

The study is focused mainly on mechanisms related to flowering acceleration in plants expressing *cdc25* from *Schizosaccharomyces pombe* (Spdc25 plants). In yeast, the gene in question codes a phosphatase responsible for activatory dephosphorylation at mitosis entry. In higher plants, however, the ortholog has not been identified yet. Some doubts even exist on the importance of this activatory dephosphorylation, though dephosphorylation itself has been documented in plants.

Previous studies of our team revealed many differences in Spdc25 tobacco plants; majority of them can be induced in WT by cytokinin application and thus, the hypothesis of cytokinin-like effect of *Spdc25* expression have been proposed. As the earlier flowering was one of the most pronounced effects, the aim of this study has been to characterize mechanisms, responsible for this phenomenon. The analyses of phloem exudates revealed weak tendency to lower saccharide transport to the apex in transformants. The sacharide content in the apex, however, was similar or slightly higher with significantly higher glucose proportion in transformants. Thus, a role of saccharides in flowering regulation should not be excluded. The analysis of the flowering-inducing genes expression has shown the only change: the expression of the tobacco homologue of *SOC1* was elevated in the transformants.

Previous results of our team achieved with Spdc25 tobacco have been verified with *Arabidopsis* expressing the same gene. The cytokinin-like effect has not been observed in this species. Earlier flowering of transformants have not been observed *in vivo* either under the inductive nor the non-inductive conditions, when the flowering is activated by different signaling pathways. Importantly, in the Spdc25 plants which were transplanted *ex vitro* flowering was accelerated. The sucrose content in medium could be responsible for this behavior.

As *Spdc25* expression impact differs between the tobacco and the *Arabidopsis*, transgenic *Arabidopsis* plants were further briefly characterized. Root system architecture is affected by *Spdc25* expression, however in the opposite manner to the tobacco. Moreover, in contrast to tobacco, *de novo* organogenesis is not strongly affected. The results point to species-specific effect of *Spdc25* expression, when the cytokinin like effect has been observed only in tobacco.