

## ISOPRENE EFFECT: YESTERDAY, TODAY, TOMORROW

G. A. Sanadze

Brief historical review of research performance regarding isoprene effect (IE) is given in this paper: special role of light as a source of energy and CO<sub>2</sub> as a source of carbon, establishing energoplastic stream as a whole which, penetrating green photosynthetic cell, is underlined here. The existing data allow us to review IE as exhibition of excretory function of leaf. We tried to describe IE in the light of concept of thermodynamics of nonequilibrium processes. It is shown that the cell represents a dissipative structure. Up-to-date information of Monson and his colleagues regarding existence of double carboxylation in a photobiosynthesizing cell leading to the formation of dimethylallylpyrophosphate - isoprene precursor is emphasized in this paper. On the whole IE is reviewed as a result of regulation of carbon and free energy transformation in chain of photosynthetic reactions under the conditions caused by CO<sub>2</sub> deficiency within lighted autotrophic cell and the cell represents the structure permanently dissipating entropy. The paper states about the first photobiological reactor for isoprene production in large quantities via transgenic unicellular organisms. The issue on obligate loss of part of free energy by cell is discussed in this article.

### BIOCHEMICAL CONTROLS ON THE CO<sub>2</sub> RESPONSE OF LEAF ISOPRENE EMISSION: AN ALTERNATIVE VIEW OF SANADZE'S DOUBLE CARBOXYLATION SCHEME

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Sanadze's double carboxylation scheme was originally proposed to explain aspects of biochemical control over the isoprene emission rate from photosynthesizing leaves. The scheme was based on two chloroplastic carboxylation reactions, including that by RuBP carboxylase, the initial carboxylation reaction in C<sub>3</sub> photosynthesis, and that by an unknown carboxylase with the proposed function of providing substrate to a chloroplastic version of the mevalonic acid pathway. Since the development of Sanadze's original scheme, discoveries have made it clear that chloroplastic isoprenoid biosynthesis occurs through a pathway other than that involving mevalonic acid, and that the substrate for isoprenoid biosynthesis originates in part from phosphoenolpyruvate (PEP) transported from the cytosol. We have developed a biochemical scheme to accommodate these observations and, at the same time, explain the response of isoprene emission rate to changes in atmospheric CO<sub>2</sub> concentration. Like Sanadze's original scheme, our scheme also depends on control by two carboxylases, one of which is RuBP carboxylase. However, unlike Sanadze's original scheme, the second carboxylase in our scheme is cytosolic in its location and is well known as PEP carboxylase. In this paper, we provide a brief review of this alternative 'double carboxylation' scheme, including the development of a biochemical model, based on control by PEP carboxylase, to explain the CO<sub>2</sub> response of isoprene emission rate. We also present new data on application of the model to describe the response of isoprene emission rate in poplar and aspen leaves to light, temperature and CO<sub>2</sub> concentration.

This paper is dedicated to the 80<sup>th</sup> birthday celebration of Guivi Sanadze whose research into the biochemical nature of isoprene emission inspired all of us to view photosynthetic carbon flow in a new light.

### BIOSYNTHESIS AND ACCUMULATION OF ISOPRENOID CAROTENOIDS AND CHLOROPHYLLS AND EMISSION OF ISOPRENE BY LEAF CHLOROPLASTS <sup>1)</sup>

Hartmut K. Lichtenthaler

Chloroplasts and other plastid forms possess a genuine biosynthetic pathway for the synthesis of isopentenyl diphosphate (IPP) and isoprenoids: the 1-deoxy-D-xylulose-phosphate/2-C-methylerythritol 5-phosphate pathway, known as DOXP/MEP pathway. This isoprenoid pathway provides the C<sub>5</sub> isoprenoid precursors (IPPs) needed for the light-induced biosynthesis of chlorophylls (C<sub>20</sub> phytyl side-chain) and of the tetraterpenoid carotenoids (C<sub>40</sub> isoprenoids) which are essential constituents of photochemically active thylakoids of chloroplasts. The performance of the DOXP/MEP pathway is reviewed and the accumulation and final concentration of chlorophylls and carotenoids in photosynthetically active leaves is provided. Under high-light (> 1000 μmol photons m<sup>-2</sup> s<sup>-1</sup>) and high temperature conditions (> 28 °C) many plant leaves emit volatile hemiterpenes at high rates, either isoprene (broadleaf trees) or methylbutenol (American ponderosa pines), both of which are formed via the plastidic DOXP/MEP pathway. Biosynthesis and physiological significance of the emission of isoprene and methylbutenol are briefly discussed.

