Supplementary Materials

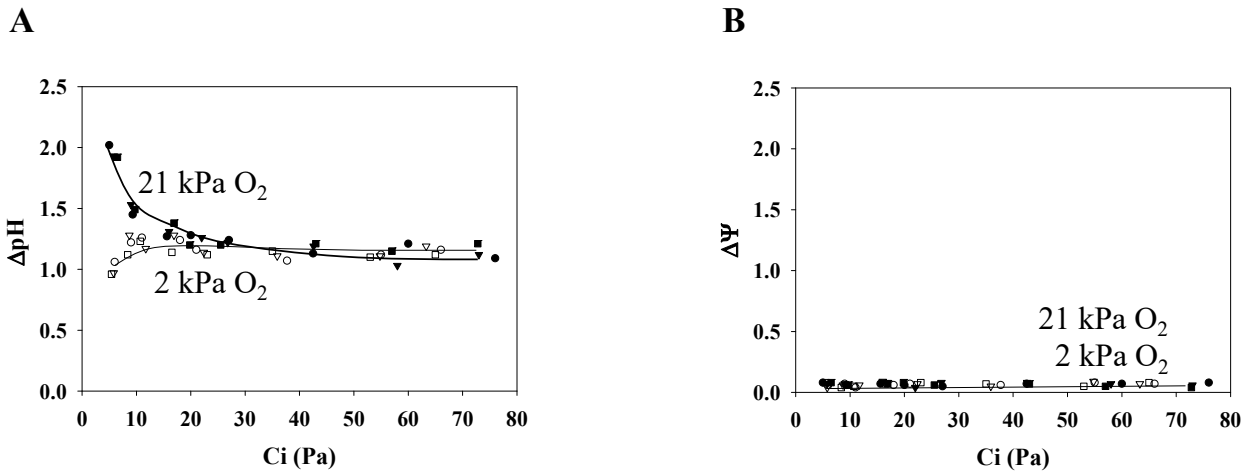

Figure S1. Both ΔpH and ΔΨ which contribute to proton motive force (pmf), reflected as the total electrochromic shift (ECS) signal, were separately determined with ECS in Figure 3 following the method of Cruz et al. (2001). Please see the details in the text. (**A**), ΔpH; (**B**) ΔΨ. Closed circle, 21 kPa O_2; Open circle, 2 kPa O_2. Data were from three independent experiments using leaves attached to three wheat plants (N = 3: sample 1, circle; 2, square; 3, triangle). The ambient partial pressures of CO_2 were changed from 100 to 5 through 80, 60, 40, 30, 20, and 10 Pa at 21 and 2 kPa O_2, for the same leaves. Lines in the graphs were arbitrarily drawn to indicate the trends of the data.

