Vasquez Martinez, Terry Erwin, Yadvinder Malhi
TAM-07	PERU	-12.8	-69.3	1983.8	2011.6	Timothy Baker, Abel Monteagudo-Mendoza, Ted Feldpausch, Alwyn Gentry, Rodolfo Vasquez Martinez, Terry Erwin, Oliver Phillips
TAM-09	PERU	-12.8	-69.3	2010.7	2014.7	Victor Chama Moscoso, Javier Silva Espejo, Walter Huaraca Huasco, Abel Monteagudo-Mendoza, Oliver Phillips, Yadvinder Malhi
TEC-01	BRAZIL	-1.7	-51.5	2002.9	2012.8	Filomeno Amaral, Almir Gomes, Renato Frazo, Simon Lewis, Timothy Baker, Samuel Almeida, Maria Aparecida Freitas, Oliver Phillips
TEC-02	BRAZIL	-1.7	-51.5	2003.2	2012.8	Filomeno Amaral, Renato Frazo, Almir Gomes, Maria Aparecida Freitas, Samuel Almeida, Oliver Phillips
TEC-03	BRAZIL	-1.7	-51.5	2003.2	2012.8	Filomeno Amaral, Almir Gomes, Renato Frazo, Maria Aparecida Freitas, Samuel Almeida
TEC-04	BRAZIL	-1.8	-51.5	2003.3	2012.8	Filomeno Amaral, Samuel Almeida, Renato Frazo, Almir Gomes, Samuel Almeida, Maria Aparecida Freitas, Oliver Phillips
TEC-05	BRAZIL	-1.8	-51.6	2003.5	2012.8	Filomeno Amaral, Almir Gomes, Renato Frazo, Samuel Almeida, Maria Aparecida Freitas, Oliver Phillips
TEC-06	BRAZIL	-1.7	-51.4	2003.3	2012.8	Filomeno Amaral, Renato Frazo, Almir Gomes, Samuel Almeida, Maria Aparecida Freitas, Oliver Phillips
TEM-03	BRAZIL	-2.4	-59.9	2003.9	2011.6	Iêda Leão do Amaral, Atila Alves de Oliveira, Oliver Phillips
TEM-04	BRAZIL	-2.4	-59.8	2003.9	2011.7	Iêda Leão do Amaral, Atila Alves de Oliveira, Oliver Phillips
TEM-05	BRAZIL	-2.6	-60.2	2004.0	2011.7	Iêda Leão do Amaral, Atila Alves de Oliveira, Oliver Phillips

Plot Code	Country	Latitude	Longitude	Initial Census Date	Final Census Date	Data contributors
YAN-01	PERU	-3.4	-72.8	1983.4	2015.5	Ximena Tagle Casapia, Gabriel Hidalgo Pizango, Roel Brienen, Timothy Baker, Abel Monteagudo-Mendoza, Jhon del Aguila Pasquel, Alwyn Gentry, Rodolfo Vasquez Martinez, Oliver Phillips, Eurídice Honorio Coronado
YAN-02	PERU	-3.4	-72.8	2001.1	2015.5	Ximena Tagle Casapia, Gabriel Hidalgo Pizango, Timothy Baker, Jhon del Aguila Pasquel, Roel Brienen, Abel Monteagudo-Mendoza, Rodolfo Vasquez Martinez, Eurídice Honorio Coronado, Oliver Phillips
ZAR-02	COLOMBIA	-4	-69.9	2004.9	2009.8	Eliana Jimenez-Rojas, Esteban Álvarez Dávila, Maria Cristina Peñuela Mora, Jon Lloyd, Oliver Phillips
ZAR-03	COLOMBIA	-4	-69.9	2004.9	2009.8	Eliana Jimenez-Rojas, Maria Cristina Peñuela Mora, Jon Lloyd, Esteban Álvarez Dávila, Oliver Phillips
ZAR-04	COLOMBIA	-4	-69.9	2005.1	2009.8	Eliana Jimenez-Rojas, Maria Cristina Peñuela Mora, Esteban Álvarez Dávila, Jon Lloyd, Oliver Phillips
PIB-05	GUYANA	5	-58.6	2006.3	2012.2	Abel Monteagudo-Mendoza, Olaf Banki, Carey Bhodejat, Jamile Haarlo, Davendra Kanoo, Antonio Pena Cruz, Hansrajie Sukhdeo, Hans ter Steeg, Roel Brienen, Oliver Phillips
PIB-06	GUYANA	5	-58.6	2006.3	2012.2	Abel Monteagudo-Mendoza, Olaf Banki, Carey Bhodejat, Jamile Haarlo, Davendra Kanoo, Antonio Pena Cruz, Hansrajie Sukhdeo, Hans ter Steeg, Roel Brienen, Oliver Phillips
PIB-12	GUYANA	5	-58.6	2006.3	2012.2	Abel Monteagudo-Mendoza, Olaf Banki, Carey Bhodejat, Jamile Haarlo, Davendra Kanoo, Antonio Pena Cruz, Hansrajie Sukhdeo, Hans ter Steeg, Roel Brienen, Oliver Phillips
TAP-00	BRAZIL	-3.3	-54.9	1983.5	1995.5	Natalino Silva

Supplementary Information Table 8: List of all 1125 genera present in the phylogeny with their respective Genbank Accession numbers and sequence source for rbcL and matK sequences where applicable.

Genus	rbcl	source rbcl	matk	source matk
Abarema	12-0027154	RBG	GQ981925	Genbank
Abatia	AF206726	Genbank	EF135498	Genbank
Abuta	JQ626102	Genbank	JQ626504	Genbank
Abutilon	12-0028266	RBG	120028266	RBG
Acaciella	-	-	HM020733	Genbank
Acalypha	12-0028252	RBG	120028252	RBG
Acanthocladus	AM234190	Genbank	-	-
Acanthosyris	DQ329172	Genbank	DQ329183	Genbank
Acca	150038523	RBG	150038523	RBG
Achatocarpus	12-0028245	RBG	120028245	RBG
Achyrocline	13-0032564	RBG	130032564	RBG
Acidoton	AB267913	Genbank	AB268017	Genbank
Acioa	GQ424473	Genbank	-	-
Acmanthera	AF344454	Genbank	AF344524	Genbank
Acnistus	12-0028239	RBG	120028239	RBG
Acosmium	12-0027096	RBG	120027096	RBG
Acrocomia	AM110212	Genbank	AM114639	Genbank
Actinostemon	AB233883	Genbank	AB233779	Genbank
Adelia	12-0029848	RBG	120029848	RBG
Adelobotrys	AF215530	Genbank	-	-
Adenarake	KF263345	Genbank	KF263231	Genbank
Adenaria	12-0028257	RBG	120028257	RBG
Adenocalymma	13-0032567	RBG	130032567	RBG
Adenophaedra	AY794930	Genbank	-	-
Adesmia	U74254	Genbank	AF142690	Genbank
Adiscanthus	-	-	140037125	RBG
Aegiphila	GQ981656	Genbank	GQ981928	Genbank
Aeschynomene	AB045784	Genbank	AF272086	Genbank
Agarista	12-0029835	RBG	120029835	RBG
Ageratina	KJ841084	Genbank	KJ840849	Genbank
Agonandra	JQ625908	Genbank	JQ626377	Genbank
Aiouea	JQ625982	Genbank	AJ247143	Genbank
Aiphanes	AJ404831	Genbank	AM114641	Genbank
Albizia	12-0027155	RBG	120027155	RBG
Alchornea	HM446755	Genbank	HM641813	Genbank
Alchorneopsis	AY794962	Genbank	HM446655	Genbank
Aldina	U74252	Genbank	-	-
Alexa	JQ625719	Genbank	JQ626338	Genbank
Alibertia	Z68843	Genbank	GQ981930	Genbank
Allamanda	DQ660626	Genbank	DQ660495	Genbank
Allantoma	AF077657	Genbank	140037120	RBG
Allophylus	JQ626023	Genbank	EU720665	Genbank
Alnus	FJ844584	Genbank	FJ011815	Genbank
Aloysia	12-0028259	RBG	120028259	RBG
Alseis	Y18709	Genbank	FJ905331	Genbank
Alvaradoa	AF123277	Genbank	-	-
Alzatea	AVU26316	Genbank	AY151567	Genbank
Amaioua	JQ626322	Genbank	GQ981931	Genbank
Amanoa	AY663562	Genbank	AY830258	Genbank
Ambelania	DQ660628	Genbank	DQ660497	Genbank

Genus	rbcl	source rbcl	matk	source matk
Amburana	12-0027097	RBG	AY553712	Genbank
Amicia	-	-	AF203583	Genbank
Amomyrtella	-	-	150038108	RBG
Ampelocera	12-0029820	RBG	12-0029820	RBG
Ampelozizyphus	AJ390037.1	Genbank	-	-
Amphiodon	JQ625776	Genbank	-	-
Amphirrhox	AB354404	Genbank	AB354476	Genbank
Amyris	KJ082118	Genbank	KJ012461	Genbank
Anacardium	JQ626226	Genbank	GQ981932	Genbank
Anadenanthera	12-0027156	RBG	EU812064	Genbank
Anartia	JQ626134	Genbank	-	-
Anaueria	PER001	-	120029645	RBG
Anaxagorea	AY743439	Genbank	AY743477	Genbank
Andira	12-0027098	RBG	120027098	RBG
Angostura	JQ593927	Genbank	JQ589080	Genbank
Aniba	JQ626084	Genbank	JQ626487	Genbank
Anisocapparis	-	-	140037075	RBG
Anisophyllea	AY973480	Genbank	AY973459	Genbank
Annona	JQ625732	Genbank	JQ626342	Genbank
Anomalocalyx	-	-	140037126	RBG
Anthodiscus	FJ670162	Genbank	FJ670000	Genbank
Anthodon	-	-	HM230160	Genbank
Antonia	JQ625999	Genbank	150038109	RBG
Antrocaryon	-	-	AY594460	Genbank
Aparisthmium	AY794955	Genbank	GQ981929	Genbank
Apeiba	JQ625941	Genbank	JQ626394	Genbank
Aphandra	AJ404837	Genbank	AM114612	Genbank
Aphelandra	L01884	Genbank	GQ981937	Genbank
Aptandra	DQ790141	Genbank	DQ790178	Genbank
Apterokarpos	13-0032561	RBG	130032561	RBG
Apuleia	U74249	Genbank	EU361858	Genbank
Apurimacia	12-0027169	RBG	120027169	RBG
Arachnothryx	JQ594657	Genbank	JQ589669	Genbank
Aralia	12-0029800	RBG	120029800	RBG
Arapatiella	AY904376	Genbank	EU361859	Genbank
Archontophoenix	AJ404806	Genbank	AM114660	Genbank
Archytaea	AY380342	Genbank	HQ331545	Genbank
Ardisia	-	-	GU134982	Genbank
Armatocereus	-	-	HM041650	Genbank
Arnaldoa	EU841098	Genbank	EU841316	Genbank
Arrabidaea	AF102641	Genbank	130032568	RBG
Arrojadoa	13-0032574	RBG	130032574	RBG
Aspidosperma	JQ626066	Genbank	JQ626476	Genbank
Asteranthos	Z80198	Genbank	-	-
Astrocaryum	JQ626256	Genbank	JF758213	Genbank
Astrocasia	AY663569	Genbank	AY830261	Genbank
Astronium	12-0028223	RBG	120028223	RBG
Atamisquea	-	-	140037076	RBG
Ateleia	12-0027099	RBG	GU220020	Genbank
Athyana	-	-	140037087	RBG
Attalea	GQ981675	Genbank	GQ981943	Genbank
Aureliana	-	-	EF537319	Genbank
Averrhoidium	-	-	150038110	RBG
Avicennia	AY008830	Genbank	AF531771	Genbank
Ayenia	-	-	130032602	RBG
Azara	AJ418820	Genbank	-	-

