**Tall stature and small leaves: ecological strategies that enhance tree growth across the subtropical Brazilian Atlantic Forest**

**Supplementary information**

Table S1: Plot codes, spatial location, plot area (in hectares), census interval (in years), species richness, number of stems for all species in the community, and mean height per plot (in meters) across the subtropical Brazilian Atlantic Forest.

| **Plot and census information** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Plot code | Latitude | Longitude | Area (ha) | Census 1 | Census 2 | Census interval (yr) | Species richness | Number of stems | Mean height (m) |
| Aluvial-Lages | -27.84 | -50.23 | 0.96 | 2017 | 2022 | 5 | 61 | 1742 | 8 |
| Bom Jardim da Serra | -28.34 | -49.74 | 1.00 | 2012 | 2016 | 4 | 49 | 1114 | 9 |
| CapaoAlto | -28.20 | -50.75 | 1.00 | 2013 | 2017 | 4 | 61 | 1738 | 11 |
| CRH-01 | -25.27 | -48.69 | 0.06 | 2016 | 2022 | 6 | 15 | 71 | 8 |
| CRH-02 | -25.36 | -48.78 | 0.06 | 2016 | 2022 | 5 | 17 | 155 | 8 |
| CRH-03 | -25.30 | -48.66 | 0.06 | 2016 | 2021 | 5 | 40 | 122 | 10 |
| CRH-04 | -25.29 | -48.74 | 0.06 | 2016 | 2022 | 6 | 11 | 60 | 8 |
| CRH-05 | -25.40 | -48.79 | 0.06 | 2016 | 2022 | 5 | 14 | 104 | 8 |
| CRH-07 | -25.30 | -48.67 | 0.06 | 2016 | 2022 | 6 | 23 | 125 | 5 |
| CRH-08 | -25.30 | -48.67 | 0.06 | 2016 | 2021 | 5 | 38 | 113 | 8 |
| CRH-09 | -25.30 | -48.68 | 0.06 | 2016 | 2021 | 5 | 39 | 101 | 12 |
| CRH-10 | -25.33 | -48.66 | 0.06 | 2016 | 2022 | 6 | 31 | 88 | 13 |
| CRH-11 | -25.33 | -48.67 | 0.06 | 2016 | 2022 | 6 | 27 | 91 | 11 |
| CRH-12 | -25.29 | -48.68 | 0.06 | 2016 | 2022 | 6 | 39 | 87 | 11 |
| CRH-13 | -25.30 | -48.70 | 0.06 | 2017 | 2022 | 5 | 14 | 26 | 10 |
| CRH-14 | -25.36 | -48.78 | 0.06 | 2017 | 2022 | 5 | 19 | 115 | 12 |
| CRH-15 | -25.30 | -48.66 | 0.06 | 2017 | 2021 | 4 | 35 | 80 | 7 |
| CRH-16 | -25.31 | -48.66 | 0.06 | 2016 | 2021 | 5 | 17 | 77 | 11 |
| CRH-17 | -25.30 | -48.66 | 0.06 | 2017 | 2022 | 5 | 17 | 106 | 10 |
| CRH-18 | -25.30 | -48.66 | 0.06 | 2017 | 2022 | 5 | 4 | 12 | 7 |
| CRH-19 | -25.31 | -48.69 | 0.06 | 2017 | 2021 | 5 | 26 | 60 | 7 |
| CRH-20 | -25.32 | -48.70 | 0.06 | 2016 | 2021 | 5 | 41 | 101 | 12 |
| CRH-21 | -25.32 | -48.70 | 0.06 | 2016 | 2021 | 5 | 33 | 117 | 12 |
| CRH-22 | -25.32 | -48.70 | 0.06 | 2017 | 2021 | 5 | 37 | 149 | 11 |
| CRH-23 | -25.29 | -48.66 | 0.06 | 2016 | 2021 | 5 | 22 | 94 | 11 |
| CRH-24 | -25.30 | -48.67 | 0.06 | 2016 | 2021 | 5 | 27 | 62 | 12 |
