



BOOK OF ABSTRACTS

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FOOD NUTRITION

ASSESSMENT OF FERMENTATION METHOD ON NUTRITIONAL, ANTI-NUTRITIONAL COMPOSITION AND MICROBIAL PROPERTIES OF MUNG BEAN (*Vigna radiata*) 'IRU'

¹Lawal, R. T., ¹Ishola, A. D. and ²Oyegoke, O. A.

¹Department of Science Laboratory Technology, Faculty of Science, Osun State Polytechnic, Iree, Nigeria

²Department of Statistic Faculty of Science, Osun State Polytechnic, Iree, Nigeria

Correspondence author email: lawalrtunde@gmail.com +2348034618105

ABSTRACT

The study investigated the effect of fermentation on the nutritional and anti-nutritional composition of fermented mung bean 'iru' as protein condiment for food product. The mung bean was processed to mung bean 'iru' using the local method of producing 'iru' from African locust beans. The mung bean sorted, washed and boiled for 1 hr. the boiled seed was dehulled to remove the seeds coat, washed and boiled again for 1 hr. The water was drained, spread on sack bag to cool and wrapped with enough banana leave (*Musa sapientum*) and packed in a cleaned container, fermented for 5 days in warm place at room temperature. The fermented products were isolated. Mung bean 'iru' were dried using an electric oven at 50⁰C for 18 hrs and the dried mung bean 'iru' were used for chemical analysis. The fermented samples were cultured on the following medium; plate count agar, potato dextrose agar and nutrient agar to isolate microorganisms. The microbial load of bacteria, yeast and fungi were 8.85×10^6 CFU/ml, 1.18×10^6 CFU/ml and 3×10^4 CFU/ml respectfully. The overall microorganisms isolated and identified from the sample were *Pediococcus* sp, *Lactobacillus* sp, *Staphylococcus aureus*, *Bacillus* sp, *Aspergillus flavus*, *Aspergillus niger*, *Candida* sp and *Geotrichum* sp. The proximate composition was analysed using standard methods and the following results were observed; ash content (2.080 ± 0.06 %), crude fibre (2.857 ± 0.02 %) were lower than moisture content (7.646 ± 0.08 %), crude fat (6.683 ± 0.13 %) while protein content (20.349 ± 0.07 %) and carbohydrate content (60.385 ± 0.12 %) were higher and energy (1527.566 ± 0.15 kJ/g) with the highest value. Anti-nutritional factors values were tannin (1.434 ± 0.04 mg/g), phytic acid (1.915 ± 0.09 mg/g) were lower than oxalate (2.701 ± 0.07 mg/g), phytate (6.798 ± 0.14 mg/g) and phenol (15.255 ± 0.13 %) had highest value. Mung bean 'iru' is a good source of protein and energy.

Keywords: Mungbean, fermentation, microbial, proximate, antinutrient

PREDICTING THE HYDROLYSIS INDEX OF COOKIES MADE FROM CARDABA BANANA STARCH USING MACHINE LEARNING ALGORITHMS

*Babatunde Olawoye¹, Oyekemi Popoola¹ and Oladapo Fisoye Fagbohun²
Department of Food Science and Technology, First Technical University Ibadan, Oyo
state.

Department of Biomedical Engineering, First Technical University Ibadan, Oyo state.

*Corresponding author

Email: btolawoye@gmail.com

ABSTRACT

The demand for food that convey additional health benefits aside its primary nutritional properties had been on the increasing end due to the emergence of degenerating diseases. With this view, this study aimed at predicting the hydrolysis index of gluten free-cookies produced from banana starch using a machine learning approach. The cookie was produced by varying the production process; baking temperature (150 - 180 °C) and baking time (10 -20 mins) using central composite design. The hydrolysis kinetics of the cookies was determined and predicted using various machine learning algorithm (artificial neural network, decision tree and support vector machine). The results revealed that all the machine learning algorithm were adequate in predicting the hydrolysis index of the cookies ($r^2 > 0.9$). Among the machine learning algorithm, decision tree was found to be the most accurate owing to the fact that it has the highest correlation coefficient and lowest root mean square of error. In conclusion, the hydrolysis index of the gluten-free cookies could adequately be predicted using machine learning algorithms.