**THE MORPHOLOGICAL AND CYTOGENETIC STUDY OF MICROSPOROGENESIS OF NEW SYNTHESIZED AMPHIDIPOID *TRITICUM SINSKOPALEOCOLCHICUM GANDIL.* (2N=42) WITH GENOMIC COMPOSITION A<sup>S</sup>A<sup>S</sup>A<sup>U</sup>A<sup>U</sup>BB**

**Zh.O.Shakaryan,A.E.Avakyan, M.G.Arutyunyan,M.Ts.Hovannisyan**

The comparative morphological and cytological study of new synthesized amphidiploid *T.sinskopaleocolchicum Gandil.* (2n=42) with genomic composition A<sup>S</sup>A<sup>S</sup>A<sup>U</sup>A<sup>U</sup>BB has been carried out. It has been revealed from the results of meiosis analyze, that the parental forms *T.sinskayae* (2n=14) A<sup>S</sup>A<sup>S</sup> and ♂ *T.paleocolchicum* (2n=28) A<sup>U</sup>A<sup>U</sup>BB show partial homology in the first stage of metaphase. It was defined that morphological stability of amphidiploid is conditioned by polymorphism and adaptability of organisms and by the phenomena of amphidiploidization that in its turn brings to balance the chromosomes associations. The parental forms have genes, which affect the disturbance between chromosomes and frequency of chiasms creation. The direct correlation between chromosomes violations and not balanced distribution during the first anaphase are determined.

**ECOLOGICAL MONITORING OF THE SOILS OF THE BASIN OF THE RIVERS GUSARCHAY-GUDYALCHAY OF THE NORTH-EAST PART OF AZERBAIJAN**

**G. Sh. Mammadov, G. M. Abdullayeva**

In north and east of the big Caucasus, the basin of the Gusarchay-Gudyalchay of Azerbaijan has been investigated. According to the result of the ecological monitoring, deterioration of the majority of indicators of fertility is revealed. It is necessary to improve and protect these soils in order to preserve fertility. Basically it is important to pay attention to traction and rebuilding of the forests.

**ECOLOGICAL FEATURES AND ESTIMATION OF SOILS OF ARID THIN FORESTS OF TURIANCHAY STATE RESERVE**

**T.A.Kholina**

The largest area of pistachio-juniper thin forest in Azerbaijan is on the territory of Turianchay State reserve. Considering increasing antropogenous influence, as well as the influence of erosive processes it is necessary to estimate the territory of the reserve, particularly topsoil. For the first time, soil evaluation on characteristic and diagnostic signs of soils of Turianchay reserve has been performed, and main soil bonitet scale has been compiled.

**THE INFLUENCE OF SYSTEMIC FUNGICIDES *IN VIVO* ON FUNCTIONING OF SOME OXIDES OF PLANTS**

**M.V. Kurashvili\*, M.S. Gordeziani\*, T.G. Varazi\*, T.I. Ananiashvili\*, N.D. Kordzadze\*\*, A.D. Chubinidze\*\***

It has been studied the influences of different concentrations of systemic fungicides: Bailetone (triadimefon) and Ridonete (the mix of mancozeb and metalaxyl) on the peroxidase and phenoloxidase activities in leaves and roots of following plants: tomato (*Lycopersicum esculentum*), vine (*Vitis vinifera*), trifoliolate orange (*Poncirus trifoliolate*), boxtree (*Buxus sempervirens*), maize (*Zea mays*) and ryegrass (*Lolium perenne*). It has been shown that activation of oxidizing enzymes by fungicides takes place in plants which have low enzymatic activities. It has been established that both fungicides, especially Ridonete have high phloem mobility and during incubation moves from leaves into roots, where induces the activation of oxidizing enzymes. It has been concluded that in plant the transformation of tested fungicides is carried out by directly participation of oxidizing enzymes, in spite of basic components of these fungicides belong to different chemical classes.

**THE ECOLOGICAL FEATURES OF THE THREE VAROTIES OF FALSE SPIDER MITES (FAMILY *TEMUIPALPIDAE*) OF FAUNA OF ARMENIA**

**K.P. Dilbaryan**

The paper gives ecological data of some representatives of super family *Tetranychoidae* Reck, which are harmful mites of many agricultural plants. The thermal limit and the sum of effective temperatures, necessary for the development of various stages of mites are stated.

## **THE INFLUENCE OF JOINT APPLICATION OF NATURAL MELIORANTS AND ORGANIC FERTILIZERS ON CHANGING THE MOBILE FORMS OF HEAVY METALS IN TECHNOGENE – POLLUTED SOILS IN NOEMBERYAN REGION**

**H. E. Khachatryan**

The paper deals with the results of vegetation and field experiments which have been carried out in technogene – polluted soils in Noyemberyan. It presents the influence of joint application of natural meliorants (zeolite, dacite tuff) and organic fertilizers (manure, biohumus) on changing contents of movable forms of heavy metals.

## **THE RESEARCH ON THE DYNAMICS OF DETOXIFICATION OF ARRIVO AND TOPAZ UPON TREATMENT OF TOMATO BY SPRAYING AND DROP METHODS UNDER THE GREEN HOUSE CONDITIONS**

**L.H. Adjemyan, V.S. Mirzoyan, K.V. Avetisyan, V.V. Mokatsyan**

Under the green house conditions the plants of tomato (Sort Morable) were treated with a 0,1 % mixture of Arrivo and Topaz by usual spraying method (50 mL per each plant) as well as a drop method (200 mL per plant plus irrigation). The residual amount of the pesticides in the leaves and tomato fruits were determined with the help of thin layer chromatography after 1, 5 and the 8 days of treatment, while the detoxification of Arrivo was continual, both upon the treatment by usual spraying method and by drop method.