| CRH-25 | -25.30 | -48.66 | 0.06 | 2017 | 2021 | 5 | 31 | 128 | 13 |
| CRH-26 | -25.30 | -48.65 | 0.06 | 2016 | 2021 | 5 | 48 | 101 | 10 |
| CRH-27 | -25.32 | -48.66 | 0.06 | 2016 | 2022 | 5 | 40 | 95 | 11 |
| CRH-28 | -25.30 | -48.66 | 0.06 | 2016 | 2021 | 6 | 44 | 114 | 10 |
| CRH-29 | -25.30 | -48.66 | 0.06 | 2016 | 2021 | 6 | 25 | 107 | 10 |
| CRH-30 | -25.33 | -48.70 | 0.06 | 2016 | 2022 | 6 | 16 | 107 | 11 |
| CRH-31 | -25.33 | -48.69 | 0.06 | 2016 | 2022 | 6 | 15 | 81 | 9 |
| CRH-32 | -25.31 | -48.68 | 0.06 | 2016 | 2022 | 5 | 11 | 36 | 8 |
| CRH-33 | -25.30 | -48.70 | 0.06 | 2017 | 2021 | 4 | 20 | 62 | 10 |
| CRH-34 | -25.32 | -48.68 | 0.06 | 2016 | 2022 | 6 | 30 | 113 | 11 |
| CRH-35 | -25.32 | -48.68 | 0.06 | 2016 | 2022 | 6 | 22 | 75 | 12 |
| EEA-01 | -29.39 | -50.24 | 0.12 | 2017 | 2023 | 6 | 20 | 136 | 10 |
| EEA-02 | -29.38 | -50.24 | 0.12 | 2017 | 2023 | 6 | 25 | 209 | 10 |
| EEA-03 | -29.37 | -50.26 | 0.12 | 2017 | 2023 | 6 | 18 | 142 | 9 |
| ENN-01 | -29.62 | -50.18 | 0.12 | 2014 | 2020 | 6 | 44 | 260 | 9 |
| ENN-02 | -29.61 | -50.19 | 0.12 | 2014 | 2020 | 6 | 49 | 245 | 11 |
| Epagri-SJC | -27.75 | -50.43 | 1.00 | 2015 | 2022 | 7 | 73 | 1575 | 10 |
| FNC-01 | -27.11 | -52.78 | 1.20 | 2012 | 2017 | 6 | 61 | 809 | 12 |
| MFO-01 | -29.54 | -50.19 | 0.12 | 2014 | 2020 | 6 | 45 | 227 | 11 |
| Mundo Novo-Urubici | -28.07 | -49.63 | 1.00 | 2015 | 2019 | 4 | 27 | 1732 | 9 |
| PARNAMUL-Lages | -27.79 | -50.35 | 1.00 | 2015 | 2019 | 4 | 66 | 1002 | 8 |
| Parque Sao Joaquim\_1 | -28.09 | -49.50 | 0.20 | 2016 | 2020 | 4 | 29 | 444 | 7 |
| Parque Sao Joaquim\_2 | -28.07 | -49.51 | 0.20 | 2016 | 2020 | 4 | 12 | 119 | 4 |
| Parque Sao Joaquim\_3 | 28.16 | -49.61 | 0.20 | 2016 | 2020 | 4 | 17 | 425 | 6 |
| Parque Sao Joaquim\_4 | 28.14 | -49.63 | 0.20 | 2017 | 2020 | 3 | 27 | 410 | 6 |
| Pedras Brancas1-Lages | -27.86 | -50.19 | 1.00 | 2012 | 2016 | 4 | 82 | 1752 | 11 |
| Pedras Brancas2-Lages | -27.85 | -50.17 | 1.00 | 2012 | 2016 | 4 | 64 | 1527 | 8 |
| PNA-01 | -29.17 | -50.12 | 0.34 | 2014 | 2020 | 6 | 23 | 268 | 9 |
| PNA-02 | -29.18 | -50.10 | 0.34 | 2014 | 2020 | 6 | 21 | 222 | 10 |
| PNA-03 | -29.16 | -50.09 | 0.34 | 2014 | 2020 | 6 | 27 | 134 | 9 |
| PRM-01 | -29.49 | -50.21 | 0.12 | 2014 | 2019 | 5 | 35 | 272 | 10 |
| PRM-02 | -29.49 | -50.19 | 0.34 | 2014 | 2019 | 5 | 29 | 212 | 10 |
| PRM-03 | -29.48 | -50.22 | 0.34 | 2014 | 2019 | 5 | 29 | 258 | 8 |
| Vargem | -27.56 | -50.96 | 0.96 | 2014 | 2015 | 1 | 68 | 1358 | 8 |

