**Killi et al. "**Lipid peroxidation and chlorophyll fluorescence of photosystem II performance during drought and heat stress is associated with the antioxidant capacities of C3 sunflower and C4 maize varieties"

## Supplementary Information S1.

**Table S1** Chlorophyll *a* fluorescence parameters used in the fluorescence transient analysis

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| *Technical fluorescence parameters* | |
| $\mathbf{F_t}$ | Fluorescence emission from a dark-adapted leaf at the time t |
| $\mathbf{F_0}$ | Minimal fluorescence from a dark-adapted leaf |
| $\mathbf{F_M}$ | Maximal fluorescence from a dark-adapted leaf |
| $\mathbf{F_J}$ | Fluorescence intensity at the J-step (at 2 ms) |
| $\mathbf{F_I}$ | Fluorescence intensity at the I-step (at 30 ms) |
| $\mathbf{F_V}$ | Maximal variable fluorescence from a dark-adapted leaf. $F_V = F_M - F_0$ |
| $\mathbf{V_J}$ | Relative variable fluorescence at 3ms. $V_J = (F_{2ms} - F_0) / (F_M - F_0)$ |
| $\mathbf{V_I}$ | Relative variable fluorescence at 30ms. $V_I = (F_{30ms} - F_0) / (F_M - F_0)$ |
| $\mathbf{M_0}$ | Slope of the curve at the origin of the fluorescence rise. It is a measure of the rate of the primary photochemistry. $M_0 = 4(F_{300\mu s} - F_0) / (F_M - F_0)$ |
| *Derived parameters* | |
| $\boldsymbol{F_v/F_m}$ = | $[F_m - F_0]/F_m = \varphi_{Po} = TR_0/ABS$ = maximum quantum yield of PSII primary photochemistry, measured in samples in dark-adapted state. $F_v/F_m$ expresses the probability that an absorbed photon will be trapped by the PSII reaction centre. |
| $\boldsymbol{\Psi_{Eo}}$ = | $ET_0/TR_0 = 1 - V_J = 1 - (F_{2\ ms} - F_0)/(F_m - F_0)$. $\Psi_{Eo}$ expresses the probability that the energy of a trapped excitation is used for electron transport beyond $Q_A$. $V_J$ represents the relative variable fluorescence at 2 ms (step-J) ($V_J = (F_J - F_o)/(F_m - F_o)$). |
| $\boldsymbol{\Delta V_{I\text{-}P}}$ = | $1 - V_I = (F_m - F_{30\ ms})/(F_m - F_0)$, I-P phase (Oukarroum et al., 2009). This parameter indicates relative contribution of the I-P phase to the fluorescence transient OJIP; it is regarded as a measure of the efficiency of electron flux through PSI to reduce the final acceptors of the electron transport chain, i.e. ferredoxin and NADP. $V_I$ indicates the relative variable fluorescence at 30 ms (step-I) ($V_I = (F_I - F_o)/(F_m - F_o)$). |
| **RC/ABS=** | $(1-(F_o/F_m))/(M_o/V_J) = \varphi_{Po}\ (V_J/M_0)$. This parameter represents the total number of active reaction center per absorbtion. $Mo = 4(F_{300\ \mu s} - F_o)/(F_m - F_o)$. $M_0$ represents the initial slope of the double normalised fluorescence induction curve, and is a proxy of the net rate of PSII closure. |
| $\mathbf{PI_{abs}}$ = | (RC/ABS) $[\varphi_{Po}/(1-\varphi_{Po})]$ $[\Psi E_o/(1-\Psi E_o)]$. Performance index on absorption bases; absorption of antenna Chls of PSII. This measure incorporates photochemical and non-photochemical processes, such as absorption and trapping of excitation energy, electron transport beyond the primary plastoquinone (QA) and dissipation of excess excitation energy. |
| $\mathbf{PI_{tot}}$= | Performance Index total ($PI_{tot}$) is the potential for energy conservation from photons absorbed by PSII to the reduction flux (RE) of PSI end acceptors. The $Pi_{tot}$ is a multi-parametric indicator of four measures of photosynthetic electron transport: (1) the concentration of reaction centres; (2) the quantum yield of PSII photochemistry; (3) the capacity for uptake of electrons in the electron chain between PSII and PSI; (4) the efficiency with which an electron can transfer from the reduced intersystem electron acceptors to the PSI end electron (Strasser et al., 2010, 2004; Tsimilli-Michael and Strasser, 2008).<br>$PI_{TOT} = PI_{ABS}\ [\delta_{Ro}/(1-\delta_{Ro})]$<br>where $\delta_{Ro} = (1 - V_J)/(1 - V_J) = (F_m - F_I)/(F_m - F_J)$.<br>$\delta_{Ro}$ is the efficiency of an electron can transport from a reduced PQ to PSI end electron acceptor. |

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| **K-band=** | $V_{OJ}300 = (F_{300\ \mu s} - F_o)/(F_J - F_o)$. K band indicate relative variable fluorescence at 300 μs (transient normalized between $F_o$ and $F_K$). This parameter express the breakdown of the oxygen-evolving system (Srivastava et al., 1997). |
| **ChlF steps=** | The ChlF induction phase has different time steps called as: 20–50 μs (O-step), 2 ms (J-step), 30 ms (I-step), around 0.8 s (P-step; peak) and generally denoted $F_O$, $F_J$ and $F_I$. The last step (P-step) indicates the highest fluorescence intensity ($F_m$), when saturating light is used. |