## **COMPARATIVE INVESTIGATION OF TOMATO LOCAL VARIETIES AND AMERICAN HYBRIDS**

**G.V. Avagyan**

It were investigated tomato local varieties (NVER, GYUMRI, ERAZ, LIA, SYUNIK, ZURAB, LUSINE) and American hybrids (TOPSPIN, HYPEEL-108, HYPEEL-45, SHASTA, FERRY-Morse, SUN-6117, CXD-152, HEINZ-8892, TARIM, Halley-3155, AB-407). Comparative study showed that local varieties have the following advantages: bigger fruits with higher testing quality and higher demand for fresh consumption. Foreign hybrids have higher yield, more transportable and resistant then local varieties, and used mainly for processing. It is suggested to use the parental forms of Armenian tomato varieties NVER, SYUNIK, ZURAB and American hybrids SHASTA, FERRY Morse, CXD-152 for creating new resistant varieties or hybrids with high yield and marketable quality.

## **PROGNOSIS OF THE PHYSIOLOGICAL CONDITIONS OF *Cerambyx cerdo* L. IN GEORGIA WITH THE METHODS OF HEMATOLOGICAL ANALYSIS**

**M.S. Chkoidze**

The paper starts with the descriptions of the consistency of hemolymph of *Cerambyx cerdo*. The research shows, that pests hemolymph consists of the following hemocytes: proleukocytes, macronucleocytes, micronucleocytes, phagocytes, enocytes and dead cells. Special type of homocyte, Grain bolls was discovered in pupas and beetles. The results of researches of 2007-2008 for establishing physiological stability of *Cerambyx cerdo*'s population in natural conditions gives us the right to make a conclusion that the *Cerambyx cerdo* in natural conditions is affected with many diseases, which are provoked by fungi, viruses, bacteria's, unicellular organisms, from sporozoa. Besides the effects of diseases do not have an influence on decreasing quantity. It is proved that the *Cerambyx cerdo*, spread in western part of Georgia is characterized with lower viability, than that from east Georgia.

## **ALKALIPHILIC ACTINOMYCETES OF SOME SOILS OF EASTERN GEORGIA**

**D.T. Pataraya, M.A. Gurielidze, T.A. Berishvili, N.T. Cholokava, G.V. Zaalishvili, T.R. Urushadze, R.M. Khvedelidze**

Alkaliphilic actinomycetes isolated from raw humus calcareous, cinnamonic calcareous, alluvial calcareous, cinnamonic leached, mountain-meadow soddy and mountain-meadow soils of Eastern Georgia have been studied. Distribution of alkaliphilic actinomycetes in soils has been studied. 109 cultures of alkaliphilic actinomycetes have been isolated. On the basis of morphological-cultural, physiological-biochemical and antagonistic properties their specific composition has been identified. It has been stated that these soils are rich in representatives of *Streptomyces*, *Nocardia*, *Streptosporangium* and *Micromonospora* genera. The cultures, characterized by alkaline protease, amylase and nitratereductase activities have been revealed. The species with hydrocarbons: hexane, benzene, 3,4-benzpyrene

and dichlorobenzene detoxification ability have been established. The revealed cultures are not pathogenic to plants and some of them stimulate growth and development of plants.

#### **SELECTION OF BACTERIA DEGRADING SODIUM PENTACHLOROPHENOLATE**

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T. Z. Sachaneli\*, L. D. Zuroshvili\*\*, Kh. J. Varsimashvili\*, L. M. Tinikashvili\***

The ability to degrade sodium pentachlorophenolate (concentration 0.75 mM or 1.0 mM) has been studied in bacteria isolated from soils of different regions of Georgia, under the conditions of deep cultivation. Several strains capable of degrading over 90% of sodium pentachlorophenolate were revealed. All investigated cultures degraded better Na-PCP in the presence of glucose, an additional source of carbon, in the nutrient medium. The strain under conditional number 9J52, degrading sodium pentachlorophenolate by dechloridation, displayed the best result. Introduction of toxicant into nutrient medium at different stages of culture growth has no significant impact on biomass accumulation.

#### **AVERAGE STATISTICAL PARAMETERS OF MOBILE ZINC IN RAW-HUMUS CALCAREOUS SOILS OF WESTERN GEORGIA**

**N.T. Nikoleishvili**

The paper describes average statistical characteristics of mobile zinc in soil of the experimental plot on the variant application of fertilizers. The coefficient of variation of this element was studied. It is stated, that the difference in content of mobile zinc in raw-humus calcareous soil on the variant without fertilization is certain. In the conclusion of the paper shows dynamics of mobile zinc in raw-humus calcareous soils of Western Georgia.

