

ABSTRACT

Keywords: *Rosa*, germplasm, variability, rootstock, cut flowers, ornamental value

The genus *Rosa* L. is part of the Rosaceae family, a large family with approximately 90 genera and over 2500 species of trees, shrubs or herbaceous plants spread throughout the globe.

Originally from the temperate regions of the northern hemisphere (North America, Europe, Asia and the Middle East), the genus *Rosa* presents the greatest diversity of species identified in western China. It is also distributed in warmer areas, such as New Mexico, Iraq, Ethiopia, Bengal and southern China.

The doctoral thesis entitled "***Studies and research on an assortment of roses, used for ornamental purposes***" has as its main objective the development of a complex study of a collection of roses that includes 278 varieties, of which 19 are own, homologated creations.

Results presented in this paper were obtained based on research conducted during 2021-2025. The experimental polygon included the rose collection and the rootstock and grafted plant cultures, organized in the Odaia Manolache locality, Vânători commune, Galați county.

The doctoral thesis contains 200 pages and is structured in two parts, in accordance with the regulations in force, namely the first part - ***Current state of research*** - and the second part - ***Own contributions***. The thesis consists of nine chapters, to which the bibliography is added.

Part I - Current state of research - (50 pages, 25% of the total thesis) includes a chapter based on the bibliographical material used in the scientific documentation necessary for the preparation of the work. The information was systematized according to the issue addressed.

Chapter 1. General considerations regarding the genus *Rosa*

The chapter is structured in 8 subchapters and analyzes aspects regarding the origin and distribution area, taxonomy, biological peculiarities, ecological requirements and economic importance of plants of the genus *Rosa*. Also included are data regarding the classification of roses and their breeding.

Part II – Own contributions – is the most comprehensive and includes xxx chapters, written on 150 pages, which represents 75% of the total volume of the thesis.

Chapter 2 is structured in xxx subchapters in which clarifications are made regarding the purpose and objectives of the activities carried out, as well as the materials and research methodologies specific to each experience.

Chapter 3 presents a brief study of the natural setting and the administrative-organizational conditions specific to the location of the rose collection where the research activity was carried out (Odaia Manolache locality, Vânători commune, Galați county).

Chapter 4 is intended for the inventory and description of the rose germplasm fund from Vânători and includes two subchapters. The first subchapter, and the most extensive, presents in the form of summary tables the 278 cultivars from the collection, with specifications regarding the height and diameter of the bush, the color of the flowers, the number of petals/flower, the intensity of the flower fragrance and the recommendations for use. The 19 own creation varieties, approved in the period 2018-2025, are described separately. All the material is accompanied by plates with images of the cultivars. In the second subchapter, a study was conducted on both the share occupied by the main classes of varieties, as well as their classification according to the mode of use (park, containers/pots, cut flowers) and according to several more important morphological characters (plant height, flower color and fragrance). The statistics also included the author's own creations, distributed by classes and categories of characters, according to the description made by the author.

Chapter 5 includes a study of the variability of the main ornamental characters of some of the own rose cultivars. The first subchapter analyzed the phenotypic variability of some quantitative characters of interest in the improvement and conservation of the germplasm fund (plant height, floral stem length, number of shoots per plant, number of flowers per plant, number of flowers per stem, height and diameter of flowers, number of petals in the flower). The study material consisted of three cultivars from the *Thea hybrida* class ('Baladin', 'Adal', 'Gossip', 'Hot Ring') and one from the *Floribunda* class ('Blue Dance'). In the second subchapter, a comparative analysis of the coefficients of variability (cv%) obtained in the first subchapter was made, highlighting the differences between the genotypes and the characters analyzed. As a common feature for all the analyzed varieties, it was possible to observe low or mostly low variability of plant height and floral stem length, or very low variability of number of petals/flower, height of floral bud and diameter of open flower. Number of shoots/plant fell into the category of characters with low to medium variability. In contrast, number of flowers/plant and number of flowers/stem were the characters with the highest variability.

Chapter 6 analyzes results regarding the influence of the rootstock on the morphological characters of rose varieties. The content of the chapter was structured in two subchapters that analyze the influence of the rootstock on the morpho-decorative characteristics of some rose varieties from the *Thea hybrida* class, as well as the particularities of the flowers and flowering of grafted roses. The experiments used as biological material four rose varieties recommended for cut flowers ('Explorer', 'White Chocolate', 'Nina' and 'Catrina') and three types of rootstock: *Rosa laxa* and two biotypes of *Rosa canina* 'Inermis' ("de Buzău" and "de Brașov"). In the first subchapter, grafted roses from the 12 variants were analyzed, in terms of some characters of the vegetative organs (number, length and diameter of shoots, length of internodes, number of leaves/shoot, number of flowers/plant, length of floral bud, diameter of open flower and

