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Book of Abstracts

1st International Conference on One Health: Problems & Solutions

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Book of Abstracts

1st International Conference
One Health: Problems & Solutions

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About "One Health: Problems and Solutions" Conference

*"Getting Together to Enhance Better Cooperation and Collaboration
between Health and Environmental Professionals
to Promote Understanding of the Importance of One Health"*

On June 1-2, 2018, the 1st International Conference on "One Health: Problems and Solutions" was held at Khazar University, Azerbaijan. Khazar University has been incorporated into the Planetary Health Alliance (PHA) Consortium housed at Harvard University; simultaneously, the conference announced as "Partner Event" by PHA held its annual conference at University of Edinburgh, UK.

More than 30 experts from Azerbaijan, Turkey, Russia, Iran, Georgia, USA, Canada, and Switzerland participated in the conference. Moreover, the representatives of the Republic of Azerbaijan Ministry of Health, in Ministry of Ecology and Natural Resources, Ministry of Emergency Situations, Ministry of Transport, Communication and High Technologies, Ministry of Agriculture, Food Safety Agency, and the local district municipality attended the conference.

The professionals with various expertise ranging from public health to ecosystem health, and also government officials gathered to build capacity, discuss the problems and solutions, tackle health problems, and support One Health approaches. The goals of the conference were to enhance better cooperation and collaboration between health and environmental professionals, promote understanding of the importance of One Health, exchange data and knowledge, and recognize and improve human, animal, and ecosystem health issues in Azerbaijan and the world.

Conference highlights were:

• Antimicrobial Resistance
• Ecosystem Health (plant, human, animal and environment)
• Public Health
• One Health Approach

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**1ˢᵗ International Conference
One Health: Problems & Solutions**

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[01]

Evaluation of the Quality of Eidss' Database for Maintaining a High Level of Electronic Reporting

Zlata Rasulzade[1], Narmin Ustun[1], Rita Ismailova[1], Nazifa Mursalova[2], Rakif Abdullayev[1], Viktor Qasimov[2]

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ABSTRACT

Electronic reporting was officially implemented in Azerbaijan in 2010 through Electronic Integrated Disease Surveillance System (EIDSS), which allows storage and tracking of surveillance data for 67 notifiable diseases, including Especially Dangerous Diseases (brucellosis, anthrax etc.). Aim of this work was to explain the importance of maintaining a high level of electronic reporting in the country. A chi-square trend test was conducted by using of Epi-INFO software to assess significant changes in data quality indicators for brucellosis: timeliness of data entry and completeness of laboratory and epidemiological data over the period 2010-2017. A total of 2824 cases of human brucellosis were reported to the EIDSS during the study period. Timeliness of data entry into EIDSS significantly increased from 25.7% (2010) up to 92.6% (2017) ($p<0.001$). The proportion of completed fields for sample collection data increased from 88.3% in 2010 to 98.2% in 2017. The laboratory data entry into EIDSS was not complete in 2010, and completeness of laboratory data (conducting of test, test name, test result) has increased since 2013 (84.5%, 84.5% and 82.2% respectively) and have significantly improved by years reaching a maximum value for all indicators – 95.9% in 2017 in average ($p<0.001$). Possible measures for increasing data quality might be entering of information directly by medical institutions; conducting of remote online trainings on users' workplaces; simplification of laboratory module's interface and continued implementation of Data quality indicators, developed by Ministry of Health and ongoing monitoring by EIDSS Working Group. Timeliness of data entry, completeness of laboratory and epidemiological data for brucellosis has significantly improved over the years after introducing of the EIDSS. Ongoing evaluation of the EIDSS data quality indicators for all notifiable diseases should be conducted in order to ensure data quality and timely identification of data reporting issues.

Keywords: brucellosis; data quality; electronic reporting; quality indicators

[02]

Isolation of Bacillus Anthracis from Soil in Selected High-Risk Areas of Azerbaijan in 2017

Sheyda Shikhaliyeva[1], Rita Ismayilova[1], Gulkhar Jahanova[1], Sabina Ibrahimova[1], Rakif Abdullayev[1]

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ABSTRACT

The problem of anthrax spread remains very serious for Azerbaijan. There are some permanent high-risk areas with multiple pockets of anthrax infection in the soil, which persist for a long time. This unresolved problem can potentially lead to new epizootics, the possibility of spreading the pathogen outside the epizootic area with infected livestock products, and human diseases. In the Republican Anti-Plague Station (RAPS), we have carried out an investigation of the soils from these high-risk points, in particular from the cattle burial sites, for the presence of anthrax spores. The choice of sites for soil collection was determined based on the archival data from RAPS. All regions of the republic have been divided between the five Anti Plague Divisions (APDs) namely Mingechavir, Imishli, Khachmaz, Shemkir, Lenkoran. Samples of soils were collected by APDs and sent to RAPS for analysis. Each APD collected 20 soil samples, thus the total number of samples equalled to 100. Laboratory diagnostics was carried out in the BioSafety Level 2 (BSL 2) laboratory of RAPS by the bacteriological method and confirmed by PCR. Out of the 100 samples, four cultures of Bacillus anthracis have been isolated. Two cultures were isolated from the soils collected by the Mingechavir APD at the cattle burial sites in the Gakh district (one of them from the village of Chalair and one - the site at Ingloy village). Two cultures were isolated by the Shemkir APD in the Shemkir district (one of them from the village of Seifeli and another - from the village of Sabirkend). Considering active livestock development in these areas we recognize the necessity of carrying out continuous monitoring activities there. When anthrax spores are discovered in soils, we recommend large-scale soil disinfection and additional vaccination of animals.

Keywords: Bacillus anthracis; culture; spore; laboratory diagnostics

[03]

Microbial Structural Transformation of Tibolone (Hrt Drug) by Cunninghamella Blakeasleena, Produced Five New Metabolities (Methylated and Hydroxy Metabolites) and their Advance In-Silico Studies

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ABSTRACT

Five new and one known bio-transformed metabolites were obtained by the microbial transformation of tibolone and (Acetylinic steroid) (HRT drug) with fungi *Cunninghamella blakesleana.* This study is based on the biotransformation of an acetylenic steroid (tibolone) with a new fungi culture (*Cunninghamella blakesleana*) to produce and identify novel biocatalyst for producing structurally novel and therapeutically potent metabolites. In the present study, hydroxylation, methylation and isomerizations are the keen chemical reactions catalyzed by fungal extracellular complex enzymatic system CYP P450 on tibolone. The structures of bio-transformed products were characterized by using various advanced spectroscopic techniques, including 1D ^{1}H-NMR, 2D homonuclear and heteronuclear (^{1}H-^{1}H NMR (COSY, NOESY), (^{1}H-^{13}C NMR) HMBC and HSQC), ^{13}C-NMR, I.R, U.V and mass spectrometry techniques, the structures were finally confirmed by HREI-MS / HRFab-MS techniques. The relative stereochemistry was assigned by 2D [1]H-^{1}H NOESY experiment. *In-silico* based studies were also carried out to predict the structural Pharmacophore features of metabolites. In conclusion, the biotransformation of tibolone was carried out by using fungi *Cunninghamella blakeasl*eena, out of the six bio-transformed products five were characterized as new compounds, Methylation of tibolone are new and novel enzyme catalyzed reaction attained by microbial transformation. However, fungi *Cunninghamella blakesleana* has been explored as a new source to obtain and identify these novel transformed products,

Keywords: microbiology; structural transformation; new metabolites

[04]

Biosynthesis of Silver/Exopolysaccharide Nanocomposite by Nostoc sp. Ibrc-M5064 and Evaluation of its Antioxidant, Photocatalytic Activity and Antibacterial Effects on Multidrug Resistant Bacteria

Parisa Aletayeb, Parinaz Ghadam, Parisa Mohammadi

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ABSTRACT

Based on the definition of the IUPAC (International Union of Pure and Applied Chemistry), Nanoparticles are called particles that have dimensions less than 500 nm. There are various physical and chemical methods for making nanoparticles, due to the disadvantages of these methods, biological methods of production have been widely considered. One of the biological methods for producing nanoparticles is the use of microorganisms. In this study, the exopolysaccharide of Nostoc sp. IBRC-M5064 was extracted and used as a biopolymer bed for produced AgNPs for manufacturing of nanobiocomposite with proportion of 1AgNP:10 polysaccharide. It had maximum wave length at 386 nm and the result of FESEM (Field emission scanning electron microscopy)-EDX (Energy- dispersive X- ray spectroscopy) analysis confirmed that the AgNPs have been stabilized on the polysaccharide matrix. Finally, the antioxidant and photocatalytic activity of the exopolysaccharide-silver nanobiocomposite were investigated. It was recognized that the nanocomposte scavenges DPPH (2, 2-diphenyl-1-picrylhydrazyl) and it can reduce the amount of methyl orange dye by photocatalytic activity. Also, antimicrobial activity of this nanocomposite against multi drug resistant (MDR) *P. aeruginosa* B52 isolated from burn and *P. aeruginosa* 48 isolated from mucus was investigated and it was shown that it is an effective agent against them. In conclusion, this biosynthesized nanocomposite, which is synthesized with low cost, is an effective antioxidant and antibacterial agent.

Keywords: multidrug resistant bacteria; nanoparticles; antimicrobial activity

[05]

Fungi Screening, Green Synthesis and Characterization of Silver Nanoparticle Using Selected Fungi

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ABSTRACT

Nanotechnology deals with particles in the size range 1-100nm that have important applications in different fields of medicine, chemistry, nuclear physics and so on. Silver nanoparticles are the most commonly and widely used ones. Physical and chemical syntheses are prevalent methods for nanoparticle production, which are energy consumer and utilize harmful chemicals. Living organisms like microorganisms including fungi, bacteria, yeast, actinomycetes and microorganisms, such as plants, algae, etc. (as an intermediary in the production of nanoparticles from inorganic compounds) are used in the green synthesis of nanoparticles. Biological synthesis of nanoparticles is an environmental protective method, which reduces the risk for human health, air, and whole ecosystem. Furthermore, the formation of nanoparticles is performed in normal temperature and pressure. The shape and size of nanoparticles can be controlled by choosing the suitable pH and temperature. In this study, 24 strains of fungi isolated from desert soils were screened in terms of silver nanoparticles synthesis. The A17 isolate were chosen as superior strain that could rapidly synthesize monodisperse silver nanoparticles. The optimum conditions for silver nanoparticle synthesis were investigated and produced nanoparticles with 1mM silver nitrate final concentration, in pH8 at room temperature are smaller in size, monodisperse and with high stability. Synthetized nanoparticles in optimum condition were characterized by UV-visible spectrophotometry, DLS, XRD, TEM and FTIR. It was found that produced nanoparticles are in the form of Ag/AgCl with the size range 5-15nm. Proteins and carbohydrates are attached to nanoparticles, which play an important role in nanoparticle stability. Nanoparticles have the ability to remove heavy ions, photocatalytic decomposition of methyl orange color, antioxidant activity and antimicrobial activity against standard bacterial pathogens *P.aeruginosa* ATCC 27853, E.coli ATCC 25922, *B.subtilis* ATCC 6633 and *S.aureus* ATCC 1431 and multi drug resistant isolated *P.aeruginosa* B52 from burn and *P. aeruginosa* 48 isolated from mucus.

Keywords: fungi; silver nanoparticle; green synthesis

[06]

Antimicrobial Effects of Rhamnolipid-Type Biosurfactant, Produced by *Pseudomonas Aeruginosa Ma01*, Against Clinical Isolates of *Pseudomonas Aeruginosa*

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ABSTRACT

Pseudomonas aeruginosa is a leading cause of nosocomial infections and standard antibiotic regimes against *P. aeruginosa* are increasingly becoming ineffective due to the rise in drug resistance. A vast number of approaches to develop novel antimicrobial agents are currently pursued. In recent years, rhamnolipids derived from *P. aeruginosa* have emerged as an important group of biosurfactants that are being considered as an alternative conventional antimicrobial agent. In addition, they are environment-friendly and effective at low concentrations .A detailed analysis of the *P. aeruginosa* MA01, having high capacity for rhamnolipid-type biosurfactant production, was previously described. Here, we report the antimicrobial effects of rhamnolipid against a number of clinical isolates of the planktonic *P. aeruginosa*. 30 clinical isolates of *P. aeruginosa* were collected from respiratory secretions and burn wounds. The minimum inhibitory concentration (MIC) of purified rhamnolipid biosurfactant against planktonic cells was evaluated using micro-dilution methods. The production and purification of rhamnolipid biosurfactant was carried out as described earlier (Hajfarajollah et al. 2015). The results of this study suggest that rhamnolipid biosurfactant produced by *P. aeruginosa* MA01 has antimicrobial activity against different clinical isolates of planktonic *P. aeruginosa*. MIC values of rhamnolipid were between 0.14×10^8 - 0.59×10^8 µg/ml (for various clinical isolates of *P. aeruginosa*). Due to the proficient antimicrobial effects of rhamnolipid type biosurfactant against clinical isolates of *P. aeruginosa*, it seems that it can be a promising alternative to antibiotics for targeting bacterial pathogens. Further studies are underway to reveal the exact role of biosurfactant for inhibiting the growth of pathogenic bacteria at the cellular and molecular levels.

