



9– OVERCOMING DORMANCY IN ‘ALBION’ STRAWBERRY USING SULFURIC ACID

HEDER ASDRUBAL M VALENCIA^{1*}; TATIANA DE C CARRASCO¹; LUANA DE S MARINKE¹; GISELY PAULA GOMES¹; JULIANO TADEU V DE RESENDE¹.

¹ UEL- UNIVERSIDADE ESTADUAL DE LONDRINA- DEPARTAMENTO DE AGRONOMIA, PR

INTRODUCTION

Obtaining plants from achenes is one of the first steps in a strawberry breeding program since each achene can generate different plants genetically. However, obtaining plants from achenes is one of the biggest obstacles to be overcome as they present integumentary dormancy, resulting in low germination, making it necessary to apply strategies to break their dormancy. The use of sulfuric acid (H₂SO₄) (SA) is the most recommended to break the dormancy of the dispersion units (seeds, nuts, achenes, and others) of some species. Therefore, the objective of this work was to verify the effect of concentrations and immersion times of sulfuric acid on the breaking of dormancy of strawberry achenes of the Albion cultivar.

MATERIALS AND METHODS

Pseudofruits of strawberry were sanitized with tap water for 5 minutes, then placed in a blender jar along with 1 liter of water, at a low speed for 2 minutes to preserve the achenes. After being filtered and washed with tap water, they were finally set on paper towels to dry at room temperature for 24 hours. After removing the achenes, the fertilization test was performed by evaluating their flotation capacity, by immersing the achenes in water, thus separating viable from non-viable achenes (Chandler et al., 2012); viable achenes were considered those that sink in the jar, and non-viable ones were those that float. The moisture content was determined by drying in an oven at 105°C for 24 hours (MAPA, 2009), using four repetitions of 20 seeds each. The chemical scarification was carried out by immersing the achenes in concentrated SA (0%, 70%, 80%, and 90%), for 5, 10, and 15 minutes. Subsequently, the achenes were washed in distilled water to completely remove the residues. For the in vitro germination of strawberry seeds MS (Murashige – Skoog) culture medium with a 25% concentration of mineral salts was used (Eidam, 2012), supplemented with 30g/L of sucrose, 0.1 g/L of myo-inositol, and 6g/L of agar. The pH of the medium was adjusted to 5.8, to fill 20mL of medium in every flask and then sterilized in an autoclave at 120°C for 20 minutes. For each treatment, four repetitions with 20 achenes were employed (total = 80 seeds for each treatment). The treatments were kept incubated for a period of 70 days, and after this period, the number of normal seedlings was quantified.

RESULTS AND DISCUSSION

Dormancy caused by factors inherent to the seed coat can be interrupted by scarification, through the rupture or the weakening of the integument (Guedes et al., 2011). In this experiment, the control group did not present positive germination, which was expected because there was no scarification agent.

Based on the Pearson correlation, there was a positive strong correlation between the treatments and the germination percentage creating a response surface around the application of SA at 70% indicating a direct influence on the germination of strawberry achene and another surface, with moderate correlation, around 90% of the concentration of the acid. On the other hand, there was a negative correlation between the treatment 80% of sulfuric acid for 10 minutes and the germination percentage (Figure 1).

