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Olga Turkovskaya et al., Occup Med Health Aff 2017, 5:2(Suppl)
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POLYCYCLIC AROMATIC HYDROCARBONS (PAHS): THE PECULIARITIES OF THEIR DEGRADATION BY LIGNINOLYTIC FUNGI

Olga Turkovskaya[a], **Natalia Pozdnyakova**[a], **Ekaterina Dubrovskaya**[a], **Sergei Golubev**[a] and **Svetlana Balandina**[a]
[a]Russian Academy of Sciences, Russia

Primary screening of 20 strains of ligninolytic fungi belonging to wood- and soil-inhabiting *basidiomycetes* and *ascomycetes* for degradative activity toward PAHs (phenanthrene, anthracene, and fluorene) showed that all the *basidiomycetes* examined were active in degrading the studied compounds. Of the three compounds tested, anthracene was the least available to all the fungi. The degradation of this compound varied from 16 to 91%. *P. ostreatus* MUT2977, Lenzites *betulina*, *T. versicolor* MUT3403, and T. maxima metabolized phenanthrene, anthracene, and fluorene more intensely (up to 90%). Phenanthrene and fluorene were degraded by basidio- and *ascomycetes*. Their decrease with *P. ostreatus* D1 was about 100%. One of the most active was the ascomycete *C. herbarum*, which degraded all the PAHs 100%.

The ligninolytic enzyme system catalyzes the key stages of PAH degradation by fungi. We showed that all examined members of the genera Pleurotus and Trametes, as well as *Len. betulina, St. murashkinskyi*, and *Sch. commune*, produced laccase and Mn-peroxidase. Lignin peroxidase and Mn-peroxidase activities were detected in B. adusta only, whereas laccase activity was in *Str. rugosoannulata* only. These properties are typical of these fungi. We found for the first time that PAH degradation by the *ascomycetes* Lec. aphanocladii, *F. oxysporum* and *C. herbarum* was accompanied by the production of Mn-peroxidase only. In the ascomycete *G. candidum*, ligninolytic enzyme activity was not found.

Despite some differences, the degradation of phenanthrene, anthracene, and fluorene followed the same scheme, forming quinone metabolites at the first stage: 9,10-anthraquinone in the case of anthracene, 9-fluorenone in the case of fluorene, and phenanthrene-9,10-quinone in the case of phenanthrene. Data were obtained which supported the hypothesis that the degree of PAH degradation may depend on the composition of the extracellular ligninolytic complex. The presence in the cultivation medium of only laccase (*Str. rugosoannulata*) resulted in accumulation of the corresponding quinones in the medium. Successive production of laccase and Mn-peroxidase (*P. ostreatus* D1) resulted in the formation and subsequent utilization of these metabolites. The simultaneous presence of two enzymes, the activity of one of which is low (*St. murashkinskyi*), resulted in slow degradation of these quinones. Finally, if both enzymes were highly active (*T. hirsuta*), the quinone metabolites formed were degraded quickly. The metabolites of "deep" degradation of the PAHs (2,2'-diphenic and phthalic acids), which are included in basal metabolism of fungi, were found.

Therefore, the affiliation of the fungi with different eco-physiological groups and their cultivation conditions affect the composition and dynamics of production of the ligninolytic enzyme complex and, consequently, the completeness of PAH utilization. From the data obtained, we speculate that laccase can catalyze the initial attack on the PAH molecules to give quinones and that peroxidase catalyzes the following oxidation of these compounds, ultimately resulting in pollutant mineralization.

Biography

Olga Turkovskaya is head of the Environmental Biotechnology Laboratory at the Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences. Her Main research areas are degradation of xenobiotics by bacteria, plants, and fungi at natural sites and in wastewater, basic aspects of plant and microbial interactions with man-made environmental pollutants, influence of pollutants on natural ecosystems, selection and study of Plant-Growth-Promoting Rhizobacteria (PGPR) and development of biotechnologies for nature protection.

turkovskaya_o@ibppm.ru

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OCCUPATIONAL STRESS, AND SLEEP QUALITY ON FATIGUE AMONG COMMERCIAL AIRLINE PILOTS- BASED ON MODERATING EFFECTS OF JOB RELATED FACTORS