number of petals/flower). Regarding the number of shoots/plant, it was found that it was one of the characters that varied very little, with small, insignificant differences predominating compared to the average of the experience. Neither did the separate influence of the experimental factors (rootstock and graft) highlight statistically assured differences. In the cumulative influence of the factors on the diameter of the shoots, the differences were insignificant, except for the values above the control of the 'White Chocolate' variety grafted on *R. laxa* and *Rosa canina* 'Inermis' "de Braşov" rootstock, and with values below the control and significantly negative differences of the 'Catrina' variety. Among the factors, this character was influenced only by the graft. Shoot length was the character strongly influenced not only by the common interaction graft/rootstock, but also by each of these factors separately. In all graft – rootstock combinations, the differences from the average of the experiment were statistically assured. Internode length had smaller variations between variants, the differences from the control, resulting from the interaction of the rootstock – graft, being insignificant or at most distinctly significant. Among the experimental factors, the graft was the one that made the difference (negative for 'Explorer', positive for 'White Chocolate'). Also, the number of leaves/plant detached the variants through large differences, the increased influence being given by the varieties 'Explorer' and 'White Chocolate' and by the rootstock *R. laxa*.

In the second subchapter, the influence of the scion-rootstock interaction on the particularities of the flowers and the flowering of roses was analyzed. The cumulative interaction of the scion and the rootstock did not have a major influence on the number of flowers/plant, on the other hand, the influence was evident in the case of the variants that were grafted with the varieties 'Catrina' (positive effect) and 'Nina' (negative effect). The diameter of the flowers was noted as a character determined mainly by the scion. The length of the floral bud was positively influenced by the rootstock *R. laxa* and *R. canina* 'Inermis' de Buzău and by the grafts from 'Explorer' and 'White Chocolate'. The major influence on the number of petals/flower was had by the scion and insignificantly by the rootstock.

Chapter 7 presents the results regarding the utilization of roses as cut flowers. The first subchapter analyzes the influence of culture conditions on the content of photosynthetic pigments in some varieties of roses grown in the sunroom for utilization as cut flowers. Four varieties from the *Thea hybrida* group were used, with flowers of different colors: 'Salma' – white with a pink center; 'Sunsilk' – yellow, 'Nina' – orange-coral; 'Explorer' – dark red. The determinations were made before the flowers were harvested, from leaves on stems with flowers in three stages of flower opening: I - fully open bud; II – open flower; III - three days after phase II. By comparing the results obtained, it was highlighted that all varieties presented the highest content of photosynthetic pigments in samples harvested in the flowering phase, and the lowest content in stage III (after flowering). In all varieties and in all harvesting phases, the values of chlorophyll a content were much higher compared to the values of chlorophyll b. Regarding the ratios chlorophyll a / chlorophyll b and chlorophyll pigments / carotenoid pigments, the results show levels slightly lower than the theoretical limits, which suggests the manifestation of physiological stress, probably caused by abiotic factors in the solarium for plants.

The second subchapter of this chapter aimed to establish the effect of different preservation solutions on the longevity in vase of cut flowers from the four varieties analyzed in the previous subchapter ('Salma', 'Sunsilk', 'Nina' and 'Explorer'). Two commercial preservatives (*FloraLife Oasis* and *FloraLife Express Universal*), 0.4% fructose solution and distilled water as a control were used. The results obtained were analyzed both for each variety, the data being reported to the control (distilled water), and for all 16 variants, as a bifactorial experiment (preservation solution and variety). Of the four varieties studied, 'Explorer' was the longest-lived as a cut flower. Even kept in water, it could be preserved for 19 days, and in commercial solutions 21 days. In the fructose solution, less favorable to the other varieties, 'Explorer' could be preserved for 17 days.

The appearance of the flowers after 5 days of storage was very good, with evenly opened buds and no signs of wilting or bending of the floral peduncle. And after 9 days the flowers maintained their beautiful flower appearance, with no tendency to discolor or deform, especially in distilled water (M) and in commercial preservatives (V₁ and V₂). Compared to the average of the experience, of 14.8 days of storage, the varieties that exceeded this value with statistically assured differences were 'Explorer' and 'Salma'. In all variants, 'Explorer' exceeded the control by approx. 15 -42%, the differences being very significantly positive. 'Salma' exceeded the control only in variants M, V₁ and V₂, while in the sucrose solution (V₃) it was below the control value by 32.4%.

The 'Nina' variety recorded negative differences compared to the control in all types of solutions used; except for variant V₁, with insignificant differences, the rest of the variants were framed with very significantly negative differences. The separate influence of the storage solution indicated the efficiency of each of them, regardless of the variety in which it was used, the most effective were the commercial solutions, primarily *FloraLife Oasis* (V₁), with an average storage duration of 17.2 days. *FloraLife Express Universal* (V₂) also had similar values, with an average storage duration of 15.7 days. The results obtained in the case of using the fructose solution confirm the data from the specialized literature that do not recommend the exclusive use of sugars in the storage water, taking into account the fact that a high sugar content stimulates microbial activity.

Chapter 8 summarizes the main conclusions resulting from the research conducted. A series of recommendations on the propagation and improvement of roses as well as their use as cut flowers were also mentioned.

All documentary materials from the specialized literature used in the thesis are included in the list of consulted bibliographic materials (244 bibliographic references).