Appendix G. Standardization of $V_{c,max25}$ and J_{max25}.

The Rubisco-limited photosynthesis equations and the temperature at which studies reported $V_{c,max}$ were noted, together with the kinetic properties of Rubisco (O, τ, K_c and K_o). Next, the kinetic properties of Rubisco at 25°C for different temperature response functions (TRF1, TRF2, TRF3 and TRF4) were scaled to the $V_{c,max}$ measurement temperature of the reported studies using different temperature dependence functions of Rubisco kinetics (TRF1, TRF2, TRF3 and TRF4; see Appendix D). The Rubisco-limited photosynthesis equation (Eqs. F.3 or F.5: see Appendix F) used by the different studies was matched with our equation of Rubisco-limited photosynthesis (Eq. F.3). The detailed procedure for the standardization of $V_{c,max25}$ is described below.

First, we recorded $V_{c,max}$, J_{max} and the corresponding kinetic properties of Rubisco (e.g. O=20.5kPa, τ =2923.149 (unitless), K_c= 40.4Pa and K_o=24.8kPa) utilized by different studies. Second, we generated W_c values of reported studies using reported kinetic properties of Rubisco at the measurement temperature and the corresponding equations the studies used (Eq. F.3 or Eq. F.5).

Third, we estimated the standardized $V_{c,max}$ value at the measurement temperature by the slope of scatter plot between sampled C_i and W_c values using eq. F.3 in Appendix F for C_i was < 20Pa, where the kinetic properties of Rubisco at reported measurement temperature were used for different cases. Our corresponding reference values of O, τ, K_c and K_o are derived for the measurement temperature using different temperature response curves (TRF1, TRF2, TRF3, and TRF4; see Appendix D). Finally, if the measurement temperature was different from 25°C, we obtained $V_{c,max}$ at 25°C ($V_{c,max25}$) using temperature dependence function of $V_{c,max}$ (see Appendix

E) based on different temperature response curves (TRF1, TRF2, TRF3, and TRF4; see Appendix E for details).

We used a similar approach for standardisation of Jmax except that we used eq. F.4 (Appendix F) instead of eq. F.3 and used the C_i between 20-35Pa, instead of was C_i < 20Pa.

We compared the effect of scaling $V_{c,max}$ to $V_{c,max25}$ using different temperature dependence functions of $V_{c,max}$ that have been proposed (Bernacchi et al. 2001, Leuning 2002, Kattge and Knorr 2007) so that our result is not contingent on one type of temperature dependence function. Using the similar fashion, the maximum electron transport rate at 25°C (J_{max25}) (µmol electron m^{-2} s^{-1}) was calculated, although only 32 out of 42 studies reported the values of J_{max}.

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