Genus	rbcl	source rbcl	matk	source matk
Baccharis	12-0028268	RBG	120028268	RBG
Bactris	AM110214	Genbank	AM114642	Genbank
Bagassa	JQ625997	Genbank	JQ626434	Genbank
Balfourodendron	-	-	FJ716747	Genbank
Balizia	-	-	140035558	RBG
Banara	12-0028307	RBG	120028307	RBG
Banisteriopsis	HQ247439	Genbank	HQ247199	Genbank
Barnadesia	12-0028293	RBG	120028293	RBG
Barnebya	AJ402924	Genbank	AF344531	Genbank
Barnebydendron	-	-	EU361868	Genbank
Bastardiopsis	KJ082134	Genbank	KJ012469	Genbank
Batesia	AY904375	Genbank	-	-
Bathysa	AM117206	Genbank	FJ905336	Genbank
Batocarpus	12-0029793	RBG	120029793	RBG
Bauhinia	12-0027176	RBG	120027176	RBG
Begonia	-	-	130034056	RBG
Behuria	JQ899085	Genbank	-	-
Beilschmiedia	-	-	EU153825	Genbank
Bejaria	GU176639	Genbank	AF440412	Genbank
Belencita	-	-	EU371746	Genbank
Bellucia	EU711385	Genbank	-	-
Berberis	AF139878	Genbank	AB069827	Genbank
Bernardia	12-0029849	RBG	120029849	RBG
Bertholletia	Z80178	Genbank	-	-
Bertiera	AJ224845	Genbank	HM119515	Genbank
Bixa	Y15139	Genbank	FM179929	Genbank
Blakea	EU711386	Genbank	-	-
Blanchetiodendron	13-00322580	RBG	130032580	RBG
Blastemanthus	KF263343	Genbank	KF263229	Genbank
Blepharandra	AF344461	Genbank	AF344532	Genbank
Blepharocalyx	-	-	AY521531	Genbank
Bocageopsis	PER007	-	120029647	RBG
Bocconia	-	-	130034073	RBG
Bocoa	JQ626179	Genbank	JQ626415	Genbank
Boehmeria	12-0029802	RBG	120029802	RBG
Bombax	AF022118	Genbank	AY321171	Genbank
Bonellia	12-0029856	RBG	120029856	RBG
Bonnetia	HQ332012	Genbank	HQ331549	Genbank
Bonyunia	AJ235818	Genbank	-	-
Borojoa	AJ286694	Genbank	GQ981946	Genbank
Bothriospora	-	-	FJ905339	Genbank
Botryarrhena	PER008	Genbank	120029648	RBG
Bougainvillea	12-0028246	RBG	120028246	RBG
Bourreria	AF258345	Genbank	DQ197229	Genbank
Bowdichia	12-0027101	RBG	AY386937	Genbank
Brachyotum	-	-	140037082	RBG
Brasiliocroton	AY794907	Genbank	-	-
Brasiliopuntia	AY875234	Genbank	AY875370	Genbank
Bredemeyera	EU644699	Genbank	EU596520	Genbank
Brodriguesia	130032581	RBG	EU361890	Genbank
Brosimum	JQ625739	Genbank	JQ626346	Genbank
Brownea	Z70159	Genbank	EU361891	Genbank
Browneopsis	AM234233	Genbank	EU361894	Genbank
Browningia	12-0028248	RBG	120028248	RBG
Brugmansia	HM849829	Genbank	HM851090	Genbank
Brunellia	FJ707536	Genbank	EF135512	Genbank

Genus	rbcl	source rbcl	matk	source matk
Brunfelsia	HM446761	Genbank	HM446659	Genbank
Buchenavia	FJ381805	Genbank	HM446660	Genbank
Buddleja	AJ001758	Genbank	AJ429346	Genbank
Bulnesia	EU002275	Genbank	EU002172	Genbank
Bunchosia	HQ247454	Genbank	HQ247225	Genbank
Burdachia	AF344462	Genbank	AF344534	Genbank
Bursera	12-0028241	RBG	120028241	RBG
Butia	JX903252	Genbank	JX903668	Genbank
Buxus	DQ182333.1	Genbank	AF543728.1	Genbank
Byrsonima	AB233898	Genbank	AB233794	Genbank
Byttneria	AF022123	Genbank	AY321196	Genbank
Cabralea	DQ238055	Genbank	-	-
Caesalpinia	KP094413	Genbank	KP093492	Genbank
Calatola	JQ592254	Genbank	JQ588040	Genbank
Calliandra	AM234252	Genbank	HM020736	Genbank
Callicarpa	JQ594368	Genbank	JQ589422	Genbank
Callisthene	-	-	130032617	RBG
Calophyllum	HQ332018	Genbank	HQ331555	Genbank
Calotropis	12-0029833	RBG	120029833	RBG
Calycolpus	13-0032607	RBG	130032607	RBG
Calycophyllum	12-0028303	RBG	120028303	RBG
Calymmanthium	AY875230	Genbank	AY015291	Genbank
Calyptranthes	12-0029828	RBG	120029828	RBG
Campnosperma	KJ594639	Genbank	KJ708854	Genbank
Campomanesia	12-0028308	RBG	120028308	RBG
Campsiandra	-	-	EU361908	Genbank
Candolleodendron	EF466154	Genbank	JX295890	Genbank
Cantua	AY725864	Genbank	L48566	Genbank
Capirona	JQ626324	Genbank	120029649	RBG
Capparicordis	-	-	140037086	RBG
Capparidastrum	KJ082172	Genbank	KJ012501	Genbank
Capparis	GQ981684	Genbank	GQ981949	Genbank
Capsicum	12-0029804	RBG	120029804	RBG
Caraipa	HQ332025	Genbank	HQ331564	Genbank
Carapa	AY128219	Genbank	AY128181	Genbank
Carapichea	AJ002184	Genbank	-	-
Cardenasiodendron	GU935419	Genbank	-	-
Cardiopetalum	-	-	150038112	RBG
Carica	CPACPRBCLA	Genbank	AY483221	Genbank
Cariniana	Z80179	Genbank	120028310	RBG
Carpotroche	-	-	140037111	RBG
Caryocar	12-0029650	RBG	120029650	RBG
Caryodaphnopsis	-	-	EU153828	Genbank
Caryodendron	AB233857	Genbank	AB233753	Genbank
Cascaronia	-	-	AF272072	Genbank
Casearia	JQ626018	Genbank	JQ626446	Genbank
Casimiroa	EU042975	Genbank	EU042837	Genbank
Cassia	AM234244	Genbank	EU361909	Genbank
Cassipourea	JQ625770	Genbank	HM446665	Genbank
Castela	EU042989	Genbank	EU042851	Genbank
Castilla	JQ592803	Genbank	JQ588396	Genbank
Castilla	JQ592803	Genbank	JQ588396	Genbank
Castilla	JQ592803	Genbank	JQ588396	Genbank
Castilla	JQ592803	Genbank	JQ588396	Genbank
Cathedra	JQ625808	Genbank	DQ790182	Genbank
Catostemma	JQ626285	Genbank	AY589069	Genbank

Genus	rbcl	source rbcl	matk	source matk
Cavanillesia	GQ981691	Genbank	HQ696686	Genbank
Cavendishia	-	-	AF382747	Genbank
Cecropia	JQ626251	Genbank	JQ626552	Genbank
Cedrela	AY128220	Genbank	AY128182	Genbank
Cedrelinga	12-0027105	RBG	-	-
Ceiba	12-0029806	RBG	HQ696702	Genbank
Celtis	12-0028240	RBG	120028240	RBG
Cenostigma	13-0032582	RBG	130032582	RBG
Centrolobium	BOLIN021	-	-	-
Cereus	12-0029830	RBG	120029830	RBG
Ceroxylon	AJ404781	Genbank	AM114607	Genbank
Cespedesia	AJ420168	Genbank	EF135518	Genbank
Cestrum	12-0028238	RBG	120028238	RBG
Chaetocarpus	JQ626189	Genbank	JQ626531	Genbank
Chamaecrista	AM234248	Genbank	EU361914	Genbank
Chamaedorea	AJ404787	Genbank	AM114623	Genbank
Chaunochiton	DQ790142	Genbank	DQ790179	Genbank
Cheiloclinium	JQ626275	Genbank	JQ626564	Genbank
Chelyocarpus	AJ404746	Genbank	AM114562	Genbank
Chimarrhis	JQ626106	Genbank	JQ626508	Genbank
Chiococca	CCWCPRBCL	Genbank	AY538378	Genbank
Chionanthus	DQ673309	Genbank	HM751206	Genbank
Chione	AM117215	Genbank	-	-
Chlorocardium	12-0029651	RBG	120029651	RBG
Chloroleucon	-	-	AY386921	Genbank
Chomelia	GQ852316	Genbank	140037128	RBG
Christiana	AJ233149	Genbank	-	-
Chromolucuma	EF558591	Genbank	-	-
Chrysobalanus	L11178	Genbank	EF135519	Genbank
Chrysochlamys	HQ332031	Genbank	HQ331570	Genbank
Chrysophyllum	JQ626243	Genbank	JQ626548	Genbank
Cinchona	AY538478	Genbank	AY538379	Genbank
Cinchonopsis	AY538482	Genbank	AY538383	Genbank
Cinnamodendron	EU669512	Genbank	EU669485	Genbank
Cinnamomum	CNMCPRBCLA	Genbank	AJ966800	Genbank
Citharexylum	HM853911	Genbank	HM853879	Genbank
Citronella	-	-	150038113	RBG
Citrus	AB505950	Genbank	FJ716730	Genbank
Clarisia	12-0029826	RBG	120029826	RBG
Clathrotropis	-	-	JX295951	Genbank
Clavija	CLJCPRBCLA	Genbank	120028286	RBG
Cleidion	AY794936	Genbank	-	-
Cleistocactus	-	-	130034067	RBG
Clethra	CTFCPRBCLA	Genbank	AJ429281	Genbank
Clibadium	AY215095.1	Genbank	AY215775.1	Genbank
Clitoria	12-0027107	RBG	120027107	RBG
Clusia	JQ626019	Genbank	JQ626447	Genbank
Clusiella	AY625019	Genbank	HQ331585	Genbank
Clytostoma	13-0032569	RBG	130032569	RBG
Cnicothamnus	EU384961	Genbank	EU385339	Genbank
Cnidoscolus	12-0029808	RBG	120029808	RBG
Coccocypselum	FJ209066	Genbank	-	-
Coccoloba	JQ626225	Genbank	JQ626541	Genbank
Cochlospermum	AF022129	Genbank	120028291	RBG
Cocos	AM110211	Genbank	AM114637	Genbank
Cojoba	GQ981709	Genbank	GQ981971	Genbank

