

LILIUM JANKAE A. KERN., SPECIE OF SPONTANEOUS FLORA WITH ORNAMENTAL VALUE

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Abstract

In situ conservation of the species of the Romanian flora which are of interest is a method which should be applied to all species from an area where they are in danger of disappearing. The paper which is a part of a more ample study has as main purpose the isolation of some species with ornamental value from the spontaneous flora and their protection by the introducing them in the architectural landscape. We determined and isolated the *Lilium jankae* A. Kern specie, from the spontaneous flora, and then we found the ways to introduce it in the *in vitro* growth and conservation, in order to improve the collection of ornamental plants with new species from the Liliaceae family, valuable ornamental species. We also followed the protection of the specie which has the status of a vulnerable taxon (VU), by presenting a classic culture: the period of propagation, of plantation, the soil and climate conditions that are necessary to the culture in protected spaces, the problems rose at its introduction into another areal than the original one. The acclimatization of the new formed bulbs takes place in percentage of 100, the rate of propagation of *Lilium Jankae* A. Kern specie; raises until 80 – 90%, higher on the layer of peat and treatment of stimulating rooting powders with auxine, the neogormed bulbs are superior from the perspective of the structure. We recommend the conservation of *Lilium Jankae* A. Kern specie thought *in vivo* culture in order to protect the specie and for improving the ornamental plants' collections

Key words: vulnerable specie (VU), *Lilium Jankae* A. Kern, red list, bulbs, *in vivo*, scales, propagation, bulbification

INTRODUCTION

In situ conservation of the species from Romania's flora which are of interest is a method which must be applied to all species from an area where they are in danger of disappearing. The paper which is a part of a more ample study has as a main purpose the isolation of some species with ornamental value from the spontaneous flora and their protection by introducing them in the architectural landscape. The introduction of those species in culture represents according to Cristea *et al* 1996, also a way of protecting the environment, action which is important for our country and also for the education of our younger generation of students. The association of horticultural plants – cultivated with species from the spontaneous flora, into a garden can take us to obtaining in all seasons, of architectural landscape, with special character, which can perfectly mix the elements of the rustic character with the noble ones, ensuring the eye of the observer with a new image. (Roger and Mortyn, 1992). Due to the pollution and to the imprudent intervention of the human in nature, a great part of the spontaneous species from Romania's Flora has disappeared. But not only the species from the Romanian Flora are in danger, but also lots of other regions on the globe are in the situation in which some of the species are in danger of disappearing, while others become more and more rare, and this way the biodiversity is being threatened, so that human intervention for its protection is necessary. The introduction in culture of spontaneous species with ornamental value according to Bonnechere and De Bruyn 1998 is generally a part of the culture history of men kind, and especially of a nation. In the gardens of the

ancient royal palaces, the presence of ‘*sovaje*’, ‘*vivace*’ or wild plants, as we say, with special value and remarkable colored aspect, are written as essential elements of architectural landscape (Bajard and Bencini, 1996; Wharton 1995). In ancient Egypt the arte of gardening and the presence of wild varieties of plants, brought from all over the world, has made so that the art of gardening on this part of the globe be remarkable and immortal in time (Gallert, 1998).

Even from the middle of the last century, in our country researchers were preoccupied by looking at the vegetal carpet and by its improvement with species from the spontaneous flora, mainly species with ornamental value, rare species or in danger of disappearing species (Borza and Boşcaiu, 1965), which found themselves in natural reservations, but which in fact were all over the country (Mohan et al.1993). So, more later it was carefully followed the association of plants from different mountain or under mountain areas of Romania, their isolation and their description under all aspects (Coldea, 1991). The up datation of the ‘red list’ for Romania (Dihoru and Negrean 2009), which includes the species which are in danger on the territory of the country and the initiation of studies for their preservation (Boşcaiu et al., 1994), represents the basis from which we started our studies, but we also used some programs of preservation and protection, of their culture in special arranged spaces, of creation of some *in vitro* collections for the purpose of protecting and repopulating the areas where they originate or of other architectural spaces. Retezat Mountains are the cradle of some protected species due to their rarity, with expressive flowers, eradicated in other parts of the globe, from different causes, but especially due to its imprudent picking (because of the beauty of its flower), here being framed perfectly Lilia of Janca, after its common name (according to Tătaru, 1993)), *Lilium jankae*, a relative of the Dacyc lily, with big flowers, sulphurous, which also migrated in the Balcanic Peninsula, being typical to Bihor and Retezat Mountains (Opriş, 1990).

