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Poster Abstract – E.04

IMPROVEMENT OF PLASTID TRANSFORMATION IN POTATO (*SOLANUM TUBEROSUM* SSP. *TUBEROSUM*)

VALKOV V., MANNA C., FORMISANO M., GARGANO D., SCOTTI N., CARDI T.

CNR-IGV, Institute of Plant Genetics, Research Division Portici, Via Università 133, 80055 Portici (Italy)

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The integration and expression of transgenes in the plastidial genome of higher plants presents several interesting features. In previous reports, using tobacco vectors, plastid transformation in potato ranged from one transplastomic shoot every 15 biolistic shots to one every 35, transformation efficiencies varying with the genotype and the targeting region. Such low efficiencies prevented the use of plastid transformation in more genotypes and for more aims. We improved the plastid transformation efficiency in the important potato *cv*. Désirée up to one transplastomic shoot every eight shots by selecting resistant calli on spectinomycin containing medium and regenerating shoots on a optimized series of media. That efficiency was further increased to about one event per bombarded plate by designing a set of new transformation vectors carrying homologous potato flanking sequences. In order to increase transgene expression, especially in non-green plastids, we analyzed GFP expression at the transcript and protein level in leaves and tubers of transplastomic plants produced with a number of vectors containing different promoters and 5'-UTRs. Correct integration of the transgene was proved by PCR and Southern blot analyses, while levels of transcript and protein accumulation were determined by northern and western blot hybridisation, respectively. Detectable transcripts accumulated with all vectors and in both organs, although differences between vectors and generally lower expression in tubers than in leaves were observed. The highest transcript accumulation was obtained with the *rrn* promoter. Further, the GFP protein could be detected in tubers only when this promoter and a synthetic 5'-UTR containing the *rbcL* ribosome-binding site were used. The results presented are of particular interest for the production of transplastomic potato plants and for developing a system for protein accumulation in potato tubers.