Keywords: Functional food; Decision tree; Support vector machine; Food security; Celiac disease

ORANGE-FLESHED SWEET POTATO COMPOSITE BISCUIT: A SUPER SNACK FOR ALLEVIATING FOOD INSECURITY AND MICRONUTRIENT DEFICIENCY IN AFRICA

Rebecca Olajumoke Oloniyo

Department of Food Science and Technology, Federal University of Technology, P.M.B. 704, Akure, Nigeria

*Corresponding author e-mail and phone no: ajufaye@gmail.com; Mobile no: 0806-641-0631.

ABSTRACT

Sweet potato tuber that was categorized as “poor man’s food” is gaining more recognition in the world as one of the valued food crops due to its great nutritional potentials as a food based approach in alleviating food insecurity and micronutrient deficiency. Orange-fleshed sweet potato (OFSP) is an emerging bio-fortified variety of sweet potatoes in the tropical and sub-tropical regions; it has a great chance for being acceptable as staple food diet of the consumer food chain to tackle food insecurity and micronutrient deficiency in Africa. OFSP is rich in β -carotene (a precursor of vitamin A) and other micronutrients of great nutritional values but low in protein content. This study was carried out to produce biscuit from blends of OFSP, soybeans concentrate (source of protein), potato starch and date palm. The biscuit was evaluated for proximate, mineral, anti-nutrient and consumer acceptability using standard methods. The results showed that protein values ranged from 5.99 to 19.42%, ash contents ranged between 2.91 and 3.81%. Calcium values ranged from 101 to 238 mg/100g, Magnesium values ranged between 15.37 and 30.19 mg/100g, potassium ranged from 186.37 to 451.03 mg/100g, Sodium-potassium ratio (Na/K) was <1 . It was observed that all the anti-nutritional factors considered were within the acceptable limit standard. The OFSP composite biscuit was favourably considered to other market biscuits samples. Thus, OFSP composite biscuit will be a suitable food approach to combat food insecurity and micronutrient deficiency in Africa.

Keywords: orange-fleshed sweet potato composite biscuit, proximate composition, minerals composition, anti-nutrient

PROXIMATE ANALYSIS AND MINERAL CONTENT DETERMINATION OF TRADITIONALLY PROCESSED LOCUST BEAN (*Parkia biglobosa*) FRUIT PULP FOR POSSIBLE INDUSTRIAL APPLICATION.

¹Olalude C.B, ²Adegboyega A.M and ³Babatunde S.Y

^{1&2} Department of Chemistry, The Polytechnic, Ibadan

³Federal College of Agriculture and Animal Health Technology, Moor Plantation, Ibadan.

Corresponding author- olaludechristianah@gmail.com, 08024905462

ABSTRACT

This study examined the nutritional properties and industrial application of African locust bean properly known as Iru in southwest Nigeria. Locust bean was processed into food condiment which is used as a spice that gives an African meal a pleasant flavor. The production process of locust bean includes boiling for 12 hours, soaking the seeds in water, de-hulling, boiling for another 6 hours and ferment for 4 days. Proximate analysis and mineral content of the African locust bean (*Parkia biglobosa*) fruit pulp was determined using standard methods AOAC (1995). The results showed that African locust bean contain 42.8% Moisture, 37.34% Protein, 24.21% Fibre, 0.9% Fat, 3.55% Ash, and 17.0% Carbohydrate using Proximate Analysis. The Mineral elements present are Calcium 9.01mg/100g, Potassium 20.5mg/100g, Magnesium 35.00mg/100g, Iron 3.31mg/100g, Phosphorus 73.00mg/100g with the use of Atomic Absorption Spectrophotometer Analysis technique. With the values gotten for the nutritional and mineral analysis of African locust bean, it should therefore be substituted for Monosodium Glutamate (MSG) used industrially for the production of various magi and flavorings which are not nutritive but are carcinogenic chemicals while locust bean has no health side effect. The food industry should package the locust bean in a way which would make the condiment much more attractive to its consumer and non-consumers because is faced with packaging problem.

Keywords: Nutritional, Locust bean, Proximate, Mineral, Industry

MOISTURE SORPTION CHARACTERISTICS OF CASSAVA DOUGH MEAL (lafun) FLOUR

Anyaiwe Uche Capulet and Timilehin David Oluwajuyitan*

Department of Food Science and Technology, Federal University of Technology, Akure, Nigeria.