MATERIAL AND METHODS

In a first step, we followed *in vitro* propagation protocol at *Lilium Jankae* A. Kern specie, the culture under layer ideal for the formation of the new bulbs, for their propagation, and in another step we will follow the capacity of the material propagated in the nursery, to adapt to another area then the one where the specie originates. *Taxonomic Lilium jankae* A. Kern is a plant with long-lived stem of 30 – 120 cm, with “lancewidth” and thick leaves, with papulae on the borders and on the nervations. In soil, it presents a yellowish bulb formed of many scales (Fig.1). The flowers of sulphurous colour have recurved petals, with orange or brick colour anteres (fig. 2). The most common form is *Lilium linearifolium* Sugar.

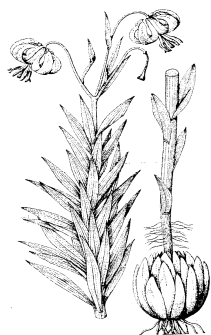


Fig. 1 *Lilium jankae* A. Kern (the plant with flower and bulb)



Fig. 2 *Lilium jankae*, A. Kern (the first stage of flowering)

From the chronological point of view it is sporadic in Occidental and Meridional Carpathians: in the districts of Alba, Braşov, Hunedoara, Covasna, Bihor and Vâlcea (*Flora RPR, vol. XI*, 1966). The specie's area as a geoelement is a European endemic: **Bu Ju Rm** (Bulgaria, Yugoslavia, and Romania), a Dacian – Balcan element. From the point of view of the habitat, it is a helophyte plant, at the mountain and under mountain floor, on a limestone under layer, from 500 to 1700 m: between Abrud and Roşia Montană, in Bihor Mountains, Cozia at 1100 m, Vlădeasa, Piule Massif etc. are just some points marked on the map (see Fig. 3). It is important from the scientific point of view, it is very decorative, a source for obtaining new varieties in the culture of flowers. Janca's Lilia is also a medicinal plant with a special value (*Dihoru and Negrean, 2009*).

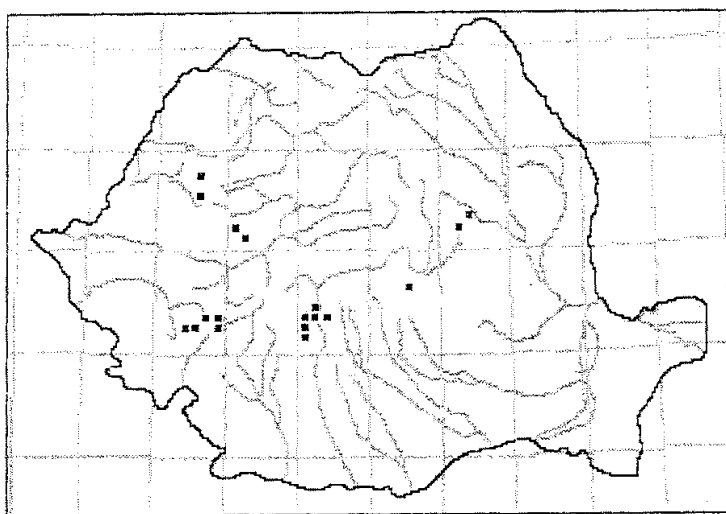


Fig. 3 The area of propagation for the *Lilium jankae* A. Kern specie (According to Dihoru and Negrean 2009)

