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COMPARATIVE STUDIES ON THE *PELARGONIUM* GENUS

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Abstract
In our country Pelargonium are well known and cultivated in both towns and villages. Improving technological links to Pelargonium species in greenhouses covered with plastic film is one of the main concerns of the flower growers, which leads to the production of high quality and low production costs for the decoration of gardens and balconies.
As a result of the widening of the variety of Pelargonium it is necessary to constantly study them in comparative crops to see how they express their genetic dowry in the conditions of the areas in which they are grown.
The aim of the present study was to investigate the differences that occur between different Pelargonium varieties, to be able to recommend to producers the variants that satisfy the wishes of the flower lovers. We studied the plant growth in height, the number of shoots on the plant, number of inflorescences per plant, the number of flowers in the inflorescence and leaf number.
For landscaping gardens and balconies it is advisable to cultivate P. peltatum "Ruby Pacruby" and P. peltatum "Rocky Pacrocky" due to the early flowering and the special habitus of the plants.

Keywords: greenhouse, Pelargonium, varieties.

1. INTRODUCTION

Being founded on the principles of three major groups - manufacturers, researchers and the commerce industry, the flower culture industry has a uniqueness character. The most involved in the flowers production are of course the growers; they are responsible for both cultivation and marketing of crops. In order to obtain profitable productions, growers rely on the information received from the academic community, researchers and teachers involved in the development of the scientific base and the dissemination of novelties in the field of flower culture.

Pelargonium is one of the most used genres in the world for decorative flowerpots or pots. The *Pelargonium* genus, with some 800 mostly herbaceous species (Ghanbariyan et al., 2014), is part of the *Geraniaceae* family, along with the *Geranium* genus with whose representatives are often confused. Pelargoniums covered with glandular bristles were originally included in the genus Geranium, but recent data from the literature now refers to them as *Pelargonium* (Iancu, 2017).

Pelargonium is distinguished from the other genera in the family Geraniaceae by the presence of a hypanthium, which consists of an adnate nectar spur with one nectary, as well as a generally zygomorphic floral symmetry (Roschenbleck et al., 2014).

Acording to Aldasoro, 2002, *Geraniaceae* is a botanical family comprising six genera characterized by flower features. Kubitzki in 2007 shows 5 genera in Geraniaceae family - *Hypseocharis*, *Pelargonium*, *Erodium*, *Monsonia and Geranium* and Takhtajan in 2009 shows 4 genera-

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Geranium, *Erodium* (including *California*), *Pelargonium*, *Monsonia* (including *Sarcocaulon*). Species of *Geraniaceae* contained within online publication The Plant List belong to 7 plant genera *California*, *Erodium*, *Geranium*, *Hypseocharis*, *Monsonia*, *Pelargonium* and *Sarcocaulon*.
If given enough light pelargoniums can be grown indoors as houseplants but they are often seen in parks and gardens (Roschenbleck et al., 2014).
Data about *Pelargonium sp*. are also found in the history of modern medicine, 1897, with the help of Steves' Consumption Cure, based on pelargoniums extracts tuberculosis was treated (Umckaloabo, 1996).

2. MATERIALS AND METHODS

The experience was carried out in a private greenhouse, located in Purcăreni, Argeş. It is a monofactorial experience where the variants were:
V1- *Pelargonium peltatum* "Ruby Pacruby";
V2- *Pelargonium peltatum* "Rocky Pacrocky";
V3- *Pelargonium zonale* x *Pelargonium peltatum* "Calliope Dark red";
V4- *Pelargonium peltatum* "Pac Lilac";

Figure 1. Pelargonium peltatum "Ruby Pacruby"

Figure 2. Pelargonium peltatum "Rocky Pacrocky"

V1 – *Pelargonium peltatum* "Ruby Pacruby" (figure 1). This plant shows medium precocity, *P. peltatum* type, with red, semi-double flowers. It is a kind of medium vigor. The response to growth retardant treatments is poor.
V2 - *Pelargonium peltatum* "Rocky Pacrocky" (figure 2). This plant is a *P. peltatum* type with semi-double flowers. It is an early type of medium vigor. The response to growth retardant treatments is medium.
V3 - *Pelargonium zonale* x Pelargonium peltatum "Calliope Dark red" (figure 3). It is an interspecific hybrid *P. zonale* x *P. peltatum*, presenting the best characteristics of both. The flowers

