

***StCDF1* gene editing in wild potato protoplasts**

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One of the major domestication traits in potato is tuberization at long-day conditions [1]. A key regulatory gene for tuberization time control in potato is *StCDF1* encoding CYCLING DOF FACTOR family protein. Late tuberization at short day is associated with intact allele of this gene and early tuberization at long day is associated with mutations leading to either truncated gene product or modification at C-terminus [2]. Genome comparison between wild and domestic potato showed that most studied long-day potato varieties contain truncated version of the *CDF1* gene [3]. The aim of the present study is the reconstruction of frameshift mutation leading to premature stop-codon at C-terminus of the *CDF1* gene product in wild potato. Two wild potato species namely *Solanum chacoense* and *S. polyadenium* were selected for modification. The structure of the *CDF1* gene was examined in selected genotypes. In order to integrate the precise mutation and create the truncated version of the CDF1 factor two gRNA were designed and cloned in plasmid vectors containing also Cas9 endonuclease gene. Both vectors were used for protoplast transfection with further DNA extraction and target region sequencing. Mutations were found in both wild potato species. The experiment showed the possibility to edit *CDF1* gene in potato cells. Developed gene editing strategy can further be applied for whole plants for modification of tuberization time trait in wild potato.

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References

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