Jung HS[a] and **LEE HJ**[a]
[a]The Catholic University, Republic of Korea

It has been reported that pilots' fatigue is the biggest human cause of aircraft accidents, and the International Civil Aviation Organization (ICAO) has recommended that each nation should introduce, operate, and manage a Fatigue Risk Management System (FRMS) to prevent aircraft accidents caused by fatigue and reduce pilots' fatigue. This study aimed to build and test a path model to explain factors and paths influencing pilots' fatigue to develop a Korean-style fatigue management model for pilots and its management plans fit for the circumstances of South Korea. A survey was conducted with pilots that were members of the Airline Pilots Association of Korea and working for a domestic airline with a questionnaire on their general characteristics, job related factors, psychosoical factors (Type A Behavior and self-esteem), occupational stress, sleep quality and fatigue. Data was collected with an online survey from September 9 ~ October 9, 2015.

The main findings were as follows: First, the subjects average scores are as follows: 5.3 points (0~10 points) in Type A Behavior among the psychosocial factors, 30.3 points (10~40 points) in self-esteem, 61.3 points (0~100 points) in occupational stress, 8.8 points (0~21 points) in sleep quality, and 98.1 Points (19~133 points) in fatigue and had an average of 7.9 hours of sleep. Second, the path analysis results show that a higher tendency toward Type A Behavior of psychosocial factors and lower self-esteem led to higher occupational stress (β=0.961, $p<0.05$), which in turn resulted in lower sleep quality (β=0.699, $p<0.001$) and higher fatigue (β=0.489, $p<0.001$). Their lower sleep quality led to higher fatigue (β=0.185, $p<0.05$).Third, occupational stress had significant positive (+) mediating effects between the psychosocial factors and sleep quality and between the psychosocial factors and fatigue. Sleep quality had significant positive (+) mediating effects between occupational stress and fatigue. Fourth, the study examined moderating effects according to their job related factors and found that occupational stress had greater impacts on sleep quality in the pilots whose job career was less than ten years than in the pilots whose job career was ten years or longer. The psychosocial factors had significantly greater impacts on occupational stress among captains than co-pilots. Sleep quality had significantly greater influences on fatigue at full service carriers low cost carriers.

Based on these findings, the study made the following proposals: First, there is a need to develop programs to reduce or control pilots' fatigue and build systems in the policy aspect since pilots have a difficult time avoiding fatigue and inevitably experience it due to their job characteristics. Second, there is a need to develop a standardized instrument to measure the subjective fatigue of airline pilots, analyze the flight routes and forms to measure their fatigue objectively, and collect and analyze their biometric data before introducing an FRMS recommended by ICAO. Third, there is a need to develop and apply an intervention program to manage the psychosocial factors at the individual level and occupational stress at the organizational level fit for the organizational culture of the nation.Fourth, there is also a need to provide personal custom information based on smartphone applications or websites for the search of data and the operation of interventions and educational programs by taking into account the occupational characteristics of pilots and the usefulness of media. Finally, a future study needs to test the effects of intervention programs and investigate the depression levels reflecting the fatigue characteristics in prospective research to track and observe the subject groups.

Biography

Jung HS is a Professor in Preventive medicine. She is presently working in The Catholic University, Republic of Korea. Her main research interest includes Nursing, Public Health and industrial nursing.

hyesun@catholic.ac.kr

Sandra Andrusaityte et al., Occup Med Health Aff 2017, 5:2(Suppl)
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THE INFLUENCE OF URBAN GREEN SPACES AND SOCIAL ENVIRONMENT ON PRESCHOOL-AGE CHILDREN OVERWEIGHT

Sandra Andrusaityte[a], **Regina Grazuleviciene**[a] and **Inga Petraviciene**[a]
[a]Vytautas Magnus University, Lithuania

Background: Recent research has found that residential environment can have impacts on child development and body mass index (1-3), however, the available evidence of simultaneous investigating the associations of low socioeconomic status and residential green spaces with childhood obesity is scarce (4-6). The aim of this study was to assess the associations between urban green spaces, social environment and risk for overweight/obesity among 4–6 year old children.

Methods: This epidemiological study included 1,489 Kaunas children followed-up from birth. Body mass index (BMI) was evaluated according to International Obesity Task Force (IOTF) criteria for children. We compared two child's BMI groups: The overweight/obesity group (BMI ≥18 kg/m2) and the reference group (BMI <18 kg/m2). Individual exposure to greenness levels was assigned as the average of satellite-derived Normalized Difference Vegetation Index (NDVI) of each participant home, and residential distance to nearest City Park was assessed by GIS. We used logistic regression models to estimate associations as odds ratios (OR).

