ABSTRACT

Key words: ornamental onion, bioregulators, crop technology, cut flowers, cycocel, gibberelic acid, *Allium* 'Purple Rain', *Allium giganteum* Regel., *Allium karataviense* 'Ivory Queen', *Allium moly* L., *Allium saxatile* M. Bieb.

The genus *Allium* is one of the largest genera of plants, in therms of the existing species in the worldwide spontaneous flora, of the morpho-anatomical and physiological diversity characters and as well as an echological adaptation. Originating from the regions of steppe of Central and Western Asia, onion is one of the oldes plants taken into the crop. The species of the genus *Allium*, are known and grown since ancient, due to their medicinal and nutritive qualities.

The importance of the genus *Allium*, is not found only in its nutritive and medicinal qualities, but also in the aesthetic characteristics. In 1841, Jane Loudon, in the publication *Ladies Flower Garden,*describes the genus *Allium* of being the kind of plants, with bulbs, witch produces the most beautiful and varied flower plants. They are also described as perennial plants,very chairs witch did not required a special attention, but producing abundant flowers of a rare beauty and variety.

As a garden plant, the ornamental onion fits, thru the amount of species and cultivars, to any type of use. It can decorate in any landscape style, thru the diversity of colors and shapes, of the inflorescences and foliage. From the romantic panicles, in translucent shades, up to the geometrical spherical umbels in shades of dramatic purple, the species and cultivars of the genus *Allium*, has the largest range of flowers stem height, of the foliage or inflorescences.

These plants can be present in the garden all over the year, thru many species witch florish in spring, summer or autumn. They are characterised also, by a remarkably resistance at deseases.

And because they have a true arsenal of aesthetic resources, could not be absent of the floral design area. As cut flowers, they can delight not only by the shape and colour, but they also give to the florist a full satisfaction thrue the longevity they can prove.

In Romania, the ornamental onion is for the moment, less known and used, in the landscape design compositions but, from an ecological point of view, it folds very well on the natural conditions. Many species of the genus *Allium,* that grow spontaneously within the territory of the country, own important ornamental qualities (*Allium paniculatum* L., *Allium ursinum* L., *Allium saxatile* M. Bieb.) and some of them find itself in actual catalogs of the ornamental plants. In this respect, there have been conducted numerous studies for including in the ornamental plants crop of some *Allium* species with ornamental value.

Draghia ş.a. (2010) have been conducted some researches regarding to some spontaneous flora species from the north-east of Romania, like *Allium ursinum* L., with the aim to evaluate the capability of adaptation and the possibility of including them in the ornamental plants crop.

The present work proposes itself an in-depth study of a wide of species and cultivars from the genus *Allium*, under the aspect of technological features, in order to encourage the cultivation of such plants, in the areas of the north-east of Romania. The investigations aimed to study some technological aspects that may be introduced in the process of cultivation and exploitation of the ornamental species of the genus *Allium*.

The assortments taken into the study include a number of five species and cultivars, which were selected under the decorative appearance, morphologic, and ecological traits. It includes some of the most present species and cultivars on the ornamental plant market, which can be suitable to different ways of using both in landscape architecture and floral design (*Allium* 'Purple Rain', *Allium giganteum* Regel., *Allium karataviense* 'Ivory Queen', *Allium moly* L.). It also has been selected a taxa from the existing flora of Romania, which is in the progress of employment of a place in the ornamental plant crop (*Allium saxatile* M.Bieb).

Thus, the main purpose of the PhD. thesis with the title **"*Studies regarding the biology, ecology and crop technology for some ornamental Allium taxa*"** is the deep study concerning the possibility to incuding of these species in the existing ornamental plant assortment used in the landscape architecture from our country, to optimize the technology of cultivation and the kind of exploitation. The optimal study of these species and cultivars of ornamental onion and the fixing of optimal crop technology, represets the main objective of these thesis.

The research carried out and the results shown, have ment to promote this ornamental species of the genus *Allium* and the recommendation of their use, both as garden plants and cut flowers. The complexity of the experiences, is based on the way of the plants react to the interaction of the experimental factors.

In order to optimize the technology of culture and keeping of the cut flowers, have been conducted researches which affected the following major objesctives:

- The establishment of growth bioregulators influence of the morphological, physiological and ornamental characters of the *Allium* species and cultivars;
- The establishment of the growth bioregulators in the keeping process of the cut flowers of the ornamnetal *Alliums;*
- Determination of the influence of the planting times, over the ornamental characters of the *Allium* species and cultivars;
- Determination of the influence of the mother bulb size, over the ornamental characters of the *Allium* species and cultivars.