Genus	rbcl	source rbcl	matk	source matk
Colicodendron	-	-	130034082	RBG
Colletia	CUU59819	Genbank	-	-
Cologania	AF181932	Genbank	GQ246140	Genbank
Colubrina	AJ390047	Genbank	GU135023	Genbank
Columellia	130034079	RBG	130034079	RBG
Combretum	EU338147	Genbank	FM179938	Genbank
Commiphora	FJ466630	Genbank	JF270711	Genbank
Compsoneura	EU090509	Genbank	EU090470	Genbank
Conceveiba	AY788170	Genbank	FJ670011	Genbank
Conchocarpus	-	-	130032615	RBG
Condalia	12-0028242	RBG	120028242	RBG
Condaminea	HM164161	Genbank	FJ905347	Genbank
Connarus	CNFRBCL	Genbank	EU002174	Genbank
Conocarpus	FJ381822	Genbank	-	-
Conostegia	EU711388	Genbank	-	-
Copaifera	12-0029861	RBG	EU361918	Genbank
Copernicia	AM110199	Genbank	AM114582	Genbank
Cordia	JQ626197	Genbank	JQ626469	Genbank
Cordiera	150038163	RBG	150038163	RBG
Cordyline	HM640529	Genbank	HM640647	Genbank
Cornus	EU002276	Genbank	EU002175	Genbank
Cornutia	JQ592281	Genbank	JQ588061	Genbank
Corythophora	AF077653	Genbank	140037115	RBG
Cosmibuena	AY538483	Genbank	AY538385	Genbank
Couepia	JQ625980	Genbank	JQ626426	Genbank
Couma	DQ660640	Genbank	DQ660512	Genbank
Couratari	JQ626050	Genbank	JQ626511	Genbank
Couroupita	Z80181	Genbank	-	-
Coursetia	12-0027109	RBG	AF547188	Genbank
Coussapoa	12-0029822	RBG	120029822	RBG
Coussarea	12-0029824	RBG	120029824	RBG
Coutarea	AM117221	Genbank	GQ981975	Genbank
Crateva	AY483265	Genbank	AY483229	Genbank
Cremastosperma	AY743536	Genbank	AY743559	Genbank
Crepidospermum	150040005	RBG	-	-
Crescentia	AF102643	Genbank	-	-
Crinodendron	AF291940	Genbank	AY935929	Genbank
Crotalaria	Z70134	Genbank	GQ246141	Genbank
Croton	12-0028261	RBG	HM446680	Genbank
Crudia	AM234230	Genbank	EU361922	Genbank
Cryptocarya	GQ248578	Genbank	AJ247158	Genbank
Cuervea	KJ594207.1	Genbank	KJ593844.1	Genbank
Cupania	12-0029794	RBG	120029794	RBG
Curatella	FJ860341.1	Genbank	120028224	RBG
Curupira	DQ790150	Genbank	DQ790187	Genbank
Cyathostegia	-	-	HM347480	Genbank
Cybianthus	-	-	120029827	RBG
Cybistax	12-0029819	RBG	120029819	RBG
Cyclolobium	BOLLC377	Genbank	GQ246151	Genbank
Cymbopetalum	AY841608	Genbank	DQ125055	Genbank
Cynometra	AY289677	Genbank	EU361925	Genbank
Cynophalla	-	-	120029857	RBG
Cyrilla	CYQCPRBCL	Genbank	AJ429282	Genbank
Cyrillopsis	FJ670170	Genbank	FJ670024	Genbank
Cyrtocarpa	CPU39272	Genbank	AY594464	Genbank
Dacryodes	JQ626006	Genbank	JQ626441	Genbank

Genus	rbcl	source rbcl	matk	source matk
Dahlstedtia	-	-	130034051	RBG
Dalbergia	12-0027161	RBG	HQ427296	Genbank
Dalea	-	-	AY386860	Genbank
Daphnopsis	HM446790	Genbank	HM446682	Genbank
Dasyphyllum	EU841115	Genbank	EU385342	Genbank
Davilla	FJ860342.1	Genbank	FJ514769	Genbank
Deguelia	12-0027170	RBG	140035565	RBG
Dendrobangia	JQ626064	Genbank	JQ626474	Genbank
Dendropanax	DAU50244	Genbank	DAU58609	Genbank
Dendrophorbium	GU817755	Genbank	-	-
Dendrosipanea	HM164162	Genbank	FJ905324	Genbank
Derris	U74234	Genbank	AF142715	Genbank
Desmanthus	-	-	AF521820	Genbank
Desmodium	EU717279	Genbank	EU717420	Genbank
Dialium	12-0027113	RBG	EU361930	Genbank
Dialypetalanthus	AJ251366	Genbank	FJ905348	Genbank
Diatenopteryx	AJ402943	Genbank	EU720682	Genbank
Dicella	HQ247479	Genbank	HQ247260	Genbank
Dichapetalum	GQ424469	Genbank	-	-
Diclinanona	PER023	RBG	DQ125056	Genbank
Dicorynia	JQ626129	Genbank	EU361931	Genbank
Dicranostyles	AY101043	Genbank	-	-
Dictyocaryum	AM110204	Genbank	AM114616	Genbank
Dictyoloma	12-0029813	RBG	-	-
Dicymbe	PER024	-	EU361932	Genbank
Dicypellium	-	-	AJ247161	Genbank
Didymocistus	AY663581	Genbank	-	-
Dilodendron	12-0029821	RBG	120029821	RBG
Dimorphandra	12-0027114	RBG	EU361934	Genbank
Dinizia	13-0032584	RBG	EU361951	Genbank
Dinoseris	EU384967	Genbank	EU385346	Genbank
Dioclea	-	-	130033193	RBG
Diospyros	EU980663	Genbank	DQ924003	Genbank
Diplokeleba	12-0029843	RBG	120029843	RBG
Diploon	JQ626045	Genbank	JQ626461	Genbank
Diplopterys	AF344460	Genbank	AF344530	Genbank
Diplotropis	12-0027115	RBG	120027116	RBG
Dipteryx	12-0027119	RBG	-	-
Diptychandra	13-0032585	RBG	EU361935	Genbank
Discocarpus	AY663582	Genbank	AY830267	Genbank
Discophora	JQ625904	Genbank	JQ626375	Genbank
Distictella	140037099	RBG	140037099	RBG
Ditaxis	AB233865	Genbank	AB233761	Genbank
Dodecastigma	AY794885	Genbank	150038518	RBG
Dodonaea	AM235129	Genbank	EU720567	Genbank
Dolichodelphys	-	-	FJ905350	Genbank
Doliocarpus	FJ860360.1	Genbank	130034083	RBG
Drimys	EU669518	Genbank	EU669474	Genbank
Drypetes	12-0028225	RBG	120028225	RBG
Duckeodendron	Y14760	Genbank	140037108	RBG
Duckesia	-	-	140037109	RBG
Duguetia	AY738171	Genbank	AY740551	Genbank
Dulacia	DQ790137	Genbank	DQ790174	Genbank
Dunalia	-	-	EF438836	Genbank
Duranta	12-0028267	RBG	120028267	RBG
Duroia	JQ626024	Genbank	JQ626449	Genbank

Genus	rbcl	source rbcl	matk	source matk
Dussia	JQ625757	Genbank	AY386903	Genbank
Dystovomita	HQ332051	Genbank	HQ331594	Genbank
Ecclinusa	JQ626076	Genbank	150038116	RBG
Echinopsis	FR853367	Genbank	FN669743	Genbank
Eirmocephala	JQ590740	Genbank	JQ586947	Genbank
Elaeagia	-	-	FJ905355	Genbank
Elaeis	AJ404830	Genbank	AM114644	Genbank
Elaeodendron	AY380347	Genbank	DQ217541	Genbank
Elaeoluma	JQ626242	Genbank	JQ626547	Genbank
Elizabetha	140037127	RBG	EU361940	Genbank
Elvasia	FJ670171	Genbank	FJ670028	Genbank
Embelia	JF738675	Genbank	-	-
Emmotum	JQ626244	Genbank	JQ626549	Genbank
Endiandra	JF738632	Genbank	AJ247162	Genbank
Endlicheria	JQ625787	Genbank	JQ626354	Genbank
Endopleura	-	-	140037112	RBG
Enterolobium	JQ626149	Genbank	GQ981984	Genbank
Eperua	JQ626198	Genbank	JQ626458	Genbank
Ephedranthus	AY841616	Genbank	AY841396	Genbank
Eremanthus	EU384972	Genbank	EU385351	Genbank
Eriosema	AM235007	Genbank	-	-
Eriotheca	12-0028226	RBG	120028226	RBG
Erisma	JQ626108	Genbank	JQ626510	Genbank
Erithalis	X83635	Genbank	-	-
Erythrina	12-0027120	RBG	120027120	RBG
Erythrochiton	12-0028294	RBG	-	-
Erythrostemon	JN796934	Genbank	AY386845	Genbank
Erythroxylum	PER028	-	GQ981987	Genbank
Escallonia	12-0028277	RBG	120028277	RBG
Eschweilera	JQ625971	Genbank	JQ626416	Genbank
Esenbeckia	12-0028271	RBG	120028271	RBG
Espostoa	-	-	130034068	RBG
Espostoopsis	-	-	HM041694	Genbank
Etaballia	-	-	AF272073S2	Genbank
Eugenia	JQ625914	Genbank	JQ626380	Genbank
Euphorbia	AY794827	Genbank	EF135539	Genbank
Euphronia	-	-	AB233741	Genbank
Euplassa	PER029	Genbank	EU642689	Genbank
Euterpe	AJ404802	Genbank	AM114647	Genbank
Euxylophora	-	-	150038117	RBG
Exellodendron	JQ625744	Genbank	-	-
Exostema	12-0029810	RBG	120029810	RBG
Exostyles	13-0032586	RBG	150038555	RBG
Faramea	GQ981734	Genbank	GQ981990	Genbank
Ferdinandusa	JQ625906	Genbank	JQ626376	Genbank
Ficus	JQ626312	Genbank	JQ626578	Genbank
Fissicalyx	-	-	AF272063	Genbank
Flacourtia	AF206768	Genbank	EF135541	Genbank
Forsteronia	-	-	130032563	RBG
Fraunhofera	-	-	JF410097	Genbank
Froesia	FJ670173	Genbank	FJ670036	Genbank
Fuchsia	HM850012	Genbank	HM851003	Genbank
Fusaea	AY743445	Genbank	AY743483	Genbank
Fusispermum	AB354410	Genbank	AB354482	Genbank
Gaiadendron	GIDRBCL	Genbank	DQ787445	Genbank
Galactia	EU717287	Genbank	EU717428	Genbank

Genus	rbcl	source rbcl	matk	source matk
Galipea	150040015	RBG	150040015	RBG
Gallesia	12-0028302	RBG	AY042590	Genbank
Garcinia	JQ626234	Genbank	JQ626543	Genbank
Gaultheria	GAHCPRBCLA	Genbank	GEU61317	Genbank
Gaya	-	-	FJ204706	Genbank
Geissanthus	AF213810	Genbank	-	-
Geissospermum	DQ660643	Genbank	DQ660517	Genbank
Genipa	Z68839	Genbank	AY538388	Genbank
Geoffroea	12-0027121	RBG	AF270880	Genbank
Geonoma	AJ404834	Genbank	AM114655	Genbank
Glandonia	AF344478	Genbank	AF344548	Genbank
Gleditsia	Z70129	Genbank	AY386849	Genbank
Gliricidia	JF738386	Genbank	AF547197	Genbank
Gloeospermum	AB354413	Genbank	AB354485	Genbank
Glycydendron	AB267942	Genbank	AB268046	Genbank
Gochnatia	12-0028274	RBG	120028274	RBG
Godmania	13-0032571	RBG	130032571	RBG
Godoya	KF263352	Genbank	KF263236	Genbank
Goethalsia	AJ233151.1	Genbank	-	-
Gonatogyne	AJ418815	Genbank	AY552429	Genbank
Gongylolepis	EU384980	Genbank	EU385359	Genbank
Goniorrhachis	AM234232	Genbank	EU361959	Genbank
Gonzalagunia	HM446803	Genbank	HM446693	Genbank
Gordonia	AF380042	Genbank	AF380085	Genbank
Goupia	JQ626141	Genbank	EF135544	Genbank
Grabowskia	HQ216120	Genbank	140037077	RBG
Graffenrieda	AF215532	Genbank	-	-
Grazielodendron	-	-	AF270862	Genbank
Grias	AF077652	Genbank	-	-
Griselinia	AF307916	Genbank	AJ429372	Genbank
Guadua	12-0028311	RBG	120028311	RBG
Guapira	12-0028249	RBG	120028249	RBG
Guarea	AY128229	Genbank	AY128188	Genbank
Guatteria	AY740976	Genbank	AY740927	Genbank
Guazuma	GQ981753	Genbank	GQ982003	Genbank
Guettarda	GQ981754	Genbank	GQ982004	Genbank
Guianodendron	-	-	JX124403	Genbank
Guibourtia	BOLXX004	-	EU361962	Genbank
Guilandina	-	-	EU361900	Genbank
Gustavia	JQ626207	Genbank	GQ982005	Genbank
Gymnanthes	AY794851	Genbank	140037102	RBG
Gymnosporia	AY380352	Genbank	EU328974	Genbank
Gyrocarpus	GYRCPRBCLA	Genbank	DQ401370	Genbank
Hamelia	GQ981757	Genbank	GQ982006	Genbank
Hancornia	DQ660646	Genbank	DQ660519	Genbank
Handroanthus	-	-	150038119	RBG
Haploclathra	HQ332068	Genbank	HQ331614	Genbank
Harleyodendron	13-0032587	RBG	130032587	RBG
Harrisia	-	-	150038122	RBG
Hasseltia	12-0028227	RBG	12-0028227	RBG
Hebepetalum	HM544047	Genbank	HM544082	Genbank
Hedyosmum	HDYCPRBCLA	Genbank	DQ401339	Genbank
Heisteria	DQ790160	Genbank	DQ790196	Genbank
Helianthostylis	-	-	140037106	RBG
Helicostylis	JQ626081	Genbank	JQ626485	Genbank
Helicteres	AJ233127	Genbank	AY321186	Genbank