Results: About 7.5% of the 4–6 aged children were overweight/obese. The lower neighborhood greenness exposure (NDVI-100 m< median) during pregnancy and over 4 years was associated with increased children's overweight/obesity risk. Low maternal education, smoking, and sedentary behavior were also statistically significant risk factors associated with children's overweight/obesity in the univariate and multivariate models. Children from lower SES families residing in low greenness exposure area had 3-fold increased risk of overweight/obesity.

Conclusion: Low residential greenness exposure of low SES families is associated with increase the risk of overweight/obesity in preschool-age children. The usage of city green spaces for increasing physical activity has been recommended as a measure to prevent overweight/obesity among children.

Biography

Sandra Andrusaityte is working as a researcher in Department of Environmental Sciences Vytautas Magnus University, Lithuania. For the last 5 years she has been involved in the epidemiological research of studding environmental exposure impacts on human health. In 2015 she gained a Doctor's degree in Biomedical sciences, Ecology and Environmental sciences. She is trained as an Epidemiologist and Biostatistician in the Emory Health and Exposome Research Center in Atlanta, USA. Her Areas of research are Biomedical Sciences, Environmental Epidemiology, Public Health, focusing on impact of natural environment and social environment on children health. She has been involved in the EC 7FP projects: PHENOTYPE and HELIX.

sandra.andrusaityte@vdu.lt

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EMOTIONAL LABOR AND WORKPLACE VIOLENCE OF PRESCHOOL TEACHERS

Souk Young Kim[a] and Eunju Seo[b]
[a]Eulji University, South Korea
[b]Shinsung University, South Korea

Purpose: The purpose of this study was to assess emotional labor and workplace violence of preschool teachers and to analyze the relationship between emotional labor and workplace violence.

Methods: The study surveyed 255 preschool teachers from July to September 2016 in Korea. The questionnaire was structurally designed to include items about emotional labor and workplace violence. For the analysis of the collected data, the SPSS 24.0 software was used, and descriptive statistics, t-test and correlation analysis were conducted.

Results: In emotional labors of preschool teachers, 'effort for emotional control/diversity' scored 76.25(±17.61), 'Overload for client service/conflict' 65.28(±25.94), 'emotional dissonance and damage' 57.52(±24.79), 'organizational supervision/monitoring' 49.23(±25.82), and 'organizational support/protection system' scored 41.66(±19.03) out of 100. According to the reference guideline of this measures, the score of 'Overload for client service/conflict' and 'organizational supervision/monitoring' were 'warning/caution' level. In workplace violence of preschool teachers, 'customer's emotional and sexual violence' scored 7.12(±11.84), 'colleague's emotional and sexual violence' 4.98(±12.34), 'customer/college's physical violence' 1.67(±10.50) and 'organizational support system against violence' scored 43.69(±28.87) out of 100. According to the reference guideline of this measures, the score of 'colleague's emotional and sexual violence' was 'warning/caution' level. In the correlation analysis between emotional labor and workplace violence, 'effort for emotional control/diversity', 'Overload for client service/conflict', 'emotional dissonance and damage', 'organizational supervision/monitoring' were positively correlated with 'customer's emotional and sexual violence', 'college's emotional and sexual violence', 'customer/college's physical violence'.

Conclusions: Emotional labor level of preschool teacher was high and emotional labor were positively correlated with workplace violence. Therefore, measures are needed to reduce the emotional labor of preschool teachers and organizational support are required.

Biography

Souk Young Kim presently working in Eulji University, South Korea. His main research interest includes Clinical Physiology, Health Psychology, and Abnormal physiology.

ksy@eulji.ac.kr

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ISOLATION AND IDENTIFICATION OF BACTERIAL STRAINS IN AEROSOLS SAMPLES FROM AN A IRON FOUNDRY AND STUDY OF THEIR RESISTANCE TO HEAVY METALS

Daniellys Alejo Sanchez[a] and **Ester M Hernandez Martinez**[a]
[a]Central University "Marta Abreu" of Las Villas, Cuba

Statement of the Problem: Air pollution poses a significant environmental risk to health. Different investigations have shown the presence of bacteria in the atmosphere. However, few studies of air quality based on microbiological components have been carried out in Cuba. In general, investigations are focused on physical and chemical characterization of different atmospheric pollutants. The aim of this research was to isolate and identify bacterial strains present in workplace atmosphere in an iron foundry and determinate their resistance to heavy metals.

