PRODUCTION OF CHITOSANASE WITH *Aeromonas* sp STRAIN: OPTIMIZATION OF FERMENTATION CONDITIONS.

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Introduction. Chitosan and its derivatives have shown various functional properties which make it possible to use them in many fields including food, cosmetics, biomedicine, agriculture, environmental protection, and wastewater management[1]. Chitosan oligosaccharides may be produced by chemical and enzymatic methods. However, there are many problems existing in chemical processes. Alternatively, enzymatic processes lack these efects and permit the breakdown of chitosan under mild conditions[2].
The aim of this work was to optimize the fermentation process for producing of chitosanase with a strain of *Aeromonas* sp.

Methods. We used a strain of Aeromonas sp isolated from Four Marshes, Coahuila, and provided by the Department of Biotechnology of the U. A. de C. The fermentation was carried out in Erlenmeyer flasks of 250 mL with a volume of mineral medium supplemented with chitosan oligosaccharide as an inducer. Factor were studied simultaneously, using a constant agitation of 150 rpm, 2 levels of pH (6.0 and 7.0), 3 temperature levels (30, 35 and 37^{0}C) and 2 oligosaccharide concentration as an inducer (1.0 and 1.5%). The microorganism growth was monitored by turbidimetry, the concentration of extracellular protein for Lowry method, and enzyme activity by measuring the amount of reducing sugars produced from chitosan.

Results. Figure 1 shows that the accumulation of the protein is slow at first, having a major peak between 48 and 60 hours, at which time practically production reaches a maximum. Similarly, it is observed that the best treatment is the T11 (pH 7.0, 37^{0}C, inducer concentration of 1.5% added to the medium), which is significantly better than the rest.

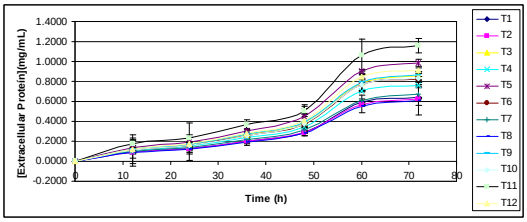

Figure 1. Extracellular protein production by *Aeromonas* sp.

The results also show that the production of extracellular enzyme (chitosanase) is directly associated with the growth rate of the microorganism, being higher at 60 hours, just when reaching the end of the exponential growth phase. Table 1 shows the calculated growth rate for each treatment.

Table 1. μ values obtained from growth curves for each treatment.

Treatment	μ	Treatmen	μ
T1	0.0092	T7	0.0096
T2	0.0089	T8	0.0087
T3	0.0122	T9	0.0123
T4	0.0109	T10	0.0119
T5	0.0141	T11	0.0164
T6	0.0119	T12	0.0132

Conclusions. It was possible to optimize the fermentation process for obtaining chitosanase with *Aeromonas* sp. The highest production was reached at a temperature of 37^0 C, pH 7.0 and adding 1.5% chitosan oligosaccharides. The maximum values for this process were 1.1580 mg/mL of extracellular protein and an enzymatic activity (non-optimized) of 1.5912 U / mL.

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References.

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