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Aminoacids Absorption by Poblano Chili Crops in Presence of Fulvi-75 Organic Fertilizer

Ramírez A, Navarrete JM*, Gomez B, Fabila L, Fernández K and Zúñiga MA

Faculty of Chemistry, National University of Mexico, Mexico

***Corresponding author:** Navarrete JM, Faculty of Chemistry, National University of Mexico, Mexico

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Abstract

Fulvi acids are well known as products of organic matter final evolution, which promotes better absorption by vegetables of minerals from the soil. However, aminoacids are one very important factor too in the metabolism of organic matter, either vegetable or animal, but the effect of fertilizers related with aminoacids is not so known. This paper attempts to measure, in terms of percentage, the different absorption of 15 aminoacids by one vegetable (poblano chili), when it is escorted or not by one Mexican fertilizer: Fulvi-75.

Introduction

Fulvi-75, made and distributed by Mexican Company Fitochem (www.fitochem.com.mx), was used as fertilizer. It is a compound made by 78.9 % of fulvic acids as percentage of final mixture. Fifteen ^{14}C labelled aminoacids were used: ^{14}C-L- Amino Acid Mixture, 50 µCi (1.85MBq) in ethanol: water (2.98), sterile packaged, Perkin-Elmer, Product number NEC850E. Seeds of Mexican vegetable poblano chili were used to test the absorption of mentioned aminoacids, till 21 days later they started their germination. It was considered in this research, that ^{14}C present in the fertilizer, as natural component by its organic cycle, is negligible when compared with ^{14}C labelled aminoacids, and it was considered as background of counts per unit time, from those counts produced by used aminoacids (Table 1), since any way they are absorbed in different proportion when fertilizer is used.

Table 1: ^{14}C labelled aminoacids (Perkin-Elmer product number NEC850E) and percentage present in the mixture)(Total Radioactivity 50 µCi).

Fertilizers		
Alanine(13.05%)	Glutamic acid(16.15%)	Metionine(0.73%)
Arginine(3,14%)	Histidine(3.47%)	Proline(1.98%)
Aspartic acid(12.48%)	Isoleucine(6.35%)	Serine(1.51%)
Fenilalanine(8,93%)	Leucine(14.94%)	Tirosine(2.78%)
Gliccine (3.43%)	Lisine(2.16%)	Valine(7.67%)

Experimental

Two groups with same weight of poblano chili seeds were sown in equal masses of black ground land, in two different plant pots, numered 1 and 2. Once they have started to grow up, both of them were irrigated daily during 21 days with 50ml of water solution containing the mixture of aminoacids labelled with 11.1 d/ml-m of ^{14}C, previously made by diluting 50 µCi of commercial product from Perkin Elmer, The radiochemical Centre, Amersham, England, in 1 liter of water, and then 1ml. of this solution in 100ml. of water, and finally 1ml. of this in another 100ml. of water, to get an activity of 11.1d/m-ml, used to irrigate daily pots 1 and 2, each one with 50ml. of labelled solution [1,2]. But pot 1 was irrigated also with 50ml. of one solution containing 1mg/ml of the organic fertilizer Fulvi-75, produced by Mexican industry Fitochem (www.fitochem.com.mx), while pot 2 was irrigated also with 50ml. of just water. After 21 days of daily irrigation, one little leaf from plants in pots 1 and 2 were cut

out and weighed. These leaves were then crushed by separate in two small laboratory mortars, which were washed each with 4ml. of solvent used for liquid scintillation detector (Ultima Gold CR, Perkin-Elmer), and detected during 4 hours, same time considered to obtain the background counts in the system with just liquid scintillation (Figure 1).

Figure 1: Fulvi-75, 14C labelled aminoacids and small experimental plantation.

Results

Counts obtained from leaf samples in pot 1 and 2 were corrected by background and they show one statistical variation to 1.6% and 2.3% respectively, when divided by counts per time and leaf weight. Then, result from sample 1 was divided by result from sample 2, and a final result equal to 2.76 or 276% was produced.

Conclusion

This result seems to proof that pot 1, irrigated with fulvic acids in water solution, it has absorbed one proportion equal to 2.76 times more labelled aminoacids than pot 2, irrigated with just water, while both pots 1 and 2 were irrigated with same dose of aminoacids.

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