

THE EFFECT OF ROOTING SUBSTRATE ON THE DEVELOPING OF TOP CUTTING OF *PILEA* SPECIES

EFFECTUL SUBSTRATULUI DE ÎNRĂDĂCINARE ASUPRA DEZVOLTĂRII BUTAȘILOR DE *PILEA*

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Abstract. *Pilea* genus, are grouping around 600-715 species belonging to the family Urticaceae are indoor plants, with less finicality to environmental conditions. Grows and develop well in partial shade, are decorating by colored foliage, which varies from silver, green, red to brown and appears in different shapes and sizes. Species multiply relatively quickly and easily, by cuttings. It has a high resistance to disease attack but often is attacked by spiders. In our research, has studied the effect of rooting substrate in the case of three species: *P. cadierei*, *P. mollis*, *P. spruceana*. It was followed the degree of rooting and development of cuttings in three substrates: perlite, peat + sand, peat + perlite.

Key words: *Pilea* species, top cuttings, rooting substrate

Rezumat. Genul *Pilea*, grupează aproximativ 600-715 specii care fac parte din familia Urticaceae și sunt plante de interior, puțin pretențioase față de condițiile de mediu. Cresc și se dezvoltă bine la semiumbă, decorează printr-un foliaj divers colorat, care variază de la argintiu, verde, roșu până la maro și se prezintă în diferite forme și mărimi. Speciile se înmulțesc relativ repede și ușor, vegetativ, prin butași. Prezintă o rezistență ridicată la atacul bolilor însă deseori sunt atacate de păianjeni. În cercetările efectuate, s-a studiat efectul substratului de înrădăcinare în cazul a trei specii de *Pilea*: *P. cadierei*, *P. mollis*, *P. spruceana*. S-a urmărit gradul de înrădăcinare și dezvoltare a butașilor în trei substraturi: perlit, turbă+nisip și turbă+perlit.

Cuvinte cheie: specii de *Pilea*, butași de vârf, substrat înrădăcinare

INTRODUCTION

The three species studied have different morphological characters, originating from tropical forests in Asia. Grow and develop well in shady and humid places.

The studied species are less known and cultivated in our country, although very adaptable to the different environmental conditions and requires minimal maintenance work (Cantor, 2008). All the studied species are recommended as indoor plants, but *Pilea cadierei* is recommended also for miniature gardens under glass (terrariums), even aquariums (Macke, 2004). The goal of the research was to disseminate *Pilea* species and to improve the assortment of indoor plants, with species with less finicality and special morphological characteristics. In this way, we used vegetative multiplication and we studied the influence of substrate on rooting of three *Pilea* species. Once with making the study of these new species is envisaged to improve technology and their culture.

MATERIAL AND METHOD

The biological material used in this experience in was represented by the three species: *P. cadieri*, *P. mollis*, *P. spruceana* (fig. 1) from the didactical collection of the Department of Floriculture. As rooting substrate were used following: perlite, peat+sand and peat + perlite. *Pilea cadieri* or Aluminium plant is a herbaceous plant about 10-40 cm tall, native to China and Vietnam. It is commonly cultivated as an ornamental plant and it has green leaves with gray spots, far, is the most common species. Sometime loses its basal leaves becoming less attractive, but it is powerful branching and make a beauty bush (Reimherr, 2008). *Pilea mollis* has a size of 20-25 cm, strongly branched embossed and spiny leaves. The variety "Moon Valley" is green colored leaves that contrast with dark brown narrows (Şelaru, 2006). *Pilea spruceana* is a species of medium size (30-40 cm), well branched, with oval leaves, embossed and brightly colored. The variety "Norfolk" has brownish or green leaves with red-purple veins.



Fig. 1. The studied *Pilea* species

The experience was founded in 2009 in the didactical greenhouse of UASVM Cluj, at the Department of Floriculture. The top cuttings have been made on 10.02.2009, harvested from healthy mother biological pure plants. The cutting was performed 1-2 mm below the basal node and after that was removed the upper third leaves to reduce transpiration. The average of cuttings length was different: 6.60 cm at *Pilea cadieri*, 5.50 cm at *Pilea mollis* and 6.90 cm at *Pilea spruceana*. From each variant was made 30 cuttings. Another important experimental factor in this experience was the rooting substrate. Thus, three substrates were used following: a) perlite; b) peat+sand (in equal percent of 1:1); c) peat+perlite (in equal percent of 1:1). The prepared cuttings for rooting were treated with a Radistim (root stimulator).

