5TH NATIONAL CONFERENCE ON ENVIRONMENT AND HEALTH

(Organized by the LivingScience Foundation, Ile-Ife CAC/IT/91834)

Venue: Redeemer's University, Ede, Osun State, Nigeria + Online at https://meet.google.com/gpe-yntu-pxy

Date: Tuesday October 13 - Wednesday October 14, 2020

BOOK OF ABSTRACTS





The NJEH is the only journal of its kind in Nigeria that seeks, in a rigorously scholarly fashion, to bridge the gap between Science, Practice, and Policy in the field of Environment-Health. Just like our Conference series, the Journal appeals to a distinguished readership of academics, professionals, policy makers, and other key stakeholders in the environment-health sector. Our ultimate goal is translating research findings in Environment-Health into visible positive benefits for the common man in Nigeria.

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Nigerian Journal of Environment and Health (NJEH) is published by LivingScience Foundation, P.O.Box 1674, Ile-Ife, Nigeria

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LIVINGSCIENCE FOUNDATION, P.O.BOX 1674, ILE-IFE, OSUN STATE, NIGERIA.

"Science for life more abundant (John 10:10)"

The aim of the *Living*Science Foundation is to enhance public health in Nigeria by facilitating and promoting sound evidence-based, comprehensive and holistically-derived, home-grown environmental-health policies and practices; undergirded by a conviction that an all-wise benevolent Creator designed the world to run sustainably.

The Specific Objectives of the Foundation are to

i. provide an authoritative voice showing that studying and doing Science from a creationist perspective will not only make best sense of our world, it will also yield abundant life for people and the entire ecosystem. This will entail a direct standing up to, and scientific refutation of the currently prevalent evolution theory of origins.
ii. seriously engage in the business of identifying peculiar traditional and modern hazards in the Nigerian environment; scientifically evaluate attendant health risks particularly to identified susceptible, vulnerable and sensitive subpopulations; and widely communicate the findings in society, while advocating for remedial actions as may be necessary.
iii. provide information, education, and advisory services on health and environment to the general public, various tiers of government, and other stakeholders. This may involve undertaking resourced projects and contract works that support the vision of the Foundation.

We welcome your inputs as Partners, Collaborators, and Sponsors. For more details, kindly contact us on +234 805 710 6482, or visit our website at: www.lsfnigeria.org

PLEASE MARK THIS DATE ON YOUR CALENDAR: 6TH NATIONAL CONFERENCE ON ENVIRONMENT AND HEALTH, APRIL 13-14, 2021

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Welcome!



It gives me great pleasure to welcome distinguished participants to the 5th National Conference on Environment and Health.

Our theme for this year is particularly appropriate and timely. Going with available statistics, Nigeria might as well be among the most vulnerable nations in the world, to the scourge called cancer. The cases are mounting, while the resources to provide care are dwindling. It is therefore quite heartening to learn that as much as 80% of cancers need not occur at all in the first instance - if appropriate basic steps could be taken in the lifestyle and environment dimensions. However, whereas individuals could take responsibility to address the lifestyle-related issues, environmental issues (such as regulation of importation and use of pesticides, air pollution, groundwater contamination, unregulated use of ionizing and non-ionizing radiation) must be jointly and holistically addressed by relevant governmental and non-governmental stakeholders.

When diseases are prevented from occurring in the first place, there are no personal beneficiaries to showcase. That's why only few Organizations would consider paying so much price for a product that can be discerned and appreciated only by a tiny fraction of the population. And that's why the LivingScience Foundation does it! We bring together the experts, encouraging them to share their findings and establish the scientific facts; then we go ahead to push the uptake of the findings in society by communicating them strategically with the relevant authorities and the general public. I sincerely thank all our worthy partners in this enterprise.

I wish you God's blessings and fruitful deliberations at this year's Conference.

Pastor Ezekiel A. Odeyemi

(Fellow, The Institute of Leadership and Management (InstLM), Fellow, the Institute of Supervision and Leadership (ISL); Fellow, the Chartered Institute of Commerce of Nigeria (CICN); Fellow, the Chartered Institute of Management and Leadership (CIML))

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Dear distinguished colleagues,

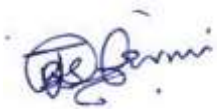
Welcome to the 5th National Conference on Environment and Health!

Not one or two notable foreigners have in recent times publicly expressed their conviction that the real asset of Nigeria is the core of dedicated professionals, patriotically slaving away at their duty posts hoping for a better country. This is certainly true of several Nigerian scientists in the Environment-Health sector. Unfortunately, our efforts have often been dissipated, and they remain unknown to other colleagues or the policy makers who could leverage on those efforts to bring about tangible benefits for OUR society.

Unfortunately, no one is going to bridge this gap for us, and we simply have to keep on trying until we get it right! This Conference series is one little step in that right direction; and we thank everyone who has been contributing to keep it going and growing.

I have been particularly impressed by the high quality of many of the abstracts submitted here. The language may not be so flowery at times, but these are the fundamentals needed to be established before our society could move forward. Thankfully, these excellent studies are now being showcased in a local conference where they can be appreciated by the local audience that can see to their uptake into society. The LivingScience Foundation is committed to further sharing these important information widely among other stakeholders, especially policy makers both through the Communique of the Conference, and through our peer-reviewed scholarly Journal, the Nigerian Journal of Environment and Health. I invite all the authors of Abstracts submitted here to consider polishing up their work and submitting them to the Journal for publication.

To both those who will be attending the Conference physically at Ede, and those who will be joining online, it is my deep pleasure, on behalf of the LivingScience Foundation and our Partners, to say a big WELCOME!



Joshua Ojo (Ph.D)
Professor of Health Physics and Environment
Obafemi Awolowo University, Ile-Ife
and
President, LivingScience Foundation, Ile-Ife

5TH NATIONAL CONFERENCE ON ENVIRONMENT AND HEALTH

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Venue: Redeemer's University, Ede, Osun State, Nigeria + Online at https://meet.google.com/gpe-yntu-pxy

Date: Tuesday October 13 - Wednesday October 14, 2020

Theme: **COMBATTING ENVIRONMENTAL AND OCCUPATIONAL CANCERS IN NIGERIA**

PROGRAMME SCHEDULE

Day 1: Tuesday 13th October, 2020

09.00 – 09:50	Pre-Opening Activities: Mount Posters (Physical and Online).
(09:50 – 14:05)	**PLENARY SESSION I: Formal Opening Ceremonies**
09:50 – 10.00	**Opening** Opening Prayer**.** National Anthem. Redeeemer's University Anthem **Pastor Gbenga Akosile, RUN Chaplaincy.**
10:00 – 10:10	**Introductions – Dr Beatrice Emma-Okon** (Treasurer, Steering Committee of the National Conference on Environment and Health)
	Welcome Addresses:
10.10 – 10.20	**Prof Anthony Akinlo**, Vice Chancellor, Redeemer's University, Ede
10.20 – 10.30	**Pastor Ezekiel Odeyemi** (FISL, FCICN, FCIML), Chairman, Board of Trustees, LivingScience Foundation, Ile-Ife
10.30 – 10.40	**Opening Remarks** –
10.40 – 10.50	**Goodwill Messages –**
	Keynote Address 1:
10.50– 11:00	Citation of Prof **M.K.C. Sridhar**
11.00 – 11.30	MAJOR AGENTS OF ENVIRONMENTAL AND OCCUPATIONAL CANCERS IN NIGERIA **M.K.C. Sridhar**
11:30 – 11:45	Interactions. Questions and Answers
	Prizes and Award –
11.45 – 12.15	i. Quiz Competition for Secondary Schools
12:15 – 12.30	ii. Announcement of A.F. Oluwole Prize for Environment-Health Citation of Prof A.F. Oluwole Citation of the Winner**: TO BE ANNOUNCED**
12.30 – 12.45	**Refreshment/Tea Break**

	Keynote Address 2:
12.45 – 12.55	Citation of **Prof Mohammed Nasir Sambo**
12.55 – 13.25	INNOVATIVE RESOURCE MOBILISATION IN ADDRESSING THE MENACE OF CANCERS IN NIGERIA **Mohammed Nasir Sambo**
13.25 – 13.40	Interactions. Questions and Answers
13:40 - 13.50	**Chairman's Closing Remarks –**
13:50 – 14:05	**Closing Prayer. National Anthem - RUN Chaplaincy**
14.05- 14:20	**Group Photographs./Networking**
14:20 – 15:00	**Lunch / Press Conference**
	Afternoon session:
(15:00 – 17:15**)**	**PLENARY SESSION II:**
15:00 – 15:30	KEEPING THE UNIVERSAL HEALTH COVERAGE (UHC) PROMISE ON CANCER AND NCDs IN NIGERIA Adeniyi **Oginni**
15.30 – 15:40	Interactions. Questions and Answers
15:40 – 16.00	CANCER STATISTICS AND INFORMATION MANAGEMENT Olufemi A**defehinti**
16.00 – 16:10	Interactions. Questions and Answers
16:10 – 16.25	Tea Break. Networking
16.25 – 16.45	EXPOSURE ASSESSMENT TO CARCINOGENS IN FUMIGATION OF RESIDENCE AND AGRICULTURAL PRODUCTS Tope **Akinwunmi**.
16.45 – 17:00	ANTIOXIDANT, Î±-AMYLASE AND ARGINASE INHIBITORY CAPACITIES OF TACCA LEONTOPETALOIDES STEM AND LEAVES PHENOLIC EXTRACTS: AN IN VITRO ASSESSMENT OJ **Avwioroko**
17:00 – 17:15	Interactions. Questions and Answers
17:15	Closing and Networking

Day 2: Wednesday 10th April, 2019

(09:00 – 11:40) **PLENARY SESSION III**

09:00 – 09:15	IONIZING AND NON-IONIZING RADIATIONS AS CARCINOGENS Joshua **Ojo**
09:15 – 09:30	SURVEY OF SOME CARCINOGENIC POLLUTANTS IN THE CEMENT INDUSTRY O.H. **Joshua** *et al.*
09:30 – 09:40	Interactions. Q&A
09:40 – 09:55	ACCESS TO CANCER CARE: PROBLEMS AND PROSPECTS Ifeoma **Okoye**
09:55 – 10:10	TRIPLE NEGATIVE BREAST CANCER: DETECTION AND TREATMENT OPPORTUNITIES BEING DEVELOPED OS **Odusanya**
10:10 – 10:20	Interactions. Q&A.
10:20 – 10:30	Short Break
10:30 – 10:40	ELEMENTAL ANALYSIS AND RISK ASSESSMENT OF SOIL AND VEGETABLES FROM A CRUDE OIL-POLLUTED AREA IN LAGOS STATE, NIGERIA. OO **Oketayo**
10:40 – 10.50	CONTRIBUTIONS OF SOME CRITERIA AIR POLLUTANTS BY PETROLEUM PRODUCT RETAILING STATIONS TO NIGERIA AIRSHED: PRECURSORS OF CLIMATE CHANGE MONITORS Festus M. **Adebiyi**
10:50 – 11:00	Interactions. Q&A
11:00 – 11:25	BIG DATA ANALYTICS IN CANCER MANAGEMENT OE **Olubusoye**
11:25 – 11:40	Interactions. Q&A
11:40 – 11:55	Tea Break
11.55 – 13:25	**Special Panel Discussion on COVID-19**
13:25 – 14:10	Lunch / **Interaction at POSTER Stands**

(14:10 – 16:05) **PARALLEL SESSIONS I**

Location 1: [MONITORING AND SURVEILLANCE]

14:10 – 14:25	CURBING OCCUPATIONAL AND ENVIRONMENTAL CANCER THROUGH EFFECTIVE COMPLIANCE MONITORING AND ENFORCEMENT SM **Maike**.

14:25 – 14:40	GEOCODING MEDICAL AND HEALTH RECORDS FOR SUSTAINABLE HEALTH SERVICE DELIVERY IN ILE-IFE, OSUN STATE, NIGERIA JK **Opele and** OS **Aboyeji**.
14:40 – 14:55	GIS ASSESSMENT ON FOREST DEGRADATION AND ITS EFFECT ON FOREST BATHING IN OSOGBO, NIGERIA AI **Oyegbami** and OH **Adedeji**
14:55 – 15:10	Interactions. Questions & Answers
15:10 – 15:25	AWARENESS, KNOWLEDGE AND UPTAKE OF CERVICAL CANCER SCREENING AMONG WOMEN OF REPRDUCTIVE AGE IN SELECTED WARDS IN EDE SOUTH LOCAL GOVERNMENT AREA, OSUN STATE OO **Kayode**
15:25 – 15:40	PHYSICOCHEMICAL, FUNCTIONAL AND BIOLOGICAL PROPERTIES OF PROTEIN HYDROLYSATES FROM MONODORA MYRISTICA (CALABASH NUTMEG) SEEDS Adeoluwa **Falade et al.**
15:40 – 15:50	*Interactions / Q&A*
15:50 – 16:05	*Tea Break*
	Location 2: [CHEMICAL PREVENTATION]
14:10 – 14:25	TOXICOLOGICAL EFFECTS OF SUBACUTE EXPOSURE TO DIFFERENT PESTICIDES VIA INHALATION ON MALE WISTAR RATS AO **Akande** and OS **Akinsomiso**ye
14:25 – 14:40	KOLAVIRON PROTECTS AGAINST HAEMATO-HEPATIC DISTURBANCE OF BENZENE IN CHEMICAL-INDUCED MYELODYSPLASIA IN WISTAR RATS SO **Olaniyi** et al
14:40 – 14:55	CHEMOPREVENTIVE ROLES OF MEDICINAL FOODS AGAINST ENVIRONMENTAL CARCINOGENS-INDUCED CANCERS JO **Teibo** et al.
14:55 – 15:10	Interactions. Questions & Answers
15:10 – 15:25	CHEMOPROTECTIVE EFFECT OF ALOE VERA GEL ON BENZENE-INDUCED MYELODYSPLASIA IN WISTAR RATS SO **Olaniyi**
15:25 – 15:40	MUTATIONAL ANALYSIS OF P53 GENE IN CERVICAL CANCER AND USEFUL POLYMORPHIC VARIANTS IN EXONS 3 AND 4 O **Omotoso** et al.
15:40 – 15:50	Interactions. Questions & Answers
15:50 – 16:05	*Tea Break*

(16:05 – 17:20) **PARALLEL SESSIONS II**

Location 1: [AIR POLLUTION]

16:05 – 16:20 ASSESSMENT OF SOURCE PROFILES FOR SUSPENDED PARTICULATE POLLUTANTS IN IBADAN, NIGERIA USING POSITIVE MATRIX FACTORIZATION
GO **Akinlade**

16:20 – 16:35 ASSESSMENT OF PARTICULATE MATTER (PM 2.5,10) LEVEL IN SOME SELECTED AREAS IN SOUTH-WEST NIGERIA
AO **Oke** et al.

16:35 – 16:50 ASSOCIATION BETWEEN PM2.5 AND MORTALITY OF STOMACH AND COLORECTAL CANCER IN XI'AN: A TIME-SERIES STUDY
Crystal Jane **Ethan** et al.