In order to obtein more concludent results, regarding the optimising the crop technology and the possibility of cultivation of these *Allium* species/cultivars, there were

used, as working methods: biometrical, phenological analysis, laboratory analysis for the physiological and biochemical, statistical data processing and interpretation

The researches were structured in three diffrent organised experiments, conducted in the field of the Floriculture Discipline, of the University of Agriculture Sciences and Veterinary Medicine ”Ion Ionescu de la Brad” from Iași.

The PhD thesis is structured in two parts, witch comprise in total a number of nine chapters.

The first part – study of documentation, contains three chapters and hold a volume by 32,5% from the entire thesis. Chapter I, talks about historical aspects on the crop of the *Allium* genus, the nutritional importance of it like vegetables and spices, the importance for the farmaceutical industry and for medicine, and as well as the importance as ornamental plants.

The chapter II comprises aspects regarding the biology of the ornamental species and cultivars, of the genus *Allium*, from a taxonomical aproach, interspecific and intraspecific diversity, ecological elemets and the interaction with the environmental factors and the morphological description.

In the chapter III are presented some aspects regarding the ornamental *Allium* species and cultivars crop technology and the possibilities of using them like garden plants and cut flowers.

The second part is structured in six chapters, holding 76,5% by the by the entire volume of the thesis. Chapter IV presents detailed, the aim and the objesctives of the researches, the method of investigation, the material used and the organisation in the field and laboratory of the experiments.

The general researches methods were represented by the documentary and field study, the experiment, the observation, the comparison, analisys and the synthesis. The main research method was the experiment, the entire research process being structured in three differents experiments. Each one of these, having its own experimental factors and work methods. As working methods, were used biometry techniques, physiologycal and biochemical analisys (determination of chlorophyll and carotenoids pigmets, the determination of dry weight and the content of soluble carbohydrate) and the statistical analysis of obteined data.

The chapter V describes the organisational place of the experiments deployment, by the general presentation of the horticultural farm, the analysis of the natural conditions, the climatic conditions and of the existing vegetation.

The chapter VI comprises the obteined results regarding the influence of the bioregulators treatemets, over the growing and development of the ornamental onion studied cultivars. The reserch regarding the bioregulators influence, focussed on both determination of their action on the nost important morpho-decorative characters and as well as on the phenophases succesion, for hightlighting the decorating period of the studied species and cultivars. Also, there were done physiological and biochemical analysis for the determination the treatements influence over the content of asimilating

pigments and soluble catbohydrates. The GA_3 treatements increases the vegetative growings of leaves for *Allium* 'Purple Rain', *Allium saxatile, Allium karataviense* ,'Ivory Queen'. It can be recommended the aplication of GA_3, to promote the flower stem growing and the diameter of the inflorescence of *Allium* 'Purple Rain', *Allium giganteum* of *Allium saxatile* . The bulb production at *Allium* 'Purple Rain', *Allium giganteum, Allium moly, Allium karataviense* "Ivory Queen" can be increased with GA_3 treatements.

The chapter VII treats the way of the morpho-decorative characters , can be affected by the different bulb planting times, by the different sizes of those at the planting time and the plants answer to the interaction of the experimental factors. In this experiment, it was studied the ornamnetal onion culttivar *Allium* 'Purple Rain'. This is a quite new cultivar on the ornamental plants market, but presents very important morpho-decorative characters and it can be used in many ways, like garden plant or like cut flower. The summer and autumn planting times, leades to obtain the best results regarding to the morpho-decorative characters.

The chapter VIII describes the obteined results from the experiment regarding the influence of the bioregulators over the longevity of the cut flowers and the way by continue the development of the inflorescences after harvesting.

In this study regarding the resistance of the cut flowers, there were selected from the studied assortment, some species and cultivars witch fits the best of this way of use, like lenght and resistance of the flower stem, dimension and aspect of the inflorescence. Thus, there were studied like cut flowers, *Allium* 'Purple Rain', *Allium moly* and *Allium giganteum*. From all studied ornamental onion taxa, there can be succesfull used like cut flowers *Allium* 'Purple Rain', *Allium giganteum* and *Allium moly,* not only like morfo-decorative characters but also like longevity after harvesting.

The chapter IX, presents the conclusions witch were extracted after the researches, during the three experimental years. This chapter comprises, also, the recommendations regarding the efficiency of the aplication of some technologycal methods, wich were studied.

The PhD thesis ends with the bibliography, witch comprises the entire list of sourses and documentary materials consulted in the process of elaborating the reserches.