*Corresponding authors; email: tdoluwajuyitan@futa.edu.ng

ABSTRACT

Understanding the relationship between relative humidity and equilibrium moisture content (EMC) of any foods materials assist in maintaining good keeping quality. The adsorption isotherms for lafun supplemented with soy cord and residue were investigated. Six saturated salts were used which are Lithium chloride (RH: 11% a_w , 0.22); potassium (RH: 93%, a_w : 0.38); Magnesium chloride (RH: 33%, a_w 0.56); Potassium chloride (RH: 86%, a_w : 0.40); Potassium acetate (RH: 23%, a_w : 2.81); Potassium carbonate (RH: 43%, a_w : 1.15) providing constant relative humidity environments ranging from 11 – 93%. The experimental data were compared with five widely recommended models in the literature for food adsorption isotherms (GAB, Oswin, Modified Oswin, BET and Henderson). The moisture adsorption isotherm was sigmoidal in shape and was influenced by temperature and Oswin model was best fits for all the samples at different temperatures.

Key words: Sorption, Packaging materials, Equilibrium Moisture Content, Water activity, Models.

SENSORY EVALUATION OF MEAT DERIVED FROM HERITAGE TURKEY HENS ADMINISTERED WITH *Moringa olerifera* EXTRACTS

Onyinye Ogbu

Federal Polytechnic, Oko, Anambra State, Nigeria

Email Address of corresponding author: ogbuonyinyeac@gmail.com

ABSTRACT

A lot of organic substances have being recently administered to poultry with sole aim of boosting their productivity, without commensurate check on the acceptability of these meats to consumers. This study therefore accessed the organoleptic properties of thigh meat derived from heritage turkey hens that were administered aqueous *Moringa olerifera* leaf and seed extracts. Meat samples were obtained from turkeys that were given *Moringa* extracts as thus; Sample one (T1) was from turkeys that had no leaf and seed extract thus served as control. Meat sample two (T2) were from turkeys that had 1% *Moringa* seed weight per volume (w/v). Meat sample three (T3) were from turkeys with 0.5 % seed and 0.5% leaf extract w/v. Meat sample four (T4) were from turkeys given 1% leaf extract w/v. 50g of the thigh muscle meat from these turkeys were cooked and subjected to 9-point hedonic scale, where it was scored for colour, texture, taste and general acceptability. There were significant differences for all the parameters measured among the treatments. The meat colour, taste, texture, flavour and general acceptability improved on the meat samples administered with *Moringa* leaf and seed extracts. The meat sample four (T4) (leaves extracts) were best in terms of colour, taste, flavour as well as general acceptability. Sensory evaluation being an important aspect of meat marketing to consumers, was not negatively affected by the taste of *Moringa*, rather the leaves extracts improved the turkey meat quality most.

Key words: Turkey, *Moringa olerifera*, meat, sensory.

**PASTING AND PHYSICOCHEMICAL PROPERTIES OF COMPLEMENTARY
DIET FROM FERMENTED PRO-VITAMIN A BIOFORTIFIED MAIZE,
GERMINATED LENTIL SEED AND PIGEON PEA**

Dada Mopelola

Federal University of Technology, Akure, Ondo State, Nigeria

Email address: dadamopelola@yahoo.com

ABSTRACT

The study investigated complementary diet from fermented provitamin A biofortified maize (PVA), germinated lentil seed and pigeon pea. The flour blends formulation were in the following ratios 70:15:15, 60:30:10 and 60:10:30 of fermented PVA maize, germinated lentil seed flour and germinated pigeon pea respectively. Proximate and mineral composition, pasting properties, amino acids profile, anti nutritional factor, starch digestibility and sensory attributes were determined. The moisture, protein, ash, fat, crude fibre and carbohydrate ranged from 4.88 to 5.90%,10.65 to 15.27%,0.48 to 0.96%,5.67 to 6.30%,0.88 to 1.09% and 70.56 to 77.23%, respectively while the energy ranged from 400.02 to 402.55 Kcal/100g. Potassium was most abundant mineral present and the antinutrients reduced significantly. The most abundant essential amino acid was leucine while glutamic acid was most abundant non essential amino acid. The most acceptable sample was sample LSM compared with commercial control sample. Therefore, this complementary diet may be used to ameliorate protein energy malnutrition in children

Keywords: complementary diet, fermented provitamin A biofortified maize

ROLES OF AFRICAN WOMEN FARMERS IN MITIGATING FOOD INSECURITY

Shoge, O. Mansurat.¹; Shehu A. Bature²; Adeleke B. Saanu³; and Adegboyega, T. Taofeek^{1,3}

¹Department of Chemistry, Faculty of Science, Air Force Institute of Technology, PMB 2014, Nigerian Air Force Base, Kaduna, Kaduna State, Nigeria.

²Biology Unit, Faculty of Science, Air Force Institute of Technology, PMB 2014, Nigerian Air Force Base, Kaduna, Kaduna State, Nigeria.

