Appendix B. Relationship between photosynthetic capacity and other variables, including statistics.

1. *The relationship between $V_{c,max25}$ and various variables.*

   Predicting photosynthetic capacity ($V_{c,max25}$) for the first combination of plant functional types (PFT1), that consisted the growth form (herbaceous (H), shrubs (S) and trees (Tr)), environmental variables (day length, (D), relative humidity, (RH), temperature (T) and radiation (R)) and leaf nitrogen content (LNC_a). The general form of the linear-mixed effects model is described below, where the expected value of $V_{c,max25}$ is denoted by $\hat{V}$, a is the intercept and b_i's are the coefficients.

   $$\hat{V}(PFT1) = a + b_0H + b_1S + b_2Tr + b_3D + b_4RH + b_5T + b_6R + b_7LNC_a \quad \text{(B.1)}$$

   The values of intercept and coefficients for different temperature response functions are described in Table A6.

2. *The relationship between J_{max25} and various variables.*

   The relationship between J_{max25} and various determinants; here a subset of the original data was utilized because only 50 studies reported J_{max} values. The general form of the linear-mixed effects model is described below, where the expected value of J_{max25} is denoted by $\hat{J}$, a is the intercept and b_i's are the coefficients.

   $$\hat{J}(PFT1) = a + b_0H + b_1S + b_2Tr + b_3D + b_4RH + b_5T + b_6R + b_7LNC_a \quad \text{(B.2)}$$

   The values of intercept and coefficients for different temperature response functions are described in Table A7.

3. *Calculation of r^2 for the linear mixed effects model of $V_{c,max25}$*

   The coefficient of determination, r^2, is a ratio of explained variation to the total variance in $V_{c,max25}$. In the linear mixed model, the fitted $V_{c,max25}$ values was obtained for the population predictions (based only on the fixed effects estimates). Specifically, we used the following equation:

$$r^2 = 1 - \frac{\sum_{i=1}^{n}(V-\hat{V})^2}{\sum_{i=1}^{n}(V-\bar{V})^2} \tag{B.3}$$

where $\bar{V}$ is the mean of the observed $V_{c,max25}$. The r^2 for the linear mixed effects model of J_{max25} was calculated in a similar fashion.