



Advanced English for Plant Biologists

spring 2013

Lesson No. 1

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Correct mistakes in the following sentences

- When did you born? **When were you born?**
- I'll going to explain the problem. **I am going to explain the problem.**
- She wore her mother skirt. **She wore her mother's skirt.**
- I didn't understood this lesson good. **I haven't understood this lesson well.**
- I saw yesterday in the field my friends. **I saw my friends yesterday in the field.**

spring 2013



Plant physiological ecology;
Stress physiology; Root ecology;
Consequences, patterns and
mechanisms of root water leakage
(hydraulic lift); Mechanisms of
drought, salinity, and low nutrient
acclimation and adaptation in
plants; Mechanisms of
competition for nutrients and
water; Applications of plant
physiological ecology to
restoration and conservation in
stressful environments.

Drought stress





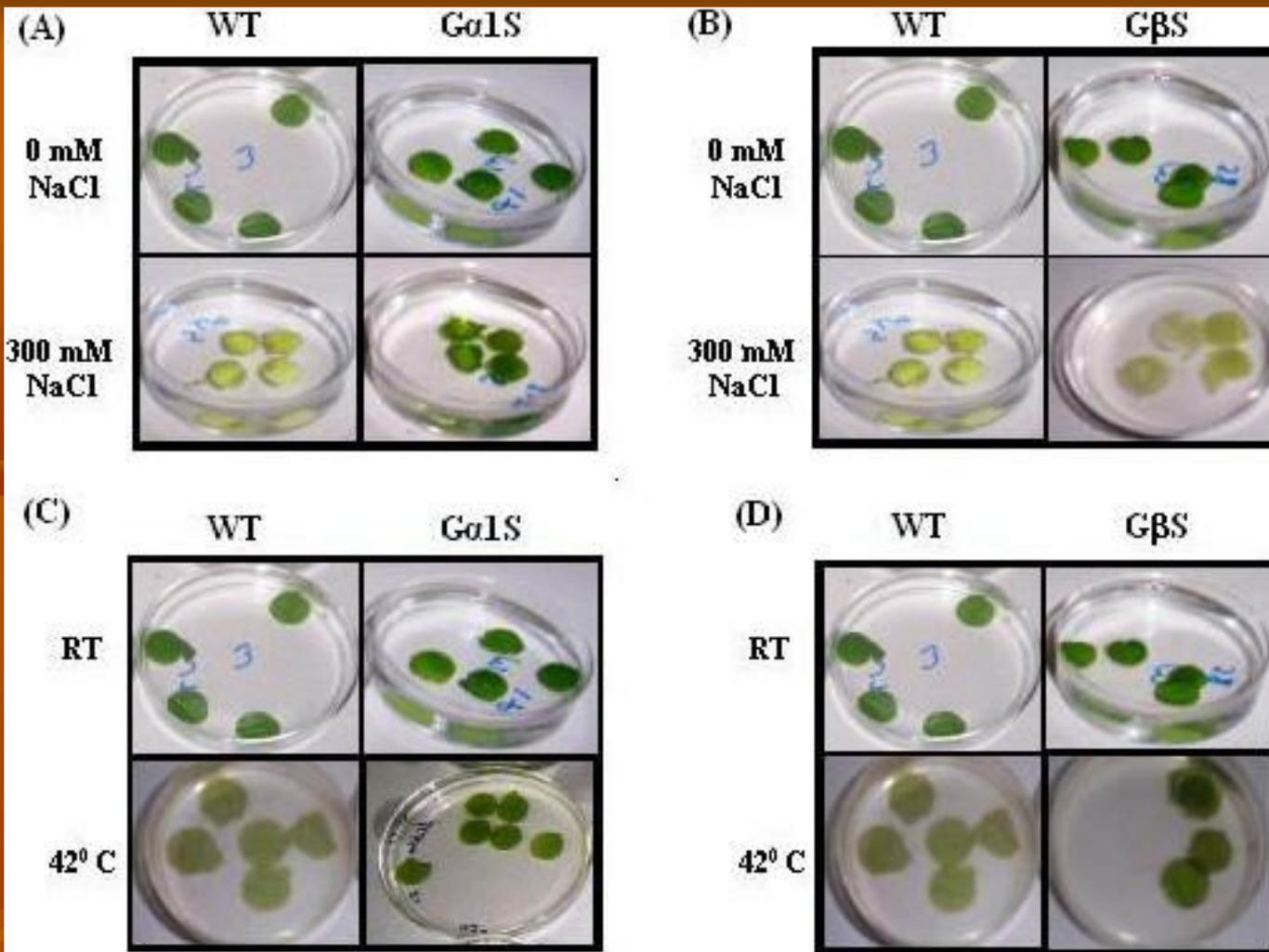
www.eead.csic.es/stressphysiology

**Leaves of the tomato mutant chloronerva.
This mutant lacks nicotianamine and is
therefore impaired in iron transport**

spring 2013



Tobacco plants stressed by drought

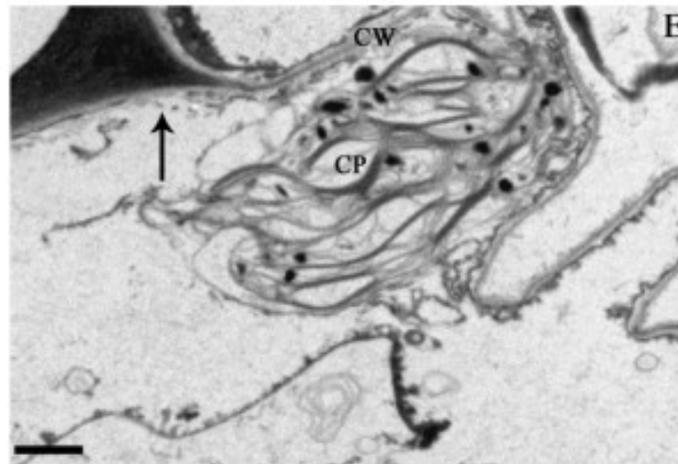
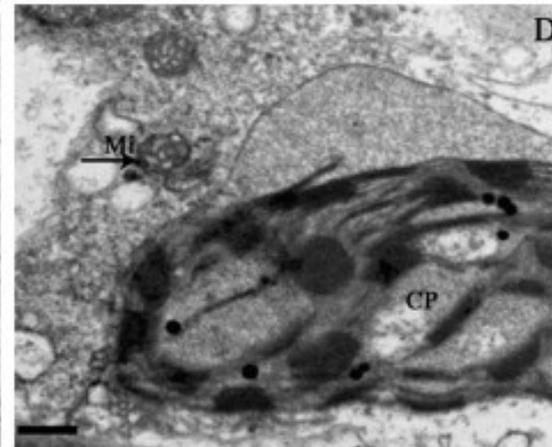
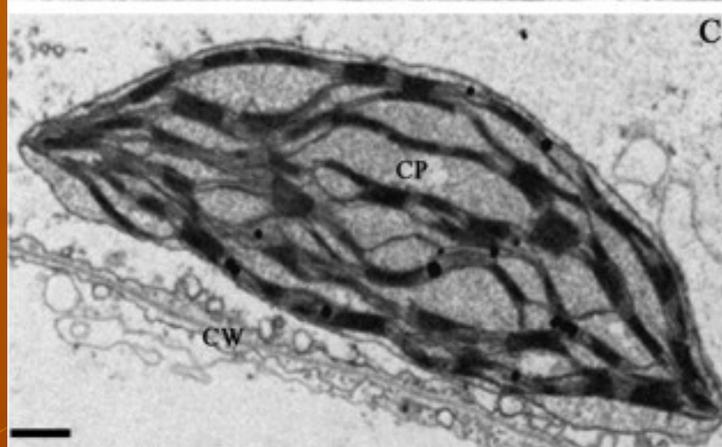
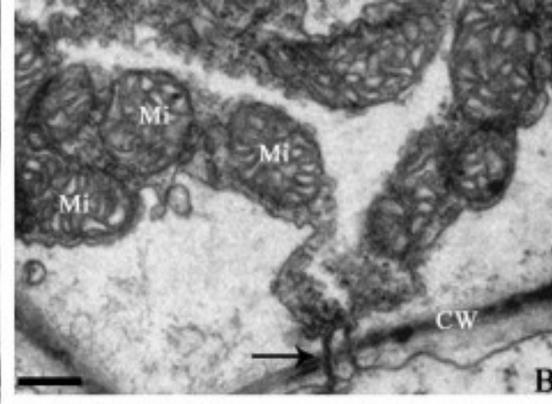
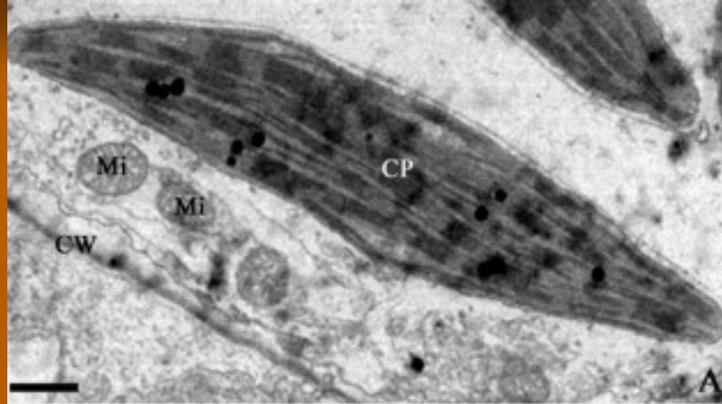


To test for salinity tolerance, leaf disks from T0 transgenic plants and WT tobacco were floated separately on 0 and 300 mM NaCl for 72 h. Salinity-induced loss of chlorophyll was lower in Ga1 overexpressing lines (sense) compared with those from the WT (**Fig 2A**). However, Gβ overexpressing lines (sense) showed no difference when compared to WT plants (**Fig. 2B**).