³Food Security and Safety Niche Area, Faculty of Natural and Agricultural Sciences, North-West University, Private Bag X2046, Mmabatho 2735, South Africa.

Correspondence: moshachemist@yahoo.com

ABSTRACT

In Africa, micro-level studies have shown that women play a very important role in many aspects of crop production. Consequently, the role of women in food value chain production systems remains critical in ensuring food security. Questionnaires (n = 185) were randomly distributed to farmers in Africa to obtain information regarding the demographic and farm characteristics, occupation and responsibilities, skills and leadership, and effective participation in food production in Africa. The socio-demographic characteristics revealed 45.9% male and 54.1% female with a least first-degree level of education. 170(91.9%) respondents were from West Africa, 10(5.4%) from South Africa and 5(2.7%) from Central Africa. The age bracket was between 31 to 40 years with 67.6% married, 29.7% single, and 2.7% divorced. The farm characteristics revealed that 45.9% owned a farm, 51.4% do not, while 2.7% were neutral. The crops production ranged from rice, maize, tubers, legumes, livestock, palm oil, and cassava. The occupation and responsibility of the farmers revealed that 81.1% have been involved in farming processes. A 56.8% lack of funding as a major barrier faced by women was recorded. Also, a total of 58.8% agree, 21.6% strongly agree, 8.1% disagree and 10.8% strongly disagree with the effectiveness of women's participation in addressing food scarcity and insecurity in Africa. 56.8% of the respondents perceived that it was not easy for women to gain leadership opportunity and experience in farming. The results also indicated that 56.8% of the women do not face any discrimination in rural market and 18.9% of their male counterpart face discrimination. Similarly, it was observed that about 89.2% of the respondents do not have processing machines and about 73.0% of them were making effort towards acquiring them. Therefore, women's active participation in food production needs to be further intensified through a responsive agropreneurship incentives.

Keywords: Africa region, agropreneur, food production, questionnaire, women scientists

Effects of heat treatment on nutrients, antinutrients, and radical scavenging potential of selected underutilised varieties of marble vine (*Dioclea reflexa*) seed flours

Mary A. Ajatta^{1,*} and Oluwatooyin F. Osundahunsi²,

¹Department of Food Science and Technology, Bamidele Olumilua University of Education, Science and Technology, Ikere, Ekiti State, Nigeria.

²Department of Food Science and Technology, Federal University of Technology, Akure, Ondo State, Nigeria.

*Correspondence: maryajatta01@gmail.com Tel: +2348034770944

ABSTRACT

This study aims to assess the nutrients, antinutrients, and antioxidant potential of full fat, full fat roasted, and defatted roasted marble vine (*Dioclea reflexa*) seed varieties (black and dark brown). The seeds were roasted at 110 °C for 35 min and defatted with *n*-hexane. The results showed that the protein contents of the defatted roasted black (36.2 g/100 g) and dark brown (35.9 g/100) varieties were not significantly different from each other while the fibre content of the defatted black (5.53 g/100 g) was clearly higher compared to the dark brown variety (3.97 g/100 g). The seeds were initially rich in sources of minerals and roasting significantly reduced the antinutrient properties of the original seed flour to a minimal level in the black variety compared to the dark brown variety. Defatted roasted *D. reflexa* is well comparable with other legumes and could be used to access the mineral bioavailability, enhance the nutrient contents. Also, compounds with antioxidant activities effectively scavenged free radicals in a concentration-dependent manner. Therefore, *D. reflexa* could be of great use as a functional food ingredient in food industry to prevent negative health effects caused by oxidative stress.

Keywords: Marble vine; roasting; nutrients; antinutrients; antioxidant

FOOD AND ENVIRONMENTAL SAFETY

EFFECTS OF DIFFERENT PRETREATMENTS ON THE HELMINTHOLOGICAL QUALITIES OF CARROTS (*Daucus carota* subspecies *sativus*) PURCHASED FROM DIFFERENT MARKETS IN AKURE, NIGERIA

Omolara Ojuolape Adeoye
Department of Microbiology, Federal University of Technology Akure, Nigeria
*E-mail: adeoyeomolara89@yahoo.com.