Keywords: pseudomonas aeruginosa; rhamnolipid; antimicrobial

[07]

Drug-Resistant Destructive Pulmonary Tuberculosis

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ABSTRACT

Increasing the effectiveness of treatment by improving the reparative processes in the treatment of patients with drug-resistant destructive pulmonary tuberculosis (DR DPT) is one of the topical problems of medicine. One of such methods of complex treatment is collapsotherapy. The aim of the study was to scrutinize the effectiveness of collapsotherapy in the complex treatment of patients with DR DPT. 76 patients were examined with DR DPT. 23 of them (30.3%) with full sensitivity to all anti-tuberculosis drugs (ATD), 25 patients (32.9%) with mono- and polyresistance and 28 (36.8%) - with multiresistance. Patients were divided into two groups: I group - basic group, 34 patients, who were prescribed treatment with ATD taking into account the sensitivity test with the use of collapsotherapy and group II (control group) consisted of 42 patients, who only received ATD, also taking into account sensitivity. As a result of the study, it was found that the use of collapsotherapy in patients with DR DPT in the complex treatment increases the effectiveness of treatment, and also by sputum microscopy at the end of the second month in 79.4% and at end 4 months of treatment in 94.1% of patients there was persistent abacillation (in the control group, 52.4% and 66.7%, respectively). It was also found that the use of collapsotherapy for patients with DR DPT led to the closure of the decay cavities in 58.8% (in the control group 23.1%). Thus, we came to the conclusion that the use of collapsotherapy in the complex treatment of newly diagnosed DR DPT, taking into account the test for sensitivity to antibacterial drug, increases the effectiveness of treatment.

Keywords: drug resistant pulmonary tuberculosis; collapsotherapy; effective treatment

[08]

Drug Resistant Pulmonary Tuberculosis in Patients with Chronic Obstructive Pulmonary Disease

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ABSTRACT

The present study reports the clinical and functional features of the current of drug-resistant pulmonary tuberculosis (TB) in patients with chronic obstructive pulmonary disease (COPD). The present study reports the 180 patients who were examined in therapeutic departments of Tuberculosis Hospital No. 4 in Baku, which is the base of the Phthisiatry Department of the Azerbaijan Medical University from January 2013 to December 2017. Among the examined were 33 women and 147 men aged 41 to 69 years. 110 patients (61%) had a widespread process in the lung, destructive changes were found in 126 (70%) patients. All patients were divided into two groups: the first group - 119 patients who had obstructive ventilation disorders in their pulmonary function test study, the 2nd group was formed from 71 patients with unchanged functional indices. Among the examined were 33 women and 147 men aged 41 to 69 years. 110 patients (61%) had a widespread process in the lung, destructive changes were found in 126 (70%) patients. Multidrug-resistant form was found in 36.1% of patients of the 1st and 20.5% in the 2nd group. The results of examination and treatment of patients with COPD testified to the severity and slow regress of clinical and radiological manifestations of the disease, the long-term preservation of bronchial patency disorders. All this led to the advisability of developing a basic of treatment program for patients with TB with COPD. The results obtained indicate a negative effect of bronchial obstruction on the tuberculosis process, which led to the development of a basic treatment program combining different methods for eliminating the causes of bronchial obstruction: adequate etiotropic chemotherapy, exposure to pathogenic agents, modern regimens of bronchodilator therapy, and smoking control.

Keywords: drug resistant pulmonary tuberculosis; chronic obstructive pulmonary disease

Impact of GMO Products on Human Health

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ABSTRACT

At present, 870 billion humans suffer from chronic starvation in the world according to the UN World Food Program information. The protectors of the transgenic organisms conceal an impact of GMO on humans and animals, but then announce these products as unique rescue of the whole mankind from starvation. But the population of the planet continues to increase and possessing resources can't meet the people's need for food yet. Consequently, it is necessary to increase volume of the food – stuffs production sometimes, particularly agricultural crops. The supporters of GMO cite an example for the doubtless advantage of organisms' data: high productivity, improving frost and drought stability of such cultures, an ability to put up resistance to many disease and pests. According to the official information of GMO – cultures (soybeans, maize, rope, cotton, rice, wheat, also sugar beet, potato and tobacco), more than 170 million hectares have been sown in the world today, approximately half of the territory falls to shares of China, India, Brazil and Argentina. The USA is in the first place in the world for measure of the village areas, where GMO crops are cultivated. More often fertile condition is created in the cultivated plants for herbicides, insects or virus. In their turns, the specialists – opponents of GMO present a data of researches confirming negative impact of GMO on both human body and the whole environment. In several articles, they talk about the apparent harm, which GM products affects human's health. Particularly, it's possible to observe allergic reactions, oppression of the human's immunity system. The various metabolism disorders can be revealed. Long-term usage of products containing GMO can develop the human's pathogenic microflora resistance to antibiotics, which can lead to increase in difficulties for different diseases treatment, down to their recovering impossibility. GMO - products can cause various mutations in human's organism and lead to the oncological diseases. Based on the several observations it was revealed that GMO – products negatively influence to children's' organism. Therefore, beginning from 2004, use of GMO – products prescribed for 4 – years old children is wholly prohibited in some European countries. But what is the situation in Azerbaijan regarding the GMO? Bringing genetic materials of genetically modified plants to the territory of Azerbaijan, regionalization and inclusion to the state register have been prohibited by the 21st article of the Law on "protection and rational use of the genetic resources of the cultivated plants" adopted in February 2012. According to this document, GMO plants are unlawful. Bringing GMO plants, regionalization and inclusion to the State Register are prohibited.

Keywords: GMO products; agricultural crops; resistant pathogenic microflora

[10]

Toxigenic Species Participated in the Formation of Mycobiota of Some Plants and their Influence on the Human Organism

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ABSTRACT

The research provides information about mycobiota of some cultivated and wild plants (*Alhagi pseudalhagi, Alhagi mourorum Medik, Glyeyrrhiza glabra, Medicaqo sativa L, Lycopersicon esculentum Mill, Zea mays L.*) spread in the different ecological areas of Azerbaijan and toxigenic fungi species involved in the formation of this mycobiota. It became clear that phytopathogenic and toxicogenic fungi on the mycobiota of above mentioned plants is quite higher and their share in the formation of mycobiota depending on the studied plants varies between 45-75%. Fungicide feature of essential oil obtained from the plants of Artemisia scoparia Waldst and its influence on the toxigenic fungi has been studied in researches. It became clear that essential oil obtained from the plants weakens the growth of fungi in various degrees. Their quantitative indicator has been identified depending on the amount of essential oil and on biological properties of fungi. From the of researches carried out it became clear that in the formation of mycobiota of plants such as *Alhagi pseudalhagi, Glyeyrrhiza glabra, Lycopersicon esculentum Mill, Medicaqo satival, Zea mays L.* are involved both phytopathogens and toxigens. Prevalence rate of toxigens in this mycobiota is high and toxigenic substances synthesized by them are very dangerous for human health. Some species of fungi, including some molds, are known to be capable of producing secondary metabolites, or mycotoxins. Several fungis commonly cause superficial infections involving the dry body skin, or nails. One of these species from the genus of is *Aspergillus, Candida* and others. Aspergillosis comprises a variety of manifestations of infection. They cause mycosis, bronchial asthma, bronchopulmonary aspergillosis poisoning and so on. From this point of view, essential oil obtained from the plant of *Artemisia scoparia Waldast* in a wild form widely spreads in Azerbaijan (Absheron), which is able partially or completely to stop the development of fungi and it can be used as a promising mean for production of biological drugs.

Keywords: mycobiota; human health; biological drugs.

[11]

Antibiotic Resistance in Oral Disease

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ABSTRACT

The purpose of this research is to summarize and organize information about "growing global problem" called antibiotic resistance with a special focus on dental practice, as about 10% of outpatient antibiotics prescribe by dentists. Antibiotic is called as "Life-saving drug". Inappropriate, illogical and incorrect use of antibiotics has led to development of antibiotic resistance. The present study is a literature survey, as far as we know no earlier research has been done about this issue in Azerbaijan. Therefore, we reviewed many books, different research articles and many web pages related to the topic. So, this research can only be considered the first step towards a more profound understanding of antibiotic resistance. Some countries, such as the United States, France and the United Kingdom, as well as many international organizations including World Organization for Animal Health, World Health Organization and the European Commission support programs to take measures that address antimicrobial resistance, and they hope to decrease the resistance flow out. Resistance issue should be addressed globally by all countries, because if it remains uncontrolled, by 2050 antimicrobial resistance will cost approximately 10 million lives every year worldwide at a cost of £63 trillion, more than the present annual death toll from cancer. Antibiotic resistance among oral diseases is a globally rising problem and information about such resistance for Azerbaijan is completely lacking and very limited data is available for nearby countries. Thus, this research will provide valuable information about antibiotic resistance. The findings might be useful in treating medical conditions that are related to dental practice and may direct future research to decrease this challenging situation faced by global society today.

Keywords: antibiotic resistance; oral diseases

[12]

Molecular Structure and Phylogenetic Relationships of Azerbaijan Local Barley Accessions

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ABSTRACT

Food security is an urgent global issue for ensuring sustainable food supply for the current and future generations. Climate change adversely affects the global agricultural system, and thus increases the risk of food shortage. Plant genetic diversity covers a wide range, at both the evolutionary and ecological level. Ecologically the variation ranges from the natural ecosystems and traditional low-input agriculture to modern, intensive production systems. At the crop evolutionary level, it covers a wide range of diversity from wild ancestors to modern cultivars. The resulting diversity in plants has been the basis for providing food and satisfying other human needs for millennia and it continues to do so for the development of plant characters required to adapt barley to the increasingly and rapidly changing environmental situations and socio-economic conditions. DNA-based molecular markers are tools that might help plant breeders to directly evaluate genetic variation among relatives without effect of environmental factors. To examine the genetic diversity of *Hordeum vulgare* L. growing in the different regions of Azerbaijan Republic, nuclear genomes of 60 accessions were studied using RAPD markers. In total, 58 fragments were amplified, of which 52 were found to be polymorphic. A level of polymorphism was revealed between 78.57% and 100%. High values of the polymorphic index content (PIC), highest amounts of effective multiplex ratio (EMR) and marker index (MI) indices showed the effectiveness of the application of RAPD primers and the possibility of their use in further investigations in this direction. A-23, B-68 and A-22 primers were among those markers which produced the highest number of bands and polymorphic bands, they also dedicated the highest rate of polymorphic index content. The genetic structure of the germplasm collection was analyzed and a UPGMA dendrogram was constructed. Cluster analysis based on Jaccard similarity index showed that all genotypes could be grouped into seven main clusters. This study revealed that RAPD marker could properly separate studied barley genotypes based on geographical distribution and similarity in climates and showed the wide genetic diversity among Azerbaijan barley accessions.

Keywords: genetic diversity; molecular marker RAPD; Hordeum vulgare L.

[13]

Impact of Atmospheric Pollution on Human's Health in Azerbaijan

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ABSTRACT

The anthropogenic pollution of atmosphere is connected with the mechanical, physical, chemical and biological factors which are distinctly revealed in the places of the people's compact living, especially in megalopolis, where weather conditions are also evidently distinguished from the analogical parameters outside the city. There are always million tons of contaminated substances in the atmosphere. Atmospheric pollution leads to diseases increase of both respiratory organs and cardiovascular systems. Almost 20% of the respiratory organs diseases and 10% disease system of blood circulation are related to the atmospheric contamination. At present, the industrial cities where on average more than 50% of population can be attributed to the dangerous zones, so the pollutants content in their atmosphere significantly increases the permissible concentrations. The atmospheric pollution plays a great role with motor transport, which possesses significant toxicity and ability to accumulate in organism. The lead accumulating in human's organism beside other harmful substances can be a reason for the unfavorable consequences, as well as it possesses mutagenic, cancerogenic, and teratogenic characters. According to the data of the World Health Organization for 2014, approximately 3.7 million of human die because of the atmospheric pollution in the world every year. Total quantity of deaths related to the influence of polluted air reach seven million indoors and in atmosphere. According to International Agency on WHO cancer study. The air contamination is a main reason for emergence of oncological diseases. Sharp increase in admixture concentration preserved for days raises death rate the elder people due to respiratory and cardiovascular diseases. The higher pollution of air is observed in the republic. Decrease in the air pollution was observed in connection with the industrial manufacture reduction because of some known reasons since 1990. But increase of the vehicle flow (mainly automobiles) began to show its negative influence on atmosphere. According to the information of the Ministry of Ecology and Natural Resources of Azerbaijan, 96% of all the toxic substances thrown into the atmosphere fall to share of five cities (Baku, Sumgayit, Ganja, Shirvan, Mingachevir). According to the information of 2010-2015 years, quantity of the harmful substances in the above-mentioned five cities' atmosphere is 2-3 times bigger than the determined standards of the air quality in the Azerbaijan. The main pollution sources of air are power stations, industry and transport. According to the official statistics, the air contamination was 1,170 million tons in 2016. 188000 tons fall to the share of stationary sources and 982000 tons to the mobile sources. According to the information of the State Statistical Committee of AR, the pollutants' quantity thrown into the atmosphere was 121 kg per capita in our Republic in 2016. An amount of the patients with respiratory diseases rose from 608559 people in 2000 till 749438 people in 2016, a quantity of the patients with malignant tumors rose from 6227 (2005) till

10807. The statistical analysis permitted to establish correlation between air pollution level and such diseases, like upper respiratory tract infection, heart failure, bronchitis, asthma, pneumonia, emphysema and eye diseases.

