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Opinion

Stimulation with Low Doses of Irradiation in Plants Grown in Cuba: A Successful Practice

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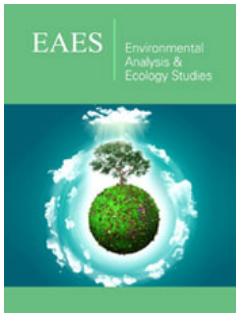

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Opinion

Since the advent of agriculture, until the creation of the most recent transgenic organism, human beings, like other living beings, have never been able to escape dependence on their environment. However, in his quest to improve their living conditions and obtain a greater number of satisfactions, he has managed not only to reduce the death rate, but also, unfortunately, the number of species that make up biodiversity [1].

One of the main problems in Cuba is insufficient food production, Since crops are affected by different biotic and abiotic factors that cause a reduction in agricultural yields.

To obtain genetic variation, gamma rays are used, which are physical mutagens that have been shown to be useful for the modification of new variants of traits that can lead to the improvement of crops and can be used as a complementary tool in plant breeding. Which indicates that mutations can generate new genetic diversity, essential for the improvement of crops. In this sense, stimulating physical methods constitute a viable alternative. All this is related to the fact that living organisms have developed adaptation mechanisms at low doses of radiation that can lead to the stimulation of certain vital functions of the organism, a process called radio-stimulation [2].

The efficiency of a mutagenic agent to generate genetic variability in plants will depend on the dose and the physical characteristics of the plant material, such as its temperature and water content, as well as on physiological variables, such as the type of tissue (in meristems there is more probability than in differentiated tissues), age (young tissues are more prone than adults), biochemical constitution (content of nitrogen, magnesium, potassium, iron, phosphorus, fats, lipids and proteins), the cell division cycle (a high mitotic activity causes greater sensitivity to radiation), the chromosomal number (the higher the number, the lower the sensitivity) and the volume of the cell nucleus [3].

Currently in our country the use of stimulation with low doses of irradiation has been aimed at the induction of mutations to generate genetic variability in some economically important crops, with the aim of obtaining varieties of crop plants, which guarantee under certain environmental and production conditions, and stable yields, of the products harvested with the required quality. These crops include rice (*Oryza sativa L.*), tomato (*Solanum lycopersicum L.*), sugar cane (*Saccharum spp.*), Banana (*Musa sp.*) And beans (*Phaseolus vulgariz L.*), crops of great importance due to their high level of consumption, as well as other crops that, although not among the most demanded by the Cuban population [4-7].

The use of nuclear technology in genetic improvement programs developed by a group of scientific institutions in Cuba, has become a successful tool because it has allowed to generate variability and offer the possibility of selecting nonexistent characteristics in the species;

as well as accelerating the introduction of new mutant varieties under production conditions, making the benefits of this technique accepted by producers [8-11].

The induction of mutations is a tool with great potential to reduce the time required to obtain varieties resistant or tolerant to different types of biotic or abiotic stress. This method is an alternative that allows incorporating a greater source of genetic variability to the conventional plant breeding process in Cuba.

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