16:50 – 17:05 OXIDATIVE STRESS, INFLAMMATION AND HEPATOTOXICITY IN MALE WISTAR RATS EXPOSED TO POTASSIUM BROMATE AND SODIUM NITRITE
O **Adewale** *et al.*

17:05 – 17:20 *Interactions / Q&A*

Location 2: [CARCINOGENECITY IN FOODS]

16:05 – 16:20 DETERMINATION OF POLYCYCLIC AROMATIC HYDROCARBONS AND POTENTIALLY TOXIC METALS IN COMMONLY CONSUMED BEEF SAUSAGE ROLL PRODUCTS IN NIGERIA
Oyekunle et al.

16:20 – 16:35 EVALUATION OF HUMAN HEALTH RISK ASSESSMENT OF POTENTIAL TOXIC METALS IN COMMONLY CONSUMED CRAYFISH (PALAEMON HASTATUS) IN NIGERIA
FM **Adebiyi** et al.

16:35 – 16:50 APPRAISAL OF HEALTH RISK ASSESSMENT OF POTENTIALLY TOXIC METALS IN EDIBLE FRUITS IN ILE-IFE, NIGERIA
OT **Oyasowo** et al.

16:50 – 17:05 RADIOLOGICAL RISKS FROM CONSUMPTION OF VEGETABLES IN TWO REGIONS WITH DISPARATE CANCER PREVALENCE IN ONDO CITY
SO **Inuyom**i and JO **Ojo**

17:05 – 17:20 *Interactions / Q&A*

(17:20 – 17:50**)** **PLENARY III**

Chairman: **Joshua Ojo**. (Professor of Health Physics and Environment). President, LivingScience Foundation, Ile-Ife

Rapporteurs: **Dimeji Babatunde** and **Tosin Alani**

17:20 – 17:50 Communique and Closing

POSTERS (View on http://conferences.lsfnigeria.org)

- ANALYSES AND DISTRIBUTION OF VARIOUS TYPES OF CANCERS RECORDED IN IFE-IJESHA CANCER REGISTRY IN THE FIVE YEAR PERIOD 2010 -2014
- OXIDATIVE STRESS, INFLAMMATION AND HEPATOTOXICITY IN MAKE WISTAR RATS EXPOSED TO POTASSIUM BROMATE AND SODIUM NITRITE
- RADIOLOGICAL ASSESSMENT OF GRAINS, VEGETABLES, FRUITS AND TUBER CROPS CULTIVATED IN OKEMESI TOWNSHIP, EKITI STATE, NIGERIA
- ENVIRONMENTAL FACTORS AND CANCER PREVALENCE IN ONDO STATE, SW-NIGERIA: IMPACT OF RADIOACTIVITY IN SOIL AND IN AIR
- ASSOCIATION BETWEEN PM2.5 AND MORTALITY OF STOMACH AND COLORECTAL CANCER IN XI'AN: A TIME-SERIES STUDY
- INGESTION OF LEAD, MERCURY, AND SELENIUM BY BABIES THROUGH BREASTMILK IN THREE GOLDMINING AREAS OF NIGERIA

PROFILES

SPECIAL GUESTS OF HONOUR



Anthony Enisan Akinlo is a Professor of Economics, with a PhD in Monetary and Development Economics from the Obafemi Awolowo University, Ile-Ife, in 1995. He has over 130 publications in the areas of reforms and growth. He has supervised 23 PhD theses, 5 M.Phl theses and 31 M.Sc theses. He has served and still serving on the Editorial Board of a number of impact journals in his field. He has served the Obafemi Awolowo University in various capacities: Head, Department of Economics, 2002 to 2006; Director, Centre for Industrial Research and Development (now Institute for Entrepreneurship and Development Studies), 2007 to 2011, and Dean, Faculty of Social Sciences, 2013 to 2015. He has equally served in various committees of the University. Professor Anthony Akinlo has participated in many international sponsored Research works and carried out consultancies for such organizations as IDRC, African Economic Research Consortium (AERC), Institute of Developing Economies (IDE), Population Research Fund (NPF) and UNDP. Professor Akinlo served as Visiting Professor to many institutions including; United Nations World Institute of Development and Research (UNWIDER), Helsinki; Institute of Developing Economies, Japan; Ekiti State University, Ado-Ekiti; Federal University, Oye-Ekiti. He is a Pastor-In-Charge of Zone (PICZ), The Redeemed Christian Church of God, Osun Province 7, Ile-Ife. He is married with children.

Emeritus Prof A.F. Oluwole



Doyen of Environment-Health studies in Nigeria**,** Prof A.F. Oluwole was born in September 1939 at Ijare, Ondo State. He joined the services of the then University of Ife (now Obafemi Awolowo University), Ile-Ife in 1969 as a Lecturer I and rose to become a Professor in 1978. Between 1975 and 1976 he served as the acting Head, Department of Physics, after which he became the Coordinator of the University's Nuclear Technology Programme (1976 – 1980). The Programme gave birth to the Centre for Energy Research and Development (CERD), where Prof Oluwole served as the pioneering Director (1980 to 1983). Prof Oluwole not only raised the profile of research on the Nigerian environment by attracting several multi-million dollars international fundings for pioneering original research, he also spearheaded the introduction of the Health Physics and Environment option into the postgraduate programmes at the Obafemi Awolowo University, Ile-Ife.

Outside the Obafemi Awolowo University, Prof A.F. Oluwole held various teaching and research positions at several academic institutions including the University of California, Berkeley, (1964/65, 1969), University of Heidelberg FRG (1971), University of Sussex (1970), University of Washington, Seattle, (1972), Columbia University (1974), McMaster University, (1977).Federal University of Technology, Akure, (1984/85), Nuclear Research Center, Washington State University, Pullman (1985, 1991), University of Surrey, (1989, 1990, 1992, 1993, 1994) and University of Stuttgart, FRG (1989, 1990, 1992, 1993, 1994).

Apart from teaching and research, the meritorious services of Prof A.F. Oluwole include membership of**:** Federal Panel on Ionising Radiation (1970 to 1990); Natural Sciences Research Council Committee on the National Institute of Nuclear Sciences (1975); FMST's Review Panel on National Policy on Science and Technology (1983). National Panel on Integrated Energy Policy for Nigeria by Ministry of petroleum and Energy 1984, Energy Panel on National Nuclear Centre and Science village, Abuja by FMST, 1987., Energy Commission of Nigeria (2001). Prof Oluwole was also a member of the International Atomic Energy Agency (IAEA) Committee on Nuclear Information Services (1982), and Nuclear Data (1993).

Prof Oluwole was inducted a fellow of the Nigerian Institute of Physics in 1996. He is a member of several professional bodies, including the Tau beta Pi-American National Honour Engineering Society (1964), American Physical Society (1968), American Association of Physics Teachers (1968), Science Association of Nigeria (1970), West African Science Association (1970), Nigeria Institute of Physics (1974), New York Academy of Sciences (1980), and the American Nuclear Society (1982), American Association for the Advancement of Science (1996).

He has authored over eighty scholarly articles in reputable local and international journals in addition to several important books and Monographs

An accomplished scholar, Prof Oluwole was awarded the Nigerian National Order of Merit (NNOM) for Science in 2004. Among over a dozen other prestigious awards received by Prof A.F. Oluwole are the Doctor of Science *(Honoraris Causa)* from the Federal University of Technology, Akure (2006) and the Adekunle Ajasin University, Akungba, Ondo State (2008). In 2019, Prof A.F. Oluwole was appointed Emeritus Professor at the Obafemi Awolowo University, Ile-Ife.

INVITED SPEAKERS

Prof M.K.C. Sridhar, Professor of Environmental Health, College of Medicine, University of Ibadan, Ibadan



- Professor Mynepalli K. C. Sridhar has specialized in Environmental Health since 1964. He obtained his B.Sc degree in Chemical and Biological Sciences and went for M.Sc (Biochemistry with Fermentation Chemistry specialty) at MS University, Baroda, India. He obtained Ph.D from Indian Institute of Science, Bangalore, India, worked on wastewater treatment, worked for some time before taking up an appointment at the University of Ibadan, Ibadan in 1977.
- He has been involved with teaching and research at postgraduate level, and community service for better environment and healthful living. His research focus ranged from Water, Sanitation and Hygiene, wastes to value added products, environmental microbiology, Toxicology and communicable disease prevention and control through environmental management. He carried out several research projects dealing with pathogen survival in environment, indigenous and low cost technologies in water and sanitation.
- He established Renewable Resources Centre at University of Ibadan and several pilot scale, demonstration and turnkey projects on waste to wealth and waste to energy. These include organic fertilizer, plastics recycling, biogas, smokeless charcoal/biochar and several other innovative processes in resource recovery and utilization which benefit communities.
- He was a consultant to UNDP, UNICEF, World Bank, several NGOs and Government bodies and agencies. Traveled extensively and visited several environmental management institutions and facilities in India, Switzerland, Sweden, Finland, Denmark, The Gambia, Lebanon and USA. Trained various categories in environmental field (over 35 PhDs, more than 200 Masters students and others) and published over 400 scientific papers in international Journals, a dozen books, and several Technical Reports. He was awarded 'Outstanding Researcher Award 2016' by the College of Medicine, University of Ibadan.

Prof Mohammed Nasir Sambo, Executive Secretary and Chief Executive Officer, NHIS, Abuja



Until his appointment as the Executive Secretary/Chief Executive Officer for the National Health Insurance Scheme in 2019, Prof Mohammed Nasir Sambo, was the Provost, College of Medicine, Kaduna State University.

This first rank academic graduated with an MBBS from the University of Jos in 1993, and capped it with the distinguished Fellowship of the West African College of Physicians in 2003, where he was the Best Candidate in the Final Fellowship examination. At various times, he was Deputy Dean, Faculty of Medicine, and Head, Department of Community Medicine, at the Ahmadu Bello University, Zaria. Assistant Director/Zonal Coordinator in the South West Zone of the NHIS, (with concurrent responsibility for Lagos); and the Assistant General Manager and Head of HMO Division at the NHIS Headquarters, in Abuja.

He was also a member of the Ministerial Technical Working Groups for the Public Private Partnership Policy on Health, the National Health Strategic Development Plan, and the all-important National Health Policy.

He has also attracted at different times, the attention of the United Nations Development Programme (UNDP), United Nations International Children's Emergency Fund (UNICEF), United Nations Population Fund (UNFPA), Department for International Development (DFID), British Council and German Technical Corporation Agency (GTZ).

An Examiner, former Head of Quality Assurance, Faculty of Community Health and member of the Accreditation Team of the West African College of Physicians, he also holds the impressive distinction of being a Visiting Scholar at the University of Aberdeen, Scotland, United Kingdom.

He is a proud recipient of the Vice Chancellor's Award at ABU, Zaria also holds a Masters degree in International Affairs and Diplomacy and also an authentic and remarkable scholar with indelible footprint on the sands of time, through the publication of over 70 of his scholarly articles in reputable Peer Review Journals, nationally and internationally.

He is happily married and blessed with children.

Olusanya Elisa OLUBUSOYE (PhD)



Olusanya E. Olubusoye is a Professor in the Department of Statistics, University of Ibadan (U.I.) and a Senior Research Fellow with the Centre for Econometric and Allied Research (CEAR), University of Ibadan, Nigeria. He was a visiting scholar to the International Monetary Fund (IMF) in 2006. He served as a Nigerian Technical Expert to Ethiopia under the Nigeria Technical Aid Corps scheme between 2006 and 2008. During this period, he was deployed to the Department of Statistics, Addis Ababa University, Ethiopia as an Assistant Professor. He was an Associate Lecturer with the Pan African University, Institute for Basic Sciences, Technology and Innovation (PAUISTI), Nairobi, Kenya. He served as a consultant to the African Union on Education Management Information System and development of indicators for monitoring the Plan of Action for the second decade of education for Africa. As a team player, he had collaborated with other researchers in several research projects undertaken for local and international organizations, including the African Econometric Research Consortium based in Nairobi, Kenya, MacArthur Foundation and World Bank funded projects. He was a modeler in the Federal Government of Nigeria project on Assets Decision Support System implemented by Adam Smith International and funded by UK Department for International Development. He is a member of the Royal Statistical Society (RSS), London; American Statistical Association (ASA); and The Nigerian Statistical Association (NSA). He holds the highest professional award of Chartered Statistician by the Royal Statistical Society, London. He served as the 2nd Vice President of the NSA and Chair of the National Organizing Committee (NOC) of the first international statistical conference held in September 2017 in Lagos, Nigeria. He has been coordinating the University of Ibadan Laboratory for Interdisciplinary Statistical Analysis (UI-LISA) since inception in 2015. Among others, some of his works include: *Modelling Inflation Process in Nigeria,* funded by the African Econometric Research Consortium (AERC), Nairobi, Kenya; *Spatio-Temporal Information Systems Modelling and Econometric Analysis of Revenue Allocation in Nigeria (1999-2008)* funded by the MacArthur Foundation and *Statistical literacy and empirical modelling for national transformation*, a Faculty Lecture delivered in October 2014. He is currently the principal investigator (PI) in a USAID funded project on *Enhancing Election Participation in Nigeria*.

Organizing Committee Members



Aaron Oladipo Aboderin MD, FMCPath, FRCPath(UK) is Professor of Clinical Microbiology and Parasitology at the Obafemi Awolowo University, Ile-Ife. He is also Consultant Clinical Microbiologist at the Obafemi Awolowo University Teaching Hospitals Complex since 2000 where he coordinates the Residency Training programme for the institution. For many years Prof Aboderin was the Head of the Department of Medical Microbiology and Parasitology. He also served two-terms as Deputy Provost, College of Health Sciences, Obafemi Awolowo University.

He is involved with the training and examination of a large number of students and resident doctors in clinical microbiology all over the country. He was acknowledged as having been a major contributor to the National Action Plan for Antimicrobial Resistance 2017-2022 jointly commissioned by the Federal Ministry of Agriculture and Rural Development, The Federal Ministry of Environment, and The Federal Ministry of Health, The Primary focus of his research is on epidemiology of enteric infections and antimicrobial resistance and has over 50 peer-reviewed journal articles. He chairs the Steering Committee of the National Conference of Environment and Health.



Adeniyi Samuel Oginni; M.B.Ch.B; MPH; Ph.D. is a public health physician, environmentalist, human rights activist, university lecturer and public opinion leader. He is a fellow of the World Health Organisation (WHO) Field Epidemiology Training Scheme. Also a fellow of the Emerging Leaders' Programme of the World Heart Federation (WHF). He is working on Tobacco Control through advocacy for 100% smoke-free legislations, especially in African countries. He is currently in a collaborative research with other WHF Emerging Leaders across the globe, assessing compliance of hospitality facilities in Kampala with the 100% smoke-free law of the government of Uganda.

