

# BIOACCUMULATION OF HEAVY METALS IN FRUIT OF SOME NEW TOMATO HYBRIDS

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## Abstract

In our study the focus was on determining the level of toxic heavy metals such as Pb, Mo, Cd and Hg in tomato fruit at one commercial hybrid - Adriatic F1 and nine new hybrids grown under identical conditions in greenhouse. Depending on their concentration and capacity for bioaccumulation, they can provide a range of health risks.

The concentration of heavy metals in the research was determined by flame atomic absorption spectrophotometry. Average concentrations of heavy metals varied in factors from hybrid, the lowest concentration of lead (11.96 ug/kg<sup>-1</sup>), molybdenum (26.25 ug/kg<sup>-1</sup>) and cadmium (7.41 ug/kg<sup>-1</sup>) and mercury (0.86 ug/kg<sup>-1</sup>), is found in the hybrid marked as 140, while the highest concentration of cadmium (39.23 ug/kg<sup>-1</sup>) in the hybrid 116, while the maximum concentration of lead (40.99 ug/kg<sup>-1</sup>), molybdenum (96.64 ug/kg<sup>-1</sup>) and mercury (3.08 ug/kg<sup>-1</sup>) we measured in the commercial hybrid Adriatic F1.

Pearson's correlation coefficient showed that there is a strong positive correlation of 0.83 between molybdenum content with mercury, a medium strong positive correlation of 0.69 exists between molybdenum content with lead and mercury with cadmium (0.52) and lead (0.64).

An increase in the concentration of metals in tomato fruits can be conditioned by their concentration in the the genetic predispositions of the plants.

## Introduction

The content of heavy metals in vegetables can represent a direct threat to human health (3), therefore this study tends to assess the presence of heavy metals in new selected tomato hybrids. Tomato is a vegetable that is consumed in all periods of the year in fresh and processed state. Due to its importance in nutrition, it should be health-safe. Cadmium is a non-essential heavy metal. It is extremely toxic even at low concentration. (1)

## Material and method

The experiment was set up in protected areas at a tomato grower in Albania. The commercial hybrid and the new eight hybrids are produced by seedlings and grown under the same conditions.

The presence of heavy metals in tomato fruits was made in the State Phytosanitary Laboratory of the Republic of North Macedonia

The researched elements Pb, Mo and Cd determined by flame atomic absorption spectrophotometry

## Discussion

Average concentrations of heavy metals varied in factors from hybrid, the lowest concentration of lead (11.96 ug/kg-1), molybdenum (26.25 ug/kg-1) and cadmium (7.41 ug/kg-1) and mercury (0.86 ug/kg-1), is found in the hybrid marked as 140, while the highest concentration of cadmium (39.23 ug/kg-1) in the hybrid 116, while the maximum concentration of lead (40.99 ug/kg -1), molybdenum (96.64 ug/kg-1) and mercury (3.08 ug/kg-1) we measured in the commercial hybrid Adriatic F1. The metal concentrations showed variation which can be attributed to the differences in physiology of the different samples for uptake, exclusion, bioaccumulation and retention of heavy metals (4)

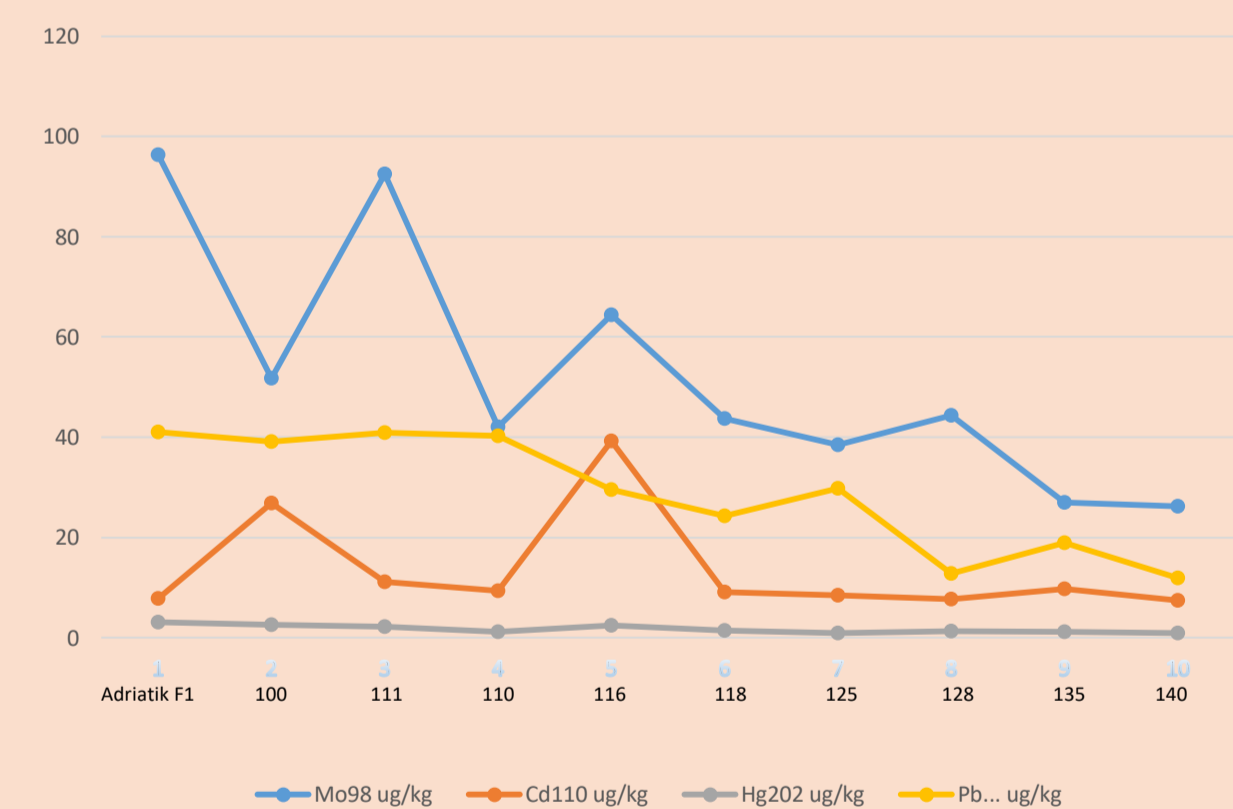
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## Conclusion

Different concentrations of metals in fruits of new tomato hybrids and in one commercial hybrid are within the limit of what is allowed according to the Rulebook on Contaminant Content Official Gazette of RSM, no. 227 of 6.10.2021.

The content varies depending on the genetic predisposition of the hybrids and their ability to bioaccumulate heavy metals..

Sample	Mo98 ug/kg	Cd110 ug/kg	Hg202 ug/kg	Pb ug/kg
Adriatic F1	96.34	7.86	3.08	40.991
100	51.75	26.89	2.63	39.051
111	92.56	11.12	2.21	40.855
110	42.01	9.38	1.22	40.287
116	64.43	39.23	2.5	29.583
118	43.68	9.07	1.37	24.278
125	38.44	8.47	0.87	29.826
128	44.33	7.73	1.33	12.797
135	26.94	9.76	1.16	18.909
140	26.25	7.41	0.86	11.96



## Reference

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