[14]

Evaluation of Genetic Diversity of Tetraploid Wheat Species Using AFLP Markers

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ABSTRACT

Diversity farming is the single most important modern technology to achieve food security in a changing climate. Scientists have shown that diversity provides a natural insurance policy against major ecosystem changes, be it in the wild or in agriculture. It is now predicted that genetic diversity will be most crucial in highly variable environments and those under rapid human-induced climate change. In addition to increasing the diversity of crops and varieties in a single field, increasing the diversity of traits within one variety might help climate change adaptation. The genetic diversity of 144 tetraploid wheat genotypes representing 14 different species, including 101 accessions of *T. durum* Desf. was evaluated using AFLP marker system. Out of tested 14 primer combinations 5 combinations with maximum number of polymorphic fragments were chosen. A total of 249 fragments were identified, of which 189 (76%) were polymorphic. The number of fragments ranged from 40 to 60, the average was 49.8. The maximum value was obtained by E-ACT/M-CTC. The number of polymorphic fragments per primer combination ranged from 32 to 45 and averaged 37.8. The polymorphism rate varied from 66.7% for E-ACT/M-CTC to 83.3% for primer pairs ACT/M-CCC and E-ACT/M-CTA. The current research revealed a high level of polymorphism for studied tetraploid wheat collection, which was 76.3%. The PIC calculated for each primer combination varied from 0.16 (for E-ACG/M-CTC) to 0.21 (for E-ACT/M-CTA). The primer pairs E-ACT/M-CCC, E-ACT/M-CTA, E-ACG/M–CTA were considered as the most effective to study genetic diversity in tetraploid wheats. Dice genetic similarity index for the entire collection ranged from 0.67 to 0.99, which indicates that durum wheat varieties of Azerbaijan were fairly similar to each other and with other tetraploid species. The maximum level of genetic similarity was detected between two genotypes of *T. durum* v. *leucomelan*, whereas the minimum level of similarity was observed between *T. timopheevii* and *T. carthlicum* species. Based on the principal coordinate analysis (PCoA) all studied tetraploid species were divided into two groups. PCoA revealed clear differences between the A^uA^uBB and A^bA^bGG genomes, although differentiation within A^uA^uBB genome group was faint. The obtained results on genetic diversity and genetic relationship of wheat accessions can be used for future breeding programs.

Keywords: genetic diversity; wheat; AFLP markers; polymorphism rate

[15]

Race Analysis of *Puccinia striiformis* f.sp. *tritici*, Serious Disease of Wheat in Iran

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ABSTRACT

Wheat is widely cultivated around 6 million hectares in Iran and it is the most important crop all over the world. Wheat (*Triticum aestivum* L.) is one of the strategic cereals, which directly has roll in providing humans food and indirectly in producing animal's protein. Wheat breeding program is designed to improve yield potential, disease resistance and increase wheat quality. Yellow (stripe) rust caused by *Puccinia striiformis* f.sp. *tritici* is the most widespred disease, which caused huge damage and lost in epidemic year in Iran. Using of resistance cultivars is accepted as the best way to control and prevent rust spreading. In this research, genetic of pathogenicity of 26 isolates of stripe rust from different parts of important wheat-growing areas in Iran, with using of 56 differential and isogenic lines with Bolani susceptible check, under greenhouse condition were studied. Race 6E6A+, *Yr27* from Neishabour (Eshgh Abad) and 7E22A+,*Yr27* from Kermanshah were less aggressive races in this research and races 206E182A+,*Yr27* from Islam Abad, 207E190A+,*Yr27* from Fars and race 231E150A+,*Yr27* from Mashhad with more than 19 known wheat genes were the most aggressive ones. According to these results, virulence was observed on plant with genes *Yr1, Yr2, Yr3, Yr6, Yr7, Yr8, Yr9, Yr18, Yr21, Yr25, Yr26, Yr28, Yr29, Yr31, Yr32, YrSU, YrND, YrCV* and *YrA*. No virulence was detected on plants with genes *Yr4, Yr5, Yr10, Yr15, Yr24* and *YrSP*. We can use these genes in future wheat breeding programs.

Keywords: wheat; stripe rust; resistance cultivars

[16]

Integrated Solid Waste Management System

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ABSTRACT

As a growing economy, Azerbaijan has faced with increased household consumption of products and services over the past decade resulting in much larger quantities of domestic wastes produced. With the support of international organization, such as UNDP, the government of Azerbaijan launch the course for improving the National Solid Waste Management system. The survey results and the database used by the Ministry of Ecology and Natural Resources and the Ministry of Economic Development created Solid Waste Management strategy of the country. While the waste collection and processing has been improved, the matter of proper disposing off the waste without harming the environment and ecology still needs attention. The implications are directly reflected in capital Baku, where the system of municipal waste collection, transportation and disposal is apparently efficient, but the existing landfills used for dumping and disposing off the waste do not meet the international sanitary standards. With rising environmental concerns, landfills have turned out to be a source of various diseases with destructive impact on natural landscape, environment and ecology. According to Environmental and Social impact assessment report on rehabilitation and closure of dump sites in the greater Baku area, there are 78 unauthorized dumping sites, all of which are reported to have detrimental effects on environment and ecology e.g. relief, soil cover, vegetation, surface and underground water, ecosystems, habitats and wildlife. In retrospect, a self-sufficient, sustainable and profitable system of municipal sewage treatment integrated with Biogas Cogeneration and Organic Fertilizer production unit is introduced here. The system is qualified as Clean Development Mechanism (CDM) with reduced CO_2 Emission and high Carbon Credit under Kyoto's Protocol (International Environmental Forum for Global Warming), as well as a Potential Renewable Energy Source in foreseeable future. This integrated Solid Waste Management System can treat almost all kinds of Solid waste, including Municipal Sewage sludge (MSW), Food waste, Industrial and Agricultural waste which usually contains 60% of biodegradable mass. So, they are more suitable for biogas generation in anaerobic condition. The plant can be conveniently located inside city premises, which will eliminate the need of dumping solid waste in some remote Landfill far away from the city for aerobic composting, which will not only require a large land area but also it will cost a high tipping fee (transportation cost). Moreover, there will be no useful by-products at the end of the process. On the contrary, if the same solid wastes are treated in Cogeneration biogas plant, it will yield no waste at the end of process with significantly useful by-products as the Degraded Biomass (digestrate) can be used as an organic fertilizer with high NPK (Nitrogen, Phosphorus, Potassium) content. Organic Fertilizer is considered a rarity, since it has a high commercial demand and it is approximately three times more expensive than Artificial Fertilizer. It is also less likely to be soluble in soil than artificial fertilizer and, hence, does not contaminate underground water table.

Keywords: integrated solid waste management system; biomass degradation

[17]

Identification of Antibiotic Resistance Genes and Bacteria from Slaughtered and Retail Chickens in Azerbaijan

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ABSTRACT

Increased food demand has forced changes in poultry husbandry practices. Antibiotics such as avoparcin, virginiamycin, streptomycin and chlortetracycline are not only administered prophylactically, but subtherapeutic doses are administered routinely via feed to increase feeding efficiency, such as rate of weight gain in poultry. Research suggests subtherapeutic doses of antibiotics in feed promotes bacterial resistance by decimating the susceptible population of micro-organisms normally present in animals, selecting drug resistant strains. If drug-resistant bacteria spread to humans through the consumption of animal products, resistant bacteria could colonize their new hosts transferring antibiotic resistance to the normal drug-susceptible bacteria already present in the human gut flora. The result is food-borne infections which are difficult to treat because antimicrobial susceptibilities do not respond as expected to the corresponding drugs. Potentially, serious and even fatal outcomes could result if antibiotic resistant pathogens spread systemically in a patient. Using phenotypic and genotypic methods, the spectra of antibiotic resistance in flora present on slaughtered and retail chickens in Azerbaijan is surveyed. Twenty chicken samples will be collected from ten retail markets and twenty chicken samples will be collected from ten abattoirs (two samples will be collected from every site; n=40). Samples will be processed for antibiotic susceptibility testing by the disk diffusion method. Each isolated and identified colony will be submitted to an antibiogram test carried out by the disk diffusion method, as recommended by the National Committee for Clinical Laboratory Standards (National Committee for Clinical Laboratory Standards. , 2003)(NCCLS). Isolates will be screened for the following antibiotics and doses: ampicillin (AMP) 10 mg, cefazolin (CFZ) 30 mg, gentamicin (GEN) 10 mg, spiramycin (SP) 100 mg, doxycycline (DOX) 30 mg, cephalexin (CFX) 30 mg, sulphonamide (SOUTH) 200 mg, cephalothin(CEF) 30 mg, penicillin (PEN) 6 mg, enrofloxacin (ENRO) 5 mg, tetracycline (TET) 30 mg, neomycin (NEO) 30 IU, norfloxacin (NOR) 10 mg, erythromycin (ERI) 15 mg, amoxicillin (AX) and 25 mg chloramphenicol (CLO) 30 mg. Eight common antibiotic resistance genes will be screened by PCR using primers. The survey is the first in Azerbaijan to examine antimicrobial resistance genes in slaughtered and retail chickens from Azerbaijan.

Keywords: antibiotic resistance genes; animal products

[18]

Endoscopic Intervention in Diminutive Colorectal Polyps

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ABSTRACT

Analysis of the pathohistological structure of small polyps and an assessment of the risk of their transition to malignant formations. The study was done on the basis of endoscopy department of the surgical department of the Central Hospital of Customs, 42 small-sized polyps (up to 5 mm, diminutive) that were removed endoscopically with biopsy forceps and analyzed by pathohistological analysis were analyzed. Of 42 diminutive polyps in 11, signs of dysplasia were found, 31 cases of dysplasia were not detected. Among identified 42 diminutive polyps of the pathogenic histologically, the distribution was as follows: hyperplastic-11, inflammatory -11, tubular -19, tubulo-villous-1. Polyps with dysplasia belonged to groups tubular and tubulo-villous. The study confirms the fact that there is no direct proportionality between the size of the polyp and its pathohistological structure, even in small polyps, signs of dysplasia may be detected. Even the diminutive polyps may also be considered "precursors" of cancer. Polypectomy for adenomatous polyps reduces the risk of colorectal carcinogenesis of polyps at an early stage and reduces the risk of developing colorectal carcinoma.

Keywords: diminutive colorectal polyps; polypectomy; colorectal carcinogenesis

[19]

Medicinal Naphthalan Oil

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ABSTRACT

The medicinal naphthalan petroleum has no analog in the world. It is used for more than 1,000 years for medicinal purposes. From 1905 to 1914, the German engineer Egger put on the world market a variety of this treatment. Even two companies were opened in Dresden and Magdeburg. From the beginning of the First World War, the exploitation of this deposit by Egger was stopped. In 1932, near this deposit, the first sanatorium was opened. Since 60s of the past century, more than 70,000 people annually have been treated in this sanatorium. In this sanatorium, the treatment of these diseases is performed: osteochondrosis of the cervical and spinal vertebrae; periarthrosis; traumatic impairment of peripheral nerves; peformational osteoarthrosis; atherosclerosis of veins in lower extremities. Endoarterielitis, chronic venous insufficiency, trophic ulcers; sterility (in consequence of the inflammatory gynecological disorders); skin diseases: scaly herpes, eczema, neurodermatitis, skin itch, cheilitis, ichthyosis, skeledermis and other itching dermatoses; dentistry (gingivitis, parodontitis, parodonthosis); burns of I-III degrees; otolaryngology (chronical tonsillitis, pharyngitis, atrophic and allergic rhinitis). The treatment was conducted by bathing and smearing of raw and refined petroleum, putting paraffin-naphthalan coatings. In the treatment, deterred naphthalan petroleum and the mixture of its naphthenic hydrocarbons were used. Investigations of structural-grouping and physicochemical properties of naphthalan petroleum were carried out under the guidance of academicians Yu.H.Mammadaliyev, A.M.Guliev, A.M.Abbasov, corresponding member of NAS of Azerbaijan F.I.Samedova, professor H.H.Hashimov. Four candidate dissertations were defended in this sphere: in 1976 – by R.Babayev, 1979 – by A.Muradov, 2003 – by G.Isayeva, 2016 – by A.Alizade. The researches in the field of medicine have proved that use of the deterred naphthalan petroleum together with physiotherapeutic procedures is inexpedient as the absorption of rays by the film of the applied petroleum occurs and rays do not penetrate to the surface of the skin. It has already been proven long ago that the curative properties of this petroleum are stipulated by naphthenic hydrocarbons in its composition. The technology has been developed for obtaining from this medicinal petroleum "White Naphthalan Oil" consisting of 98 % naphthenes and 2 % isoparaffinic hydrocarbons. The yield of this oil based on the distillate is 70 %. On October 23, 2014 "White Naphthalan Oil" has been registered by the Ministry of Health of the Republic of Azerbaijan as a medicinal product for an external use. Now, "White Naphthalan Oil" is produced at the Experimental Industrial Plant of NAS of Azerbaijan. The Azerbaijan i20020026 patent has been obtained on "White Naphthalan Oil". The composition of "White Naphthalan Oil" has been researched in Munich (Germany) with the most modern facilities. It has been proven that in its composition, there are biomarkers, such as sterans, androstans, cholestans, hopans. "White Naphthalan Oil" has

passed clinical tests in the Center of Rehabilitational Medicine in the Ministry of Health of the Republic of Azerbaijan.