Table S2: Information about species used to conduct the analyses. SD = standard deviation. In addition to the Relative Growth Rate used in the analysis (see main file), we calculated the mean absolute Annual Growth Rates (AGR) and included in this file as supplementary information. The AGR estimates was calculated per stem by accounting for the stem dbht1 minus stem dbht0, divided by t in years, and summarised as species mean absolute growth rate. This AGR information is crucial for restoration projects.

| **Species information**  Species identity, growth rates, number of stems per species, median height, and forest stratum category | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Species code | Species | Family | Relative Growth Rate  (mm\*mm-1/yr) | Mean absolute growth rate (dbh, mm/yr) | SD absolute growth rate (dbh, mm/yr) | Number of stems | Median height (m) | Forest stratum |
| Actc | *Actinostemon concolor* | Euphorbiaceae | 0.18 | 0.9 | 1.0 | 37 | 7.1 | Understory |
| Alcg | *Alchornea glandulosa* | Euphorbiaceae | 0.24 | 4.8 | 4.7 | 56 | 12.2 | Canopy |
| Alct | *Alchornea triplinervia* | Euphorbiaceae | 0.22 | 4.6 | 6.7 | 15 | 15.0 | Canopy |
| Alle | *Allophylus edulis* | Sapindaceae | 0.64 | 2.0 | 3.2 | 473 | 7.0 | Understory |
| Allg | *Allophylus guaraniticus* | Sapindaceae | 0.31 | 1.9 | 1.5 | 32 | 7.0 | Understory |
| Annr | *Annona rugulosa* | Annonaceae | 0.38 | 1.8 | 2.5 | 93 | 7.0 | Understory |
| Arca | *Araucaria angustifolia* | Araucariaceae | 0.32 | 4.3 | 4.1 | 822 | 12.0 | Canopy |
| Atlg | *Ateleia glazioveana* | Fabaceae | 0.19 | 4.4 | 4.6 | 10 | 22.0 | Canopy |
| Bnrt | *Banara tomentosa* | Salicaceae | 0.27 | 1.3 | 1.2 | 112 | 8.0 | Understory |
| Btha | *Bathysa australis* | Rubiaceae | 0.20 | 0.6 | 0.7 | 15 | 8.2 | Understory |
| Blps | *Blepharocalyx salicifolius* | Myrtaceae | 0.25 | 2.3 | 2.1 | 203 | 9.0 | Understory |
| Cbrc | *Cabralea canjerana* | Meliaceae | 0.19 | 2.1 | 1.9 | 39 | 14.0 | Canopy |
| Clyg | *Calyptranthes grandifolia* | Myrtaceae | 0.19 | 2.3 | 2.3 | 12 | 10.0 | Canopy |
| Cmpx | *Campomanesia xanthocarpa* | Myrtaceae | 0.28 | 2.0 | 2.2 | 140 | 9.0 | Understory |
| Csrd | *Casearia decandra* | Salicaceae | 0.31 | 1.5 | 1.5 | 517 | 7.0 | Understory |
| Csro | *Casearia obliqua* | Salicaceae | 0.24 | 1.7 | 1.8 | 207 | 8.3 | Understory |
| Csrs | *Casearia sylvestris* | Salicaceae | 0.25 | 2.1 | 2.1 | 108 | 9.4 | Understory |
| Cdrf | *Cedrela fissilis* | Meliaceae | 0.46 | 3.8 | 4.2 | 44 | 12.8 | Canopy |
| Chri | *Chrysophyllum inornatum* | Sapotaceae | 0.19 | 1.5 | 1.4 | 23 | 10.0 | Canopy |
| Chrm | *Chrysophyllum marginatum* | Sapotaceae | 0.19 | 1.6 | 1.8 | 16 | 17.0 | Canopy |
| Cnnd | *Cinnamodendron dinisii* | Canellaceae | 0.22 | 1.1 | 1.4 | 46 | 6.0 | Understory |
| Ctrg | *Citronella gongonha* | Cardiopteridaceae | 0.30 | 2.3 | 1.9 | 29 | 7.8 | Understory |
| Ctrp | *Citronella paniculata* | Cardiopteridaceae | 0.33 | 2.7 | 1.6 | 13 | 9.0 | Understory |
| Clts | *Clethra scabra* | Clethraceae | 0.28 | 3.4 | 3.0 | 46 | 9.0 | Understory |
| Crda | *Cordia americana* | Cordiaceae | 0.18 | 2.1 | 2.1 | 16 | 14.0 | Canopy |
| Cssc | *Coussarea contracta* | Rubiaceae | 0.19 | 1.7 | 1.2 | 140 | 8.0 | Understory |
| Cpnv | *Cupania vernalis* | Sapindaceae | 0.32 | 1.7 | 2.1 | 309 | 10.0 | Canopy |
| Dlbf | *Dalbergia frutescens* | Fabaceae | 0.24 | 1.4 | 1.2 | 39 | 6.5 | Understory |
| Dphf | *Daphnopsis fasciculata* | Thymelaeaceae | 0.22 | 2.4 | 1.5 | 31 | 6.8 | Understory |
| Dtns | *Diatenopteryx sorbifolia* | Sapindaceae | 0.20 | 4.2 | 2.5 | 24 | 12.0 | Canopy |
| Drma | *Drimys angustifolia* | Winteraceae | 0.27 | 2.9 | 3.3 | 254 | 6.0 | Understory |
| Drmb | *Drimys brasiliensis* | Winteraceae | 0.28 | 1.8 | 1.6 | 86 | 6.0 | Understory |
| Eryd | *Erythroxylum deciduum* | Erythroxylaceae | 0.54 | 2.7 | 4.9 | 49 | 8.5 | Understory |
