ロベリアの新規黄色花および橙色花作出の試み

作物生産生物学　　園芸学分野

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(Background and purpose) Flower colour is an important feature for the appreciation and purchasing of ornamental flowers. Flavonoids and their class, anthocyanins, are principal colour determinants in most flowers and their biosynthetic pathway are well established. Recently, gene transformation techniques have made it possible to obtain new flower pigment-synthesizing genes from certain plants and express those genes in different species in order to achieve modification of flower colour. *Lobelia erinus* is a popular ornamental plant with blue, dark-pink, or white flowers that native to South Africa which is used as edging plant in gardens, and only 2 month are required from sowing to flower blooming. Representative anthocyanins such as delphinidin as well as flavonoes are present in *L. erinus*. In this study, I'm trying to construct three binary vectors for producing yellow and orange flowers through regulating flavonoid synthetic athway in *L. erinus*.

(Methods) For creating a yellow variety, *L. erinus* chalcone isomerase (*LeCHI*) gene was amplified and transferred into vector pBI-sense, anti sense-GW vector. In addition, *Antirrhnum majus* aureusidin synthase (*AmAS1*) gene and chalcone 4'-O-glucosyltransferase (*Am4'CGT*) gene were amplified and transferred into vector pIG121-Hm. For creating an orange variety, *Rosa Hybrid* dihydroflavonol 4-reductase (*RhDFR*) gene was amplified and introduced into vector pIG121-Hm. The created construscts were then transformed to *L. erinus* cv. Aqua Blue, Aqua Lavender and Regatta Rose through agrobacterium-mediate transformation.

(Results and Discussion) Binary vector pBI-sense, anti sense-GW:LeCHI-IR carry an inverted repeat sequence of *LeCHI* was constructed for *CHI* suppression. Binary vector pIG121-Hm:4'CGT-35Sp-AS1 carrying *AmAS1* and *Am4'CGT* was contrasted for the coexpression of these two genes to induce aurone (yellow pigment) synthesis. Binary vector pIG121:RhDFR carrying *RhDFR* was constructed for the expression of *DFR* to induce pelargonidin (orange pigment) synthesis. Since the bacteria elimination of explants and callus development was not going well, the transgenic plant wasn't achieved right now. Further research of construction of a new vector carrying triple genes of *LeCHI*, *AmAS1* and *Am4'CGT* for modification of yellow colour, and *F'3H* and *F3'5'H* suppression for modification of orange colour, as well as the study of phenotype of transgenic plants need to be done.