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Functional Plant Biology

Supplementary Material

Differential effects of elevated CO_2 on awn and glume metabolism in durum wheat (*Triticum durum*)

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Supplementary material

Table S1. Summary of growth conditions used in this study.

Country and location	Germany, Hohenheim
Cultivation time window	5/4/16-1/8/16
Sowing month	April
Total precipitations during growth period	271 mm
Temperature (min °C, max °C, cumulated °C.d)	2.6, 24.8, 1679
Fertilisation: added N; NPK balance	202 kg N ha^{-1}; 10-5-5

Table S2. Agronomic properties. Values shown here are average ± SE (n = 5 plots). Parenthesed asterisks stand for near-significance ($P < 0.08$).

Parameter (units)	**Ambient CO_2**	**Elevated CO_2**
Yield (g grain m^{-2})	397±27	344±32
Harvest index (dimensionless)	0.476±0.003	0.467±0.010
Total dry matter per surface area (g m^{-2})	833±55	731±55
Tiller number per surface area (m^{-2})	454±22	398±17 (*)
Average dry matter production rate (µmol carbon m^{-2} s^{-1})	5.59±0.37	4.90±0.37

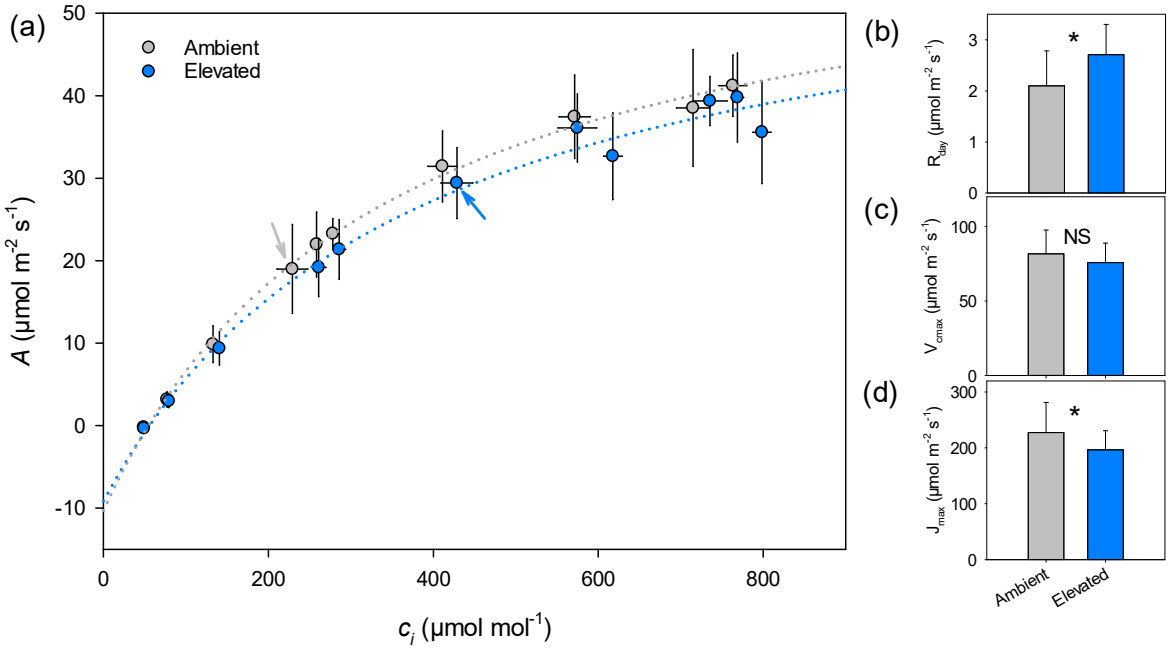

Fig. S1. Photosynthetic properties of flag leaves at half anthesis stage (Z65) in wheat cultivated under ambient or elevated CO_2. (a) Net assimilation response curve to intercellular CO_2 mole fraction, under 1,500 µmol m^{-2} s^{-1} PAR (saturating light). (b-d) day respiration, maximum carboxylation velocity and maximum electron flux calculated from A/c_i curves. The asterisks indicate statistical significance ($P < 0.05$). Mean ± SD ($n = 20$).