| Egnh | *Eugenia handroi* | Myrtaceae | 0.19 | 1.8 | 1.9 | 21 | 11.0 | Canopy |
| Egnm | *Eugenia multicostata* | Myrtaceae | 0.19 | 2.3 | 2.3 | 11 | 12.7 | Canopy |
| Egnp | *Eugenia pyriformis* | Myrtaceae | 0.35 | 1.4 | 1.5 | 44 | 8.5 | Understory |
| Egns | *Eugenia subterminalis* | Myrtaceae | 0.22 | 1.4 | 1.9 | 41 | 8.0 | Understory |
| Egnun | *Eugenia uniflora* | Myrtaceae | 0.26 | 1.2 | 1.0 | 114 | 7.0 | Understory |
| Egnur | *Eugenia uruguayensis* | Myrtaceae | 0.27 | 1.5 | 1.5 | 33 | 8.0 | Understory |
| Fjsl | *Feijoa sellowiana* | Myrtaceae | 0.29 | 2.4 | 3.0 | 77 | 6.0 | Understory |
| Grcg | *Garcinia gardneriana* | Clusiaceae | 0.19 | 1.2 | 1.3 | 18 | 8.4 | Understory |
| Gpro | *Guapira opposita* | Nyctaginaceae | 0.20 | 1.4 | 1.4 | 35 | 8.0 | Understory |
| Gymk | *Gymnanthes klotzschiana* | Euphorbiaceae | 0.29 | 1.8 | 2.3 | 430 | 8.0 | Understory |
| Hlta | *Helietta apiculata* | Rutaceae | 0.24 | 2.7 | 1.8 | 23 | 20.0 | Canopy |
| Hrna | *Hieronyma alchorneoides* | Phyllanthaceae | 0.22 | 4.2 | 4.2 | 83 | 14.3 | Canopy |
| Hrth | *Hirtella hebeclada* | Chrysobalanaceae | 0.20 | 1.4 | 1.0 | 11 | 13.7 | Canopy |
| Ilxd | *Ilex dumosa* | Aquifoliaceae | 0.24 | 2.7 | 3.0 | 33 | 9.0 | Understory |
| Ilxm | *Ilex microdonta* | Aquifoliaceae | 0.25 | 2.1 | 2.2 | 271 | 10.0 | Canopy |
| Ilxp | *Ilex paraguariensis* | Aquifoliaceae | 0.23 | 2.1 | 2.0 | 39 | 9.5 | Understory |
| Ilxt | *Ilex theezans* | Aquifoliaceae | 0.25 | 1.5 | 1.5 | 55 | 8.0 | Understory |
| Jcrp | *Jacaranda puberula* | Bignoniaceae | 0.25 | 2.3 | 2.3 | 268 | 8.0 | Understory |
| Lmnt | *Lamanonia ternata* | Cunoniaceae | 0.26 | 3.9 | 4.2 | 81 | 10.0 | Canopy |
| Lpla | *Laplacea acutifolia* | Theaceae | 0.20 | 3.0 | 2.3 | 11 | 10.0 | Canopy |
| Lthb | *Lithraea brasiliensis* | Anacardiaceae | 0.26 | 2.8 | 3.1 | 352 | 9.0 | Understory |
| Lhdv | *Luehea divaricata* | Malvaceae | 0.47 | 4.6 | 4.5 | 57 | 16.0 | Canopy |
| Mchp | *Machaerium paraguariense* | Fabaceae | 0.34 | 1.7 | 2.9 | 63 | 9.0 | Understory |
| Mtye | *Matayba elaeagnoides* | Sapindaceae | 0.24 | 2.0 | 2.5 | 690 | 10.0 | Canopy |
| Mlss | *Meliosma sellowii* | Sabiaceae | 0.19 | 1.7 | 2.7 | 16 | 9.5 | Understory |
| Mcnc | *Miconia cinnamomifolia* | Melastomataceae | 0.23 | 5.6 | 3.3 | 12 | 17.2 | Canopy |
| Mlls | *Mollinedia schottiana* | Monimiaceae | 0.20 | 1.1 | 1.3 | 39 | 6.0 | Understory |
| Mqnp | *Moquiniastrum polymorphum* | Asteraceae | 0.27 | 5.0 | 7.9 | 18 | 10.0 | Canopy |
| Mllc | *Muellera campestris* | Fabaceae | 0.50 | 1.7 | 2.4 | 92 | 7.5 | Understory |
| Myrcgg | *Myrceugenia glaucescens* | Myrtaceae | 0.25 | 1.7 | 1.7 | 21 | 5.0 | Understory |
| Myrcgnms | *Myrceugenia mesomischa* | Myrtaceae | 0.20 | 1.6 | 2.3 | 54 | 7.0 | Understory |
| Myrcgnmr | *Myrceugenia miersiana* | Myrtaceae | 0.22 | 1.5 | 2.5 | 62 | 7.0 | Understory |
| Myrcgnmy | *Myrceugenia myrcioides* | Myrtaceae | 0.21 | 1.5 | 2.6 | 178 | 7.0 | Understory |
| Myrcgo | *Myrceugenia oxysepala* | Myrtaceae | 0.25 | 1.1 | 1.3 | 53 | 5.0 | Understory |
| Myrcgl | *Myrcia glomerata* | Myrtaceae | 0.24 | 1.3 | 1.0 | 212 | 6.0 | Understory |
| Myrcgn | *Myrcia guianensis* | Myrtaceae | 0.25 | 1.8 | 1.7 | 74 | 7.5 | Understory |
| Myrcob | *Myrcia oblongata* | Myrtaceae | 0.16 | 0.9 | 1.2 | 12 | 3.0 | Understory |
| Myrcol | *Myrcia oligantha* | Myrtaceae | 0.22 | 1.3 | 2.2 | 26 | 6.0 | Understory |
| Myrcpl | *Myrcia palustris* | Myrtaceae | 0.26 | 1.7 | 1.4 | 105 | 6.0 | Understory |
| Myrr | *Myrcia retorta* | Myrtaceae | 0.19 | 1.9 | 2.8 | 147 | 10.0 | Canopy |
| Myrs | *Myrcia splendens* | Myrtaceae | 0.24 | 1.6 | 2.1 | 58 | 8.0 | Understory |
| Myrcng | *Myrcianthes gigantea* | Myrtaceae | 0.29 | 2.7 | 2.5 | 16 | 13.0 | Canopy |
| Myrcnp | *Myrcianthes pungens* | Myrtaceae | 0.27 | 4.4 | 9.2 | 16 | 9.0 | Understory |
| Myrcrfl | *Myrciaria floribunda* | Myrtaceae | 0.19 | 1.3 | 1.0 | 10 | 9.0 | Understory |
