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DETERMINATION OF PEROXIDAZE ENZYME ACTIVITY DURING THE GROWTH PERIOD OF GRAIN AND LEGAL PLANTS

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A R T I C L E I N F O.

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Annotation

The enzyme peroxidase is common in animals and plants. The enzyme peroxidase prevents the accumulation of H2O2, a toxin formed during oxidation, i.e., the enzyme acts on hydrogen peroxide as an acceptor. [10,11]
Peroxidase enzyme activity varies during the germination period of cereals and legumes, with the highest peroxidase enzyme activity during the germination period of cereals being on the first day of wheat, at a mass of 1,158 μm mol / min.g.
In legumes, the highest activity of the peroxidase enzyme is on day 9 of the soybean germination period, with an activity of 0.687 mc mol / min.g. formed a mass.

It is known that as a result of metabolism in living organisms, oxidized products are formed "free radicals" and peroxide compounds of organic, inorganic substances. Adverse conditions can accelerate this process. Free radicals damage the cell, disrupting its structure and function. [6,8]

There are several specific anti-oxidation mechanisms in the cell, including superoxide dismutase, catalase, peroxidase, and glutathione reductases. These antioxidant systems neutralize the amount of free radicals in organisms. [6,7,8,9,10,13]

A number of basic biochemical processes in living organisms, including nutrition and respiration, take place in the presence of enzymes. These include the enzyme peroxidase, which is found in plants. This enzyme controls redox processes in plant cells. The enzyme peroxidase is common in both animals and plants. It is a two-component enzyme that contains a polypeptide chain of 300 amino acid residues, gems, and carbohydrates. The toxin formed during the oxidation of peroxidase prevents the accumulation of H_20_2, i.e., the enzyme acts on hydrogen peroxide as an acceptor. [7,8,10,11,12] Peroxidase is an enzyme in plants that is sensitive to adverse environmental influences.

Various biologically active compounds with antioxidant properties have been identified in extracted cereals. [1,3]

Also, peroxidation of lipids during germination of cereals and legumes varied, with the highest concentration of lipid peroxidation during the germination of cereals being found on day 3 of wheat and on day 7 of legumes. [2]

It is known that peroxidation of lipids determines the antioxidant system of plants, and its high level

leads to an increase in the activity of antioxidant enzymes.

The activity of the enzyme peroxidase has been studied in many plants and it has been found that its activity depends on time, conditions and type of organism. Peroxidase is an enzyme that is sensitive to the effects of adverse environmental factors in plants. The enzyme peroxidase has been shown to play an important role in the biosynthesis of ethylene in the plant body, in the regulation of auxin levels, and in the protection of plant tissues from damage by pathogenic microorganisms [4,5,9,10,13]

The aim of this study was to determine the activity of the enzyme peroxidase during the germination of cereals and legumes.

Object of research: harvested wheat, barley, soybeans, mung bean.

The essence of the method: In the reaction catalyzed by peroxidase, the product formed by benzidine diphenoxynondiimine turns blue. (benzide blue)

Reactive and required equipment: A) acetate buffer pH 4.7. B) benzidine solution in acetate buffer pH-4.7. Fill a 200 ml volumetric flask with 60-80 ml of distilled water, 2.3 ml of glacial acetic acid, followed by 0.184 g of benzidine. Dissolve the flask in a 600C water bath until the benzene is completely dissolved. Then 5.45 grams of sodium acetic acid is added and mixed well. Cool the flask to 200 ° C and add distilled water to the mark. V) 3% hydrogen peroxide.

G). SF. D) stopwatch E) centrifuge.

Procedure: Take 0.5 g of plant material, crush it well with acetate buffer and add 50 ml of water to the mark, then centrifuge 4000-5000 rpm or filter. To the SF cuvette add 2 ml of centrifuge, 2 ml of benzidine solution and 2 ml of distilled water. SF 625-700 nm. 2 ml of water is added to the control. 2 ml of hydrogen peroxide is added to the experiment. The activity of the enzyme is determined by the following formula:

$$A = \frac{E(a \cdot b \cdot v)}{c \cdot t}$$

A - activity of the enzyme peroxidase (mk.mol / min.g. Mass); **E -** extension; **a-**obtained buffer mixture (ml) for plant extraction**; b -** is the volume after additional centrifugation; **v-** dilution of the extract in the cuvette; **c-** cuvette thickness (2cm); **t-** time seconds.

Results: The results showed that the activity of the peroxidase enzyme, which is part of the antioxidant enzyme system, depends on the germination period of the harvested cereals and legumes, and its activity varies.

High peroxidase activity was 1.158 μm / mol.g. on the first day of the germination period in cereals from wheat. (Table 1)