Dr. Oginni is the Executive Secretary, Osun State Health Insurance Agency. He is a past chairman of the Osun state chapter of Nigerian Medical Association and presently chairs its Committee on Environment. He is the President of Christian Initiative for Nation Building (CINB), an NGO registered with the Corporate Affairs Commission of the Federal Republic of Nigeria with health promotion and disease prevention as one of its thematic focus and member of the Non-Communicable Diseases (NCDs) Nigeria Alliance. Dr. Oginni sits on the Boards of Community Building and Development Initiative (CBDI) and Network of Non-governmental Organisations in Osun State (NETNOS).

In the past 29 years he has been involved in many public health promotion and legislative advocacy programmes within government establishments as well as Non-Governmental Organisations which yielded positive results. Some of the results include, but are not limited to the enunciation of an HIV/AIDs policy for Osun state in 2003, the enactment of a law abrogating female genital cuttings (female circumcision) by the Osun State House of Assembly in 2007 and the enactment of Osun State Prohibition of Smoking in Public Places Act in 2009 which was achieved through the collaborative efforts of the Nigerian Heart Foundation (NHF) and the Nigerian Medical Association during his tenure as Chairman of the association. His research interest is in workplace safety. His other areas of expertise include management and leadership development. Dr Oginni is the Secretary to the Steering Committee of the National Conference on Environment and Health.



Beatrice Oluyomi Emma-Okon is a Senior Lecturer and the Acting Head of Department of Medical Biochemistry, College of Health Sciences Obafemi Awolowo University Ile-Ife. Her area of Research are Lipids in Health and disease and Pathophysiology of Type 2 Diabetes Mellitus. She is a member of the Nigerian Society of Biochemistry and Molecular Biology, American Association for Clinical Chemistry and American Society of Biochemistry and Molecular Biology. Mrs Emma-Okon is the Treasurer to the Steering Committee on Environment and Health.

Oluwatoyin Ikuteyijo is a doctoral student at the Swiss Tropical and Public health, University of Basel Switzerland. Her research interests are in the areas of Violence against Women, Adolescent Sexual Health, Child Health and Environmental Health. She is a Fellow of Ife Institute of Advanced Studies, the French Institute for Research in Africa (IFRA) as well as a 2019 Policy Communication fellow (PRB). Mrs Ikuteyijo is a member of the Mixed Method International Research Association (MMIRA) and she serves on the Board of Advisers of the LivingScience Foundation.





Ismail Adeleke Ajani was born on the 4th of January, 1960 in Osogbo, Osun State to the family of Alhaji and Madam R. A. Ajani. He had his elementary School education at St. Michael Primary Iyin-Ekiti and John Mackay Primary School Osogbo; while he had his Secondary Education at Doherty Memorial Grammar School Ijero- Ekiti and Ado Grammar School. He further went through Higher School Education at Ondo High School in Ondo State, He gained admission to University of Ife (now Obafemi Awolowo University (OAU) Ile-Ife to study Agriculture (Plant Science) in 1981. Mr. Ajani bagged the Bachelor of Agriculture (B.Agric.) in 1985 and did his NYSC Primary Assignment at Nigerian Agricultural and Cooperative Bank Owerri, Imo State. In his quest for academic excellence, Mr. Ajani bagged Master of Science (M.Sc.) Agriculture in 1992 from University of Ibadan (UI)..

Mr. Ajani was among the Pioneer Staff of the National Environmental Standards and Regulations Enforcement Agency (NESREA) in 2007. Between 2008 and 2015, Mr Ajani served as the Ekiti State Coordinator, and he became the Zonal Director, Southwest Zone of NESREA from July, 2015 from which position he retired earlier in the year. Mr Adeleke Ajani has attended several International Conferences and Trainings both within and outside the country on Environment with interest and vast experience in Compliance Monitoring and Enforcement, Industrial Ecology, Forest Resource Management, Biodiversity Conservation and Management, Environmental Planning and so on. Mr. Ajani is a devout Muslim happily married to Mrs. Bosede Ajani his best half and mother of his lovely children.



Tope Akinwumi *fwapceh* (DPH, B.SC (H\E),MEM, M.Sc, PhD) is a Public and Environmental Health expert, a registered Environmental Health Officer with Environmental Health Officers Registration Council of Nigeria (EHORECON) and currently the President of Environmental Health Officers Association of Nigeria ,Osun State Chapter.

Dr Akinwumi has served in various capacity including Head of Division , Health Education and Community Mobilization, and as Water Supply Officer in Egbedore L. G in Osun State where he made a tremendous achievements in the areas of borehole drilling and supervision ,rehabilitation of HPBH, MBH, Hand washing.

Mr Akinwumi is currently the Head of Department, Water and Environmental sanitation Olorunda L.G , Igbona- Osogbo, Osun State where he is in charge of supervision of water and waste management

activities at the centre of Osogbo (Osun State capital) potable water supply and quality control, market sanitation, flood control activities, food hygiene, environmental impact assessment, pollution control, excreta and sewage management, sanitary inspection of premises, pest & vector control and other environmental health activities.

He is the leader/coordinator of a popular weekly radio programme on Osun State Broadcasting Cooperation Ile- Awiye Oke - Bale Osogbo, tagged **"Imototo Ayika Wa"** meaning Environmental Sanitation where the public is educated / enlightened on the components of Environmental Health to improved quality of life, survival, promote hygienic condition and welfare and sustainable environment .

Dr Akinwumi is a part- time lecturer at Environmental Health Officers Registration Council of Nigeria (EHOREON} training centre, Ilesa and chief examiner to the Council certification examination in Nigeria with a good track record.

Dr Akinwumi was inducted as fellow of West African Postgraduate College of Environmental Health in 2015 and Fellow of Nehemiah Fellows, Diocese of Osun Anglican communion. He is a member of several professional and social bodies where he has been decorated with awards and recognitions He has attended several conferences, training and workshops home and abroad on issues relating to water quality assurance, waste management, climate change, health education, pollution control dispute management e.t.c and presented many technical papers in various conferences, meetings and workshops. He is happily married and blessed with children.

Oluropo F. DAIRO BSc, MSc, Electronic and Electrical Engineering, Ph.D Physics



Since October 2010, Dr Dairo joined the Department of Physical Sciences in Redeemer's University as an Assistant Lecturer. His research visits traversed the International Satellite Beacon symposium at Abdus Salam International Centre for Theoretical Physics (ICTP, Italy), Quantum, Atomic, Molecular and Plasma Physics (QuAMP) at Durham/Newcastle University, UK, courtesy of Institute of Physics (IOP), UK and Gaseous Electronic Conferences at North Carolina State University, USA courtesy of American Physical Society. Prior to the appointment he was with *Société Internationale de Télécommunications Aéronautiques* (SITA) where he started as an intern in 2002 and was welcomed back to top-flight service as a Field Service Engineer after his studies in the UK in 2009.

While in the UK, he obtained PgD Communication Engineering and MSc Electronic Instrumentation Systems in 2006 and 2007, respectively from the University of Manchester. Among the opportunities enjoyed while in the UK are: communication support staff of the Alumni Relation and Development Unit of the University of Manchester (UK and North America campaign, 2006-2007), EDEXCEL Specialist Marker (Systems and Control, 2006-2008), NIST short course on Laser measurement (US Department of Commerce, Boulder, Colorado, 2007) and member of staff Creative Support Ltd (2007-2009). Dr Dairo is an alumnus of the Obafemi Awolowo University with BSc (Hons) in Electronic and Electrical Engineering. He is an active member of Institute of Electrical and Electronic Engineers (IEEE), Optical Society of America (OSA), Society of Satellite Professionals International (SSPI), American Physical Society (APS), Institute of Physics (IOP) and Nigerian Union of Radio Science (NURS). His specific research interests include: Radio communication and environmental monitoring; Molecular effect of green house gases on radio communication; Atmospheric transmission at microwaves frequency; and Nano-Photonics and sensing applications.



Joshua Ojo is a Professor of Health Physics and Environment at the Department of Physics and Engineering Physics, Obafemi Awolowo University, Ile-Ife, Nigeria. He obtained his PhD in Engineering Physics from the same University in 1995, and served as Head of Department between 2011-2015. Prof Ojo acquired broad research experience from top laboratories in several parts of the world including Britain, the United States, Czech Republic, Poland, and Italy. He has published over 50 articles in local and international peer-reviewed journals. Provoked by results he obtained during a series of research contracts carried out under the auspices of the International Atomic Energy Agency (IAEA), Vienna between 2001 and 2014, Prof Ojo decided to form a non-governmental organization that would conduct research into environment-health issues of peculiar relevance to Nigeria, communicate the findings widely in the country, and advocate for possible mitigating actions at the appropriate levels. The LivingScience Foundation was consequently registered with the Corporate Affairs Commission in October 2016. Prof Ojo's broad research interest is in assessment of risks associated with exposure to environmental hazards by various population subgroups. His works include both measurements and modeling of exposure to the hazards. He is particularly interested in toxic and essential elements, pesticides, tropospheric ozone, microwave radiation associated with GSM communication, and environmental radioactivity. He is happily married to Olusola and they are blessed with six children.



Olufemi Aluko is a Senior Lecturer in the Environmental Health Unit of the Department of Community Health, in the College of Health Sciences of the Obafemi Awolowo University. Dr Aluko has published over 25 peer-reviewed articles in professional journals covering various fields in public health. He has served in several research and consultancy services in Nigeria, including being the technical lead on the World Bank assessment of the Water, Sanitation and Hygiene assessment in rural Nigeria project with Hanovia Nigeria Limited. He was also engaged by WaterAid Nigeria to review the 2011 WASH policy of Bauchi state. Olufemi is a registered Environmental Health Officer with the Environmental Health Registration Council of Nigeria (EHORECON). Between 2005 and 2011, he was a state level UNICEF consultant, with Rural Water Supply and Sanitation Agency on the Water Supply and Sanitation Sector Reform programme between 2005, until November 2011.



Isijaan A. Nkanta is a Senior Enforcement Officer at National Environmental Standards & Enforcement Regulatory Agency (NESREA). He is a Federal University of Technology Owerri (FUTO) trained Industrial Chemist with post graduate degrees, certifications and research interests in Science Education, Educational Technology, Science Communications, Environmental Chemistry, Chemical Technology, Green Technology and Geo-Informatics.

He is a member of various professional bodies including International Union of Pure & Applied Chemistry (IUPAC), Chemical Society of Nigeria (CSN), Nigerian Environmental Society (NES) amongst others and has served in various capacities both at workplace and professional associations.

He was Head, Chemicals, Pharmaceuticals & Pesticides Sector, Telecommunications & Broadcast Facilities Sector, School Outreach Program at NESREA Osun Field Office, Osogbo and currently the Vice Chair, Chemical Society of Nigeria (CSN), Osun State Chapter.

Isijaan is also passionate about Educational and Industrial Advancement in Africa. He has raised hundreds of young scientists and has engaged in several religious and community development initiatives. He was pioneer Youth Coordinator at Rivers Community (RIVCOM), Abuja. Isijaan is ordained into the evangelical cum pastoral ministry for over two decades. He is a true Ijaw son from Obolo (Andoni), Rivers State.

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INVITED ABSTRACTS

Major Agents of Environmental and Occupational Cancers in Nigeria

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Cancer is as old as life itself. Even though the disease has been with humanity for centuries, there has been no accepted treatment and the mortality is very high. More recent studies in Nigeria indicate 72,000 deaths every year, with an estimated 102,000 new cases of cancer annually. The incidence of cancers are on the increase in Nigeria and other low economy countries. Nigeria recorded five types of cancers of which breast and cervical cancers are the most predominant types. There are 11 Cancer Registries in the country located in the tertiary institutions and yet the data available is scanty and mostly based on hospital records. Community based data which are vital for health planning is not available. Cancer hotspots in the country may be the industrialized cities such as Port Harcourt, Lagos, Sango Otta, Aba to name a few, and Niger Delta region. Cancer may be caused from several factors which may be environmental, occupational or as a result of lifestyle choices. The environment whether built or workplace plays a major role in causing cancer through pollutants or contaminants which may be physical, chemical or biological in nature. People may be exposed to these agents through water, soil, air, or food. Some of the well known carcinogenic chemicals which trigger cancers are polyaromatic hydrocarbons (PAH), inorganic chemicals such as silicates, lead, cadmium and arsenic, pesticide residues, hormones, radiation, and several others. Food may be a source of carcinogens through the soil plant interactions, usage of agrochemicals, and cooking methods we adopt to prepare the food at home or outside. Air is a major source of pollutants arising from burning activities and these agents may be dust/ particulate matter, aerosols and several emissions arising from industries, automobiles and other developmental activities. Occupational cancers also need to be addressed in Nigeria as several industries use a variety of hazardous materials. Most notable small and medium scale industries need to be addressed as a priority as they use very crude methods and outdated technologies in handling the toxic and hazardous materials in the processes and products. Waste handling and management are critical areas which need to be managed effectively. Typical examples include recycling facilities which involve recovery of lead and other precious and heavy metals (e.g. batteries, electronic waste, healthcare wastes, etc.). Nigeria has all the environmental regulations and policies which are required to maintain a healthy and safe environment with cancer free communities. Yet the environment is heavily polluted and continuing to degrade unchecked. This must stop if we aim at a healthful life. Cancer has no cure but a combination of treatments is given to relieve the suffering. More benefits can be derived at low cost if we focus our attention on sound environmental management practices. The available technologies and skills among the people are sufficient enough to start off with environmental cleanup without any further delay. Our governmental machinery should support such move among the communities.

Key Words: Environment, Cancers, Occupations, Health, Protection, Nigeria.

Big Data Analytics in Cancer Management

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It is well known that cancer is an extremely complex disease because it changes and evolves rapidly. Experts have revealed that "a single tumor can have more than 100 billion cells, and each cell can acquire mutations individually[1]". To have a better understanding of the evolution of cancer, clinicians and researchers often collect samples of the tumor's genetic makeup. The measurements underlying these sample data produce an extraordinarily large volume of diverse information. Employing the power of big data analytics and high-performance computational methods can help to: identify important mutations in the cancer genome; understand how the cancer genome changes in time; discover new potential cancer drugs; and identify patterns that can help prevent, diagnose, treat, and ultimately cure cancer. The plan of this paper is to examine the big data analytics techniques and machine learning algorithms which are helpful in the identification of patterns that are potentially linked to cancer disease. A practical application of the machine learning algorithm is demonstrated using breast cancer data to develop a diagnostic model to help the medical team determine whether a tumor biopsy is malignant or benign.

