

Summary

Biogenic amines are nitrogenous organic bases, derived through the decarboxylation of corresponding amino acids. The responsible enzymes, amino acid decarboxylases, can be present in microorganisms, i.e. naturally occurring or added lactic acid bacteria (LAB) involved in fermentation in foods and beverages. They can be both formed and degraded as a result of normal metabolic activities in humans, animals, plants, and microorganisms.

Biogenic amines have become an increasingly important topic of research due to their potential implications on human health. Sauerkraut is one example of a fermented food product which can contain a high level of biogenic amines. The production of BAs in sauerkraut has been widely studied; however, the factors influencing their formation and the mechanisms of action are still poorly understood. Previous studies have shown that temperature, pH, salt concentration, oxygen availability, and the composition of microflora play important roles in the production of BAs.

The aim of this study was to determine the effect of yeast strains and lactic acid bacteria isolated during the sauerkraut fermentation on the level of biogenic amines. Three hypotheses were verified. The first assumed the ability of selected lactic acid bacteria strains to produce biogenic amines. The second took into consideration that some yeast strains can reduce the level of biogenic amines. The last hypothesis assumed the possibility of using selected microorganisms to reduce the level of biogenic amines in sauerkraut. The study included three stages.

The results of the first stage of research showed that of the 25 strains of lactic acid bacteria, only *Leuconostoc mesenteroides* did not produce the biogenic amines. Cadaverine was produced in 18 samples, tyramine in 9 samples, and putrescine in 7 samples. Tryptamine was not produced by any of the LAB strains.

The results of the second stage of the study showed that all of the nine selected yeast strains were characterized by the ability to reduce the content of biogenic amines in the growth medium. The strains characterized by the highest degree of utilization of biogenic amines were *Clavispora lusitaniae* and *Debaryomyces hansenii*.

The last stage was carried out on three varieties of white cabbage. The results indicated that *Clavispora lusitaniae* showed the highest reduction in the level of biogenic amines in sauerkraut. The results of the analysis showed that the most important aspect affecting the content of BA and volatile compounds in sauerkraut was the type of cabbage variety used for fermentation and the activity of microorganisms.

In conclusion, studies have shown that some lactic acid bacteria can produce biogenic amines. Furthermore, the tested yeast strains showed a predisposition to reduce the level of these compounds. Finally, there is potential to use microorganisms as starter cultures to reduce the content of biogenic amines in sauerkraut.

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