THE ROLE OF GIBBERELLINS IN THE REGULATION OF FLOWERING IN PLANTS

Summary

The results of studies with exogenous gibberellins application showed that the hormones influence on flowering of long-day plants and short-day plants in different manner. In *Arabidopsis*, as well as other long-day plants, gibberellins stimulate flowering. In rose plants, and also some long-day plants, exogenous gibberellins are even able to replace long inductive photoperiod. In many short-day plants cultivated under non-inductive conditions of short night, gibberellin application delays or inhibit flowering. However, in *Pharbitis nil* (a model short-day plant) cultivated under sub-inductive conditions, gibberellins stimulate flower bud formation. Thus, the effects observed after gibberellins application in short-day plants are not unequivocal and depend on plant specious as well as time and place of hormones application. Because in some long-day plants, e. g. *Lolium temulentum*, photoperiodic induction, influencing on genes encoding gibberellic 20-oxidase, leads to the increase of gibberellins level in leaves, and next their transport to the apex where the evocation and flower morphogenesis take place, gibberellins were even historically considered as the flowering signal in LDP. Nevertheless, the most essential progress in understanding of gibberellins role in the regulation of generative development comes from molecular studies. In *A. thaliana* gibberellins trigger one of four flower induction pathways. The gibberellic pathway activates the expression of genes involved in flower formation both directly, through the activation of *LFY* and *FT* genes, and indirectly, through the positive regulation of *SOC1* gene. It seems that the effects underlie the stimulating influence of gibberellins on flowering in long-day plants, and perhaps in some short-day plants, as well. In rose plants, correctly functioning gibberellin signal transduction pathway determine simultaneously stem elongation which is followed by flowering. Gibberellins are also involved in morphogenesis and sex differentiation of emerging flowers.