Perspective
Volume 12:11, 2022

Journal of Bioprocessing & Biotechniques

ISSN: 2155-9821 Open Access

Raw Materials to Make Made by Bacteria using Bananas Ethanolic Extracts

Wen Zhou*

Department of Environmental Biotechnology, University of Strathclyde, Glasgow, UK

Introduction

One of the most significant crops in the world is the banana. However, it also produces a significant amount of leftover lignocellulosic biomass, which is currently underappreciated. These leftovers may be used as feedstock for bio-based processes using a biorefinery strategy. The following goals of this project, which is based on the use of banana leaves, using a statistical regression model, it was possible to I identify the influence of specific physical and environmental factors on the amount of glucose found in banana leaf extract (BLE), and produce bacterial nanocellulose (BNC) using BLE (70% v/v) and kombucha tea as the fermentation medium. Additionally, X-ray diffraction (XRD), Fourier transform infrared (FTIR), and thermogravimetric analyses were used to assess the physicochemical properties of BNC [1].

Of terms of metric tonnes harvested, the banana, a perennial tropical crop in the Musicale family, is one of the most significant crops in the world. For many developing nations, it is also important from an economic and food perspective. Different by-products are produced during the banana production process, including starchy material, rejected fruits that don't meet the commercial standard; this by-product is used to make flour, cattle feed, or snacks and lignocellulose biomass, which includes rachis, leaf, and pseudo stem. These lignocellulose residues, however, are typically not valued. Although banana leaves are often left on the plantation ground, they can be used to package some goods [2].

On the other side, the banana is finally wrapped when the rachis carrying the banana bunches reaches the collection facility. The rachis is stacked up to be thrown away. The leading exporter of bananas in the world, Ecuador, is thought to have a waste-to-product ratio of 3.79 and an annual waste generation of 2.65 Mt of biomass on a dry basis. The circular bio economy model-based valorisation of residual biomass would be a sustainable strategy that may create new employment opportunities, be crucial for food security, and be in accordance with some of the Sustainable Development Goals [3].

Description

The leftover biomass must go through a pre-treatment stage before it can be valorised. Pre-treatment activities may be physical, chemical, biological, or a combination of these. Various methods, including steam, crushing, grinding, ultrasound, microwaves, or drying, are used in physical preparation. In contrast, oxidising, basic, or acidic reagents are used in chemical pre-treatment. On the other hand, fungi and enzymes are the foundation of biological pre-treatment. To make it easier for enzymes to reach the polymers in the cellulose's enzymatic hydrolysis stage, the pre-treatment process often entails solubilizing the hemicellulose structure and lowering the biomass's lignin content. Enzymes are employed to break down the complex sugars in the biomass, increasing the amount of simple sugars.

Certain goods have historically been packaged in banana leaves. However, new uses for this leftover biomass are being researched. Produced lignocellulose micro/nanofibers, and the results showed that this biomass has a higher yield and cheaper cost of production than the cellulose nanofiber (CNF) production method, which makes it more suitable for use in the making of paper. Using dried banana leaf as the carbon source, reported a maximum bioethanol yield of 0.38 g/g sugar for the generation of bioenergy. Banana leaf extract has also been researched for usage. As a result of Chai et a discovery's that pressed banana leaf juice contains a lot of glucose, they created lipases.

A contemporary trend is the valorisation of waste biomass using bio-based methods. Different obstacles do, however, stand in the way of these developments. high production costs when compared to petroleum-based products. Additionally, the functioning of a biorefinery can be affected technically and economically by the diversity of the quality, physical, structural, and chemical composition features of biomass. It is unclear whether these characteristics differ according on geography, crop management, or the environment. The yield of fermentable sugars in the juice recovered from the banana leaves may also be impacted, however this is unknown [4].

Prior to getting the BLE, some physical characteristics were measured, including fresh weight (g), length from the base to the apex of the leaf blade (cm), and breadth at the broadest point of the blade (cm). Additionally, on both the upper and lower sides, visual clues to leaf blade colour and petiole type were identified. These descriptors were created using the colour scheme from the International Network for the Improvement of Banana and Plantain's descriptor guide for bananas. Then, each sample's extract was collected by running the leaves through a "traipse" mill three times. This device, which consists of three rollers that press the banana leaf to produce juice from sugar cane, was used to press the leaves three times.

The findings of examining these variables as a mixed regression model show that storage time and the source of the sample are very important variables influencing RS recovery. The RS content falls by 1.134 units per day as the duration from banana leaf collecting to juice extraction rises. This suggests that extended ambient storage lowers the RS content, presumably as a result of the presence of microorganisms like fungi and bacteria that result in the biodegradation of the leaf. Sugarcane has shown comparable outcomes. Solomon came to the conclusion that the majority of sugar plants in India take an average of 3 to 5 days between harvest and milling, losing 1.0–1.3 sucrose units from the cane in the process [5].

Conclusion

The yield of a bio-based production process can be impacted by a few feedstock variables. Building sustainable biorefineries can benefit from testing these yields through predictive modelling. In this regard, banana leaves have the potential to serve as supplies of reducing sugars for bio-based processes that take a biorefinery approach. To put this into practise, it is vital to understand the relationship between storage duration, the location of the feedstock supply, and the process yield. It has been found that during storage periods of three to five days, the yield of banana leaves drops by roughly 28.82% to 64.32%.

***Address for Correspondence:** Wen Zhou, Department of Environmental Biotechnology, University of Strathclyde, Glasgow, UK, E-mail: wenzhou234@gmail.com*

Received: 01 November, 2022, Manuscript No: jbpbt-23-86132; **Editor Assigned:** 03 November, 2022, PreQC No: P-86132; **Reviewed:** 15 November, 2022, QC No: Q-86132; **Revised:** 20 November, 2022, Manuscript No: R-86132; **Published:** 27 November, 2022, DOI: 10.37421/2155-9821.2022.12.546

The corrected R2 for the linear model linking these variables to reduced sugar production is 0.7507. These factors, which are crucial for industrial scale-up, had not been taken into account in earlier research on the value of banana leaves.

Acknowledgement

None.

Conflict of Interest

There is no conflict of interest by author.

References

1. Rana, Gajendra Kumar, Yogendra Singh, S. P. Mishra and Hemant K. Rahangdale. "Potential use of banana and its by-products: A review." *Int J Curr Microbiol App Sci* 7 (2018): 1827-1832.
2. Padam, Birdie Scott, Hoe Seng Tin, Fook Yee Chye and Mohd Ismail Abdullah. "Banana by-products: An under-utilized renewable food biomass with great potential." *J Food Sci Technol* 51 (2014): 3527-3545.
3. Hikal, Wafaa M. and Hussein AH Said-Al Ahl. "Banana peels as possible antioxidant and antimicrobial agents." *Asian J Agric Res* (2021): 35-45.
4. Dos Santos, Stella Buback, Mariana de Oliveira Faber, Ana Cristina de Araujo Collaço and Erika Cristina G. Aguieiras, et al. "Sequential hydrogen and methane production using the residual biocatalyst of biodiesel synthesis as raw material." *Int J Hydrog Energy* 46 (2021): 23658-23669.
5. Alzate Acevedo, Sasha, Álvaro José Díaz Carrillo, Edwin Flórez-López and Carlos David Grande-Tovar. "Recovery of banana waste-loss from production and processing: A contribution to a circular economy." *mol* 26 (2021): 5282.

How to cite this article: Zhou, Wen. “Raw Materials to Make Made by Bacteria using Bananas Ethanolic Extracts.” J Bioprocess Biotech 12 (2022): 546.