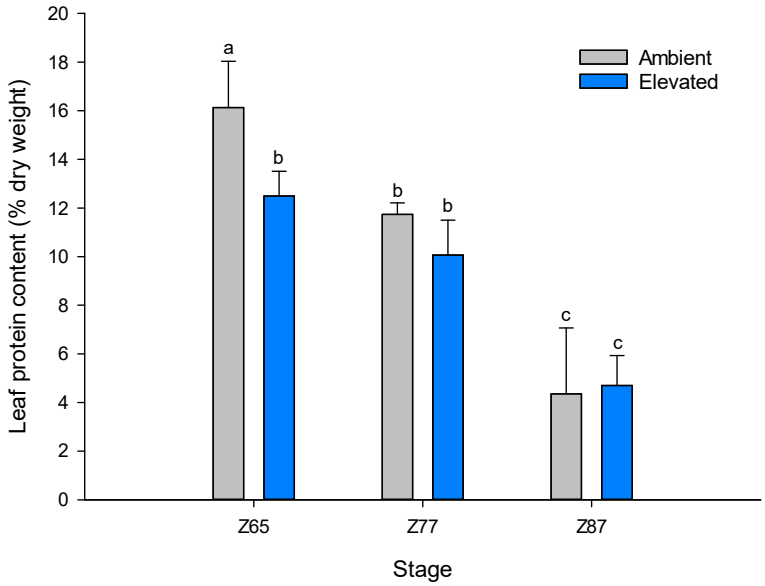

Fig. S2. Flag leaf protein content, in % (g prot per 100 g leaf dry weight). Letters stand for statistical classes (two-way ANOVA, $P<0.05$). Data shown are mean±SD, $n = 4$.

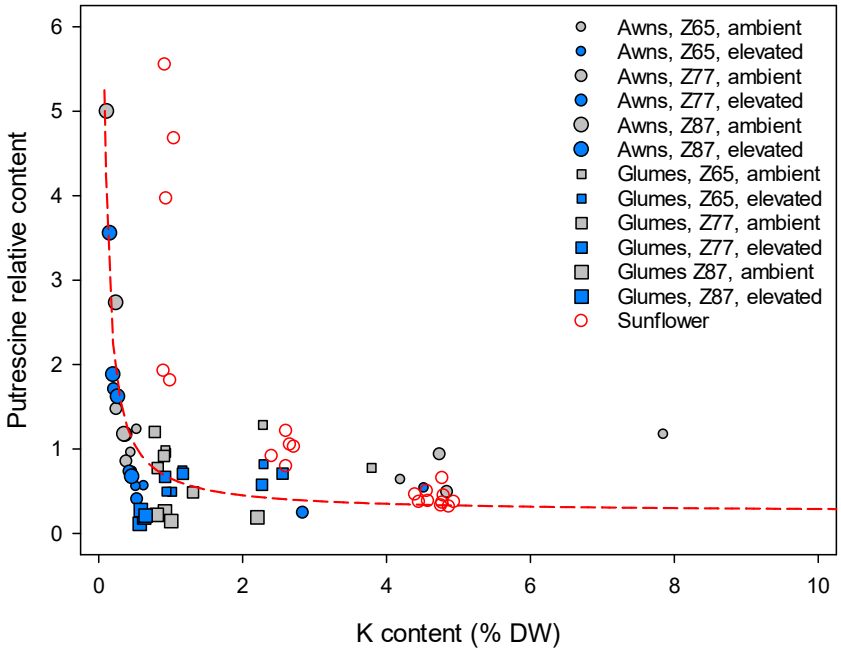

Fig. S3. Relationship between putrescine relative content and potassium elemental content in awns and glumes. Putrescine is expressed relative to its average content at Z65 grown under ambient CO_2 conditions. The red dashed line stands for a hyperbolic trend to emphasize the negative relationship between putrescine and K. Awns appear as circles, and glumes appear as squares. The size of the symbol reflects time. As in other figures, grey and blue represent ambient and elevated CO_2 conditions, respectively. Empty red discs stand for data obtained in (Cui et al., 2019) in sunflower leaves for comparison (putrescine content relative to usual conditions, i.e., 1 mM KCl in nutrient solution).

