Effects of nitrogen and phosphorus limitations on polyhydroxyalkanoate synthesis by *Halomonas elongata* strains grown under saline conditions

Adorján Cristea¹,*, Ana-Maria Bratovianu¹, Andreea-Melisa Tripòn¹, Timea Kristea¹ and Horia Leonard Banciu¹

¹Babeș-Bolyai University, Faculty of Biology and Geology, Department of Molecular Biology and Biotechnology, 5-7 Clinicilor Street, Cluj-Napoca, Romania.

*Corresponding author, E-mail: cristea.adorjan@gmail.com.

Abstract
Polyhydroxyalkanoates (PHAs) are polyesters produced and stored intracellularly by various microbes during periods with an excess of carbon (C) source and limitation of nitrogen (N) and/or phosphorus (P) nutrients. We aimed to explore the influence of N and P nutrient limitation on the synthesis of PHAs in two *Halomonas* strains. *H. elongata* DSM 2581T and the environmental strain 2FF used in this study were grown in shake flask cultures (at 37°C and 180 rpm) on liquid mineral DSM 343 medium with 8% (w/v) NaCl and three nutrient limitation conditions: simultaneous N and P limitation, N limitation or P limitation. D-glucose (1% w/v) was used as an excess carbon source in all experiments. Accumulation of PHAs was quantified by the crotonic acid assay. The highest PHA production was evidenced after 72 hours of growth under N limitation (1.56 g·l⁻¹) in strain DSM 2581T and simultaneous N and P limitation (0.7 g·l⁻¹) in strain 2FF. Additionally, higher biomass (as cell dry weight) and PHA yields were achieved at 180 rpm as compared to 110 and 140 rpm shaking speeds. This study is a first attempt to investigate the influence of N and P on PHAs synthesis in *Halomonas* spp. cultured at high salinity (8% NaCl), although similar tests were previously conducted on *Halomonas* spp. (Jin et al., 2013; Ilham et al., 2014) but at much lower salinity (0.1% and 1% NaCl, respectively).

Keywords: *Halomonas*, nutrient limitation, polyhydroxyalkanoates, saline.

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References