[20]

Ecological and Epidemiological Study of *Francisella Tularensis* in Gusar and Khachmaz Regions in the Northern Part of Azerbaijan

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ABSTRACT

Francisella tularensis is a highly virulent bacterium for humans and rodents. In some countries, endemic regions with frequent outbreaks are bordering with the regions with no history of tularemia. In Azerbaijan, there are natural foci of this infection. The main goal of this study is to define the prevalence and distribution of *F. tularensis* pathogen in Khachmaz and Gusar regions of Azerbaijan. In total, 13 trips were made to Khachmaz region in 6 months (April-September) during spring, summer and autumn, where arthropod specimens (ticks) were collected. Each of these monthly (2-3 times a month) trips lasted 9 days. Collected ticks were identified through microscopy, and they were grouped and tested by RT-PCR. 8216 ticks that were collected are distributed as follows: *Dermacentor marginatus* (3650) 44 %, *Rhipicephalus sanguineus* (2932) 35%, *Rhipicephalus turanicus* (1421) 17%, *Ixodes ricinus* (118) 1.5%, *Hyalomma plumbeum* (52) 0.6%, *Hyalomma asiaticum* (41) 0.4 %, *Haemaphysalis punctata* (1) 0.01%. 1269 tick pool (8216 ticks) samples were tested by RT-PCR. 12 samples were positive for tularemia. The following ticks were identified in the given samples: *Dermacentor marginatus, Hyalomma plumbeum, Rhipicephalus turanicus, Rhipicephalus sanguineus.* Results of the study conducted in the Northern part of Azerbaijan show that the prevalence of tularemia was high. However, there was no confirmed human case of tularemia in this region for the last ten years. These results will further contribute to Public Health and Veterinary services as a part of "One Health" program.

Keyword: *Francisella tularensis*; arthropod specimens

Comparative Evaluation of the Distribution of Mosquito Vectors in Azerbaijan

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ABSTRACT

Previous scientific research (1967 and 1980) has indicated that certain regions of the Azerbaijan Republic are natural foci of arboviruses. Results of those studies showed that West Nile virus is widely distributed across different regions of Azerbaijan. Also, Sindbis virus was isolated in 1967 and 1977 in Azerbaijan from the blood of birds. These pathogens are known to be transmitted by mosquitoes. The goal of this study was to define the presence of potential mosquito vectors for the diseases of concern. Mosquitoes were collected as a part of two CBEP projects in Azerbaijan during 2012 – 2017 using CDC light traps and BG traps. The species were identified using taxonomic keys (Identification Guide), pooled based on their location, and stored in a freezer for further processing. The pools were homogenized, and the RNA was extracted and tested for SINV and WNV by PCR. 587 mosquitoes (8 species) were collected from the Northern regions in 2012- 2013. Known vectors for WNV and SINV were collected: *Culex pipiens* (44.8 %), *Aedes vexans* (32.7 %) and *Mansonia richardii* (0.17%). 5,422 mosquitoes (17 species) were collected from the Southern regions in 2015 - 2017. Known vectors for WNV and SINV were collected: *Culex pipiens* (35.22 %), *Aedes vexans* (15.15 %), *Culex mimeticus* (8.89 %), *Culiseta longiareolata* (0.05%). All samples were negative for WNV, only one sample consisting of four female *Culex mimeticus* collected from Masalli rayon was positive for Sindbis. All the data were collected in database which also includes GPS coordinates. The focus of this study was WNV and SINV. However, it is known that several of the species found in Azerbaijan are vectors for other diseases. For example, WNV (*Culex pipiens, Culex mimeticus*, *Culex modestus*, *Culex theileri*, *Aedes vexans*), SINV (*Culex longiareolata, Orthopodomia pulchripalpis*, *Culex mimeticus*, *Culex pipiens*), JEV (*Culex tritaeniorhynchus*), TAHV (*Aedes caspius*), malaria (*Anopheles maculipennis, Anopheles hyrcanus, Anopheles sacharovi, Anopheles claviger*, *Anopheles superpictus, Anopheles subalpinus*). Vector borne diseases constitute a significant potential threat for the Azerbaijani population. The presence of known vectors of those diseases present ongoing potential public health problem.

Keywords: mosquitoes; vector borne diseases; vector diversity

[22]

Cataloging and Study of Ticks – Potential Vector for Rickettsia in Azerbaijan

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ABSTRACT

The North and the South of Azerbaijan are mountainous rural regions with abundant potential of interactions between humans, domestic and wild animals. Despite the favorable environment for ticks and putative tick-borne pathogens, their presence has not been systematically investigated. Hence, the goals of this study were to get an overview of the potential vectors for *Rickettsia* present in Azerbaijan and to determine *Rickettsia* vectors. Ticks were collected at different times in the Northern and Southern regions of Azerbaijan during 2012 - 2017. They were collected directly from farm animals (cattle, sheep, poultry), as well as by dragging over vegetation on the nearby farms and fields. The tick species were identified by entomologists using taxonomic keys (Identification Guide). After identification, ticks were pooled by species, homogenized and RNA was extracted. RNA of all pooled samples from the northern part of Azerbaijan was tested with a broad range *Rickettsia* Real-Time PCR (R.A.P.I.D. system and Bio-Rad instrument) Republican Anti-Plague Station (RAPS). The collection in the northern region (Khachmaz, Guba and Gusar) of Azerbaijan yielded 3,578 ticks belonging to 13 different species. The most common ones were: *Rhipicephalus (Boophilus) annulatus* (51.6%), *Argas persicus* (18.3%), *Ixodes ricinus* (12.9%) and *Dermacentor marginatus* (9.7%). *Rickettsia* RNA was detected in 58 of the samples, all belonging to *Dermacentor marginatus,* rendering 8.2% of the tested tick of this species as vectors. In the southern region (Lankaran, Masalli and Gizilaghaj National Park) of Azerbaijan, 3,818 ticks of 12 different species were collected. The most common species were: *Rhipicephalus (Boophilus) annulatus* (70.6%), *Hyalomma marginatum* (20.6%) and *Rhipicephalus turanicus* (4.2%). These species are also known as *Rickettsia* vectors. However, those ticks have not been tested for *Rickettsia* so far. All collected ticks were identified, homogenized and stored in RAPS at -80°C for future studies. In addition, there was another regional project implemented in the southern region (Lankaran) in 2008 – 2009. Total 31 ticks were collected during this study. 12 of them belonged to *Hyalomma spp.* and 4 of those were positive for *Rickettsia felis.* The data indicate a broad diversity of tick species in Azerbaijan with regional differences and a dominance of *Rhipicephalus (Boophilus) annulatus.* Many of the detected tick species could potentially serve as a vector for *Rickettsia*

spp., however so far, *Rickettsia* RNA was found only in *Dermacentor marginatus* and *Hyalomma spp.* Whether these speciesare indeed the only ones, needs to be confirmed. Additionally, more comprehensive surveillance encompassing all the country is needed.

Keywords: Rickettsia vectors; diversity of tick species

[23]

Epidemiological Features of Human Brucellosis in Azerbaijan

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ABSTRACT

Human brucellosis represents a significant burden to public and veterinary health globally, including the republic of Azerbaijan. Human brucellosis persists annually throughout the country, particularly in the central region, where large animal markets are located. Brucellosis is a bacterial disease transmitted to humans by consumption of infected, unpasteurized animal milk or through direct contact with infected animals. The purpose of this study was to examine and describe epidemiological features of human brucellosis in Azerbaijan. Data set of all human brucellosis cases from 2012 to 2016 years in Azerbaijan was obtained from the Electronic Integrated Disease Surveillance System (EIDSS). Suspected cases of human brucellosis are confirmed by laboratory testing with the Rose Bengal, Huddleston and the Wright serum agglutination tests. Epidemiologic risk factors, such as, age, gender, date and location of new cases, contact with animals and their products and month for each case were analyzed. Data was analyzed using the Analysis Visualization Report (AVR) module of EIDSS and Epi Info 7.0. During the 5 years period, a total of 1516 laboratory confirmed brucellosis cases were reported. The greatest number of cases were reported in 2016 (403 cases). From 2012-2014, the report of new brucellosis cases was fairly steady ranging from 2.42 to 3 cases / 100,000 population. The years 2015-2016 demonstrated a marked increase in incidence with 3.18 cases / 100,000 in 2015 and 4.08 cases / 100,000 in 2016. Brucellosis can occur any time of the year, however, the majority of cases are reported during February - July. Reporting of cases was highest in the month of May with a total of 201 cases (13 %) during the 5 years. In Azerbaijan, the birth of small ruminants occurs in early spring and is often demarcated by an increase in the incidence of livestock brucellosis. The age group of the highest number of cases was 30-59 year. Of the reported cases in the 30-59 years age group, the majority of cases were reported in males (68 %, 95% CI: 63 % – 71 %). About 80 % of all cases were in rural areas. Approximately, 51 % (95% CI: 48% - 54%) of cases reported consumption of unpasteurized milk and dairy products , consumption of undercooked meat was 14% (95% CI:12% - 16%), assistance in animal birth was 24% (95% CI: 21% - 26%),contacts with sick animals were 10% (95%CI:9% - 12%), potential laboratory or other occupational exposure was 1% (95% CI:1% - 2%). These results suggest that human brucellosis persisted annually in Azerbaijan. Consumption of home-made milk products obtained from bazaars or neighbors were identified as probable sources of human brucellosis infections in Azerbaijan. It suggests that brucellosis spreads among farm animals in our country and that home-made milk products are not pasteurized. Health education programs should be increased, and veterinary control should be improved. Vaccination remains the most appropriate control measure in Azerbaijan. Since 2009, the veterinary service has been carrying out a vaccination campaign in Azerbaijan among goats and sheep.

The introduction of vaccination among cattle is envisaged. Vaccination campaigns could reduce the prevalence of animal brucellosis and reduce the risk of transmission to humans.

Keywords: human brucellosis; epidemiology

[24]

Epidemiological Innovation: EPI Network

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ABSTRACT

Epidemiology, the backbone of public health, is indeed at the crossroads of data and health sciences. There are numerous opportunities for epidemiological education and networking in West Asia, particularly in the Caspian region. This presentation introduces challenges and strategies for the advancement of epidemiology in this region. The importance of a regional epidemiological network (Epi Net) will be highlighted; examples from Asia and Canada will be presented. Epi Net can be well promoted through active participation in regional and global events.

Keywords: public health; epidemiology; epidemiological network

[25]

Breast Cancer in Basra (Iraq): Pattern of Geographical Distribution

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ABSTRACT

Breast cancer occupies a high rank among malignant diseases in Basra and some evidence suggests that the risk is getting increased with time. This article is designed to provide a profile on the geographical distribution of incident breast cancer in various parts of Basra governorate. All newly diagnosed cases registered with Basra Cancer Registry Office during a four- year period (2009-2012) were used for the study. The average annual crude incidence rate of breast cancer was 24.49 per 100000 females and age-standardized incidence rate was 34.86 per 100000 females. Great variation in the incidence rate was noticed across different districts with highest incidence in Basra city 40.22 per 100000 females and the lowest was in Northern districts of Madina (11.04 per 100000 females) and Qurna (12.56 per 100000 females). The incidence rates in other districts were between two extremes. The risk of breast cancer is relatively high in Basra with great variation in different districts. The variation could reflect true risk difference, difficult accessibility to oncology services in Basra or incomplete registration of cases.

Keywords: breast cancer; epidemiology; geographical distribution

[26]

Characterization of *Brucella Spp.* in Azerbaijan, 2014

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ABSTRACT

Republican Anti-Plague Station (RAPS) in Azerbaijan provides confirmatory tests for especially dangerous pathogens (e.g.*Yersinia pestis*, *Bacillus anthracis, Brucella spp., Francisella tularensis*). In Azerbaijan, RAPS and its regional Anti-Plague Divisions (APDs) are responsible for testing human samples for abovementioned pathogens. RAPS receive samples for confirmatory test from patients referred by Baku, regional hospitals and APDs. The aim of this study was to isolate and identify *Brucella* cultures from human blood samples. In 2014, 1,137 blood samples were collected by RAPS from patients with clinical symptoms, such as high temperature, perspiration, chills, myalgia, arthralgia, headache, fatigue, and lack of appetite. All samples were tested using the Azerbaijan Ministry of Health (EDPs Laboratory Guidelines, 2013) algorithm via bacteriology and serology tests. Blood serum was tested for the presence of the antibodies of *Brucella spp*. via Huddleson *reaction,* Rose Bengal test and *Wright's reaction. Samples positive for Brucella spp. per Huddleson and Rose-Bengal reactions further were tested by Wright's reaction. Positive blood samples by Wright's reaction with titers 1/200 and higher were then cultured.* Isolated pure cultures were examined by biochemical (Urease, Oxidase, Catalase, TSI/H_2S, Dye sensitivities) and serology (Trypaflavine, Agglutination with specific polyvalent serum, anti -A and anti -M monospecific sera) tests. Data showed that 54.3% of total serum samples were positive by Huddleson reaction; 35.6% were positive by Rose-Bengal reaction, and 38.7% from total samples were positive by Wright's reaction. Positive blood samples with titer 1/200 and higher from first diagnosed patients (n=89) were cultured. All isolates were identified as *Brucella melitensis* (an overall isolation rate was 16.9%). The reports about positive results are sent to the Ministry of Health and State Veterinary Control Service (SVCS) and entered into the Electronic Integrated Disease Surveillance System (EIDSS) database of the Ministry of Health of Azerbaijan. Datain the system allows tracking the incidence of brucellosis and making operational decisions. Future genetic analyses of these isolates can help identifying of subtypes of *Brucella melitensis* and establishing the origin of *B.melitensis* circulating in the Azerbaijan territory and comparing the results with neighboring countries.