KEEPING THE UNIVERSAL HEALTH COVERAGE (UHC) PROMISE ON CANCER AND NCDs IN NIGERIA

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Cancer is the second leading cause of mortality globally, claiming 9.6 million lives a year but it is also a disease of inequity. In 2018, Nigeria recorded 115,950 cases of cancers with a mortality of 70,327. Premature deaths from NCDs were 289,701 while 18.2% of these were due to cancer. Accessing treatment and care for cancers and other NCDs continues to push patients and their families into financial hardship or to near bankruptcy especially in low and middle income countries of the world. In order to address this, leaders from all UN member states including Nigeria unanimously committed to achieving universal health coverage (UHC) by the year 2030 in the most ambitious political declaration on health in history made on 23rd September, 2019. Nigeria's commitment to UHC has been symbolized by the passage of the National Health Act of 2014, which in section 11 mandates the establishment of a Basic Health Care Provision Fund (BHCPF); to support the effective delivery of primary and secondary healthcare services through the provision of a Basic Minimum Package of Healthcare Services (BMPHS) and Emergency Medical Treatment (EMT) to all Nigerians. The BMPHS defined in the revised guideline for the implementation of the BHCPF approved by the Emergency National Council on Health on 6th August, 2020 includes primary and secondary care for

[1] https://research.cornell.edu/news-features/cancer-and-big-data-analytics

Diabetes Mellitus, Hypertension, SCD, mental health and other chronic diseases at focal Primary Health Centres (PHCs) and accredited public and private secondary care facilities. This package excluded care and treatment for cancers. This paper assesses the status of implementation of BHCPF and suggests means of inclusion of care and treatment of cancers into the BMPHS as a step towards keeping the pledge to ensure that all people everywhere should get the quality health services they need without facing financial hardship.

EXPOSURE ASSESSMENT TO CARCINOGENS IN FUMIGATION OF RESIDENCE AND AGRICULTURAL PRODUCTS

Tope Akinwunmi *fwapceh* (DPH, B.SC (H\E),MEM, M.Sc, PhD)
President, Environmental Health Officers Association of Nigeria, Osun State

Chemical disinfectants are chemical substance used to control, prevent, or destroy harmful microbes, insects, vermin's, rodents such as bacteria, virus, fungi, housefly, termite, ants etc. workers in hospital, healthcare facilities, poultry facilities, abattoir, food products mainfactning plants, schools, hotels, residential premise, sanitary and similar services, etc. frequently use chemical disinfectants to eradicate the disease causing microbes or insects. Disinfection/fumigation is a process in which chemical or physical means is used to control or destroy the insect pests or microorganisms that are capable of causing diseases or vehicle diseases. Choice of the disinfectant to be used depends on purpose, situations, season, and fumigator. There has been recent interest in the use of chemical fumigation in health care facilities because of concerns about the role of the environment as a cause of health care associated infections (HAIs) and a perception that current surface cleaning and disinfection. This study is assessing the exposure to carcinogens in fumigation of residence and agricultural products, with particular attention to exposures associated with the post- COVID-19 pandemic requirements for extensive chemical fumigation at schools, markets, religious centres, hotels, offices and other enclosed buildings.

Cancer Statistics and Information Management

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Globally, the burden of cancer is on the increase[1]. In 2016, WHO reported that Cancer is now responsible for one in three premature deaths globally, and was the leading cause of premature death in 48 countries in 2012, ranking above infectious and parasitic diseases, cardiovascular disease, and intentional and unintentional injuries (WHO, 2016)[2]. Despite this growing cancer burden, cancer continues to be a relatively low public health priority in Africa and the low-income countries of the world[2]. In 2019, more than 90% of high-income countries reported that treatment services for cancer were available in the public health system, compared to less than 15% of low-income countries, where survival is unacceptably low[1].

Factors contributing to this abysmally low cancer survival rate in low income countries including Nigeria are many and they include; low level of awareness of the disease symptoms and burden, import of lifestyle from the western countries, increasing level of exposure to environmental carcinogens, low Socio-economics conditions, high infection rate, late presentations of cancer patients

to health facilities, lack of access to quality clinical services, (diagnosis, treatment, follow-up and palliative care), lack of trained Personnel in cancer care, lack of good statistics and research[1-2,3]..
To avoid the negative impacts of cancer on individuals, communities and the government, cancer control strategy is a must at all levels. There is a need for universal health coverage and cancer care for all by spending wisely and equitably by the government and other agencies involved in cancer programs. In addition, functional population-based cancer registries must be set up for proper management of information on cancer cases.

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Ionizing and Non-ionizing Radiations as Carcinogens

-**Prof Joshua Ojo**, Department of Physics and Engineering Physics, Obafemi Awolowo University, Ile-Ife

The presentation reviews the historical recognition of ionizing radiation as a carcinogen, and draws parallel to the current resistance in some quarters to acknowledging carcinogenic properties of non-ionizing radiation. Well-established non-thermal modes of action of electromagnetic radiation, including massive disruptions at the voltage-gated calcium channels are reviewed. Data obtained from our laboratory at Ile-Ife on both ionizing and non-ionizing radiation in the Nigerian environment are cited to bring the subject matter home.

SPECIAL SEMINAR ON COVID-19 RESPONSE AND HEALTH SYSTEM IN NIGERIA

Speakers
Prof Christian Happi (Director, African Centre for Excellence in Genomics of Infectious Diseases, Redeemer's University, Ede),
Dr Niyi Oginni (Executive Secretary, Osun Health Insurance Agency, Osogbo, and
Dr Tope Akinwunmi, President, Environmental Health Officers Association of Nigeria, Osun State Chapter).

Moderator: Dr Beatrice Emma-Okon. Head, Department of Clinical Biochemistry, Obafemi Awolowo University, Ile-Ife.

Discussion Panel examining the response to the COVID-19 pandemic in Osun State, Nigeria. Both positive and negative fall-outs from the pandemic are highlighted, and vital lessons needed to strengthen health infrastructure and systems in Nigeria are identified.

CONTRIBUTED ABSTRACTS

SURVEY OF SOME CARCINOGENIC POLLUTANTS IN THE CEMENT INDUSTRY

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The source identification of Polychlorinated Dibenzo-p-Dioxins (PCDDS) and Polychlorinated Dibenzo-p-Furans (PCDFS) in West Africa has been most difficult problem to tackle due to unavailability of the facility to analyse the samples and high cost of sampling equipment. This study is based only on one source in determining the PCDDS/PCDFS at cement industries in Nigeria, Cameroun and Benin Republic. The sampling adopted the gravimetric (method) principle for extractive source analysis using *Paul Gothe Bochum* stack sampler and PCDDS/PCDFS traps from Concept Life Sciences Laboratory in UK. The traps were exposed through the acceptable guidelines and transported back to the same laboratory for analysis in UK. The parameters recorded during PCDDS/PCDFS sampling are stack temperature, ambient temperature, pressure, flow rate and moisture content at isokinetic mode. The PCDDS/PCDFS results from different cement industries are: Nigeria (Plant A = 0.0209 ng/TEQ/Nm^3; Plant B = 0.0316 ng/TEQ/Nm^3), Cameroun (Plant A = 0.0062 ng/TEQ/Nm^3; Plant B = 0.0143 ng/TEQ/Nm^3) and Benin Republic (Plant A = 0.0101 ng/TEQ/Nm^3). The production capacity of each cement industry reflects on the annual total PCDDs/PCDFs emission which ranged from 0.046 ng/yr to 3.67 ng/yr which is proportional to the production capacity of their facilities. All the results recorded are below Nigerian standard and international standards. By comparing the standards, the disparity between Nigeria and other international Countries are high while other neighbouring Countries do not have the PCDDS/PCDFS standard. This is due to the paucity of data for PCDDS/PCDFS from different sources to review the standards. Based on the nature of PCDDS/PCDFS on humans and ecosystems, the major concern is long range transmission and accumulation in the food chain and animals. From the previous studies, it is revealed that this study has limitation due to one source assessment. It is being recommended that Nigerian Government should carry out national emission inventory along with neighbouring Countries. Also, existing standards and regulations on open burning, industries, mobiles and dumpsite should be strictly implemented.

Toxicological Effects of Subacute Exposure to Different Pesticides via Inhalation on Male Wistar Rats

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This study investigated the combined toxicological effects of six pesticides: DD Force (Dichlorvos), Sniper (Bifenthrin), Industrial Camphor (Terpenoid), Edible Camphor (Turpentine), Kerosene and their combined effects on reproductive activities of male Wistar rats by inhalation in an improvised inhalation chamber. Eighty -one male wistar rats (150-200g) divided into seven groups (A-F), containing 9 rats each were exposed to the pesticides for 30 days at 25%, 50% and 75% dose obtained from the 96 hour median lethal concentration (LC_{50}) using standard methods. Groups A-F was exposed to the pesticides by inhalation for 8 hours daily while the rats in group G (control) received normal feed and water. At the end of the experimental period, half of the treated rats were sacrificed by cervical dislocation and the rest were withdrawn from pesticide exposure for two weeks for possibile recovery. Blood samples were collected by cardiac puncture from the rats from which testosterone level was measured. Semen was collected from the epididymis and sperm parameters were assessed using standard methods. The epididymides and testes were excised, fixed in Bouin's fluid for histological examination. The results showed that the pesticides had deleterious effects on the sperm parameters of the treated rats, however there was a significant decrease in sperm counts of Wistar rats exposed to industrial camphor, kerosene and the combined pesticides when compared with the control. The combined pesticides showed a significant decrease in the level of serum testosterone. Pronounced degeneration was observed in the histology of the testes and epididymides of the rats following exposure to the pesticides. In conclusion, pesticide exposure may affect spermatogenesis leading to poor semen quality and reduced male fertility although there were signs of recovery particularly in the level of testosterone after the rats were withdrawn from these pesticides.

Keywords Pesticides, Toxicology, Sperm Parameters, Epididymis, Testes

RADIOLOGICAL ASSESSMENT OF GRAINS, VEGETABLES, FRUITS AND TUBER CROPS CULTIVATED IN OKEMESI TOWNSHIP, EKITI STATE, NIGERIA.

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Exposure to radiation is a natural phenomenon in the human environment. This is received from naturally occurring radionuclides in water, air, soil and food. Ingestion is one of the two major pathways through which these nuclides enter the human systems. Radiological assessment of fruits, vegetables, grains and tuber crops cultivated and consumed in Okemesi township, Ekiti State has been carried out using a 76mm by 76mm lead-shielded Sodium Iodide detector (NaI(Tl)) located at the Centre for Energy, Research and Development (CERD), Obafemi Awolowo University, Ile-Ife, Nigeria. The mean activity concentration of the radionuclides in the food samples was 155.76 ± 14.22 $Bqkg^{-1}$ for ^{40}K, 8.00 ± 0.24 $Bqkg^{-1}$ for ^{238}U and 7.39 ± 0.21 $Bqkg^{-1}$for ^{232}Th.The value obtained for Annual Effective Dose due to intake of the food crops (D_{ing}) ranged from 104.32 to 687 µSv yr^{-1} while values for Excess Lifetime Cancer Risks (ECLR) ranged from 0.365 t0 2.407. Although the radioactivity levels in the food crops were lower than the world-wide limits, some values obtained for the A_{ED} and the ELCR were higher than the recommended limits of UNSCEAR 2000. The rank order of D_{ing} and ELCR in the food types was tubers > fruits > vegetables > grains. Consumption of food cultivated in the area over a long period of time may induce a degree of health risks which should not be overlooked.

Keywords: Natural radioactivity, Food, Okemesi, Gamma spectrometry, Nigeria

Title: TRIPLE NEGATIVE BREAST CANCER: DETECTION AND TREATMENT OPPORTUNITIES BEING DEVELOPED

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Abstract: 1. INTRODUCTION: In this work we present the various efforts we have made towards the early detection and treatment of Triple negative breast cancer (TNBC) through the support of the Pan African Materials Institute (PAMI) TNBC is a type of breast cancer that does not express the genes for estrogen receptor (ER), progesterone receptor (PR) and Her2. TNBC is the most prevalent breast cancer type among women of African descent. It is very virulent, recurrence is high and occurs mostly in women of
child bearing age. Early detection remains the ultimate key to treatment. In our research group, we have been making concerted efforts towards developing an array of new technologies geared towards early detection and treatment of TNBC.

2. MATERIALS AND METHODS;
2.1 Nanoparticles synthesis: we synthesized gold nanoparticles through the novel use of indigenous plant, Nauclea latifolia and bacteria, Serratia marcescens. The plant and bacteria extracts were each reacted with gold (III) chloride trihydrate. The resultant nanoparticles were functionalized by conjugating with LHRH [1, 2].
2.2 Drug encapsulation: A locally extracted anti-cancer agent, Prodigiosin, encapsulated in polymeric microspheres using water-in-oil emulsion method [3].
2.3 Hydrogel technology: we have also encapsulated anticancer drugs in temperature sensitive hydrogels made with poly acrylamide gel and PNIPA[4,5,6]
2.4 Cell Culture: all our devices were tested in vitro using TNBC cell lines, MDA-MB-231 and MDA-MB- 468. We also tested them on normal cell lines, MCF-10A.

3. RESULTS AND DISCUSION: Gold nanoparticles in the range of 30-60nm were synthesized with the plasmon resonance occurring at 535nm. These nanoparticles are used for imaging to enhance the detection of breast cancer. The encapsulation systems for drugs in polymeric microspheres and nanospheres can be applied for localized drug delivery. These devices were tested on TNBC cell lines.

KEYWORDS: Breast cancer, nanoparticles, drug delivery, detection, prodigiosin.
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Title:	ANALYSES AND DISTRIBUTION OF VARIOUS TYPES OF CANCERS RECORDED IN IFE-IJESHA CANCER REGISTRY IN THE FIVE YEAR PERIOD 2010 -2014
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Abstract:	This work presents analyses of data on cancers diagnosed and recorded at the Ife-Ijesa Cancer Registry located at the Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) Ile-Ife for the five-year period 2010-2014. The relative distribution of the 2,042 cancer cases, by site, were: Breast (25.5%),

Reproductive sites (18%), Blood and Bone Marrow (13.3%), Gastro-intestinal Tract, G.I.T. (12.4%), Lymphoma (6.2%), Liver and Gall Bladder (4.4%), Skin (2.7%), Metastatic (2.3%), Cytology (2.1%), Ear, Nose and Throat E.N.T., (2.1%), Lungs (1.9%), Connective tissue (1.9%), Kidney (1.5%), Jaw (1.4%), Endocrine (1.1%), Eye (0.6%) and Others (2.9%). Fifty-seven percent (1169 cases) of these were in female subjects; however, if the 523 cases of breast cancer (all females) were excluded, more cancers (57.5%) would be recorded for males. Indeed, for cancers in Blood and Bones, Kidney, Jaw, and Eye, there were at least twice as many cases in Males than in Females, while for ENT there were in male subjects, over thrice as many cases as were in females. The average age at diagnosis ranged from 25.0 years for cancers of the Eye to 63.4 years for cancers at Reproductive sites. The youngest case was sacrococcygeal teratoma in an 8-day old female subject while the oldest subject was a 101 year female diagnosed with breast cancer. In female subjects below 20 years, there was no record of cancer of the Lungs, E.N.T. or Jaw, and there were only very few cancer cases at the Skin and G.I.T. in those subjects. There were no records of cancer of the Liver and Gall Bladder and Metastatic cancer in subjects below 20 years, either male or female.

