Table S1 Sampling situation of each subplot

|  |  |  |  |
| --- | --- | --- | --- |
| Subplot | Elevation | Number1 | Number2 |
| D0101 | 496.62 | 31 | 22 |
| D0104 | 501.9 | 24 | 21 |
| D0108 | 488.7575 | 23 | 21 |
| D0211 | 499.13 | 253 | 49 |
| D0307 | 493.785 | 76 | 35 |
| D0403 | 530.86 | 88 | 34 |
| D0411 | 481.8125 | 164 | 39 |
| D0601 | 535.2825 | 25 | 21 |
| D0606 | 528.5475 | 184 | 47 |
| D0609 | 493.9675 | 46 | 24 |
| D0613 | 446.21 | 26 | 17 |
| D0704 | 548.025 | 36 | 24 |
| D0711 | 455.8975 | 38 | 26 |
| D0808 | 495.6975 | 40 | 26 |
| D0902 | 530.5125 | 25 | 18 |
| D0904 | 548.4075 | 35 | 25 |
| D1006 | 530.58 | 16 | 15 |
| D1013 | 442.4575 | 30 | 25 |
| D1109 | 490.87 | 33 | 23 |
| D1201 | 512.5825 | 22 | 21 |
| D1205 | 548.6175 | 60 | 38 |
| D1211 | 464.58 | 15 | 9 |
| D1309 | 494.1875 | 67 | 18 |
| D1313 | 456.415 | 5 | 3 |

Number1: The actual number of *Castanopsis eyrei* in the subplot; Number2: The number of *C. eyrei* samples in the subplot

Table S2Characteristics of thirty SSR primers studied

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Repeat sequence** | **Size range (bp)** | **Reference** |
| Ccu62F15 | (TC)17 | 141-163 | Ueno et al. 2003 |
| Ccu90T17 | (TC)23 | 156-190 | Ueno et al. 2003 |
| Ccu87F23 | (TC)19 | 267-289 | Ueno et al. 2003 |
| Cch10 | (GTTTTG)3(GT)8 | 184-199 | Huang et al. 2009 |
| Cch12 | CAAC(CA)2GAAC | 150-175 | Huang et al. 2009 |
| Cch14 | (CACCCA)5 | 153-157 | Huang et al. 2009 |
| Ccu16H15 | (TC)16 | 136 | Shi et al. 2011a |
| Ccu28H18 | (CT)26 | 140 | Shi et al. 2011a |
| Ccu33H25 | (TG)11(TC)15 | 197 | Shi et al. 2011a |
| Ch2 KF725651 | (AC)6(AG)14 | 144-178 | Jiang et al. 2015 |
| Ch4 KF725653 | (AC)6(AG)6 | 213-281 | Jiang et al. 2015 |
| Ch5 KF725654 | (AC)6(AG)8 | 166-198 | Jiang et al. 2015 |
| Ch9 KF725658 | (AC)6(AG)5 | 167-195 | Jiang et al. 2015 |
| CS43 | (CT)9 | 92-106 | Shi et al. 2011b |
| CS92 | (GA)12…(AT)3 | 151-171 | Shi et al. 2011b |
| CS561 | (CT)20 | 316-352 | Shi et al. 2011b |
| CS620 | (CT)12 | 118-154 | Shi et al. 2011b |
| CS627 | (CT)16 | 190-232 | Shi et al. 2011b |
| CS687 | (CT)12 | 129-151 | Shi et al. 2011b |
| CFA04 | (AAG)11 | 174-202 | Shi et al. 2011b |
| CFA12 | (AGA)11 | 232-246 | Fu et al. 2010 |
| CFA25 | (GTT)7 | 224-240 | Fu et al. 2010 |
| CFA26 | (AAC)7 | 206-230 | Fu et al. 2010 |
| CFA31 | (GA)19 | 184-200 | Fu et al. 2010 |
| CFA35 | (AG)18 | 208-226 | Fu et al. 2010 |
| CFA45 | (AG)15 | 236-246 | Fu et al. 2010 |
| CFA46 | (TC)17 | 234-262 | Fu et al. 2010 |
| CFA57 | (TCT)23 | 174-202 | Fu et al. 2010 |
| CFA61 | (AC)11 | 180-200 | Fu et al. 2010 |
| CFA63 | (AT)7(TC)9 | 246-262 | Fu et al. 2010 |
| CFA71 | (AC)9…(AG)6 | 180-190 | Fu et al. 2010 |