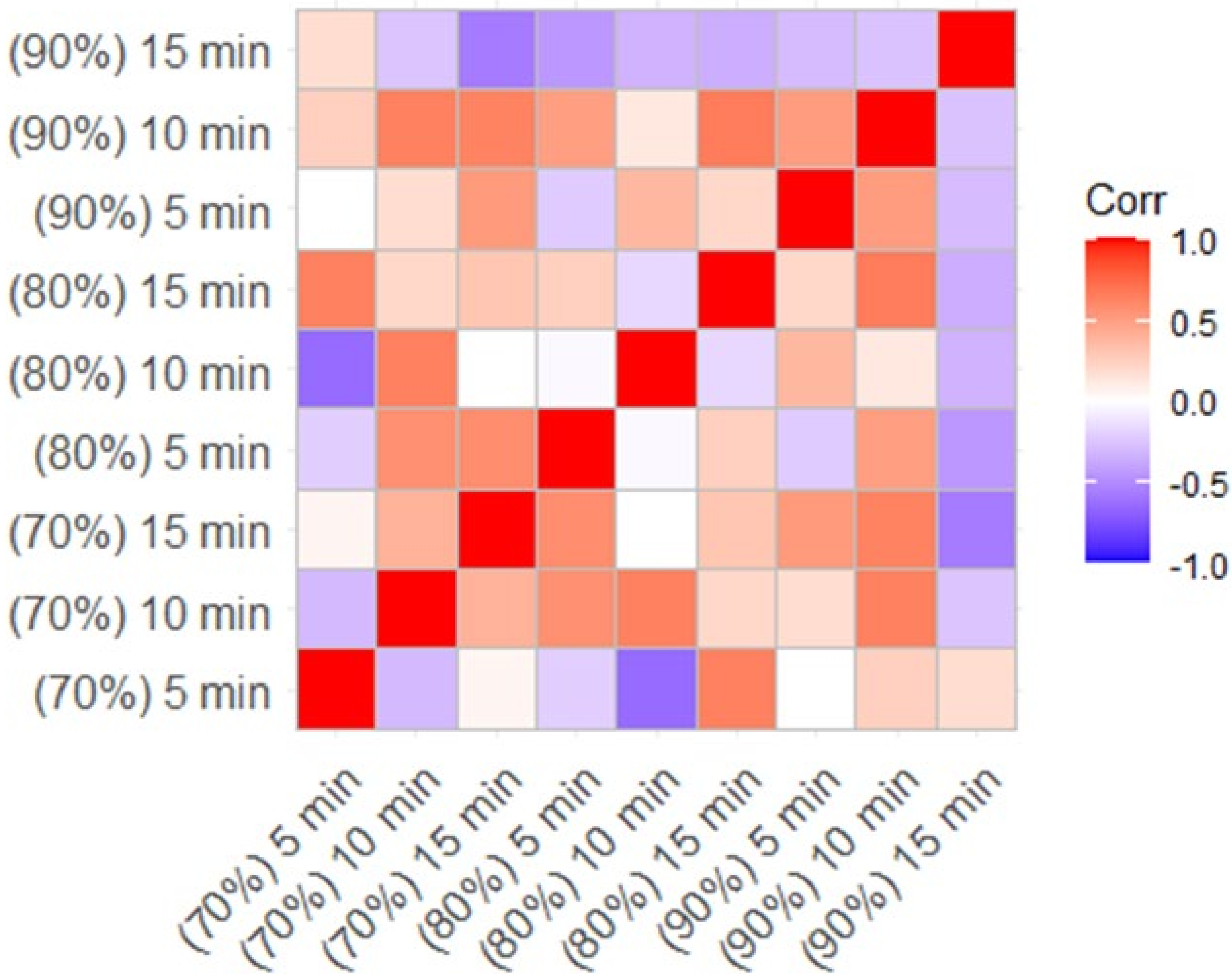


Figure 1. Pearson correlation. Effect of chemical scarification by H₂SO₄ on strawberry achenes Albion cv germination percentage.

There was significant efficiency of SA, regarding the concentration used, in promoting the germination of NS of achenes of Albion cv. The highest germination percentage obtained by treating the achenes of the cultivar with sulfuric acid, at 72 days after inoculation, was 56% followed by 45% both at 70% of acid (Figure 2).

