INFLUENCE OF THE COMPOSITION OF PRODUCTION MEDIUM ON THE CHEMICAL STRUCTURE, MOLECULAR MASS AND QUALITY OF THE GUM PRODUCED BY XANTHOMONAS CAMPESTRIS PV. CAMPESTRIS

Cintia Regina Rodrigues Carignatto; Ana Flávia Azevedo Carvalho; Pedro de Oliva Neto
São Paulo State University – UNESP, Av. Dom Antônio 2100, 19806-900 Assis, São Paulo, Brazil.

Xanthomonas are bacteria responsible for the production of the biopolymer xanthan gum that has great applicability in several industrial sections. These bacteria do not present great nutritional demands, but the available nutrients in the medium influence in the process of xanthan biosynthesis. The present work aimed to study the influence of the composition of production medium on the chemical structure, molecular mass and quality of the gum produced by Xanthomonas campestris pv. campestris. The fermentation was carried out in two stages, biomass and biopolymer production using media formulated by experimental design and media mentioned in the literature. It was verified that the nutrients used in the production medium interfere in the chemical composition and molecular mass of the produced gum. The absence of the nutrient nitrogen and the presence of little citrate (0.1%) and lecithin (0.001%) favored the formation of the xanthan more viscous than the gum produced in medium described by Garcia-Ochoa et al. (1992). This better gum presented molecular mass ten times larger (1.17 x 10^6 g/mol), and structure with more acetate and less piruvate than the gum produced in the last medium mentioned. In relation to the temperature, the production conducted at 25ºC favored the cellular growth and the gum production, but at 30ºC the better quality xanthan was produced. The comparative study among production in orbital incubator with 300 ml of medium and the bioreactor with 4 L of medium revealed that the second was more efficient, producing 3 times more gum and with yield 3.6 times superior.

Key-words: xanthan production, formulated medium, Xanthomonas campestris, chemical structure, viscosity.