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Transgenic sweetpotato expressing mutant phytochrome A, *S598A*

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Objective

Energy crisis is one of our concerns in 21st century. To overcome this problem, several alternative energy sources including bioenergy have been developed. Sweetpotato is a good target of bioenergy for its high starch content. However, its quality should be improved for the use as a commercially valuable bioenergy source. For this purpose, we have tried to transform sweetpotato.

Materials and Methods

1. Material: Sweetpotato (*Ipomoea batatas* L.) cv. Yulmi
2. Methods: Calli induction and maintenance: N6 media (2mg/L 2,4-D)
   Regeneration: MS media
   Vector: pCAMBIA2301 with oat mutant phytochrome A (*S598A*)

Result and Discussion

We developed efficient tissue culture and regeneration systems using the meristem of sweetpotato (*Ipomoea batatas* L.) cv. Yulmi. On N6 media with 2.0 mg/L 2,4-D, meristems isolated from apical and lateral buds were cultured and embryogenic calli were induced. Then, we transformed those embryogenic calli through bombardment. Transformed calli were selected under selection marker pressure and survived calli were regenerated on MS media with 0.1 mg/L 2,4-D followed by MS media. According to our methods, fast multiplication and long-term maintenance of embryogenic calli were possible. The plants regenerated from our protocol are now grown in a greenhouse and they are developing normally. Thus our results are very promising, and now provide a firm basis for a range of genetic manipulations. With this system, we are now introducing genes that can increase crop biomass such as hyperactive oat mutant phytochrome A(*S598A*), phytochrome B(*PhyB*) and *ABF3*. And we have confirmed that the introduced gene(*S598A*) was successfully incorporated and expressed in calli and regenerated plantlet by GUS histochemical assay, PCR and genomic DNA blot analysis. Now, we are trying to observe phenotypic changes that the transformed gene can make.

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