ABSTRACT

In order to control the rate of helminthic infection through consumption of carrots (a – ready to eat vegetable), the effects of different pretreatments on the helminthological qualities of carrot was investigated. Fresh carrots were purchased from different markets in Akure and were divided into two groups each. First group kept unwashed while the other group was washed with potable water and further subdivided into 5 groups. The 2nd subgroup was subjected to different pretreatments (vinegar, sodium hypochlorite, brine, sugar solution and moringaseeds aqueous extract) at different contact time. Results from this study showed that unwashed carrots bought from Shasha market had the highest helminthological contamination while carrots bought from Oja-Oba market and Isinkan market recorded the lowest. The various pretreatments used were able to remove the helminth's ova or larvae found on carrots even at 10 minutes contact time except those washed with potable water and brine. At ≥ 20 minutes contact time, no helminth was found on the carrots. From this findings, it can be concluded that carrots should be properly disinfected using any of the pretreatments mentioned above before consumption to prevent being infected with helminths.

Key words: Helminth, carrots, pretreatments, contact time.

ASSESSMENT OF THE KNOWLEDGE AND ATTITUDE OF FOOD HANDLERS IN PREVENTING MICROBIAL CONTAMINATION OF INDIGENOUS FERMENTED FOOD IN ONDO STATE.

¹Adeyemo, S. A. and ²Jeff-Agboola Y.A.

¹* Department of Biology Science, Faculty of Sciences, National Open University of Nigeria, Akure Study Centre +2347061999591adeyemosodiq51@gmail.com *Corresponding author

²Department of Biological Sciences, University of Medical Sciences, Ondo City, Nigeria,

ABSTRACT

Fermented food plays an important role in cities and towns of many developing countries, contributing economically and helping to meet the demands of people producing it. The study assessed the knowledge and attitude of food handlers in preventing microbial contamination of locally fermented food (e.g.Garri, Elubo, Fufu, Iru etc.) in Ondo State. A cross-sectional survey was carried out among some households in some highly populated street where indigenous fermented food is mostly consumed (Oke-Aro, Ijoka, Isolo, Oshinle and Oke-Ijebu) as well as the two major markets (Oja-Oba and Iloro Market) of Akure, Ondo State. Quantitative method (questionnaire) was used to collect data from 120 households. It is evident from the study that female dominantly produced fermented food. This confirms the public perception that males do not usually cook. The study revealed that consumers within the age group of 26-30 dominated fermented food production. The conclusion is that married women produced fermented food more than other categories of marital status. Finally, through formal or informal means, producers do not have enough safety orientation either from school, government bodies or home. The study recommends that Government through the Ministry of Health should embark on food safety education programme. Outreach programmes should be conducted in various communities where people are less likely to have proper knowledge on food safety.

Keywords:-Gender, Indigenous, Fermented Food, Food Safety, Education

EVALUATION OF THE BACTERIAL DIVERSITY OF READY-TO-EAT AFRICAN SALAD SOLD IN LAGOS, NIGERIA

Gbenga Adedeji Adewumi

Department of Microbiology, University of Lagos, Akoka, Lagos, Nigeria

Correspondence: gadewumi@gmail.com

ABSTRACT

In this study, the bacterial diversity of African salad, locally known as *abacha*, was assessed using polyphasic approach by combining culture-independent molecular techniques with culture-based genotypic typing methods. Microbiome profiling by 16S rRNA gene amplicon illumina sequencing revealed 52255, 36077 and 57060 reads of bacteria with 474, 538 and 364 OTUs from *abacha* samples ALC, ALE and ALW, respectively. In total, the most abundant Phyla in ready-to-eat (RTE) *abacha* were Proteobacteria, Firmicutes, Actinobacteria and a very few unclassified phyla, while at the species level Enterobacteriaceae group, *Acinetobacter pittii* group, *Weissellaconfusa* group, *Acinetobacter baumannii*, *Enterobacter_uc* (unclassified), *Staphylococcus sciuri* group, FMZ_s (not assigned a name yet), *Streptococcus gallolyticus* group, *Bacillus*, *Staphylococcus saprophyticus* group and other related species were identified. Cultured bacterial strains found include *Staphylococcus simulans*, *Bacillus weidmannii*, *Lactobacillus hokkaidonensis* and *Phreato bacteroligotrophus*. The combination of high-throughput illumina sequencing platform and culture-dependent genomic approach has enabled a broader description of the bacterial composition and diversity of *abacha*, as well as, identification of numerous low abundance bacteria that may constitute safety and quality issues, regarding freshly prepared RTE *abacha*. Conclusively, this study indicated that the bacterial composition of *abacha* is significantly more diverse than earlier reported and confirmed the occurrence of bacteria with pathogenic traits and unknown functions. There is, therefore, a great need for food processor and consumers to adopt hygienic practices to minimize risks of transmission of foodborne pathogens through *abacha* and other related RTE foods. Education of food handlers and the general public on food safety measures, effective Hazard Analysis Critical Control Point (HACCP) application and Good Manufacturing Practices (GMP) implementation is also imperative.

