OPTIMIZATION OF ELASTOLYTIC PEPTIDASE BIOSYNTHESIS BY Bacillus thuringiensis IMV B-7324

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The cultivation conditions of Bacillus thuringiensis IMV B-7324 for synthesis of the elastolytic
peptidase were studied. By mono- and two-factorial experiments it was optimized the nutrient medium and conditions of growth for the synthesis of B.

**thuringiensis**

IMV B-7324 elastolytic peptidase. It was established that maximal synthesis of the enzyme (5.15 U/mg of the protein) occurs at the exponential phase of growth on 18 h in submerged cultivation. As a result of screening experiments it was shown that all components of the basic medium except gelatin are significant for the enzyme biosynthesis. The elimination of gelatin leads in 9.8-fold increase of the elastolytic activity (50.55 U/mg of the protein). The influence of the nitrogen and carbon sources on the enzyme synthesis was studied. It was established that the optimal sources are the ammonium sulfate and arabinose. Their usage allows us to increase in 17.4 and 4.6 times the elastolytic activity (90 and 24 U/mg of the protein). The optimal concentrations of the ammonium sulfate and arabinose in the medium which allow to increase the elastolytic activity in 24.7 times (127.45 U/mg of the protein) was determined by the bifactorial experiment on three levels. The optimized nutrient medium contains (g/l):

- arabinose — 13.0; (NH4)2SO4 — 14.0; KH
- PO — 1.6; (CH3COO)2Zn — 0.25; MgSO4∙7H2O — 0.75.

IMV B-7324 was 132.5 U/mg of protein during the growth by submerged cultivation for 18 h in 200 ml of the optimized nutrient medium at initial pH 7.0, on a shaker at 220 rpm at 37 °C.

**Key words:** Bacillus thuringiensis, elastolytic peptidase, bifactorial experiment

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1. Rao M. B., Tanskale A. M., Ghatge M. S., Deshpande V. V. Molecular and biotechnological
aspects of microbial proteases.


2. Qihe C., Guoqing H., Yingchun J., Hui N. Effects of elastase from a *Bacillus* strain on the tenderization of beef meat.

*Food Chem.*
http://dx.doi.org/10.1016/j.foodchem.2005.06.043


*Res. J. Microbiol.*
2008, 3(12), 661–672.
http://dx.doi.org/10.3923/jm.2008.661.672

5. Matselyukh O. V. Obtaining of mutants of *Bacillus* sp. with enhanced elastase production. *Biotekhnolohiia*.
2010, 3(2), 42–47. (In Ukrainian).

6. Matseliukh O. V., Varbanets L. D., Ivanitsa V. O. *Bacillus thuringiensis* IMV B7324 strain — the producer of extracellular elastase.


*Mikrobiol. zh.*


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