

# Iron deficiency delays flowering of arabidopsis under long days

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*Arabidopsis thaliana*. Credit: Wikipedia.

Iron (Fe) is an essential micronutrient for plant growth and development, and participates in many biological processes. Fe deficiency was shown

to delay flowering time which influences the quantity and quality of the progenies of angiosperms. However, the connection between Fe deficiency and flowering is obscure.

In a study published in *Plant Science*, the researchers from Xishuangbanna Tropical Botanical Garden (XTBG) of the Chinese Academy of Sciences and Yunnan University explored the nexus between flowering and Fe deficiency by investigating the function of the Fe-deficiency-induced transcription factors bHLH38, bHLH100, and bHLH101 (bHLH38/100/101) in the control of flowering time.

The researchers first investigated whether the flowering time of wild-type plants was affected by Fe-deficiency treatment, and found that Fe deficiency had a [negative influence](#) on flowering [time](#) under long days.

Through phenotype analysis, they then analyzed the expression levels of the flowering-related genes CONSTANS (CO), FLOWERING LOCUS T (FT) and others in the bhlh38/100/101 triple mutant, and verified the relationship between bHLH38/100/101 and FT.

The transcription of bHLH38/100/101 increased in the morning under normal growth conditions. The proteins functioned antagonistically with CO or other flowering activators to inhibit flowering. Under Fe deficiency, expression of bHLH38/100/101 was strongly induced and, subsequently, exceeded bHLH38/100/101 interaction with CO and restricted the function of CO to promote flowering.

"Our results indicated that iron deficiency affects flowering of Arabidopsis under long days through bHLH38/100/101–CO–FT signaling," said Liang Gang from XTBG.

**More information:** Wanqin Chen et al, Iron deficiency-induced transcription factors bHLH38/100/101 negatively modulate flowering

time in *Arabidopsis thaliana*, *Plant Science* (2021). DOI: [10.1016/j.plantsci.2021.110929](https://doi.org/10.1016/j.plantsci.2021.110929)

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