

DETERMINATION OF NPK IN SOME LOCAL POPULATIONS OF PEPPER IN ORDER TO OBTAIN ADEQUATE FOOD COMPLIANT WITH THE EU FOOD SAFETY RULES

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Abstract

In some food products, we can encounter pesticides, in some cases accidental or intentionally by the manufacturer (insecticides, herbicides, defoliant, etc.) that can cause allergic, neurotoxic, teratogenic and carcinogenic effects. Given the requirement of Law 312/2003, which governs agricultural policy in agriculture on the production and use of fresh vegetables for consumption or industrial processes, they must not contain residues of pesticides and heavy metals, nitrates or other products exceeding the maximum permissible levels.

Due to the high content of vitamins and capsaicin in peppers and due to the beneficial effects it has both as food and as therapy, knowing the admitted contents of NPK in the pepper fruit is of major importance in obtaining high-quality vegetables, especially among individual small producers that use crops from local populations. The physiological and biochemical determinations were performed in the Central Laboratory of the Faculty of Agriculture of Craiova, and the material under study was brought from 5 areas of Oltenia.

Key words: pepper fruits, phosphorus content, parameters evolutions.

INTRODUCTION

The pepper (*Capsicum annum* L) originates from Central America and South America. Christopher Columbus found the pepper in Haiti, where it was brought from, to Europe [2, 3].

The fruit of the pepper present a high value as an aliment, due to its elevated content of natural sugars and vitamins and the fact that it is habitually consumed as raw, state in which these components are processed directly, by the human body [1, 3].

Elevated levels of capsaicin are characteristic to hot/chili pepper varieties. While in the 70s the consumption of hot/chili peppers was linked to a series of illnesses of the digestive tract and of the blood vessels, recent studies taken place in Australia, Hungary and the USA (countries

where the pepper is highly consumed) have revealed that, in truth, the chili pepper prevents cardio-vascular diseases, cures some illnesses of the digestive tract, prevents prostate cancer and type II diabetes. Recently, the chili pepper has started being used in cosmetic products targeting cellulite and has proven to be a great success [4, 5].

On top of ascorbic acid, the fruits of the pepper contain other vitamins, such as B₁ și B₂, PP and E. Capsaicin, active component in peppers, give it the hot/chili taste, characteristic to many varieties [4].

The levels of Capsaicin differs according to species and variety, between 0.27 and 1.12mg/100g of raw substance for hot/chili fruits, and minute quantities for sweet varieties [3].

MATERIAL AND METHOD

The biological material studied was represented by twenty local populations of pepper that have been grown in 2009, under field conditions, in five regions of Oltenia, namely: Dabuleni (D1, D2, D3, D4), Bailesti (B5, B6, B7, B8), Daneti (D9, D10, D11, D12), Teasc (T13, T14, T15, T16) and Dobresti (D17, D18, D19, D20).

To express the fruit quality in terms of food, the content of some quality indicators was taken into account, namely: nitrogen, phosphorus and potassium. Analyses were performed at the technological maturity of the pepper fruit in the Central Laboratory of the Faculty of Agriculture, Craiova.

The analysis method used for nitrogen was the classical method Kendall, the colorimetric method for the others and the potassium was analyzed by flame photometry.

The links between the parameters studied were analyzed in terms of correlation coefficients (r) [6].

RESULTS AND DISCUSSIONS

The nitrogen content of the pepper fruits ranged from 2.16% to local populations D1, B5 and 2.94% to local populations T16, D20 (Fig. 1, Table 1).

Table 1. The nitrogen content in the crops of pepper fruit studied

Variant	Local population	Nitrogen %100g
D1	DABULENI	2.16
D2	DABULENI	2.67
D3	DABULENI	2.64
D4	DABULENI	2.57
B5	BĂILEȘTI	2.16
B6	BĂILEȘTI	2.49
B7	BĂILEȘTI	2.19
B8	BĂILEȘTI	2.4
DA9	DANEȚI	2.54
DA10	DANEȚI	2.7
DA11	DANEȚI	2.61
DA12	DANEȚI	2.76
T13	TEASC	2.82
T14	TEASC	2.4
T15	TEASC	2.46
T16	TEASC	2.94
DO17	DOBREȘTI	2.49
DO1845	DOBREȘTI	2.7
DO19	DOBREȘTI	2.58
DO20	DOBREȘTI	2.94

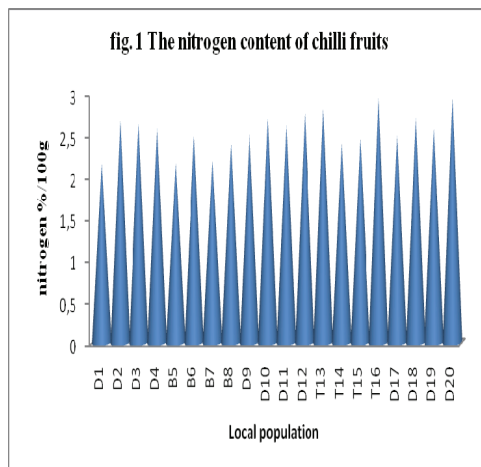


Fig. 1. Representation of the nitrogen content in the crops of pepper fruit studied

Phosphorus existent in pepper fruits ranged from 0.7% to local populations B5, B8 and 1.8% to local population D17 (Fig. 2, Table 2).