Keywords: Brucella melitensis; electronic integrated disease surveillance system

[27]

Monitoring Incidence of Vibrio Cholerae and Related Vibrios in Water Sources and Patients in Baku and Baku Districts of Azerbaijan in 2016

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ABSTRACT

Cholera is a devastating diarrheal disease that can result in death within days if it is left untreated. The majority of cholera cases are caused by consumption of contaminated water or food. During 2016, we analyzed a large number of samples from patients with intestinal diseases and different water sources in Baku region of Azerbaijan, and here we present our results on detection of Vibrio Cholerae and other contaminants. We collected: 1. fecal and vomit samples from patients diagnosed with intestinal disease and suspicion of cholera infection; 2. samples of water from various natural and municipal sources - drinking water, as well as sea, lakes, rivers, etc. where people can get infected if the water is contaminated. To conduct a study of the material for identifying presence of Cholerae Vibrio, after its sowing on selective and alkaline media, the microorganism is identified based on morphological, cultural and biochemical abilities and agglutination by specific serum. In the absence of the agglutinable properties of the isolated microorganism, it is referred to as non-agglutinable NAQ-vibrion and according to the differences in the enzymatic activity it is divided into VII groups. Our laboratory analyzed 19555 samples- 19081 from humans and 474 from various water sources. Among human samples - 10620 (55%) obtained from the patients with severe intestinal diseases, 546 (2.9%) from the patients with toxic infection, 7911 (41.5%) from control groups, and 4 cases of the individuals, who had recently contacted with sick people or suspicious cases. Vibrio Cholerae has not been found in the samples of patients, while NAG-vibrio was found in 3 samples and Pseudomonas aeruginosa - in 26 samples. Heiberg groups NAG-vibrio was detected in 92 samples from water sources, including 5 samples from drinking water, 65 – from seawater, and 22 – from canals. In our study of patients and control groups, as well as water sources we have not found Vibrio cholera, but detected 92 cases of NAG-vibrio in different water sources, including drinking water. It's known that NAG-vibrios can cause a diarrheic disease thus obviously there is a need to expand epidemiological studies of its sources and improve hygienic measures in the areas where NAG-vibrios have been discovered.

Keywords: Vibrio Cholerae, contaminated water

[28]

Prevalence *Yersinia Enterocolitica* Among People for 2012-2017 in Azerbaijan

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ABSTRACT

Azerbaijan is a country at the crossroads of the Eastern Europe and the Western Asia that has a history of environmental Yersinia species foci. The Republican Anti-Plague Station (RAPS) in Baku is responsible for surveillance, identification, documentation and preventive measures against very dangerous infections including Yersiniosis and Brucellosis. Yersiniosis caused by *Yersinia enterocolitica* (YE) is characterized by a lesion of the gastrointestinal track and general intoxication which can cause the degeneration of the musculoskeletal system, liver and other organs. The bacterium YE is characterized by six bio groups based on phenotypic characteristics, and by serotyping 60 serotypes, on the basis of their O lipopolysaccharide (LPS) surface antigen. In the last years for Azerbaijan, two serotypes are generally considered the causative agents of Yersiniosis, strain O:3 (biogroup 4) and O:9 (biogroup 2) (YE). A strong serological cross-reaction appears between different species of *Brucella* and YE serotype O:9, which seriously complicate the diagnostic works of Brucellosis and Yersiniosis in humans. This cross-reaction often makes it impossible to perform a differential serological diagnosis between *Brucella* and YE. Brucellosis is a highly contagious zoonosis disease with great significance in medicine. The ability to differentially diagnose YE and *Brucella spp* is critical for defining appropriate therapeutic regimes. Clinical serum samples were investigated by indirect hemagglutination reaction (IHAR) for the detection of antibodies for YE. Data suggests that IHAR was the most promising method and deserved efforts for its further development. The work is conducted in a biological safety cabinet (BSCs class AII), using all required personal protective equipment (PPE). During the period 2012-2017, 4,265 samples suspected of Yersiniosis were received by RAPS. As part of our diagnostic algorithm, samples were tested for YE by IHAR. Out of these samples, 299 (6.28%) were positive by IHAR for serogroup O:3 and 369 (8.7%) for serogroup O:9. We recommend diagnostic methods by using ELISA. Using this method, a differentiation between antibodies against YE 0:9 and Brucellosis can be done with high sensitivity and accuracy.

Keywords: Prevalence *Yersinia enterocolitica*

[29]

Enteric Infections Caused by Nag-*Vibrios* in Azerbaijan in 2016-2017

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ABSTRACT

V. cholerae is the causative agent of water-borne cholera and persists in the environment between disease outbreaks. In Azerbaijan, non-agglutinable *vibrios* (NAG-*vibrio*) are the main strains causing cholera-like symptoms in humans. Continuous monitoring of infection and disease flow will provide information to devise strategies to fight disease and reduce burden on health personnel and resources. Samples were tested for NAG-*vibrio* at the Republican Anti-Plague Station (RAPS), Baku. Strain isolation and identification of *V. cholerae* serogroups remain as the gold standard for cholera diagnosis, where suspected samples are cultured and tested for classical cholera and cholera El-Tor using a type-specific O cholera serum agglutination assay. Negative cholera samples are still tested for NAG-*vibrios* and other cholera-like *vibrios* as per standard operating procedures and guidance from "Instructions and Guidelines for Laboratory, Clinical Diagnosis, Prevention and Treatment of Infections in Humans" (Ministry of Health, Azerbaijan, 2010, Laboratory Diagnostics of Especially Dangerous Pathogens, 2013) and regulation N64 for sample collection and testing (Ministry of Health, Azerbaijan). Abundance and distribution of environmental *V. cholerae* were assessed in sentinel sites along public recreational areas in water sources (e.g., beach, potable and waste water). NAG-*vibrios* are based on biochemical properties following Heiberg's classification of 7 distinct NAG-*vibrio* groups (I through VII). Active and passive surveillance provided descriptive epidemiological data. From a total of 24308 samples, 605 samples were environmental (2%) and 23703 were of human origin (98%). Testing of 605 environmental water samples identified 138 NAG–*vibrio* positive samples (23%).The 23703 human samples originated from either enteric infection (55%), food poisoning (2.7%), and from control groups (41%).One percent of food poisoning samples was NAG–*vibrio* positive (n=7). Two of 7 NAG–*vibrio*-positive samples belonged to groups I and II, and the 3 remaining samples to groups III, IV and VII, respectively. *V. cholerae* prevalence showed temporal fluctuation in environmental samples (i.e., 2015: 23%; 2016: 19%; 1st half of 2017: 35%) and an increase in humans (2015: 0.01%; 2016: 0.02%; 1st half of 2017: 0.09%), with 29% of human samples co-localizing with environmental samples. Knowledge from such data is critical to build efficacious counter-epidemic and sanitary measures for cholera prevention.

Keywords: water-borne cholera; *Nag-vibrio*; enteric infections

[30]

Assessment of Laboratory Diagnostic and Surveillance System for Enteric Infections in Azerbaijan

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ABSTRACT

Acute Enteric Infections (AEI) rank globally as one of the leading contributors to infectious pathologies; only surpassed by acute respiratory viral infections. According to the World Health Organization, approximately 4 billion cases of diarrheal diseases are reported annually worldwide. Our study sought to gain a better understanding of the etiology of infections that fall within the generalized diagnosis of enteric infections with unassigned etiological agent. We hypothesized that meticulous assessment of patient diagnostic and surveillance data from enteric infections in Azerbaijan, and of supplemental patient information, would increase our knowledge of the enteric disease situation in the country. In consequence, our ability to assign causative agents to enteric infections would be enhanced and gaps in public health detection and reporting requirements could be identified. Given the high number of AEI cases with unknown etiology in Azerbaijan, AEI patient data was analyzed using the Electronic Integrated Disease Surveillance System (EIDSS) with data from Regional Centers of Hygiene and Epidemiology. The data ranged from 2014 to 2016 and combined patient information from annual reports from the Bacteriology Laboratory at the Republican Center of Hygiene and Epidemiology. 13458 cases of AEI with identified etiology and 32237 cases of AEI with unidentified etiology were analyzed from 2014 to 2016.The analysis revealed that yersinosis (0.3% of the cases), shigellosis (0.6%), and salmonellosis (5.7%) were the most common AEI cases. Opportunistic bacterial infections accounted for the remaining cases. Our study also investigated whether bacterial results with established etiology were being reported in a timely fashion by our emergency notification system. Indeed, between 2014 and 2016, the notification process of enteric infections improved with every year (i.e., 2014: 67.4% of timely notifications; 2015: 80.4%; 2016: 87.3%). EIDSS entry deficiencies included the lack of antibiotic treatment information in 57.4% of the cases, and an overwhelming incidence of AEI diagnosis based on clinical-epidemiological data (78.6%) and not confirmatory laboratory assays, indicating that treatment received was not etiologically substantiated. The absence of point-of-care, pathogen detection assays covering more agents, especially viral agents, might in part explain the high rate of clinical diagnosis of AEIs as "acute enteric infections of unknown etiology". In fact, in Azerbaijan, only rotaviruses are currently tested when viral enteric infections are suspected. An integrated approach is needed to improve AEI tracking, diagnosis and etiologically appropriate treatment. Better communication among health system databases with established minimum data entry requirements, including treatment and disease chronology information, capability for multiple pathogen testing and improvement in the quality of EIDSS entries to reconcile

electronic and paper forms of notification are needed. The use of rapid immunological or molecular diagnostic methods, or simple-to-use test strips using immunochromatographic technology, rather than traditional long-term culture assays, should expedite pathogen identification and facilitate testing of multiple pathogens. Altogether, such efforts will improve diagnosis, treatment and spread control of diarrheal diseases in the country.

[31]

Evaluation of the Surveillance System on Hepatitis B in Azerbaijan in 2012-2016

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ABSTRACT

The WHO estimates there are 240 million hepatitis B virus carriers in the world. 2% of adult population (18-60 years) in Azerbaijan is infected, that means that *Hepatitis B* is *moderately endemic* in the country. The objective of this study was to evaluate strong and weak components of the epidemiological surveillance system and develop recommendations for its improvement. Evaluation of the surveillance system was conducted by using "Updated Guidelines for Evaluating Public Health Surveillance Systems" (CDC, Atlanta, 2005). The descriptive analysis of Hepatitis B morbidity was carried out using the electronic database obtained from the Electronic Integrated Disease Surveillance System (EIDSS) for 2012-2016. Surveillance of Hepatitis B covers the entire population of the country (except Nakhichevan) with using of the Standard Case Definition. Since 01.04.2010 the electronic notification system (EIDSS) was officially implemented in the country. Confirmed Hepatitis B was defined as case with clinical signs and epidemiological links and positive result of ELISA (sensitivity of method = 99.3%). In the last 10 years the number of new cases gradually decreased in particular from 465 cases in 2009 to 91 cases in 2016. It was observed that men were more frequently infected than women (~60.5% vs 38.7%). The highest percentage of infected people (38.5±0.4% in average) was found in the 30-59 years age group. It was revealed that strong components of surveillance system of Hepatitis B were: usefulness, simplicity, flexibility, acceptability and sensitivity. Representativeness of the data is low because of excepting of Nakhichevan in EIDSS. The program "Diagnostics of Hepatitis B among pregnant women and prevention of Hepatitis B among newborn" started in 2009 by the Azerbaijan MH in cooperation with Rostropovich-Vishnevskaya foundation and currently covers more than 95.0% of relevant individuals. Epidemiological surveillance system of Hepatitis B in Azerbaijan is useful, strong, simple, flexible and sensitive. There is a tendency of decreasing numbers of new cases from year to year. Hepatitis B is more prevalent in males. In order to increase representativeness, it is necessary to involve Nakhichevan into the electronic notification system. In order to improve operation of the system in general it is necessary periodically to carry out similar evaluation of surveillance that will allow to timely detect weaknesses of system and to take purposeful measures for its improvement.