Title:	Association between PM2.5 and mortality of stomach and colorectal cancer in Xi'an: a time-series study
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Abstract:	Background: Globally, fine particulate matter has been associated with several health problems including cancer. However, most studies focused mainly on lung cancer. Stomach and colorectal cancers play significant roles in increasing public health's cancer globally. This study focused on investigating a possible significant association between exposure to fine particulate matter (PM2.5) and mortality due to stomach and colorectal cancer in Xi'an from 2014 to 2016.
	Method: Using time-series analysis, the study applied both single and multi-pollutant(s) approaches for investigations; PM2.5 was the pollutant of interest. Generalized additive model (GAM) was the core statistical method used with the addition of distributed lag model (DLM) to observe delayed effects.
	Results: As a single pollutant, PM2.5 was significantly associated with stomach cancer mortality only RR (95%CI): 1.0003 (1.0001, 1.002). For the multi-pollutant analysis, PM2.5 combinations with NO2 were significantly associated with both stomach and colorectal cancer mortality RR (95%CI): 1.0103 (1.009, 1.021) and

1.054 (1.0324, 1.0667), respectively. Also, PM2.5 combination with O3 was significantly associated with colorectal cancer mortality, RR (95%CI): 1.0151 (1.0091, 1.0172), but no association was noted for combination with SO2.

Conclusion: Though this study has reported significant associations, it will be beneficial for the public's health if more studies further investigate the relationship between exposure to PM2.5 and other cancer mortality.

Keywords: Fine particulate matter. Stomach cancer Colorectal cancer. Mortality. Time-series. Public health

Title: MUTATIONAL ANALYSIS OF P53 GENE IN CERVICAL CANCER AND USEFUL POLYMORPHIC VARIANTS IN EXONS 3 AND 4

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Abstract: Background: Cervical cancer is not spontaneous but occurs through a multistep process and develops with age. Factors contributing to the pathogenesis and progression of cervical cancer include exposure to carcinogens and Human papillomavirus (HPV), poor attitude to screening and health intervention, late presentation, among others. Mutations in p53 gene have been attributed to several cancer cases.

Objectives: Although several studies have reported the association of p53 protein accumulation and mutations with cancer prognosis, few have explored the p53 gene mutational landscape with respect to the histopathological analyses in cervical cancer, especially among the African population. This study aim to find any relationship between the mutation patterns in p53 gene and cervical carcinoma staging.

Methods: Genomic DNA was isolated and purified from cervical tissue biopsies. The purified genomic DNA was used as a template in Polymerase Chain Reactions (PCR), the PCR products were sequenced and analyzed.

Results: Nineteen (19) polymorphic variants were identified from the sequence analysis. Missense mutations occurred in 47 % of the samples, 32 % were silent mutations, 16 % were frameshift mutations, and 5 % nonsense mutations. The mean age of study participants is 59 ± 16.9 years; the age category 56- 65 years has the highest incidence (26.7%) of cervical cancer cases reported in this study. Socio-

biological characteristics of the study participants revealed that 60 % have husbands with multiple sexual partners and that only 23.3 % of the participants have ever done Papanicolaou (Pap) smear test prior to diagnosis, while 20 % were unaware of the screening test.

Conclusions: Increased severity of cervical carcinoma staging as revealed from the histopathological analysis was found to be associated with the accumulation of higher levels of mutations in the p53 gene. The relationship between age and cervical cancer development is evident in the present study. Molecular analysis of p53 gene mutations may prove useful as a screening biomarker for cervical cancer.

Keywords: cancer genomics, cervical carcinoma, gene mutation, severity, polymorphic variation.

Title:	Determination of polycyclic aromatic hydrocarbons and potentially toxic metals in commonly consumed beef sausage roll products in Nigeria
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Abstract: Levels of polycyclic aromatic hydrocarbons (PAHs) and potentially toxic metals (PTMs) were determined in the commonly consumed beef sausage roll products (coded BS1 – BS6) in Nigeria. This was done in order to assess the safety of regular consumption of these products with respect to the substances determined. Three batches of six samples of beef sausage roll products were collected from Ile-Ife, Osun sate, Nigeria. A part of the pretreated sample was Soxhlet extracted using n-hexane and analyzed with Gas Chromatography coupled with Flame Ionization Detector (GC-FID) to identify and quantify each of the PAHs in the sample, while Atomic Absorption Spectrometer (AAS) was used to profile the concentrations of As, Cd, Co, Cu, Pd, Mn and Zn in the digested sausage roll samples. Levels of PAHs in the samples ranged from 1.84 μg/g of Acenaphthylene in BS5 to 282.83 μg/g of Benzo[k]fluoranthene in BS1. Concentrations of benzo[a]pyrene in all the samples were higher than the guideline value of 0.003 mg/kg/day. For PTMs, a range of 0.075 μg/g As in both BS1 and BS6 to 2.950 μg/g Cu in BS3 was obtained.

The study concluded that both PAHs and PTMs occurred in the samples at levels that called for caution on the part of consumers to prevent health infarctions that might be associated with prolonged regular and large consumption of beef sausage roll products.

Key words: sausage roll, Metals, Health hazards, Polycyclic aromatic hydrocarbons, Nigeria

Radiological Risks from Consumption of Vegetables in Two Regions with Disparate Cancer Prevalence in Ondo City.

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The aim of this study is to determine the radiological risks from consumption of vegetables from two regions with disparate cancer prevalence in Ondo city, Ondo state of Nigeria. Studies have shown that exposure to radionuclides can cause adverse health effects including various types of cancer in man. Also significantly higher radioactivity has also been measured in water and soil samples from the eastern part of the city compared with samples from the west. In this study, cancer case notes of 1030 subjects were retrieved from the medical record department at Obafemi Awolowo University Teaching Hospital Complex (OAUTHC), 78 cases were from Ondo city with 71 from West and 7 from East respectively. Based on population level, this gives an approximated prevalence of 3:1. And with the usage of food basket analysis, samples of vegetables commonly grown and consumed in and around the city of Ondo were identified. Eleven samples of selected vegetables were collected from each region and analyzed by gamma spectrometry in order to determine the mean concentrations of the radionuclides ^{214}Pb and ^{224}Ra which were used to assess the levels of the natural-occurring radionuclides ^{234}U and ^{232}Th respectively. ^{40}K was also assessed. The annual effective dose was computed by combining the concentrations, consumption rate of sample and the dose conversion factor for naturally-occurring radionuclides. The content of ^{214}Pb, ^{224}Ra and ^{40}K radioactivity varies from 27.50±2.21 to 37.50±2.17 Bq/kg; 3.40±0.52 to 4.33±0.72 Bq/kg and 81.55±2.03 to 93.33±2.15 Bq/kg respectively. The mean annual effective dose equivalent and the radium equivalent were determined from the measured activity concentration of the radionuclide respectively and found to be within the permissible limit of UNSCEAR 2000. The investigation also shows there is no difference in the abundance of naturally-occurring radionuclide in vegetables from Ondo West and Ondo East, even though significant differences had been observed by us in radioactivity levels in soil and water samples from the two regions. Tete (*Amarathus Hybridus*) had the highest amount of naturally-occurring radioactivity (^{214}Pb, ^{224}Ra and ^{40}K) among the vegetables. The result therefore indicates that the selected vegetables collected, do not pose any significant radiological risk.

Keywords: Gamma spectrometry, CsI detector, Natural radionuclides, Cancer, Annual effective dose, Vegetables, Ondo Town

Geocoding Medical and Health Records for Sustainable Health Service Delivery in Ile-Ife, Osun State, Nigeria

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Nigerian public health institutions across the three levels of care have operated the traditional paper-based medical and health records system for the past ten decades. However, the advent of information technologies, particularly GIS-based systems, are currently replacing this ancient way of managing patients' medical and health records system. GIS-based technologies are useful for bridging the gap in public health system and its operational environment. This study proposes a framework for geocoding medical and health records and the design of a prototype geospatial database in for managing patients medical and health records.

The methodology adopted involves development of a GIS-based address system for keeping medical and health records for patients visiting hospitals and health centres. Using the framework, a prototype GIS-based patient medical and health record database was designed. The useability of the prototype database for manging medical and health records was tested using existing patients' records and disease index cards currently being kept hospitals and health centres.

It is expected that the results of the research will provide a better alternative for managing patients medical and health records system for sustainable health service delivery in Nigeria.

Keywords: Geocoding, Medical and Health Records, Health Service Delivery, Geospatial database.

Title:	ASSESSMENT OF PARTICULATE MATTER (PM 2.5,10) LEVEL IN SOME SELECTED AREAS IN SOUTH-WEST NIGERIA
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Abstract:	The severe side effect of Particulate Matter (PM) inhalation in our environment has necessitated the need to monitor the PM and take appropriate measure. Dust is present everywhere, but most times, it is not visible to the eyes even when it is above the permissible limit set by United State Environmental Protection Agency (USEPA)– 150 µgm-3. This study was carried out to determine different PM levels at different locations at selected areas in Southwest Nigeria using a developed dust density measurement system. It was observed that PM level in residential areas at Oye-Ekiti, Akure, and Ibadan were below 120 µgm-3 in most cases and above in few cases. PM level in Federal University Oye-Ekiti environment was at some time

above 150 µgm-3. The PM level in public transport also showed that commuters are exposed to dust hazard as the dust density level was above 200 µgm-3. The results obtained suggested that all reasonable precautions have been taken to reduce the levels in some of the study areas.

Keywords: Particulate Matter, severe, environment, permissible, effect, measurement.

Title: Elemental Analysis and Risk Assessment of Soil and Vegetables from a Crude Oil-polluted Area in Lagos State, Nigeria

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Abstract: Energy Dispersive X-rays Fluorescence (EDXRF) spectrometry was used to determine the concentrations of nineteen potentially toxic metals in soil and vegetable samples collected from an oil-polluted area of Lagos State. The enrichment factors (EF) were calculated to identify the pollution load index of these heavy metals in the soil and vegetable samples [telfairia occidentalis (fluted pumpkin) and vernonia amygdalina (bitter leaf)]. The mean concentration ranged from 36.765 – 39460 mg/kg, 1.436 – 14010 mg/kg, and 0.928 – 29520 mg/kg for the soil and the two vegetables samples respectively. The vegetable samples were enriched with heavy metals such as Fe, Cr, V, and Ti, (EF = 1.000-1.43) with the source traceable to the oil-polluted soil. The mean concentrations of these heavy metals in the vegetable samples were higher than the recommended standards set by the Food and Agriculture Organization of the United Nations/World Health Organization and control. The results obtained in this study gave the baseline levels of these heavy metals in the samples and also indicated the risk of exposure of these environmental media to Fe, Cr, V, and Ti.

Keywords: enrichment factors, heavy metals, risk of exposure, EDXRF

ENVIRONMENTAL FACTORS AND CANCER PREVALENCE IN ONDO STATE, SW-NIGERIA: IMPACT OF RADIOACTIVITY IN SOIL AND IN AIR

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Association has been investigated between prevalence of cancer and radioactivity levels in soil and in air at five geographically-contiguous and culturally-identical Local Government Areas (LGAs) in Ondo State, Southwest Nigeria. To choose the sites, the southwestern region of Nigeria was classified into five class intervals of registry reported prevalence of cancer using geospatial technique on data from 830 patients obtained from the ife-ijesha Cancer Registry, Obafemi Awolowo University Teaching Hospital, Ile-Ife for sample collection, Five towns conveniently accessible on the road network were chosen from each of these LGA At such five samples were randomly collected and taken to the laboratory for evaluation of gamma radioactivity using Csl-based spectrometer. Furthermore, a survey meter was used at each sample collection point to determine in view the gamma done rate in air. There was a good correlation between results obtained to view by survey meter and laboratory gamma spectrometry. No statically significant relationship was observed between Cancer prevalence and the levels of gamma spectrometer measured in the study area in general. However, wide disparity in cancer prevalence was observed between the two LGAs (Ondo East and Ondo West) into which she city Ondo is divided. Ondo East fund a prevalence of 54 cancer cases per million. While the prevalence for Ondo West in the same period was 187 cases per Million. The activity higher in soil samples from Ondo West. The P-Levels of the difference were respectively ($p=0.025$) for ^{40}K, 0.006 for ^{238}U. and 0.081 for ^{232}. The Study concludes that environmental radioactivity is associated with cancer prevalence in the city of Ondo, although the picture in the entire Southwest Nigeria is not conclusive given the limited size of data in the study.

KEY WORDS: Radioactivity, Background Radiation, Cancer Prevalence, Gamma Spectrometry

Title:	Curbing Occupational and Environmental Cancer Through Effective Compliance Monitoring and Enforcement
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Abstract:	From the womb to old age, people around the world are exposed to countless carcinogens in their foods, air, water and consumer goods. For example, benzene, a known cause of human leukaemia, is a common pollutant from vehicle exhaust. Radon, a natural radioactive gas found in many homes, raises the risk of lung

cancer. Arsenic, linked to skin, liver, bladder and lung cancer, contaminates some drinking water supplies. Other known human carcinogens include asbestos, hexavalent chromium, vinyl chloride, etc. Also, exposure to hormonally active agents during critical periods of human development, particularly in the womb or during childhood, may trigger cancer later in life. For instance, the risk of breast cancer could be influenced by exposures to carcinogens, during puberty. Carcinogens can damage DNA, disrupting hormones, inflaming tissues, or altering genetic signature.

There is substantial evidence that synergism between two different exposures can cause some cancers. For example, a smoker that was exposed to Asbestos in the workplace, will experience high risk of carcinogenicity. It's so difficult to link human cancers to environmental pollutant(s) due to dearth of research by epidemiologists. Apart from environmental factors, technological advances in medicine has witnessed increased use of CT scans. Reduction in use of the latter, therefore, reduces exposures. There is no doubt that environmental pollution, however, increases risks of cancer prevalence. This calls for a check on use of chemicals in the environment.

Lifestyle factors, which are important causes of cancer are huge issues: tobacco smoking, physical inactivity, nutrition, and obesity; that have potential to increase cancer deaths, should be controlled.

Occupational Health and Safety is concerned with the wellbeing of all employees and persons in a workplace. It deals with conditions and factors that have direct bearing on health and safety. In order to have a uniform standard, rules and practice, the Agency had developed guidelines and strategies in form of Environmental Audit (EA) and/or Environmental Management Plan, (EMP), permitting and licensing, etc., to ensure that facility owners comply with environmental, health and safety standards. This way, a facility management can regulate her environment, ensure adherence to health standards and improve on productivity.

The main theme is that risks to employees and other parties should be eliminated or minimized. The organization should declare its Occupational Health and Environmental Safety Policy, which should be implemented in a voluntary manner, in letter and spirit. The systems should be monitored, compliance to policy objectives ensured, and continually improved. Such conformance is certified through issuance of a certificate of Environmental Management System by the Agency, and duly certified by the Agency's management.

All undesired events and incidences in a workplace which can give rise to death, ill health, injury, damage, or other loss, need to be thoroughly investigated, people be trained to safeguard against them, and these need to be eliminated. Similarly all hazards, i.e. source/incidents capable of injuring or exposure to ill health, damage to property or workplace environment, etc. should be identified and action plan drawn for safe guard against them. A successful Environmental Management

System should facilitate management of EH and S risks and have various elements integrated into the EMS.

