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SUCCULENT PLANTS IN THE COLLECTION OF THE INSTITUTE OF BOTANY AND PHYTOINTRODUCTION IN ALMATY

Abstract. The article “Succulent plants in the collection of the Institute of Botany and Phytointroduction of Almaty” presents the results of the introduction work with the succulents of our collection. Promising and commercially profitable plants from succulents were chosen, since they are not whimsical in care, and as a result of evolution, they easily adapt to a more or less arid climate and can be widely used. In this publication, we talked about the birth of succulents, interesting for phytodesign.

Keywords: succulent, introduction, closed ground, collection, phytodesign.

An important step in the introduction of greenery plants is the study of individual taxonomic groups (genera, species), which allows for introduction on the basis of a careful and comprehensive account of their biological, morphological and environmental features. As a result, it is possible to predict the possibility of introducing certain species into the culture and to enrich the collection gene pool of greenhouse.

Purpose: The introduction of succulent plants in the collection of the Institute of Botany and Phytointroduction.

The collection of succulents at the Institute of Botany and Phytointroduction has a long history beginning in 1932. Most of the plants were grown from seeds and live plants coming from the gardens of Germany, the Czech Republic, Brazil and other countries. Some of the plants were obtained by exchange from flower growers. The most active period of increasing the collection was from 1972 to 1982. Thanks to the peculiar structure of the plant, they are not comparable with any other group. They can exist in extreme conditions (for example, with a lack of organic matter in the soil, water in the soil and air, as well as temperature differences). As a result, the evolution of the morphological structure of succulent plants can adapt to a more or less arid climate. The distribution area of succulent plants: deserts and semi-deserts of South Africa, Mexico, Central America, mountainous areas of South America [1-3].

Succulent plants are divided, depending on the method of accumulation of water, leaf, stem and root. In the collection of the greenhouse of the Institute of Botany and Phytointroduction, there are all three varieties of succulents. Among them there are also “hard-leaved” and “herbaceous” ones.

According to the results of the introduction observations, a group of 125 species of succulents was collected and taxonomic, consisting of 47 genera belonging to 17 genus: *Agavaceae* – 17 *species, Aloaceae* – 16*, Amaryllidaceae* – 9*, Apocynaceae* – 1*, Aroliaceae* – 1*, Asclepiadaceae* – 6*, Asparagaceae* – 4*, Asteraceae* – 5*, Commelinaceae* – 2*, Crassulaceae* – 43*, Cucurbitaceae* – 1*, Draceanaceae* – 3*, Euphorbiaceae* – 12*, Hyacinthaceae* – 1*, Portulacaceae* – 2*, Urticaceae* – 1*, Vitaceae* – 1.

The most numerous genus: *Crassulaceae, including 43 species and Agavaceae – 19* (table).

For many years, the introduction work has allowed us to choose certain conditions for plants to grow. Most of the succulent species in our greenhouse grow well, blossom and bear fruit. The microclimate in the greenery: in winter the temperature reaches 10-12 °C, in spring-summer period it is 40-50 °C, the illumination on average is 80,000 lx. At low air humidity we produce irrigation with water. Plants grow in the soil and containers on the shelves in the "dry" exposure of "Arid plants". For them, an appropriate soil

Family, genus and number of species of succulents of the Institute of Botany and Phytointroduction

Family	Genus	Quantity
Agavaceae	*Agave* L.	10
	Yucca L.	1
	*Nolina*Michauz.	2
	*Dasylirion*Zucc.	1
	*Titanopsis*Schwantes.	1
	*Faucaria*Schwantes.	1
	*Ruschia*Schwantes.	1
	*Trichodiadema*Schwantes.	1
	*Corpuscularia*Schwantes.	1
Aloaceae	*Aloe* L.	3
	*Gasteria*Duval.	5
	*Bowiea*Harv. Ex Hook.f.	1
	*Hawortia*Duval.	7
Amaryllidaceae	*Haemanthus*L.	1
Apocynaceae	*Pachypodium*Lindl.	1
Aroliaceae	*Cussonia*Thunb.	1
Asclepiadaceae	*Ceropegia*L.	2
	*Stapelia*L.	1
	*Sarcostemma*R. Br.	1
	Hoya R. Br.	1
	*Huernia*R. Br.	1
Asparagaceae	*Albuca*L.	1
	*Drimiopsis*L.	1
	*Nolina*Michauz.	2
Asteraceae	*Senecio*(Tourn.) L.	5
Commelinaceae	*Tradescantia*L.	1
	*Cyanotis*D.Don.	1
Crassulaceae	*Crassula*L.	4
	Cotyledon Thunb.	1
	*Pachyphytum*Klotzschet Otto	2
	Sedum L.	6
	*Echeveria*DC.	10
	*Monanthes*Haw.	1
	*Graptopetalum*Rose.	1
	*Kalanchoe*Adans.	14
	*Sinocrassula*A.Berger.	1
	*Adromischus*Lem.	2
	*Aeonium*Webb et Berth.	1
Cucurbitaceae	*Neoalsomitra*Hutch.	1
Draceanaceae	*Sansevieria*Thunb.	3
Euphorbiaceae	*Euphorbia* L.	10
	*Monadenium*Pax.	1
	*Syandenium*Boiss.	1
Hyacinthaceae	*Ornithogalum*L.	1
Portulacaceae	*Portulacaria*L.	1
	*Ahacampseros*L.	1
Urticaceae	*Pilea*Lindl.	1
Vitaceae	*Cissus*DS.	1

composition was selected, consisting of sod-earth, sand, and humus at a ratio of 1:2:0.5. The above environmental conditions of closed ground allow plants to always remain highly decorative and multiply.

