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Perspective

Green Coffee Beans are used as an Alternate Growing Medium for Neurospora Sitophila to Provide a Fruity Scent

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Abstract

The synthesis of flavours seems to be a promising application for biotechnological methods. De novo synthesis allows for the simultaneous formation of pyrazines, lactones, acids, short-chain alcohols, esters, aldehydes, ketones, methylketones, and other volatile odours that are chemically distinct from one another (Yamauchi H, 1991). This study examined the effectiveness of green coffee beans as a substitute culture medium for the formation of a fruity scent by several Neurospora sp. strains. A validation method for the synthesis of aromas was also reported in the study, and the average recovery of volatile compounds utilising the SPME approach was 30.5 percent. After being fermented for 72 hours by the strain LB26DSC, green coffee beans produced the maximum amount of ethyl hexanoate, 25.43 $mg.L^{-1}$.

This is the first study, to the best of the authors' knowledge, describing the manufacture of ethyl hexanoate by Neuropora sp. utilising green coffee beans as a culture medium, which offers a promising alternative to the traditional methods used to create this fragrance compound.

Keywords: Flavors, Aroma production, Green coffee and Neuropora sp.

INTRODUCTION

A significant shift toward the bio-generation and usage of flavour compounds of biotechnological origin (bioflavors) has been noticed in response to the expanding market for flavoured and fragranced products, which calls for fresh ways for aroma chemical synthesis. Since they produce flavours in benign circumstances, with excellent regio- and enantioselectivity, don't produce harmful waste, and can be branded as "natural," biotechnological procedures seem like a promising option (Pastore GM et al., 1995). De novo synthesis allows for the simultaneous formation of pyrazines, lactones, short-chain alcohols, esters, aldehydes, ketones, methylketones, acids, and other volatile odours with varied chemical compositions. Numerous fungus species have been identified as volatile fruity scent generators while growing in culture media (Krings U et al., 1998). The funguses from the genus Neurospora have drawn a lot of interest because of their potent ability to produce a pleasant and fruity odour.

Several studies are currently evaluating the use of inexpensive nutrient sources and the use of unconventional media for the production of new added-value compounds, such as the production of fruity banana and pineapple flavour by Ceratocystis fimbriata grown on steam-treated coffee husk or sugar cane bagasse (Barros FFC et al., 2008).

In order to test an alternate growth medium for the production of a fruity scent by the various strains of Neurospora sp., green coffee beans were used in this article (Cameotra SS et al., 1998). The research also included descriptions of the validation procedures for the creation of aromas, the typical recovery of volatile compounds, and the product components.

RESULTS

The structure the presence of C-source transforms the green coffee's high levels of nitrogen and mineral salts into a substrate that is suited for the development of microbes, helping to make this a realistic commercial process. It is a significant and promising substrate because to the high concentrations of various crucial micronutrients for microbial growth, and it does not require nutrient supplementation (Soares M et al., 2000).

CONCLUSION

This study examined the use of green coffee beans as an alternate culture medium, which proved to be an effective supply of carbon, nitrogen, and mineral salts for the production of the fruity ester after microbe growth. The validation method for the synthesis of aromas was also tested, and the average recovery of volatile compounds utilising the SPME approach was 30.5 percent. After being fermented for 72 hours by the strain LB26DSC, green coffee beans produced the maximum amount of ethyl hexanoate, 25.43 mg.L-1. This is the first study, to the best of the authors' knowledge, describing the manufacture of ethyl hexanoate by Neuropora sp. utilising green coffee beans as a culture medium, which offers a promising alternative to the traditional methods used to create this fragrance compound.

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