Genus	rbcl	source rbcl	matk	source matk
Helietta	-	-	140037103	RBG
Heliocarpus	12-0029818	RBG	120029818	RBG
Heliotropium	HM850048	Genbank	HM850863	Genbank
Hennecartia	AF022950	Genbank	-	-
Henriettea	HM446810	Genbank	HM446698	Genbank
Henriettella	JQ626220	Genbank	150038121	RBG
Henriquezia	140037121	RBG	-	-
Hernandia	HRNCPRBCLA	Genbank	AJ966799	Genbank
Herrania	GQ981762	Genbank	GQ982011	Genbank
Heteropterys	HQ247495	Genbank	HQ247284	Genbank
Heterostemon	-	-	EU361968	Genbank
Hevea	AB267943	Genbank	AB268047	Genbank
Hibbertia	FJ860367.1	Genbank	HQ896421	Genbank
Hibiscus	AY328174	Genbank	AF345329	Genbank
Hieronyma	AY830387	Genbank	AY830268	Genbank
Hillia	AM117233	Genbank	-	-
Himatanthus	JQ625987	Genbank	JQ626428	Genbank
Hippocratea	13-0032576	RBG	130032576	RBG
Hippotis	HM164165	Genbank	FJ905365	Genbank
Hirtella	JQ625956	Genbank	JQ626404	Genbank
Hoffmannseggia	AY308531	Genbank	EU361969	Genbank
Holocalyx	U74244	Genbank	AY553714	Genbank
Homalium	AJ418822	Genbank	HM446700	Genbank
Hornschuchia	AY841625	Genbank	-	-
Hortia	JQ625842	Genbank	130034084	RBG
Huberia	JQ899092	Genbank	-	-
Huberodendron	13-0032603	RBG	130032603	RBG
Huertea	AY646109	Genbank	FM179926	Genbank
Humiria	AB233889	Genbank	AB233785	Genbank
Humiriastrum	JQ626167	Genbank	JQ626522	Genbank
Hura	AB233886	Genbank	AB233782	Genbank
Hydrochorea	-	-	130033195	RBG
Hylenaea	KJ594297.1	Genbank	KJ593908.1	Genbank
Hylocereus	-	-	AY015310	Genbank
Hymenaea	JQ625969	Genbank	JQ626412	Genbank
Hymenolobium	PER038	-	AY386934	Genbank
Hyospathe	AJ404804	Genbank	AM114646	Genbank
Hyptidendron	-	-	120029809	RBG
Ilex	12-0028228	RBG	120028228	RBG
Indigofera	U74214	Genbank	AF142697	Genbank
Inga	12-0029860	RBG	JQ626408	Genbank
Ipomoea	AY100962	Genbank	AJ429355	Genbank
Iriartea	AJ404793	Genbank	AM114617	Genbank
Iriartella	AM110203	Genbank	AM114615	Genbank
Iryanthera	JQ625975	Genbank	JQ626420	Genbank
Isertia	AY538489	Genbank	AY538393	Genbank
Itaya	AJ404748	Genbank	AM114564	Genbank
Ixora	EU817422	Genbank	HM119545	Genbank
Jablonskia	AY663590	Genbank	-	-
Jacaranda	JQ626146	Genbank	JQ626519	Genbank
Jacaratia	AF405245	Genbank	AY461574	Genbank
Jacquemontia	AY101039	Genbank	EU330286	Genbank
Jacqueshuberia	AY904391	Genbank	EU361984	Genbank
Jacquinia	AF213816	Genbank	12-0029856	RBG
Jatropha	12-0029805	RBG	120029805	RBG
Joannesia	AJ418808	Genbank	-	-

Genus	rbcl	source rbcl	matk	source matk
Jodina	-	-	150038120	RBG
Joosia	AY538492	Genbank	AY538396	Genbank
Juglans	AF206785	Genbank	U92851	Genbank
Kageneckia	KAU06808	Genbank	DQ860447	Genbank
Kaunia	-	-	140037083	RBG
Kerianthera	AY538493	Genbank	AY538397	Genbank
Kielmeyera	AY625015	Genbank	HQ331641	Genbank
Klarobelia	AY743452	Genbank	AY743490	Genbank
Koanophyllon	-	-	140037092	RBG
Koeberlinia	KBECPRBCL	Genbank	AY483222	Genbank
Krameria	Y15032	Genbank	FJ670058	Genbank
Kuhlmanniodendron	GU929701	Genbank	-	-
Kutchubaea	AM117235	Genbank	140037113	RBG
Lacistema	AB233894	Genbank	AB233790	Genbank
Lacmellea	JQ626053	Genbank	JQ626466	Genbank
Lacunaria	JQ626113	Genbank	140037117	RBG
Ladenbergia	AY538494	Genbank	AY538398	Genbank
Laetia	JQ625734	Genbank	JQ626344	Genbank
Lafoensia	AY905411	Genbank	GQ982030	Genbank
Laguncularia	FJ381825	Genbank	-	-
Lamanonia	13-0032577	RBG	130032577	RBG
Lantana	HM850104	Genbank	HM850972	Genbank
Laplacea	AF380045	Genbank	AF380088	Genbank
Larrea	AF200471	Genbank	AF542602	Genbank
Lathyrus	HM029364	Genbank	AF522085	Genbank
Laxoplumeria	140037100	RBG	140037100	RBG
Leandra	GQ981785	Genbank	GQ982031	Genbank
Lecointea	AM234260	Genbank	EU361990	Genbank
Lecythis	JQ626036	Genbank	JQ626453	Genbank
Leonia	JQ626288	Genbank	JQ626572	Genbank
Leopoldinia	AJ404798	Genbank	AM114656	Genbank
Lepechinia	AY570387	Genbank	-	-
Lepidocaryum	AJ829880	Genbank	-	-
Leptolobium	U74255	Genbank	-	-
Leucaena	GU135204	Genbank	GU135042	Genbank
Leucochloron	14-0035232	RBG	140035232	RBG
Libidibia	-	-	EU361901	Genbank
Licania	AB233846	Genbank	GQ982032	Genbank
Licaria	JQ625945	Genbank	JQ626395	Genbank
Lindackeria	GQ981788	Genbank	GQ982034	Genbank
Lippia	HM853891	Genbank	HM853858	Genbank
Lissocarpa	EU980794	Genbank	DQ924078	Genbank
Lithraea	-	-	AY594470	Genbank
Lonchocarpus	HM446818	Genbank	HM446705	Genbank
Lophanthera	AF344491	Genbank	AF344559	Genbank
Loreya	JQ626318	Genbank	140037118	RBG
Lorostemon	AF518401	Genbank	HQ331648	Genbank
Loxopterygium	-	-	140037088	RBG
Lozania	AJ418804	Genbank	FJ670026	Genbank
Ludwigia	LUDRBCLX	Genbank	GU134991	Genbank
Luehea	BOLLC121	-	120028254	RBG
Lueheopsis	JQ626279	Genbank	140037124	RBG
Luetzelburgia	U74185	Genbank	AY553716	Genbank
Luma	-	-	AM489995	Genbank
Lunania	AB233936	Genbank	AB233832	Genbank
Lundia	13-0032572	RBG	130032572	RBG

Genus	rbcl	source rbcl	matk	source matk
Lupinus	HM850145	Genbank	HM851129	Genbank
Luxemburgia	Z75685	Genbank	-	-
Lychnophora	13-0032565	RBG	130032565	RBG
Lycianthes	12-0028243	RBG	120028243	RBG
Lycium	HQ216128	Genbank	AB036627	Genbank
Lytocaryum	AY044633	Genbank	-	-
Mabea	JQ625917	Genbank	JQ626381	Genbank
Maburea	DQ790165	Genbank	DQ790201	Genbank
Macairea	EU711394	Genbank	-	-
Macbrideina	-	-	FJ905366	Genbank
Macfadyena	AF102649	Genbank	GU134972	Genbank
Machaerium	12-0027129	RBG	130033200	RBG
Machaonia	GQ852339	Genbank	150038129	RBG
Maclura	12-0028256	RBG	120028256	RBG
Macoubea	JQ625771	Genbank	JQ626352	Genbank
Macrocarpaea	-	-	AJ010523	Genbank
Macrocnemum	12-0028309	RBG	120028309	RBG
Macrolobium	JQ625745	Genbank	EU361996	Genbank
Macropeplus	12-0029854	RBG	-	-
Macrosamanea	-	-	140035543	RBG
Macrotorus	-	-	150039162	RBG
Magnolia	12-0029855	RBG	AY008996	Genbank
Magonia	-	-	140037096	RBG
Mahurea	AY625018	Genbank	HQ331650	Genbank
Malanea	AM117245	Genbank	-	-
Malmea	AY743453	Genbank	AY743491	Genbank
Malouetia	JQ625814	Genbank	JQ626356	Genbank
Malpighia	HQ247542	Genbank	HQ247334	Genbank
Malvaviscus	JQ592519	Genbank	JQ588237	Genbank
Mammea	AY625029	Genbank	HQ331652	Genbank
Manicaria	AJ404797	Genbank	AM114645	Genbank
Manihot	AB233880	Genbank	AB233776	Genbank
Manilkara	JQ625936	Genbank	JQ626390	Genbank
Maprounea	AJ418810	Genbank	150038519	RBG
Maquira	JQ626014	Genbank	JQ626443	Genbank
Maraniona	JN083774	Genbank	AY247263	Genbank
Marcgravia	Z83148	Genbank	AJ429289	Genbank
Margaritaria	GQ981795	Genbank	GQ982040	Genbank
Margaritopsis	AM117247	Genbank	140037114	RBG
Marila	AY625010	Genbank	HQ331660	Genbank
Maripa	JQ591163	Genbank	JQ587303	Genbank
Marlierea	130032608	RBG	130032608	RBG
Martiodendron	13-0032589	RBG	EU361999	Genbank
Mascagnia	AF344500	Genbank	HQ247347	Genbank
Matayba	JQ625852	Genbank	EU720676	Genbank
Matisia	12-0028305	RBG	120028305	RBG
Mauritia	12-0029654	RBG	120029654	RBG
Mauritiella	12-0029655	RBG	120029655	RBG
Maytenus	JQ626259	Genbank	JQ626557	Genbank
Melanopsidium	-	-	130032611	RBG
Melanoxylon	AY904388	Genbank	EU362000	Genbank
Melicoccus	JQ626266	Genbank	EU720610	Genbank
Meliosma	HM446826	Genbank	HM446712	Genbank
Melloa	13-0032573	RBG	130032573	RBG
Melocactus	-	-	HM041719	Genbank
Memora	-	-	140037123	RBG

