Cite this as: Tao LU, Jie-wei SHI, Zhou-ping SUN, Ming-fang QI, Yu-feng LIU, Tian-lai LI, 2017. Response of linear and cyclic electron flux to moderate high temperature and high light stress in tomato. *Journal of Zhejiang University-Science B (Biomedicine & Biotechnology)*, 18(7):635-648.
http://dx.doi.org/10.1631/jzus.B1600286

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*)**

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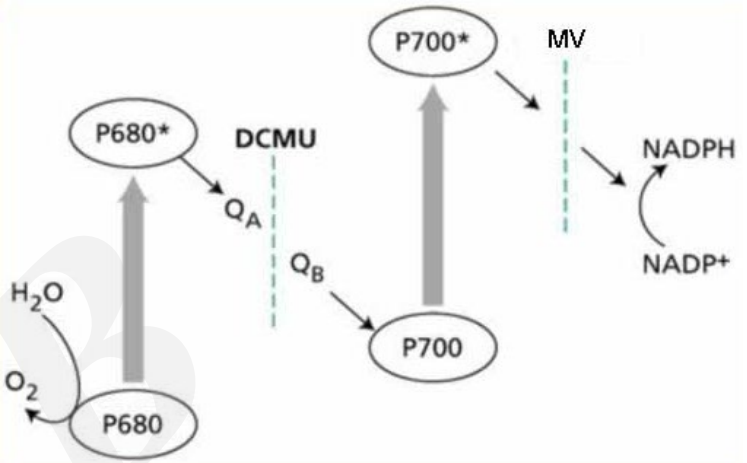
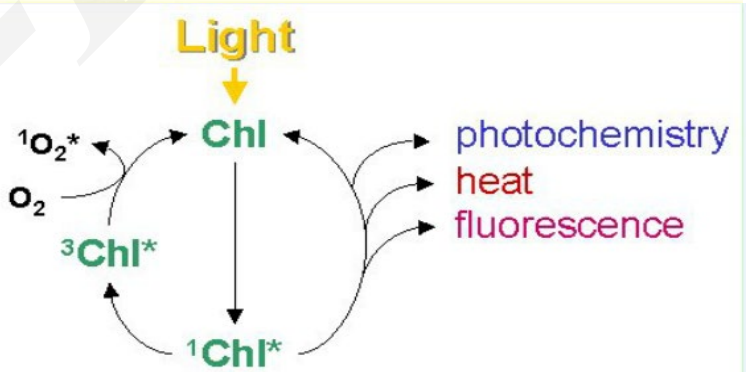
Innovation points

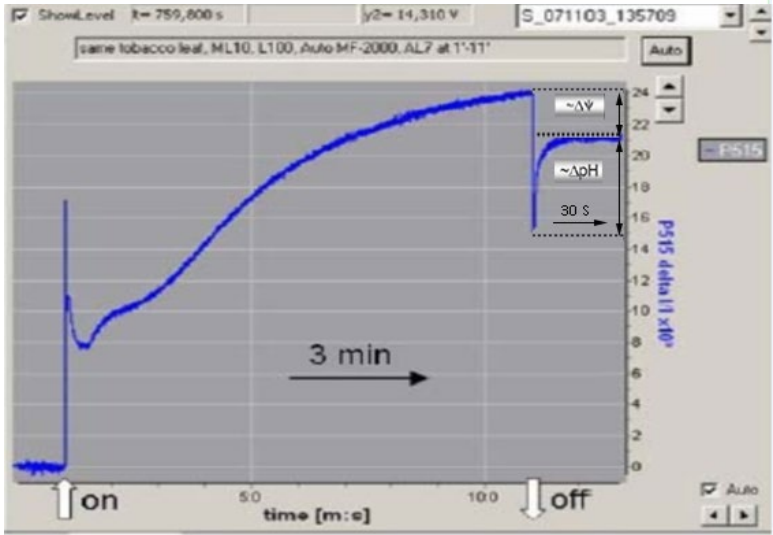
- **Introduction** of two electron transfer inhibitors: diuron (DCMU, impedes electron transport after Q_A) and methyl viologen (MV, suppresses Fd-dependent CEF)

- **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*.







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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 Fv/Fm, 1-*qP*, Fv'/Fm' 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.

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