Keywords: electronic integrated disease surveillance system; hepatitis B

[32]

Rabies Risk Factor Assessment of Agricultural Animals in Azerbaijan 2014-2016

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ABSTRACT

Rabies is a viral disease of the central nervous system and distinguished by a particularly high mortality rate. An agent of the disease is neurotropic rabies virus, which belongs to the family *Rhabdoviridae, Lyssavirus genus.* This zoonotic disease is endemic in many countries including Azerbaijan. From 2011 to 2013, 6 people and 83 animals died of rabies in Azerbaijan, highlighting the need for a better understanding of regionally specific risks and for intensified countermeasures. The risk factors for rabies infections vary from country to country and need to be well understood for effective surveillance, prevention, and eradication programs. Despite the fact that the country implements preventive vaccination of dogs and mandatory vaccination of human, cow and dogs there are still more cases especially in Sheki-Zagatala region (Gakh). The study goal was to assess the rabies risk factors based on the cases of 2014-2016 in Azerbaijan. We conducted case-control study in August 2016 in Sheki-Zagatala – the most affected rabies region in Azerbaijan. The questionnaire with 62 questions were distributed. It was distributed in two villages in affected areas and in two control areas from which no rabies was reported. The one hundred responders were personally interviewed. The list of "confirmed" and "probably cases" of cattle and dog of this region for 2014-2016 years were taken from Republican Veterinary Laboratory Database. Human rabies data were taken from Republican Anti-plague station. Human cases were diagnosed based on symptoms and exposure history, while all animal cases were confirmed histologically. Laboratory testing of animal brain material was based on indirect fluorescence assay (IFA) of necropsy samples and PCR testing. A case-control study and descriptive analysis of the research area was conducted. During the study period, 11 lethal human and 143 lethal animal cases of rabies were recorded. Of the 143 animal samples, 122 were suitable for PCR testing. Of these 108 were PCR positive for rabies virus RNA, while 14 were negative. The positive samples were primarily from cattle (35) and dogs (53). The primary transmission route in cattle and dogs appeared to be wildlife (4 cases (20%) vs. 2 controls (3%) [OR=52, CI 95% 6.7-405]. Thirteen (13%) respondents saw dead wild animals (jackals), and sixty-five (65%) saw wild animals near the village and pastures. Also, one additional information: there was a positive jackal case in the region every year from 2013

to 2016 and (89%) rabies positivity rate was identified. Livestock with pastures located near the forest were at more risk for rabies (7 cases (64%) vs. 25 controls (57%) [OR=1.82, CI 95% 0.32-10]. Rabies vaccination was also shown to be protective (4 cases (20%) vs. 40 controls (50%) [OR=0.32, CI 95% 0.09-1.09]. It turned out that 78% of rural residents either saw wild predators moving around freely in pasture areas or saw their carcasses. Wild animals biting is a major risk of rabies for agricultural animals [OR=52, CI 95%, 6.7-404.7, p<0.0002]. Also, 78% of bitten animals were from pastures without a herdsman. Compared to 2011-2013 and backed by other statistical information from the Ministry of Health and State Veterinary Control Service the rabies incidence in Azerbaijan seems to be increasing. The results show, that vicinity to wild predators stands out as the highest risk factor for transmission into farm animals. Since livestock is currently not vaccinated in Azerbaijan, future preventive measures will include minimizing contact of humans and domestic animals with wildlife and improving public awareness. Extending the existing prophylactic vaccination program needs to be considered, since presently only cats and dogs are included, as well as a mandatory vaccination of all domestic animals within a 3 km radius of confirmed rabies cases.

[33]

A Highly Sensitive Immunochromatographic Strip for the Detection of Staphylococcal Enterotoxin A, B, and C in Milk and Dairy Products.

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ABSTRACT

Staphylococcus aureus is an important foodborne pathogen and can produce a wide range of enterotoxins (SEs), which contribute to food poisoning. Rapid detection of SEs with an ELISA and gold-nanoparticle-based immunochromatographic (ICT) strip will save the time. The aim of this study was improvement and optimization of highly sensitive immune-based methods for detection of S. aureus SEs. The main goal of this thesis was to develop three ICT systems for the detection of staphylococcal enterotoxins type A, B and C (SEA, SEB a SEC), and to use them for the determination of these toxins in milk and dairy products. Initially, the appropriate conditions for the detection of staphylococcal enterotoxin B, such as nitrocellulose membranes, immobilization and reaction buffer, suitable concentration of each immunoreagent and also stabilization additives, were chosen. For staphylococcal enterotoxin A and C, the protocols developed in previous years were modified. The visual limit of the detection of SEA in culture medium was 1 ng·ml-1, of SEB 2.5 ng·ml-1 and of SEC 0.1 ng·ml-1. The cross-reactivity of used antibody was determined firstly with isolated commercial enterotoxins, then with enterotoxins produced by *Staphylococcus aureus* cells and finally with another 25 bacterial species including the most frequent food pathogens and technologically used bacterial cultures. The capability of all tests to detect the number of enterotoxins, that can cause illnesses was proved. Furthermore, the developed ICT systems were used for the determination of enterotoxins in milk and dairy products during various conditions of cultivation. We hope that our research may contribute to developing new strategies for the detection of *S. aureus* SEs during food production and to prevent risk of food contamination by toxins produced by pathogenic *S. aureus*. In future, we will evaluate the multiplexed ICT strip detection methods of staphylococcal enterotoxins type A, B and C.

Keywords: Staphylococcal enterotoxins; foodborne pathogen

[34]

Veterinary Public Health and Food Safety

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ABSTRACT

The Health and Welfare of Animals as well as Public Health are the three pillars of Veterinary Medicine and are strongly interlinked with each other. Similarly, these three pillars also contribute to build up essential columns of knowledge for the building Veterinary Education. The close relationship between Human and Animal Health (along with Wildlife and Environmental Health) has been recognized since ancient times. "One World, One Health" approach tries to promote partnership for developing mutual cooperation between the professionals working in the human and veterinary fields. Definition of Health is the state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Meanwhile, definition of Veterinary Public Health is "the contributions to human health through understanding and application of veterinary science". This is an essential part of public health and includes various types of cooperation between the disciplines that link the health triad, people-animals-environment, and all the interactions of them. Public health aims to; maintain control of zoonotic diseases, control food security and food safety, support the structure of veterinary services, and organize terms of probation for people from developing countries. The convergence of animal and human health is not a new concept. Indeed, 70% of all human pathogens are zoonotic, 80% of animal pathogens are multi-host pathogens, and 75% of emerging infectious diseases are zoonotic. Their aetiological factors vary widely, such as bacteria, viruses, parasites, fungi and prions in origin. Zoonotic diseases in different livestock species exist in high numbers, as being around 250. Diseases can be transmitted through the food. As seen among the zoonotic factors, there are numerous factors that are effective thorough the food. Controlling these factors by food control cannot be sufficient because there are many other effectors, acting thorough variable routes and mechanisms. Not only the factors themselves but also their toxins or secrets may be effective. More than 70 % of human pathogens originate from the zoonoses. For example, in general, transmission of disease-bearing factors between human-insect and carnivores, or of flu-bearing pathogens between chicken-quail-wild fowl-duck and human as well as many farm or wild animals within. Further example is the faecal transmission of carnivore oocysts or tissue cysts of mice, sheep and pigs to the embryos of human couples. In addition, upon the ingestion of pathogenic *E. coli* by the cattle it is transmitted either by faecal excretion to the environment that leads to further contamination of food and water or directly to the person in contact with or consuming the animal products. Moreover, human beings may exchange the pathogenic factors to each other. In recent years, the urbanization tended to increase rapidly. Indeed, nearly the half of world population was living in urban areas in 2000 and it is predicted to increase up to 60% by 2030. Food-borne disease and zoonoses are generally recognized as important public health problems causing decreased economic productivity in both developed- and less developed countries. The majority of recent reemerging human

infectious diseases originate from animals or animal products. For control, we need a coordinated response across the veterinary and human health sectors. Surveillance and early warning are essential. Veterinary surgeons and medical doctors must get together and share the knowledge. Food safety and public health issues should be more intense in veterinary education.

[35]

A Study of the Methylenetetrahydrofolate reductase Gene Polymorphism C677t in Precancerous Colorectal Lesions in Azerbaijan Population

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ABSTRACT

Methylenetetrahydrofolate reductase (MTHFR) plays a key role in folate metabolism, and folate is implicated in carcinogenesis by its role in DNA methylation, repair, and synthesis. The most frequently studied *MTHFR* gene polymorphism is C677T, which is involved in the pathogenesis of many diseases including precancerous colorectal lesions (Ulcerative colitis, Crohn disease, Colorectal adenomas, Hyperplastic Polyps, Familial Adenomatous Polyposis). We aimed to investigate *MTHFR* C677T polymorphism in patients with precancerous colorectal lesions in Azerbaijan population. Blood samples were collected from the Center of Scientific Surgery Named After Academician Topchubashov. Genomic DNA of 53 patients with precancerous colorectal lesions and 80 healthy controls was isolated using protocol provided by the manufacturer (Qiagen, Netherland). Genotyping was performed by Polymerase Chain Reaction-Restriction Fragment Length Polymorphism (PCR-RFLP) to determine the frequency of the *MTHFR* C677T polymorphisms. The frequencies of the CC, TT, and CT genotypes of *MTHFR* (C677T) were 64.1%, 17 %, and 18.9% In the patients with precancerous colorectal lesions and 57.5 %, 2.5 %, and 40%, respectively, in the healthy control group. The CT genotype was significantly different between patients with precancerous colorectal lesions ($P<0.0001$) and control subjects ($P=0.0008$). The frequencies of C and T alleles were 77.5% and 22.5%, respectively, in the healthy subjects and 73.5% and 26.5%, respectively, among the patients. A frequency of mutant type T allele was increased significantly as compared with that of the C allele in case subjects. Our finding suggests that there is convincing evidence that *MTHFR* (C677T) gene polymorphism related to high risk of precancerous colorectal lesions.

Keywords: methylenetetrahydrofolate reductase; genotyping

[36]

Fungal Community of Forest Ecosystem in Azerbaijan

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ABSTRACT

Azerbaijan Forests are valuable natural resource that integrates soil, water, vegetation, wildlife and microorganisms, which mutually affect each other. Important duties standing in front of mankind are to reveal the biological diversity of forest ecosystems, guard, restore their natural richness and promote sustainable control practices in forest management (Edmonds et al., 2000). Currently, forests in Azerbaijan occupy 11.8% of the total territory and they represent mixture of deciduous plant species at elevations of 400-1700m. Despite of the 107-tree species in the flora of Azerbaijan, forest forming tree species are minority. These are mainly deciduous plants, such as Fagus L., Quercus L. and Carpinus L. Conifers are species of Pinus L., Juniperus L. and Taxus L. Life longevity of the trees is different, sometimes up to 100 and more years. In general, the forest ecosystem reflects low dynamics of natural fluctuation without side interventions. In Azerbaijan, diversity of fungal groups distributed in forests has been explored, since the beginning of the last century. A number of studies on fungal associates of forest trees have been conducted after 50s of last century in Azerbaijan. Present-day situation of the forests, their development, protection, restoration and rational use, require scientific based approach in the planning of forestry in future. From this point of view the study of organisms, including fungi and insects associated with forest tree species, remains the urgent problem for providing health in the forest system. Our studies since 1994 was directed to analyse the fungal diversity associated with tree and bush species in the republic. A total of 165 micromycetes and 109 macromycetes residing to various fungal groups were registered. Pycnidial fungi with conidiomata being adapted to different ecological conditions and type special structures are able to poliphagy live style and this create opportunity for fungi adaptation on various host plant species. Species of Ascochyta, Cylindrosporium, Cytospora, Diplodia, Gloeosporium, Marssonina, Phoma, Phyllosticta and are common on tree branch and leaf cover. From ecological view point they are typical mesophyles and grow in relatively humid areas. Bark (Cryphonectria parasitica) and insect associated wood pathogenic fungi (Ophiostoma spp, mainly O. novo-ulmi, O. ips) were also among recorded species. Ophiostoma ulmi sensu lato caused severe Dutch elm disease in the country in 1980s, but last years reduced disease level was observed. Cryphonectria parasitica is causal agent of blight in sweet chestnut stands and the population of fungus is expanding each year. Ophiostoma ulmi sensu lato caused Dutch elm disease in the country in 1980s, but last years the disease level was reduced. Powdery mildew fungi are abundant on the plants of the family Fagaceae, especially leaves of oaks and chestnuts growing in north part of country (South Caucasus) are heavily infected with Erysiphe species (Erysiphe azerbaijanica, E. quercicola). Macromycetes associated with trees mainly were Armillaria mellea, Funalia gallica, Fomitopsis ulmaria, Laetiporus sulphureus and Pleurotus ostreatus

are major destroyers both of dead and living trees in forest ecosystem. In conclusion, our study highlights few important groups of fungi. Study of wild biodiversity is important to understand the role of each component in forest, also role of each fungus in order to support health of forest ecosystem.

[37]

Microbiological (Diagnostic) Control of Infectious Diseases Common to Animals and Humans

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ABSTRACT

The urgency of interaction between leading scientists and specialists of various departments for the purpose of controlling the safety of animal and human health is beyond doubt. Especially relevant this interaction becomes when we already face with the problems. An example is 2016 - the largest in recent decades, an epizootic outbreak of anthrax among reindeers in the Yamal-Nenets region, which has caused human diseases. Therefore, we should periodically discuss possible areas of cooperation between veterinary and medical specialists. The epidemiological situation of diseases common to humans and animals both in the world and in the Russian Federation continues to be unstable. Therefore, microbiological and virological (diagnostic) control of animal infectious diseases (tuberculosis, brucellosis, anthrax, leptospirosis, rabies, avian influenza) is very important. An organized system for the control of the safety of products and raw materials of animal origin in accordance with the requirements of the technical regulations of the Customs Union ensures well-being in the Leningrad Region for infectious animal diseases, incl. zooanthroponozis. In 2017, measures were taken in the territory of the Leningrad Region against 58 infectious diseases including common for humans and animals (rabies, anthrax, tuberculosis, brucellosis, leptospirosis, salmonellosis, listeriosis and highly virulent avian influenza) and animal species infections. In total, the following number of carcasses was investigated to veterinary and sanitary examination: cattle 46 497, pigs 397 044, small cattle 3404, birds of different species more than 24 million. In order to control the safety of products and raw materials of animal origin, we studied genomic polymorphism of circulating microorganisms (streptococci) in livestock farms. The coding genes, resistance to antibiotics were determined. To ensure the safety of food and foodstuffs, it is necessary to improve the regulatory and methodological basis of the system of state supervision over the use of antibiotics in different farms, regardless of the form of ownership.