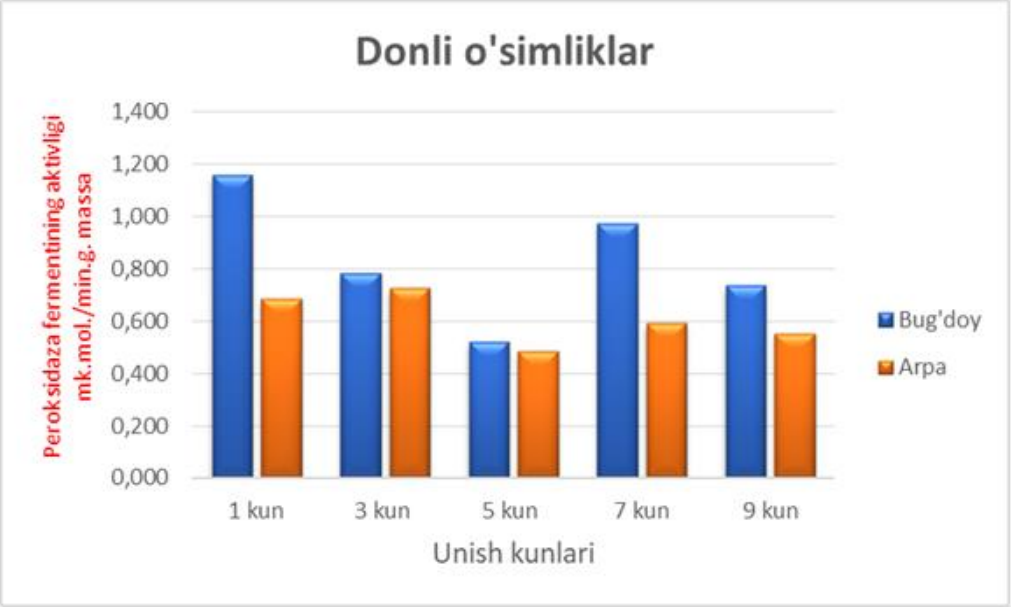
Table 1

Peroxidase activity during germination of cereals and legumes (mk.mol / min.g.massa)				
Growth days	**Legumes**		**Cereals**	
	Mung bean	**soybean**	**Wheat**	**Barley**
1 day	0,523 ± 0,065	0,488 ± 0,046	1,158 ± 0,075	0,685 ± 0,044
3 day	0,438 ± 0,015	0,608 ± 0,069	0,781 ± 0,036	0,725 ± 0,046
5 day	0,425 ± 0,013	0,652 ± 0,102	0,519 ± 0,087	0,484 ± 0,034
7 day	0,477 ± 0,032	0,608 ± 0,242	0,972 ± 0,01	0,592 ± 0,083
9 day	0,156 ± 0,044	0,687 ± 0,016	0,736 ± 0,107	0,553 ± 0,02

In the following days of the growing season, activity declined. On the 9th day of the germination period, it was found to be equal to 0.736 µm / mol.g.mass.

Peroxidase enzyme activity was found to be lower in barley during the germination period than in wheat. (picture 1). The highest peroxidase activity was on day 3 of the germination period, with a mass of 0.725 µm / mol / min.

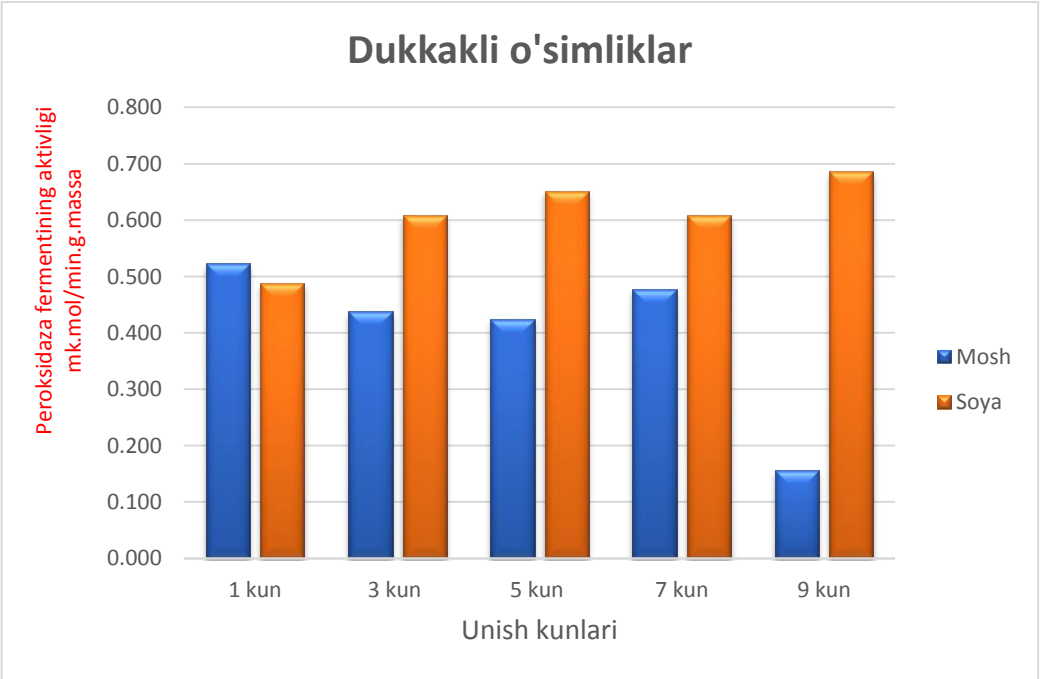
Picture 1



During the germination period of legumes, the maximum activity of peroxidase in the shade was detected on the 9th day of the germination period, ie 0.687 µm / min.g. mass. (Table 1)

The highest activity of the peroxidase enzyme in Mosh was found on day 1 of the germination period, with a mass of 0.523 µm / mol / min.g. picture 2)

Picture 2



A number of scientific studies have shown that changes in the activity of antioxidant enzymes are due to metabolic processes in the cell during the germination of cereals. [8,9,10,11,12,13]

Conclusion. Thus, the results obtained show that the activity of peroxidase during the germination of cereals and legumes varies, and its high activity is on day 1 of the germination period of cereals and wheat, at 1,158 μ.mol / min. g.mass, was on the 9th day of the period of germination in the shade from legumes, the activity was 0.687 mk.mol / min.g.mass.

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