Figure S1. Violin plots of the indica rice leaf SPAD values (a) and nitrogen content (b) in different controls (A: ambient, E: elevated [CO$_2$], T: warming and ET: elevated [CO$_2$] & warming). The indica rice varieties include cvs Xiangliangyou 143 and Yangdao 6 planted in FACE1 system. The violin plot is a box plot with the width of the box proportional to the estimated density of the observed SPAD readings and N content. The maximum density of the group specific data distribution is indicated by the largest width of the violins. The white dot in the violin plot is the median, the thick vertical bar indicates the interquartile range, and the thin vertical bar indicates 95% confidence intervals. A linear fit between normalized SPAD readings, N content and different controls is presented in insert.
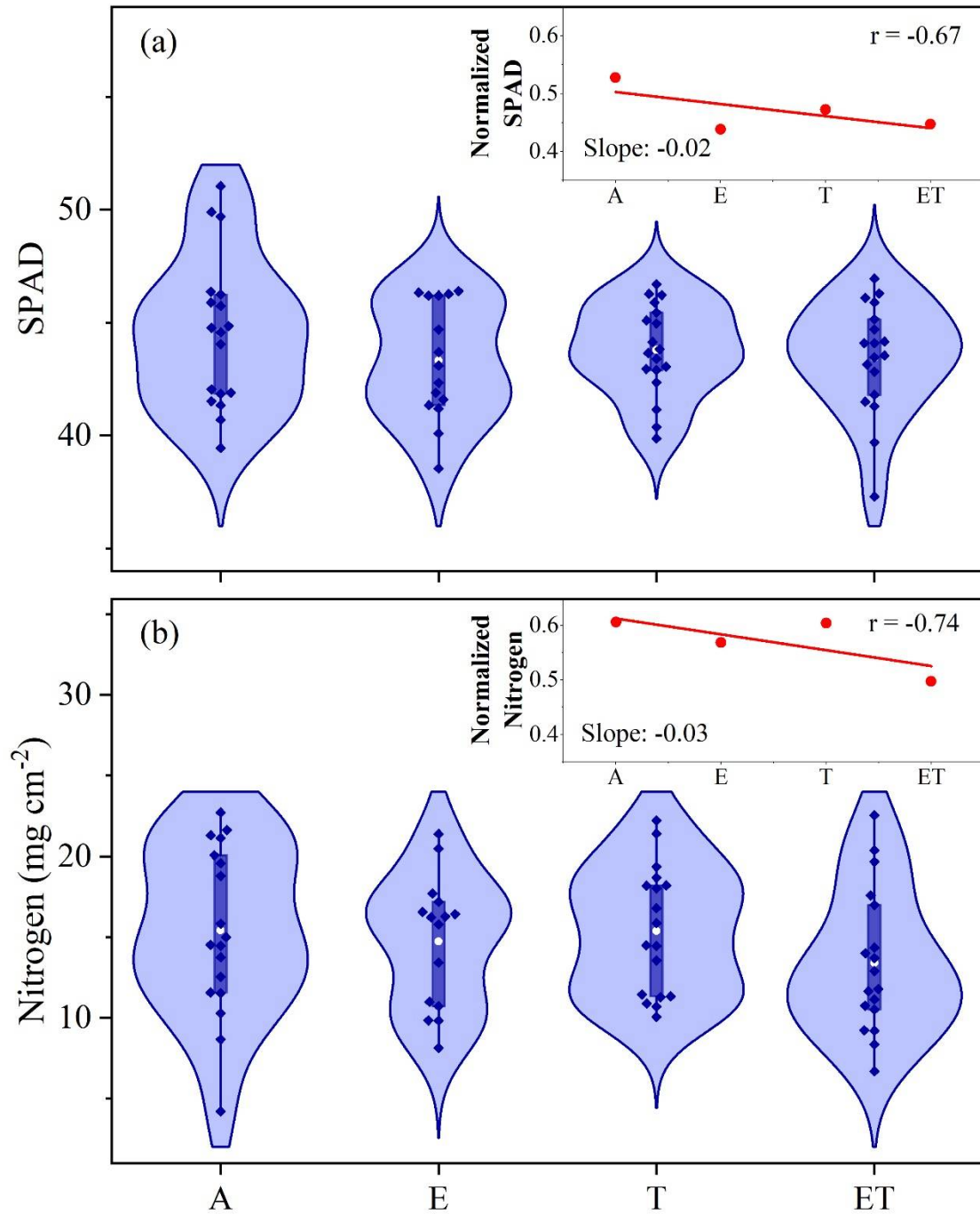
Figure S2. Violin plots of the japonica rice leaf SPAD values (a) and nitrogen content (b) in different controls (A: ambient, E: elevated [CO_2], T: warming and ET: elevated [CO_2] & warming). The indica rice varieties include cvs Changyou5 and