HELIANTHUS ANNUUS (Sun-Flower)

The students worked at this research with two parallel cases, which were under observation for 6 weeks (the experiment itself started in the moment the seeds germinated, on 19th February). Both parallel works were made of 6 bottles, built following the TerrAqua Column model, which were given different quantities of nutrients (1, 5 and 10 grams), added differently (in soil and normally).

The first case (E1) implied the presence of aquatic plants in the water. The second one (E2) was supposed to let the plants grow in the upside of the columns without any aquatic plants to be placed in the bottom level.

The normal conditions of the simulated laboratory were the proper light (as a mixture between low-powered natural light and artificial compensatory one) and the temperature of the room that admitted variations between 21 and 27 Celsius degrees (21 - 27˚C). Also, the plants were given the proper quantity of water, depending on the condition of their soil, so the experiment didn't suffer any changes because of it.

The proportionality of the plants' height has maintained for all of the 6 weeks (when it comes to E1) and for only 1 week (in the case of E2), which indicates that the aquatic plants influenced the growth. A huge difference also appeared while using the TDS Adwa AD31, which indicating, among the 6 weeks, values starting with 200 ppm to 600 ppm (last week of E1) and more than 2000 ppm (E2).

However, it's important to mention that the E2 plants grew faster (after a week, they were over than 4 cm, when the E1 plants were under this value).

Regarding E2, the differences between bottles appeared really quickly (the bottles to be received nutrients in soil had thinner plants, which grew slowly, so the difference between the medium height of the higher plants and the lower ones exceeded 5 cm).

On another hand, a capital observation students made is the fact that the number of "survivors" was a big difference between E1 and E2. Only two bottles kept the plants alive in E1 (the 1 g columns) which means that the others dried (at different times), while the E2 made it with the complete bottles (each one had at least a plant alive) on the second week of April.

It seems that Vallisneria americana had a really important impact on the experiment E1, because its existence kept in balance all the plants and the values of nutrients in water as well.

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VIGNA RADIATA (Mung Been)

Firstly, three plants grew in each pot. The reasearch implied giving different quantities of nutrients to each pot, directly and in soil: 1, 5, 10 grams per week. Despite the proportionality of the first week growth, some plants dried after a while. On the 10th of March, the quantity of plants reduced to a half. A week later, only 1 g experiments were still alive. Even if at the very beginning, the 1 g experiment grew faster than the 1 g in soil ones, in the end the former were smaller. Regarding the 5 g and 5 g in soil experiments, the things are different. The 5 g in soil were bigger from the beginning to the end, when both of them died on the 10th March. There was almost no difference between 10 g and 10 g in soil experiments, the former dying after three weeks and the latter after two weeks.

Even if the 1 g in soil experiment grew faster, the quantity of nutrients in water from the 1 g experiment was bigger, the quantity being proportional with the plant height. The same thing is relieved by the other experiments. The quantity of nutrients in water from 5 g experiments and 10 g experiments increased faster after the plants had dried, the difference between the measurements being smaller at the ones in soil.

In conclusion, the increase of the quantity of nutrients lead to faster plant death, drying 66, 66% of the plants. As usual, fertilizer excess triggers loss. It was proved that 5g per week of fertilizer or more is too big for our plants, only 1g being enough for our plants to have grown properly. If the pot were bigger, the fertilizer wouldn't be so hurtful.

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The experiment was meant to show how important laboratory conditions are when it comes to plants' growth and evolution. Mung been seeds were planted at the beginning in 7 different bottles, made on the principle of TerrAquaColumn.

The students let the same quantity of light, water and warmth to interact with the plants, but the differences that determined them grow and evolve differently were the quantity of nutrients used and the way of putting them in contact with the subjects (directly and in soil).

It is remarkable that the way of growth was the same for three of the plants, those that survived until the experiment ended: the blank test bottle (which was the bottle where the plant grew naturally, without being given any nutrients) and the bottles which were given 1 gram of nutrients, directly and in soil. The 5 and 10 grams experiments did not make it, which provides the toxicity of a more than 1 gram of nutrients quantity used.

The students could observe little differences between the 1 gram bottles, but the contrast between them and the blank test one was truly visible: The 1 gram bottles' plants reached maturity faster than the blank test and the reason is well-known: the nutrients made this acceleration in growth and evolution possible.

All the plants blossomed and formed healthy fruits, from 1 to 3 and even 4 seeds per pod.

It seems the number of pods per plant and the number of seeds per pod were influenced by the nutrients. So, the blank test plant had less pods than the other ones. Otherwise, the 1 gram in soil bottle had less pods than the one that was given 1 gram of nutrients directly (the report of a complete cycle of evolution from planted seed to mature formed seed between the 1 gram plants was 1/2 : this means that the 'in soil' bottle was a bit less efficient than the 'directly' one).

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