#### **NUTRIENT RESERVE FORMS OF POTASSIUM IN SOME SOILS OF AZERBAIJAN**

**V.V. Bashirov**

Nutrient reserve forms (immediate, intermediate and potential) of potassium in chestnut soils (irrigated, regular and light chestnut) were investigated. The light chestnut soils differ from other soils according to the amount of immediate nutrient reserve and have the highest amount of easily assimilated potassic compounds (1,36-1,96% according to the soil profile). It can be explained that the soil absorbing complex in light chestnut soils was formed perfectly because of generation of high disperse clay minerals in the result of intensive weathering and soil forming processes. The amount of intermediate nutrient reserve is quite high (35,8-41,5%) in the irrigated chestnut soils. It's more correct to explain it with the connection of high amount (28,85-33,7%) of silt fraction in those soils as well as domination of potassic compounds in chemical composition of the silt fraction. The highest rate (59,31-63,19%) of potential nutrient reserve in regular chestnut soils can be explained with low portion of immediate nutrient reserve in the content of total potassium reserve in these soils.

#### **EFFECTIVE TECHNOLOGY OF MIXED GRASS CROP GROWING FROM LEGUME CEREALS**

**R. A. Sahakyan, A.R. Baghramyan, G.A. Tovmasyan**

During the years of trials performed in high mountainous conditions of the country (about 2100m above sea level) the high efficiency and economic reasonability of minimal (energy saving) technology of growing perennial mixed grass crop from legume cereals was proved. Comparing with conventional methods it does not affect negatively on yield, at the same time reducing the labor and fuel expenses by 57-62%, assuring the yield of 330-350 center per hectare of high quality green mass which equal to 62-64 center per hectare of the fodder unit.

#### **AMELIORATION OF SODIUM SOLONETZ-SOLONCHAK OF ARARAT PLAIN BY USING HCL-INDUSTRIAL WASTE OF SCIENTIFIC-INDUSTRIAL ASSOCIATION "NAIRIT"**

**V.A. Papinyan, V.N. Nuriganyan, A.S. Hovhannisyan, R.R. Manoukyan**

For melioration of sodium solonetz-solonchak of Ararat plain as a meliorant were used hydrochloric acid- industrial waste of scientific industrial association "Nairit" and were conducted vegetative experiments in polyethylene tubes with height 120 cm, diameter 15 cm and field experiments on 4 hectare in Zartonk village of Armavir region. On the basis of implemented research for melioration of sodium solonetz-solonchak of Ararat plain it is recommended using of 30 % HCL as a meliorant. After adding hydrochloric acid in soil it is necessary to plough it with turnover of a layer.

## **MIGRATION OF HEAVY METALS IN THE SYSTEM OF THE SOIL-PLANT IN LENKORAN REGION**

**A.B.Akhundova, M.Z.Zarkua, H.J.Salimova**

The carried out investigations gave us an opportunity to reveal the definite tendency for the accumulation of the learnt microelements in the separate plants. In particular, the degree of manganese accumulation vibrates from 0.2 to 0.79, molybdenum-0.5-1.2; copper-0.54-1.23; cobalt-0.25-1.1; nickel-0.15-1.1; vanadium-0.05-0.2; zinc-0.38-1.6; lead-1.0-2.5; cadmium-2.0-2.8 independence on degree of soil provision by microelements. Analysis of coefficient of the biological absorption by organs of the different wood rocks allows to reveal definite regularity. Heavy metals are absorbed by the leaves more energetically than branches. The carried out investigations showed that the studied heavy metals on biological activity in plants of the Lenkoran region can be placed in the following lines:  $KBP_{Cd} > KBP_{Pb} > KBP_{Zn} > KBP_{Cu} > KBP_{Ni} > KBP_{Co} > KBP_{Mo} > KBP_{Mn} > KBP_{V}$ . The got results give the ground to believe that a kind specification leaves its traces on distribution of microelements in plants. The large limits of the vibration in microelement composition, it is obvious are connected with the soil conditions which distinguish on microelement composition.

## **AGROCHEMICAL PECULIARITIES OF THE MAIN SOILS OF GEORGIA**

**O.I. Zardalishvili, T.F. Urushadze, A.T. Txelidze, T.T. Urushadze**

The existing data (including own research) of the total (%) and mobile (mg/100 gr soil) forms of the main nutrients elements (nitrogen, phosphorus, potassium) in the soils of Georgia have been generalized. As a result authors have stated the following decreasing indexes of soil fertility: mountain-meadow > meadow-cinnamonic > brown forest, red, chernozems, black, cinnamonic, grey-cinnamonic > raw-humus calcareous > haloporphic soils > alluvial > subtropical podzols.

## **SOIL - ECOLOGICAL PECULIARITIES OF THE ABSHERON PENINSULA IN AZERBAIJAN**

**V.A.Babayev**

The paper deals with the contemporary condition of the Absheron peninsula, occupying a significant place in the economy of the republic and more than 100 years, settling under unremitting anthropogenic pressing. The paper gives the short characteristic of the contemporary soil-ecological condition of the Absheron peninsula, composed on the basis of the collection, generalization and analysis of own investigations, literature and fund materials. The main influential factors, negatively influencing ecological stability of biosphere of the peninsula, are violation of exploitation of the natural richness of the district and ecologically unfavorable placing of the industrial objects of oil-processing, chemical and metallurgical branches of the industry

## **THE EVOLUTION OF CHANGES INTERNAL PRESSURE OF TIRES OF VEHICLES EXPLOITING IN MOUNTAIN CONDITIONS**

**A. P.Tarverdyan, G. S. Yeritsyan**

The internal pressure of vehicles' tires is changed depends on pressure of atmosphere and air temperature in mountain conditions. The formula for evaluation of that change is deduced.