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are semi-double, velvety and dark red and the leaves are glossy green. They bloom all summer, they are heat and drought-resistant plants and they grow best in a 4-hour sunshine location.
V4 - *Pelargonium peltatum* "Pac Lilac" (figure 4). This plant is a *P. peltatum* type with semi-double flowers. It is a kind of medium vigor. The response to growth retardant treatments is poor.

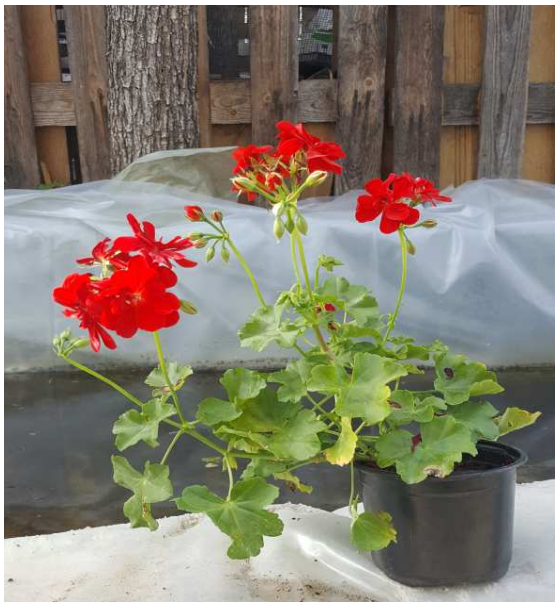

Figure 3. Pelargonium zonale x Pelargonium peltatum "Calliope Dark red"

Figure 4. Pelargonium peltatum "Pac Lilac"

Plants were delivered as seedlings (figure 5).

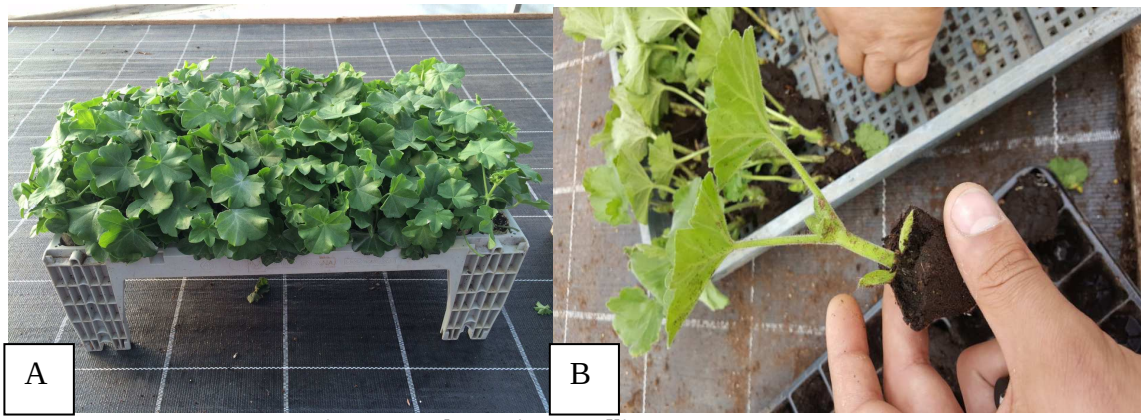

Figure 5. Pelargonium seedlings: A-more, B-one

On October 14, 2017, transplantation was performed in a multiplying greenhouse, in pots of ø 7 filled with blond peat with a pH of 6.5-7.
During the growing period the plants were properly groomed. Transplantation was made on plastic pots of ø 12. The planting and verification of the plants was done once every two days. During winter, the optimum temperature of minimum 18 °C was ensured by greenhouse heating. In the summer, when the temperature was raised in the greenhouse, it was airtight by raising its sides. Spray treatments with fungicides, insecticides and growth inhibitors have been applied:

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02.11.2017 – Switch 10 g/ 9 l water;
06.11.2017 – Alar 85 PS 15 ml/ 9 l water, when the seedlings had 3-4 leaves;
12.11.2017 – Topsin 10 g/9 l water;
18.11.2017 – Teldor 10 g/ 9 l water;
25.11.2017 – Floricur Solo 250 EW 10 g/9 l water;
07.12.2017 – Teldor + Nuprid + Mospilan 10 g/ 9 l water;
20.12.2017 – Topsin + Dithane 10 g/ 9 l water;
27.12.2017 – Alar 85 PS 10 g/ 9 l water;
08.01.2018 – Karate Zeon 2 ml/ 9 l water;
17.01.2018 – Topsin + Reldan 10-15 g/ 9 l water;
03.02.2018 – Mirage 10 ml/ 10 l water;
20.02.2018 – Topsin + Dithane 10 g/ 9 l water;
03.03.2018 – Teldor + Mospilan 10 g/ 9 l water;
20.03.2018 – Dithane 10 g/ 9 l water;
04.04.2018 – Teldor + Nuprid 10 g/ 9 l water;
19.04.2018 – Switch 10 g/ 9 l water;
Biometric measurements have been made on plant growth in height, the number of shoots on the plant, number of inflorescences per plant, the number of flowers in the inflorescence and leaf number.

3. RESULTS AND DISCUSSIONS

It was determined the rate of growth in plant height by performing measurements weekly starting from planting and until May.

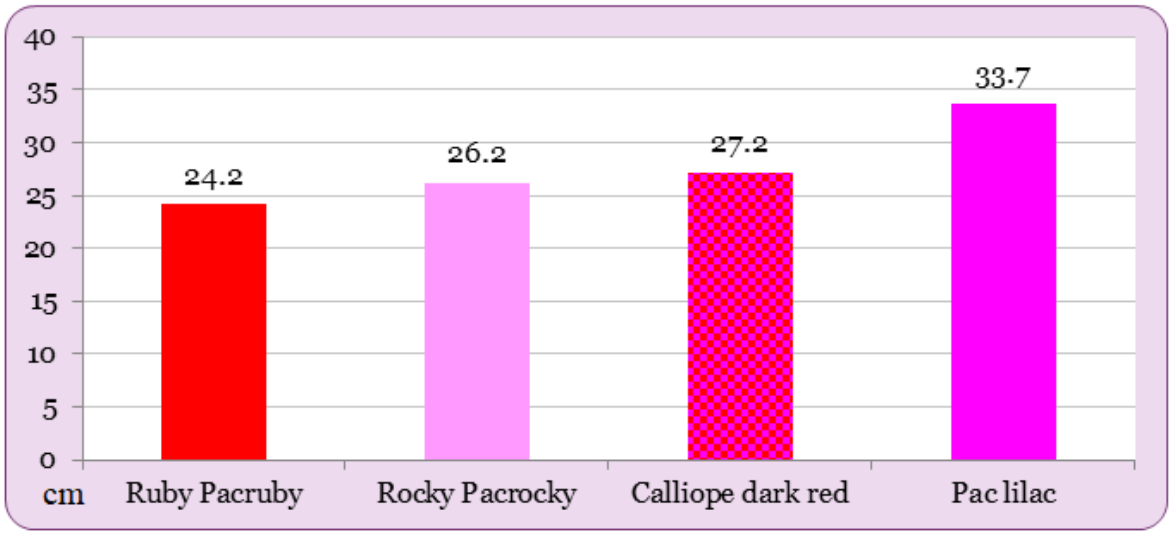

Figure 6. Plant height at the end of the research period (cm)

There are some differences in the **plant height** (figure 6) of the studied varieties. In the treatment with growth retardants *P. peltatum* "Ruby Pacruby" responded best, while *P. peltatum* "Pac lilac" was the weakest.
The highest **number of shoots on the plant** (figure 7) was recorded in *P. peltatum* "Ruby Pacruby" and the lowest in *P. peltatum* "Pac lilac".