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Assessment of Source Profiles for Suspended Particulate pollutants in Ibadan, Nigeria using Positive Matrix Factorization

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Positive Matrix Factorization receptor model developed by the United States Environmental Protection Agency known as EPA PMF receptor model and reconstructed mass model were applied to air pollution data collected over Ibadan south west Nigeria. The essence was to determine the source profiles responsible for the high pollution level of Ibadan and to compare the sources resolved by these two methods. Particulate matter load was sampled over Ibadan, southwest Nigeria with the aid of low volume Gent air sampler, equipped with the Norwegian Institute for Air Research (NILU) Stacked Filter Unit (SFU). Two separate 47-mm nuclepore filters were mounted on the SFU to collect both fine and coarse particulates separately. Trace elements were determined using instrumental neutron activation analysis (INAA) and energy dispersive x-ray fluorescence (EDXRF) spectrometry. Five factors were resolved each for both fine and coarse fractions using EPA PMF. For the fine fraction, soil dust, vehicular emission, oil combustion, open burning and copper-rich source were the major sources of fine particulates over Ibadan city contributing 42, 16, 10, 22 and 10% respectively to the total aerosol loading over Ibadan. Vehicular emission, continental soil, sea salt, locally generated dust and copper-rich source were the sources identified for the coarse particulates. These contributed 7, 49, 13, 23, and 8% respectively. It was observed that emission from open burning was very high (22%), being the second largest contributor to the fine particulates. Reconstructed mass model showed good agreement with PMF in implicating soil dust as the major contributor of airborne pollutants over Ibadan. There was good correlation between the reconstructed mass and the measured mass with r^2 values of 0.87 and 0.98 for fine and coarse particulates respectively. The result of this work showed that re-suspended soil particulates were the major constituents of airborne particulate matter over Ibadan, with over 70 % contribution to the coarse mass and over 40 % contribution to the fine mass.

Keywords: Particulate Matter, Reconstructed mass, Refuse burning, PMF, Receptor model

Title: Chemopreventive roles of Medicinal foods against Environmental carcinogens-induced Cancers

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Abstract: Introduction: Cancer is a multifactorial heterogeneous disease, which is the main cause of death in some countries along with cardiovascular diseases, and it is expected to increase about 70% cases in the next 20 years. These have been related to different factors of behavioural and dietary risks, among which are the reduced consumption of vegetables, limited physical activity and consumption of alcohol and tobacco, which may cause negative impact on health, certain infections, exposure to ionizing radiation and more importantly environmental pollutants and carcinogens. Cancer risks are increasing as a result of environmental carcinogens which are numerous and mediate various cancers. Lately, attention is more on the roles of medicinal foods in cancer chemo-prevention.

Methods: In order to reduce the risk, incidence and mortality of cancer cases in Nigeria. We reviewed some medicinal foods, leafs and spices that has chemo-preventive and potent pharmacological activities. Treatment of cancer is very expensive, hence the need to prevent the condition primarily, or even secondarily. Functional foods and medicinal foods that have chemo-preventive role against carcinogenesis driven by environmental pollutants were reviewed from various researches conducted over the years.

Results and Discussion: The anti-tumour, anti-cancer, antioxidant, anti-inflammatory properties of medicinal foods, their bioactive compounds, their mechanism of action as well as their possible chemo-preventive roles against various forms of cancer such as lung, breast, prostate cancers with high incidence and mortality driven by environmental pollutants and carcinogens were explored. Frugal Chemo-prevention, using natural products and foods were considered due to

some factors which include readily available, cost effective as well as economical provident due to the current state of the global economy and as such foods, herbs and spices that are already known globally are considered.
Conclusion: In this present review, we presented the chemo-preventive potentials of some medicinal foods and functional foods, on environmental carcinogens induced cancers. In a bid to enhance plant medicines and compounds for possible drug development.
Keywords: Cancer Chemo-prevention; Medicinal foods; Pharmacological properties; Mechanism of action.

Kolaviron Protects Against Haemato-hepatic Disturbance of Benzene in Chemical-Induced Myelodysplasia in Wistar Rats

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Benzene, an industrial solvent constitutes an environmental contaminant implicated in myelodysplasia and hepatic injury through oxidative stress mediated mechanism. kolaviron is a biflavonoid from Garcinia kola with proven chemoprotective potentials against myriads of solid tumors. This study investigated the chemoprotective role of kolaviron in ameliorating the pre-leukemic condition of benzene-induced myelodysplasia in rat model. Hepatic injury and myelodysplasia were induced in Wister rats by intravenous administration of 0.2 mL of benzene solution every other days for 5 consecutive weeks. Following benzene intoxication and leukemogenesis, 200mg/kg Kolaviron was post-administered each day orally for seven days. Myelodysplasia was assessed by comparing the morphology and hematological parameters of control and benzene-exposed animals. Genotoxicity was also determined by examining the formation of micronucleated polychromatic erythrocyte in the rat marrow. The redox status and liver dysfunction were assessed by determining the markers of oxidative stress and transaminases in the plasma. Benzene administration successfully induced myelodysplasia in rats as shown by haematological imbalance, blast appearance and deformed blood cell morphology coupled with clastogenicity and altered bone marrow cellularity. Myelodysplasia rats also displayed significant reduction in arylesterase activity and total sulphydryl content with concormitant increase in advanced oxidation protein products in their plasma relative to control group. Moreover, an impairment in liver function was suggested by significant increase plasma activities of transaminase enzymes. However, post-treatment of myelodysplasia rats with kolaviron mitigated the haematological imbalance, blood cell morphological alteration and ameliorated the formatiom of micronucleated polychromatic erythrocyte relative to untreated rats. Moreover, treatment with kolaviron improves the plasma antioxidant level by raising the activity of arylesterase, total sulphydryl and reduction in the generation of AOPPs and enhanced liver function by alleviating increase in plasma activities of transaminases in the post-treated rats relative to untreated rats. Finally, the results of this study showed that kolaviron elicited a protective potential against benzene-induced myelodysplasia and hepatotoxicity in wistar rats.

Chemoprotective Effect of Aloe Vera Gel On Benzene-Induced Myelodysplasia in Wistar Rats

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Benzene, an industrial solvent, has been shown to cause myelodysfunction and liver injury through oxidative stress-mediated mechanisms. Aloe vera is a succulent perennial evergreen flowering plant used traditionally in the treatment of jaundice that possessed antioxidant properties, anti-tumour activity and cytotoxic against melanoma human cancer cell line. The present study investigated the protective effects of Aloe vera gel on benzene-induced myelodysplasia in rats. Twenty male albino rats weighing between 80-100g were randomly divided into four groups of five (5) animals each. Group I serves as control animals which received feed and water only, group II animals were orally treated with Aloe vera gel (AVG) (150mg/kg b.w.) for one weeks, group III were given intravenous injection of 0.2 mL of a benzene mixture every other day for 5 consecutive weeks alone while group IV were intravenously injected with 0.2 mL of benzene mixture every other day for 5 consecutive weeks followed by daily oral administration of Aloe vera gel (150mg/kg b.w.) for one weeks. Benzene administration altered haematological parameter and induced blood cell morphological deformation leading to blast cells appearance, anisocytosis and poikilocytosis in the blood film. It also induced a clastogenicity shown by significant elevation in the formation of micronucleated polychromatic erythrocyte in marrow of rats exposed by 408.23% relative to control. Moreover, benzene caused a significant elevation of plasmal advanced oxidation protein products (AOPPs) with concormitant reduction in total sulphydryl and arylesterase activity. Besides, it induced hepatic damage revealed by a significant increase in plasma liver biomarker enzymes: AST, ALT, and ALP activities 26.58%, 46.30% and 19.81% respectively relative to control. However, post-treatment with Aloe vera gel restored blood haematology to near normal and mitigated morphological influence on blood cells. It also restored sulphydryl content and arylesterase activity of the blood and abrogated the increase in plasmal content of AOPPs, ALT, AST and ALP activities. Overall, Aloe vera gel offered chemo-protective and hepatoprotective effect on Benzene-induced myelodysplasia rats.

GIS Assessment on Forest Degradation and its Effect on Forest Bathing in Osogbo, Nigeria

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Rapid urbanization has contributed significantly to loss of urban forest and green spaces due to land fragmentations over time. The changes in urban forest pattern have affected biodiversity, urban-ecology, quality health and urban sustainability. Forest bathing is a visit to forest leisurely for health purposes and reviewed studies had affirmed that forest bathing help to prevent cancer. This study examined the interrelationship between urban forests and residential land use as indicator of improved forest bathing in Osogbo, Nigeria. Copies of semi-structured questionnaire were randomly administered to 405 residents to elicit information on urban forest services and management. Changes

in vegetation cover was examined by the Normalized Difference Vegetation Index (NDVI) and Land Use Land Cover (LULC) change of the study area derived from Landsat imageries of 1987, 1997, 2007 and 2017. The data obtained from the administered questionnaire were subjected to descriptive statistical tools (mean Â± SD). The LULC analysis revealed that 2017 had the highest amount of built up area (7.26 km2) compared to 1987 when built up area was 56.29 km2. Dense vegetation was highest in 1987 (113.40 km2) when compared to 2017 (53.80 km2). NDVI value for 1987 was highest (-0.206 â€“ 0.418) due to presence of dense vegetation while the value for 2017 (-0.009 â€“ 0.299) indicated loss of vegetation. There was rapid deforestation and fragmentation of the urban forest between 1987 and 2017. Less than half (47.4%) of the residents considered tree planting as a waste of space, while 59.5% indicated that forest trees helped them to environmental disasters. Many houses (57.0%) in the study area were without trees in their surroundings and majority (73.5%) were not aware of the usefulness of forest bathing. The study concluded that urbanization had negative effects on the loss of urban forest in the study area and aggressive campaign on the importance of the forest should be done.

AWARENESS, KNOWLEDGE AND UPTAKE OF CERVICAL CANCER SCREENING AMONG WOMEN OF REPRDUCTIVE AGE IN SELECTED WARDS IN EDE SOUTH LOCAL GOVERNMENT AREA, OSUN STATE

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Cervical cancer is the second most frequent cancer among women between 15 and 44 years of age and most frequent cancer among women in Nigeria. It is the most preventable cancer known to man. Objectives: The general objective was to assess the awareness, knowledge and uptake of cervical cancer screening among women of reproductive age in selected wards in Ede South Local Government Area of Osun State. The specific objectives of the study were to assess the level of awareness, knowledge and determine factors influencing the uptake of cervical cancer screening among women of reproductive age in selected wards of Ede South LGA.

Methodology: The study was a descriptive cross-sectional study carried out among women of reproductive age in selected wards in Ede South Local Government Area of Ede town, Osun State, Nigeria. Multistage sampling was used as the sampling technique for the study. Data was collected by using a semi structured, self-administered and interviewer guided questionnaire. Data was analyzed using the SPSS version 21. Level of significance was set at 5%.

Results and Discussion: The mean age of respondents was 25.74+8.29. 185 (72%) of the respondents were Christians, 70(27.2%) of them-muslims and 2(0.8%), traditionalists. The mean knowledge score was 16.81+5.12 with 72.8% of the respondents having good knowledge and 26.8% poor knowledge. Though the level of knowledge was high only 11.6% of the respondents had ever had cervical cancer screening done before and 84.5% had never had cervical screening done before. Reported reasons for not screening were no symptoms (33.5%) and no reason (32.9%). 71% were however willing to

partake in cervical cancer screening. There were statistically significant associations between practice of cervical cancer screening and age at marriage (p=0.05), religion (p=0.02) respectively.

Conclusion: The study revealed a high level of awareness as well as knowledge but a very low level of uptake of cervical cancer screening among women of reproductive age in selected wards of Ede South LGA, adequate sensitization on the importance and purpose of cervical cancer screening and the need for women to take control of their health is therefore recommended.

Keywords: Knowledge, Awareness, Practice, and Cervical Cancer

EDXRF analysis and risks assessment of potentially toxic elements in sand fraction (tailing) of Nigerian oil sands

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Elemental composition of sand fraction of Nigerian oil sand was determined to assess the human and ecological risks to the sand fractions. Soxhlet extraction of bitumen from the oil sand was done using toluene as the extracting solvent. Elemental analysis was done using Energy Dispersive X-ray Fluorescence (EDXRF) spectrophotometry and risks calculated using elemental concentrations as variables. It was observed that the elemental concentrations in this study were comparatively higher than those of Nigerian oil sands and bitumen, indicating that the larger percentages of the elements were extracted into the sand fraction which is part of the tailings (including water) that will be discarded as wastes during the recovery of bitumen from the oil sands. Close inter-element clustering existed between the elements (Fe and V) and (Cu, As, Nb, Sc, Ga, Rb, Ca, Se, V, Mn, Zn, K, Ti, Ni, Sr and Zr); indicating chemical affinity and/or similar sources. Contamination factor results indicated varying degrees of contamination by the elements, while modified degree of contamination indicated an ultra-high degree of contamination of the sand fractions by the elements. Pollution load index indicated deterioration of site quality, while potential ecological risk index and modified ecological risk index results indicated very high ecological risks by the elements. Study concluded that the elemental levels were high enough to degrade the environment and cause ill-heath to humans at long exposure if the sand fraction (tailing) is disposed indiscriminately. Therefore, regular environmental monitoring assessment should be carried out to screen uncritical disposal of tailings during the development of the natural resource.

Contributions of some criteria air pollutants by petroleum product retailing stations to Nigeria airshed: precursors of climate change monitors

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This study was carried out on the petroleum product retailing stations to infer the contribution of criteria air pollutants to the host airshed. ToxiRAE II SO2 and NO2 detectors (model PGM-1130) were used to measure the concentrations of gases respectively within four major petroleum products retailing filling stations in Ile-Ife, Nigeria for 10 hours each day between the hour of 8.00 am and 6.00 pm with intervals of 30 minutes for a week per station. Generally, the mean concentrations of SO2 were comparatively higher than the concentrations of NO2 in the retailing stations. Comparison of the mean values of the SO2 and NO2 with the USEPA standard permissible limits indicated that the measured air pollutants were present at elevated levels. The SO2/NO2 results indicated that the effect of vehicular emissions is about the same as the effect of industrial pollution on the ambient air quality. Air quality index results suggested that air pollution posed little or no risk, but there is a need for cautionary statement. It is concluded that if not probably monitored, with time hazardous effect can arise from the increase in the level of the pollutants in the ambient air. It is recommended that governments should encourage energy producers to clean smoke stacks by using scrubbers which trap pollutants before they are released into the atmosphere and catalytic converters in vehicles to reduce their emissions, and that petroleum products retailing stations should be cited faraway from residential areas.

