

## COMBINATION ABILITY STUDY OF SEVERAL LINES SYNTHESIZED BY AGROARFA ALBANIA BASED ON THE TEST METHOD

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### ABSTRACT

Creating new lines and hybrids, with higher production capabilities than existing ones, suitable for particular ecological and agricultural environments, remains a continuing problem ahead of the maize breeding programs. For this purpose, the Genetic Improvement Center, Agroarfa Lushnja, works through a genetic improvement program for maize. The aim is to create hybrids of the 500-600 class, suitable in the irrigated conditions of the coastal area of Albania. This paper presents the testcross data of some inbred lines generated by the self-pollination of the hybrid 32F73, it is a late maturing hybrid, but which goes well in the conditions under which the study was conducted. From the F<sub>2</sub> population of the 32F73 hybrid were selected the most interesting plants for production indicators and other agronomic traits. Then the plant selection work continued until their phenotypic uniformity reached at the sixth generation of self-pollination (I<sub>6</sub>). Parallel to this, some of the selected plants of the F<sub>2</sub> population of 32F73 hybrid were crossed with some of our best lines (AS2, AS4, AS5, AS8, AS10 and AS13) and continued with self-pollination until they reached the minimum inbred. All the lines created after the selections were crossed with four different tester lines that were AS17, AS19, AS20 and AS23. Their hybrid combinations, obtained from the testcross, line x-tester, were tested in the second year to see the heteroz effect of any hybrid combination, inbred line x tester. This paper gives the data of hybrid combinations (line x tester) for two important indicators, yield (kv/ha) and weight of 1,000 kernels (g). If an inbred line represents high combining ability with all tester lines, it means that the line has general combining ability. On the contrary, it can be characterized for specific combining ability. The test was carried out with hybrid combinations of 35 inbred lines of 7 selected groups, crossed with 4 tester lines. From the study, interesting data were obtained from which some combinations are of interest to further work in the genetic improvement programs of maize.

**Key words:** Combining ability, crossing, tester cross

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## THE EVALUATION OF THE ENERGY EFFICIENCY OF DAIRY FARMS WITH FREESTALL AND LOOSE HOUSES IN KONYA SUGAR INDUSTRY AND TRADE INC., TURKEY

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### ABSTRACT

Energy use is indispensable for sustainable agricultural production. Determination of energy use efficiency is pivotal for the productivity of dairy farms. In recent years, the Konya Region has the highest milk production and the greatest number of animals in Turkey. The dairy farms owned by the Konya Sugar Industry and Trade Inc (ITI) are the biggest farms in the Konya region and are run by entrepreneurs and leaders in livestock breeding. For this reason, it is important to evaluate the energy efficiency of these farms, for the development of animal breeding in the region and country. This study was carried out between 2017 and 2018, to evaluate energy use of the dairy farms of the Konya Sugar ITI. The company owns the Şekersüt Dairy Farm (SDF) with 7600 animal-capacity and the Çumpaş-Danabank Dairy Farm (CDF) with 1000 animal-capacity. Loose and freestall dairy houses are used on the farms. These farms were assessed for their energy use efficiency, net energy yield, specific energy, and energy productivity parameters. Consequently, energy productivity and energy use efficiency for SDF and CDF were calculated to be 3.6L/100 MJ and 0.11, and 5.2L/100 MJ and 0.16, respectively. Increased energy efficiency will be possible by determining the high-energy use efficiency value for other dairy farms in the research area and developing the applications accordingly, with this goal. Furthermore, it is also recommended that the dairy farm management is redesigned or improved to create a new barn design that is appropriate for animal welfare and high milk yield.

**Keywords:** Energy efficiency, Energy productivity, Net energy yield, Specific energy, Energy Saving

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## ANALYSIS OF EMISSIONS FROM DIESEL PASSENGER CARS IN NORTH MACEDONIA

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### ABSTRACT

The process of sharp increase in the presence of internal combustion diesel engines among passenger cars in the Macedonian fleet of vehicles, significantly increases its share in polluting emissions from the burning of diesel fuel in transport. Therefore proper analysis and accurate calculation of emission factors from diesel passenger cars and their pollution emissions will be calculated through the Tier 2 method for emission calculations from the European Environmental Agency. This study is based on data obtained from official institutions and their adequate approximation obtained results which give us an approximate figure to the actual situation of pollution from passenger cars with diesel Internal combustion engines.

**Key words:** Diesel vehicles, Emission factor, Tier 2, Air Pollution

## THE SURFACE WATERS THAT FLOW TO LAKE OHRID AND ROLE OF DIATOMS IN BIOLOGICAL MONITORING

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### ABSTRACT

Ohrid Lake is one of the oldest lakes in the world, formed about 2-3 million years ago. Many of lakes of the globe are about 10,000 to 45,000 thousand years old and formed during the glacial period. In an old lake, with hills and mountains that separated them from other waters, a whole collection of plants and animals is developed. Lake Ohrid is located at a height of 695m, with a surface of 358.2 km<sup>2</sup> and a coastline of 87.5 km. About 2/3 of the lake is in the North Macedonian part and 1/3 belongs to the Albanian side. It represents an exceptional source of water, the great biological diversity and the endemic species that are presently threatened by many factors. Most of the Ohrid Lake basin is formed by tectonic forces. At a later stage of the alpine oogenesis the holes of Ohrid, Prespa and Debarca are formed. The Ohrid Lake itself is formed on Bilisht-Korça-Debarca. As a geomorphologic characteristic of the catchment basin we mention abrasive formations (rugged rocks, bare rocks and rocks and subsoil), river formations (river valleys, river beds, erosive and accumulative terraces) karstic formations (cracks, water holes, pits and fields karstic surface as well as holes and underground holes). Biomonitoring is the use of biological indicators as assessors of environmental change. Since, chemical compounds of the rivers pass through mass flows over a short period of time, chemical monitoring gives an instantaneous water quality picture only for the sampling moment. In Albania, biological monitoring based in diatoms, for the first time is carried out in Albanian rivers (fresh water), the data are presented by Miho et al., (2005); on PhD thesis by Kupe L., (2006). After then had continued with further studies in the area of ecological (diatoms) assessment of fresh and marshes water.

**Keywords:** surface water, biological monitoring, sources, benthic diatoms.

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## A REVIEW OF THREATENED AND RISKED ENTOMOPHAUNA ON SHKODRA LAKE AREA

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### ABSTRACT

In this paper are presented some Shkodra Lake Area Entomophauna species that are endangered in this habitat and have their threatened categories at the national level based on the Red List of IUCN (International Union for the Protection of Nature). There are exactly 39 species with their risked categories. These data are derivative of a several-year monitoring, based on expeditions carried out in different areas in this area. About 39 species of Insects Order (Odonata 2 species, Mantopera 2 species, Neuroptera 2 species, Lepidoptera 24 species, Coleoptera 9 species) from different regions of Northern Albania. Most of them seem to be threatened on their habitats, belonging to the IUCN red list, where: 30 species belong to the vulnerable category (VU), such as Erynnis Tages; 6 are near threatened species (LR), such as Lestes Dryas; 2 are endangered (EN), such as Gmnopleurus Mopsus; 1 are critically endangered (CR) such as Osmoderma Eremita. Some of threatening aspects we can point out are related with this habitat, like the deterioration or disturbing, especially during reproductive period (i.e. before the egg disposal), pollution of waters and other ecological changes. The quality of water is considered good. [1,2]. We wish to contribute in the further knowledge of Insectophauna of Albania Region, focusing also in preservation and conservation of endangered species and their respective habitats, especially warm field-hilly regions, warm lower grass areas, rich vegetation areas and water heated areas. Most of them have a negative impact on ecological system [3].

**Key words:** threatened species, endangered species, IUCN category, Red List of Insects, habitat, scientific name, chorology, bio-ecology of species.

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## OXIDE DISPERSION STRENGTHENED STEELS AS CANDIDATE STRUCTURAL MATERIALS FOR NUCLEAR AGGRESSIVE ENVIRONMENTS

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### ABSTRACT

In this paper, a description of the past and present research activities for the development of the Oxide Dispersion-Strengthened (ODS) Steels will be carried out, showing why ODS steels are considered among the best candidate structural materials in very aggressive nuclear environments: it can find application as material for the cladding in nuclear fast breeding reactors, or in the blanket/first wall of the fusion reactor as well. General information about the anisotropy of its microstructure, its tensile and creep properties, how they result affected by, and also its resistance to irradiation will be provided.

**Keywords:** Oxide dispersion strengthened steel, Anisotropy, Microstructure, Mechanical properties

## HIGH TEMPERATURE TENSILE TEST OF 12Cr FERRITIC ODS STEEL

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### ABSTRACT

The ODS steel, studied for more than thirty years, is an alloy characterized by very high performances, and depending on the purpose, its composition is changed in order to satisfy the requirements. In particular, the 12Cr ferritic ODS steel is widely regarded as a candidate structural material for fusion reactor and advanced next generation fission reactors. In this study, mechanical properties of the alloy will be tested at different temperatures: their dependency on the microstructure and on the temperature will be investigated, focusing the attention on the anisotropy of the alloy and how it affects its performances. Fracture surface analysis at room temperature will be performed as well.

**Keywords:** Oxide dispersion strengthened steels, Tensile properties, Anisotropy, Microstructure

## PREVALANCE AND MOLECULAR CHARACTERIZATION OF *GIARDIA DUODENALIS* IN LIVESTOCK IN VAN, TURKEY

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### ABSTRACT

*Giardia duodenalis* (*Giardia lamblia*, *Giardia intestinalis*), a flagellated parasite, is a gastrointestinal pathogen that affects public health worldwide. There are limited studies on the epidemiology and molecular characterization of *G. duodenalis* in farm animals in Turkey. Molecular characterization is required to determine the zoonotic potential of *Giardia* infection. In the present study, 71 calf 50 lamb, and 66 goat fecal stool samples were obtained from the animal rectum using a disposable latex glove and the samples were transferred to the laboratory. Then, the presence of cysts was examined with a microscope using of saturated zinc sulfate flotation method (ZnSO<sub>4</sub>; 33%). Afterwards, the samples were scanned with ELISA-based rapid diagnostic test kits for diagnosis. Then, DNA was extracted with QIAamp DNA Stool Mini Kit (Qiagen, Germany). Nested PCR was then conducted with the corresponding primers. DNA sequence analysis was conducted on beta-giardin gene region of each PCR positive samples. Then, sequence analyses were blasted and compared with the access numbers in the gene bank (M36728 for sub-genotype A1, AY072723 for sub-genotype A2, for AY072724 sub-genotype A3, AY072725 for sub-genotype B1, AY072726 for sub-genotype B2, AY072727 for sub-genotype B3, AY072728 for sub-genotype B4). In the microscopic examination, *Giardia* cysts were identified in 41 calves, 18 lambs, and 23 goats. Positivity was determined with rapid test kits in 38 calves, 16 lambs, and 20 goats. In nested PCR results, specific bands (511 bp) were obtained in 46 calves, 21 lambs and 24 goats. Sequencing findings demonstrated Assemblage A and sub-genotype A3 presence in all animal samples. The importance of treatment and the need to take protective measures due to its zoonotic importance were emphasized.

**Keywords:** *Giardia duodenalis*, nested PCR, assemblage, farm animals.

## BIO-MONITORING OF NARTA LAGOON

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### ABSTRACT

Narta is considered as one of the most important lagoon areas in Albania based on the high biodiversity values and the number of habitats found there. The natural ecosystem of Narta is characterized by a rich diversity of habitats as lagoon area, delta of Vjosa River, salt marshes, sand dunes, pine forest, islet of Zverneci. The relations between these various types of habitats are of great ecological importance. The studies for this area have shown the importance of the area related to the interesting and specific flora. In the vast variety of habitats, many of the plants species that occur are specifically and uniquely found in this coastal area. Level of trophic state is based on standard methods for analysis of macrophytic vegetation and chlorophyll a, dissolved oxygen (DO) and biological oxygen demand (BOD), Phosphor contents. Also, are measured physic characteristics of waters like temperature, Ph. Plant communities' evaluation is based on qualitative and quantitative characteristics and is classified through principals of Zurich–Montpellier school. Monitoring of chlorophyll a content, dissolved oxygen (DO) and biological oxygen demand (BOD), phosphor contents, and macrophytes species are carried out during a year from April to September 2018. In Lagoon are selected four stations for samples taking. Evaluation of water trophic level is based on classification proposed by Håkansson [4]. Oligotrophic: clear and blue water, with very low levels of nutrients and algae. Mesotrophic: slightly green water, still clear, moderate levels of nutrients and algae. Eutrophic: green and murky water, with higher amounts of nutrients and algae. Hypertrophic: supersaturated in phosphorus and nitrogen, excessive phytoplankton growth, poor water clarity. Flora of Narta Lagoon belongs to the aquatic macrophytes rooting in sediment. Two main groups are commonly distinguished: *Zoostera* and *Rupia*. The aquatic vegetation strongly influences the light conditions, temperature, oxygen concentration, sedimentation rate and turbulence in the water body. Analyses for determination of dissolved oxygen (DO) and biological oxygen demand (BOD) are realized through Winkler method. Based on the collected data we can evaluate that Narta Lagoon is characterized by Mesotrophic state level.

**Key words:** macrophytes, trophic state, Chl a, BOD, DO.

## LABORATORY SCALE ELIMINATION OF SOME HEAVY METALS WITH HOLLOW ALUMINOSILICATE SPHERES

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### ABSTRACT

This examination aims to eliminate venomous heavy metals in wastewater using hollow aluminosilicate spheres. The chemical and physical parameters of hollow aluminosilicate spheres were investigated. The effects of contact time, amount of hollow aluminosilicate spheres and pH on the treatment of heavy metals in the water environment were evaluated by batch experiments. The yield capacities of hollow aluminosilicate spheres were examined for Cd<sup>2+</sup>, Ni<sup>2+</sup> and Zn<sup>2+</sup>, with amounts of 57.29%, 23.66%, and 45,17% respectively. The following heavy metal removal efficiency of hollow aluminosilicate spheres was determined: Cd<sup>2+</sup> > Zn<sup>2+</sup> > Ni<sup>2+</sup>.

**Keywords:** Adsorption, Hollow aluminosilicate spheres, Heavy metals, Wastewater