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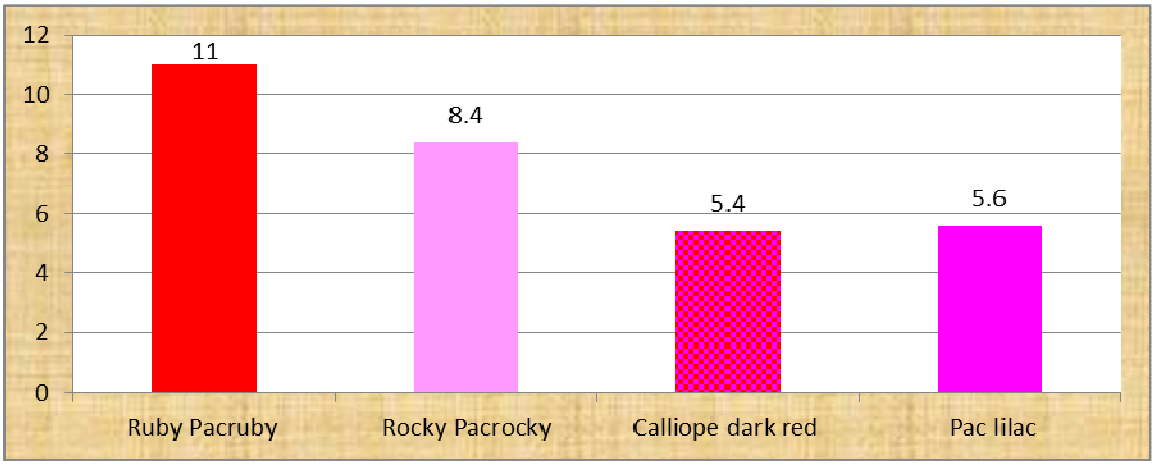

Figure 7. Number of shoots on the plant at the end of the research period

On January 2, 2018 the inflorescences began to appear on the plants. The number of inflorescences per plant differs from one variety to another.