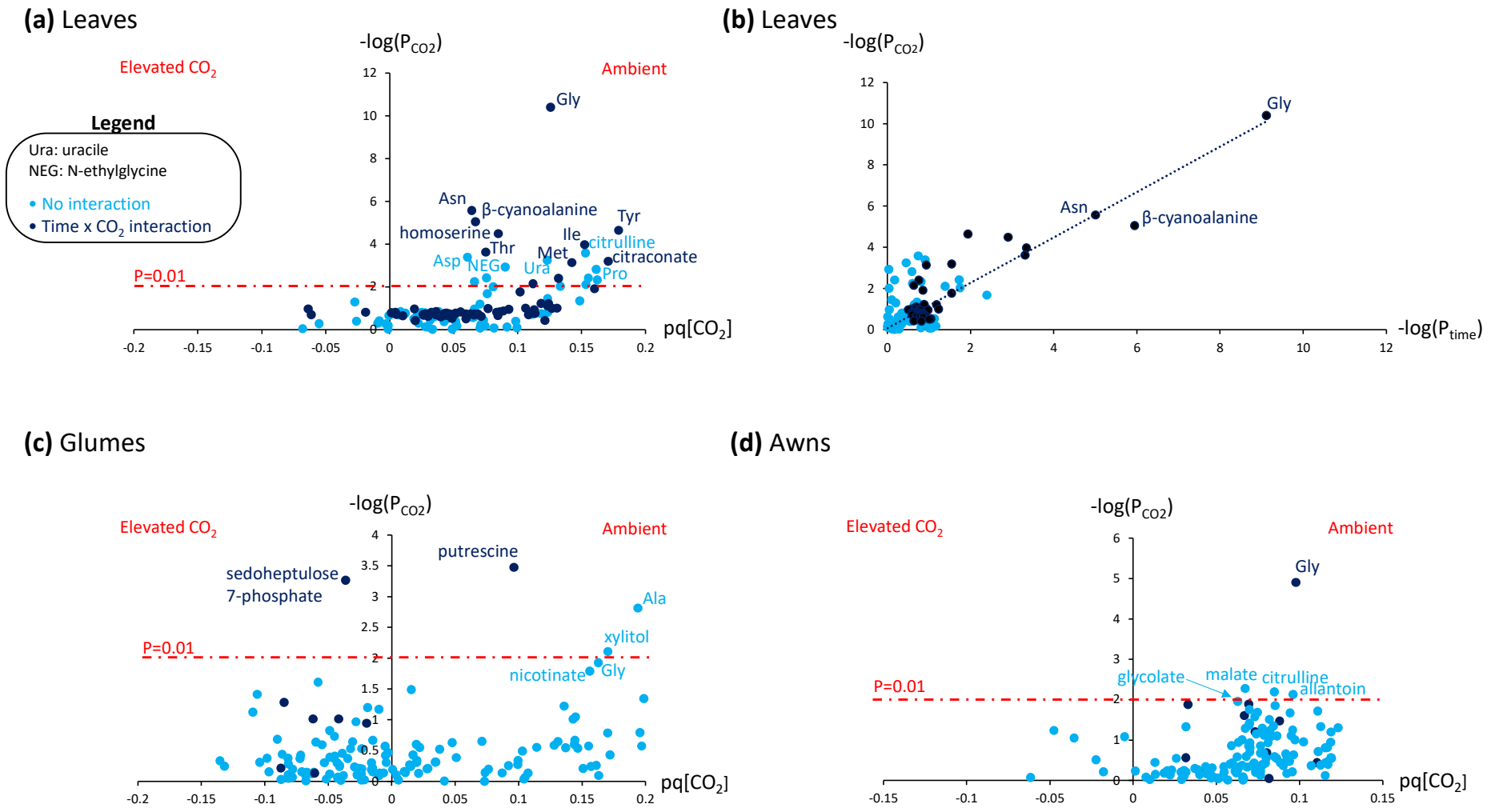

Fig. S4. Magnification of Fig. 2: most significant metabolites affected by CO_2 in leaves (a,b), glumes (c) and awns (d) at BBCH stages Z77 (late milk) and Z87 (hard dough), found using GC-MS metabolomics.