ӘЛ-ФАРАБИ АТЫНДАҒЫ ҚАЗАҚ ҰЛТТЫҚ УНИВЕРСИТЕТІ
КАЗАХСКИЙ НАЦИОНАЛЬНЫЙ УНИВЕРСИТЕТ ИМЕНИ АЛЬ-ФАРАБИ
AL-FARABI KAZAKH NATIONAL UNIVERSITY

БИОЛОГИЯ ЖӘНЕ БИОТЕХНОЛОГИЯ ФАКУЛЬТЕТІ
ФАКУЛЬТЕТ БИОЛОГИИ И БИОТЕХНОЛОГИИ
FACULTY OF BIOLOGY AND BIOTECHNOLOGY

Студенттер мен жас ғалымдардың

«ФАРАБИ ӘЛЕМІ»

атты халықаралық ғылыми конференциясы

Международная конференция студентов и молодых ученых

«ФАРАБИ ӘЛЕМІ»

International Scientific Conference of Students and Young Scientists

«FARABI ALEMI»

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ҚАЗАҚСТАН РЕСПУБЛИКАСЫ БІЛІМ ЖӘНЕ ҒЫЛЫМ МИНИСТРЛІГІ
МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РЕСПУБЛИКИ КАЗАХСТАН
MINISTRY OF EDUCATION AND SCIENCE OF REPUBLIC OF KAZAKHSTAN

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МАТЕРИАЛДАРЫ
Алматы, Қазақстан, 6-8 сәуір 2023 жыл

МАТЕРИАЛЫ
международной научной конференции
студентов и молодых ученых
«ФАРАБИ ӘЛЕМІ»
Алматы, Казахстан, 6-8 апреля 2023 года

MATERIALS
International Scientific Conference
of Students and Young Scientists
«FARABI ALEMI»
Almaty, Kazakhstan, April 6-8, 2023

Алматы
«Қазақ университеті»
2023

The object and methods of the research: the cultivars Alyans and Ushkonyr, laminar box, dark room

The results of the research: All tubers that were treated with 20 ppm GA3 were healthy and resulted with the de novo tubers which shows the effect of 100 % in sprouts formation. The high percentage of tubers that were treated with 2 ppm GA3 didn't show any sprout formation. Some formed 1-2 new sprouts.

Scientific advisor: Candidate of Biological Sciences, Assoc. Prof. Ernazarova G.I.

STUDY OF GROWTH DYNAMICS OF LACTOSE-DEGRADING YEAST IN MILK WHEY AND PRODUCTION OF BIOETHANOL BASED ON IMMOBILIZED YEAST CELLS

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Milk whey is recognized as a unique valuable protein and carbohydrate raw material containing more than 200 vital nutrients and biologically active substances. At present, the processing of milk whey to produce ethyl alcohol, which is widely used as a fuel has been proposed. Bioethanol is an alternative form of liquid fuel for gasoline engines. It is ethyl alcohol that is produced from biomass or biodegradable waste components and used as a biofuel. The production of bioethanol can provide economic benefits to farmers and rural communities by creating jobs and generating income. It is a renewable fuel, which means it can be produced sustainably without depleting natural resources or causing significant harm to the environment.

The aim of the research work is to study the growth dynamics of lactose-splitting yeast in milk whey, and to obtain bioethanol based on the immobilization of yeast cells on various sorbents.

Yeast cultures of the collection of microorganisms of the Laboratory of Applied Microbiology KazNu - strains Saccharomyces cerevisiae and Kluyveromyces marxianus АИ1 - were used as objects of study. Milk whey from the company "Amiran", cow's milk serum and kurt were used as a substrate. The study of the general microflora of dairy products was carried out by traditional microbiological methods - the Koch method, the Bradford method, the microscopy method, the optical density, the morphological and cultural properties of pure cultures of isolated yeasts were studied and growth dynamics of yeast cultures in milk whey.

During the research work, to study the general microflora of dairy products, samples were cultivated in nutrient agar and facultative media for the cultivation of yeast and Saburo dextrose agar. The total microbial amount of cow's sour cream was – 2.7x10^6CFU/ml, the amount of yeast – 1.9x10^6CFU/ml, in kurt samples it was found that the total microbial number is – 5.8x10^6CFU/ ml, the amount of yeast -3.8x10^6CFU/ ml.

