# SIGNIFICANCE OF GLUTATHIONE-DEPENDENT SYSTEM IN THE ADAPTATION OF PLANT VARIETIES *LOLIUM PERENNE* L. OF UKRAINIAN BREEDING

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*Analysis the content of reduced glutathione and antioxidant enzymes – glutathione reductase (GR) and glutathione-S-transferase (GST) in the vegetative organs of plants 5 varieties of ukrainian breeding Lolium perenne L. – Adriana-80, Leta, Orion, Sviatoshynskyi and Lytvynivskyy-1. Found varietal specificity of plant L. perenne L., which is due to the variation of the level of activity glutathione-dependent elements of the system. Experimentally established that the plants of L. perenne L. varieties Andriana-80 and Leta are the most promising for planting urbolandshaftiv, have high level of glutathione and significant activity of GR and GST.*

***Lolium perenne L., glutathione, glutathione-dependent system, glutathione reductase, varieties.***

The lawn surface is an integral part of gardening modern arbitariness. The absence of a system of automatic irrigation and soil salinity are the main problems generated soddy coatings settlements of Ukraine. Excessive soil salinity suffers 25 % of the globe (Kuznetsov, 2006), which has a direct negative impact on the growth and development of plants. Resistance of plants to adverse environmental factors, primarily determined by their physiological and biological characteristics. Application viscoadaptive to stress conditions plants is one of the main requirements in the selection of planting material for landscape objects. Paganism perennial (L. perenne L.) is one of the main components of lawn kulturpflanzen for various purposes and is of great practical importance in landscape construction. The stability analysis of plants of L. perenne L. to adverse environmental factors may be based on an assessment of the effectiveness of the glutathione-dependent system.

Glutathione (GSH) is a biologically active substance, a Tripeptide (L-gamma-glutamyl-L-zistel-glycine), is one of the universal regulators of biochemical and physiological homeostasis of any organism. Found that thiol (solely) group is the main functional part of Tripeptide and easy as enzymatic and nonenzymatic oxidation, resulting in disulfde (the oxidized form of glutathione (GSSG) [19]. Restored glutathione (GSH) is a low molecular weight thiol, biosynthesis and catabolism which occurs by glutamin cycle. The oxidation of reduced glutathione catalyzed by enzymes with different specificity to acceptors of hydrogen. The reverse process - recovery of oxidized glutathione catalyzes the glutathion reductase (GR) [5, 8, 13, 19].

Glutathione is an important component of low molecular weight antioxidant system, its reduced form consists of residues glutamic acid, glycocol and cysteine. The study of the transformation of the glutathione system in the plant organism is quite a relevant issue in the field of gardening, because it is an indicator of sustainability. The functional role of glutathione diverse, because it is contained in almost all plant tissues and is involved in many physiological and biochemical processes: protects the body against reactive oxygen compounds, restores and sumerize disulfide bond, affects the activity of enzymes, protein biosynthesis and proliferation of nucleic acids, supports the functions of membranes, are the reserve cysteine, increases the resistance of plant cells to chemical ii physical environmental factors, leads to resistance to heavy metal cations (Dolgova, 2009).

It is established that the redox system botela glutathione causes significant changes in the activity of protein synthesis in mitochondria. There is activation of protein translation in the presence of glutathione in its active form and, conversely, the inhibition of this process, if glutathione is in the reduced form (Saturday, 2003). Thus, it is determined that in the redox control of protein synthesis in mitochondria of cereals, participates thiol-disulfde currency, which includes the redox system of glutathione.

Glutathione is a precursor photogelatin - low molecular weight peptides containing a large number of SH-groups (Grill et al, 1985), which provides stability to the plants due to the activation mechanism of detoxification of metal and the increase in the concentration of glutathione and the synthesis of PF. One of the most important mechanisms of plant resistance to the effects of metals is the detoxification of heavy metal ions in the cell by binding them with SH-groups of some low molecular weight peptides and proteins (Hall, 2002).

The action of a solution of cadmium in various concentrations (0-100 mg/dm3) on the germination of barley caused an increase in the total number of compounds containing SH-groups. It should be noted that it was found increased (compared with control) of the total pool of glutathione (GSH+GSS), and the trend has been a sharp increase in GSH in comparison GSS.

It is established that an important role in adaptation of lawn grasses to salinity plays an enzyme TRP, which is accompanied by more intensive growth of roots and shoots of plants main getnotify herbs [6].

**The object of our research** were the plants of L. perenne L. 5 varieties of domestic breeding - Hadrian-80, Summer, Orion, Svyatoshinsky and Litwinski-1, which were selected from the territory of the nursery Kiev experimental station NSC "FROM" NAAS of Ukraine in 2013

**The aim of the research** is the assessment of the content of glutathione in the vegetative organs of plants 5 varieties of the domestic breeding of L. perenne L. and identification of promising varieties for landscaping in residential areas.

**Materials and methods research.** The content of reduced glutathione was determined by the method of E. Beutler et al. (1963) modified by C. M. Gryshko and D. C. Sedikova [1]. The basis of the method lies reaction tolazoline exchange, during which released the anion of 2-nitro-5-thiobenzoate.

To determine the reduced forms of glutathione used a 20% homogenate of plant tissues produced at 0.3 M potassium-phosphate buffer with pH 7.5 (4.26 deaths g K2HPO4 dissolved in 100 ml H2O). The obtained homogenate was centrifuged for 20 min at 6 000 R/min To 2 ml of supernatant was added to 3 ml saguling reagent (100 ml which contains 1,67 g NRO, 0,2 g Trilon B, 30 g NaCl) and they were re-centrifugation for 10 min at 6 000 R/min Then in the cuvette was made to 2 ml of 0.3 M potassium phosphate buffer, 0.05 ml of 1 mm solution of reagent Ellman, 2 ml of the obtained supernatant and perform the measurement of optical density at 412 nm on photoelectrocolorimeter KLF-3 .

**Conclusions**

On the basis of experimental data it was established that plants L. perenne L. cultivars Andrian-80 and Summer is the most adapted to urban conditions and they can be recommended for landscaping unbalanced.

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