

High Concentrated Sucrose from Rice

Background

To produce a bio-fuel, starch rich plants (corn, sorghum, potatoes, and cassava) and sugar rich plants (sugar cane and sugar beet) are used as a feedstock. However, there are demerits to both materials. The starch rich plants need to be saccharized, causing enormous cost. Although the sugar rich plants do not require a saccharization step, the extraction of sugar solution is needed and it consists of various forms of low concentration (less than 20%) sugar, which are not suitable for the fermentation process. Two major sugar-producing plants, sugar cane and sugar beet can only grow in limited climates such as tropical and cold regions. To meet energy needs, there is an urgent need to find a new sugar-producing plant that can be grown in warm climates such as China and the US, with vast expanses of land and huge energy consumptions.

Technology Overview

Nagoya University researchers have revealed that POEM (pollen tube-dependent ovule enlargement morphology) by mutation of *gcs1* gene in *Oryza sativa* (rice) can allow the storage of a highly concentrated sucrose (98%) as a liquid. For bio-ethanol production, the purity of the sucrose is one of the reasons for the rate-determining step of the bio-fuel production efficiency. This technology enables the production of bio-fuel without a saccharization step that requires massive energy input.

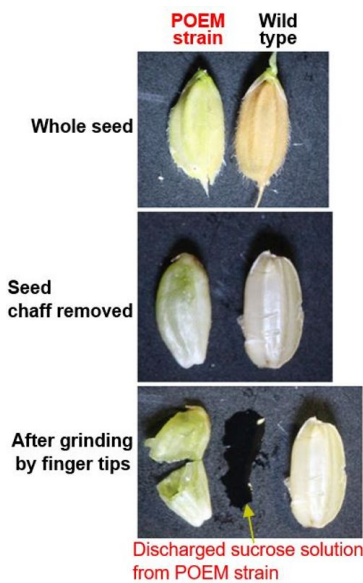


Figure 1: Phenotype comparison between wild type rice and GCS1 mutant strain

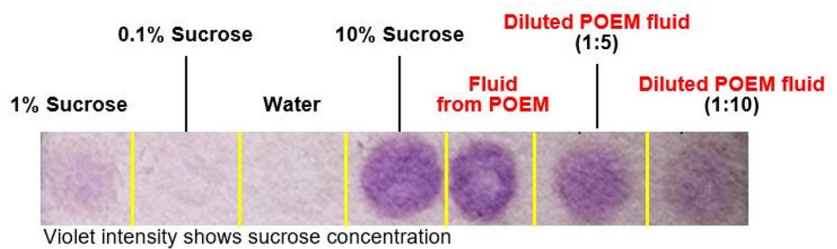


Figure 2: Various solutions on sucrose test paper

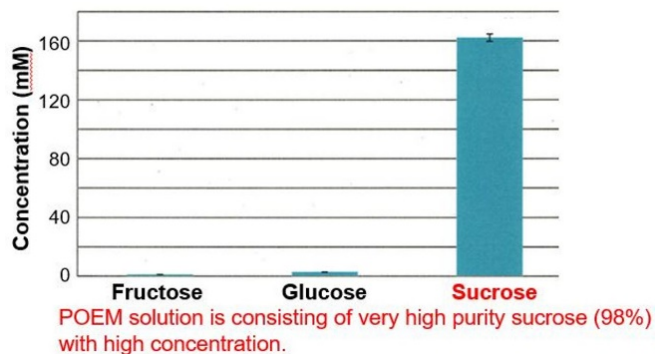


Figure 3: High quality sucrose from POEM rice

Applications

This technology is not limited to poaceae, but could include plants that express GCS1 such as legume family, fruit trees, potatoes, oilseed crops, feed crops, etc.

Seeking

Licensing

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