RESULTS AND DISCUSSION

The technology of introducing in culture has had a few *stages*: the isolation of the plant and the establishment of the area; the gathering of the propagation material, healthy and well developed bulbs, with perfect formed scales; the detachment of the scales is preferable to be made with a part of a disc in order for the multiplication to succeed; planting can be made in different mixtures of soil; the maintenance must be done in conditions of protection during the cold season; the planting in nursery must be done for the maturation; the planting takes place after three years. The development and the order of the stages of the *Lilium Jankae* A. Kern specie in the propagation protocol is shown in table 1. Following the observations column, we can see the essential conditions for the success of each stage. This way, at its gathering, the bulb must be selected after its size, its full maturation and its perfect state of health, the distance for planting the scales in little wood boxes, is of about 1 – 1,5 cm. At the storage of the planted material it must be kept in mind that in that space the temperature must not pass over or under 0°C, this is why there should be used cold and buried nursery. In order to flower, the lily bulbs need negative temperatures, but the juvenile material must be protected of these temperatures, in the stage of their plantation in the nursery, after 3 years the vernalization has a natural development, and the organization of the planting must ensure the development of the periodical observations. In the last

stage, the bulb is planting after about 3 years, in order to ensure the maturation and the flower of the specie. In this last stage, the depth of plantation of the new formed bulb is very important, the bigger the diameter, the deeper the planting.

Table 1

The stages of development of the propagation protocol and the insertion in culture of the *Lilium Jankae* A Kern specie

No. of stages	The characteristic of the developing stages	OBSERVATIONS
1.	<i>The gathering of material for propagation</i>	Mature bulb with yellowish healthy colour
2.	<i>The detachment of the scales from the chosen bulb</i>	It is preferable with a part of a disc
3.	<i>The plantation in little wood boxes in different mixtures (see table 2)</i>	The little boxes should have the length of 60 – 70 cm, and the height of 12-15cm,
4.	<i>The storage of the little boxes with planted material</i>	It is preferable to store them over winter in cold buried nursery (under 0°C)
5.	<i>The plantation in nursery for the maturation of the material</i>	In a well established area, in order to facilitate the observations concerning the evolution of the material <i>in vivo</i> are being made periodically
6	<i>The plantation at the final place (after 3 – 4 years), for the acclimatization and the maturation of the obtained material</i>	It is the time which ensures the flowering, keeping in mind the planting depth, which is in reverse order to the size of the bulb

We wish to present more detailed the soil conditions in order for the culture to succeed, the propagation rate, the time or the period of formation of minibulbs and the viability percentage after the cold season, all the aspects according to the composition of the mixture of used soil. The variants on which the plantation was made, the results and their interpretation are presented in Table 2. Among the variants we remind the using of treatment with rooting powder at the base of the scale in order to stimulate it to form vegetal buds and and to stimulate the rooting system at the level of the disc.

Table 2.

Lilium jankae A. Kern scales' evolution on different mixtures of soil (after 6 – 7 months from their planting in little boxes)

No. Crt.	The mixture of the propagation under layer	Propagation and viability rate (%)	The period of maturity for bulbs (days)	Observations
1.	Peat	70	180	- acceptable evolution
2.	Easy soil	62	170	- acceptable evolution
3.	50% peat + 50% easy soil	80	180	- good evolution
4.	75% peat + 25% easy soil	100	170	- very good evolution
5.	50% peat + 50% perlite	41	200	- the weakest evolution
6.	Peat + treatment with rooting powder with auxine	100	120	- very good evolution and shorter time of maturation

Each variant was made up of 100 scales which have facilitated the estimation of the averages. The evolution of the propagation material has depended on the presence in the medium of the peat in mixture with soil in equal parts (Var. 4) and the treatment applied at the base of the disc, with rooting powder with auxine, which has stimulated the development of the vegetal buds, and has shortened the maturation period of the new

formed bulbs. The application of the rooting powder, of the material for the propagation of some species of flowers is frequently and successfully used in the horticulture practice. The propagation rate and the viability of the scales after their planting (of about 6-7 months) is from 40% to 100%. The added perlite in under layer did not stimulate the propagation, the percentage being of only 41%, it looks like added in medium it cannot ensure the feeding of the explant for so many months. The peat associated with the treatment with rooting powder with auxine (6) and the mixture of 75% peat + 25% soil have generated the maximum percentage of 100% of propagation and viability. The values concerning the propagation rate and the viability of the material after this period are presented in the graphically representation from fig. 4.