## **SUBSTANTIATION OF PARAMETERS OF HEATING PUMP HELIOSYSTEM OF HEATING INSTALLATION FOR THE COMBINED DRYING OF VEGETATIVE RAW MATERIAL**

**V.N.Javruyan, A.V. Hovhannisyan, A.R.Simonyan, A.S.Martirosyan**

The paper deals with the basic diagram of worked out heating pump heliosystems installation for the combined drying of vegetative raw material. It gives the patterns of analytical calculation of parameters of units and subsystems of helio heat pump installations, including helio-collector, the low-temperature tank accumulator, heating pump, high-temperature tank accumulator and drying room for the combined drying.

## **ENERGETIC-TECHNOLOGICAL EFFICIENCY OF REPLACING FIELD BOARDS OF PLOUGHS WITH ROAD-ROLLERS (SECOND INFORMATION)**

**A.A. Hovhanisyan**

The contact resistance while slipping on the plough trunk of the field boards of general significance influences considerably the whole dragging resistance. In order to reduce the power of dragging contact we have suggested to change field boards with slipping contact with road rollers with rolling surface. Having analyzed theoretically the process of interaction of the rolling field board and furrow wall it has been proved that it is possible to reduce dragging resistance by up to 23% while replacing field boards of the plough with slipping contact with road-rollers.

## **INFLUENCE OF MORPHOMETRICAL AND HYDRAULIC CHARACTERISTICS ON THE FORM OF CROSS-SECTION OF A CHANNEL**

**I.G. Kruashvili, E.G. Kukhalashvili, I.D. Inashvili**

Proper selection of design parameters for hydraulic engineering constructions of the protective line of river side is in direct connection with engineering problems of regulation of channels. Change of flow depth with taking into account its sustainable width, is the function of discharge of channel-forming flow, channel bed slope, diameter of particles, and coherency of soil. Proceeding from the above mentioned, for solution of the problem the theoretical model is used, which considers the change of depth of channel cross-section taking into account width and is presented in the form of qualitative dependence. Unknown characteristics included into theoretical model have been established and the forecast model of change of sustainable cross-section has been received.

## **INVESTIGATION OF THE PROCESS OF CONCENTRATION OF NATURAL FRUIT JUICES USING THE THEORY OF SIMILARITY AND DIMENSIONS**

**J. V. Katsitadze, E. D. Katsitadze, T. A. Chuchulashvili**

The paper gives the methodology to receive general and analytical form of criteria equation to investigate the process of concentration of natural fruit juices and on the basis of experimental data an adequate mathematical model has been received.

## **THE CATTLE INFESTATION BY SOME ROUNDWORMS AND PROTOZOA IN DIFFERENT NATURAL-CLIMATIC ZONES OF ARMENIA**

**L.A. Movsisyan**

Cattle infestation by roundworms and protozoa is registered in all geographic areas of Armenia and equals to 74.69%. The highest level of infestation was detected in autumn 2007, in lowlands with arid continental climate (90%). Intestinal Strongylata were the most prevalent group of parasites (62.9%). Cattle infestation by *Nematodirus sp.* was as large as 12.9%; *Cooperia sp.* - 42.26%; *Trichostrongylus sp.* - 21.38%; *Ostertagia sp.* - 13.55%; *Oesophagostomum sp.* - 18.9%; *Haemonchus sp.* - 15.66%; *Chabertia sp.* - 0.90%; *Bunostomum sp.* - 3.91%; *Marshallagia sp.* - 0.30%. The level of animals infestation by lungworms was approximately 1.50%, i.e. *Dictyocaulus sp.* - 1.50%; *Protostrongylus sp.* - 0.30%. *Toxocara vitulorum* roundworm was detected in 1.50% of animals, *Trichocephalus sp.* - in 2.10%, and *Eimeria sp.* - in 32.22% of cattle.

## **POSSIBILITIES OF THE MECHANISM OF BIOCHEMICAL ADAPTATION TO ENVIRONMENTAL CONDITIONS FOR 5 SPECIES OF ANURA SPREAD IN ARMENIA**

**E. M. Yegiasaryan, E. Kh. Barsegyan, M. A. Davtyan**

The ureothelic type of nitrogen excretion is common for 5 species of frogs, spread in different geographical zones of Armenia (from 740 to 2500 m above the sea level). The isoenzyme spectrum of these species' liver arginase was investigated. It showed the significant differences in biochemical processes regulation, which seems to be giving a possibility for survivability and development, and can be a manifestation of "biochemical adaptation" to particular environmental conditions.

