
Optimization of Tissue culture *Limonium sinuatum* rooting by using multiplication media and pre-rooting media

The genus *Limonium*, formerly called statice, is a member of the family Plumbaginaceae, which consists of 150 wild species. In recent years, statice (*Limonium sinuatum*) has become a popular ornamental flower crop around the world. The attractive colour and longevity makes it an ideal candidate for sale, both as a fresh and dry flower, in the flower market. HilverdaKooij is a leading company with many years' experience working on the propagating of new *Limonium* varieties. Every year, on average, HilverdaKooij sells 1 million *L. sinuatum* young plants to the growers worldwide.



Conventional propagation of many *Limonium* cultivars is by side shoot or rooting cuttings, which take 6-8 months to develop with limited (20-30%) success (Fujita, 1993). So micropropagation has been developed to improve the propagating efficiency. Micropropagation is the science of growing plant cells, tissues or organs isolated from the mother plants, on artificial media. The objective of plant propagation, via micropropagation, is to propagate plant true-to-type, that is, as clones. This technique could quickly (year round) produce disease and pest free mature plants.

Currently in HilverdaKooij, 4 different *L. sinuatum* cultivars (22016 Azur Wings; 8008 Blue Wings; 4004 Cobalt Wings; C024 tested pot plant) have a low rooting percentage (60-70%) in the plant tissue culture. Previous research showed that in tissue culture, the phase of multiplication and the rooting phase are usually opposite processes. In the first phase the plant has to make more plants, in the second phase the plant has to stop dividing and make roots. The transition between these phases can be difficult. There are plenty of researches about hormones' effect in tissue culture of different plants. However, most of them studied plant multiplication and rooting as two steps separately. There are only limited articles found that mention the phenomenon that multiplication hormones give an influence on the rooting stage. In this research, we also introduce a pre-rooting media. Pre-rooting media are an intermediate between multiplication and rooting. It aims to makes a better transition from multiplication stage to rooting stage.

The question was raised from former research study: Is there a relationship between

multiplication parameters and rooting efficiency? What effects do the pre-rooting media have on rooting of the 4 different *L. sinuatum* cultivars? My research objective was to optimize rooting for these 4 different *L. sinuatum* cultivars by using the different concentration of multiplication media and pre-rooting media.

In this research, tissue culture stock clumps of these four cultivars are first multiplied on three different multiplication media. After 7 weeks, plants are cultured on three different pre-rooting media for 2 weeks. And then, plants are transferred to rooting medium for 3 weeks.

The results show that medium 16-8 with NAA (1-naphthaleneacetic acid) gives the best rooting percentage for four cultivars. For cultivar 8008, the low concentration of BA (6-benzyladenine) used in multiplication stage improves roots formation. For cultivar 22016 and 8008, plants with pre-rooting stage had higher rooting percentages than plants without pre-rooting stage.

For HilverdaKooij, the outcome of this research can help the company to optimize rooting for the four tested *L. sinuatum* cultivars by using the different concentration of multiplication media and pre-rooting media. They can help the company solve the low rooting percentages problems of some *L. sinuatum* cultivars, and this can contribute to a more efficient production system for the company. This research result shows the phenomena that multiplication hormone gives the influence on rooting stage. This can contribute to further tissue culture experiments about *L. sinuatum* rooting and other tissue culture crops.

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