RESULTS AND DISCUSSIONS

Regarding the period of rooting of cuttings, we can conclude that: *P. spruceana* rooted fastest (18 days), in the substrate composed by peat + sand. It was followed by *P. cadieri*, which rooted in 19 days in peat + sand. *P. mollis* has rooted in 20 days, in the same substrate. There is a delay of roots, in the substrate composed by peat + perlite (table 1). In the table 2 are presented the morphological characters of cuttings before rooting. The total number of prepared cuttings, in the each substrate was 30. The highest cuttings length was made at *Pilea spruceana* an average of 6.90 cm. It was followed by *Pilea cadieri* with an average of 6.62 cm. The shorter cuttings were made at *Pilea mollis*, with a length of 5.49 cm.

Table 1

The situation of *Pilea* cuttings, in the three rooting substrate

Species	Rooting substrate	Date of making cuttings	Date of rooting	Number of day of rooting
<i>P. cadierei</i>	Perlite	10.02.2009	-	-
	Peat+sand	10.02.2009	01.03.2009	19.0
	Peat+perlite	10.02.2009	04.03.2009	22.0
Average (Control)				20.5
<i>P. mollis</i>	Perlite	10.02.2009	-	-
	Peat+sand	10.02.2009	02.03.2009	20.0
	Peat+perlite	10.02.2009	06.03.2009	24.0
Average (Control)				22.0
<i>P. spruceana</i>	Perlite	10.02.2009	-	-
	Peat+sand	10.02.2009	26.02.2009	18.0
	Peat+perlite	10.02.2009	03.03.2009	21.0
Average (Control)				19,5

Table 2

Centralized table concerning the observation of cuttings, before rooting

Species	Rooting substrate	Number of prepared cutting	The length of cutting (cm)	The number of leaves
<i>P. cadierei</i>	Perlite	30	7,04	6,02
	Peat+sand	30	6,44	5,40
	Peat+perlite	30	6,38	4,40
Average (Control)		30	6,62	5,27
<i>P. mollis</i>	Perlite	30	5,70	8,20
	Peat+sand	30	5,78	6,00
	Peat+perlite	30	5,00	6,20
Average (Control)		30	5,49	6,80
<i>P. spruceana</i>	Perlite	30	7,40	7,00
	Peat+sand	30	6,60	6,60
	Peat+perlite	30	6,70	6,00
Average (Control)		30	6,90	6,53

Table 3

The influence of rooting substrate on morphological characteristics at three species of *Pilea*

Species	Rooting substrate	Number of prepared cutting	The length of cutting (cm)	The number of leaves	The length of roots (cm)
<i>P. cadierei</i>	Peat+sand	30	16,9	10,2	10,6
	Peat+perlite	30	17,2	8,8	10,0
Average (Control)		30	17,0	9,5	10,3
<i>P. mollis</i>	Peat+sand	30	12,0	13,2	6,4
	Peat+perlite	30	9,9	11,0	4,6
Average (Control)		30	10,9	12,1	5,5
<i>P. spruceana</i>	Peat+sand	30	12,4	16,8	6,0
	Peat+perlite	30	14,6	16,8	8,2
Average (Control)		30	13,5	16,8	7,1

The dates from table 3 show that the rooting substrates influence different three *Pilea* species. Regarding the total length of the cuttings we can conclude that *P. cadierei* reach high values in the mixt substrate of peat + perlite (17.2 cm), *P. mollis* have lower values in this mixt substrate (9.9 cm) and *P. spruceana*, also in peat + perlite, achieved the best results (14.6 cm).

Analyzing the number of leaves at every species, *P. spruceana* is remarking through a high number of leaves (16.8), in the both rooting substrate. This species was followed by *P. mollis*, which formed 13.2 leaves in the substrate of peat + sand, and in the substrate formed by peat + perlite has a few leaves (11.0). *P. cadierei* evolve in the same direction, in peat + sand recorded a high number of leaves in the second substrate, forming only 8.8 leaves. Studying the influence of root system, it appears that *P. cadierei* have the longest roots, in both rooting substrates. *P. mollis*, recorded higher values in peat + sand, but in the peat + perlite, presents low values. *P. spruceana* formed the longer roots (8.2 cm) in peat + perlite.

CONCLUSIONS

1. *Pilea spruceana* rooted fastest (18 days), in the substrate composed of peat + sand. The *P. mollis*, rooted at the latest, within 24 days in peat + perlite.

2. Regarding the influence of rooting substrate on the morphological characters of cuttings, we can say that both the total length of cuttings and the rest of the characters analyzed were favorably affected by both rooting substrates (peat + sand and peat + perlite).

3. Longest root system was formed in peat + sand (*P. cadierei* and *P. mollis*), and *P. spruceana* formed the richest roots in peat + perlite.

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