Supplemental Table S1. Direct effects of each leaf anatomical traits through other traits on photosynthetic parameters.

| Parameters | LT | UCT | UET | PT | ST | LET | LCT | *d* | TSP |
|---|---|---|---|---|---|---|---|---|---|
| IQY | 0.467 | -0.686 | 0.002 | -0.487 | -0.165 | 0.230 | 0.154 | -0.047 | 0.285 |
| AQY | 0.378 | -0.652 | 0.121 | -0.514 | -0.073 | 0.210 | 0.273 | 0.080 | 0.131 |
| α | 0.420 | -0.676 | 0.070 | -0.506 | -0.111 | 0.222 | 0.224 | 0.023 | 0.200 |
| $P_{max}$ | 0.134 | 0.004 | 0.437 | 0.218 | 0.012 | 0.185 | -0.063 | 0.672 | -0.519 |
| $I_{sat}$ | -0.415 | 0.120 | 0.267 | -0.118 | 0.630 | -0.124 | 0.265 | 0.893 | -1.052 |
| $I_c$ | -0.076 | 0.334 | -0.068 | 0.358 | -0.100 | -0.314 | -0.370 | 0.174 | -0.332 |
| $R_D$ | 0.302 | -0.201 | -0.194 | 0.293 | -0.183 | 0.148 | -0.411 | -0.013 | 0.086 |
| $R_d$ | 0.467 | 0.270 | -0.859 | -0.407 | 0.084 | 0.097 | -0.253 | 0.032 | -0.034 |
| $V_{cmax}$ | -0.097 | 0.076 | -0.122 | 0.271 | 0.258 | 0.398 | -0.539 | 0.025 | 0.259 |
| $J_{max}$ | 0.116 | 0.255 | -0.101 | -0.022 | -0.044 | 0.016 | -0.378 | 0.482 | -0.029 |
| TPU | 0.231 | -0.517 | -0.632 | -0.474 | 0.320 | 0.462 | 0.241 | 0.018 | 0.265 |
| $\Gamma^*$ | -0.362 | 0.092 | -0.099 | -0.207 | 0.150 | 0.011 | 0.359 | -0.075 | -0.241 |
| $g_i$ | 0.545 | -0.685 | 0.002 | 0.060 | 0.053 | 0.416 | -0.340 | -0.163 | -0.078 |
| $C_i$ | 0.073 | -0.159 | -0.352 | 0.032 | -0.321 | -0.275 | 0.067 | -0.772 | 0.613 |
| $g_s$ | 0.120 | -0.327 | 0.413 | 0.274 | -0.102 | 0.241 | 0.125 | 0.345 | -0.181 |
| VPD | 0.286 | 0.052 | -0.246 | 0.220 | -0.579 | -0.311 | -0.328 | -0.576 | 0.579 |
| A | 0.160 | -0.287 | 0.423 | 0.198 | -0.080 | 0.291 | 0.109 | 0.392 | -0.213 |
| E | 0.216 | -0.236 | 0.479 | 0.445 | -0.343 | 0.059 | -0.006 | 0.184 | -0.046 |
| WUE | -0.163 | -0.056 | 0.152 | -0.167 | 0.583 | 0.482 | 0.120 | 0.673 | -0.496 |

LT – leaf thickness, UCT – upper cuticle thickness, UET – upper epidermal thickness, PT – palisade tissue thickness, ST – spongy tissue thickness, LET – lower epidermal thickness, LCT – lower cuticle thickness, w – guard cell width, l – guard cell length, d – stomatal density, TSP – total stomach pore area, IQY – intrinsic quantum yield, AQY – apparent quantum yield, $\alpha$ – the absolute value of slope between $I = 0$ and $I = I_c$, $P_{nmax}$ – maximum photosynthetic rate [μmol ($CO_2$) $m^{-2}$ $s^{-1}$], $I_{sat}$ – light saturation point [μmol (photon) $m^{-2}$ $s^{-1}$], $I_c$ –light compensation point [μmol (photon) $m^{-2}$ $s^{-1}$], $R_D$ – dark respiration [μmol ($CO_2$) $m^{-2}$ $s^{-1}$], $C_i$–Intercellular $CO_2$ concentration (μmol $mol^{-1}$), $V_{cmax}$–Maximal Rubisco carboxylation rate (μmol $m^{-2}$ $s^{-1}$), $J_{max}$–Maximal electron transport rate (μmol $m^{-2}$ $s^{-1}$), $T_p$–Rate of triose phosphate export from the chloroplast (μmol $m^{-2}$ $s^{-1}$), $R_d$–Day respiration (μmol $m^{-2}$ $s^{-1}$), $\Gamma^*$–$CO_2$ compensation point in the absence of dark respiration (Pa), $g_i$– Internal (mesophyll) conductance to $CO_2$ transport (μmol $m^{-2}$ $s^{-1}$ $Pa^{-1}$), $K_{oc}$ –A composite parameter (Pa): $K_{oc} = K_c\left(1 + {}^{O}/_{K_o}\right)$.