Keywords: bacterial diversity, African salad, *abacha*

AFLATOXIN CONTAMINATION OF SPICES IN NIGERIA

^{1*}Owoade A. O. and ²Jeff-Agboola Y. A.

^{1,2}Department of biological sciences, University of medical sciences, ondo

Owoadetobiloba@gmail.com

^{1*}Corresponding author

ABSTRACT

Species commonly used in Nigeria are fundamental ingredients in many traditional dishes. These spices give taste to food and make them palatable. The purpose of this research is to review the levels of aflatoxins in some spices commonly used in Nigeria. This work aims to review some aflatoxins concentrations in some spices in Nigeria. Fungi with highest percentage occurrence on all the samples are mostly from the genus, *Aspergillus*. Aflatoxin is a poisonous substance produced by toxigenic strains of two fungi: *Aspergillus flavus* and *Aspergillus parasiticus*. Aflatoxin-producing fungi are spread by wind, insects and decomposed soil wastes. These fungi are therefore present in air, soil and water. Once released, Aflatoxin producing fungi are difficult to eliminate as they remain stable throughout some agricultural groundnut value chain i.e. from the farm through storage to the consumption of these commodities. In Nigeria, little work has been carried out on mycobiota and aflatoxin contamination and most from the southern part of the country. Several studies that examined spices showed that nutrient composition vary and aflatoxins analysis of the sample revealed that researchers analysed mycotoxin fungi on Potato Dextrose Agar by Agar plate method and determined the level using Enzyme-linked Immunosorbent Assay (ELISA). According to most report, Chili peppers are susceptible to infection by aflatoxin producing fungi and subsequent contamination by aflatoxins at every stage.

Keywords: Aflatoxin, Food safety, Spices

OCCURRENCE AND MITIGATION OF MYCOTOXINS IN WEST AFRICAN FOODS

^{1*} Ajibua E. O. and ²Jeff-Agboola Y. A.

^{1,2}Department of biological sciences University of medical sciences,
Ondo eajibua@gmail.com, +2347037024986 *Corresponding author

ABSTRACT

Mycotoxins have attracted worldwide attention due to the significant losses associated with their impact on human and animal health, and consequent national economic implications. Mycotoxins are toxic substances that can infect many foods with carcinogenic, genotoxic, teratogenic, nephrotoxic, and hepatotoxic effects. Mycotoxin contamination of foodstuffs causes diseases worldwide. The major classes of mycotoxins that are of the greatest agro economic importance are aflatoxins, ochratoxins, fumonisins, trichothecenes, emerging Fusarium mycotoxins, enniatins, ergot alkaloids, Alternaria toxins, and patulin. Thus, in order to mitigate mycotoxin contamination of foods, many control approaches are used. Prevention, detoxification, and decontamination of mycotoxins can contribute in this purpose in the pre-harvest and post-harvest stages. Therefore, the purpose of the review is to elaborate on the recent advances regarding the occurrence and mitigation of main mycotoxins in West African foods, as well as the methods of detoxification of mycotoxins in order to reduce or fully eliminate them.

Keywords: Mycotoxin contamination, prevention and good agricultural practices

AN ASSESSMENT ON THE IMPACT OF MYCOTOXINS CONTAMINATION ON POULTRY PERFORMANCES

¹*Folorunso A. O. and ²Jeff-Agboola Y. A.,

^{1,2}Department of biological sciences University of medical sciences, Ondo

¹*Corresponding author: ayomidebunmi29@gmail.com, +2348108164132.