wuyungeng 23 planted in FACE1 system. The violin plot is a box plot with the width of the box proportional to the estimated density of the observed SPAD readings and N content. The maximum density of the group specific data distribution is indicated by the largest width of the violins. The white dot in the violin plot is the median, the thick vertical bar indicates the interquartile range, and the thin vertical bar indicates 95% confidence intervals. A linear fit between normalized SPAD readings, N content and different controls is presented in insert.
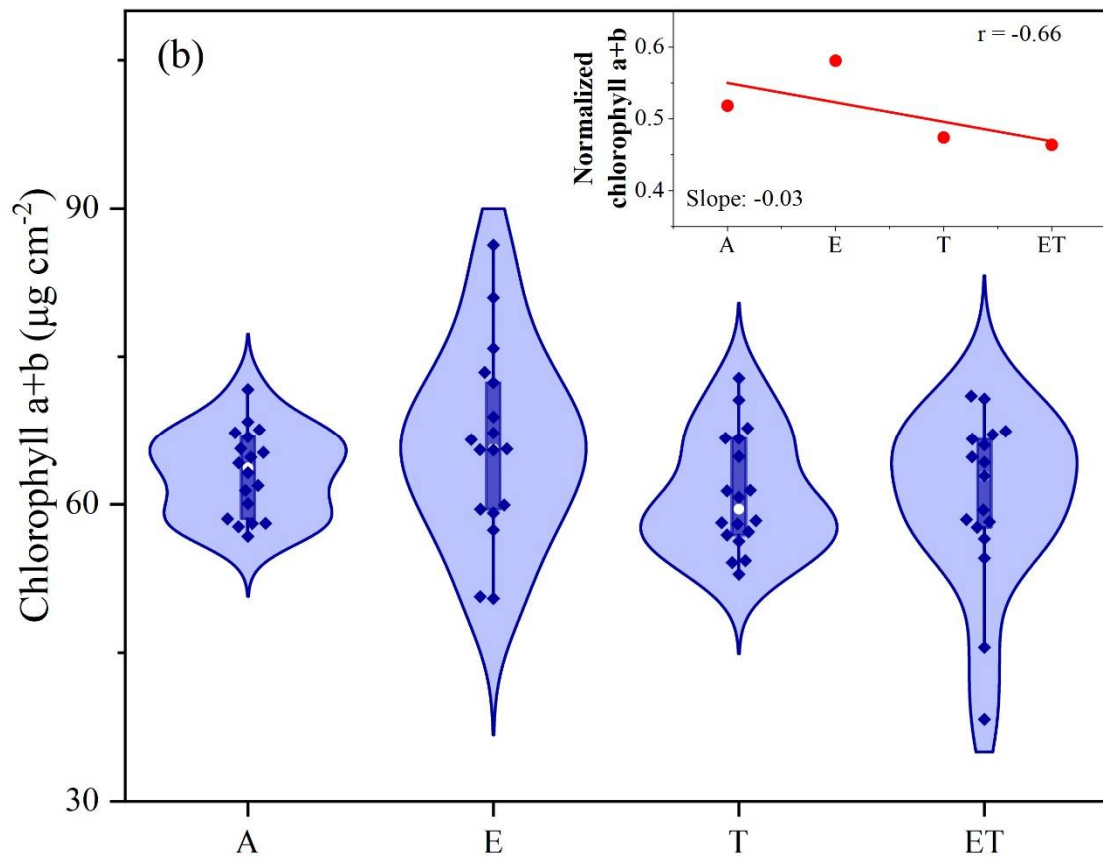
Figure S3. Violin plots of the indica rice leaf chlorophyll a+b content in different controls (A: ambient, E: elevated [CO₂], T: warming and ET: elevated [CO₂] & warming). The indica rice varieties include cvs Xiangliaingyou 143 and Yangdao 6 planted in FACE1 system. The violin plot is a box plot with the width of the box proportional to the estimated density of the observed chlorophyll a+b content. The maximum density of the group specific data distribution is indicated by the largest width of the