Methodology & Theoretical Orientation: Indoor air samples were collected from an iron foundry located in Villa Clara province, Cuba. To identify the bacteria of the pure cultures, their 16S rRNA genes were amplified and sequenced. The identification was performed with the BLAST program. To study the resistance of isolated bacteria different concentrations of Fe, Zn, Cu, Pb, Sn, Al and Mn in the form of their salts were tested using alamarBlue®

Findings: 11 isolated bacteria were identified. They are Pantoea agglomerans, Enterobacter cloacae, Staphylococcus aureus, Bacillus oceanisediminis, Bacillus flexus and Exiguobacterium aurantiacum. All bacterial strains showed an increase in the cell viability at high concentrations of Fe, Zn and Cu and, at low concentrations of Mn. However, all Pb concentrations conducted to an increase of the cell viability for Exiguobacterium aurantiacum whereas for Bacillus oceanisediminis this increase was observed only at high concentrations. Staphylococcus aureus, Bacillus oceanisediminis, Pantoea agglomerans, Bacillus flexus and Exiguobacterium aurantiacum showed increased cell viability at high concentrations of Sn while Pantoea agglomerans, Bacillus flexus and Exiguobacterium aurantiacum shown this increment at low concentrations.

Conclusion & Significance: In the iron smelting industry, identified bacterial strains can be harmful to health and even more if it is considered their resistance to tested metals.

Biography

Daniellys Alejo Sanchez has experience in analysis of environmental samples. She completed her PhD in the of Antwerp University. This investigation was related to gaseous pollutants, their relationship with meteorological variables and adverse effects on human health. Nowadays, she is the director of the RIP project "Characterization and analysis of particulate compounds in multiple workplace atmospheres" which is developed between the University of Antwerp and the Universidad Central "Marta Abreu" de las Villas. The results showed in this presentation are being carried out in the framework of this project. They are very important because they represent one of the first studies made in workplace atmosphere in iron foundries in Cuba.

daniellysas@uclv.edu.cu

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ENVIRONMENTAL HAZARDS AND HUMAN HEALTH

Anas H Al-Sharqi[a]
[a]Azadi Teaching Hospital, Iraq

An environmental hazard is a substance, state or event which has the potential to threaten the surrounding natural environment and/or adversely affect human's health. This term incorporates topics like pollution, natural disasters and human made hazards. Health studies investigate the human health effects of exposure to environmental hazards ranging from chemical pollutants to natural, technologic or terrorist disasters. The environment in which we live can be considered as having three fundamental sets of components, physical, chemical, biological. Associations between an exposure and an adverse health effect do not, on their own, prove that the former is the cause of the latter. Many other non-causal associations could explain the findings. Physical hazards involve environmental hazards that can cause harm with or without contact. Examples are earthquakes, electromagnetic fields, floods, light pollution, noise pollution, vibration, x-rays etc. Radioactivity is associated with an exposure dependent risk of some cancers notably leukemia. The scientific evidence of adverse health effects from general environmental exposure to these fields is "not proven". If there are adverse effects yet to be proven, the risk is probably likely to be small. Chemical substances causing significant damage to the environment. Tobacco smoke is the single biggest known airborne chemical risk to health, whether measured in terms of death rates or ill-health. To a much lesser degree of risk, these adverse effects apply to non-smokers exposed passively to side stream tobacco smoke. Health effects of concern are asthma, bronchitis, lung cancer and similar lung diseases, and there is good evidence relating an increased risk of symptoms of these diseases with increasing concentration of Sulphur dioxide, ozone and other pollutants. Biohazards generally fall into two broad categories: those which produce adverse health effects through infection (microorganisms, viruses or toxins) and those which produce adverse effects in non-infective (allergic) ways.