Genus	rbcl	source rbcl	matk	source matk
Mentzelia	JF308670	Genbank	AF503308	Genbank
Meriania	EU711395	Genbank	-	-
Merianthera	JQ899101	Genbank	-	-
Metopium	GU935434.1	Genbank	-	-
Metrodorea	-	-	130032616	RBG
Metteniusa	AM421128	Genbank	-	-
Metternichia	AF022182	Genbank	-	-
Mezilaurus	-	-	120029656	RBG
Miconia	JQ626214	Genbank	JQ626538	Genbank
Micrandra	AB267945	Genbank	AB268049	Genbank
Micrandropsis	AB267946	Genbank	AB268050	Genbank
Micranthocereus	-	-	AY015314	Genbank
Microlobius	140037104	RBG	AF521842	Genbank
Micropholis	JQ625973	Genbank	JQ626417	Genbank
Mikania	JF826307	Genbank	JF826294	Genbank
Millettia	AF308714	Genbank	AF142726	Genbank
Mimosa	12-0027180	RBG	GU135076	Genbank
Mimozyganthus	140037085	RBG	AY944556	Genbank
Minquartia	FJ038137	Genbank	DQ790185	Genbank
Mirabilis	HM850179	Genbank	HM850884	Genbank
Moldenhawera	AY904390	Genbank	EU362004	Genbank
Mollia	-	-	120029842	RBG
Mollinedia	AF050218	Genbank	GQ429060	Genbank
Molongum	X91765	Genbank	Z70185	Genbank
Molopanthera	HM164172	Genbank	-	-
Monopteryx	-	-	KP177917	Genbank
Mora	-	-	EU362005	Genbank
Morella	-	-	U92857	Genbank
Morinda	AJ318448	Genbank	JF954629	Genbank
Morisonia	12-0028282	RBG	120028282	RBG
Morithamnus	13-0032566	RBG	130032566	RBG
Moronobea	JQ626143	Genbank	HQ331665	Genbank
Morus	-	-	AF400590	Genbank
Mosannona	AY743515	Genbank	AY743508	Genbank
Mouriri	JQ626296	Genbank	JQ626576	Genbank
Moutabea	JQ625841	Genbank	JQ626362	Genbank
Mucoa	12-0029657	RBG	120029657	RBG
Mucuna	EU717281	Genbank	EU717422	Genbank
Muellera	AB045813	Genbank	-	-
Muntingia	Y15146	Genbank	FM179930	Genbank
Myracrodruon	13-0032562	RBG	130032562	RBG
Myrceugenia	-	-	AM490000	Genbank
Myrcia	JQ626253	Genbank	JQ626553	Genbank
Myrcianthes	MFU26328	Genbank	140037079	RBG
Myrciaria	JQ626319	Genbank	140037136	RBG
Myrica	AJ626757	Genbank	AY191715	Genbank
Myricaria	AY099907	Genbank	-	-
Myriocarpa	KF138193.1	Genbank	KF138021.1	Genbank
Myrocarpus	13-0032590	RBG	AY386925	Genbank
Myroxylon	12-0027131	RBG	120029860	RBG
Myrsine	12-0029815	RBG	120029815	RBG
Nacleopsis	JQ626013.1	RBG	-	-
Nealchornea	AY794865	Genbank	140037129	RBG
Nectandra	GQ981812	Genbank	GQ982050	Genbank
Neea	JQ626040	Genbank	JQ626464	Genbank
Neocalyptrocalyx	JQ625979	Genbank	JQ626425	Genbank

Genus	rbcl	source rbcl	matk	source matk
Neocouma	-	-	GU973903	Genbank
Neomitranthes	KF981266	Genbank	KF981344	Genbank
Neoraimondia	-	-	HM041728	Genbank
Newtonia	-	-	AF521847	Genbank
Nicotiana	12-0029799	RBG	120029799	RBG
Niedenzuella	HQ247566	Genbank	HQ247369	Genbank
Norantea	JQ625952	Genbank	JQ626401	Genbank
Nymphaea	AB917059.1	Genbank	HQ592332.1	Genbank
Ochoterenaea	-	-	130034078	RBG
Ochroma	AF022122	Genbank	AY321172	Genbank
Ochthocosmus	FJ707535	Genbank	EF135573	Genbank
Ocotea	JQ626098	Genbank	JQ626566	Genbank
Oenocarpus	12-0029658	RBG	120029658	RBG
Onychopetalum	DQ018222	Genbank	DQ018261	Genbank
Ophiocaryon	PER059	-	-	-
Ophthalmoblapton	AY794848	Genbank	-	-
Opuntia	AY875233	Genbank	AY875369	Genbank
Orbignya	AY012508	Genbank	-	-
Oreocallis	130034080	RBG	130034080	RBG
Oreopanax	12-0029795	RBG	120029795	RBG
Ormosia	12-0027132	RBG	120027132	RBG
Orthion	AB233941.1	Genbank	AB233837.1	Genbank
Ossaea	13-0032605	RBG	130032605	RBG
Osteophloeum	JQ625884	Genbank	JQ626371	Genbank
Ouratea	JQ625759	Genbank	-	-
Oxandra	AY319066	Genbank	AY518868	Genbank
Oxyanthus	Z68836	Genbank	HM119554	Genbank
Oyedaea	AY215153	Genbank	AY215835	Genbank
Pachira	AJ233119	Genbank	AY321170	Genbank
Pachystroma	AY794847	Genbank	-	-
Pagamea	PER064	-	-	-
Palicourea	JQ625897	Genbank	GQ982058	Genbank
Paloue	-	-	EU362014	Genbank
Panopsis	DQ875850	Genbank	EU642708	Genbank
Panurea	-	-	JX295947	Genbank
Parachimarrhis	-	-	150038526	RBG
Paradrypetes	FJ670175	Genbank	FJ670039	Genbank
Parahancornia	JQ625735	Genbank	-	-
Paraia	-	-	140037133	RBG
Parajubaea	AJ829891	Genbank	-	-
Paralychnophora	-	-	130034081	RBG
Paramachaerium	-	-	AF272062	Genbank
Parapiptadenia	13-0032591	RBG	AF521849	Genbank
Parathesis	AF213814	Genbank	-	-
Parinari	AB233847	Genbank	AB233743	Genbank
Parkia	JQ625940	Genbank	JQ626393	Genbank
Parkinsonia	AY904403	Genbank	AY386917	Genbank
Patinoa	-	-	AY589074	Genbank
Pausandra	AY794887	Genbank	140037116	RBG
Pavonia	AJ233123	Genbank	AY589056	Genbank
Paypayrola	AB354429	Genbank	AB354501	Genbank
Peltanthera	AJ001762	Genbank	AJ429330	Genbank
Peltogyne	AF308718	Genbank	EU362021	Genbank
Peltophorum	AY904400	Genbank	AY386846	Genbank
Pentaclethra	AM234250	Genbank	AY386904	Genbank
Pentagonia	X83658	Genbank	FJ905374	Genbank

Genus	rbcl	source rbcl	matk	source matk
Pentamerista	AY725860	Genbank	-	-
Pentaplaris	AJ233157	Genbank	AY321163	Genbank
Pera	AY380355	Genbank	EF135578	Genbank
Perebea	12-0029664	RBG	120029664	RBG
Pereskia	AF206805	Genbank	AY875355	Genbank
Peridiscus	AY380356	Genbank	DQ411570	Genbank
Peritassa	-	-	FJ705544	Genbank
Perrottetia	AY935736	Genbank	AY935915	Genbank
Persea	12-0028270	RBG	120028270	RBG
Petaladenium	-	-	KP177896	Genbank
Phanera	13-0032592	RBG	130032592	RBG
Phenakospermum	AF243845	Genbank	AF478911	Genbank
Philacra	KF263408	Genbank	KF263286	Genbank
Philyra	AB267927	Genbank	AB268031	Genbank
Pholidostachys	AM110217	Genbank	AM114651	Genbank
Phragmotheca	-	-	AY589068	Genbank
Phyllanthus	12-0029817	RBG	120029817	RBG
Phyllostylon	BOLXX091	-	140037091	RBG
Physocalymma	120029829	RBG	-	-
Phytelephas	AJ404836	Genbank	AM114614	Genbank
Phytolacca	12-0028260	RBG	120028260	RBG
Picramnia	AF127025	Genbank	-	-
Picrasma	EU043010	Genbank	EU042872	Genbank
Picrolemma	EU043013	Genbank	-	-
Pilocarpus	AF066809	Genbank	-	-
Pilosocereus	-	-	HM041759	Genbank
Pimenta	-	-	AM490013	Genbank
Piper	AY572252	Genbank	DQ882201	Genbank
Piptadenia	BOLIN205COR	-	AF521855	Genbank
Piptocarpha	PPJCPRBCL	Genbank	150038143	RBG
Piranhea	12-0029847	RBG	-	-
Piscidia	AB045816	Genbank	AF142710	Genbank
Pisonia	HM446854	Genbank	HM446731	Genbank
Pithecellobium	GQ436357	Genbank	HM020740	Genbank
Pityrocarpa	-	-	130034053	RBG
Planchonella	GQ248683	Genbank	GQ248187	Genbank
Plathymenia	13-0034064	RBG	AF521858	Genbank
Platonia	JQ626227	Genbank	HQ331670	Genbank
Platycyamus	AB045817	Genbank	AF142709	Genbank
Platymiscium	JQ626063	Genbank	JQ626473	Genbank
Platypodium	GQ981836	Genbank	GQ982065	Genbank
Plenckia	-	-	JF410098	Genbank
Pleonotoma	KJ594438.1	Genbank	KJ594004.1	Genbank
Pleuranthodendron	AJ418832	Genbank	-	-
Pleurothyrium	150040009	RBG	150040009	RBG
Plinia	JQ626311	Genbank	AM490007	Genbank
Pluchea	EU385011	Genbank	EU385389	Genbank
Plumeria	DQ660661	Genbank	DQ660536	Genbank
Podocalyx	AY663647	Genbank	EF135583	Genbank
Poecilandra	KF263357	Genbank	-	-
Poecilanthe	13-0032594	RBG	130032594	RBG
Poeppigia	AY904370	Genbank	EU362026	Genbank
Pogonophora	AY788185	Genbank	EF135585	Genbank
Pogonopus	12-0028290	RBG	120028290	RBG
Poincianella	12-0027104	RBG	EU361904	Genbank
Polyandrococos	AJ829902	Genbank	-	-

Genus	rbcl	source rbcl	matk	source matk
Polygonanthus	AY973489	Genbank	-	-
Poraqueiba	JQ626039	Genbank	JQ626457	Genbank
Porcelia	AY841649	Genbank	-	-
Porlieria	12-0029807	RBG	12-0029807	RBG
Porocystis	-	-	150038123	RBG
Posoqueria	Z68850	Genbank	AY538412	Genbank
Potalia	AJ235816	Genbank	-	-
Poulsenia	GQ981838	Genbank	-	-
Pourouma	JQ626107	Genbank	JQ626509	Genbank
Pouteria	JQ625955	Genbank	JQ626403	Genbank
Pouzolzia	JF265556	Genbank	JF270899	Genbank
Pradosia	JQ626027	Genbank	JQ626386	Genbank
Preslianthus	-	-	120028281	RBG
Prestoea	AM110216	Genbank	AM114648	Genbank
Priogymnanthus	-	-	140037095	RBG
Prionostemma	KJ594446	Genbank	KJ594009	Genbank
Prockia	AJ418831	Genbank	EF135588	Genbank
Prosopis	12-0027165	RBG	AY944562	Genbank
Protium	JQ626194	Genbank	JQ626503	Genbank
Prunus	12-0029792	RBG	120029792	RBG
Pseudephedranthus	AY841651	Genbank	-	-
Pseudima	-	-	140037110	RBG
Pseudobombax	GQ981847	Genbank	GQ982072	Genbank
Pseudolmedia	HM446858.1	Genbank	HM446734.1	Genbank
Pseudomalmea	AY841530	Genbank	AY841398	Genbank
Pseudopiptadenia	JQ625948	Genbank	JQ626397	Genbank
Pseudosamanea	JQ591565	Genbank	-	-
Pseudosenefeldera	AY794862	Genbank	-	-
Pseudoxandra	AY319076	Genbank	AY518870	Genbank
Psidium	HM850290	Genbank	HM851054	Genbank
Psychotria	JQ625868	Genbank	JQ626366	Genbank
Pterandra	AF344506	Genbank	AF344573	Genbank
Pterocarpus	12-0027175	RBG	120027175	RBG
Pterodon	12-0027139	RBG	-	-
Pterogyne	AY904377	Genbank	EU362031	Genbank
Ptilochaeta	HQ247570	Genbank	HQ247376	Genbank
Ptychopetalum	JQ626003	Genbank	JQ626439	Genbank
Purdiaea	AY082698	Genbank	-	-
Quadrella	KJ082530	Genbank	KJ012740	Genbank
Qualea	JQ626047	Genbank	JQ626462	Genbank
Quararibea	JQ626033	Genbank	JQ626452	Genbank
Quassia	EU043017	Genbank	EU042879	Genbank
Quiabentia	AY875236	Genbank	AY875372	Genbank
Quiina	AF206815	Genbank	EF135589	Genbank
Quillaja	U06822	Genbank	AY386843	Genbank
Randia	Z68832	Genbank	HM119563	Genbank
Raphia	AJ829907	Genbank	AM114544	Genbank
Raputia	-	-	140037134	RBG
Rauhocereus	-	-	AY015326	Genbank
Rauia	-	-	130034076	RBG
Rauvolfia	DQ660662	Genbank	DQ660537	Genbank
Ravenia	-	-	FJ716746	Genbank
Recordia	HM853919	Genbank	HM853888	Genbank
Recordoxylon	JQ626133	Genbank	-	-
Reichenbachia	-	-	140037094	RBG
Remijia	AY538505	Genbank	AY538416	Genbank

