

ISOLATION AND CHARACTERIZATION OF EPS-PRODUCING LACTIC ACID BACTERIA FROM ARTISANAL SOURDOUGHS

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INTRODUCTION

Exopolysaccharides (EPS) are extracellular polymers produced by lactic acid bacteria (LAB). Composed mainly of monosaccharides, these compounds enhance the technological and functional properties of fermented foods, influencing texture, viscosity, stability, and water retention.

The present study aims to evaluate the production of EPS by LAB strains isolated from traditional sourdoughs, in order to investigate their potential functional and technological applications in food systems.

METHODS

A total of 108 LAB strains were isolated from five sourdough samples using MRS agar. To screen for EPS-producing strains, the isolates were cultured on MRS agar supplemented with 2% (w/v) sucrose. Colonies exhibiting mucus formation after six days of incubation at 30 °C were considered EPS-positive and selected for further analysis. The chosen strains were inoculated in modified MRS broth with 2% (w/v) sucrose as the sole carbon source. Following a 48-hour incubation at 30 °C, the EPS were recovered by centrifugation (6000 g, 15 min), precipitated with absolute ethanol (1:2 v/v), and stored at -18 °C. The recovered EPS were freeze-dried, and their dry weight was quantified to assess production yield.

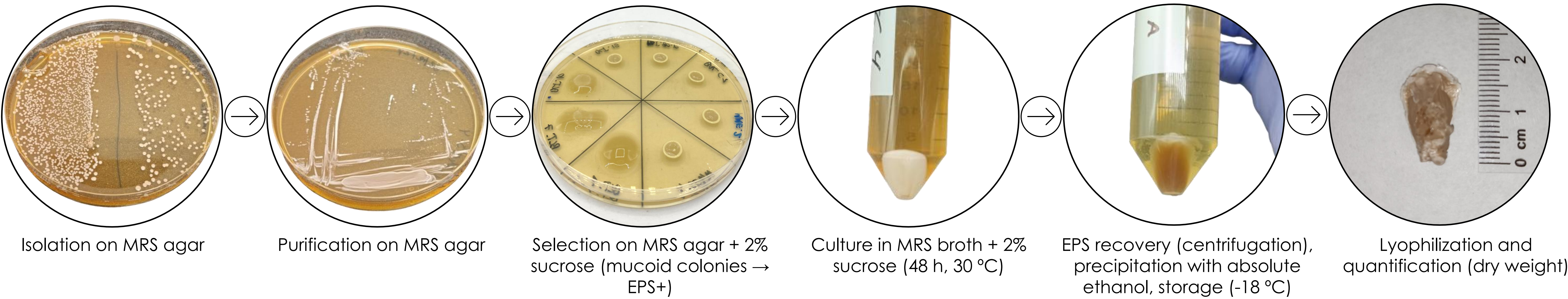


Figure 1. Experimental workflow diagram.

RESULTS

Six EPS-producing wild strains were successfully isolated and characterized.

The results indicated that the strain BLT.1 was identified as the strain that produced the highest biomass, thus highlighting its potential for applications in the production of EPS in fermented food systems.

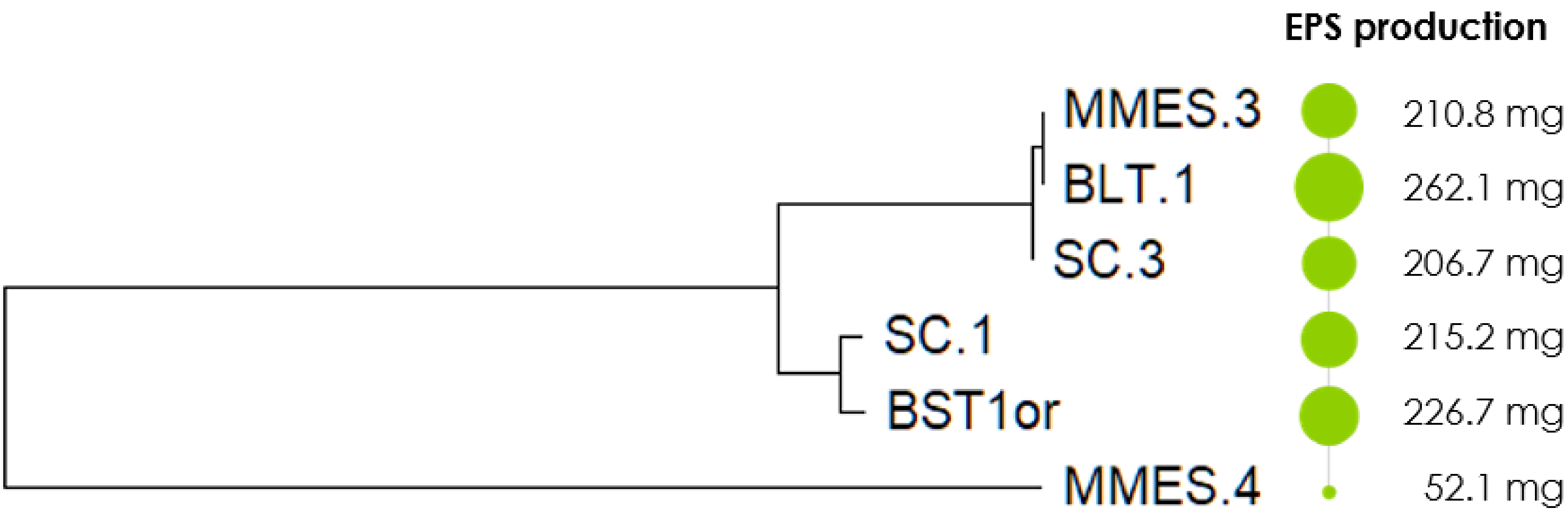


Figure 2. Phylogeny and EPS production profiles of six bacterial isolates.

Table 1. Phenotypical identification of bacterial isolates from sourdough matrices.

Code	Sourdough matrix	Colony appearance	Microscopic features	Gram staining	Oxidase test	Catalase test
BST1or	Wheat	Small, smooth, white	Cocci in chains	+	-	-
BLT.1	Wheat	Small, smooth, white	Cocci in chains	+	-	-
SC.1	Rye	Transparent, mucous	Cocci in chains	+	-	-
SC.3	Rye	Transparent, mucous	Cocci in chains	+	-	-
MMES.3	Spelt	Transparent, mucous	Cocci in chains	+	-	-
MMES.4	Spelt	Transparent, mucous	Chained bacilli	+	-	-

CONCLUSION

In this study, EPS-producing lactic acid bacteria strains were isolated and thoroughly characterized. This represents a significant advance, as these strains can be incorporated into fermented foods to enhance their functional properties and overall quality.