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GREEN LEADERSHIP IN HEALTHCARE–HOW HEALTHCARE PROVIDERS CAN MITIGATE CLIMATE CHANGE AND REDUCE THEIR CARBON FOOTPRINT

Edda Weimann [a,b]
[a]Groote Schuur Hospital, South Africa
[b]University of Cape Town, South Africa

The healthcare sector itself contributes to climate change, the creation of hazardous waste, use of toxic metals such as mercury, and water and air pollution. To mitigate the effect of healthcare provision on the deteriorating environment and avoid creating further challenges for already burdened health systems, Global Green Hospitals was formed as a global network. Groote Schuur Hospital (GSH), as the leading academic hospital in Africa, joined the network in 2014. Since then, several projects have been initiated to reduce the amount of general waste, energy consumption and food waste, and create an environmentally friendlier and more sustainable hospital in a resource constrained public healthcare setting. Various efforts have been made to reduce the carbon footprint of GSH and reduce waste and hazardous substances such as mercury and polystyrene. The hospital was able to halve the amount of coal and water used, increase recycling by 50% over 6 months, replace polystyrene cups and packaging with Forest Stewardship Council (FSC) recyclable paper-based products, reduce the effect of food wastage by making use of local farmers, and implement measures to reduce the amount of expired pharmaceutical drugs. In addition, the intensive care units in the hospital are now also participating in the recycling initiative to reduce the amount of hazardous waste and waste costs. To improve commitment from all involved role-players, political leadership, supportive government policies and financial funding is mandatory, or public hospitals will be unable to tackle the exponentially increasing costs related to climate change and its effects on healthcare.

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THE DIFFERENCES OF PULSE, CORE BODY TEMPERATURE, AND WEIGHT: BEFORE AND AFTER WORK IN THE HEAT STRESS ENVIRONMENT AT A TEA COMPANY - FILLING PROCESS

Gustina[a], **Surindar Dhesi**[a], **Baju Widjasena**[b], **M Erg**[b] and **Siswi Jayanti**[b]
[a]University of Birmingham, UK
[b]Diponegoro University, Indonesia

Statement of the Problem: Heat stress in the work environment affects worker's physical condition; the blood vessel capacity increases and dilates. Also, heat stress can trigger the heart to pump more blood to the skin to release heat. This leads to an increased pulse rate. Furthermore, it affects the evaporation mechanism of the body and causes changes in body temperature and continuous sweating affects the composition of body fluids. The purpose of this study was to determine the differences in pulse, core body temperature, weight of the workers before and after work in the heat stress environment of a Tea filling process at 30.8 degrees Celsius room temperature in average. The design of this study utilized cross-sectional methods. 15 tea workers were samples of a total workforce of 20. The data was analyzed using a Paired t-Test and Wilcoxon Signed Ranked Test.

Findings: The results showed that 80% of respondents experienced an increasing of pulse rate, 100% of respondents experienced an increasing of the core body temperature, and 66.7% of respondents experienced weight loss.

Conclusion & significant: The results of the Paired t-Test revealed there was a significant difference in pulse rate before and after working in the hot environment (p=0.007), there was also a significant difference in body core temperature before and after work in the hot environment (p=0.001). However, there was no significant difference in weight loss before and after working in the hot environment (p=0.630).

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ESTIMATION OF GENOTOXIC EFFECT OF FUNGICIDE ANTRACOL WP-63 AT FISH RAINBOW TROUT (ONCORHYNCHUS MYKISS), AFTER 8 DAY OF TREATMENT

Kemajl Kurteshi[a], **Kasum Letaj**[a], **Sokrat Gjini**[b] and **Rexhep Shkurti**[b]
[a]University of Prishtina, Kosovo
[b]University of Gjirokastra, Albania

Statement of the problem: biological monitoring provides a useful tool to estimate the genetic risk deriving from an integrated exposure to a complex mixture of chemicals. Aquatic organisms are then briefly exposed to a complex mixture of contaminants.

The purpose: This study is to estimate the genotoxic effect of fungicide antracol wp-63 in erythrocytes of fish rainbow trout (Oncorhynchus mykiss).

Methodology & theoretical orientation: the fish treated with four different concentration (7, 5, 4, 3 ml/ 40 l water) of fungicide Antracol wp-63, for 8 day. From each individual-fish, scored 2000 erythrocytes. For each fish prepare 2 slides.

Findings: the results show significant increase of number of micronuclei per 2000 erythrocytes of fish, compared with control group.

Conclusion & significance: based in obtained results we can conclude that insecticide chromagor has Genotoxic effect.

