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EFFECTS OF SOIL SALINITY ON THE MORPHOLOGICAL PARAMETERS OF SAFFRON

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Factors (physical and chemical) causing stresses, especially soil salinization have been analyzed in the article based on literature and experimental data. Importance of the plants sensitive to extreme conditions and advisability of their usage in different processes have been shown.

Key words: *plants, stress factors, temperature, productivity*

Saffron (*Crocus sativus* L.) is one of the rarest plants demonstrating both medicinal and aromatic culture qualities. Saffron has been well-known as a natural healing remedy and a dye for perfumery, cookery and textiles since ancient times.

Recent years are characterized by an increased interest to medicinal and aromatic plants, including saffron. Saffron productions have been using in medicine as well as in food and textile industries since ancient times. Azerbaijan is a historical territory of the saffron cultivation. Current cultivation areas of saffron have been significantly reduced on the Absheron coast of the Caspian Sea. They are situated mosaically in comparatively small places.

Currently, as well as in ancient times, saffron cultivated on the Absheron coast of the Caspian Sea has no analog in quality. The high quality of the Absheron saffron is apparently related to the chemical content of soils on the coast of the Caspian Sea, which also contain high levels of inorganic selenium. Saffron as representative of the *Iridaceae* family has an ability to accumulate selenium in its tissues transferring it into organic forms [1]. Thus, saffron plants used in our study accumulated more than 4 mg of selenium per 1 kg of stigma dry weight at 0.85mg/kg concentrations of inorganic selenium in soil.

Historically, Absheron is well-known for its olives, grapes, figs as well as saffron. Saffron has been cultivating in this peninsula since 8-9th centuries. At the present time, saffron grown in the village of Bilge, is the most valuable spice. Mild winter, sunny summer and fertile soils of Absheron are applicable to the saffron cultivation. The farm "Zafaran" was established in Bilge in 1927.

Now demand for saffron substantially exceeds its production, which tends to decline. Studies of this unique plant carried out in Spain, Iran, Mexico, India, France, Italy, Greece, Japan, Sweden, the USA, Turkey, Hungary, the Netherlands, and Canada scientific centers of saffron investigation can be divided into several directions: agricultural technology, ecophysiology, food technology and perfumery. Medicine and pharmacology based on unique anti-cancer properties of extracts from the stigmas of saffron should be noted particularly. Currently, effects of cytotoxic activity on cancer cells have been extensively studying in China, France, Greece, India, Iran, Italy, New Zealand, Spain, Turkey and the USA.

Increasing demand in saffron production in the world stimulates investigations directed to its reproduction, including the application of modern technologies based on the molecular-genetic analysis and biotechnological approaches using methodologies of isolated culture *in vitro*.

As a representative of the class of Monocotyledons in the family of *Iridaceae*- geophyte, Saffron is triploid ($2n=3x=24$) and its reproduction occurs in asexual manner. It is unknown in the wild and passes stages in its ontogenesis differing in the characteristics of the morphological processes. The flowering of saffron occurs in November. After flowering daughter corms are formed on the mother corm at the base of the main shoot. This period is characterized by enhanced growth of leaves and roots. At the end of March gradual drying of shoots and root system occur. From the end of April until the end of August is a hidden underground period of intensive differentiation of the generative organs characterized by the absence of vegetative organs. During September, depending on weather conditions, the growth of the central bud is induced, leading to the November blooming.

The aim of the present work was to study the morphological features of saffron exposed to varying concentrations of NaCl and to investigate features of formation and functioning of the photosynthetic apparatus under these conditions.

Linear sizes and areas of separate leaves, including the flag leaf, decreased slightly under salinity conditions but there was no precise relationship with salt tolerance. Decrease in the total area of plant leaves and areas of the main shoots under salinity conditions, occurred according to the reaction of the variety to salt stress and was mainly related to the mass extinction of leaves in sensitive varieties.

The study of the influence of different NaCl concentrations on the amount of flowers and productivity of saffron revealed that varying salt concentrations effect on these parameters differently (table).

Table. Effect of NaCl on the amount of flowers and productivity of saffron

Assay Variants	Amount of flowers per plant	Dry weight of flowers per plant
control	14	80
NaCl (0.3%)	17	85
NaCl (0.5%)	10	52

As shown in the table, 0.5% solution of NaCl had negative effect on the amount of flowers and dry weight of stigmas. In contrast, 0.3% solution of the salt stimulated formation and development of side buds and therefore facilitated formation of relatively large amounts of flowers. Stimulating effect of low salt concentrations on the plant growth and development was also reported previously [2, 3].

Salinity leads to creation of low water potential and so impedes water uptake. Salinity disturbs also metabolism processes, which is the most important among its adverse effects. Salinity disturbs nitrogen metabolism in plants leading to intensive decomposition of proteins, which results in accumulation of intermediate metabolites with toxic effects, such as ammonia etc. [3].

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**ZƏFƏRAN BITKISİNİN MORFOLOJİ PARAMETRLƏRİNƏ
TORPAQ ŞORANLIĞININ TƏSİTİ.**

Məqalədə bitkilərdə stress yaradan amillər (fiziki və kimyəvi), ədəbiyyat məlumatları və təcrübələr əsasında analiz edilmiş əsas stress amillərindən torpağın şoranlaşmaya məruz qalmasının təsiri nəticəsində bitkilərdə baş verən dəyişikliklərə toxunulmuşdur. Ekstremal şəraitdə yaşamağa uyğunlaşmamış bitkilərin əhəmiyyəti və onlardan müxtəlif proseslərdə istifadənin məqsədəuyğunluğu göstərilmişdir.

Açar sözlər: bitkilər, stress amilləri, temperatur, məhsuldarlıq

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