| Myrcrpf | *Myrocarpus frondosus* | Fabaceae | 0.23 | 1.8 | 1.3 | 39 | 10.0 | Canopy |
| Myra | *Myrrhinium atropurpureum* | Myrtaceae | 0.26 | 1.1 | 1.1 | 57 | 8.0 | Understory |
| Myrc | *Myrsine coriacea* | Primulaceae | 0.24 | 3.1 | 3.8 | 190 | 10.2 | Canopy |
| Myru | *Myrsine umbellata* | Primulaceae | 0.25 | 2.0 | 2.7 | 88 | 10.0 | Canopy |
| Nctl | *Nectandra lanceolata* | Lauraceae | 0.42 | 3.7 | 3.4 | 35 | 15.0 | Canopy |
| Nctndrmg | *Nectandra megapotamica* | Lauraceae | 0.49 | 4.1 | 4.1 | 325 | 10.0 | Canopy |
| Nctndrmm | *Nectandra membranacea* | Lauraceae | 0.22 | 1.4 | 0.9 | 10 | 12.5 | Canopy |
| Ncto | *Nectandra oppositifolia* | Lauraceae | 0.22 | 4.1 | 4.2 | 21 | 12.5 | Canopy |
| Octd | *Ocotea diospyrifolia* | Lauraceae | 0.21 | 2.2 | 2.2 | 110 | 14.0 | Canopy |
| Octe | *Ocotea elegans* | Lauraceae | 0.21 | 3.2 | 5.2 | 12 | 12.2 | Canopy |
| Octpr | *Ocotea porosa* | Lauraceae | 0.20 | 1.2 | 1.3 | 20 | 11.5 | Canopy |
| Octpb | *Ocotea puberula* | Lauraceae | 0.31 | 3.5 | 4.1 | 66 | 15.0 | Canopy |
| Octpl | *Ocotea pulchella* | Lauraceae | 0.29 | 2.5 | 2.6 | 228 | 10.0 | Canopy |
| Orpf | *Oreopanax fulvus* | Araliaceae | 0.29 | 3.9 | 5.7 | 17 | 7.5 | Understory |
| Prgl | *Pera glabrata* | Peraceae | 0.21 | 2.6 | 4.6 | 179 | 10.5 | Canopy |
| Plcp | *Pilocarpus pennatifolius* | Rutaceae | 0.25 | 1.1 | 1.1 | 44 | 6.0 | Understory |
| Ppta | *Piptocarpha axillaris* | Asteraceae | 0.22 | 4.8 | 3.6 | 14 | 12.0 | Canopy |
| Pdcl | *Podocarpus lambertii* | Podocarpaceae | 0.27 | 2.8 | 2.9 | 314 | 8.5 | Understory |
| Psyn | *Psychotria nuda* | Rubiaceae | 0.21 | 1.5 | 2.7 | 81 | 5.3 | Understory |
| Psys | *Psychotria suterella* | Rubiaceae | 0.20 | 1.1 | 1.3 | 40 | 5.0 | Understory |
| Qngl | *Quiina glaziovii* | Quiinaceae | 0.20 | 1.0 | 0.8 | 11 | 13.3 | Canopy |
| Qllb | *Quillaja brasiliensis* | Quillajaceae | 0.23 | 4.4 | 3.7 | 10 | 14.0 | Canopy |
| Rplm | *Roupala montana* | Proteaceae | 0.24 | 1.7 | 1.7 | 29 | 10.0 | Canopy |
| Rdgj | *Rudgea jasminoides* | Rubiaceae | 0.21 | 0.7 | 0.6 | 17 | 7.4 | Understory |
| Spmg | *Sapium glandulosum* | Euphorbiaceae | 0.31 | 3.2 | 5.0 | 122 | 11.0 | Canopy |
| Schl | *Schinus lentiscifolia* | Anacardiaceae | 0.28 | 2.3 | 1.7 | 30 | 9.0 | Understory |
| Scht | *Schinus terebinthifolia* | Anacardiaceae | 0.30 | 2.7 | 5.7 | 21 | 9.0 | Understory |
| Sctb | *Scutia buxifolia* | Rhamnaceae | 0.27 | 2.6 | 2.9 | 84 | 7.0 | Understory |
| Sbsb | *Sebastiania brasiliensis* | Euphorbiaceae | 0.29 | 1.7 | 2.0 | 179 | 6.0 | Understory |
| Sphr | *Siphoneugena reitzii* | Myrtaceae | 0.22 | 1.3 | 1.9 | 80 | 7.0 | Understory |
| Slng | *Sloanea guianensis* | Elaeocarpaceae | 0.21 | 2.2 | 2.0 | 58 | 12.0 | Canopy |
| Slns | *Solanum sanctaecatharinae* | Solanaceae | 0.27 | 2.4 | 1.9 | 25 | 9.0 | Understory |
| Srcb | *Sorocea bonplandii* | Moraceae | 0.18 | 0.8 | 0.6 | 31 | 7.0 | Understory |
| Styl | *Styrax leprosus* | Styracaceae | 0.83 | 2.9 | 5.5 | 129 | 8.0 | Understory |
| Symu | *Symplocos uniflora* | Symplocaceae | 0.26 | 3.0 | 2.9 | 44 | 7.0 | Understory |
| Tprg | *Tapirira guianensis* | Anacardiaceae | 0.24 | 5.5 | 4.2 | 11 | 16.5 | Canopy |
| Ttrr | *Tetrorchidium rubrivenium* | Euphorbiaceae | 0.19 | 2.9 | 13.6 | 17 | 16.8 | Canopy |
| Trcc | *Trichilia claussenii* | Meliaceae | 0.17 | 1.2 | 1.3 | 10 | 12.0 | Canopy |
| Trcl | *Trichilia lepidota* | Meliaceae | 0.21 | 2.0 | 1.7 | 12 | 11.5 | Canopy |
| Vrnd | *Vernonanthura discolor* | Asteraceae | 0.26 | 4.1 | 5.4 | 67 | 11.0 | Canopy |
| Vrlb | *Virola bicuhyba* | Myristicaceae | 0.20 | 2.5 | 2.6 | 20 | 13.4 | Canopy |
| Wnmp | *Weinmannia paulliniifolia* | Cunoniaceae | 0.27 | 3.0 | 4.2 | 62 | 8.0 | Understory |
| Zntk | *Zanthoxylum kleinii* | Rutaceae | 0.23 | 2.6 | 2.8 | 79 | 10.0 | Canopy |
| Zntr | *Zanthoxylum rhoifolium* | Rutaceae | 0.40 | 2.8 | 3.3 | 91 | 9.5 | Understory |

