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Studies concerning the lead effect *in vitro* and *in vivo* on the plants development of *Lycopersicum esculentum* L.

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Abstract The known affections of the human organism after intoxication with lead were the following: the anemia, the affection of brain vas, chronic nephritis, arterial hypertension, decrease of children capacity of learning, changes in the babies behavior and of little children (conditioned by the lead influence through the mother organism in the nursing and intrauterine development period), for instance the aggression, impulsivity, hyperactivity.
The pollutant of heavy metals type was very dangerous through the maintenance of a long time in the soil, and also thanks its taking- over by the plants and animals. Those elements of toxicity on adjusted the combination possibility of heavy metals with minerals and the oligominerals becoming locked of those, depriving of those important elements of organisms life. The lead, entered in the organism, was absorbed by the erythrocytes, the nervous and boned tissue, reins. The biochemical effect consisted in controlling the erythrocytes activity and the quantity increasing of lead in the blood. The functions of the soil were disturbed, especially nearly the streets of intense traffic, where registered big concentration of lead. So, it were affected also the organisms from the soil.

Key words

in vivo, *in vitro*, lead, *Lycoprsicum esculentum*

The systematic toxic pollutant of heavy metals type practiced its action on different organs and systems of the human organism, the effect being specific to that substance. Its spreading in the environment was increasing and very important was the fact that it was accumulated in the human organism and environment with the possibility of producing grave pathologic alterations. The heavy metals concentrated to the level of every trophic level thanks to its low mobility, respectively its concentration in plants was bigger than in the soil, in the herbivorous animals bigger than in the plants, in the carnivore tissues bigger than to the herbivorous, the bigger concentration being touched to the ending of trophic chains, respectively to the head of predatory and also the human being. The chronic intoxication with lead caused the illness and the attack of motor nerves of terminations, that it was reflected in the conductivity deregulation of nervous impulses. That conclusion was confirmed by the toxicologists in the experiences result on the animals. Annually, millions of tons of toxic pollutants were free in the air, also from natural sources and of anthropogenus. It existed four categories of emission sources: stationary (the industrial processes, industrial and household burnings), mobiles (auto traffic), naturals (volcanic eruptions, forest fires) and accidental pollutions (discharges, industrial fires). The main emission sources of lead in the environment were the auto traffic and industrial fires. The processes thanks to those it took place its emission were: the usage of doped benzene with tetraethyl lead, the depreciation of the envelopes and pillows, the oils and the vaseline used. When there were in the environment, the heavy metals suffered an absorption process between the different environments of life (air, water and soil), and also among the organisms of the ecosystems. Thus, from the air, the heavy metals could be direct imbibed or could contribute to the soil pollution through precipitations. From the contaminated soil, the plants, on the one hand, it assimilated dissolved metals, and, on the other hand, it produced the pollution through infiltration of underground waters, after that it took place the pollutant transfer towards the surface waters and the ones potable. The contaminated plants with heavy metals represented food for the animals and human.

Material and Method

To realize the experiment it was choose the sample ACE 55 VF. The experiment in vitro and in vivo realized using: the seeds and ulterior the plantles which were direct increased in the solutions with heavy metals (the lead) (V2-V4);

the seeds and ulterior the plantles which were direct increased in water solutions (V1 control).

The seeds of tomato sample were sterilized through disinfection to the surface using ethanol 70% for 15 sec and afterwards submerged in commercial bleaching clothes Clorox TM solution (5.25% NaOCl) with 20% containing 2 drops of Tween- 20 emulsifier helping to the humectation during 20 minutes. The seeds were ulterior washed with distillate water of 2-3 stages.

In preparing the crop environment it was used MS (Murashige and Skoog, 1962) the salts completed with sugar of 3% and 0.82% agar (Mermaid TM). The ph was adjusted to 5.8 with NaOH during 20 minutes. The crops maintained into a crop room to the air temperature of 25+_ 1 degree C in light presence.

The platform involved glass flacons from every sample and every jar (115 ml capacity) contained seeds which could germinate. Afterwards the explants obtained were put in a fresh environment adjusting increasing regulators which through taking roots the explants, those would contribute to the normal increasing of plants (fig. 4.2.).

The experimental variants were the following: V1- water control; V2- Pb 10 ppm; V3- Pb 50 ppm; V4- Pb 100 ppm.

The objective followed was the one of establishing the height of explants and analyzed little plants in the presence of in vitro and in vivo lead.

Results and Discussions

The height of explants of ACE 55 VF species cultivate in vitro had for the variant V3 Pb 50 ppm from the third period of final observation an average of 4.23 cm comparative with the values of the beginning period of observations when the value was of 1.17 cm. To the variant with the concentration the biggest respectively V4 Pb 100 ppm it observed an increasing in height in the last period of observation and was 2.12 cm. The variant testifier V1 and V2 had a similar increase observing values which showed a progressive increase from the first period until the end of the observation periods, the observation periods (figure 1.)