## **THE PECULIARITIES OF THE DETERMINATION OF THE MORPHOPHYSIOLOGICAL CONDITIONS OF LIVING IN THE KURA RIVER FISHES**

**G. S. Kvinikhidze, A.T. Kvesitadze, J.N. Fidler**

Investigation of phenols and microelements concentration in the water of the river Kura and simultaneously in organs (hepar, gills, eyes) of living there fishes: *Varicorinus capoeta* (khramuli), *Rutilus rutilus* (gudgeon), *W.C.Constructor* (bull heads), showed that both in the water and in the investigated organs of fishes the phenols concentration increases from village Vardzia to town Rustavi as a result of the river Kura water pollution by waste. Contrary to phenols, concentration of microelements (P,Cu, Mg,Zn,Fe,Co,Ca) (except Mg and Zn) decreases in the river Kura water. concentration of all investigated microelements in hepar and gills of fishes (e.g. Khramuli) also decreases. The difference in phenols and microelements content in organs of fishes of various species is determined. Great amount of phenols and microelements as P, Cu, Fe, is revealed in the hepar of Khramuli. In the gills of Khramuli, gudgeon and bull head there is little concentration of phenols, but big concentration of Mg and Ca<sup>+</sup> ions, that is connected to species and morphophysiological peculiarities of these organs' cells. The histological and electric microscopic studies show, that the increase of phenols concentration and simultaneous decrease of the amount of microelements concentration as well as invasion and intoxication by the helminth *Diplostomum spathaceum* cause considerable structural, ultrastructural and quantitative changes of RNA concentration and albumin in the organs' cells of the studied fishes and it indicates disturbance of albumin synthesis in the cells and decrease of morphofunctional activity. The influence of weak additional loading of 2,4 dichlorophenol (0,28mg/l) showed the significant increase of overall content of phenols in the cells of hepar, gills, eyes and bile, particularly in the fishes with the mechanically damaged skin. It indicates that morphofunctional condition of fishes plays a big role in the process of phenols accumulation in the fishes' organs. The investigation showed that the correlation of phenols and microelements concentration in the river Kura water enables to carry out biomonitoring of morphological conditions. The influence of weak additional loading of 2,4 dichlorophenol (0,28mg/l) showed the significant increase of overall content of phenols in the cells of hepar, gills, eyes and bile, particularly in the fishes with the mechanically damaged skin. It indicates that morphofunctional condition of fishes plays a big role in the process of phenols accumulation in the fishes' organs. The investigation showed that the correlation of phenols and microelements concentration in the river Kura water enables to carry out biomonitoring of morphophysiological conditions of the fishes living there.

## **DEATH OF THE NEW-BORN PIGLETS DURING THE SYNDROME MMA**

**T.K.Kurashvili, R.D.Chanturidze**

In base-farms, among 253 investigated sows, 60,07% was infected with the syndrome of MMA in different degrees. Among 1387 piglets, born by infected sows, 29,49% were dies, while among the piglets of clinically healthy sow, only 14,39% died. The death piglets is in direct dependence with the sows diseased with the syndrome of MMA.

## **ABOUT THE EPIZOOTIC PROCESS OF MAIN NEMATODOSIS OF DIGESTIVE TRACT OF RABBITS IN GEORGIA**

**M.A.Mosidze**

Passalurosis, Trichocephalosis and Trichostrongylosis are the main nematodosis of the digestive tract of rabbits in Georgia. The rabbits aged 7-12 months are more infected by the causative agent of these diseases in the second half of the year. The infective origin of Passalurosis, Trichocephalosis and Trichostrongylosis are accumulated at the farms of all kinds in the second half of the year. Dirty feed boxes are the factor of transmission of infective agent at the major farms with cellular keeping (wire netting floor); and dirty floors and feed boxes – at the adjoining farms, where rabbits are kept extensively.

## **CUMULATIVE PROPERTIES OF SULFONOL**

**Sh. A. Makaradze**

The results of estimation of cumulative properties of the preparation Sulfonol for fish and *Daphnia magna* straus are given. The experiments were carried out in the conditions of the aquarium, where water temperature was 16–18<sup>0</sup>C containing 8 ml/l of dissolved oxygen and pH – 7.2. The technical 39.4% preparation of Sulfonol (made in Sumgaiti plant) was used as testing preparation in which sodium-acilbenzolsulfonate on the basis oa normal paraffins is an active substance. At the beginning of the experiments while studying acute and chronic poisonings the main parameters of Sulfonol toxicity for year-old carps and *Daphnia magna* straus have been determined and then the coefficient of cumulation (I cum) has been calculated. It made up 1.062 for fish and 1.72 for *Daphnia magna* straus. These indices indicate weak degree of accumulation of toxic effect in fish as well as in *Daphnia magna* straus. According to the results

of functional accumulation Sulfonol for fish and *Daphnia magna* straus may be referred to the group of substances with weakly expressed degree of cumulation.

## **INTRAVENOUS CHLORPROMAZINE – PROCAINE APPLICATION IN DOGS**

**V.I. Tvaliashvili, A.I. Ruadze, S.B. Chapidze**

Relief or prevention of suffering in animals is one of our primary objectives. This paper is devoted to the problem of safe chemical restraint of dogs, with simultaneous ganglion blocking.