Evaluation of human health risk assessment of potential toxic metals in commonly consumed crayfish (Palaemon hastatus) in Nigeria

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Concentrations of potential toxic metals (Cd, Cr, Fe, Zn, Pb, Cu and Mn) were determined in crayfish (Palaemon hastatus) commonly consumed in Nigeria using Atomic Absorption Spectrophotometry. Results revealed that Fe had the highest values with a mean value of 18.88 Â± 0.10 Âµg/g, while Pb had the least mean concentration (0.91 Â± 0.01 Âµg/g). Pollution index (PI) result indicated that the crayfish were contaminated with Cd, Cr, Fe and Mn (PI values > 1). Cluster analysis showed close inter-element relationships between the investigated metals, indicating similar chemical properties and/or genetic origin. Correlation matrix showed that positive and significant correlations existed between Cr/Cd, Fe/Cd, Fe/Cr, Pb/Cd, Pb/Fe and Cu/Zn, indicating chemical affinity, while significant negative correlation existed between Zn/Cr, suggesting different sources and/or background levels. Estimated daily intake, target hazard quotient and cancer risk showed that there was no health risk associated with the consumption of the crayfish. The relative risk showed that potential health risk could be attributed only to Cd level among the analysed metals. The study concluded that consumption

of the crayfish may not pose health risk to human health at the levels of the analysed metals, but should be consumed moderately to prevent bioaccumulation of Cd.

Appraisal of Health Risk Assessment of Potentially Toxic Metals in Edible Fruits in Ile-Ife, Nigeria

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This study determined the levels, source apportionment and health risk assessment of potentially toxic metals (Ni, Mn, Cd, Cu, Zn, and Pb) in edible fruits in Ile-Ife, Nigeria. Twenty-one (21) samples comprising of banana, carrot, orange, pawpaw, cucumber, watermelon, and pineapple were obtained from three (3) popular markets in Ile-Ife, Nigeria, digested using HNO3 and HClO4, and analyzed for metal levels by Atomic Absorption Spectrophotometry. Results showed that banana had the highest mean Mn concentration (21.67 Âµg/kg) while Ni was detected as the least mean concentration (0.03 Âµg/kg) in orange and watermelon. In consonance with cluster analysis, principal component analysis identified atmospheric depositions of vehicular emissions and uptake from soils as principal sources of PTMs in fruits. Human health risk assessment indicated that carcinogenic (TR > 1) and non-carcinogenic risks (HI > 1) were associated with consumption of the studied fruits. The major concern of consumption of edible fruits was related to Pb. Children were more susceptible to health risks than adults. Frequent consumption of the fruits is discouraged and regular monitoring is encouraged so as to mitigate bioaccumulation of PTMs.

Antioxidant, Î±-amylase and arginase inhibitory capacities of Tacca leontopetaloides stem and leaves phenolic extracts: An in vitro assessment

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The use of herbal extracts in management of type 2 diabetes and male erectile dysfunction has been linked with the ability of such phyto-products to suppress α-amylase and arginase enzymatic activities, respectively. In the present study, the phytochemical components, antioxidant, α-amylase and arginase

inhibitory potentials of Tacca leontopetaloides stem (TSEE) and leaves ethanolic extracts (TLEE) were investigated in vitro using standard biochemical and spectroscopic methods. The results showed that both TSEE and TLEE are rich in total phenol and flavonoids. Fourier Transform-Infrared (FT-IR) spectroscopy identified some functional groups in the extracts representing some active compounds. TSEE exhibited higher hydroxyl radical scavenging activity than TLEE, although not statistically different (P>0.05) in their ferric reducing antioxidant power. The minimum inhibitory concentration of TSEE against α-amylase activity was lower than that of TLEE (P<0.05), suggesting its higher capacity to slow down starch digestion than TLEE. The α-amylase inhibitory effects of both extracts were, however, lower than that of acarbose (a standard type 2 diabetes treatment drug). In contrast, T. leontopetaloides leaves extract (TLEE) inhibited the arginase activity of rat penile tissue homogenate by 50% at a lower concentration (IC50 = 1.05 ± 0.01 mg/mL) than TSEE (IC50 = 2.36 ± 0.01 mg/mL). TLEE arginase inhibitory effect also compared favourably (p<0.05) with that of sildenafil citrate, a standard anti-erectile dysfunction drug used in this investigation. The findings of the present study indicated that T. leontopetaloides stem and leaves are rich in bioactive components and expressed antioxidant activity. TSEE exhibited higher potential in vitro for application in prevention of postprandial hyperglycemia in type 2 diabetic subjects while TLEE showed higher potential for use in the management of erectile dysfunction than TSEE. It was, however, suggested that clinical in vivo studies using animal models be carried out on the plant to further complement the findings of the present study.

Key words: Tacca leontopetaloides, phytochemicals, antioxidant, anti-diabetic, anti-erectile dysfunction.

Physicochemical, functional and biological properties of protein hydrolysates from Monodora myristica (Calabash nutmeg) seeds

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Monodora myristica, Calabash nutmeg, is a climber tree of the Anannacea family which grows well in many tropical forest regions of Africa. The aim of this study was to determine some of the properties (antioxidant, antibacterial and functional properties) of Monodora myristica seed peptide hydrolysates. Monodora myristica protein was extracted using alkaline solubilization, followed by acid precipitation to its isoelectric point. The protein isolate was hydrolyzed using three enzymes separately (pepsin, trypsin and pancreatin). Hydrolysates obtained with pancreatin after 8 h of hydrolysis had the highest degree of hydrolysis of 36.73% when compared with others (30.85% and 33.19% for pepsin and trypsin, respectively). All hydrolysates were soluble over a wide pH range with more than 30% solubility. Pepsin hydrolysate had the highest foam expansion and stability of 1.174% and 0.980%, respectively and trypsin hydrolysate showed the lowest foam expansion and stability of 0.978% and 0.782%, respectively. Hydrolysates obtained with trypsin after 1 h of hydrolysis had the highest DPPH scavenging activity (98.90%) when compared with pepsin and pancreatin which had 98.81% and 95.85%, respectively, while pepsin hydrolysates after 2 h hydrolysis exhibited the highest Fe2+-chelating ability of 98.22% when compared with other hydrolysates. Pepsin hydrolysates showed the highest growth of inhibition of 29 mm for Escherichia coli, 15 mm for Staphylococcus aureus, 21 mm for Staphylococcus epidermidis and 18 mm for Proteus vulgaris and were comparable with standard

drugs (ciprofloxacin, ofloxacin, nitrofurantoin and gentamicin). It could be deduced from this study that all enzymatic hydrolysates of Monodora myristica protein has potential application among functional foods, and may be a promising source of natural antioxidants and antibacterial drugs.

Title:	Oxidative stress, inflammation and hepatotoxicity in male wistar rats exposed to potassium bromate and sodium nitrite
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Abstract:	Objective: The study assessed potential combined hepatotoxic effect of bromate and nitrite in the liver of exposed male Wistar rats.
	Methods: Rats were exposed to Potassium bromate (BrO_3) (20 mg/kg of body weight, twice weekly) and /or sodium nitrite ($NaNO_2$) (60mg/kg of body weight as a single dose) orally, the experiment lasted 28 days. Hepatotoxicity was assessed by determining the activities of the hepatic transaminases, alkaline phosphatase and gamma glutaryl transferase in the serum. In addition, concentrations of nitric oxide, reduced glutathione, total thiol, malondialdehyde and activities of catalase, superoxide dismutase, and glutathione perioxidase together with the levels of pro-inflammatory markers (TNF-a, IL-6 and CRP) in the liver were investigated.
	Results: The results exposed the ability of BrO_3 and $NaNO_2$ to significantly induce hepatotoxicity, oxidative stress and inflammation individually in rats, however, this capacity was enhanced when rats were co-exposed to the toxicants as indicated by significant modification in these parameters assessed in liver compared with the control.
	Conclusion: This study emphasizes the danger of hepatotoxicity associated with combined BrO_3 and $NaNO_2$ present in the environment.
	Key words: Sodium nitrite, potassium bromate, hepatotoxicity, hepatic markers, environmental toxicants.

Ingestion of lead, mercury, and selenium by babies through breastmilk in three goldmining areas of Nigeria

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Lead, Mercury, and Selenium are the key elements associated with neurotoxicity, and infants are the most susceptible sub-population. This study evaluated the exposure of babies to Pb, Hg, and Se through breastmilk intake in three gold mining areas with different levels of gold mining activities in Nigeria. One hundred and six volunteer Mother-Baby pairs were recruited as follows: 27 pairs from Yargalma, Zamfara State, Northwest Nigeria; 31 pairs from Iperindo, Osun State, Southwest Nigeria; and 48 pairs also from Ile-Ife. Levels of Pb and Se in breast milk samples from all 106 mothers were determined using ICP-MS while Hg levels in the same samples were determined using a Direct Mercury Analyser. Next, only for the subjects from Ile-Ife, breast milk intakes in babies were determined over a two-week period using the deuterium dose-to-mother stable isotope technique. At Ile-Ife, the daily exposure of babies to lead, mercury and selenium was evaluated as ranging from 0.11 – 0.65 µg/kg b.w., 0.03 – 0.48 µg/kg b.w., and 1.37 – 9.20 µg/kg b.w. respectively. At Iperindo and Yargalma, respectively, the values were 0.06 – 2.34 µg/kg b.w. and 0.13 – 22.6 µg/kg b.w. for lead; 0.01 – 0.28 µg/kg b.w. and 0.01 – 0.23 µg/kg b.w. for mercury, and 0.88 – 29.8 µg/kg b.w. and 0.38 – 10.2 µg/kg b.w. for selenium. Compared with the benchmark dose for lead suggested by the European Food Safety Authority for developmental toxicity in infants (0.50 µg/kg b.w.) and FAO/WHO daily tolerable intake of 0.57 µg/kg b.w. for mercury, it can be concluded that the intakes of these two neurotoxic elements by babies through breastmilk do not constitute excessive risks at Ile-Ife and Iperindo. Mothers from Yargalma may however require personalized counseling to keep intakes of lead within acceptable risk limits while optimizing the well-established benefits of breastfeeding.

Keywords: radioactivity, trace elements, water, soil, cancer

Pre-Conference Quiz Competition

ADELEKE UNIVERSITY HIGH SCHOOL

PMB 214, Old Osogbo Road, Ede, Osun State

ESSAY PROPOSAL FOR BIOPESTICIDE PRODUCTION

PREPARED BY: ADELEKE UNIVERSITY HIGH SCHOOL

NAME OF STUDENT(S): ELUWA CHIAMAKA, OLUROTIMI DAVID

NAME OF ESSAY PROPOSAL: SYNTHESIS OF BIOPESTICIDES USING LOCALLY-SOURCED, HOME-MADE ORGANIC MATERIALS (RESOURCES)

NAME OF IMPLEMETING SCHOOL: ADELEKE UNIVERSITY HIGH SCHOOL

CONTACT ADDRESS: OLD OSHOGBO ROAD, EDE, OSUN STATE

TARGET: FARM PRODUCE (FIELD AND STORAGE CROPS)

SUMMARY

Aim: The menaces of insect pests are highly undesirable especially in agriculture. They are responsible for many diseases of animals and plants of economic importance as well as humans. Orange rind or skin has many essential oils that may participate in physiological reactions which could be inhibitory (Bio-pesticide) to soft bodied insects and arthropods (pests).

Method: Orange peels were soaked in boiled water and was allowed to stand for 24hours and the mixture was sieved. Few drops of locally made soap were added to the resulting solution, and it was stored in a bottle with nozzle for straying.

Application: The solution (bio-pesticide) was sprayed on the entire plants/crops to ward off pests.

INTRODUCTION/BACKGROUNG

The ecosystem is a complex and dynamic system. The activity of an organism in its ecological niche has a direct and an indirect effect(s) on the activities of other organisms along the food chains. The

most diverse and successful group of organism in the kingdom animalia is the insect. The insects show extreme adaptations to most environments and can compete favourably with humans for almost everything due to the presence of adaptable features such as mouth parts, lightweight, water resistant exoskeleton. Few of these insects are beneficiary to man e.g bees while others act as vectors and pests. Pests are highly undesirable and are responsible for many diseases of animals and plants of economic importance as well as humans. The destructive activities of pests have been on the increase over time and this maybe to the natural and anthropogenic factors such as global warming, deforestation, resistant to chemicals (pesticides). Many naturally occurring crops/plants have first line of defenses and bioactive substances that are capable of repelling pests. Citrus fruits particularly those of the class *Citrus sinensis* (sweet orange) have always remained part of human diet for many years. *Citrus sinensis* (sweet orange) fruit and its juice have several beneficial, nutritive and health properties. The increased interest in this plant is not only due to their sweet nutritive properties but also as a result of increased knowledge of their health and medicinal values. The first line of defense of sweet orange, the rind or skin has many essential oils or organic constituents which include the terpenes and their oxygenated derivatives, aromatic compounds of benzenoid structure, aliphatic hydrocarbons and their oxygenated derivatives as well as nitrogen or sulphur containing compounds. Other compounds also present in essential oils are alcohols, aldehydes, acids and other aromatic compounds. The chemical constituents of the essential oils could participate in physiological reactions that maybe inhibitory to pests. Large amount of waste is usually produced from the consumption of orange and this can contribute to environmental degradation. Thus, given the array of chemical contents of orange, especially the peel it will amount to huge economic waste to consider the orange peels as waste garbage meant only for the waste bin. Therefore, there is need to explore ways of reducing the environmental menace that may arise from huge orange peel wastes. In this regard, we like to explore the possibility of converting orange waste (peels) to industrial raw materials for the production of bio-pesticide, an eco-friendly material with almost free of cost and there is no negative impact on human health, soil, animals, plants and environment. Bio-pesticides tend to be less toxic, more quickly biodegradable, and more targeted to the specific pest.

Materials:

Citrus sinensis (sweet orange), Glass container, Water, Thermometer, Bunsen burner, Kettle, Sieve, Beaker, Funnel, Bottle with nozzle, Liquid soap

Method:

Step i: Peel an orange and reserve the rind/skin. Dried orange peels can also be used in place of fresh ones.

Step ii: Put the peels in a glass container and add boiled/hot water. Allow the mixture to stand in a warm spot for 24hours.

Step iii: Sieve the mixture to separate the solution from the peels. Discard the peels in compost.

Step IV: Add a few drops of locally made insecticide soap to the solution and mix thoroughly to combine the ingredients.

Step v: Pour the solution/pesticide into a bottle with nozzle cover. The solution is ready to be sprayed.

Probable Mechanism of Action

Disruption: Disruption of cell membrane which may result to the leakage of cell contents.
Dehydration: Dissolution of the wax layer on the cuticle (skin) which leads to water loss by evaporation.
Suffocation: Breathing openings or trachea which leads to suffocation.
Inhibition of growth hormones: The functions of certain growth hormones maybe interfered.
Metabolism: Insect essential metabolism maybe affected

Application/ Target:

Spray the entire plant with the solution; it will ward off most soft bodied insects and arthropods such as slugs, aphids, fungi, mealy bugs, ants, roaches, white flies, sawfly larvae, caterpillars, spider mites, jumping plant lice, leaf hoppers etc

Duration: The application intervals will be between 7-14 days intervals with a maximum of three applications.

Note: Pollinators and predatory insects such as lady beetles, bumble bees and hoverflies will not be affected.