violins. The white dot in the violin plot is the median, the thick vertical bar indicates the interquartile range, and the thin vertical bar indicates 95% confidence intervals. A linear fit between normalized chlorophyll a+b content and different controls is presented in insert.
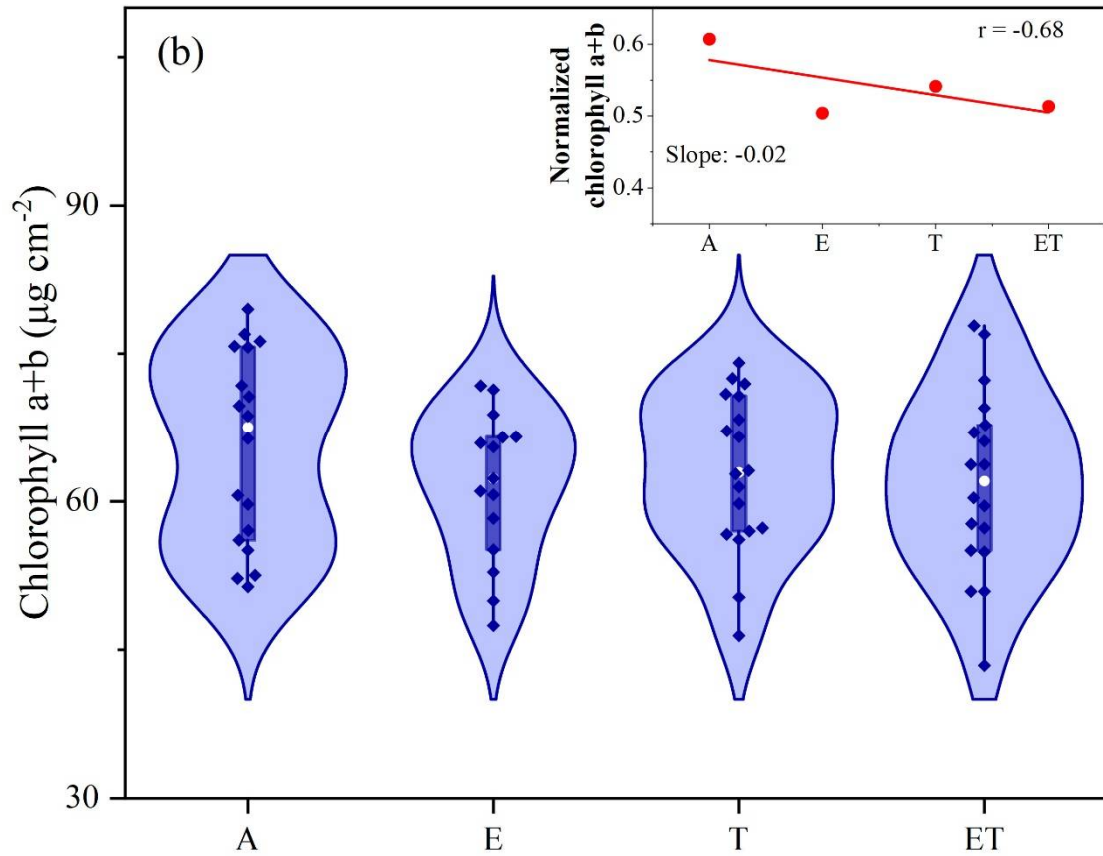
Figure S4. Violin plots of the japonica rice leaf chlorophyll a+b content in different controls (A: ambient, E: elevated [CO₂], T: warming and ET: elevated [CO₂] & warming). The indica rice varieties include cvs Changyou5 and Wuyungeng 23 planted in FACE1 system. The violin plot is a box plot with the width of the box proportional to the estimated density of the observed chlorophyll a+b content. The maximum density of the group specific data distribution is indicated by the largest width of the violins. The white dot in the violin plot is the median, the thick vertical bar indicates the interquartile range, and the thin vertical bar indicates 95% confidence intervals. A linear fit between normalized chlorophyll a+b content and different controls is presented in insert.