Genus	rbcl	source rbcl	matk	source matk
Retiniphyllum	AF331654	Genbank	-	-
Rhabdodendron	JQ625835	Genbank	JQ626361	Genbank
Rhamnidium	12-0028297	RBG	120028297	RBG
Rhamnus	KJ082543.1	Genbank	KJ012751.1	Genbank
Rhigospira	-	-	GU973904	Genbank
Rhizophora	AF127687	Genbank	AF329465	Genbank
Rhodostemonodaphne	JQ626255	Genbank	JQ626554	Genbank
Rhodothyrsus	140037119	RBG	140037119	RBG
Rhynchosia	AB045823	Genbank	-	-
Richeria	AY663616	Genbank	AY830281	Genbank
Ricinus	AY788188	Genbank	EF135590	Genbank
Riedeliella	13-0032595	RBG	AF272090S1	Genbank
Rinorea	AB354430	Genbank	AB354502	Genbank
Rinoreocarpus	AB354435	Genbank	AB354507	Genbank
Rollinia	-	-	150038517	RBG
Rondeletia	AM117265	Genbank	HM446741	Genbank
Rosenbergiodendron	HM164177	Genbank	HM119566	Genbank
Roucheria	FJ169603	Genbank	HM544121	Genbank
Roupala	12-0028232	RBG	120028232	RBG
Rourea	FJ707537	Genbank	EF135591	Genbank
Roystonea	AJ404805	Genbank	AM114630	Genbank
Ruagea	DQ238057	Genbank	AY128198	Genbank
Rudgea	Z68821	Genbank	130034075	RBG
Ruellia	GU135168.1	Genbank	GU135004.1	Genbank
Ruizodendron	AY841657	Genbank	HQ214070	Genbank
Ruizterania	JQ626202	Genbank	JQ626501	Genbank
Ruprechtia	12-0028233	RBG	120028233	RBG
Ruptiliocarpon	AJ402997	Genbank	AY935918	Genbank
Rustia	Y18716	Genbank	FJ905380	Genbank
Ryania	-	-	150038124	RBG
Sacoglottis	JQ625910	Genbank	JQ626378	Genbank
Sageretia	AJ225785	Genbank	130034074	RBG
Sagotia	AY794903	Genbank	150038125	RBG
Salacia	AJ402998	Genbank	FJ705557	Genbank
Salix	12-0028276	RBG	120028276	RBG
Salvertia	-	-	130032618	RBG
Salzmannia	13-0032612	RBG	-	-
Samaipaticereus	-	-	140037078	RBG
Samanea	13-0032596	RBG	-	-
Sambucus	SBURBCLA	Genbank	HQ593429	Genbank
Sanango	AJ001763	Genbank	-	-
Sanchezia	AJ247613	Genbank	-	-
Sandwithia	AY794904.1	Genbank	140037135	RBG
Sapindus	AY724366	Genbank	AY724324	Genbank
Sapium	12-0028301	RBG	GQ982089	Genbank
Sarcaulus	DQ377537	Genbank	150040018	RBG
Sarcopera	AF303124	Genbank	-	-
Sarcotoxicum	-	-	140037093	RBG
Saurauia	AF088852	Genbank	EU310435	Genbank
Savia	AY663619	Genbank	AY552449	Genbank
Schaefferia	-	-	130034070	RBG
Scheelea	AY044636	Genbank	-	-
Schefflera	JQ625964	Genbank	JQ626409	Genbank
Schinopsis	12-0028234	RBG	120028234	RBG
Schinus	12-0028275	RBG	120028275	RBG
Schistostemon	JX664071	Genbank	JX661963	Genbank

Genus	rbcl	source rbcl	matk	source matk
Schizolobium	AY904398	Genbank	EU362036	Genbank
Schmardaea	-	-	130034072	RBG
Schoepfia	SHOCPRBCL	Genbank	AY957454	Genbank
Schwartzia	AF303127	Genbank	-	-
Sclerolobium	AM234242	Genbank	-	-
Scleronema	12-0029665	RBG	120029665	RBG
Scutia	AJ390033	Genbank	140037081	RBG
Scyphonychium	-	-	EU720672	Genbank
Sebastiania	AY794850	Genbank	140037090	RBG
Securidaca	EU644681	Genbank	EU604029	Genbank
Seguieria	12-0028250	RBG	120028250	RBG
Semaphyllanthe	-	-	FJ905387	Genbank
Senefeldera	-	-	150038126	RBG
Senegalia	12-0027181	RBG	HM020731	Genbank
Senna	GU135268	Genbank	GU135008	Genbank
Septotheca	-	-	AY589073	Genbank
Serjania	AJ403001	Genbank	EU720640	Genbank
Sextonia	JQ626173	Genbank	JQ626456	Genbank
Sideroxylon	Z83136	Genbank	GQ429074	Genbank
Simaba	EU043024	Genbank	EU042886	Genbank
Simarouba	EU043036	Genbank	EU042898	Genbank
Simira	HM164179	Genbank	FJ905388	Genbank
Siparuna	JQ626097	Genbank	JQ626498	Genbank
Siphoneugena	12-0029816	RBG	120029816	RBG
Sloanea	JQ626032	Genbank	JQ626451	Genbank
Smallanthus	AY215177	Genbank	-	-
Socratea	AM110205	Genbank	AM114618	Genbank
Solanum	HM850361	Genbank	HM851097	Genbank
Sommera	AM117278.1	Genbank	FJ905394.1	Genbank
Sorocea	12-0028296	RBG	120028306	RBG
Souroubea	AF303125	Genbank	-	-
Spachea	HQ247575	Genbank	HQ247380	Genbank
Sparattanthelium	AF052197	Genbank	AJ627931	Genbank
Sparattosperma	120028292	RBG	120028292	RBG
Spathelia	AF066798	Genbank	FJ716739	Genbank
Sphinctanthus	12-0029834	RBG	120029834	RBG
Spirotheca	-	-	HQ696691	Genbank
Spirotropis	-	-	JX295950.1	Genbank
Spondias	GQ981882	Genbank	-	-
Spongiosperma	-	-	GU973905	Genbank
Stachyarrhena	JQ625826	Genbank	JQ626359	Genbank
Stachytarpheta	GU135267	Genbank	-	-
Stemmadenia	DQ660666	Genbank	DQ660542	Genbank
Stenopadus	EU385019	Genbank	EU385398	Genbank
Stephanopodium	13-0032578	RBG	-	-
Sterculia	JQ626037	Genbank	JQ626455	Genbank
Sterigmapetalum	AF127671	Genbank	120029666	RBG
Steriphoma	12-0028280	RBG	120028280	RBG
Stetsonia	-	-	140037084	RBG
Stifftia	EU385020	Genbank	EU385399	Genbank
Stigmaphyllon	AF344514	Genbank	HQ247393	Genbank
Stillingia	AY794843	Genbank	140037089	RBG
Stilpnophyllum	AY538510	Genbank	AY538422	Genbank
Strychnos	JQ626240	Genbank	FJ514680	Genbank
Stryphnodendron	JQ626052	Genbank	JQ626465	Genbank
Styloceras	AF093733	Genbank	-	-

Genus	rbcl	source rbcl	matk	source matk
Stylogyne	12-0029827	RBG	120029827	RBG
Stylosanthes	-	-	AF203595	Genbank
Styrax	JQ626303	Genbank	JQ626577	Genbank
Suessenguthia	-	-	140037105	RBG
Swartzia	AM234259	Genbank	EU362053	Genbank
Sweetia	12-0027150	RBG	AY386911	Genbank
Swietenia	AY128241	Genbank	AY128200	Genbank
Syagrus	AJ404827	Genbank	AM114638	Genbank
Symmeria	GQ206235	Genbank	GQ206209	Genbank
Symphonia	-	-	HQ331680	Genbank
Symphyopappus	-	-	150038127	RBG
Symplocos	JQ625921	Genbank	AY630657	Genbank
Synechanthus	AJ404786.1	Genbank	-	-
Syzygium	FJ976173	Genbank	GQ248207	Genbank
Tabaroa	130032597	RBG	130032597	RBG
Tabebuia	JQ626096	Genbank	JQ626497	Genbank
Tabernaemontana	DQ660672	Genbank	DQ660549	Genbank
Tacarcuna	AY663623	Genbank	-	-
Tachigali	JQ626001	Genbank	EU362040	Genbank
Tacinga	-	-	150039161	RBG
Talauma	L12666	Genbank	AF548642	Genbank
Talipariti	AY289678	Genbank	AB233275	Genbank
Talisia	AJ403008	Genbank	EU720643	Genbank
Tapirira	JQ625925	Genbank	JQ626383	Genbank
Tapura	12-0029846	RBG	FJ670009	Genbank
Tara	12-0027184	RBG	120027184	RBG
Taralea	PER085	Genbank	-	-
Tecoma	12-0028262	RBG	120028262	RBG
Tephrosia	U74211	Genbank	AF142712	Genbank
Terminalia	FJ381811	Genbank	GU135057	Genbank
Ternstroemia	AF380065	Genbank	AF380110	Genbank
Tessaria	12-0028258	RBG	120028258	RBG
Tetracera	FJ860393.1	Genbank	AY042665	Genbank
Tetragastris	JQ625986	Genbank	JQ626484	Genbank
Tetrameranthus	12-0029667	RBG	120029667	RBG
Tetrapterys	HQ247590	Genbank	HQ247398	Genbank
Tetrasida	-	-	150038128	RBG
Tetrastylidium	DQ790154	Genbank	DQ790190	Genbank
Tetrathylacium	-	-	GQ982110	Genbank
Tetrorchidium	AB267952	Genbank	AB268056	Genbank
Theobroma	JQ626171	Genbank	FJ514692	Genbank
Thibaudia	-	-	AF382790	Genbank
Thyrsodium	JQ626075	Genbank	JQ626480	Genbank
Tibouchina	150040010	RBG	150040010	RBG
Ticodendron	AB015455.1	Genbank	U92855.1	Genbank
Tipuana	JN083777	Genbank	AF270882	Genbank
Tococa	AF215539	Genbank	-	-
Tocoyena	HM164181	Genbank	HM119571	Genbank
Tontelea	-	-	FJ705562	Genbank
Topobea	JQ899107	Genbank	-	-
Tournefortia	EU599824	Genbank	EU599648	Genbank
Touroulia	Z75690	Genbank	FJ670037	Genbank
Tovomita	HQ332120	Genbank	HQ331684	Genbank
Tovomitopsis	HQ332123	Genbank	HQ331687	Genbank
Toxicodendron	U39271	Genbank	AY594491	Genbank
Toxosiphon	JQ593943.1	Genbank	JQ589090.1	Genbank

