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Response of linear and cyclic electron flux to moderate high temperature and high light stress in tomato

Key words: Photo-inhibition, Photo-protection,
Thylakoid membrane, Tomato

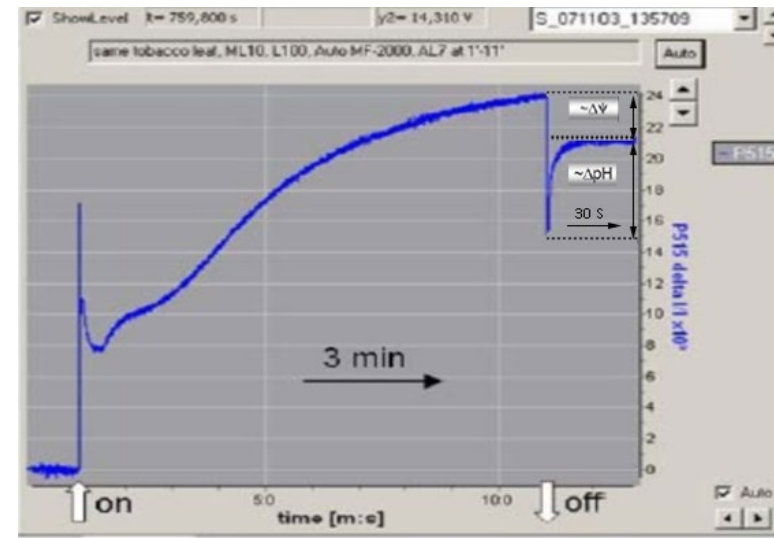
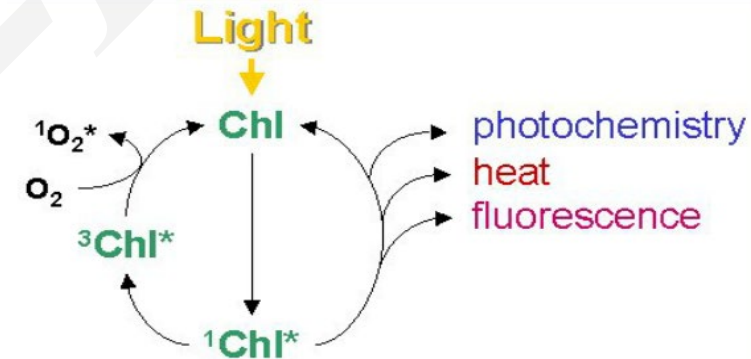
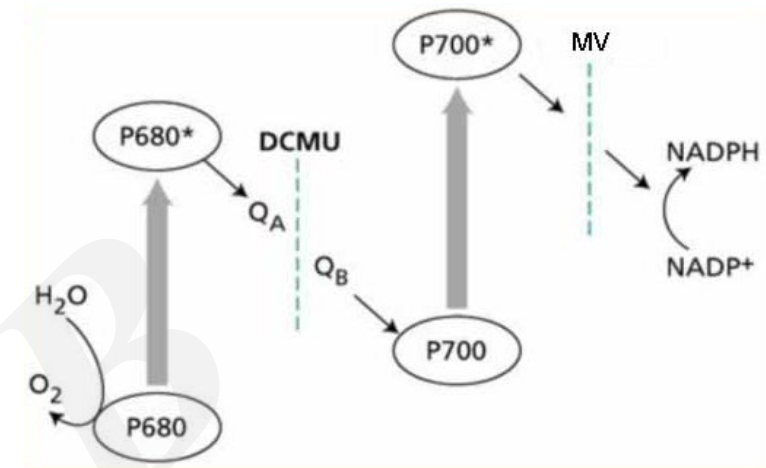
Research Summary

This paper mainly focused on evaluating the possible photoprotection mechanisms of cyclic and linear electron flux (CEF & LEF) under specific high temperature and high light stress and summarized the key roles they played in the following aspects:

- Regulation of absorbed light energy distribution**
- Balance the excitation energy allocation between PSI and PSII**
- Alleviation of the photodamage degree of photosystems**
- Moderate trans-membrane proton motive force (*pmf*)**

Innovation points

- **Introduction** of two electron transfer inhibitors: diuron (DCMU, impedes electron transport after Q_A) and methyl viologen (MV, suppresses Fd-dependent CEF)
- **Summary** of distribution of absorbed light energy and excited energy.
- **Emphasis** of the response of the thylakoid membrane and ATP-ase as well as *pmf*.



Results of the research

A series of comprehensive figures were generated to summarize the possible photoprotective mechanisms of CEF and LEF.

Fig. 1 | Effect of DCMU and MV on distribution of absorbed light energy in tomato leaves under HH.

Fig. 2 | Effect of DCMU and MV on allocation of excitation energy in tomato photosystems under HH.

Fig. 3 | Effect of DCMU and MV on F_v/F_m , $1-qP$, F_v'/F_m' and qP of tomato leaves under HH.

Fig. 4 | Effect of DCMU and MV on energy distribution and electron transport rate in photosystems of tomato leaves under HH.

Fig. 5 | Effect of DCMU and MV on fast P_{515} signal in tomato leaves under HH.

Fig. 6 | Effect of DCMU and MV on slow P_{515} signal in tomato leaves under HH.