

Succinate dehydrogenase is a source of reactive oxygen species in plants and regulates development and stress responses



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The non-competitive inhibition of SDH increases ROS production in both isolated plant mitochondria and protoplasts

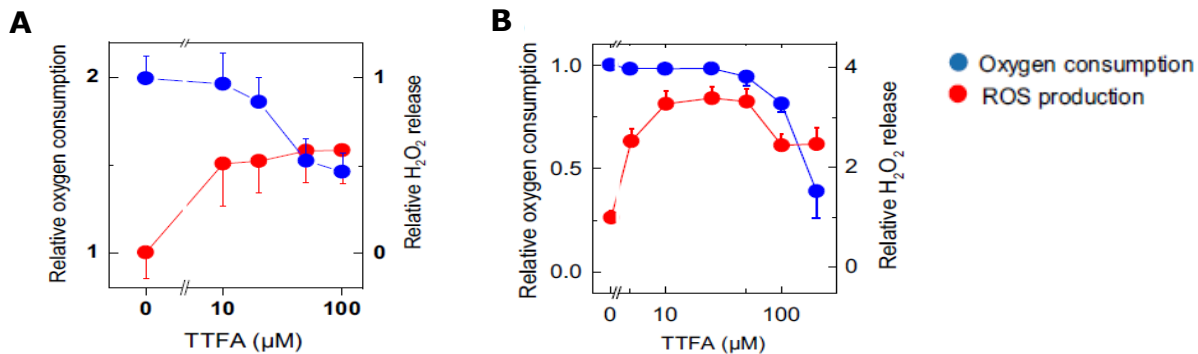


Figure 1. TTFA induces ROS production in *Arabidopsis thaliana*. Different preparations were assessed in order to determine the mechanism of ROS production in the S-pathway on different organelles of the plant cell. **(A)** Isolated mitochondria, **(B)** Isolated protoplasts. TTFA is thenoyltrifluoroacetone, an irreversible non-competitive inhibitor of the succinate dehydrogenase.

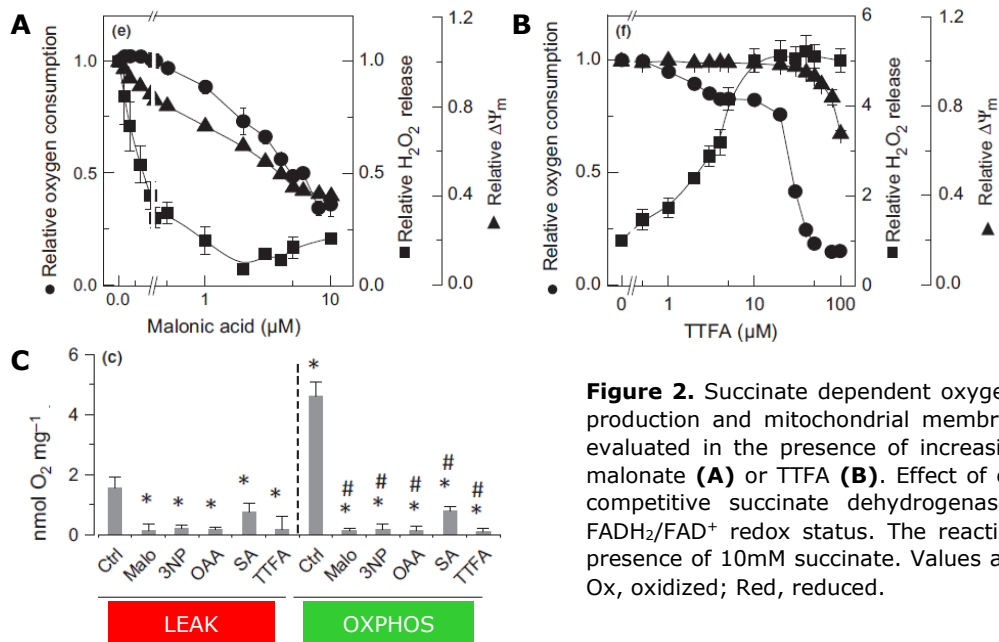


Figure 2. Succinate dependent oxygen consumption, ROS production and mitochondrial membrane potential ($\Delta\Psi_m$) evaluated in the presence of increasing concentrations of malonate **(A)** or TTFA **(B)**. Effect of competitive and non-competitive succinate dehydrogenase inhibitors on **(C)** $FADH_2/FAD^+$ redox status. The reactions were initiated in presence of 10mM succinate. Values are mean \pm SE ($N=8$). Ox, oxidized; Red, reduced.

SDH is an important site of ROS production in plant mitochondria, playing an important role in regulating plant development and responses to stress. Different molecules can physiologically control SDH-dependent ROS production by modulating SDH activity

Reference: Jardim-Messeder D, Carvezan A, Rauber R, de Souza Ferreira E, Margis-Pinheiro M, Galina A (2015) Succinate dehydrogenase as a source of ROS in plants. *New Phytol* 208:776-89

Figures and texts slightly modified based on the recommendations of the COST Action MitoEAGLE CA15203. [doi:10.26124/mitofit:190001.v2](https://doi.org/10.26124/mitofit:190001.v2)

O2k-brief communicated by M Huete-Ortega
Oroboros Instruments



Supported by project NextGen-O2k which has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 859770

