Validation study of a hplc method for biogenic amines quantification in bananas

O. BASTON - Universitatea "Dunarea de Jos" Galati
Daniela MOISE - Institute for Research-Development of the Horticultural Products Marketing and Industrialization – Horting, Bucharest
O. BARNA, Eugenia PRICOP - Universitatea "Dunarea de Jos" Galati

In this paper we describe an internal study for validating high performance liquid chromatography (HPLC) method for quantification of the biogenic amines in bananas. The evaluated features for validating the measuring method by means of the high performance liquid chromatography are as follows: linearity, precision, accuracy (repeatability and reproducibility), selectivity, sensitivity (detection limit, quantification limit), and robustness. The analyzed biogenic amines are: tryptamine, phenylethylamine, putrescine, cadaverine, histamine, serotonin, tyramine, spermidine and spermine. The calibration curves for the biogenic amines are linear and the values of the linearity coefficients (r2) are as follow: tryptamine r2 = 0,9953, β-phenylethylamine r2 = 0,9983, putrescin r2 = 0,9985, cadaverine r2 = 0,9985, histamine r2 = 0,9981, serotonin r2 = 0,9966, tyramine r2 = 0,9986, spermidine r2 = 0,9986, spermine r2 = 0,9982. The average recovery in the concentration levels 0.5 … 2 μg/ml for the banana samples recorded the following values: tryptamine 63-93%; β-phenylethylamine 80-87%; putrescine 85-99%; cadaverine 96-110%; histamine 80-93%; serotonin 60-85%; tyramine 82-98%; spermidine 80-105% and spermine 90-110%. The proposed method for biogenic amines quantification in bananas by HPLC is selective. The peaks for every biogenic amine are separated by the baseline and by the vicinity peaks. The resolution that characterize the selectivity is greater than 1. LOD (limit of detection) for every amine are as follows: tryptamine 0.006 μg/ml, β-phenylethylamine 0.050 μg/ml, putrescin 0.022 μg/ml, cadaverine 0.030 μg/ml, histamine 0.035 μg/ml, serotonin 0.015 μg/ml, tyramine 0.006 μg/ml, spermidine 0.005 μg/ml, spermine 0.009 μg/ml. LOQ (limit of quantitation) are as follows: tryptamine 0.012 μg/ml, β-phenylethylamine 0.100 μg/ml, putrescin 0.044 μg/ml, cadaverine 0.060 μg/ml, histamine 0.07 μg/ml, serotonin 0.030 μg/ml, tyramine 0.012 μg/ml, spermidine 0.01 μg/ml, spermine 0.018 μg/ml.