



Xanthan pruni, a singular biopolymer produced by Brazilian bacterium strains – 25 years of discovery

Moreira A da S

Federal University of Pelotas (UFPeL), Brazil

Abstract

Scientifically and technologically the extracellular polysaccharide produced by bacteria of the *Xanthomonas* genus is called xanthan. Xanthan is a biopolymer widely used by several industries as thickening, stabilizing, suspending agent and emulsifier additive. Traditionally the NRRL B-1459 strain of *Xanthomonas campestris* pv *campestris* has been used for this industrial production of xanthan. In 1995 our research group started the xanthan production by *X. campestris* pv *pruni* and in 2000 was reported internationally that xanthan produced by the *pruni* pathovar is chemically different due to the presence of rhamnose, absent in commercial xanthans. Taking account of the chemical composition of its xanthan, phytopathogenicity and genetic profile the bacterial was officially renamed as *Xanthomonas arboricola* pv *pruni*, and its polymer has been named xanthan *pruni* by us. For the bacterial natural biopolymers such as xanthan *pruni*, the parameters utilized in the bioreactor (fermentation) such as media, time, temperature, aeration and agitation must be extremely well defined and controlled so that the biosynthesized product has the desired properties for each kind of application. In these 25 years we had studied how the specific bacteria that produce xanthan with different chemical composition combined with fermentations with tailored parameters can result in special xanthans. Generalizing, xanthan *pruni* is gelling, very resistant to salt addition, possesses high melting and degradation temperature, forms strong physical or chemical crosslinking by interactions with cations or chemical crosslinkers and possesses higher antioxidant activity than the commercial xanthans. It has been successfully applied in foods, vaccines, biodegradable edible and pharmaceuticals films (including an anesthetic bioadhesive for humidity areas) and as encapsulating agent with high thermo and osmoprotectant effect to probiotic microcapsules for different applications. Now, experiments are being made with support of Procelys by Lesafre to reduce costs of fermentation media in scale transposition (from 14 to 1000L).

Biography

Angelita Moreira has completed her PhD in Biotechnology at 2002 in the Federal University of Pelotas (UFPeL), BR. She is professor and doctoral and master's advisor of UFPeL. He is a Technological Development scholarship holder of National Research Council - CNPq - from Brazil. It has two granted patents (xanthan gum production) and several patent applications in the Biotechnology area. She has over 50 articles that have been cited over 170 times, and her publication H-index is 9 and has been serving as a reviewer of reputed Journals. Has experience in pharmacy, industrial microbiology and food technology, acting on the following subjects: production, characterization, chemical modification and application of xanthan and poly(3-hydroxybutyrate) biopolymers.

Publications

Macagnan KL, Alves MI, Rodrigues AA, Furlan L, da Silva Rodrigues R, Diaz de Oliveira P, et al. (2017) Complete factorial design to adjust pH and sugar concentrations in the inoculum phase of *Ralstonia solanacearum* to optimize P(3HB) production. PLoS ONE 12(7): e0180563. <https://doi.org/10.1371/journal.pone.0180563>

Alves MI, Macagnan KL, Piecha CR, Torres MM, Perez IA, Kesserling SM, et al. (2019) Optimization of *Ralstonia solanacearum* cell growth using a central composite rotational design for the P(3HB) production: Effect of agitation and aeration. PLoS ONE 14(1): e0211211. <https://doi.org/10.1371/journal.pone.0211211>

[Annual Congress on Advances in Biotechnology](#) | Paris, France | February 17-18, 2020

Citation: Moreira A da S, Xanthan *pruni*, a singular biopolymer produced by Brazilian bacterium strains – 25 years of discovery, Brazil, Biotechnology Summit 2020, Annual Congress on Advances in Biotechnology, Paris, France, 17th - 18th February 2020, 09