STUDY REGARDING NITRATE AND NITRITE CONTENT IN CAULIFLOWER, FROM AGRO-FOOD MARKETS IN TIMISOARA

Bulmagă ALINA*, Lăzureanu AUREL*, Alexa ERSILIA*, Negrea MONICA*

*Banat`s University of Agricultural Science Timişoara, Romania
alinaoliveiratop@yahoo.com

Abstract. In this study we followed the monitorization of nitrate and nitrite content in caulliflower. Caulliflower samples for the analyse have been prelevate from Timisoara agro-food markets, these proceed from four location of District of Timis: Tomnatic, Jimbolia, Sânandrei şi Cenad. Nitrates (NO3), proceed from complete ammonium oxidation in the presence of nitrification enzymes, but can appear also thanks to excessive nitrogen fertilisation. The nitrites (NO2), rise from incomplete ammonium oxidation in the presence of nitrification enzymes. Those appearance indicate an advanced stadium of decomposition process of nitrogen organic substances.

Nitrate and nitrite content in cauliflower were done colorimetrically with the help of Rapid Test in the Laboratory for the Measurement of Residues of the Department of Agro-techniques of the U.S.A-V.M.B in Timisoara.

Keywords: caulliflower, nitrate, nitrite

INTRODUCTION

Nitrate and nitrite are natural soil compounds, are proceed from organic, nitrogen substances mineralization. Nitrogen mineralization depends of the microorganisms that are in soil. A part of the nitrates and nitrites, is absorbed by the plants root and is a main material for protein synthesis and other compounds with nitrogen, and on the another way is trained by the surface waters on the one that travels the earth, until to the rivers, lakes or under waters. Natural, between nitrates and nitrites from soil, water and plants, it established a balance that can be broken by the intensive use in agriculture or horticulture of the natural organic or synthetic fertilisers. Their degradation products riches the soil and it can be accumulated in crops level for the consumers [1].

MATHERIALS AND METHODES

In Autumn 2007 – Spring 2008 have been taken from the agro-food markets in Timisoara, cauliflower, with the purpose to determinate the content of nitrogen compounds (nitrate, nitrite). Have been taken 5 samples from each locality, accomplishing determination average. The nitrate and nitrite content in cauliflower, have been persuade for spring and autumn specie.

The nitrate and nitrite content in caulliflower was done with the help of rapid tests AQUA MERCK, with the Spectrophotometer SQ 118 at a wavelength of 515 and 525 nm for nitrate and nitrites. Minimum detection limits according to work method are: 1 mg/l for nitrates and 0,02 mg/l for nitrites.

Figure 1. Spectophotometer SQ 118 Merck.

Maximum limit allowed for nitrates in cauliflower, in accordance with the *Official Monitor,* February 28, 2002, regarding contaminants in food are 400 ppm [3]. The nitrite limits are not standardized, but should not exceed 1 – 2 ppm.

RESULTS AND DISCUSSIONS

The experimental results obtained are given in figures 2 – 3.

The nitrate level in caulliflower is higher in samples taken in spring than in autumn, becouse in spring the in the vegetation period of the culture, the light intensity is lessen and the nitrate content consumed through protein-genesis procces is small, favoureding in this way the nitrate acumulation in plants.

The autumn samples, which during the vegetation period in summer months had maximum light intensity, presents a lower oligoelements content in analised specie.

The nitrate content is conditioned by the oligoelements content in analised specie, especially molibden, which is retrieve in nitrate reduction activity, influenceing the reduce reaction by nitrate in nitrite.

A high level of molibden favourise the nitrate reaction in nitrite, leading to a low accumulation of nitrate in plant.

Species with low molibden content, especially those from Chenopodiaceae Family, are characterized with an increased nitrate accumulation [2]. However none of the analised caulliflower samples did not excced maximum limit allowed of 400 ppm. The high level of nitrate in caulliflower, was registered in Jimbolia city, in spring 2008 (274 ppm), and the smaller content was registered in Sânandrei locality in autumn 2007 (145,9 ppm).

Regarding nitrite content in caulliflower sampled from Timisoara markets, this was not above addmited level which is 1-2 ppm. The higher value was registered in Jimbolia, in spring (0,95 ppm), and the lower in Tomnatic, in autumn (0,23 ppm).

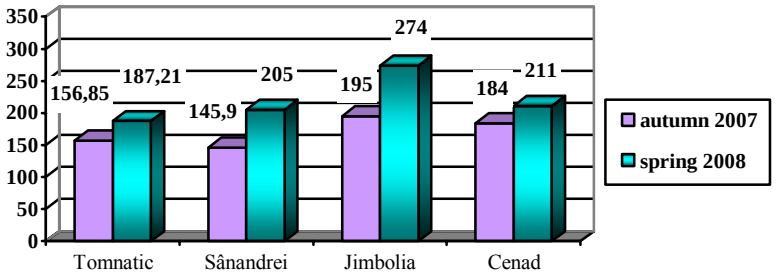

Figure 2. NO_3^- content (ppm), in caulliflower in different zones of District of Timis

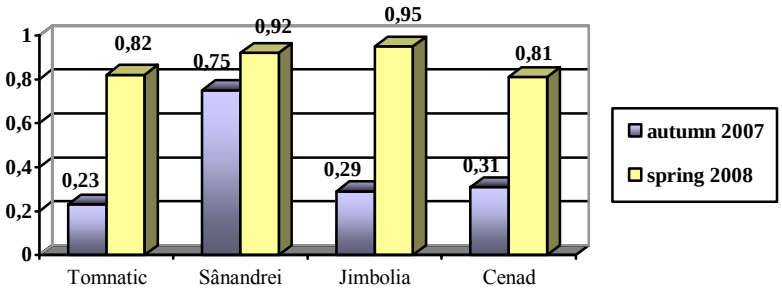

Figure 3. NO_2^-(ppm) content , in caulliflower, in different zones of District of Timis

CONCLUSIONS

- The experimental results lead to following conclusions:
- The nitrate content, in samples taken from the markets, doesn't registered values above maximum limit allowed for cauliflower.
- The higher content of nitrate was registered in Spring samples, taken from Jimbolia, (274 ppm).
- The nitrate level in cauliflower is higher in Spring samples, than Autumn samples, because in Spring the light intensity is lower and the nitrate content consumed through proteingenesis process is low.
- The nitrite level did not exceed 1 ppm, the higher value being registered in samples taken from Jimbolia, in Spring, 0,95 ppm.
- The nitric compounds accumulation in plants is realised in different ways depending by the vegetation period and harvesting time, climatic conditions and most by the light intensity, lead to nitrate reduction in plants and the nitrate content diminish in harvested products.

REFERENCES

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