ABSTRACT

Extensive research over several decades has revealed that mycotoxin is commonly found in the majority of poultry feed ingredients. All poultry is sensitive to mycotoxins. This partly depends on the type, age and production categories of poultry, their living conditions and nutritive status and partly on the type, quantity and duration of mycotoxin ingestion. Mycotoxins are toxin secondary metabolites produced primarily by fungi of the genera *Aspergillus*, *Fusarium*, and *Penicillium* that have harmed poultry, animal, and human health for thousands of years. According to a 2013 survey, 81 percent of the approximately 3,000 grain and feed samples analyzed contained at least one mycotoxin, which was higher than the 10-year average (from 2004 to 2013) of 76 percent in a total of 25,944 samples. Some common effects of mycotoxin are reduced feed intake, weight gain, feed efficiency, growth performance, immunity and hatchability along with increased mortality, organ damages (mainly kidney and liver), carcinogenicity, teratogenicity and decreased egg production. Aside from their negative health effects and decreased production rate, concerns about their importance in public health are still being debated. Decontamination methods for reducing mycotoxins in feed are technologically diverse, relying on chemical, biological, and physical strategies. Chemical remediation strategies involve enzymatic or microbial detoxification, referred to as "biotransformation" or "biodetoxification," utilizes microorganisms or purified enzymes thereof to catabolize the entire mycotoxin or cleave it to non-toxic compounds. Biological strategies involve various substances such as plant ingredients, enzymes and microorganisms. Physical processes include sorting, milling, dehulling, cleaning, heating, irradiation or combinational approaches. The increased awareness of mycotoxin prevention has enabled new strategies for the prevention and treatment of mycotoxicosis, such as beneficial microorganisms/products, as well as alternative treatments, such as plant extracts/essential oils in the poultry industry.

Keywords: Food safety, mycotoxin, poultry.

REVERSAL OF THE ALTERATIONS IN THE GUT MICROFLORA BALANCE OF NEONATAL WISTAR RATS INDUCED WITH AFLATOXIN M₁ IN MILK WITH *Nigella sativa* OIL.

Badmos A.O.¹ and Oluwafemi, F¹.

¹Federal University of Agriculture, Abeokuta Ogun State, Nigeria.

Correspondence* badmosao@funaab.edu.ng

ABSTRACT

Many health risks associated with AflatoxinM₁ (AFM₁) in neonates drives the demand for a suitable control. It is the aim of this study to determine the effects of AFM₁ on microbial flora in the gut of neonatal rats and the reversal effect of *Nigella sativa* oil. Rats were divided into three groups of 9 rats each. The first group was the control, the second group received only AFM₁ of different concentrations while the third group received *Nigella sativa* after AFM₁. Intestinal sections were excised and cultured on appropriate selective media for growth of microorganisms. Results show gut microbiota from the control group consisted of *Lactobacillus* spp., Bifidobacteria, *Streptococcus* sp., *Staphylococcus* sp. With increasing dose of AFM₁, beneficial microorganism decreased in the gut and harmful organism such as the *Helicobacter pylori* was observed in rats that received only AFM₁. Microorganisms in rats that received *Nigella sativa* oil after AFM₁ were observed to be the same as in the control group indicating repair of the gut. These findings suggest the capability of AFM₁ in modifying the gut microbiota in a dose-dependent manner and the efficacy of *Nigella sativa* oil to reverse any associated alteration, which might results to serious health hazards in neonates.

Keywords: AflatoxinM₁, neonatal health, gut microflora, *Nigella Sativa* oil, mitigation

THE ROLE OF WOMEN IN FOOD SAFETY MANAGEMENT IN AFRICA

¹*Jeff-Agboola Y. A. ²De Saeger Sarah, ³Marthe De Boevre, ⁴Jeff-Agboola L. O. and ⁵Obafaye A. A.

¹*Department of Biological Sciences, ¹University of Medical Sciences, Ondo City, Nigeria ^{2,3} Centre of Excellence in ^{2,3}Mycotoxicology & Public Health, Ghent University, Belgium ⁴Department of Public Health, Adeleke University, Nigeria ⁵Centre for Atmospheric Research, National Space Research and Development Agency, Anyigba, Nigeria

*Corresponding author: yjeffagboola@yahoo.com

ABSTRACT

Food security is linked to food safety which concerns the quality of food and not the quantity. The availability of safe food is highly dependent on the roles of individuals in ensuring the safety of raw, processed and packaged food. One of the agricultural pathways towards sustainable food and nutrition security in Africa is through local production of nutritious food, activities in which women in Africa play a crucial role. Women and girls prepare most of the African's household meals and grow much of its food. Food safety is directly linked to SDG2 which aims to "End hunger, achieve food security, improved nutrition, and promote sustainable agriculture". Also, it supports poverty reduction (SDG1), health and well-being (SDG3), cognitive development and learning (SDG4), reduced inequality (SDGs 5 and 10) and improved work and productivity (SDG8). The contribution of women in safe food production in African cannot be overlooked. Women make essential contributions to the agricultural and rural economies and their roles in ensuring food safety vary considerably. Rural women often manage complex households and pursue multiple livelihood strategies. However, there is a gender gap in access to resources such as: land, energy, technology, credit, education, pesticides and fertilizers. In addition, women have less access to training information and social protection. Therefore, this presentation focuses on highlighting the roles played by women of different categories to ascertain food safety and quality from farm to the fork which will examine gender involvement in safe food production as one of the tools towards increasing food sufficiency and consequently curbing food crisis in Africa.

