Biotechnological methods and treatments to create specialised metabolites in S. grosvenorii.

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Introduction

S. grosvenorii, commonly known as Luo Han Guo or monk fruit, is a perennial vine that is native to southern China and northern Thailand. The fruit of this plant has been used in traditional Chinese medicine for centuries due to its medicinal properties. The fruit contains a group of compounds known as mogrosides, which are natural sweeteners that are up to 300 times sweeter than sugar but have no calories or glycemic impact. Due to the high demand for natural sweeteners, there has been significant interest in the biotechnological methods and treatments used to create specialized metabolites in S. *grosvenorii*. Specialized metabolites are a diverse group of compounds that are produced by plants, fungi, and bacteria. They play essential roles in various biological processes, including defense against predators, attraction of pollinators, and adaptation to environmental stresses. In S. *grosvenorii*, the specialized metabolites are primarily mogrosides, which are synthesized from cucurbitane-type triterpenoids [1].

One of the biotechnological methods used to create specialized metabolites in *S. grosvenorii* is genetic engineering. Genetic engineering involves modifying the DNA of an organism to produce a desired trait. In S. *grosvenorii*, genetic engineering has been used to increase the expression of the genes involved in mogroside biosynthesis. For example, researchers have introduced a gene encoding a transcription factor that regulates the expression of the genes involved in mogroside biosynthesis. This approach has been successful in increasing the levels of mogrosides in S. *grosvenorii* [2].

Another biotechnological method used to create specialized metabolites in S. *grosvenorii* is tissue culture. Tissue culture involves growing plant cells or tissues in a controlled environment under sterile conditions. This approach has been used to produce large quantities of plant material that can be used for the extraction of mogrosides. Tissue culture can also be used to induce the production of specialized metabolites in S. *grosvenorii* by manipulating the growth conditions of the plant. For example, researchers have shown that exposing S. *grosvenorii* to high levels of light and low temperatures can increase the levels of mogrosides in the fruit [3].

In addition to genetic engineering and tissue culture, there are several other biotechnological treatments that have been used to create specialized metabolites in S. *grosvenorii*. These include elicitation, precursor feeding, and stress induction. Elicitation involves treating the plant with a substance that induces the production of specialized metabolites. In S. *grosvenorii*, researchers have shown that treating the plant with jasmonic acid, a plant hormone involved in stress response, can increase the levels of mogrosides in the fruit [4].

Precursor feeding involves providing the plant with a precursor molecule that is used in the biosynthesis of specialized metabolites. In, researchers have shown that feeding the plant with mevalonic acid, a precursor molecule involved in the S. grosvenorii biosynthesis of mogrosides, can increase the levels of mogrosides in the fruit. Stress induction involves subjecting the plant to environmental stresses, such as drought or high salt concentrations, which can induce the production of specialized metabolites. In S. *grosvenorii*, researchers have

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shown that subjecting the plant to water stress can increase the levels of mogrosides in the fruit [5].

Conclusion

Biotechnological methods and treatments have been used to create specialized metabolites in S. *grosvenorii*, primarily mogrosides. These methods include genetic engineering, tissue culture, elicitation, precursor feeding, and stress induction. These methods have been successful in increasing the levels of mogrosides in S. *grosvenorii* and have the potential to be used in the commercial production of natural sweeteners.

References

1. Birchfield A.S., McIntosh C.A. Metabolic engineering and synthetic biology of plant natural products—A minireview. Curr. Plant Biol. 2020;24:100163.
2. Capell T, Twyman R.M., Armario-Najera V, et al. Potential Applications of Plant Biotechnology against SARS-CoV-2. Trends Plant Sci. 2020;25(7):635–643.
3. Davies K.M., Deroles S.C. Prospects for the use of plant cell cultures in food biotechnology. Curr. Opin. Biotechnol. 2014;26:133–140.
4. Guiné R.P.F, Florença S.G, Barroca M.J, Anjos O. The Link between the Consumer and the Innovations in Food Product Development. Foods. 2020;9(9):1317.
5. Newman D.J, Cragg G.M. Natural Products as Sources of New Drugs from 1981 to 2014. J. Nat. Prod. 2016;79(3):629–661.

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