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EFFECT OF BACTERIA STRAINS *XANTHOMONAS CAMPESTRIS* ON XANTHAN GUM YIELD UNDER LABORATORY CONDITIONS

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Abstract. Xanthan is an industrially important exopolysaccharide produced by the phytopathogenic, gram-negative bacterium *Xanthomonas campestris*. Primary structure composed of a central chain consisting of β-D-glucose units and the trisaccharide side chains contain one unit of D-glucuronic acid between two D-mannose units. The D-mannose moiety has an acetyl group or a pyruvate group. Varying the bacterial strains and the fermentation conditions used in the production process significantly affects the degree of pyruvation, acetylation, and physicochemical properties of the xanthan gum. In this work xanthan gum was produced by fermentation of glucose under laboratory conditions. The effect of two bacterial strains (*X. campestris* B6719 and *X. campestris* B6720) purchased from the All-Russian Collection of Industrial Microorganisms (Moscow, Russia) on the xanthan yield was investigated. The results showed that the bacteria strains have effects of the yield of xanthan gum under laboratory conditions. The maximum xanthan gum yield (8.8 g/L) was obtained from *X. campestris* B6720 strain. The optical density of culture was maximum for the strain B6720, 1.28 (at 600 nm) on day 2 before declining. This result is in conformity with the findings of Nejadmansouri et al., (2021) when *X. campestris* was used in semi-continuous production of xanthan in biofilm reactor.[1] The strain B6720 consumes much sugar leaving a sugar concentration of 5.7 g/L of the initial concentration of 21.0 g/L, this has a similar trend when *M. alternifolia* hydrolysate was used as the main carbon source and the rate of residual sugar concentrate measured.[2]

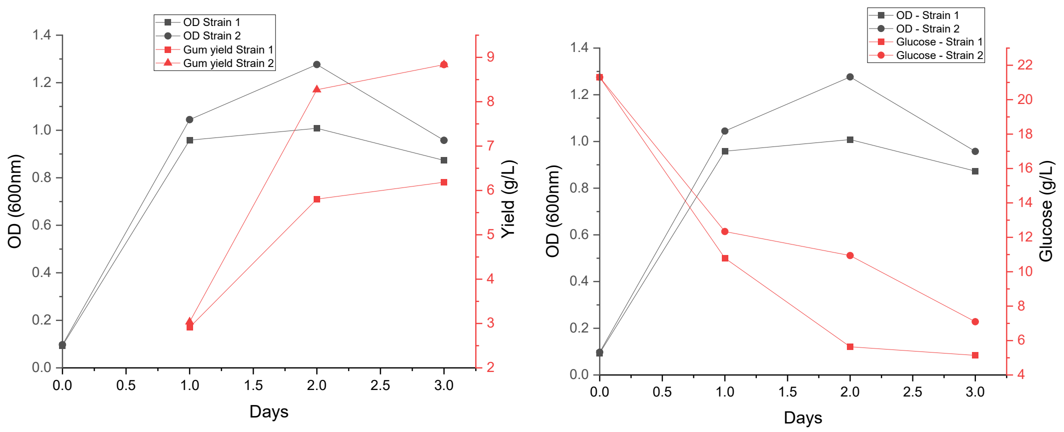

Figure 1. Optical Density, OD (600nm) of culture of the bacteria strains and xanthan gum yield (A) and Optical Density, OD (600nm) of culture of the bacteria strains and glucose consumption during fermentation (B). Strain 1 (X. campestris B6719) Strain 2 (X. campestris B6720)

References

1. Semi-continuous production of xanthan in biofilm reactor using *Xanthomonas campestris* / M. Nejadmansouri, M. Razmjooei, R. Safdarianghomsheh [et al.] // Journal of Biotechnology. – 2021. – Vol. 328, P. 1–11.

2. Effect of downstream processing on the structure and rheological properties of xanthan gum generated by fermentation of *Melaleuca alternifolia* residue hydrolysate / Z.-X. Li, J.-Y. Chen, Y. Wu [et al.] // Food Hydrocolloids. – 2022. Vol. 132, P. 107838.

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