Keywords: Food safety, Food security. Women

MICROBIAL REMEDIATION OF HEAVY METALS CONTAMINATED SOIL: A SOLUTION TO FOOD SHORTAGE CAUSED BY SOIL CONTAMINATION IN SUB-SAHARAN AFRICA

Anuoluwa, Iyadunni A.^{1*} and Ololade Zacchaeus S.²

¹Department of Biological Sciences, Faculty of Sciences, University of Medical Sciences, Ondo State, Nigeria. ²Department of Chemistry, Faculty of Sciences, University of Medical Sciences, Ondo, Nigeria.

Correspondence E-mail: ianuoluwa@unimed.edu.ng; dunnibright@yahoo.com

ABSTRACT

Most Sub-Saharan African nations are faced with increasing build-up coupled with persistence of toxic compounds in the soil. These persistent toxic materials constitute a significant danger to the environment. Among the various contaminants frequently found in sediments, soils, air and water, heavy metals remain a major contaminant. Presence of heavy metals in the environment can be attributed to discharge from various industrial processes. Though some heavy metals at minute concentrations are involved in important life processes such as enzyme production; however some may become toxic and affect many species of organisms when their concentrations exceed certain threshold limit. For example, the flora and fauna of the terrestrial environment are affected when heavy metals accumulate in the soil. Most underground sources of water become contaminated as a result of leaching of heavy metals following rainfall or accumulation of water in contaminated soil. The consumption of plants grown on heavy metals contaminated soil leads to bioaccumulation of the metals by the plant which may lead to biomagnification in humans. Conventional technologies such as soil incineration, soil flushing, soil washing etc used in treating contaminated soil is costly and also not environmentally friendly. Harnessing microbial ability in bioremediating soil contaminated with heavy metals will serve as an alternative to the use conventional treatment methods as well as improve the quality and use of the soil. This review focuses on the impact of microorganisms in bioremediation.

Keywords: heavy metals, accumulation, Sub-Saharan Africa, bioremediation

ASSESSMENT OF NOISE AND AIR QUALITY IN PEACOCK PAINT INDUSTRY, IKOT EKAN, ETINAN, AKWA IBOM STATE

^{1*}Chukwu, M. N., ²Akpan, T. L. and ³Okoli, C. G.

¹Department of Biological Sciences, National Open University of Nigeria Head Quarters

²Department of Environmental Technology, Federal University of Technology, Owerri

³Department of Environmental Health, National Open University of Nigeria Head Quarters

*Corresponding author's phone: +2348033079536; e-mail: mchukwu@noun.edu.ng

ABSTRACT

Eight sampling points were assessed for temperature, noise level and some chemical compounds. Portable handheld air monitor was used to measure air pollutants and anemometer for meteorological parameters. Results showed that the indoor concentrations of the air pollutants were higher than those of outdoor. A significant difference was observed in the mean concentrations of Cl_2 ($P < 0.05$) between the two environments. Mean concentrations of NO_2 , SO_2 , H_2S , CO and Cl_2 at all sampling points were higher than the permissible limit of Federal Environmental Protection Agency (FEPA) and thus pose environmental and health risks. Appropriate vehicle emission management, industrial air pollution control coupled with close burning management of wastes should be considered in the study area to reduce the risks associate with these pollutants. Air pollution control agencies should intervene to improve both the indoor and outdoor air quality.

Keywords: Temperature, Pollutants, Health risks, Environment, Control agencies

MYCOTOXIN: THE COST OF ACHIEVING FOOD SAFETY IN NIGERIA

Kolapo Olamilekan Ayomide
University of Medical Sciences, Ondo State
Email Address of corresponding author:pharmadez2@gmail.com

ABSTRACT

Mycotoxins are secondary metabolites produced by fungi. In Nigeria, warm and humid atmospheric conditions and organic substrate-rich soil, help in fungal growth and it impact negatively on plants and livestock. Once the livestock and plant are affected it reduces agricultural yield which leads to food poisoning and food shortage. Food contamination reduces food quality, which makes it unhealthy for human and animal consumption, and reduces its commercial value. Mycotoxins have been reported in several food products such as cereals, legumes, processed flour, and smoked-dried fish and in dried meats. