REDUCTION OF IAA METHYLTRANSFERASE ACTIVITY COMPENSATES FOR HIGH-TEMPERATURE MALE STERILITY IN ARABIDOPSIS

MOHAMAD ABBAS (UNIVERSITY OF NOTTINGHAM, UNITED KINGDOM), JORGE HERNÁNDEZ-GARCÍA (INSTITUTO DE BIOLOGÍA MOLECULAR Y CELULAR DE PLANTAS, SPAIN), NOEL BLANCO-TOURINÁN (INSTITUTO DE BIOLOGÍA MOLECULAR Y CELULAR DE PLANTAS, SPAIN), NORMA ALIAGA (INSTITUTO DE BIOLOGÍA MOLECULAR Y CELULAR DE PLANTAS, SPAIN), EUGENIO G. MINGUET (INSTITUTO DE BIOLOGÍA MOLECULAR Y CELULAR DE PLANTAS, SPAIN), DAVID ALABADI (INSTITUTO DE BIOLOGÍA MOLECULAR Y CELULAR DE PLANTAS, SPAIN), MIGUEL A. BLAZQUEZ (INSTITUTO DE BIOLOGÍA MOLECULAR Y CELULAR DE PLANTAS, SPAIN)

MOHAMAD.ABBAS@NOTTINGHAM.AC.UK

High temperature is a general stress factor that causes a decrease in crop yield. It has been shown that auxin application reduces the male sterility caused by exposure to higher temperatures. However, the fact that auxin is a key regulator of plant development poses the risk of undesired side effects caused by widespread applications, and the generation of new plant varieties with local accumulation of auxin in reproductive organs may represent an alternative. We have explored the possibility of increasing indole acetic acid (IAA) in ovaries by knocking out the IAA METHYLTRANSFERASE1 (IAMT1) gene in *Arabidopsis thaliana*. The *iamt1* mutant showed increased auxin signalling in funiculi, which correlated with a higher growth rate of wild-type pollen in contact with mutant ovaries and premature ovule fertilization. While the production of seeds per fruit was similar in the wild type and the mutant at 20°C, exposure to 29°C caused a more severe decrease in fertility in the wild type than in the mutant. Loss of IAMT1 activity was also associated to the production of more nodes after flowering and higher tolerance of the shoot apical meristem to higher temperatures. As a consequence, the productivity of the *iamt1* mutant under higher temperatures was more than double of that of the wild type, with almost no apparent trade-off.