# Study shows vitamin C is essential for plant growth

September 24 2007

Scientists from the University of Exeter and Shimane University in Japan have proved for the first time that vitamin C is essential for plant growth. This discovery could have implications for agriculture and for the production of vitamin C dietary supplements.

The study, which is now published online in *The Plant Journal*, describes the newly-identified enzyme, GDP-L-galactose phosphorylase, which produces vitamin C, or ascorbate, in plants. Vitamin C is already known to be an antioxidant, which helps plants deal with stresses from drought to ozone and UV radiation, but until now it was not known that plants could not grow without it.

Professor Nicholas Smirnoff of the University of Exeter, lead author on the paper said: 'Vitamin C is the most abundant antioxidant in plants and yet its functions are poorly understood. By discovering that the new enzyme is encoded by two genes, we were able to engineer vitamin C-free plants and found that they were unable to grow.'

The discovery also identifies the new enzyme as a key player in controlling vitamin C accumulation in response to light. Vitamin C provides protection against the harmful side-effects of light during photosynthesis, the process by which light energy is used to convert carbon dioxide into plant matter.

Professor Nicholas Smirnoff continued: 'The discovery is exciting for me because it is the culmination of a long-term research programme on

vitamin C in plants at the University of Exeter. It opens new opportunities to understand fundamental growth processes in plants and to improve plant resistance to stresses in a changing climate. In the longer term I hope that it will contribute to the efforts of plant scientists to improve crop yield in a sustainable manner.'

The findings could also pave the way for a new approach to producing vitamin C dietary supplements. In Britain we spend an estimated £20 million on vitamin C tablets each year, making this the most widely-used dietary supplement. Vitamin C is currently produced by mixed fermentation and chemical synthesis. The new enzyme provides the potential to engineer microbes to produce vitamin C by a simpler one-step process.

Source: University of Exeter

Citation: Study shows vitamin C is essential for plant growth (2007, September 24) retrieved 22 September 2024 from https://phys.org/news/2007-09-vitamin-essential-growth.html