Table S3: Functional traits selected to represent species ecological strategies, their rationale, empirical support, mean values across the sample, standard deviation (*SD*), lower (minimum) and higher (maximum) values of each trait within the dataset.

| **Functional traits selected to obtain species ecological strategies** | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Functional trait | Abbreviation | Rationale | Reference | Forest stratum | Mean value | *SD* | Lower | Higher |
| Maximum height (m) | Height | Light access and competitive ability | Westoby (1998) | All | 22.20 | 5.63 | 3.00 | 34.00 |
|  |  |  |  | Canopy | 25.40 | 5.21 | 14.40 | 34.00 |
|  |  |  |  | Understory | 20.10 | 4.82 | 3.00 | 30.00 |
| Leaf Area (cm2) | LA | Leaf energy and water balance | Diaz et al. (2016) | All | 14.80 | 31.30 | 0.76 | 704.08 |
|  |  |  |  | Canopy | 18.40 | 25.89 | 1.08 | 205.03 |
|  |  |  |  | Understory | 12.40 | 34.29 | 0.76 | 704.08 |
| Leaf Dry Matter Content (LDMC, mg/g) | LDMC | Leaf stem structures, nutrient cycling, forest productivity | Fortunel et al. (2009);  Smart et al. (2017) | All | 390.60 | 56.47 | 201.08 | 508.60 |
|  |  |  |  | Canopy | 389.40 | 54.69 | 226.13 | 508.60 |
|  |  |  |  | Understory | 391.40 | 57.64 | 201.08 | 502.37 |
| Leaf Nitrogen Content (LNC, %) | LNC | Dark respiration and photosynthetic assimilation | Rowland et al. (2017); Wright et al. (2004) | All | 1.80 | 0.55 | 0.91 | 5.20 |
|  |  |  |  | Canopy | 1.70 | 0.58 | 0.91 | 5.20 |
|  |  |  |  | Understory | 1.80 | 0.53 | 1.00 | 3.90 |
| Leaf Phosphorus Content (LPC, %) | LPC | Nucleic acids, lipid membranes, and bioenergetic molecules (e.g., Adenosine triphosphate, ATP). | Wright et al. (2004) | All | 0.10 | 0.04 | 0.04 | 0.30 |
|  |  |  |  | Canopy | 0.10 | 0.05 | 0.04 | 0.30 |
|  |  |  |  | Understory | 0.10 | 0.04 | 0.06 | 0.30 |
| Specific Leaf Area (SLA, cm2/g) | SLA | Photosynthetic assimilation, leaf nutrient concentration, and light interception | Poorter et al. (2008); Wright et al. (2004) | All | 109.50 | 40.61 | 31.91 | 265.99 |
|  |  |  |  | Canopy | 91.60 | 30.65 | 48.66 | 196.44 |
|  |  |  |  | Understory | 121.70 | 41.99 | 31.91 | 265.99 |
| Wood Density (WD, g/cm3) | WD | Hydraulic conductance, stem structures | Chave et al. (2009); Poorter et al. (2008) | All | 0.60 | 0.11 | 0.34 | 0.86 |
|  |  |  |  | Canopy | 0.50 | 0.10 | 0.34 | 0.86 |
|  |  |  |  | Understory | 0.60 | 0.11 | 0.34 | 0.82 |