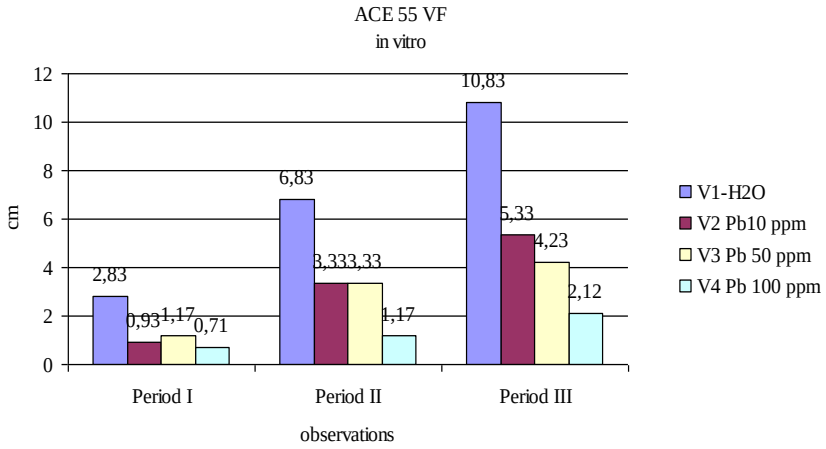

Fig.1. The rhythm of increase in the height of ACE 55 VF species of *Lycoprsicum esculentum* L. under the lead effect in different concentrations *in vitro*

The plants of the beginning of the observation period and the plants of the last period of observation to species ACE 55 VF cultivated in vivo had a different behavior from a one concentration to another. Comparative with the control variant (20,25±12,29) which developed the best to the variant V4 Pb 100 ppm from the last period of observation it observed that the average and standard departure of average of 17,17 ± 3,34. To the variants with the small concentration V3 Pb 100 ppm and medium respectively V3 Pb 100 ppm the values were 13,25 cm and 10,83 (figure 2).

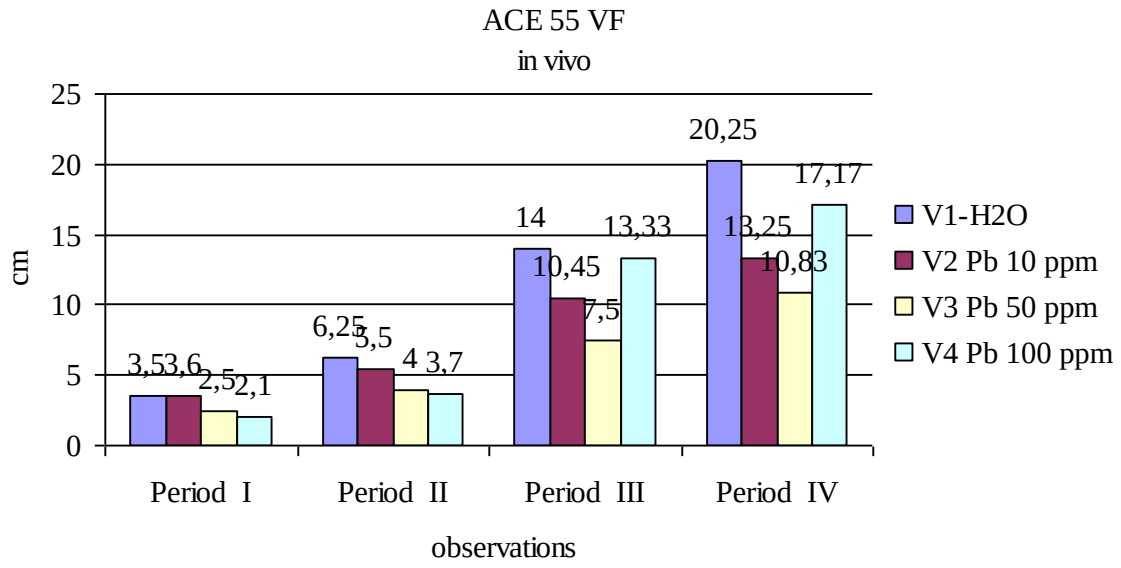

Fig.2. The rhythm of increase in the height of ACE 55 VF species of *Lycoprsicum esculentum* L. under the lead effect in different concentrations in vivo

It was obvious the stimulate effect *in vivo*, but also the delayer effect of variant with a concentration the biggest delayer of lead from the variant V4 on increasing, in height to *Lycoprsicum esculentum* L.

Conclusions

The height of explants species ACE 55 VF cultivated in vitro had for the variant V1 H2O and V2 Pb 10 ppm had a height increasing with similar values comparative with the reduced values from the variants V3 Pb 50 ppm and V4 Pb 100 ppm. The plants from the beginning of the observation period and the plants from the last one to species ACE 55 VF cultivated in vivo it had a different behavior from a concentration to another one. Comparative with the control variant (20,25±12,59) which developed the best to the variant V4 Pb 100 ppm from the last period of observation it observed the average and standard departure of average of 17,17± 3,34.

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