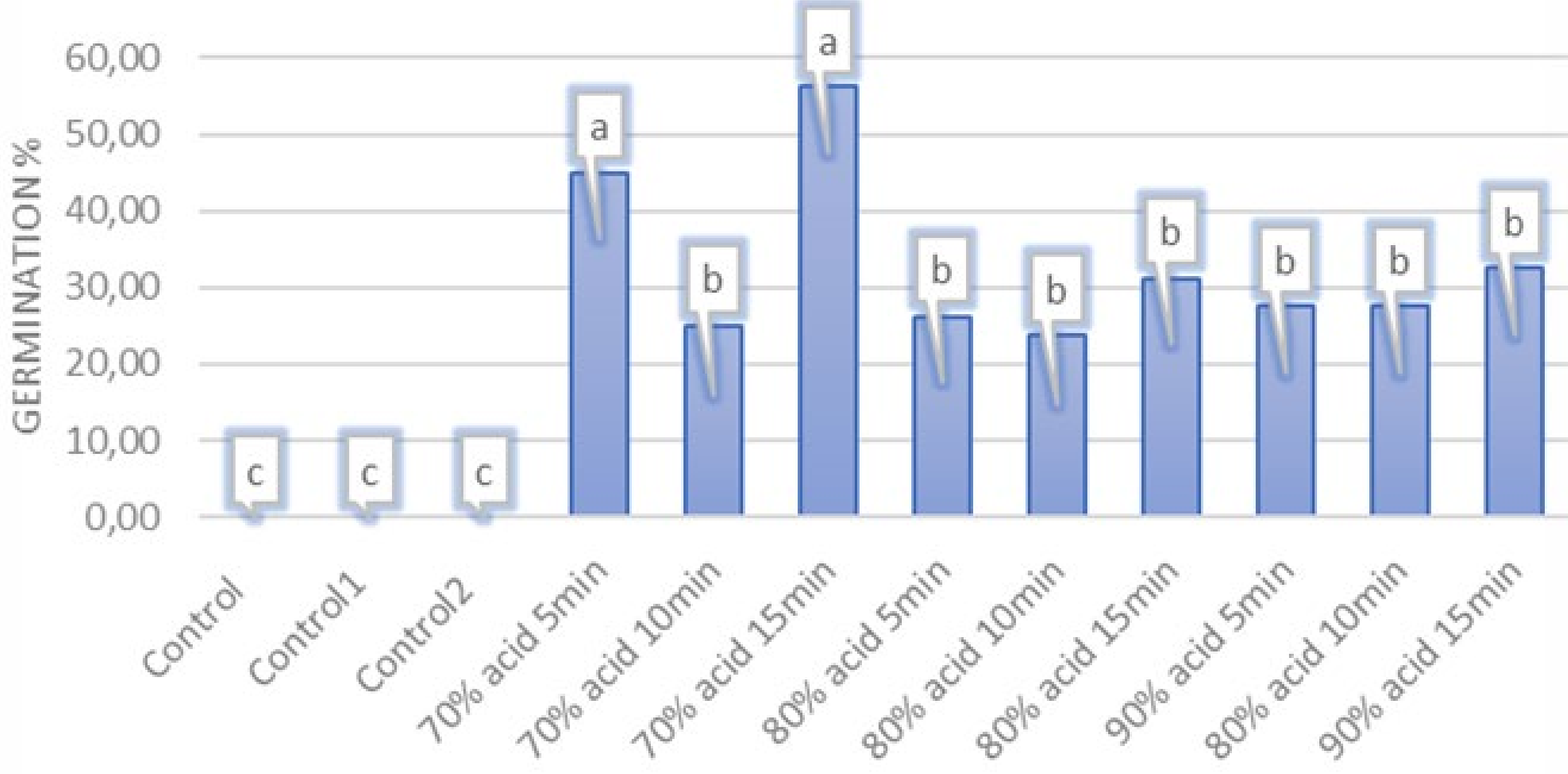


Figure 2. Scott-knott. Effect of chemical scarification by H₂SO₄ on strawberry achenes Albion cv germination percentage. Means followed by the same letter do not differ from each other by the Dunn–Bonferroni test (p <0.05)

The application of SA for dormancy breaking in strawberries has practical implications for commercial strawberry breeding programs through the micropropagation process (Figure 3).



Figure 3. Normal Seedlings grow before going to the field evaluation.

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