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Analysis of stem height feature in *Sarcococca ruscifolia* Stapf seedlings obtained from two
types of cuttings using different rooting substrates

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Abstract: This work analyses the relationship between the height of the seedling and the rooting substrates. According to the results obtained, the height differences between different substrate variants and rooting biostimulators were used for the obtaining of *Sarcococca ruscifolia* Stapf. cuttings were very different compared to the others, many of them showing highly significantly positive differences and a few distinctly significantly positive differences and significantly positive differences.

• Introduction

The species *Sarcococca ruscifolia* Stapf. is spread in Asia, and the maximum height reaches about 1 m. The species has a compact bush and evergreen leaves, white flowers are flowering in December-January and the fruits are coloured in red. It is a shade species, but it also grows in partial shade [1]. Species in the genus *Sarcococca* are considered drought tolerant [6], growing in drought conditions being a great challenge for numerous plant species. Even if *Sarcococca ruscifolia* Stapf. belongs to *Buxaceae* family, it is resistant to *Cydalima perspectalis* Walk. (box tree moth), compared to *Buxus sempervirens*, species from the same family [2, 8,9,10].

• Material and method

The biological material was represented by cuttings of the species *Sarcococca ruscifolia* Stapf. with a ring and heel (Figure 1). The experiment was polyfactorial, there were planted two types of *Sarcococca ruscifolia* Stapf. cuttings: with ring and heel. There were applied combined two factors, respectively two rooting biostimulators (Razormin and Radifarm) and five types of substrates (Figure. 2). The cuttings with ring and heel were harvested on 20.02.2023, in the morning from Iulius Mall Park, Timișoara (western Romania). The experiment was carried out in the propagation greenhouse of the Arboriculture discipline, at the Didactic and Research Base of the University of Life Sciences "King Mihai I" from Timișoara. The biometric features considered in the present research were: plant height (cm), plant diameter (cm), number of roots and main root length (cm). The analysed data were collected on May 30th 2023. There was analysed the influence of cutting type and substrate on the analysed biometric features. Statistical methods used were descriptive statistics, the data being processed with JASP software 0.18.1.0. (JASP, 2020).



Figure 1. Ring and heel cuttings of *Sarcococca ruscifolia* Stapf. (original)



Figure 2. Cuttings placed in rooting substrates (original)



Figure 3. Cuttings watered with Radifarm and Razormin (original)

• Results and discussions

Table 1

Analysis of variance (ANOVA) for characterizing the height of seedlings
Salvați traducerea *Sarcococca ruscifolia* Stapf. (cm)

ANOVA - H (cm)					
Cases	Sum of Squares	df	Mean Square	F	p
heel/ring	60.053	1	60.053	90.823	< 0.001
Variant	800.301	14	57.164	86.454	< 0.001
heel/ring * Variant	11.321	14	0.809	1.223	0.255
Residuals	277.710	420	0.661		

Note. Type III Sum of Squares

Table 2

Comparative analysis of cutting height of *Sarcococca ruscifolia* Stapf. depending on the type of cutting

Post Hoc Comparisons - heel/ring

		95% CI for Mean Difference		SE	t	p-value
Mean Difference		Lower	Upper			
heel ring	-0.731	-0.881	-0.580	0.077	-9.530	< 0.001 ***

*** p < 0.001

Note. Results are averaged over the levels of: Variant

According to the results obtained, the height differences between the 14 substrate variants used to obtain cuttings of *Sarcococca ruscifolia* Stapf. in comparison are very different from each other, many of them being very significantly positive and a few distinctly significantly positive and significantly positive.

• Conclusions

- ❑ Significant differences in the height of *Sarcococca ruscifolia* Stapf. seedlings can be observed in the case of nutrient substrate variants.
- ❑ According to the results obtained, the height differences between the 14 substrate variants were used to obtain cuttings of *Sarcococca ruscifolia* Stapf. in comparison are very different from each other, many of them being very significantly positive and some distinctly significantly positive and significantly positive.
- ❑ The results highlight the fact that the type of cutting and the substrate variant influences the height of the cuttings obtained from *Sarcococca ruscifolia* Stapf.; thus, the combined effect of the two factors must be taken into account.

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