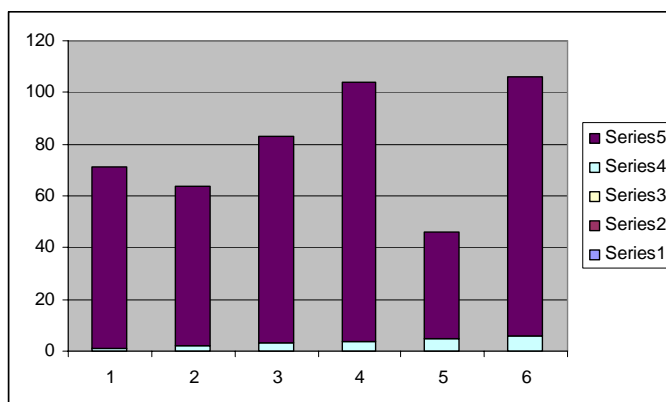


Fig. 4. The propagation and viability rate of the vegetal material of Lilium jankae A. Kern (after months)

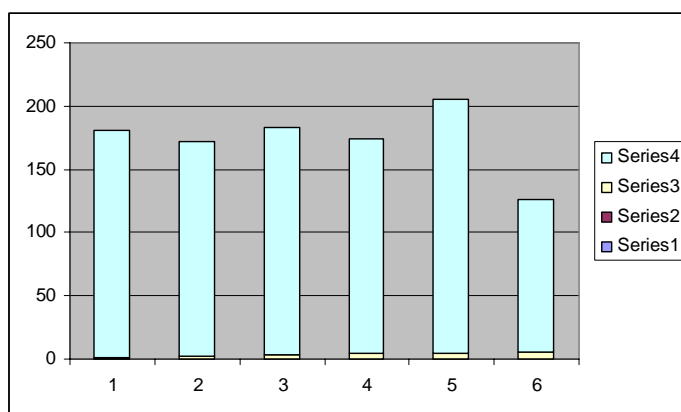


Fig. 5. The period of maturity for bulbs (in days)

The period of maturation for bulbs, expressed in days at the six variants is between 120 and 200 days. In this case too the variant to which the bulbs are maturing faster is the variant with peat + treatment with rooting powder in about 3 months (Fig. 5). The other variants need for the maturation of the bulbs over 4 – months and even longer, in their case, the variant with 75% peat + 25% soil needs for maturation only 170 days, the rest of the variants need a plus of time for the maturation of the bulbs.

The acclimatization of the plants does not raise any problems, taking place in some cases in percentage of 100%, so, recommending the storage of the species of spontaneous flora,

with decorative value also by *in vivo* propagation, and also the planting of the material aroused in a new architectural and landscape, remaining us to follow, in our next studies, the capacity of accommodation of neobulbs in the conditions of the new space.

CONCLUSIONS

- *Lilium Jankae* A. Kern specie can be propagated *in vivo* and from bulbs, by separating the scales which make up the bulb, material proved to be favorable according to the nature of the plantation under layer;
- The stages concerning the propagation and acclimatization protocol of the material obtained from the scales are six, each with its own characteristic of development (table 1);
- *In vivo propagation and viability rate* is of 100% on variants **4** – with 75% peat + 25% earth, and on **6** – with peat and root treatment with auxine;
- In perlite in mixture with peat (**5**) the scales have a weak evolution, giving the smallest percentage of regeneration (42%), on the other variants the evolution is good (**4**) or acceptable (**1,2**);
- After plantation the material needs a period of vernalization, but not of temperatures which go below minus, but between 0 – 4°C. The real vernalization is going to be ensured at the plantation in nursery;
- *The period of maturity* of the new bulbs is between 200 – 120 days, the shortest is on the variant with treatment for the stimulation of the system to root (**6** – peat + treatment with auxine powder for rooting);

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