The dynamics of growth in the optimized milk whey of yeast cultures Saccharomyces cerevisiae and Kluyveromyces marxianus was studied. The growth dynamics of yeast cultures in condensed milk serum was studied for 144 hours. Yeast growth was monitored every 24 hours by counting colonies growing in solid nutrient media using the Koch method, by determining the optical density of yeast biomass collected in whey using the Bradford method. The study showed that the most active growth time of yeast strain Kluyveromyces marxianus was 4 days, for Saccharomyces cerevisiae 6 days highest values were for Saccharomyces cerevisiae –5,8 x10^6 CFU/ml, and Kluyveromyces marxianus –7.6 x10^6 CFU/ml. The highest quantity of protein value was recorded in the strain Saccharomyces cerevisiae for 6 days - 1,093 nm whereas for Kluyveromyces marxianus was 2.137 nm on 4 days. Immobilization of the yeast cells were carried out in two sorbents sodium alginate and carrageenan. The highest obtained amount of alcohol for Kluyveromyces marxianus was 4,1% as for Saccharomyces cerevisiae 3,7% during the 48 hours in carrageenan. The largest value of the amount

of biomass was recorded in the strain Saccharomyces cerevisiae - 1,093nm for Kluyveromyces marxianus 1.906 nm – 4 days. Summing up the results of the study, it was found that whey is the preferred substrate for the growth of lactose-splitting yeast. This indicates the possibility of using whey as a substrate in the process of immobilizing yeast with sorbents. Currently, the use of bioethanol on the market not only reduces the need for crude oil, but also has a positive impact on the environment. Therefore, the production of bioethanol in industry is a promising direction.

Scientific advisor: Abdiyeva G. Zh.

STUDY OF PHYSIOLOGICAL ROLE OF MAGNESIUM IN NEW RUST RESISTANT SPRING WHEAT MUTANT LINES

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The stripe (yellow) and leaf rust, fungal diseases, conditioned by Puccinia striiformis f. sp. tritici (Pst) and Puccinia triticina Eriks. (Pt), respectively, are the most important constraints in wheat production throughout the world causing significant losses of grain yield owing to reduced grain weight and number and reduction in main characteristics of grain quality. Among rust diseases of wheat, stripe rust is presently one of the most economically essential with yield losses reaching up very huge level in susceptible varieties. Mutagenesis is a strong treatment to extend genetic variation and has been mainly applied for increase of yield however has been not extensively used for the grain improvement in terms of nutritional value and no for the relation of rusty disease resistance and and main quality characteristics. Magnesium (Mg) is an essential element in plant methabolism. For instance, Mg plays a role in the stability of all polyphosphate compounds in the cells, including those associated with the synthesis of DNA and RNA, it is the fundamental component of chlorophyll (Chl) pigments in the light-capturing complex of chloroplasts and, hence, is involved in photosynthetic CO_2assimilation. Mg also acts as a cofactor of numerous enzymes (more than 300). To broaden genetic variation for searching new spring bread wheat (T. aestivum L.) rust-resistant genotypes, grains of rust-resistant variety Kazakhstanskay-19 released and cultivated in Kazakhstan. The grains of Kazakhstanskay-19 were treated with 300 Gy irradiation doses from a ^{60}Co source at plant breeding and genetics laboratory, **t**he IAEA laboratories in Seibersdorf, Austria. Grains of selected rust resistant 300 Gy-dosed mutant lines along with the parent were analyzed for nutritionally important mineral (Mg) and distribution of metal in leaves, roots and stems of 42-days plants grown in the hydroponic system according to described (Kenzhebayeva et al., 2023). The variation was 2202.0 –3330.0 mg/kg for Mg. In mutant lines, the highest of t increases in Mg content when compared to the parental cultivar had more than1.4 times. The pattern of distribution of Mg in plants organs showed genotype-dependent profile with the biggest content in leaves, and less stems and roots.

Scientific supervisor: *Kenzhebayeva S.S Doctor of Biological Sciences, professor*

ANTIMICROBIAL ACTIVITY OF PHYTOANTISEPTICS

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Kazakhstan has a huge number of plants with antimicrobial activity that are used individually as medicinal herbs, but not as a combined extract of several herbs for antiseptic purposes.