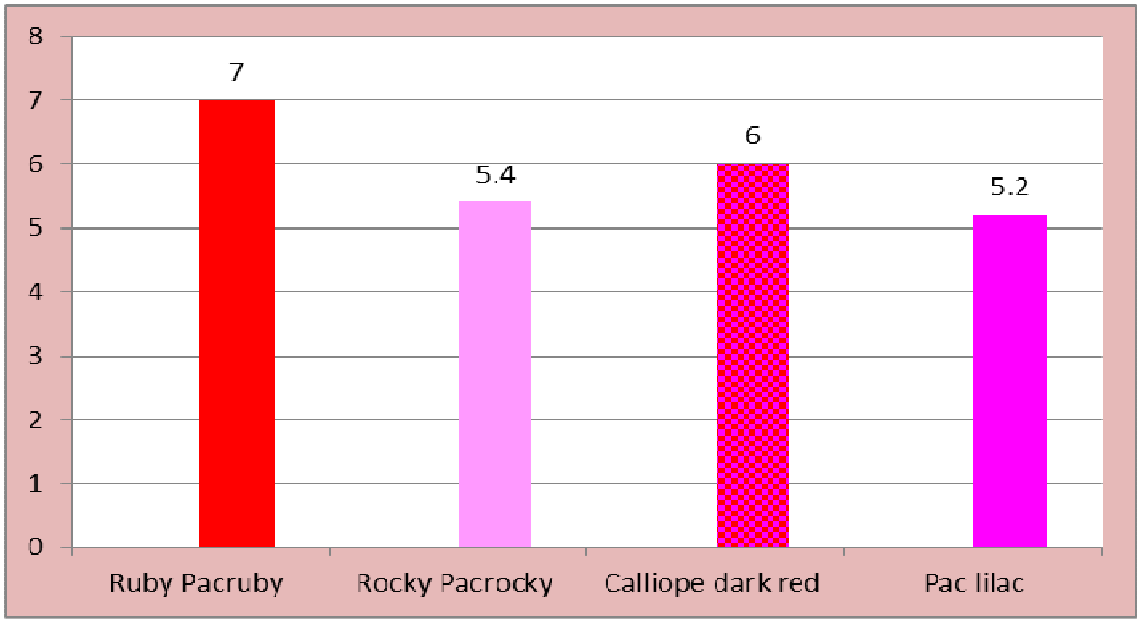

Figure 8. Number of inflorescences per plant at the end of the research period

The lowest number of inflorescences (figure 8) was 5.2 for "Pac lilac" and the highest number of inflorescences per plant had "Ruby Pacruby ".

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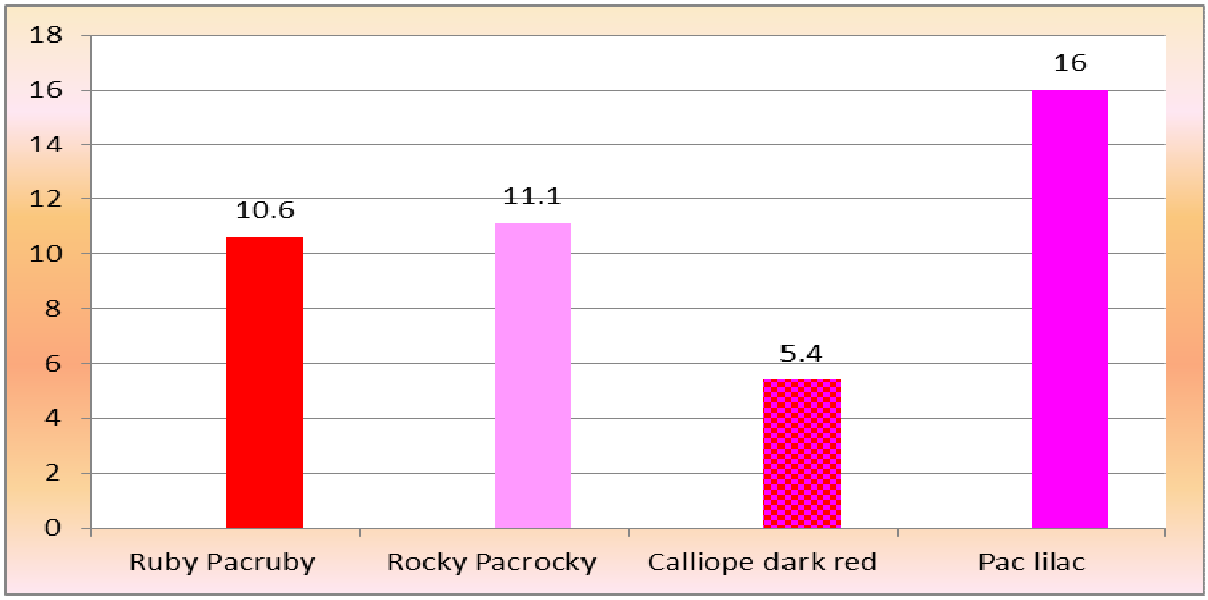

Figure 9. Number of flowers in inflorescences at the end of the research period

The lowest number of flowers in inflorescences (figure 9) was 4.6 for "Calliope dark red" and the highest number of inflorescences per plant had "Pac lilac" with 16 flowers.

The total **number of leaves per plant** (figure 10) was different from one species to another.