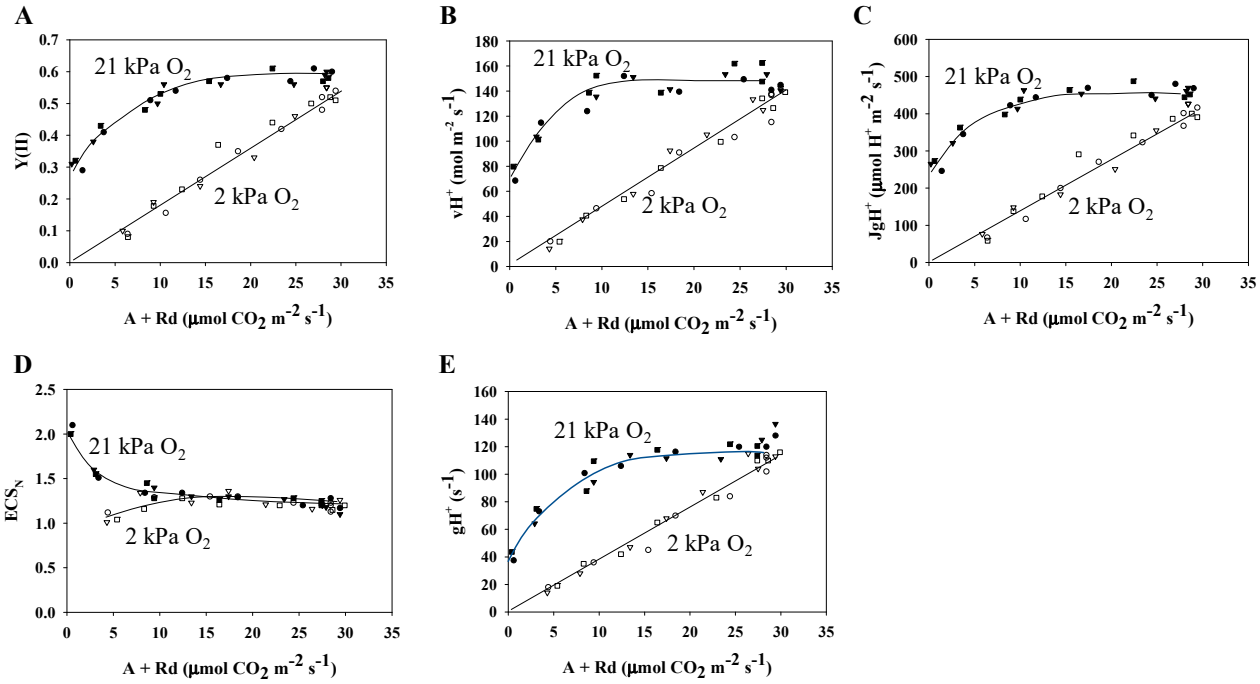

Figure S2. Relationships of Y(II), vH^+, JgH^+, ECS, and gH^+ with (A + Rd). The data for Y(II) and (A + Rd) were from Figures 1 and 2, and JgH^+ was calculated from the data in Figure 1 by the method, described in the "Materials and Methods". The data for ECS, vH^+, gH^+, and (A + Rd) were from Figure 3. (**A**) Y(II) was plotted against (A + Rd). (**B**) vH^+ was plotted against (A + Rd). (**C**) JgH^+ was plotted against (A + Rd). (**D**) ECS was plotted against (A + Rd). (**E**) gH^+ was plotted against (A + Rd). Data were from three independent experiments using leaves attached to three wheat plants (N = 3: sample 1, circle; 2, square; 3, triangle). The ambient partial pressures of CO_2 were changed from 100 to 5 through 80, 60, 40, 30, 20, and 10 Pa at the two pO_2 conditions (closed symbols, 21 kPa; open symbols, 2 kPa), for the same leaves. Lines in the graphs were arbitrarily drawn to indicate the trends of the data.

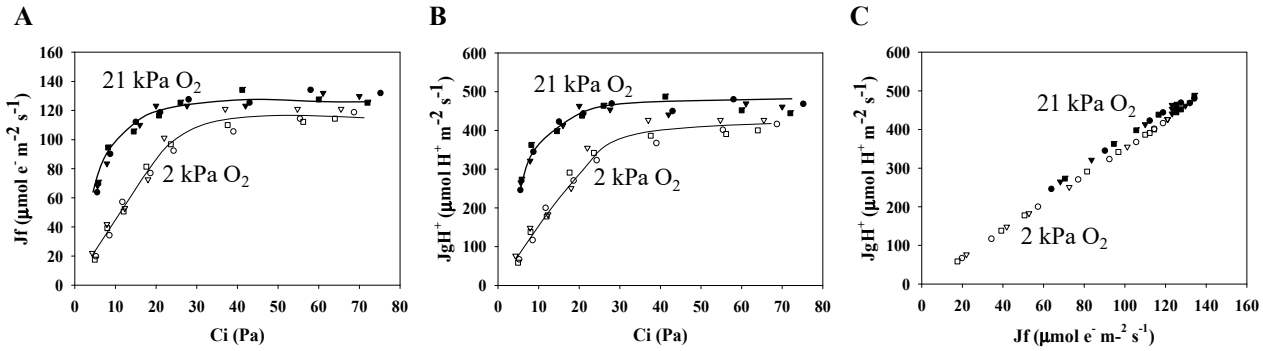

Figure S3. Dependence of Jf and JgH^+ on Ci, and the relationship between JgH^+ and Jf. The electron flux in photosynthetic linear electron flow (Jf), reflected as the electron flux in PSII [Y(II)], was calculated as α × Y(II) × PFD (please see the detail in "Materials and Methods"). The data for Y(II) and JgH^+ were from Figure 1. (**A**) Jf was plotted against Ci. (**B**) JgH^+ was plotted against Ci. (**C**) JgH^+ was plotted against Jf, both of which were from Supplementary Figures 3A and 3B. Data were from three independent experiments using leaves attached to three wheat plants (N = 3: sample 1, circle; 2, square; 3, triangle). The ambient partial pressures of CO_2 were changed from 100 to 5 through 80, 60, 40, 30, 20, and 10 Pa at 21 (closed symbols) and 2 kPa O_2 (open symbols), for the same leaves. Lines in the graphs were arbitrarily drawn to indicate the trends of the data.