Appendix 2 Table S3 Species information in 24 subplots

Table S4 Plots species diversity (SD\_SW, Shannon-Wiener index; SD\_SI, Simpson index; Pielou index, SD\_J; S, species richness) and genetic diversity (Na, observed number of alleles; Ne effective number of alleles ;I, shannon's information index; Ho, observed heterozygosity; He, expected heterozygosity)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| plot | SD\_SW | SD\_SI | SD\_J | S | Sample | Na | Ne | I | Ho | He |
| D0101 | 2.539  | 0.892  | 0.821  | 22 | 22 | 6.447 | 3.903 | 1.372 | 0.532 | 0.634 |
| D0104 | 1.496  | 0.639  | 0.650  | 10 | 21 | 6.184 | 3.768 | 1.355 | 0.517 | 0.632 |
| D0108 | 2.790  | 0.907  | 0.829  | 29 | 21 | 6.684 | 4.062 | 1.408 | 0.536 | 0.642 |
| D0211 | 2.171  | 0.797  | 0.645  | 29 | 48 | 7.790 | 4.134 | 1.436 | 0.527 | 0.639 |
| D0307 | 2.528  | 0.864  | 0.723  | 33 | 35 | 7.658 | 4.018 | 1.426 | 0.530 | 0.633 |
| D0403 | 2.234  | 0.831  | 0.734  | 21 | 34 | 7.237 | 3.924 | 1.412 | 0.541 | 0.637 |
| D0411 | 2.643  | 0.875  | 0.743  | 35 | 39 | 7.290 | 4.064 | 1.411 | 0.533 | 0.635 |
| D0601 | 2.568  | 0.895  | 0.798  | 25 | 21 | 6.237 | 3.818 | 1.340 | 0.536 | 0.626 |
| D0606 | 1.937  | 0.712  | 0.610  | 24 | 47 | 8.026 | 4.189 | 1.451 | 0.533 | 0.642 |
| D0609 | 2.838  | 0.914  | 0.792  | 36 | 24 | 7.026 | 4.043 | 1.416 | 0.534 | 0.643 |
| D0613 | 2.867  | 0.921  | 0.820  | 33 | 16 | 5.263 | 3.354 | 1.230 | 0.531 | 0.599 |
| D0704 | 2.274  | 0.843  | 0.715  | 24 | 24 | 6.737 | 4.016 | 1.383 | 0.544 | 0.636 |
| D0711 | 2.626  | 0.891  | 0.797  | 27 | 26 | 6.395 | 3.680 | 1.341 | 0.536 | 0.620 |
| D0808 | 2.784  | 0.911  | 0.811  | 31 | 25 | 6.395 | 3.899 | 1.355 | 0.538 | 0.623 |
| D0902 | 2.229  | 0.825  | 0.662  | 29 | 18 | 6.132 | 3.857 | 1.360 | 0.535 | 0.634 |
| D0904 | 2.216  | 0.841  | 0.707  | 23 | 25 | 6.395 | 4.157 | 1.394 | 0.554 | 0.644 |
| D1006 | 2.571  | 0.842  | 0.729  | 34 | 15 | 5.842 | 3.768 | 1.337 | 0.539 | 0.630 |
| D1013 | 2.472  | 0.830  | 0.695  | 35 | 25 | 6.105 | 3.746 | 1.328 | 0.521 | 0.618 |
| D1109 | 1.979  | 0.784  | 0.640  | 22 | 23 | 5.711 | 3.471 | 1.259 | 0.504 | 0.600 |
| D1201 | 2.622  | 0.893  | 0.805  | 26 | 21 | 5.763 | 3.496 | 1.272 | 0.546 | 0.611 |
| D1205 | 2.566  | 0.887  | 0.770  | 28 | 38 | 7.026 | 3.815 | 1.391 | 0.555 | 0.637 |
| D1211 | 2.802  | 0.904  | 0.824  | 30 | 9 | 4.500 | 3.144 | 1.138 | 0.522 | 0.570 |
| D1309 | 2.782  | 0.902  | 0.782  | 35 | 18 | 6.132 | 3.987 | 1.350 | 0.558 | 0.631 |
| D1313 | 2.890  | 0.916  | 0.834  | 32 | 5 | 3.395 | 2.648 | 0.987 | 0.568 | 0.547 |