Keywords: animal infectious diseases

[38]

One Health Approach to Minimize the Emergence and Spread of Antibiotic Resistance Bacteria in Azerbaijan

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ABSTRACT

Increasing prevalence of antibiotic resistant organisms including human pathogens prompted the statement of "no action today, no cure tomorrow" by the WHO's World Health Day in 2011. Antibiotic- resistant infections can happen anywhere and present a serious global public health challenge. Multidrug resistant strains including TB in prisons and *E. coli* in the poultry industry are increasing in the republic of Azerbaijan (AzerTAc, Baku, July 2014 & 2015). This is an alarming update with unintended serious consequences due to the negative impact of antibiotic resistant infections on common practices in modern medicine. Developing an "action plan today" with profound clinical outcomes requires investigation into the cause of the emerging antibiotic resistant strains in different establishments including prisons, hospitals, health clinics, the food industry and the environment. Our overarching goal of the Fulbright award to Azerbaijan is to monitor the proper use and overuse of antibiotics in an effort to identify risk factors associated with the development and spread of multidrug resistant bacteria in healthcare organizations in Azerbaijan. Specific goals of this collaborative research proposal are to: a) Compare the guidelines for antibiotic use in clinical settings in the USA and Azerbaijan; b) Survey adherence of clinicians to guidelines and patients' compliance; c) Identify antibiotic resistant clinical isolates in Baku hospitals in relation to the set guidelines; d) Designate genome-wide genetic determinants of antimicrobial drug resistance in target bacterial strains common to Azerbaijan, and e) Develop effective liposomal antibiotics against multidrug resistant strains of *Pseudomonas aeruginosa*, a potential lethal pathogen in hospitals worldwide. Our overarching goal is to understand the root causes of the antibiotic resistance phenomenon and develop an evidence-based action plan across human and animal health and the agriculture industry to minimize the emergence and spread of antimicrobial resistant microbes in Azerbaijan.

Keywords: antibiotic resistance bacteria; one health approach

[39]

Implementation of Multiplex Amplicon Sequencing in Bread Wheat Using Next Generation Sequencer

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ABSTRACT

Studies on *Triticum* have attracted large attention over more than 150 years and have produced a large amount of knowledge on genome structure, crossability, genome size, and phylogeny. In early 20th cytogenetic methods revealed that wheat species fall into three groups based upon their ploidy level; diploid einkorn wheat, tetraploid emmer wheats and hexaploid bread wheats. Among them, hexaploid *T. aestivum* L. with one of the largest and complex genome (17 GB) has an important role to ensure food safety all over the world. The whole genome of bread wheat was sequenced in 2013 and 124,201 genes were determined. At present, along with molecular markers, the more advanced technologies as re-sequencing, GBS and 90K SNP array are used in the study of genetic diversity of bread wheat collections. As a result of high-throughput sequencing technologies a large number of SNPs are obtained, the analysis of which takes too much time. The creation of amplicon panels that cover specific parts of the genome and various genes is considered to be more effective technology. Such panels were created to study many human diseases and continue to be successfully used today. Among plants, the first panels have been created for maize and barley plants. In the current research, for the first time, a panel of 830 primers including 60 gene-specific primers was designed for the wheat genome by the Kansas State University of USA using wheat exome with 5cM marker density. The genotyping of 172 bread wheat accessions was performed in the Ion Torrent Next Generation Sequencer using the constructed panel. One hundred sixty polymorphic markers were identified for A genome, 180 for B genome and 120 for D genome. The future use of the selected panel of 460 primers in the genotyping of wheat collections and for association mapping of quantitative traits in the future was recommended.

Keywords: next generation sequencer; wheat genome; genetic diversity

[40]

Biosurveillance of Schmallenberg Disease in Azerbaijan in 2012-2017

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ABSTRACT

Schmallenberg virus is an orthobunyavirus that primarily infects domestic and wild ruminants where it can cause symptoms such as transient fever, diarrhea, reduced milk production, congenital malformations and abortions. It was first described in 2011 at the onset of a major outbreak in Europe (Germany, Hungary, France). Schmallenberg virus associated cases first appeared in the Dutch/German border region, but the exact origins of it are unclear. In 2012, there was an unexpected increase of abortions in cattle and sheep in Azerbaijan, that was unrelated to infections with Brucella or Chlamydia. This surveillance study was hence launched to determine if Schmallenberg virus had made it to Azerbaijan and to monitor the situation. Following the first confirmed cases in October 2012, every Regional Veterinary Office (RVO) in Azerbaijan was notified of the outbreak. Materials collected were serum and head and neck biopsies of aborted fetuses as well as serum form other affected animals. To detect viral DNA a commercially available, real-time PCR assay was used to rapidly diagnose cases. To screen for the presence of antibodies against Schmallenberg virus the IDEXX Schmallenberg Ab Test was used. During the study period, several thousand suspicious cattle and sheep were tested each year for Schmallenberg virus RNA or antibodies against the virus. Cases with PCR confirmed Schmallenberg virus RNA were detected between 2012 and 2014 but in none of the suspected or antibody positive cases since. Between the first cases in October 2012 and January 2018 cattle or sheep with antibodies against Schmallenberg virus were found in 42 districts in Azerbaijan. The virus does not seem to be circulating at this point, but in the absence of a vaccination program and with post-outbreak herd immunity vanishing reintroduction seems possible in the future.

Keywords: Biosurveillance; Schmallenberg virus

[41]

The Contamination of Soil with Pesticides in Azerbaijan and Its Impact on Human Health

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ABSTRACT

Being designed to kill and possessing non - specific mode of action with regard to various types of species, pesticides are capable of killing or harming organisms – pests, as well as humans. As formulations, they are comprised of both "active" and "inert" ingredients. What kills the pest are the active ingredients; the function of inert ingredients in their turn is to help the active ingredients to be more effective. The named formulations contaminate almost every part of our environment. Especially, soil is being affected in many ways and times. Overuse or misuse of pesticides can have a bad damage to the soil. They affect the quality of soil in the long run. Oftentimes, it leades to a decrease in biodiversity in the soil. The so - called positive factors for the spread of pesticides at rates after they enter the soil, can depend on the type of soil and pesticides, moisture and organic matter content of the soil and so on. It is the reason why a relatively small amount of spilled pesticides can result in a much larger volume of contaminated soil. The problem is in fact huge and steadily growing. The quality of soil deteriorates and the community of organisms living in the soil are damaged as a result of misuse or over use of pesticides. In fact, pesticides are differentiated as to the level of poisons; some are deemed to be more toxic than others. Some may break down fast when applied to soils, whereas others may persist for much longer periods. The pesticide persistence depends on the type of soil and the type of pesticide itself. There are overwhelming evidences when some of these chemicals are said to have caused a potential risk to human beings and other life forms; unwanted side effects to the environment can be added to this list as well. The yearly world-wide deaths and chronic diseases because of pesticide poisoning are calculated to be approximately 1 million. Health effects caused by pesticides can be of neurological nature such as memory loss, loss of coordination, reduced speed of response to stimuli, reduced visual ability, altered or uncontrollable mood and general behavior, and reduced motor skills. Other possible health problems are asthma, allergies, and hypersensitivity. Experts also link pesticide exposure to cancer, hormone disruption, and problems with reproduction and fetal development. In order to reduce pesticide contamination (and the harm it causes) to the surrounding environment, the best way for us is to do our part to use safer, non-chemical pest control (including weed control) methods. As we know, pesticides are also widely used in cotton fields. One of our research areas, Mugan plain of the Azerbaijan Republic is one of the areas, where cotton-growing has been successfully developed. This area is no exception to the ones contaminated by pesticides. Taking into consideration that cotton-growing continues to develop in Mugan plain, it is vital to cut the pesticide usage to minimum in these areas. The research in this field is of utmost importance.

Keywords: soil contamination; pesticides; human health

[42]

Unusual Cholesterol Crystals in Renal Tubules

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ABSTRACT

Cholesterol crystals are the morphological variability that occurs during lipid nephrosis in the proximal renal tubules. The amount of cholesterol and its fractions in the blood increases after hypoalbuminemia in patients caused by proteinuria. A 21-year-old woman who has applied to the clinic with signs of edema has been examined and biopsy specimens have been investigated to clarify her clinical diagnosis. Paraffin blocks were made from the biopsy fragment submitted to the laboratory, and the microslides were prepared of them having stained them immunohistochemically and histochemically. One block was prepared for ultrastructural examination (Araldit-Epon). The semithin section 1 mkm thickness and the ultrathin section 50-60 nm thickness was taken. These sections were investigated in the JEM-1400 Transmission Electron Microscope at 80 KV voltage. Histochemically, in the examined biopsy tissue the transparent, uncolored needle-like spaces was determined in the epithelial cells of proximal tubules. In the ultrastructural images, it was identified that these spaces were cholesterol crystals. Thereby, our research revealed again that the cholesterol increasing in blood compensatory during hypoalbuminemia accumulates in the tubules when getting out with urine and this in turn prepares the ground for beginning of a new alteration in the tubules.

Keywords: Renal Tubules; cholesterol crystals; nephrotic syndrome

[43]

Investigation of Drought Stress on Yield Components of Synthetic Wheat Accessions

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ABSTRACT

Among the abiotic factors, drought is the most important environmental factors limiting crop production in the world. The adverse effect of drought on crop can be minimized by escaping stress at the most sensitive stages of crop development such as reproduction and grain filling periods. The best way to cope with them is to develop tolerant varieties that perform well under stress and under optimum environments. For this, wild relatives (*Aegilops* species) and synthetic hexaploid wheat are the best sources of genes Ae. *tauschii Coss*. is adapted to a variety of environments such as desert margins, steppe regions, stony hills, wastelands, roadsides, sandy shores, and even humid temperate forests. The diversity of the D genome of this species is much larger than that of bread wheat. This study demonstrated the difference between three groups of synthetics. Each of the three main groups (1-CIMMYT synthetics; 2-CIMMYT synthetics x modern varieties; 3-Japanese synthetics) comprised 12 lines selected in Turkey from a larger set of materials. The lines were selected based on their agronomic performance, including disease resistance. The experiment was conducted at two sites in Azerbaijan during 2015 and 2016: Baku (0 masl) under irrigated conditions and Gobustan (850 masl) under dry rain-fed conditions. At all sites, experiments were managed using optimal production technologies. The following traits were recorded during the growing season: days to heading, plant height, peduncle length, and reaction to stripe and stem rusts. Spike productivity traits (spike length, number of spikelets per spike, number of grains per spikelet and per spike, weight of spike, chaff, and grain, and 1000 kernel weight) were evaluated in Azerbaijan using five random stems from each replication. Five superior synthetics were selected from each of the three groups, based on grain weight per spike. STI was calculated for each of the three key spike productivity traits; higher values indicate better tolerance to stress. Along with the trait mean value, STI is a good indicator of germplasm performance across sites x years and ability to withstand stress conditions. For the number of grains per spike, none of the synthetics was superior to Seri which had the highest value (57.8) and the highest STI (1.29). Only two other entries (5 and 31) had more than 53 grains/spike and STI higher than 1. For 1000 kernel weight, five entries (10, 15, 29, 31, and 44) had average values exceeding 44 g and STI higher than 1, compared to the best check (Bezostaya-1) with 40.9 g and 0.94 STI. The best CIMMYT synthetics and their derivatives had grain weights per spike at least 9% higher than the best check (Seri). Entries 15 and 31 had respective grain weight per spike of 2.24 g and 2.56 g and STI of 0.73 and 0.97, while the checks were 1.85 g and 0.62 for Bezostaya-1 and 1.93 g and 0.66 for Seri. The best

synthetics demonstrated superior productivity performance combined with stress tolerance. Synthetics are frequently recommended for enhancing tolerance to abiotic stressed.

Keywords: wheat; drought stress; genetic diversity; stress tolerance

[44]

Impact of Environmental Factors on Breast Cancer Progression

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ABSTRACT

Breast cancer is a complex group of diseases that occurs in an environmentally complex world and is one of the significant causes of death among women. Environment factors along with other factors, such as air and soil pollutions, surface water and food pollution by heavy metals consequently occupies a significant place in the initiation and progression of carcinogenesis. There are tremendous gaps that still exist in understanding about what causes breast cancer. The study on literature review shows that an evidence that toxicologic studies relevant to breast cancer etiology has been substantially increased. Other specific environmental exposures such as hormonal replacement, oral contraceptives, diethylstilbestrol used for miscarriages, obesity, tobacco, radiation, exposure to light at night, metals, parabens, industrial, agricultural chemicals and many of such factors in the environment associated with breast cancer and it could be casual. These factors may affect in various way, directly or indirectly through some mediators such as early puberty. An individual prevention to avoid known hazards wouldn't be as much effective as the application of realm public policy. There are lack prevention campaigns for the risk factors. Also, effective public health breast cancer prevention to promoting mammography screening programs in Azerbaijan would be the best approach in One Health. In conclusion, all these studies on observational epidemiology and toxicology can help to produce the best evidence possible for making wise decisions on moving forward to develop new approaches and clearly delineate actionable environmental causes of breast cancer.

Keywords: breast cancer; environmental factors; public health; mammography screening

[45]

Purslane (Portulaca Oleracea L.) Tea Consumption Improves Biomarkers Associated with Immune and Antioxidant System.

