

Cite this as: Yun WU, Yi-ping XIA, Jia-ping ZHANG, Fang DU, Lin ZHANG, Yi-di MA, Hong ZHOU, 2016. Low humic acids promote in vitro lily bulblet enlargement by enhancing roots growth and carbohydrate metabolism. *Journal of Zhejiang University-Science B (Biomedicine & Biotechnology)*. 17(11):891-904.
<http://dx.doi.org/10.1631/jzus.B1600231>

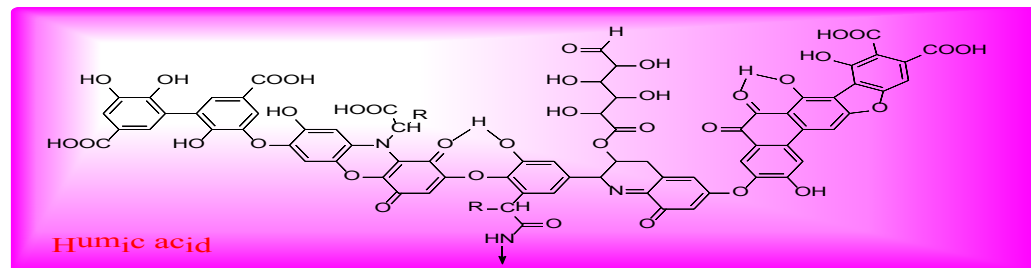
Low humic acids promote in vitro lily bulblet enlargement by enhancing roots growth and carbohydrate metabolism

Key words: Bulblet development, Humic acid, Starch metabolism, Source-sink conversion, *Lilium* Oriental Hybrids 'Sorbonne'

Research Summary

This study mainly focused on the effects of humic acid (HA) on bulblet swelling and the carbohydrate metabolic pathway in *Lilium Oriental Hybrid 'Sorbonne'* under *in vitro* conditions, and including the following aspects:

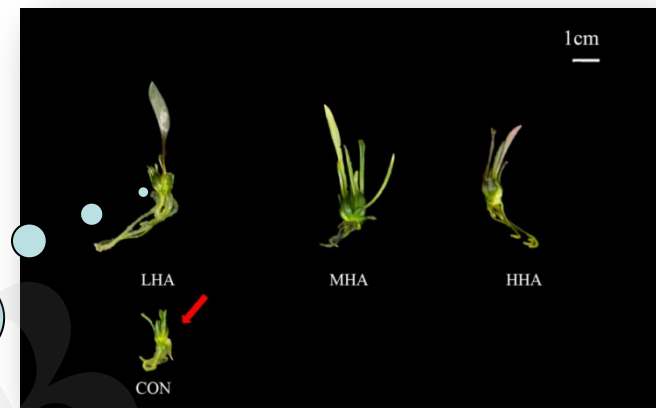
- Morphological traits response
- Non-structural carbohydrate accumulation
- Dynamic changes of starch metabolism-related enzymes
- Source-sink analysis



Innovation points

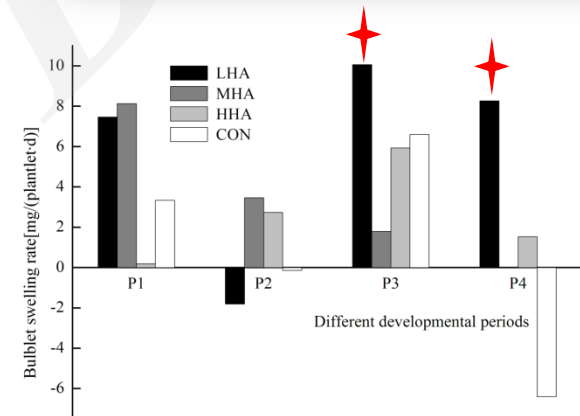
- First **HA** application in bulbous crops regarding bulb development.

468 mg
11.68 mm



- **Sucrose** is not only the carbon source but also important for molecular signals determining assimilates allocation.

- **HA** promotes starch accumulation by accelerating starch synthetic enzymes activities.



- **Relative bulblet weight** is an important indicator for source-sink balance.

Relative bulblet weight (RBW) $\approx 80\%$