Table S5 Plot information (ELE, mean elevation; CON, convexity; SLO, slope).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Plot | Group | ELE/m | CON | SLO | Plot | Group | ELE/m | CON | SLO |
| D0101 | Ⅲ | 496.62 | −9.70 | 9.70 | **D0711** | Ⅰ | 455.90 | −5.65 | 28.38 |
| D0104 | Ⅳ | 501.90 | −5.05 | 12.25 | **D0808** | Ⅱ | 495.70 | −2.82 | 37.83 |
| D0108 | Ⅲ | 488.76 | −6.81 | 29.57 | **D0902** | Ⅰ | 530.51 | −0.26 | 20.98 |
| D0211 | Ⅰ | 499.13 | 4.92 | 28.14 | **D0904** | Ⅳ | 548.41 | 4.90 | 18.66 |
| D0307 | Ⅰ | 493.79 | −13.80 | 7.79 | **D1006** | Ⅰ | 530.58 | 7.21 | 40.55 |
| D0403 | Ⅳ | 530.86 | 1.10 | 31.41 | **D1013** | Ⅰ | 442.46 | −4.05 | 26.47 |
| D0411 | Ⅱ | 481.81 | −2.24 | 26.85 | **D1109** | Ⅳ | 490.87 | −3.51 | 47.04 |
| D0601 | Ⅲ | 535.28 | −0.89 | 15.97 | **D1201** | Ⅲ | 512.58 | 17.44 | 21.66 |
| D0606 | Ⅲ | 528.53 | 1.01 | 32.38 | **D1205** | Ⅳ | 548.62 | 29.74 | 27.63 |
| D0609 | Ⅱ | 493.97 | 1.97 | 32.56 | **D1211** | Ⅲ | 464.58 | −78.82 | 31.20 |
| D0613 | Ⅱ | 446.21 | −3.24 | 9.88 | **D1309** | Ⅱ | 494.19 | 28.36 | 26.32 |
| D0704 | Ⅳ | 548.03 | 3.03 | 36.12 | **D1313** | Ⅱ | 456.42 | −41.86 | 25.77 |