Table 2. The phosphorus content in the crops of pepper fruit studied

Variant	Local population	Phosphorus P ₂ O ₅ %100g s.u
D1	DABULENI	0.8
D2	DABULENI	0.9
D3	DABULENI	1.28
D4	DABULENI	0.17
B5	BĂILEȘTI	0.7
B6	BĂILEȘTI	1.4
B7	BĂILEȘTI	0.9
B8	BĂILEȘTI	0.7
DA9	DANEȚI	1.1
DA10	DANEȚI	0.9
DA11	DANEȚI	1.2
DA12	DANEȚI	1
T13	TEASC	1.6
T14	TEASC	1.15
T15	TEASC	0.9
T16	TEASC	1.5
DO17	DOBREȘTI	1.8
DO1845	DOBREȘTI	1.3
DO19	DOBREȘTI	1.4
DO20	DOBREȘTI	1.5

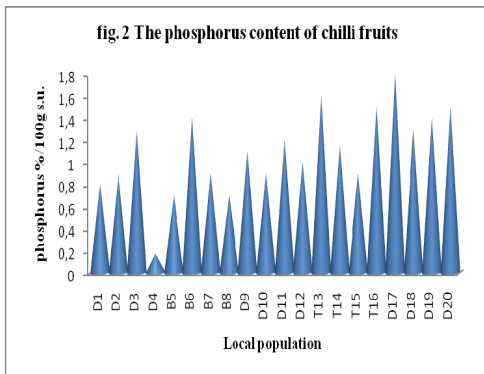


Fig. 2. Representation of the phosphorus content in the crops of pepper fruit studied

The potassium content of pepper fruits ranged from 0.68% to local populations B6, T14 and 1.16% to local population T15 (Fig. 3, Table 3).

Table 3. The potassium content in the crops of pepper fruit studied

Variant	Local population	Potassium K ₂ O %100g.s.u
D1	DABULENI	0.75
D2	DABULENI	0.88
D3	DABULENI	0.78
D4	DABULENI	0.87
B5	BĂILEȘTI	0.79
B6	BĂILEȘTI	0.68
B7	BĂILEȘTI	0.76
B8	BĂILEȘTI	0.83
DA9	DANEȚI	0.93
DA10	DANEȚI	0.83
DA11	DANEȚI	0.76
DA12	DANEȚI	0.88
T13	TEASC	0.93
T14	TEASC	0.68
T15	TEASC	1.16
T16	TEASC	1.01
DO17	DOBREȘTI	0.97
DO1845	DOBREȘTI	1.06
DO19	DOBREȘTI	0.93
DO20	DOBREȘTI	0.98

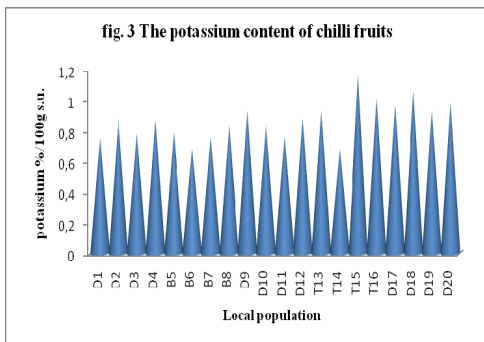


Fig. 3. Representation of the potassium content in the crops of pepper fruit studied



Fig. 4. Influence of nitrogen on plants taken in the study

Correlations between analyzed parameters (Table 1) show a significant positive connection between the content of nitrogen and phosphorus content ($r = 0.464$) and also between nitrogen and potassium content ($r = 0.471$) of pepper fruit.

Table 4. Correlations between analyzed parameters

	Nitrogen	Phosphorus	Potassium
Nitrogen	-	0.464*	0.471*
Phosphorus		-	0.235
Potassium			-

$$P_{5\%} = 0.44$$

$$P_{1\%} = 0.56$$



Fig. 5. Influence of phosphorus on plants taken in the study

CONCLUSIONS

Based on research undertaken we believe that most local populations studied meet quality standards.

The local population was noted by the highest content of nitrogen in Teasc T16, potassium in T16 Teasc and phosphorus in Dabuleni D3 of 1.28.

The nitrogen content of pepper fruits is correlated positively with the phosphorus and potassium content.

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MISCELLANEOUS