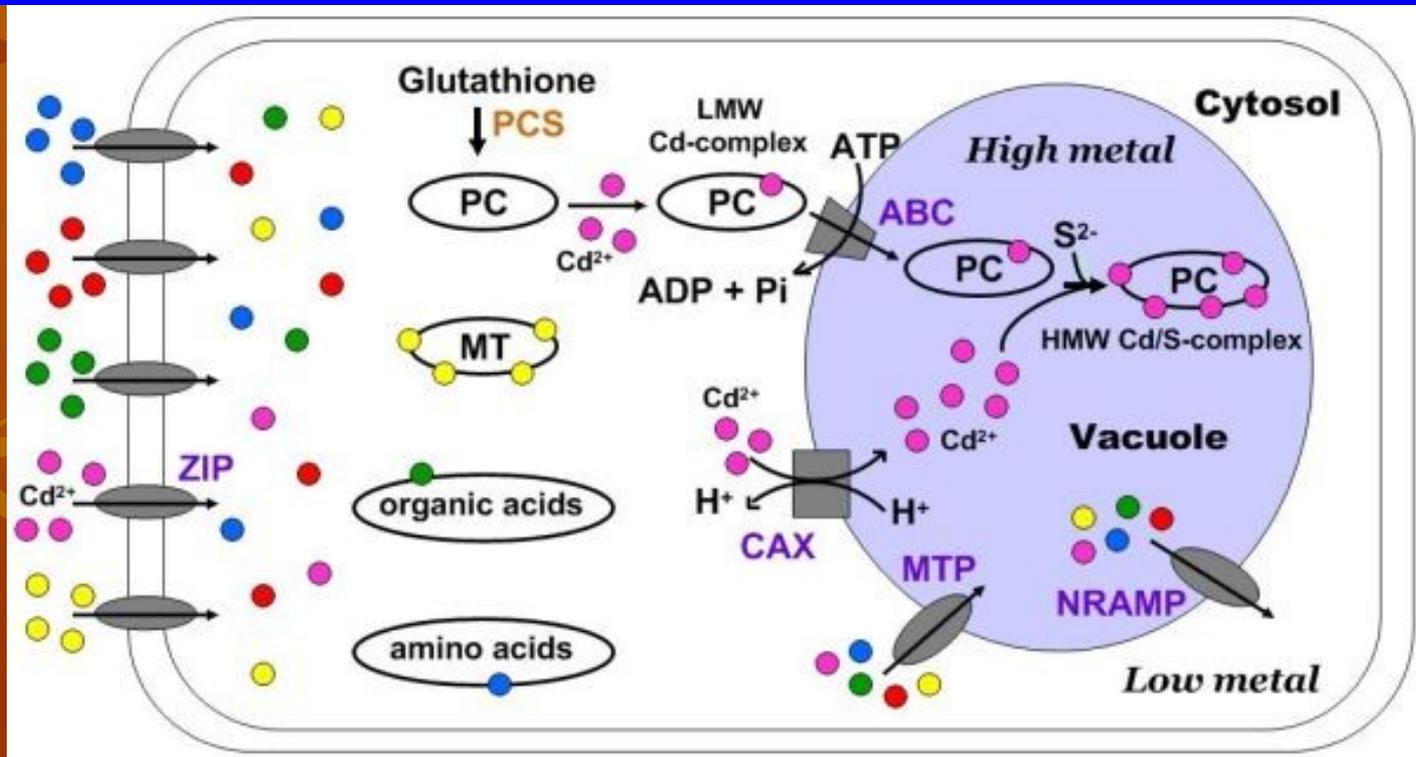
Cd-induced stress.

Control



Cadmium
treated

Vacuolar sequestration of heavy metals in plant cell. Following the uptake through transporters such as ZIP (zinc/iron-regulated transporters) family members, heavy metal ions like Cd^{2+} enters the cytosol and it stimulates the glutathione-derived synthesis of phytochelatins (PCs) by PC synthases (PCS). PCs bind cytosolic Cd^{2+} to form the low-molecular-weight (LMW) complex first, which is transported into the vacuole via a tonoplast-localized ATP-binding-cassette (ABC) transporter. In the vacuole, LMW Cd-complex then accumulate into high-molecular-weight (HMW)



■ Where do you think Cd ions are accumulated inside a plant cell?

- Source: *Agricultural and Biological Sciences* » "Abiotic Stress in Plants - Mechanisms and Adaptations", book edited by Arun Shanker and B. Venkateswarlu, ISBN 978-953-307-394-1, Published: September 22, 2011 under [CC BY-NC-SA 3.0 license](https://creativecommons.org/licenses/by-nc-sa/3.0/)
- Chapter 4
- Towards Understanding Plant Response to Heavy Metal Stress
- By Zhao Yang and Chengcai Chu



herbivory



Detached leaves inoculated with a fungal pathogen emit different number and amounts of volatiles. It is now interesting to see if we are able to measure stress related plants volatiles in a greenhouse. The main objective of this research is to determine the change in emission of volatile compounds in a greenhouse.