Table S6 Soil properties (Mean ± SE (n =3) SOC, Soil organic carbon; TN, total nitrogen; TP, total phosphate; TK, total potassium).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Plot | SOC g/kg | TN g/kg | TP g/kg | TK g/kg | pH | C:N g/kg |
| D0101 | 19.08 ± 0.18 | 3.74 ± 0.02 | 0.33 ± 0.003 | 20.40 ± 0.01 | 5.21 ± 0.06 | 5.10 ± 0.03 |
| D0104 | 48.45 ± 0.73 | 2.51 ± 0.02 | 0.25 ± 0.001 | 18.63 ± 0.12 | 4.75 ± 0.07 | 19.34 ± 0.04 |
| D0108 | 46.36 ± 0.39 | 3.18 ± 0.01 | 0.31 ± 0.01 | 20.57 ± 0.18 | 4.74 ± 0.11 | 14.57 ± 0.06 |
| D0211 | 51.92 ± 0.52 | 2.30 ± 0.01 | 0.18 ± 0.01 | 20.93 ± 0.13 | 5.03 ± 0.08 | 22.62 ± 0.04 |
| D0307 | 103.85 ± 1.28 | 3.77 ± 0.01 | 0.31 ± 0.01 | 20.40 ± 0.23 | 4.91 ± 0.13 | 27.54 ± 0.08 |
| D0403 | 74.31 ± 0.53 | 3.05 ± 0.03 | 0.27 ± 0.01 | 20.20 ± 0.15 | 4.86 ± 0.09 | 24.39 ± 0.05 |
| D0411 | 96.13 ± 1.10 | 5.09 ± 0.03 | 0.31 ± 0.01 | 19.23 ± 0.12 | 5.00 ± 0.07 | 18.88 ± 0.04 |
| D0601 | 74.74 ± 1.25 | 4.87 ± 0.02 | 0.43 ± 0.01 | 21.33 ± 0.18 | 4.62 ± 0.10 | 15.35 ± 0.06 |
| D0606 | 53.02 ± 0.53 | 2.72 ± 0.02 | 0.24 ± 0.01 | 22.60 ± 0.15 | 4.77 ± 0.09 | 19.48 ± 0.05 |
| D0609 | 67.77 ± 0.87 | 3.83 ± 0.02 | 0.40 ± 0.01 | 22.50 ± 0.15 | 4.84 ± 0.09 | 17.70 ± 0.05 |
| D0613 | 42.04 ± 1.06 | 3.14 ± 0.02 | 0.33 ± 0.01 | 20.60 ± 0.12 | 4.68 ± 0.07 | 13.40 ± 0.05 |
| D0704 | 134.13 ± 2.55 | 5.14 ± 0.03 | 0.41 ± 0.003 | 23.00 ± 0.06 | 4.70 ± 0.09 | 26.11 ± 0.02 |
| D0711 | 90.90 ± 0.50 | 4.05 ± 0.01 | 0.40 ± 0.01 | 23.10 ± 0.18 | 4.74 ± 0.07 | 22.46 ± 0.06 |
| D0808 | 73.39 ± 0.87 | 4.23 ± 0.02 | 0.35 ± 0.003 | 22.20 ± 0.15 | 4.72 ± 0.09 | 17.35 ± 0.05 |
| D0902 | 54.84 ± 0.58 | 4.56 ± 0.02 | 0.34 ± 0.01 | 21.77 ± 0.13 | 5.34 ± 0.08 | 12.03 ± 0.04 |
| D0904 | 105.75 ± 1.15 | 4.45 ± 0.01 | 0.32 ± 0.01 | 22.60 ± 0.15 | 4.89 ± 0.09 | 23.77 ± 0.05 |
| D1006 | 122.82 ± 1.25 | 4.44 ± 0.01 | 0.36 ± 0.01 | 21.83 ± 0.15 | 4.90 ± 0.09 | 27.67 ± 0.05 |
| D1013 | 52.49 ± 0.77 | 3.58 ± 0.02 | 0.36 ± 0.01 | 23.10 ± 0.10 | 5.05 ± 0.06 | 14.68 ± 0.03 |
| D1109 | 90.05 ± 0.92 | 3.99 ± 0.02 | 0.35 ± 0.01 | 22.00 ± 0.15 | 5.35 ± 0.09 | 22.60 ± 0.05 |
| D1201 | 102.10 ± 1.24 | 4.83 ± 0.02 | 0.42 ± 0.01 | 21.00 ± 0.10 | 4.95 ± 0.06 | 21.14 ± 0.03 |
| D1205 | 66.49 ± 0.90 | 3.17 ± 0.02 | 0.27 ± 0.004 | 23.83 ± 0.14 | 4.99 ± 0.08 | 20.98 ± 0.05 |
| D1211 | 50.13 ± 0.97 | 3.77 ± 0.03 | 0.36 ± 0.003 | 23.30 ± 0.17 | 4.94 ± 0.10 | 13.30 ± 0.06 |
| D1309 | 72.47 ± 0.84 | 3.37 ± 0.02 | 0.32 ± 0.01 | 20.37 ± 0.13 | 5.10 ± 0.08 | 21.53 ± 0.04 |
| D1313 | 52.74 ± 0.39 | 2.98 ± 0.01 | 0.43 ± 0.01 | 26.63 ± 0.18 | 4.61 ± 0.10 | 17.72 ± 0.06 |
| Mean ± SD | 72.7 ± 27.6 | 3.78 ± 0.801 | 0.335 ± 0.06 | 21.8 ± 1.69 | 4.90 ± 0.21 | 19.2 ± 5.32 |



FIGURES1 Principal component analysis divides 256 samples into four components

FIGURES2 Meta model for SEM

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