



Establishing a Culture Collection for Sustainable Industrial Biotechnology

Nejat Furkan Çağlar^{1,2}, Remziye Yılmaz^{1,2,*}

¹Hacettepe University, Department of Food Engineering, FoodOmics Laboratory, Beytepe Campus, Ankara 06800, Türkiye

²Hacettepe University, International Food Biosafety and Biotechnology Research and Extension Center (IFBBC), Beytepe Campus, Ankara 06800, Türkiye

*remziye@hacettepe.edu.tr

Introduction

The availability of well-characterized microorganisms within culture collections represents a strategic requirement for industrial biotechnology applications. In Türkiye, 19 culture collections comprising approximately 10,400 microbial strains are currently registered in the World Data Centre for Microorganisms (WDCM). However, the number of collections with sustainable funding, robust infrastructure, and the ability to provide services to external stakeholders remains limited. This study aims to contribute to a sustainable industrial biotechnology ecosystem by establishing a laboratory-scale culture collection structure designed to serve external users.

Materials and Methods

In this study, microbial cultures previously utilized in our laboratory were employed as the material. For methodological validation, molecular biological approaches were applied, including sequencing of the ITS and 16S rRNA gene regions. The obtained data were subsequently analyzed using bioinformatics tools, such as phylogenetic analysis and genetic polymorphism assessment. Based on these evaluations, a systematic dataset was generated, and the resulting outputs were made accessible to external users through a web-based platform.

Results

This study enabled the verification of previously defined yeast and bacterial cultures at the laboratory scale and ensured the precise determination of their taxonomic positions. Furthermore, the generated data were made available to external users through a web-based portal, thereby contributing to the sustainability of industrial biotechnology.

Conclusion and Discussion

In conclusion, verifying microbial cultures and sharing systematically analyzed data via a web-based platform enhance both the reliability of culture collections and their accessibility, supporting sustainable industrial biotechnology.

Keywords: Industrial Biotechnology, culture collection, bioinformatics, web platform

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