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ABSTRACT

Portulaca oleracea L. (purslane) is growing in Azerbaijan, the North Caucasus. It is an annual plant, characterized by fleshy, opposite, oblong, thick leaves and branching, sometimes rising prostrate and erect stems. Yellow flowers of small size are collected into bundles. Fruit-spherical or egg-shaped, there are dark brown ripen seeds. Purslane cultivated by gardeners as a vegetable. It contains more omega-3 fatty acids, α-linolenic acid, 0.01 mg/g eicosapentaenoic acid, ascorbic acid, retinol, tocopherol, vitamin B_1, B_2, B_9, carotenoids and macroelements such as Mg, Ca, K, Fe, microelements such as Se. In leaves and in stem of portulaca there are 2 types of betalainalcoloid pigments, betacyanins and betaxanthins. Both of these pigment types are potent antioxidants and have been found to have antimutagenic properties in laboratory studies. The main aim of this research was the study of effect of the Portulaca Oleracea tea on biomarkers of immune and antioxidant system of an organism. The research was held in a private clinic 'Nargiz' in Baku, which specialized in herbal treatment of different pathological diseases. In this research, bloods of 86 patients were examined: 52 women and 34 men aged from 16 to 60 years old. All patients were given three times a day 100 ml of Portulaca tea for one month. Venous blood of patients was taken before and after treatment for analysis. The basic method of study of the material was the inquiry-survey method on the D.M.Cotton's method [1996]. Immune parameters like leucocytes, neutrophils, eosinophils, lymphocytes, monocytes, erythrocyte sedimentation rate, phagocytic activity of leucocytes, level of immune complexes, level of Ig A, Ig M, IgG and Ig E were examined. Amount and activity of components of antioxidant system – thiol status, activity of glutathione reductase, glutathione peroxidase was studied by immunoassay method with the aim of determination of antioxidant activity of *Portulaca Oleracea.* Our results from this study indicated that *Portulaca Oleracea* tea consumption were effective in regulation of parameters and biomarkers associated with immune and antioxidant system.

Keywords: Portulaca oleracea; immune system; antioxidant system

[46]

Study of the Tolerance to Nature in Childhood Experience

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ABSTRACT

Access and tolerance towards nature is very important for development of children's positive environmental attitude. The children lacking opportunities to interact with nature are less capable to value and appreciate it, which may lead to further degradation of the natural environment. Their outdoor experiences can be identified as increased cognitive function and a key beneficiary. It was interesting to know if bad experience with nature can provide development of stress coping mechanism that may be used in their later life. Objective of this study was assessment of the psychological and environmental attitude towards nature among children. We assessed within the study 85 secondary school children's attitude toward wild bees in Azerbaijan. We used a questionnaire survey method to analyze children's attitude to nature. Based on the study findings we can suggest that increasing children's familiarity and experience with nature is important means of developing their tolerance, but this is effective in cases where wildlife does not cause negative experience. Our findings demonstrated that more than half of the respondents felt uncomfortable with the presence of wild bees in their neighborhood. About 35% of children liked wild bees and 65% of children were uncomfortable with them which was explained by lack of necessary knowledge or bad experience with them. Children who had bad experience with wild bees developed negative attitude toward wildlife. Negative attitude and growing bad childhood experience to nature may reduce their tolerance in the future. The lack of childhood experience with nature may in turn affect their tolerance, which will lead to difficulties for preservation of biodiversity at adequate levels. To avoid the problem, it is necessary to provide relevant information on the ecological functions of the wildlife which cause disturbances. Therefore, there is growing necessity to use special educational methods with children to help them address any emotional problems, increase self-confidence, their positive attitude and tolerance to nature in future.

Keywords: childhood; environmental attitude; emotional problems; tolerance to nature

[47]

Epidemiology of Thyroid Diseases in Azerbaijan.

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ABSTRACT

Thyroid disorders are more common and an actual medical condition around the world. It affects the function of the thyroid gland and are observed in 30%-40% of all endocrine disorders, especially in endemic areas, where are the iodine intake less than 50μg. According to the World Health Organization (WHO), almost one third of the world's population (about 1.5 billion inhabitants of the Earth), lives in areas of iodine deficiency. The prevalence of thyroid disorders also depends on ethnic and geographical factors. High-risk populations include mountainous areas with severe shortages of iodine, where the prevalence of goiter can reach 80% and is endemic. In Azerbaijan, the most common regions with thyroid disorders are Sheki, Balakan and Gakh. However, recent studies show that this disease's rates have also increased in Gadabay, Shamkir, Gazakh, Ganja and southern regions. Thyroid hormones are the main regulatory of growth, development and metabolism. Violation in their synthesis leads to the significant changes in human body. Consequently, early diagnosis of thyroid disorders is very important. These thyroid disorders were classified due to comprehensive diagnostic analysis with automated electrochemiluminescence immunoassay (ECLIA) for the in vitro quantitative determination of thyrotropin, total triiodothyronine, thyroxine, antibodies to thyroid peroxidase and thyroglobulin in human serum. In 2017, the statistic investigation of Azerbaijan Health Ministry registered 16,986 people with general glandular disease in the country. The 20% of them suffer from diffuse thyroiditis, approximately 28% have nodular thyroid disease and goiter, 32% and 20% have thyrotoxicosis and hypothyroidism, respectively. About 0.31% of investigated have malignant neoplasms of the thyroid gland. Thyrotoxicosis and nodular thyroiditis are the most common thyroid dysfunctions in Azerbaijan. It may be due to autoimmune reasons. In order to reveal the scale of autoimmune disabilities in thyroid disorders, more detailed investigation must be conducted in the future. A program of iodine supplementation must be taken in iodine deficiency areas.

Keywords: thyroid diseases; epidemiology

[48]

Monitoring of Phenylalanine in Children with Phenylketonuria

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ABSTRACT

Congenital metabolic errors include a heterogeneous group of rare genetic disorders, which are usually caused by mutant genes. Phenylketonuria (PKU), a relatively common metabolic disorder that responds to treatment, is a hereditary autosomal recessive disorder caused by a deficiency of phenylalanine hydroxylase (PAH) or one of several enzymes that mediate the biosynthesis or regeneration of the tetanhydrobiopterin cofactor. Since PKU is inherited autosomally recessively, the parents of a sick child are heterozygous carriers of a mutation in the PAH gene. In some heterozygotes, the synthesis of phenylalanine hydroxylase decreases, hence the concentration of phenylalanine (Phe) can approach the levels observed with moderate hyperphenylalaninemia. To achieve low concentrations of phenylalanine, diet therapy is prescribed. But with atypical forms of the disease, despite the diet, there is no positive dynamics. These variants of PKU are associated with a deficiency of tetrahydropterin, dehydropterin reductase, 6-pyruvyltetrahydropterine synthase, guanosine-5-triphosphate-hexyl hydrolase, etc. We examined the blood of sick children with PKU, as well as their parents. All of the examined children had a classical version of PKU. A total of 5 patients (2 boys and 3 girls) aged 8 to 11 years from 3 families were examined blood to find out the effect of a low-protein diet, having studied the dynamics of phenylalanine . To conduct a blood test in children, venous blood was taken on an empty stomach and with the help of an enzyme-linked immunosorbent assay of blood spots, the amount of phenylalanine was determined. Neonatal Phenylalanine Perkin Elmer (Finland) and the Varioscan Flash analyzer were used for analysis. In first case study, family (parents are distant relatives on the maternal line) had two, 9 and 7 years old girls with PKU. According to the mother, when the eldest of the daughters reached ninth month, she could not sit still. This served as a request for medical help. But the exact diagnosis was not established. I received treatment from a neurologist with a diagnosis of encephalopathy. Only in 4 years the child was diagnosed with PKU with an index of phenylalanine in the blood of 1751.23 μmol / l (29%) (norm ≤120 μmol / l). A diet with low protein diet is relatively respected. The youngest daughter was diagnosed at 1.5 years with a phenylalanine blood index of 1733.5 μmol / l. After diagnosis, children eat low-protein foods. A study of the blood of girls and their parents on the number of FAs showed the following results: in the older girl, the level of phenylalanine was 1200 μmol / l, and in the youngest, 1080 μmol / l. Two months later, when the analysis was repeated, the results were 1180 and 1030 μmol / l, respectively. This indicates that due to the diet indicators, results are somewhat lowered. In another case, parents are relatives (they are cousins). They have an eleven year old son. The diagnosis of PKU was put in 9 months in Iran by a neuropathologist. The reason for contacting the neuropathologist was multiple seizures. Dietary food was introduced at a limited time due to lack of funds. After 2 years, the diet was not observed at all. At the first measurement, the FA was 1625 μmol / l, after

two months 1683. μmol / l. In the third family, the father and mother are also relatives. They have a nine year old boy and a seven year old girl. According to the parents, the infant period was normal for children. They were treated at the neurologist, but there was no success. The exact diagnosis was made in Turkey. The blood test for Phe without diet was 1150 μmol / l in the boy, and the girl had 998 μmol/l. A month after the introduction of dietary nutrition, these rates were 1291 and 1059, respectively. Our analysis shows that in some patients the dietary protein-free diet has a positive effect on the concentration of phenylalanine, while in others the effect of the diet is very slight. This indicates that these patients have different mutations. Therefore, genetic research should be carried out.

Keywords: phenylketonuria; monitoring

[49]

Optımızatıon of Contemporary Clınıcal Investıgatıons in Dıagnostısıs of Prostate Cancer in Prıvate Hospıtals.

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ABSTRACT

In modern urology and in international urological protocols, a number of physical, laboratory, radiological and minimally invasive instrumental examinations have been proposed for the diagnosis of prostate diseases. Nevertheless, hyperdiagnosis work up is not a rare case in management of prostate diseases. Unfortunately, such cases may occur during diagnosis for inflammatory prostate conditions, benign prostate hyperplasia (BPH) and more often on prostate cancer (PCa) diagnosis. Interestingly, hyperdiagnosis is common as among general practitioners, as well as among urologists. Growth of private hospitals and voluntary medical insurance companies (VMIC) in Azerbaijani Healthcare System over the past 15 years has increased hyperdiagnosis cases, affecting even more when commercial interests overcoming medical ones. This article discusses the experience of optimal diagnostic algorithm work up for early detection of prostate diseases (100 patients' men at the age of 40-80 years old) in one private hospital. Modified risk factor such as smoking is also the theme of discussion All 100 patients at the age of 40-80 years old were questioned with specifically designed Prostate check-up program questioner. DRE, PSA total and TRUS or transabdominal ultrasonography done for all patients as well. Urinalysis test conducted only for symptomatic patients. Suspicious cases for PCa were sent for muliparametric MRI investigation. All results were statistically analysed primarily. DRE, PSA test in blood and TRUS examination is fast, cheap and available examination in initial diagnosis of prostate diseases in private hospitals. All these investigations are covered by most insurance companies. Apart from known risk factor for prostate cancer smoking is a strong modified factor. Men below 50 years old mainly visit urologist due to erection problems, whereas complains due to urinations is becoming more prominent after 50 years old. PSA test is prostate specific but has low sensitivity in diagnosis of prostate cancer Prostate diseases are becoming more prominent in men over 55 years old. Patient awareness programs has an outmost importance in good controlling of prostate diseases, especially the prostate cancer.

Keywords: prostate cancer; risk factors

[50]

The Protective Effect of Angiotensin Converting Enzyme Inhibitors (Aceis) and Angiotensin-Receptor Blockers (Arbs) against Cardiotoxicity in H9c2 Cell Line

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ABSTRACT

Cancer and cardiovascular disease are the most common causes of death worldwide. Many of the vital anti-cancer drugs are designed to combat cancers have cardiotoxic effects. As the number of the cancer survivors is expected to rise, management of cardiac toxicity would be prudent for medical practitioners looking after cancer patients. Doxorubicin is one of the effective anthracycline anticancer drugs used extensively as an important chemotherapeutic agent for various Cancers. Doxorubicin is known for its lethal side effects, cardiac toxicity. Cardiotoxicity is a serious dose-limiting side effect of doxorubicin in cancer patients. This means that administration of clinical doses are kept quite low and patients may not receive effective doses against cancer. Angiotensin converting enzyme inhibitors (ACEIs) and Angiotensin-receptor blockers (ARBs) may have preventive and protective role against cardiotoxicity of doxirubicin. ACEIs and ARBs, showed partially protective effect in animal and human models of doxirubicin induced cardiac toxicity. 63 H9c2 (cardiomyblast cells) is cardiac cell line widely used in numerous cardiotoxicity studies. The aim of present study is to investigate whether ACEIs and ARBs would be effective protectors to attenuate doxorubicin induced cardiac toxicity in order to improve cancer therapy.

Keywords: cardiotoxicity*; angiotensin converting enzyme inhibitors;* angiotensin-receptor blockers

[51]

Chitosan/Poly (Caprolactone) Fibrous Scaffold containing Hydrocorisone for Antibacterial Wound Dressing

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ABSTRACT

Electrospinning is a promising technique for synthesizing polymeric fibrous for bio-applications in large scale, especially for drug delivery. In this work, we fabricated fibrous scaffold including hydrocortisone beads and investigated the fibre diameter, number of beads, time of drug releasing and the effects of pH on releasing time. has attracted enormous research interest due to its flexibility, inexpensively, simplicity, being capable for broad range of polymers, etc. In addition, the fabrication of electro spun nanofibers using polymers both naturally and synthetic found to be effective in developing appropriate drug delivery system. For instance, gelatine, collagen, chitosan (CS), and hyaluronic and synthetic polymers for example poly(caprolactone) (PCL), poly lactic acid) (PLA), polyethylene oxide, and copolymers such as poly (L-lactic-co-glycolic acid) (PLGA) have been used in the synthesis and fabrication fibrous scaffold. In this work, we synthesized fibrous scaffold of CS/PCL containing beads with various loading of hydrocortisone by electrospinning. The potential application of produced nanofibrous films in wound dressing was examined by investigating hydrocortisone release. Fibber diameter, number of beads and morphology of these fibres were examined by field emission scanning electron microscopy (FESEM). Also, the in vitro release of this drug was analysed by LC/MS system.

Keywords: chitosan; poly (caprolactone); hydrocortisone; drug delivery; fibrous scaffolds

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