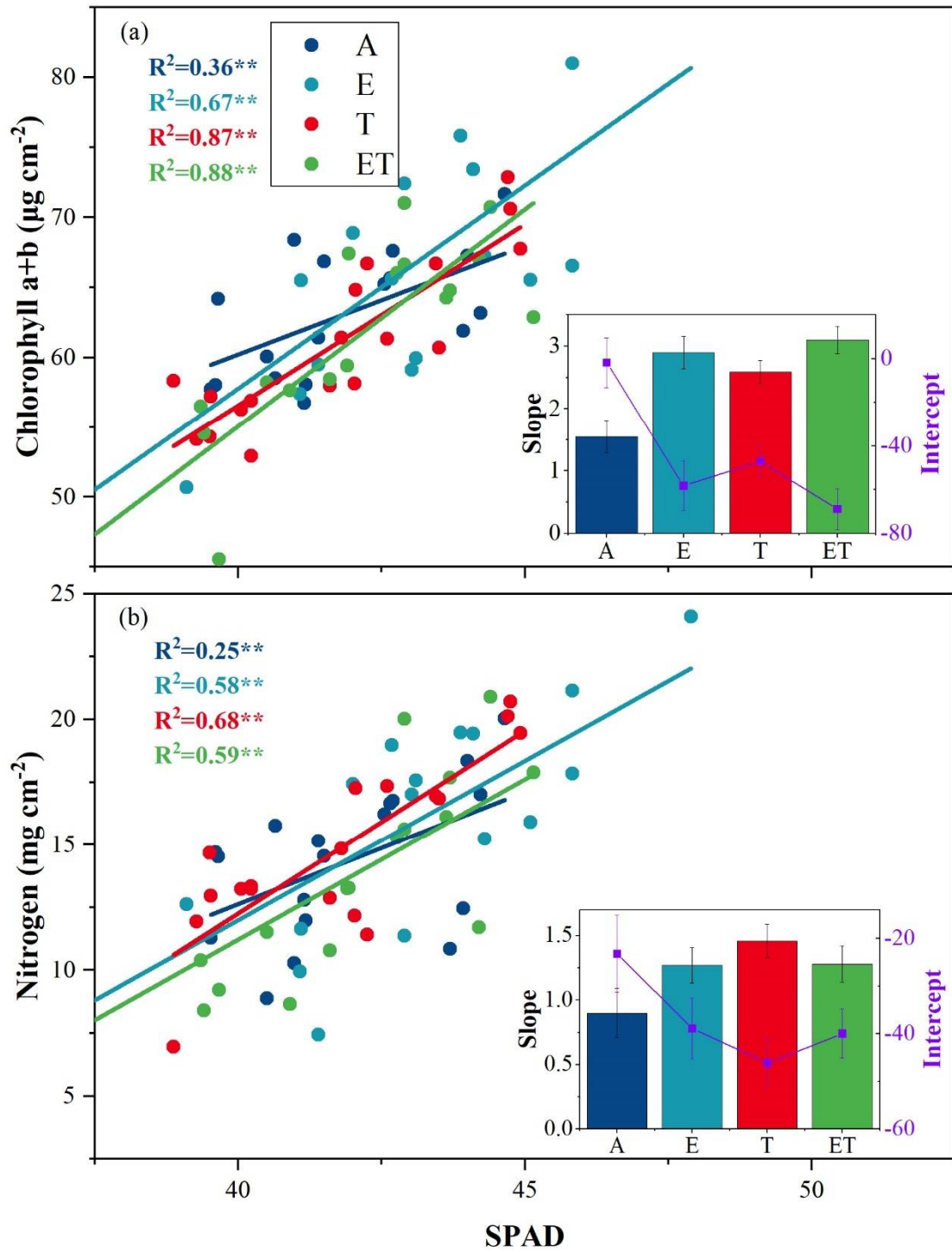
Figure S5. Scatter plots and linear fit results between indica rice leaf (a) SPAD values & chlorophyll a+b content and (b) SPAD values & nitrogen content within different controls. The estimated slope and intercept of the linear fit is presented in the inserted bar plot. ** in the plot indicates p<0.01.
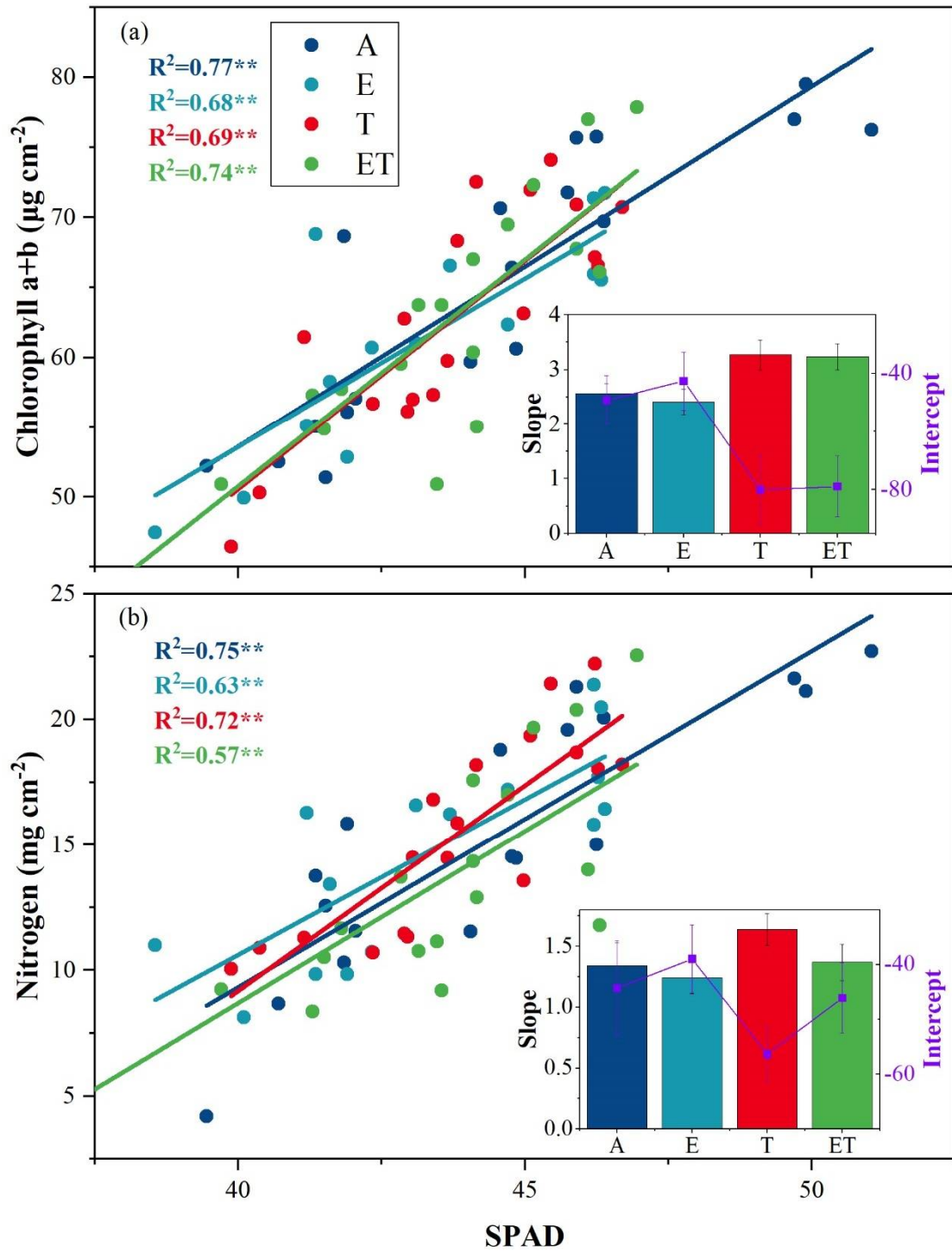
Figure S6. Scatter plots and linear fit results between japonica rice leaf (a) SPAD values & chlorophyll a+b content and (b) SPAD values & nitrogen content within different controls. The estimated slope and intercept of the linear fit is presented in the inserted bar plot. ** in the plot indicates p<0.01.
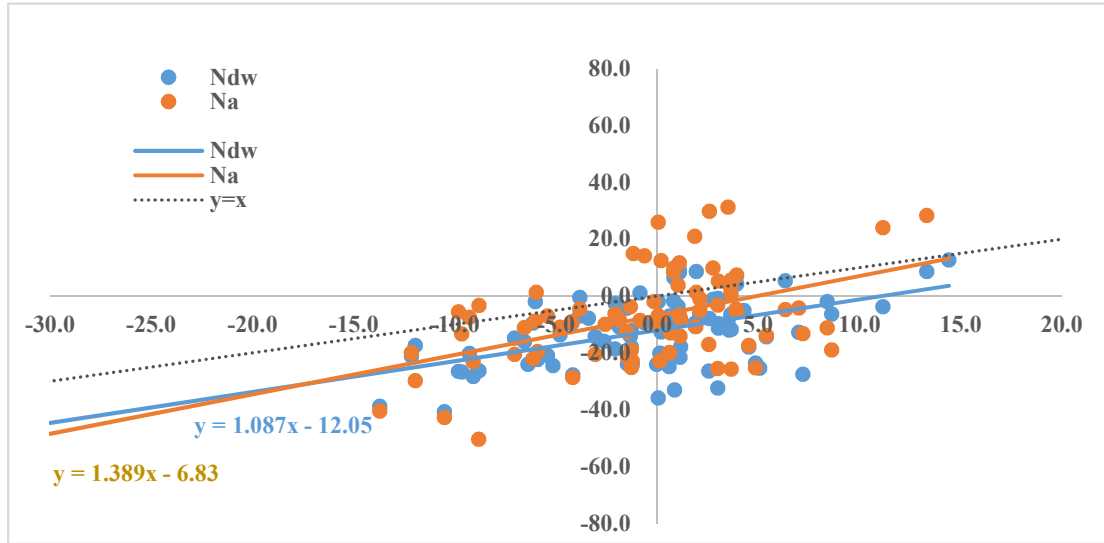
Figure S7. The relationship between the changes of SPAD and leaf Ndw (blue dots, N concentration by unit dry weight), Na (orange dots, N concentration by unit leaf area) in E relative to A of 2016 and 2017. The orange and blue regression lines represent the regression of Na and Ndw with SPAD, respectively.