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A REVIEW OF CUTANEOUS LEISHMANIASIS AND THE INTERVENTIONS FOR ITS PREVENTION AND CONTROL IN MOROCCO USING VERTICAL ANALYSIS APPROACH

Laboudi Majda[a], **Sahibi Hamid**[b], **Elabandouni Mohamed**[c], **Nhammi Haddou**[c], **Ait Hamou Sanaa**[d] and **Sadak Abderrahim**[e]
[a]National Institute of Hygiene (INH), Morocco
[b]Agronomic and Veterinary Institute Hassan, Morocco
[c]Ministry of health, Morocco
[d]Ben M'Sick, Morocco
[e]Rabat, Morocco

Leishmaniasis is considered one of the most neglected diseases worldwide. In Morocco, cutaneous leishmaniasis is an important public health problem. *Leishmania major* and *Leishmania tropica* are the two major species in this country. Despite all efforts, monitoring and control of the cutaneous leishmaniasis is still challenging. We used a vertical analysis of the control of cutaneous leishmaniasis in Morocco from the document review and publications. This analysis allowed us to develop an epidemiological model that emphasized key possible interventions. No evaluation studies of these interventions in Morocco were done. Global Evidence underline the effectiveness of preventive interventions produced in integrate inter-sectorial strategy framework (e.g use of insecticide-treated bednets, indoor residual spraying and rodents' control) rather than treatments such as based thermotherapy, cryotherapy, photodynamic therapy, CO2 laser and paromomycin. Therefore, Integrated Vector Management Control (IVMC) with community participation is recommended as effective strategy. Strengthening of the IVMC with community involvement are necessary conditions to improve the program of cutaneous leishmaniasis and prevent epidemic foci appearance.

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CHILDREN'S ENVIRONMENTAL RIGHTS AND AGE DISCRIMINATION

Refia Kadayifci[a]
[a]Louvain University, Belgium

It is a well proved fact that environmental hazards produce more significant harms when children are affected. The main objective of this paper is to demonstrate that the 'right to equality and non-discrimination' offers an appropriate, meaningful and effective basis to protect children's environmental health. Doing so requires answering whether there is a strong connection between being children and being vulnerable to environmental degradation and if there is, whether anti-age discrimination law opens a possible avenue to challenge this health disparity. I will refer to two different sources of children's environmental vulnerability: the disadvantaged situation of children in comparison with adults (*as an age group*) (this is also true for elders) and particular disadvantage of the children who are recently born (as a birth cohort). I will argue that the ECtHR and the ECJ anti-age discrimination case law reveal that children can be protected *as an age group*. And there are at least two legal strategies to avoid birth cohort discrimination toward children: 2012 Commission v Hungary ECJ case strategy and 2014 Kaltoft v Municipality of Billund ECJ case strategy. I will then demonstrate the environmental implications of these cases by giving details about why this approach is significant and how it can be legally successful.

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SHORT-TERM EFFECT OF PM10 AND OZONE ON CARDIOPULMONARY MORTALITY IN THE LOCALITY OF SANTA FE, BOGOTÁ, COLOMBIA (2012 – 2014)

Robles Liz D[a]
[a]University Santo Tomas, Colombia

Objective: Evaluate the short-term effect of PM10 and ozone on cardiopulmonary mortality in the locality of Santa Fe of Bogota for the period 2012-2014.

Methods: time series study that used Poisson models adjusted for confounding factors related to variations in time such as temperature and relative humidity, using self-correlative structures that included the 3 day moving average and deferred effects (lags) up to 5 days for individual and combined contaminants. We used hourly information recorded on the air quality monitoring station of the locality, which is a traffic type. The antecedent cause of daily cardiopulmonary mortality in the locality was obtained from the District Health Secretary of Bogota.

Results: In the exploratory analysis of the pollutants it was observed that the mean daily PM10 was 38.4µg/m3, a concentration that exceeds the annual value established by the World Health Organization of 20µg/m3, but does not exceed Daily value established by WHO and Colombian regulations (Resolution 610 of 2010), of 50 and 100µg/m3, respectively. For ozone, the maximum values established for the maximum average 8 hours by WHO (51ppb) and Colombian legislation (41ppb), were not exceeded in the locality, since the value obtained was 19.24 ppb; For the maximum hourly O3 an average of 24.66ppb was recorded, which does not exceed what was allowed by Resolution 610 of 2010, which establishes a maximum hourly concentration of 61 ppb. An effect of the exposure to PM10 and Ozone in cardiopulmonary mortality was evidenced, which was not statistically significant. In all ages, a 10µg/m3 increase in the average daily of PM10 showed a 1%(95% CI:-6.33; 9.10) increase in cardiopulmonary mortality two days before death (lag2), an increase of 3%(95% CI:-6.78; 14.16) in cardiovascular mortality in lag2 and an increase of 1%(95% CI:-13;16) in mortality from lower respiratory tract infection on the day of death (Lag0). Likewise, an increase of 11ppb in the average daily maximum 8 hours of ozone increases cardiopulmonary mortality by 5% (95% CI:-11.16; 24.57) one day before death (lag1).

