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Rubisco catalytic properties and temperature response in crops.

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Figure 2. Simulated CO$_2$ assimilation potential of Rubisco ($A_{\text{Rubisco}}$) for the C$_3$ and C$_4$ species at 15 ºC, 25 ºC and 35 ºC and at values for the chloroplastic CO$_2$ concentration ($C_c$) of (A) 250 µbar and (B) 150 µbar. Equations used to calculate $A_{\text{Rubisco}}$ were those described in the biochemical model of C$_3$ photosynthesis (Farquhar et al. 1980), as explained in Materials and Methods. The bars represent the minimum value of $A_c$- and $A_j$-limited $A_{\text{Rubisco}}$. Asterisks (*) above the bars indicate $A_c$-limited $A_{\text{Rubisco}}$ (absence of * indicate $A_j$-limited $A_{\text{Rubisco}}$). The rate of electron transport was considered 60, 150 and 212 µmol m$^{-2}$ s$^{-1}$ at 15 ºC, 25 ºC and 35 ºC, respectively. The concentration of active Rubisco sites was assumed invariable at 25 µmol m$^{-2}$ for all the species and environmental conditions. The values used for the Rubisco kinetic parameters ($k_{\text{cat}}^c$, $J^c$ and $K_{\text{c,air}}$) are those shown in Tables 1 and S1.