

The Effect of Different Hydrated Ions for Absorption of Water And Puffiness Process in Seeds

Sevinj M. ABDUYEVA-ISMAILOVA

Aim of the study: Monocotyledonous wheat and dicotyledonous pea seeds were used as subject of study. The effect of both the positive ions (Na_2SO_4 , MgSO_4 , NaOH), both the negative ions (KCl , KNO_3 , NH_4NO_3) and one positive, the other negative hydrated (NaCl , NaNO_3 , CaCl_2) ion salts for absorption of water and puffiness process in seeds was studied. The results have been obtained from salts containing different hydrated ions were a bit different. In this case, puffiness of seeds depends on the radius of ions effected, depends on their size. Indicators of pea seeds in each case were higher compared to wheat seeds.

Material and Method: Experiments were conducted in laboratories-in water culture. Monocotyledonous wheat and dicotyledonous pea seeds were used as subject of study. As stress factors in experiments both the positive ions (Na_2SO_4 , MgSO_4 , NaOH), both the negative ions (KCl , KNO_3 , NH_4NO_3) and one positive, the other negative hydrated (NaCl , NaNO_3 , CaCl_2) ion salts were taken. In order to determine the effect of different hydration ions to germination and puffiness process of seeds after determination of their dry, absolutely dry weights soaked in distilled water (control) and 0.1 and 0.2 M concentration solutions (experience options) and their wet weights were defined with the gravity method within 20-24 hours. Each of the three weights carried out on analytical, torsion or electronic scales. As 0,2 M is a stress concentration, other, higher concentration solutions were not used. Each of the three weights carried out on electronic scales. Determination of wet weight conducted every 30 minutes during the first 3 hours, and later determination conducted every 3 hours. In this way paper remaining wet all the time serves water supply for seeds placed on it. An average square edging were calculated from the obtained results). Failure was not more than 5%.

Results: The effect of both the positive ions (Na_2SO_4 , MgSO_4 , NaOH), both the negative ions (KCl , KNO_3 , NH_4NO_3) and one positive, the other negative hydrated (NaCl , NaNO_3 , CaCl_2) ion salts for absorption of water and puffiness process in seeds was studied. It was revealed that, with the effect of different hydrated ions, absorption of water and puffiness process in seeds follows the same way as in control, it is characterized by the three-phase curve regardless the composition of salts, what type of hydrate are the ions, as well as the biological characteristics of the seeds. The only difference between the two variants have been quantitative. The effect of different hydrated ions for puffiness process was due to their effect of them for activity of water molecules and their water storage capabilities. Because of small size and high electrical load density of positive hydrated ions delayed the sprouting and puffiness process in seeds due to retaining water molecules more tightly, and reducing their flow and activity on the contrary, because of big size and low electrical load density of negative hydrated ions due to increasing water flow puffiness process was more rapid compared to control. The results have been obtained from salts containing different hydrated ions were a bit different. In this case, puffiness of seeds depends on the radius of ions effected, depends on their size. Indicators of pea seeds in each case were higher compared to wheat seeds. It can be related to big size and protein-richness of pea seeds. Proteins are organic substances with the highest hydration capacity and are subject to permutoid and micellar hydration.

Keywords:hydrated ions, hydration, puffiness, germination