PLEASE CALL THESE NUMBERS FOR ANY UPDATE:

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AN ESSAY SUBMITTED BY OSOGBO GOVERNMENT HIGH SCHOOL ON "SYNTHESIS OF BIO-PESTICIDES USING LOCALLY-SOURCED, HOME – GROWN MATERIALS AN ECONOMIC AND ENVIRONMENT FRIENDLY OPTION FOR PEST CONTROL"

Pesticides are chemical or biological agents such as a virus, bacterium, antimicrobial or disinfectant that deters, incapacitates, kills pest. There are different types of pesticides and they can be grouped according to the types of pest they kill; Insecticides-Insects, Rodenticides-rodents (rats and mice), fungicides-fungi, lanicides-laruae.

Some natural materials which can be used to make certain types of pesticides are derived from animals, plants, bacteria and certain minerals. For examples Rodenticides, e.g. rat: - these are small, filthy creatures which love to reside near or in our house and they are also found on the farm too, we can use peppermint essential oil which has a particular smell and it kills rats as soon as they inhale it. It directly affects their lungs, shrink them and kill the rats off. We can as well use minty toothpaste or pepper mint leaves. Baking soda also come in handy as rat poison by adding it to flour, sugar or powdered chocolate and mix, the rats will consume it which will later kill them, as the bicarbonate in the baking soda reacts with the rat's stomach acid to produce a carbon dioxide gas. Since rats are unable to pass the gas, it build up in the rat's system and eventually causes internal blockage or rupture.

Furthermore, we can also use some of the environment natural materials for insects by using an orange or dried citrus peel, add it in a boiled water and sit the solution to a warm spot for about 24hours, then strain the peel and save the water and add a few drop of peppermint scented castile soap. Mix the solution thoroughly to combine the ingredients, use a funnel to transfer the liquid into the bottle and replace the nozzle, and spray theentire plant with solution to ward off most soft-bodied pest. Spray it directly on top of ants and insects. Most of these insecticides can be made with things that you probably have in your kitchen right now from mild dish detergent and baking soda, to essential oils, you will then have all the things that will keep those pesky bugs off your plants this spring and will help your plants to grow strong and beautiful.

In addition, you can easily make home-made garden fungicides which will keep your plants healthy and deter pests. By just mixing baking soda, mild dish soap, preferably something biodegradable without phosphates and water and mix the ingredients together into a spray bottle and then spray your plants regularly to help them grow healthy and bug-free and this solution can never be harmful to you, your family or your pets. You can also use garlic which deters much more than vampires to keep slugs, snail, aphids and any other garden creatures off your plants, the garlic is a natural solution that is perfectly safe and healthy.

Aphids, spider, mites, and other pests can cause serious damage to flowers, fruit and vegetables these creatures attack your garden in swarms, literally draining the life from your crops and often inviting disease in the process which will therefore make fruits and vegetables unsafe for consumption. Thankfully there are many homemade organic options for you to turn in your war against pests which include hot pepper combining with onions and garlic, then eat up all the vegetables thoroughly. Transfer the chopped vegies to a blender or food processor and pulse the mixture until it forms a thick, chunky paste, add warm water into the blender and give the ingredient a stir to thoroughly mix them together, then pour the solution into a glass container and keep in a warm spot for about 24hours. Strain the mixture and collect the vegetable. Infused water into another container and the water is your derived pesticides, pour your pesticides in a squirt battle

and ensure the bottle is cleaned with warm water and soap to rid of any potential contaminant and later replace the nozzle, then treat the infected plants every 4 to 5days with the solution after 3 to 4 treatments, the pest should scatter, if the area is thoroughly covered with the solution and the pesticides will keep bugs away for the rest of the season.

NAME OF SCHOOL: STERLING INTEGRATED INTERNATIONAL COLLEGE (SIICOL) ILESA.

SYNTHESIS OF BIOPESTICIDES FROM HOME-GROWN PLANTS BITTER LEAF (*Vernonia amygdalina*); A CASE STUDY

INTRODUCTION

One of the menace with which human beings have had to cope with over the centuries is the menace of pest. Year in year out individuals, farmers, and so on have had to live with these seeming enemies that have made themselves at home with every single thing that feeds, clothes and houses the human race.

Pests are organisms that cause harm to both human, animal and plant life. A pest according to Adam (2006) is any organism that spreads disease, causes destruction or is otherwise a nuisance. Some examples of pests are mosquitoes, nematodes, fungi, rodents and so on with insects topping the table.

Knowing fully well that the food for man is also food for the pests; the attack of crops by pests usually surface unannounced at any point in the long chain of crop production. Pests have the ability to damage crops at any time; they can damage seeds when sown, plants when green and tender, at the time the grains are formed or about to ripen, and at the time of storage. Studies indicate that losses due to pests overall are in the region of 30% (Lenne, 2000; Oerke and Dehne, 2004), but localized losses due to outbreaks of major migratory pests such as locusts and armyworms can be even greater, sometimes resulting in complete crop failure (Rose *et al.,* 2000).

EFFECTS OF PESTS ON CROPS

1. They spread diseases: Pests like whiteflies, aphids, mealy bugs, and thrips and so on have been known to be vectors of diseases of crops which reduce crop yield, increase cost of production and reduce farmers' income.

2. Damage to crops. This is perhaps one of the major effects of pests, they cause harm to crop at different stages, while growing and even in storage and so on. Below are some common methods of controlling pest:

Cultural control; Biological control; Physical control; Chemical control; Integrated Pest Management (IPM) and Biopesticides control. However, the use of Biopesticides has been well researched into in developed countries, but little of it has been out to use in Nigeria, hence, the need for this presentation.

BIOPESTICIDES; CURRENT STATUS AND ADVANTAGES

The use of chemically synthesized pesticides has certainly contributed towards improving agricultural production in terms of both yield and quality, thus increasing agricultural income, particularly in developed countries. However careless and prolong use of these pesticides without adhering to the safety norms and recommended practices have posed serious risk to human health, non-target organisms, environment, water bodies and commodities (food crops) containing pesticide residues (Damalas, 2009; Carvalho, 2017). This has led to increasing public awareness on the adverse effects of pesticides on the safety of foods and environment, and the search for alternatives to the widely used chemical pesticides, including biopesticides; eco-friendly, economic, target-specific and biodegradable for pest management.

Biopesticides are natural materials derived from animals, plants, bacteria as well as certain materials that are used for pest control (EPA, 2017). The US Environmental Protection Agency (EPA) categorizes pesticides into biochemical pesticides, microbial pesticides and plants containing added genetic material. However, the most common categorizations of biopesticides are botanical and microbial biopesticides. Botanical biopesticides refer to pesticides of plant origin whereas microbial biopesticides refer to pesticides that include microorganisms such as bacteria, fungi and virus.

There are about 1400 biopesticide products being sold worldwide and accounting for about 2.5% of the total pesticide market (Marrone, 2007). At present, there are 68 biopesticide active substances (34 microbial, 11 biochemical and 23 semiochemical) registered in the EU (European Union Pesticides Database, 2010) and 202 biopesticide active substances (102 microbial, 52 biochemical and 48 semiochemical) registered in the USA (USEPA, 2010). The most widely used ones are Azadirachtins; Pyrethrins; *Bacillus thuringiensis* and *Trichoderma harzianum*. However, the growth of biopesticides is projected to outpace that of chemical pesticides with the compounded annual growth rates of more than 15% (Marrone, 2014).

As opposed to conventional pesticides, biopesticides are by their nature less detrimental to non-target organism and more specific to target pests, effective at low application rate, decompose quickly without leaving problematic residue in the environment (soil, water and air) and in the crops consumed by humans. However, rapid disintegration of most botanical pesticides consequently results in more frequent application. The commercial formulations are also often more expensive than the synthetics mainly due to high cost and limited raw materials and the extraction processes of the active compounds.

BITTER LEAF; ITS BIOPESTICIDAL FUNCTION AND MODE OF EXTRACTION

The plant is widely grown in major part of the Africa and specifically readily available in every nooks and crannies of Nigeria. It is scientifically classified as belonging to the Kingdom Plantae. It is an angiosperm, of the order Asterales, family Asteraceae, genus Vernonia, and species *V. amygdalina*. The full binomial name is *Vernonia amygdalina Del.* Some of the biologically-active compounds of *Vernonia amygdalina* are saponins and alkaloids, terpenes, steroids, coumarins, flavonoids, phenolic acids, lignans, xanthones etc.

MODE OF EXTRACTION

Quite a number of methods are available for phytochemical extraction and they include; Maceration (Handa, 2008; Azmir *et al;* 2013); Hydrodistilation (Handa, 2008); Water distillation; Direct steam distillation; Supercritical fluid extraction (Martin *et al;* 2012). Ethanol extraction was used in preparing the bitter leaf extract, because ethanol is a good organic solvent and makes the extraction more effective than the used of hot or cold water.

The bitter leaf collected was washed with clean water to remove the dust and dirt, it was then macerated and extraction done by immersing certain gram of the bitter leaf in appropriate volume of 95% ethanol for 24 hours. The resultant juice extracted was air dried and stored at ambient temperature until it was used.

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Adegbehingbe, O. O.
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Adewale, Omowumi Oyeronke
Adeyemi, Adewale F.
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Shale, Karabo
Soremekun, Opeyemi
Tchokossa, P.
Teibo, John Oluwafemi
Yu, Yan
Yusuff, N. A.



Titles' Index

Invited Abstracts

MAJOR AGENTS OF ENVIRONMENTAL AND OCCUPATIONAL CANCERS IN NIGERIA

INNOVATIVE RESOURCE MOBILISATION IN ADDRESSING THE MENACE OF CANCERS IN NIGERIA

BIG DATA ANALYTICS IN CANCER MANAGEMENT

KEEPING THE UNIVERSAL HEALTH COVERAGE (UHC) PROMISE ON CANCER AND NCDS IN NIGERIA

EXPOSURE ASSESSMENT TO CARCINOGENS IN FUMIGATION OF RESIDENCE AND AGRICULTURAL PRODUCTS

CANCER STATISTICS AND INFORMATION MANAGEMENT

IONIZING AND NON-IONIZING RADIATIONS AS CARCINOGENS

ACCESS TO CANCER CARE: PROBLEMS AND PROSPECTS

Basic Science

ASSESSMENT OF SOURCE PROFILES FOR SUSPENDED PARTICULATE POLLUTANTS IN IBADAN, NIGERIA USING POSITIVE MATRIX FACTORIZATION

CONTRIBUTIONS OF SOME CRITERIA AIR POLLUTANTS BY PETROLEUM PRODUCT RETAILING STATIONS TO NIGERIA AIRSHED: PRECURSORS OF CLIMATE CHANGE MONITORS

ASSESSMENT OF PARTICULATE MATTER (PM 2.5,10) LEVEL IN SOME SELECTED AREAS IN SOUTH-WEST NIGERIA

ASSOCIATION BETWEEN PM2.5 AND MORTALITY OF STOMACH AND COLORECTAL CANCER IN XIÂ€™AN: A TIME-SERIES STUDY

TRIPLE NEGATIVE BREAST CANCER: DETECTION AND TREATMENT OPPORTUNITIES BEING DEVELOPED

MUTATIONAL ANALYSIS OF P53 GENE IN CERVICAL CANCER AND USEFUL POLYMORPHIC VARIANTS IN EXONS 3 AND 4

ANTIOXIDANT, Î±-AMYLASE AND ARGINASE INHIBITORY CAPACITIES OF TACCA LEONTOPETALOIDES STEM AND LEAVES PHENOLIC EXTRACTS: AN IN VITRO ASSESSMENT

PHYSICOCHEMICAL, FUNCTIONAL AND BIOLOGICAL PROPERTIES OF PROTEIN HYDROLYSATES FROM MONODORA MYRISTICA (CALABASH NUTMEG) SEEDS

Policy/Interdisciplinary

CURBING OCCUPATIONAL AND ENVIRONMENTAL CANCER THROUGH EFFECTIVE COMPLIANCE MONITORING AND ENFORCEMENT

GEOCODING MEDICAL AND HEALTH RECORDS FOR SUSTAINABLE HEALTH SERVICE DELIVERY IN ILE-IFE, OSUN STATE, NIGERIA

GIS ASSESSMENT ON FOREST DEGRADATION AND ITS EFFECT ON FOREST BATHING IN OSOGBO, NIGERIA

ANALYSES AND DISTRIBUTION OF VARIOUS TYPES OF CANCERS RECORDED IN IFE-IJESHA CANCER REGISTRY IN THE FIVE YEAR PERIOD 2010 -2014

CHEMOPREVENTIVE ROLES OF MEDICINAL FOODS AGAINST ENVIRONMENTAL CARCINOGENS-INDUCED CANCERS

KOLAVIRON PROTECTS AGAINST HAEMATO-HEPATIC DISTURBANCE OF BENZENE IN CHEMICAL-INDUCED MYELODYSPLASIA IN WISTAR RATS

CHEMOPROTECTIVE EFFECT OF ALOE VERA GEL ON BENZENE-INDUCED MYELODYSPLASIA IN WISTAR RATS

OXIDATIVE STRESS, INFLAMMATION AND HEPATOTOXICITY IN MAKE WISTAR RATS EXPOSED TO POTASSIUM BROMATE AND SODIUM NITRITE

DETERMINATION OF POLYCYCLIC AROMATIC HYDROCARBONS AND POTENTIALLY TOXIC METALS IN COMMONLY CONSUMED BEEF SAUSAGE ROLL PRODUCTS IN NIGERIA

EVALUATION OF HUMAN HEALTH RISK ASSESSMENT OF POTENTIAL TOXIC METALS IN COMMONLY CONSUMED CRAYFISH (PALAEMON HASTATUS) IN NIGERIA

APPRAISAL OF HEALTH RISK ASSESSMENT OF POTENTIALLY TOXIC METALS IN EDIBLE FRUITS IN ILE-IFE, NIGERIA

RADIOLOGICAL ASSESSMENT OF GRAINS, VEGETABLES, FRUITS AND TUBER CROPS CULTIVATED IN OKEMESI TOWNSHIP, EKITI STATE, NIGERIA

RADIOLOGICAL RISKS FROM CONSUMPTION OF VEGETABLES IN TWO REGIONS WITH DISPARATE CANCER PREVALENCE IN ONDO CITY

ELEMENTAL ANALYSIS AND RISK ASSESSMENT OF SOIL AND VEGETABLES FROM A CRUDE OIL-POLLUTED AREA IN LAGOS STATE, NIGERIA

EDXRF ANALYSIS AND RISKS ASSESSMENT OF POTENTIALLY TOXIC ELEMENTS IN SAND FRACTION (TAILING) OF NIGERIAN OIL SANDS

AWARENESS, KNOWLEDGE AND UPTAKE OF CERVICAL CANCER SCREENING AMONG WOMEN OF REPRDUCTIVE AGE IN SELECTED WARDS IN EDE SOUTH LOCAL GOVERNMENT AREA, OSUN STATE

SURVEY OF SOME CARCINOGENIC POLLUTANTS IN THE CEMENT INDUSTRY

TOXICOLOGICAL EFFECTS OF SUBACUTE EXPOSURE TO DIFFERENT PESTICIDES VIA INHALATION ON MALE WISTAR RATS

ENVIRONMENTAL FACTORS AND CANCER PREVALENCE IN ONDO STATE, SW-NIGERIA: IMPACT OF RADIOACTIVITY IN SOIL AND IN AIR

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