Genus	rbcl	source rbcl	matk	source matk
Trattinnickia	JQ626083	Genbank	GQ982114	Genbank
Trema	12-0028244	RBG	120028244	RBG
Trembleya	-	-	130032606	RBG
Trichanthera	GQ981903	Genbank	GQ982116	Genbank
Trichilia	JQ626046	Genbank	JQ626491	Genbank
Trichospermum	JQ594275	Genbank	-	-
Trigonia	AB233848	Genbank	AB233744	Genbank
Trigynaea	AY743449	Genbank	AY743487	Genbank
Triplaris	Y16910	Genbank	AY042668	Genbank
Trischidium	13-0032598	RBG	130032598	RBG
Trithrinax	AJ404745	Genbank	AM114556	Genbank
Triumfetta	JF265638	Genbank	JF270979	Genbank
Trixis	EU385025	Genbank	EU385405	Genbank
Trophis	KJ082625.1	Genbank	KJ012814.1	Genbank
Trymatococcus	JQ626260	Genbank	JQ626558	Genbank
Turpinia	BOLLC394	-	GQ982121	Genbank
Tyleria	KF263344	Genbank	KF263230	Genbank
Uleanthus	13-0032599	RBG	-	-
Ulex	HM850431	Genbank	HM851132	Genbank
Uncaria	AJ347007	Genbank	-	-
Unonopsis	AY743455	Genbank	AY743494	Genbank
Urbanodendron	-	-	AJ247191	Genbank
Urera	12-0028247	RBG	120028247	RBG
Uribea	-	-	AY553719.1	Genbank
Urtica	FJ432249	Genbank	EU002192	Genbank
Vachellia	HM850439	Genbank	HM850602	Genbank
Vallea	AJ403035	Genbank	-	-
Vallesia	AJ419767	Genbank	AM295075	Genbank
Vantanea	JQ625882	Genbank	JQ626370	Genbank
Varronia	-	-	140037074	RBG
Vasconcellea	12-0029803	RBG	120029803	RBG
Vassobia	12-0028236	RBG	120028236	RBG
Vatairea	JQ625866	Genbank	-	-
Vataireopsis	JQ626110	Genbank	AF142680	Genbank
Vellozia	VELCPRBCL	Genbank	130034065	RBG
Verbesina	12-0028251	RBG	120028251	RBG
Vernonanthura	12-0028278	RBG	120028278	RBG
Vernonia	12-0028269	RBG	120028269	RBG
Viburnum	HQ591701	Genbank	HQ591557	Genbank
Virola	JQ626059	Genbank	JQ626468	Genbank
Vismia	JQ626022	Genbank	HQ331694	Genbank
Vitex	12-0028287	RBG	AB284182	Genbank
Vochysia	JQ625791	Genbank	JQ626355	Genbank
Vouacapoua	JQ626170	Genbank	JQ626385	Genbank
Vouarana	JQ626103	Genbank	EU720673	Genbank
Wallacea	KF263363	Genbank	-	-
Warszewiczia	Y18722	Genbank	FJ905398	Genbank
Weberbauerocereus	-	-	HM041796	Genbank
Weinmannia	AF291915	Genbank	GQ248213	Genbank
Welfia	AJ829917	Genbank	AM114650	Genbank
Wettinia	AJ404794	Genbank	AM114619	Genbank
Williamodendron	-	-	AJ247192	Genbank
Wittmackanthus	-	-	FJ905399	Genbank
Wunderlichia	EU385028	Genbank	EU385408	Genbank
Wurdastom	KF407948	Genbank	-	-
Ximenia	DQ790149	Genbank	DQ790186	Genbank

Genus	rbcl	source rbcl	matk	source matk
Xylophragma	-	-	140037097	RBG
Xylopia	AY238958	Genbank	AY238967	Genbank
Xylosma	JQ625911	Genbank	JQ626379	Genbank
Zanthoxylum	12-0028237	RBG	120028237	RBG
Zapoteca	12-0027166	RBG	EU362064	Genbank
Zeyheria	BOLIN034	-	130034086	RBG
Zinowiewia	AY935741	Genbank	AY935922	Genbank
Ziziphus	AJ390052	Genbank	AF049848	Genbank
Zollernia	13-0032600	RBG	140035578	RBG
Zuelania	GQ981924	Genbank	-	-
Zygia	JQ625977	Genbank	JQ626423	Genbank

Supplementary Information Table 9: List of fossil-derived calibrations from 86 nodes used to date the phylogeny, taxa used for calibration, minimum age used as offset, mean age and their respective source. Ages in Ma.

Clade	Taxa 1	Taxa 2	Minimum age	Mean age	Source
Winteraceae	Drimys	Cinnamodendron	100	125	Magallon et al.,2015
Magnoliales	Magnolia	Diclinanona	86.4	108	Magallon et al.,2015
Arecaceae	Guadua	Mauritia	66.8	83.5	Magallon et al.,2015
Eudicotyledoneae	Abuta	Acalypha	100	125	Magallon et al.,2015
Ranunculales	Bocconia	Abuta	89.6	112	Magallon et al.,2015
Pentapetalae	Davilla	Matisia	79.68	99.6	Magallon et al.,2015
Dilleniales	Tetracera	Curatella	38.88	48.6	Magallon et al.,2015
Santalales	Jodina	Pouteria	56.48	70.6	Magallon et al.,2015
Loranthaceae	Gaiadendron	Schoepfia	52.4	65.5	Magallon et al.,2015
Phytolaccaceae"	Guapira	Seguieria	56.48	70.6	Magallon et al.,2015
Nyssaceae	Cornus	Mentzelia	70	87.5	Magallon et al.,2015
Ebenaceae	Diospyros	Cybianthus	27.12	33.9	Magallon et al.,2015
Ericaceae	Agarista	Saurauia	71.44	89.3	Magallon et al.,2015
Solanaceae	Solanum	Ipomoea	27.12	33.9	Magallon et al.,2015
Rubiaceae	Cinchonopsis	Psychotria	29.76	37.2	Magallon et al.,2015
Apocynaceae	Potalia	Geissospermum	29.76	37.2	Magallon et al.,2015
Bignoniaceae	Jacaranda	Tecoma	31.04	38.8	Magallon et al.,2015
Acanthaceae	Avicennia	Ruellia	22.72	28.4	Magallon et al.,2015
Lamiaceae	Callicarpa	Vitex	22.72	28.4	Magallon et al.,2015
Asteraceae	Lychnophora	Columellia	38.08	47.6	Magallon et al.,2015
Araliaceae	Schefflera	Dendropanax	29.76	37.2	Magallon et al.,2015
Combretaceae	Fuchsia	Terminalia	70	87.5	Magallon et al.,2015
Lythraceae	Lafoensia	Physocalymma	56.48	70.6	Magallon et al.,2015
Myrtaceae	Vochysia	Calyptranthes	66.8	83.5	Magallon et al.,2015
Burseraceae	Bursera	Protium	38.88	48.6	Magallon et al.,2015
Meliaceae	Swietenia	Trichilia	38.88	48.6	Magallon et al.,2015
Rutaceae	Spathelia	Zanthoxylum	52.4	65.5	Magallon et al.,2015
Malvaceae	Bixa	Theobroma	44.64	55.8	Magallon et al.,2015
Brassicales	Capparis	Eriotheca	71.44	89.3	Magallon et al.,2015
Mimosoideae	Diptychandra	Inga	38.88	48.6	Magallon et al.,2015
Papilionoideae	Dicorynia	Swartzia	44.64	55.8	Magallon et al.,2015
Rhamnaceae	Colletia	Ziziphus	38.88	48.6	Magallon et al.,2015
Ulmaceae	Ampelocera	Maquira	44.64	55.8	Magallon et al.,2015
Fagales	Anisophyllea	Juglans	70	87.5	Magallon et al.,2015
Betulaceae	Ticodendron	Alnus	66.8	83.5	Magallon et al.,2015
Celastraceae	Zinowiewia	Plenckia	29.76	37.2	Magallon et al.,2015
Cunoniaceae	Weinmannia	Sloanea	63.36	79.2	Magallon et al.,2015
Elaeocarpaceae	Sloanea	Crinodendron	49.36	61.7	Magallon et al.,2015
Clusiaceae	Garcinia	Bonnetia	71.44	89.3	Magallon et al.,2015
Tetrapterys	Tetrapterys	Malpighia	22.72	28.4	Magallon et al.,2015

Clade	Taxa 1	Taxa 2	Minimum age	Mean age	Source
Euphorbioideae	Hevea	Acalypha	29.76	37.2	Magallon et al.,2015
Anaxagorea	Anaxagorea	-	72.352	90.44	Baker et al., 2014
Bocageopsis	Bocageopsis	-	4.784	5.98	Baker et al., 2014
Duguetia	Duguetia	-	24.512	30.64	Baker et al., 2014
Fusaea	Fusaea	-	24.512	30.64	Baker et al., 2014
Guatteria	Guatteria	-	44.664	55.83	Baker et al., 2014
Malmea	Malmea	-	15.992	19.99	Baker et al., 2014
Pseudoxandra	Pseudoxandra	-	12.072	15.09	Baker et al., 2014
Unonopsis	Unonopsis	-	6.352	7.94	Baker et al., 2014
Xylopia	Xylopia	-	39.984	49.98	Baker et al., 2014
Dacryodes	Dacryodes	-	30.4	38	Baker et al., 2014
Protium	Protium	-	42	52.5	Baker et al., 2014
Andira	Andira	-	14.008	17.51	Baker et al., 2014
Cynometra	Cynometra	-	10.344	12.93	Baker et al., 2014
Dialium	Dialium	-	8.72	10.9	Baker et al., 2014
Dicorynia	Dicorynia	-	8.72	10.9	Baker et al., 2014
Dicymbe	Dicymbe	-	9.6	12	Baker et al., 2014
Diplotropis	Diplotropis	-	16.216	20.27	Baker et al., 2014
Dipteryx	Dipteryx	-	21.152	26.44	Baker et al., 2014
Eperua	Eperua	-	9.856	12.32	Baker et al., 2014
Hymenaea	Hymenaea	-	19.736	24.67	Baker et al., 2014
Inga	Inga	-	8	10	Baker et al., 2014
Lonchocarpus	Lonchocarpus	-	12.056	15.07	Baker et al., 2014
Macrolobium	Macrolobium	-	25.6	32	Baker et al., 2014
Ormosia	Ormosia	-	32.496	40.62	Baker et al., 2014
Parkia	Parkia	-	36.4	45.5	Baker et al., 2014
Peltogyne	Peltogyne	-	23.04	28.8	Baker et al., 2014
Poecilanthe	Poecilanthe	-	32.792	40.99	Baker et al., 2014
Pterocarpus	Pterocarpus	-	13.328	16.66	Baker et al., 2014
Swartzia	Swartzia	-	36.768	45.96	Baker et al., 2014
Tachigali	Tachigali	-	3.72	4.65	Baker et al., 2014
Vouacapoua	Vouacapoua	-	38.952	48.69	Baker et al., 2014
Zygia	Zygia	-	14.256	17.82	Baker et al., 2014
Carapa	Carapa	-	23.6	29.5	Baker et al., 2014
Guarea	Guarea	-	11.84	14.8	Baker et al., 2014
Brosimum	Brosimum	-	38.4	48	Baker et al., 2014
Castilla	Castilla	-	17.6	22	Baker et al., 2014
Clarisia	Clarisia	-	52	65	Baker et al., 2014
Helicostylis	Helicostylis	-	22.4	28	Baker et al., 2014
Poulsenia	Poulsenia	-	17.6	22	Baker et al., 2014
Pseudolmedia	Pseudolmedia	-	28.8	36	Baker et al., 2014
Sorocea	Sorocea	-	47.2	59	Baker et al., 2014
Iryanthera	Iryanthera	-	15.2	19	Baker et al., 2014
Virola	Virola	-	13.6	17	Baker et al., 2014
Cecropia	Cecropia	-	35.2	44	Baker et al., 2014
Pourouma	Pourouma	-	35.2	44	Baker et al., 2014

Supplementary Information Table 10: Full coefficients from models. Coefficients for all generalised least square models across 90 plots for both aboveground wood productivity (AGWP) and aboveground biomass (AGB) as a function of diversity metrics, functional and structural attributes, climate, soil variables and using a Gaussian spatial correlation structure.

Null model

AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.861515	0.106372	55.1039	0	**201.5906**
CWD	0.383832	0.104753	3.66417	0.0004	R^2
logK	-0.170605	0.0907893	-1.87913	0.0637	**0.4382399**
logMg	0.409795	0.1261758	3.24781	0.0017	
logP	0.165274	0.1142966	1.44601	0.1519	
MAT	-0.347756	0.1183831	-2.93755	0.0043	

Genus Richness

AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.86042	0.10685178	54.84625	0	203.1296
Richness	0.064339	0.09668254	0.66547	0.5076	R^2
CWD	0.355983	0.11328278	3.14243	0.0023	0.4360347
logK	-0.168094	0.09076159	-1.85204	0.0676	
logMg	0.398174	0.12791398	3.11282	0.0025	
logP	0.157995	0.11503501	1.37345	0.1733	
MAT	-0.343998	0.11899943	-2.89076	0.0049	

Shannon Index

AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.858887	0.10704304	54.73394	0	201.9355
Shannon	0.127046	0.10008535	1.26938	0.2079	R^2
CWD	0.327667	0.11415576	2.87035	0.0052	0.4354807
logK	-0.160788	0.08964491	-1.7936	0.0765	
logMg	0.387644	0.12699712	3.05239	0.003	
logP	0.142111	0.11469805	1.239	0.2188	
MAT	-0.330397	0.11958189	-2.76293	0.0071	

Simpson Index

AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.856853	0.10584233	55.33564	0	200.7335
Simpson	0.15474	0.09345611	1.65575	0.1015	R^2
CWD	0.315546	0.11205464	2.816	0.0061	0.4436086
logK	-0.154456	0.08949375	-1.72589	0.0881	
logMg	0.394553	0.12515884	3.15241	0.0023	
logP	0.126392	0.1151178	1.09794	0.2754	
MAT	-0.317031	0.11903359	-2.66337	0.0093	

Fisher's Alpha

AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.858662	0.10609511	55.22085	0	202.265
Fisher	0.107827	0.09456675	1.14022	0.2575	R^2
CWD.F	0.342796	0.11064571	3.09814	0.0027	0.4416976
logK	-0.167573	0.09001393	-1.86164	0.0662	
logMg	0.38179	0.12851488	2.97078	0.0039	
logtotalP	0.153942	0.11433706	1.34639	0.1818	
MAT	-0.350349	0.11815512	-2.96516	0.0039	

PD

AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.859172	0.10665776	54.93433	0	202.8446
PD	0.084776	0.09941988	0.85271	0.3963	R^2
CWD	0.348476	0.11299475	3.084	0.0028	0.4361231
logK	-0.17018	0.09034474	-1.88367	0.0631	
logMg	0.38977	0.1287461	3.02743	0.0033	
logP	0.158565	0.11454018	1.38436	0.17	
MAT	-0.338332	0.11913055	-2.84001	0.0057	

MPD

AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.854614	0.10669562	54.87211	0	201.6195
MPD	0.168332	0.12054374	1.39644	0.1663	R^2
CWD	0.29573	0.1224387	2.41533	0.0179	0.4217125
logK	-0.17024	0.08897228	-1.9134	0.0591	
logMg	0.394082	0.12595813	3.12867	0.0024	
logP	0.124089	0.11677617	1.06262	0.291	
MAT	-0.281131	0.12738354	-2.20697	0.0301	

MNTD

AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.915072	0.1295081	45.67337	0	203.65
MNTD	0.151675	0.0826601	1.83492	0.0701	R^2
CWD	0.429514	0.12164985	3.53074	0.0007	0.4443261
logK	-0.174738	0.09756748	-1.79095	0.0769	
logMg	0.368462	0.13046764	2.82416	0.0059	
logP	0.093694	0.11558699	0.81059	0.4199	
MAT	-0.342243	0.14448649	-2.36868	0.0202	

Total Lineage Diversity					
AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.851482	0.10390777	56.31419	0	201.1306
sesPD	0.13291	0.08538286	1.55664	0.1234	R^2
CWD	0.366666	0.1032149	3.55245	0.0006	0.4583395
logK	-0.191983	0.09100097	-2.10968	0.0379	
logMg	0.354105	0.13037448	2.71606	0.008	
logP	0.186123	0.11422668	1.62942	0.107	
MAT	-0.308234	0.11870588	-2.59662	0.0111	

Basal Lineage Diversity					
AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.861001	0.10712834	54.71009	0	203.5722
sesMPD	-0.01265	0.09687237	-0.13058	0.8964	R^2
CWD	0.388017	0.11022672	3.52017	0.0007	0.4392773
logK	-0.168477	0.09272072	-1.81703	0.0728	
logMg	0.412137	0.12817458	3.21543	0.0019	
logP	0.16449	0.11509011	1.42922	0.1567	
MAT	-0.349605	0.11999031	-2.91361	0.0046	

Neighbour Lineage Diversity					
AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.924204	0.12651427	46.82637	0	205.0481
sesMNTD	0.130031	0.08819706	1.47432	0.1442	R^2
CWD	0.376748	0.12088845	3.11649	0.0025	0.4540511
logK	-0.177414	0.09862982	-1.79879	0.0757	
logMg	0.323659	0.14011374	2.30997	0.0234	
logP	0.094598	0.11696229	0.80879	0.4209	
MAT	-0.358164	0.14177504	-2.52628	0.0134	

Simpson Index + Neighbour Lineage Diversity AGWP	Value	Std.Error	t-value	p-value	AIC
(Intercept)	5.849312	0.10243729	57.10139	0	199.0837
Simpson	0.150287	0.09267739	1.62161	0.1087	R^2
sesMNTD	0.151988	0.0807984	1.88107	0.0635	0.4721896
CWD	0.290739	0.10985374	2.6466	0.0097	
logK	-0.17766	0.08902612	-1.99559	0.0493	
logMg	0.328155	0.12829232	2.55787	0.0124	
logP	0.141448	0.11379173	1.24304	0.2174	
MAT	-0.287862	0.11668115	-2.46708	0.0157	

Null model AGB	Value	Std.Error	t-value	p-value	AIC
(Intercept)	306.62	7.59	40.38	0.00	972.01
logMg	21.85	7.92	2.76	0.01	R^2
MAT	-18.98	9.93	-1.91	0.06	0.74
Nstems	10.32	6.02	1.72	0.09	
WD	-457.09	110.41	-4.14	0.00	
WD2	567.06	109.98	5.16	0.00	

	Value	Std.Error	t-value	p-value	AIC
(Intercept)	306.62	7.59	40.38	0.00	972.01
logMg	21.85	7.92	2.76	0.01	R^2
MAT	-18.98	9.93	-1.91	0.06	0.74
Nstems	10.32	6.02	1.72	0.09	
WD	-457.09	110.41	-4.14	0.00	
WD2	567.06	109.98	5.16	0.00	

Supplementary Information Figure 14: Phylogeny (based on *rbcL* and *matK* plastid gene) of 526 Amazonian tree genera with internal and terminal branches coloured according to their contribution to wood productivity (mean DFBETAS). DFBETAS were extracted from the regression of Simpson Index and Neighbour Lineage Diversity against wood productivity, while controlling for environmental variables (climate and soil), structural attributes (wood density, potential tree size and number of stems) and spatial auto correlation. **a) DFBETAS for Simpson Index and B) Neighbor Lineage Diversity (sesMNTD).** Branches were coloured using a continuous.

DFBETA sesMNTD

−0.029 · · · 0.026
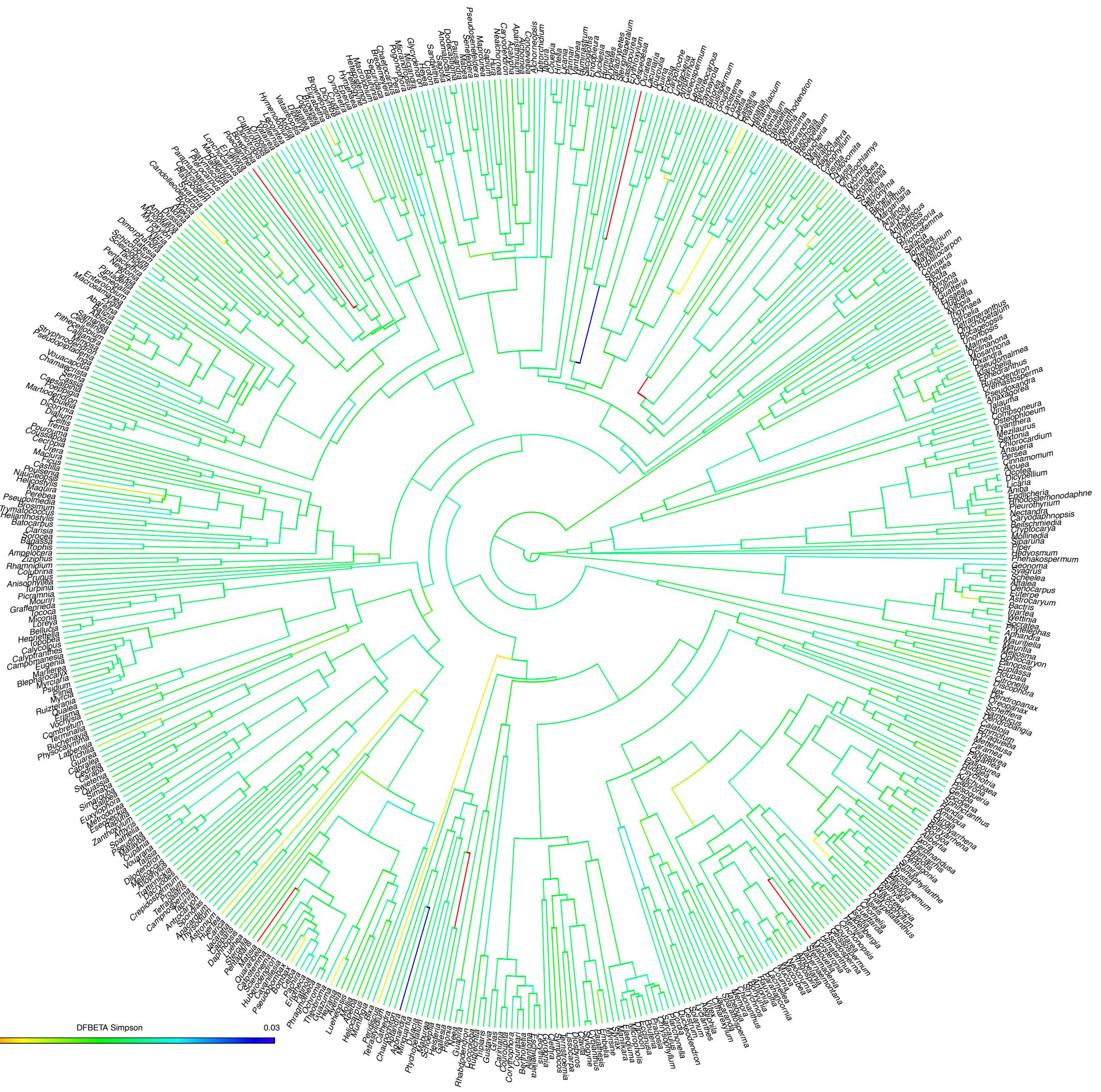
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