## **BEEF PRODUCTION IN THE ZONE OF INTENSIVE AGRICULTURE**

**L.A. Tortladze**

The investigation of the intensive raising and fattening of bull-calves of Brown Caucasian Breed has been carried out on the farm "Nikora." During the experiment 2593 feed unit was consumed. At the age of 19 months the live weight of bull-calves made up 476,2 kg., carcass weight 54,5 kg., slaughter yield 58 %, on per unit of production 5,9 feed unit was consumed. Intensive fattening is viable until the bull-calves are 15 months old.

## **PECULIARITIES OF SODIUM, CALCIUM AND CHLORINE METABOLISM OF BROILERS**

**M.K Kurashvili, N.J. Vepkhvadze**

The paper gives the data regarding biochemical and morphological composition of the broilers blood depending on their age. It is stated that chemical and morphological composition of the broilers blood is changed along with the age. Concentration of calcium and chlorine gets higher at the age of 30 days with the subsequent reduction up to the initial level of the slaughter age. Concentration of the sodium in the blood serum before 30 days was getting low with the subsequent increase.

## **THE NEW PRODUCTS FOR CHILDREN NUTRITION**

**A.V.Khotivari, G.Z.Grigorashvili, I.V.Kupatadze**

By result to grow of food value of children's food product's, we used from wild growing fruit, received different juices and puree's coup age. Chemical analysis of fruit and berry showed that sweet brier, cornel, apple has higher amount of micro-nutrients iron and ascorbic acid in comparison to other fruit and berries. This was the main reason of using these fruit berries as raw material for different food production. In time of coup age remaking we tried different norms of mixing components and define organoleptical quality of ready products. In preparing process by result of biological value growing of received product's from children's organisms securing we entered irons ions and ascorbins acid.

## **PARTICIPATION OF N-GALACTOSIDE IN THE PROCESS OF FORMATION OF MELANOIDINS**

**I.G. Abdushelishvili, R.I. Kublashvili, Z.A. Kuratashvili, B.C. Tsereteli**

The influence of galactose on the process of formation of melanoidins in reactions with the N-(o,m,p)- benzoic acids has been studied. The intermediate products of reaction N-glycoside are separated. The role of pure galactose in formation of melanoidins in conditions of different acidity has been investigated. The possibility of receiving N-galactosides from aminobenzoic acids according to our experiments is the following: p-aminobenzoic acid > o-aminobenzoic acid > m-aminobenzoic acid. In the reactions between galactose and aminobenzoic acids the formation of N-galactoside and melanoidins is observed. N- glycosides are completely transformed into the melanoidins in the buffer systems (pH-4,6; 6,95; 8,6) at the heating temperature of 100°C.

## **INFLUENCE OF GAMMA RAYS ON AMINOACID COMPOSITION OF RADIATIONALLY PROCESSED FOODSTUFF**

**S. I. Sahradyan, V. S. Voskanyan**

Optimal doses of gamma rays on quantitative composition of nitrogen-holding substans of bread, different vines and boiled sausages has been studied. It was shown that radiation by  $D\gamma = 3,0-4,0$  kGy practicaly does not affect food value of the ctudied foodstuff and it can be for their processing aimed to increase their stopage tems.

## **NEW TECHNOLOGY OF CHEESE PRODUCTION**

**Z.I. Tskhvedadze, G. T. Begheluri, E.G. Kalandia, N.F. Chitaidze**

New technology offers an alternative way of producing sheep cheese, namely, it is possible to produce an analogue of sheep cheese from cow milk, if we add capron, caprin and capryl acids in the milk. They will give the cow milk the specific smell, taste and aroma of sheep cheese. If we increase richness of cow milk by adding cream in the milk, we shall achieve the respective indexes of sheep milk. The results of numerous experiments, carried out by us prove this. There is a possibility of production of an analogue of sheep cheese from cow milk in all the regions of Georgia, as there is sufficient amount of cow milk everywhere.

## **THE GROWTH AND PRODUCTIVITY OF *CORYLUS COLURNA L.* IN NORTH-EASTERN ARMENIA**

**A.H. Ghulijanyan**

The conditions of Ijevan region are favorable for the growth and development of *Corylus colurna L.* The connection between the average current growth and wood-stock is analyzed in the paper. In the abovementioned growing area the kernel makes up 48.7% of the whole nut, content of oil in the kernel is 59.6%, of proteins 17.8%, of sugar 17%, and of ash 2.77%. The paper suggests urgent and efficient measures of protection.

## **STRUCTURE AND NATURAL RESTORATION OF DARK CONIFEROUS FORESTS OF ADJARA**

**M. A. Svanidze, N. B. Mamuladze**

The paper deals with characteristics of Adjarian dark coniferous forests structure and natural restoration. The structure of spruce-fir forests is conditioned by different ages of trees characterized by layering. Natural restoration of spruce and fir species in natural windows goes on much better, than under the forest canopy.