Table S4: Principal Component Analysis’ loadings. Loadings with values ≥ 0.35 are highlighted in bold.

| **Principal Component Analysis - loadings** (higher loadings of the three first axes are in bold)  Based on species functional trait values across subtropical Brazilian Atlantic Forest | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Functional traits | Forest stratum | PC1 | PC2 | PC3 | PC4 | PC5 | PC6 | PC7 |
| WD | All | 0.24 | -0.31 | **0.74** | -0.38 | 0.30 | 0.03 | -0.26 |
| SLA | All | **-0.50** | 0.06 | 0.04 | -0.36 | 0.45 | 0.11 | 0.64 |
| LNC | All | **-0.47** | -0.28 | 0.12 | -0.19 | -0.43 | -0.68 | -0.05 |
| LPC | All | **-0.48** | -0.33 | -0.01 | -0.04 | -0.30 | 0.70 | -0.28 |
| LDMC | All | **0.42** | **-0.49** | 0.03 | -0.01 | -0.41 | 0.14 | 0.63 |
| Height | All | -0.17 | **-0.53** | 0.03 | 0.69 | 0.44 | -0.13 | 0.02 |
| LA | All | -0.18 | **0.44** | **0.66** | 0.45 | -0.28 | 0.09 | 0.22 |
| WD | Canopy | **0.35** | -0.11 | **0.50** | -0.17 | -0.71 | -0.02 | -0.28 |
| SLA | Canopy | **-0.50** | 0.04 | **0.35** | 0.09 | -0.23 | -0.51 | 0.55 |
| LNC | Canopy | **-0.38** | **-0.49** | **0.39** | -0.04 | 0.12 | 0.66 | 0.10 |
| LPC | Canopy | **-0.54** | -0.11 | 0.03 | -0.14 | 0.10 | -0.33 | -0.74 |
| LDMC | Canopy | 0.29 | **-0.53** | 0.02 | -0.60 | 0.33 | -0.36 | 0.18 |
| Height | Canopy | -0.31 | 0.12 | **-0.49** | -0.61 | -0.44 | 0.22 | 0.14 |
| LA | Canopy | 0.01 | **0.66** | **0.47** | -0.46 | 0.34 | 0.13 | -0.01 |
| WD | Understory | 0.15 | **-0.45** | **0.73** | -0.13 | 0.36 | -0.06 | -0.29 |
| SLA | Understory | **-0.50** | -0.08 | -0.09 | 0.03 | 0.70 | 0.14 | 0.47 |
| LNC | Understory | **-0.50** | -0.25 | 0.06 | 0.13 | -0.26 | -0.77 | 0.04 |
| LPC | Understory | **-0.41** | **-0.39** | 0.15 | 0.35 | -0.42 | 0.60 | -0.04 |
| LDMC | Understory | **0.48** | **-0.35** | 0.09 | 0.11 | -0.19 | -0.07 | 0.76 |
| Height | Understory | -0.06 | **-0.53** | **-0.42** | -0.73 | -0.09 | 0.08 | -0.07 |
| LA | Understory | -0.27 | **0.42** | **0.50** | -0.55 | -0.30 | 0.10 | 0.32 |

Table S5: Principal Component Analysis’ variables importance.

| **Principal Component Analysis - variable importance**  Based on species functional trait values across subtropical Brazilian Atlantic Forest | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Forest stratum | Results | PC1 | PC2 | PC3 | PC4 | PC5 | PC6 | PC7 |
| All | Standard deviation | 1.58 | 1.17 | 0.98 | 0.94 | 0.78 | 0.62 | 0.57 |
| All | Proportion of Variance | 0.36 | 0.19 | 0.14 | 0.13 | 0.09 | 0.05 | 0.05 |
| All | Cumulative Proportion | 0.36 | 0.55 | 0.69 | 0.81 | 0.90 | 0.95 | 1.00 |
| Canopy | Standard deviation | 1.61 | 1.09 | 0.99 | 0.92 | 0.85 | 0.62 | 0.52 |
| Canopy | Proportion of Variance | 0.37 | 0.17 | 0.14 | 0.12 | 0.10 | 0.05 | 0.04 |
| Canopy | Cumulative Proportion | 0.37 | 0.54 | 0.68 | 0.80 | 0.91 | 0.96 | 1.00 |
| Understory | Standard deviation | 1.65 | 1.29 | 0.97 | 0.83 | 0.70 | 0.53 | 0.48 |
| Understory | Proportion of Variance | 0.39 | 0.24 | 0.13 | 0.10 | 0.07 | 0.04 | 0.03 |
| Understory | Cumulative Proportion | 0.39 | 0.63 | 0.76 | 0.86 | 0.93 | 0.97 | 1.00 |

Table S6: Model results for all species derived from the pGLS model for testing phylogenetic independence. Best models are highlighted in bold colour.

| **Model results**  pGLS test for phylogenetic independence | | | | |
| --- | --- | --- | --- | --- |
| Forest stratum | Predictor | Test | df | AIC |
| All | PC1 | With phylo | 3 | 290.4 |
| All | PC1 | Without phylo | 3 | **198.6** |
| All | PC2 | With phylo | 3 | 285.5 |
| All | PC2 | Without phylo | 3 | **191.3** |
| All | PC3 | With phylo | 3 | 281.7 |
| All | PC3 | Without phylo | 3 | **194.4** |
| Canopy | PC1 | With phylo | 3 | 278 |
| Canopy | PC1 | Without phylo | 3 | **14.7** |
| Canopy | PC2 | With phylo | 3 | 184.1 |
| Canopy | PC2 | Without phylo | 3 | **17.1** |
| Canopy | PC3 | With phylo | 3 | 197.2 |
| Canopy | PC3 | Without phylo | 3 | **7.2** |
| Understory | PC1 | With phylo | 3 | 437.5 |
| Understory | PC1 | Without phylo | 3 | **100** |
| Understory | PC2 | With phylo | 3 | 627.3 |
| Understory | PC2 | Without phylo | 3 | **94.2** |
| Understory | PC3 | With phylo | 3 | 601.3 |
| Understory | PC3 | Without phylo | 3 | **95.3** |

Table S7: Model selection for OLS models testing the relationship between functional strategies and species relative growth rates for all, canopy, and understory species. The models selected are highlighted in bold colour. df = degrees of freedom; logLik = log likelihood.