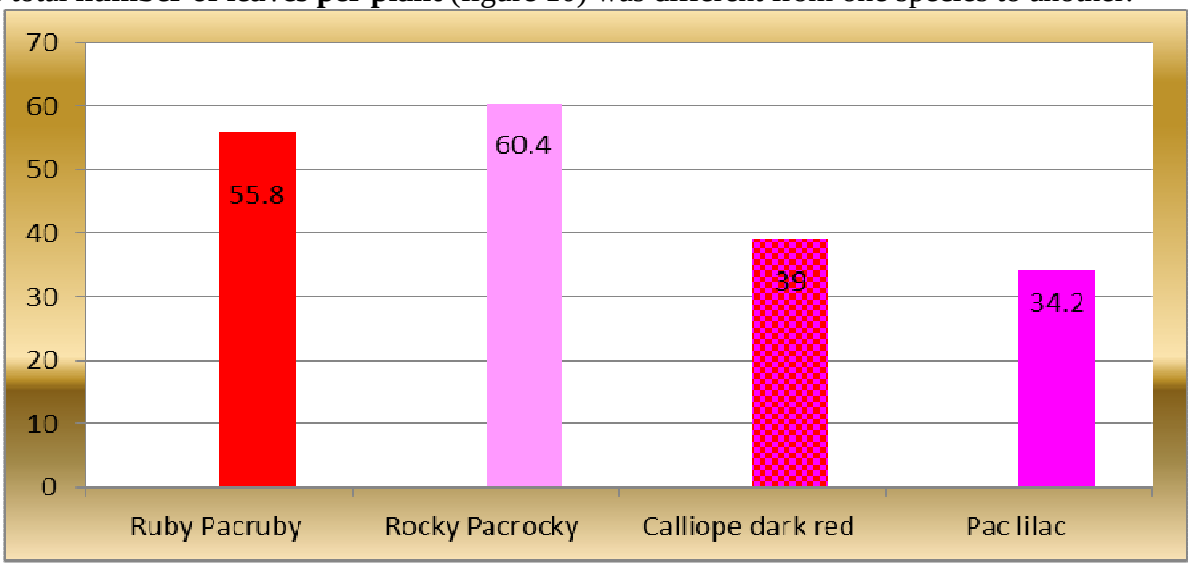

Figure 10. Number of leaves at the end of the research period

The number of leaves ranges from 34.2 leaves to V4-*P. peltatum* "Pac Lilac" and 60.4 leaves at V2-*P. peltatum* "Rocky Pacrocky".

4. CONCLUSIONS

P. peltatum "Ruby Pacruby" and *P. peltatum* "Rocky Pacrocky" recorded the highest values for the number of shoots per plant and the richest foliage.

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P. peltatum "Pac Lilac" is highlighted by the fact that it is early, showing interest for flower lovers in the cold season.
The highest number of inflorescences per plant was observed in *P. peltatum* "Ruby Pacruby" and *P. zonale* x *P. peltatum* "Calliope Dark red".
The largest number of flowers in inflorescence was *P. peltatum* "Pac Lilac" and *P. peltatum* "Rocky Pacrocky".
For landscaping gardens and balconies between the studied variants, we recommend *P. peltatum* "Ruby Pacruby" and *P. peltatum* "Rocky Pacrocky" due to the early flowering and the special habitus of the plants.
P. zonale x *P. peltatum* "Calliope Dark red" had a poor development.

5. REFERENCES

Aldasoro, J.J., Navarro, C., Vargas, P., Saez, L.L., Aedo, C. (2002). California, a new genus of *Geraniaceae* endemic to the southwest of North America. *Anales lard.Bot. Madrid*, 59(2), 209-216.

Ghanbariyan, A. Z. M., Abdusi, V., Danaee, E. (2014). The effect of different vermicompost rates on the some growth characteristics of *Pelargonium hortorum*. *Intl J Farm & Alli Sci*, 3(12), 1225-1228.

Iancu, C.E. (2017). Contribuții la evaluarea farmacognostică și biologică a unor specii din familia *Geraniaceae* [Contributions to the pharmacological and biological evaluation of some species of the *Geraniaceae* family]. PhD thesis. Iași: Gr.T. Popa University of Medicine and Pharmacy.

Kubitzki, K. (2007). Geraniaceae. The Families and Genera of Vascular Plants (vol. IX, Flowering Plants Eudicots). Springer.

Takhtajan, A. (2009). Flowering Plants, second edition. Springer.

Umckaloabo, H. A. (1996). Late vindication of a secret remedy, *Pharm. Historian*, 26, 2–4.

http://www.theplantlist.org/1.1/browse/A/*Geraniaceae*.

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