## **PENETRATION OF LIQUID ATMOSPHERIC PRECIPITATION THROUGH CANOPY OF BASIC FORMATIONS OF SUBALPINE FORESTS**

**O.I. Dvalishvili**

By the stationary way was investigated the penetration of liquid atmospheric precipitation through the canopy of subalpine forests. Holding ability of canopy of atmospheric precipitation and the protective role of canopy of different formations of subalpine forests is revealed. The hydrological role of these forests in the redistribution of a liquid atmospheric precipitation on a surface of ground is determined. Recommendations with a view of augmentation of water resources of the country, prevention of occurrence of erosive processes, high waters, flooding and harmful consequences, connected to them, are given to the corresponding facilities.

## **THE SOCIO-ECONOMIC STATE OF THE POPULATION AND THE WAYS OF ITS IMPROVEMENT IN LORI MARZ**

**A.T.Kirakosyan**

Lori region is one of the regions in Armenia with huge economic potential. On July 1, 2008 the recorded population made 281,7 thousand people. At the end of April 2008 the supply of labor resources presented the following picture: 13,8 thousand people were looking for jobs, out of which 11,9 thousand were unemployed. Now the social state of the marz in its main features is the same as it is in the republic (low level of living standards of the population, higher percent age of poverty, higher level of unemployment, social tension). The typical social problems for the region are high level of migration and the outflow of young and qualified labor resources, low level of natural growth (1.4%), growth of poverty (54.2%), disproportionate distribution of the population, superiority of small rural communities. The major way to solve the problems of the marz is the development of the economy and first of all the improvement of the industrial sector. The industrial sector is presented by 98 large and medium enterprises. The paper describes some enterprises in large cities of the region. Building up the industrial enterprises, providing an effective investments environment and consequently creation of new available vacancies will considerably calm down the social tension.

## **THE PROBLEMS ABOUT THE DEVELOPMENT OF THE SOCIAL-ECOLOGICAL-ECONOMIC SYSTEM**

**N.G. Afyan**

The cases of the development of the social-ecological-economic system, as well as the influence of the ecological and economic interactions on this process are analyzed in the paper. In this paper a number of authors studied the mentioned problems but the methods of the investigation of the social-economic potential are not studied properly. Ecological economic contradictions chiefly influence all the factors of the production on all levels of social ecological system, and make an influence on the effectiveness of their use and the effectiveness of the activity of all system on the whole.

## **GEORGIAN FOOD SECURITY ANALYSIS: PROBLEMS AND PROSPECTIVE**

**P.P. Koguashvili, G.V. Zibzbadze**

The paper analyzes the feasible reasons of global food security crisis and the real level of Georgia's food security. It is pointed out that the fields of agrarian sector, that should provide country's food security are not relevant to modern demands. The paper also gives recommendations of developing agrarian sector. Namely, manufacture and social development in village, the agro crediting and material-technical maintenance and marketing cooperatives forming regulations and so on. Grain growing economy and especially production of wheat has a great strategic and social-economic significance in agrarian sphere. One third of product in food sector comes from the grain economy. According to the world standard food security and protection based on grain producing, especially on wheat which provides developing the other branches of food complex to increase wheat economy and to decide real problems in this sphere is the most important condition for safe guarding of independence and security of the country. In recent years the grain production reduction and the price permanent increase tendency has been revealed in the whole world. It is conditioned by population growth. Population growth level outnumbers the grain production growth per capita. Because of this, the countries having relevant land resources, try their best to provide local grain production development. According to scientists and experts the agrarian land transformation gives possibility to expand the sown areas by 4 thousand hectares, to 180-200 thousand hectares in Georgia. The structural transformation of the sown land makes it possible to produce 1.4-1.5 million tones of grain in average time period. This number is absolutely satisfying for Georgia to provide its food safety guarantee.

## **SOME ISSUES OF THE REGULATION OF BANKING ACTIVITY**

**S.S. Sukiassyan**

The overall issues concerning the regulation and supervision of banking activity are studied in the paper. The emphasis is made on the fact that international cooperation in the sphere of regulation of banking activity is being developed in the direction which involve the gradual transition from implementation of quantitative standards the gradual transition towards the risk-oriented supervision. The latter could not prevent the world financial crisis. An attempt is being made to identify the influence of the so-called "passive" risk before the evaluation of the risks of active operations, one should find the influence of the so-called «passive» risk, when for one unit of capital, the banks, have an opportunity to draw much larger funds from the investors.

## **TEA GROWING IN GEORGIA: THE REASONS OF CRISIS, WAYS OF REHABILITATION AND PROSPECTS**

**R.Kh. Jabnidze**

The paper deals with the issue of the growing in Georgia, reasons of prolonged crisis, particular measures of its rehabilitation and prospects of its further development in market conditions.

## **THE ROLE OF PROFESSIONAL ORGANIZATION IN DEVELOPMENT OF ACCOUNTING AND AUDITING IN ARMENIA**

**H.G. Mnatsakanyan**

The article refers to the modern problems in the field of accounting and auditing in the Republic of Armenia and presents the role and necessary activities of professional organization of Armenia for proper development auditing.