| **Model selection (AICc) results**  AICc selection for models that test the effect of functional strategies in species growth | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Response | Response Intercept | PC1 | PC2 | PC3 | df | logLik | AICc | delta | weight |
| All | -1.38 | - | -0.06 | -0.04 | 4 | -7.18 | 22.71 | 0.00 | 0.34 |
| All | -1.38 | -0.02 | -0.06 | -0.04 | 5 | -6.28 | 23.08 | 0.37 | 0.28 |
| **All** | **-1.38** | **-** | **-0.06** | **-** | **3** | **-8.79** | **23.78** | **1.08** | **0.20** |
| All | -1.38 | -0.02 | -0.06 | - | 4 | -7.91 | 24.17 | 1.46 | 0.16 |
| All | -1.38 | - | - | -0.04 | 3 | -12.13 | 30.46 | 7.75 | 0.01 |
| All | -1.38 | -0.02 | - | -0.04 | 4 | -11.30 | 30.94 | 8.23 | 0.01 |
| All | -1.38 | - | - | - | 2 | -13.61 | 31.33 | 8.62 | 0.00 |
| All | -1.38 | -0.02 | - | - | 3 | -12.80 | 31.81 | 9.10 | 0.00 |
| **Canopy** | **-1.44** | **-0.04** | **-** | **-0.1** | **4** | **6.54** | **-4.24** | **0.00** | **0.53** |
| Canopy | -1.44 | - | - | -0.1 | 3 | 4.47 | -2.45 | 1.79 | 0.22 |
| Canopy | -1.44 | -0.04 | 0.01 | -0.1 | 5 | 6.58 | -1.86 | 2.38 | 0.16 |
| Canopy | -1.44 | - | 0.01 | -0.1 | 4 | 4.51 | -0.17 | 4.07 | 0.07 |
| Canopy | -1.44 | -0.04 | - | - | 3 | 1.11 | 4.27 | 8.51 | 0.01 |
| Canopy | -1.44 | - | - | - | 2 | -0.58 | 5.40 | 9.64 | 0.00 |
| Canopy | -1.44 | -0.04 | 0.01 | - | 4 | 1.14 | 6.56 | 10.80 | 0.00 |
| Canopy | -1.44 | - | 0.01 | - | 3 | -0.55 | 7.60 | 11.84 | 0.00 |
| **Understory** | **-1.34** | **-** | **-0.09** | **-** | **3** | **-4.38** | **15.13** | **0.00** | **0.42** |
| Understory | -1.34 | - | -0.09 | 0.04 | 4 | -3.70 | 16.02 | 0.89 | 0.27 |
| Understory | -1.34 | -0.01 | -0.09 | - | 4 | -4.10 | 16.82 | 1.69 | 0.18 |
| Understory | -1.34 | -0.01 | -0.09 | 0.04 | 5 | -3.41 | 17.77 | 2.64 | 0.11 |
| Understory | -1.34 | - | - | - | 2 | -10.35 | 24.88 | 9.75 | 0.00 |
| Understory | -1.34 | - | - | 0.04 | 3 | -9.77 | 25.92 | 10.79 | 0.00 |
| Understory | -1.34 | -0.01 | - | - | 3 | -10.11 | 26.59 | 11.46 | 0.00 |
| Understory | -1.34 | -0.01 | - | 0.04 | 4 | -9.53 | 27.69 | 12.56 | 0.00 |

Table S8: Ordinary Least Square model results, considering the best and more parsimonious model (Table S7). Relative growth rates for all, canopy, and understory species are the response variables, and the principal components 1 to 3 are the predictor variables.

| **Model results**  Effect of functional strategies in tree growth | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Response | Predictor | Estimate | SE | Statistic | CI 2.5% | CI 97.5% | R2.adj |
| All | PC2 | -0.06 | 0.02 | -3.14 | **-0.104** | **-0.028** | 0.068 |
| Canopy | PC1 | -0.03 | 0.01 | -2.01 | -0.099 | 0.005 | 0.208 |
| Canopy | PC3 | -0.10 | 0.03 | -3.37 | **-0.174** | **-0.051** | 0.208 |
| Understory | PC2 | 0.08 | 0.02 | -3.55 | **-0.136** | **-0.043** | 0.146 |

Gráfico, Histograma

Descrição gerada automaticamente

Figure S1: Density plot showing the density distribution of species median height across the dataset. Species with median height < 10 m were categorised as understory species, while species ≥ 10 m were categorised as canopy species.

Uma imagem contendo Linha do tempo

O conteúdo gerado por IA pode estar incorreto.

Figure S2: Histograms of functional traits and relative growth rates’ values across subtropical Brazilian Atlantic Forest. SLA: Specific Leaf Area, LA: Leaf Area, LNC: Leaf Nitrogen Content, LPC: Leaf Phosphorous Content, LDMC: Leaf Dry-Matter Content, WD: Wood Density.

Gráfico, Gráfico de dispersão

O conteúdo gerado por IA pode estar incorreto.

Figure S3: Scatterplots of the relationship between relative growth rates and functional traits. SLA: Specific Leaf Area, LA: Leaf Area, LNC: Leaf Nitrogen Content, LPC: Leaf Phosphorous Content, LDMC: Leaf Dry-Matter Content, WD: Wood Density. The size and colours of the dots indicate species relative growth rates; therefore, the largest and greenest dots represent the species with the highest relative growth rate.