We carry out reproduction work mainly vegetatively, since not all plants under the conditions of the greenhouse undergo a full cycle. The collection is constantly updated with new species. Due to its unpretentiousness to the content, as well as high ornamental, these plants are popular among the population and are actively used in design.

When creating a collection of greenhouse, the main task was to present the morphological diversity of the species of succulents. As a result of many years of work, we selected promising plants for scientific study, as well as for commercialization. In the course of the selection, we identified the most interesting succulents according to the above principles from our collection [4].

An extensive family of the of Agave (Agavaceae), which includes 9 genus and is represented by 19 species. Of this family Agave L. is the most numerous genus. These are typical representative succulents that have rosettes of leaves with spines covered at almost all edges, the stem is very short. The leaves accumulate and store water in a viscous, colloidal state, which prevents its rapid evaporation in hot weather. The plant blooms once in a lifetime, then dies, but leaves a lot of "babies." Types of agaves are widely used in traditional medicine and cosmetology.

Picture 1 – *Agave victoriae-reginae* T.Moore

Picture 2 – *Nolinarecurvata* (Lem.) Hemsl

One of the perspective plants, also widely used in design, belongs to the genus nolin (Nolina Michauz.) Or so-called "bottle tree". This representative of the "hard-leaved" succulents has narrow, long and hard leaves that are not a water store. The water in these plants is stored in an expanded stem base or caudex reservoir, and is used in case of drought. In our greenergy, this plant appeared in the 1980s. Today it grows in the subtropics division, its height reaches about 2 meters, the length of the leaves is 1.5 meters, and the diameter of the caudex is 1 m. Hats, mats and other items are woven from the leaves of *Nolina* in the homeland.

The spurge family (Euphorbiaceae) are stem succulents. Our collection includes 3 genera (Euphorbia L., Monadenium Pax. And Syandenium Boiss.), 11 species. The leaves of these plants appear exclusively at a young age, and then they fall off, since photosynthesis occurs directly in the stems. Here they store water, which, in case of its shortage, is used. The juice of these plants is poisonous, so you need to work with them carefully.

Picture 3 – *Euphorbiaobesa* Hook

Thus, as a result of the introduction work, promising and commercially beneficial plants from the succulents of our collection were chosen, since they are not whimsical in care, and as a result of evolution can easily adapt to a more or less arid climate, can be widely used. In this publication, we talked about the genera of succulents, interesting for phytodesign.

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СУККУЛЕНТНЫЕ РАСТЕНИЯ В КОЛЛЕКЦИИ ИНСТИТУТА БОТАНИКИ И ФИТОИНТРОДУКЦИИ Г. АЛМАТЫ

Аннотация. «Алматы қаласының Ботаника және фитоинтродукция институтының жинағындағы суккулентті өсімдіктер» мақаласы біздің коллекцияның сукуленттерімен таныстыру жұмыстарының нәтижелерін ұсынады. Болашағы бар, сатуға қолайлы Суккулентті өсімдіктер таңдалып алынған, өйткені олар күтімді қатты қажет етпейді және эволюция нәтижесінде құрғақ климатқа жеңіл бейімделгендіктен, кеңінен қолданысқа ие болады. Бұл жарияланымда біз фитодизайн үшін қызықты әрі құнды суккуленттердің туыстары жайында айтамыз.

Түйін сөздер: суккулент, интродукция (жерсіндіру), жабық грунт, коллекция, фитодизайна.

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СУККУЛЕНТНЫЕ РАСТЕНИЯ В КОЛЛЕКЦИИ ИНСТИТУТА БОТАНИКИ И ФИТОИНТРОДУКЦИИ Г. АЛМАТЫ

Аннотация. В статье «Суккулентные растения в коллекции Института ботаники и фитоинтродукции г.Алматы» приводится результаты интродукционной работы с суккулентами нашей коллекции. Были выбраны перспективные и коммерчески выгодные растения из суккулентов, так как они не прихотливы в уходе, а в результате эволюции легко адаптируются к более или менее аридному климату, могут широко использоваться. В данной публикации мы рассказали о родах суккулентов, интересных для фитодизайна.

Ключевые слова: Суккулент, интродукция, закрытый грунт, коллекция, фитодизайна.

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