THE INFLUENCE OF THE SUBSTRATE ON ROOTING CUTTINGS OF SOME SPECIES OF MEDICINAL PLANTS

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Abstract

The purpose of this work was to evaluate the influence of different substrates on the rooting capacity of two species of medicinal plants cuttings: Rosmarinus officinalis L. and Lavandula angustifolia Mill.

Rosmarinus officinalis L. cuttings root up to 10 days faster when using perlite as substrate.

Following the study of the rooting of Lavandula angustifolia Mill. cuttings, it was stated that the optimal substrate is the mixture of perlite + Radi-Stim.

Key words: substrate, rooted cuttings, *Rosmarinus officinalis, Lavandula angustifolia*.

INTRODUCTION

This paper presents the rooting of cuttings for two medicinal herb species: *Rosmarinus officinalis* L. and *Lavandula angustifolia* Mill.

The name "rosemary" derives from the Latin (*ros* - dew and *marinus* - sea, or "dew of the sea".

According to legend, The Virgin Mary is said to have spread her blue cloak over a white-blossomed rosemary bush, when the Holy Family was resting during the Flight to Egypt, and the flowers turned blue. The shrub then became known as the 'Rose of Mary'.

In Ancient Greece students wore before exams garlands of rosemary leaves. It was believed that the flowers had the effect of improving their memory.

From rosemary leaves (*Rosmarini folium*) a volatile oil with strong stimulating effect is obtained. Rosemary has the following properties action: purifying, antiseptic, antiemetic, antifebrile, diuretic (stimulates renal secretion and thus cleanses the body of residue).

Lavandula angustifolia Mill. is significant for the volatile oil which is found in the aerial part of the plant, nevertheless the highest content is found in the inflorescences.

The raw material is the inflorescence (*Lavandulae flos*) used in fresh or dried state.

The pharmacodynamic action: antiseptic, healing, soothing, in demand over intellectual, combat stress, emotions, states of emotional instability (in adolescents), diuretic, disinfectant etc.

MATERIALS AND METHODS

1. Influence of substrate on rooting of *Rosmarinus officinalis* L. cuttings

For this experiment we have studied rosemary cuttings (collected from a local crop) which were rooted on different substrates in a controlled environment (Greenhouse of the Phytotechnics Departament - USAMV Cluj-Napoca).

In the experiment we used three different substrates:

- V1= mixture (soil, peat, fermented manure, sand) – control variant;
- V2= water;
- V3= perlite.

The experiment was established in 28.01.2013. In order to process the post-variance analysis data for each substrate, we have established four repetitions each with three plants (Fig. 1).

Fig. 1. The three substrates used in the experiment

2. Influence of substrate on the rooting of *Lavandula angustifolia* Mill. cuttings

Lavender cuttings (local crop) which were harvested in the autumn, were put on rooted on different substrates in a controlled environment (Greenhouse of the Phytotechnics Departament).

In the experiment there have been used five different rooting substrates:

V_1 - mixture (soil, peat, fermented manure, sand) – Control variant

V_2 - mixture (soil, peat, fermented manure, sand) + Radi-Stim
V_3 - water
V_4 - Perlite + Radi-Stim
V_5 - Perlite

RADI-STIM No. 2 has been designed in order to stimulate the rooting of lignified and semi-lignified cuttings and has the following advantages (according to the manufacturer):

- Faster rooting
- Increase in the percentage of rooted cuttings
- Average number of roots per cutting is greater
- Average length of the roots is greater
- Further development of the plants is intensified due to the complex composition, the cuttings are protected during the callus formation and root branching against attacks from different pathogens, thereby reducing mortality caused by molds.

The experiment was established in 22/11/2012. In order to process the variance analysis data for each substrate, we have established three four repetitions each with three plants.

RESULTS AND DISCUSSION

1. Substrate influence on the rooting of *Rosmarinus officinalis* L. cuttings

When using water and perlite results were better than when using the mixture of soil, fermented manure, peat and sand.

Rooting time decreased by 6 days in the case of water, and 10 days in the case of perlite (Table 1).

Table 1

Substrate influence on the rooting of the species Rosmarinus officinalis L.

Variant	Rooting time (days)	%	± Differences	Significance
Mixture - Control	47	100	-	-
Water	41	86.2	-6	X
Perlite	37	78.2	-10	XX

LSD 5% = 5.22 LSD 1% = 7.32 LSD 0,1% = 10.34;

2. Substrate influence on the rooting of *Lavandula angustifolia* Mill. cuttings

Lavender cuttings have failed to root in water, therefore this option was not taken for statistical calculation. After investigations it was found for the variant V_2 (soil + Radi-Stim), the rooted cuttings recorded significant

negative differences compared with control after 85 days (V_1 - 97 days). V_4 variant (Perlite + Radi-Stim) influenced rooting after 68 days. Recording significant negative differences compared to the control variant. The V_5 variant (Perlite) recorded significant negative differences compared to the control variant, and the rooting of the cuttings took place after 69 days.

From Table 2 it can be seen that the fastest variant has been rooting in perlite + Radi-Stim variant.

Table 2

Rooting time of lavender cuttings, 4 substrates (Cluj-Napoca, 2013)

Variant	Rooting time (days)	± Differences		Significance
		%	No. of days	
Mixture - Control	97.89	100	-	-
Mixture + Radi-Stim	85.56	87.4	-12.33	0
Perlite + Radi-Stim	68.55	70.0	-29.34	000
Perlite	69.67	71.2	-28.22	000

LSD (5%)=10.63 LSD (1%)=6.10 LSD (0.1%)=25.87

CONCLUSIONS

The rooting time for *Rosmarinus officinalis* L. cuttings, fell for six days in case of water use and 10 days when using perlite, so it is recommended that the rooting of sprouts takes places in perlite to make.

Following the study on the rooting of Lavandula angustifolia Mill. cuttings, it was found that the best solution is the mixture of perlite + Radi-Stim.

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