Conclusions: the results show evidence in the association of PM10 and O3 contaminants and cardiopulmonary mortality, although the values are not statistically significant. In addition, it was possible to show that the age group with the highest risk of cardiopulmonary mortality is those older than 65 years.

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AN IGNORED HAZARDOUS SUBSTANCE IN CORAL REEFS: ARTIFICIAL RADIONUCLIDES

Wuhui Lin[a] and **Fangfang Deng**[b]
[a]Guangxi University, China
[b]Institute of Oceanography, China

Artificial radionuclides, one of most concerned hazardous materials, are widely measured in various environmental matrixes and are recognized as a significant proxy of the "Anthropocene". Artificial radionuclides are mainly released from the nuclear power plants in the routine and accidental condition in the contemporary ocean. Recently, some coastal nuclear power plants are located near the coral reef region in Southeast Asia. Coral reefs are one of vital marine ecosystems and are characterized by high biodiversity and ecosystem services. Although marine biotas in marine ecosystem of coral reefs will receive additional radiation dose from artificial radionuclides, artificial radionuclides in the reef-building coral are rarely reported around the world. In our study, two most common artificial radionuclides, 90Sr and ^{137}Cs, were simultaneously measured for the first time in the reef-building coral in the South China Sea. The activity of ^{137}Cs was lower than the limit of detection (0.2 Bq/kg) of the High Purified Germanium γ Spectrometry in all reef-building coral skeleton. By contrast, the activity of ^{90}Sr ranged from 0.97 Bq/kg to 1.58 Bq/kg with a mean value of 1.21 Bq/kg, which was significantly higher than ^{90}Sr activities in sediment and other biotas. Therefore, the fingerprint of ^{137}Cs/^{90}Sr activity ratio of coral skeleton (<0.17) is greatly distinct from that of other environment matrixes, such as that of seawater and sediments (1.5). The mechanism of the abnormal activities and ratio of artificial radionuclides in coral skeleton is illustrated by the "Concentration Factor-Based Skeleton Model". Our model may also shed new light for heavy metal and trace elements in coral reefs. Artificial radionuclides in coral reefs should be paid more attention, especially for the future operation of floated nuclear reactors on the surface ocean and the coastal nuclear power plants near coral reefs.

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DETECTION OF EUTROPHICATION PRESENCE IN INLAND WATER BODIES, USING VICARIOUS CALIBRATION METHOD RELATING TO THE LAUNCH OF SENTINEL 2 AND 3 SATELLITES

Zimbini Faniso[a], **Derek J Griffith**[a] and **Edwin Magidimisha**[b]
[a]CSIR Defence, South Africa
[b]University of Fort hare, South Africa

This paper clarifies the study results on the detection of eutrophication presence in inland water bodies using vicarious calibration methods. Water eutrophication is defined as the high enrichment of water with nutrients. When the amount of nutrients is excessive in water it causes a huge damage in ecosystem. This enrichment is due to surface run-off after heavy rainfalls; it gathers all the filthy rubbish on top of the surface e.g. fertilizers from crops farms and dirty stuffs and flood them to the rivers, dams, lakes and reservoirs. This process becomes a challenge in our country since it is a result to death of aquatic animals and plants due to shortage of oxygen. The flooded nutrients enable the growth of plants under water which affects living animals some eventually die and that damage water and lead to diseases to people who use the water for living. This study has performed in-situ measurements collecting measurements of sentinel 2 and 3 overpass over the Roodeplaat dam in South Africa for the detection of eutrophication in water. The study used a quantitative method where the Analytical Spectral Device (ASD) with an optical sensor took three measurements on different sites of the dam. Then using the Radiative Transfer Modelling tool i.e. Modtran the results showing the spectral of water leaving radiance were obtained and viewed under different modtran characters which are rural and urban. These two compare the behaviour of water reflected signal at rural area and at urban area form.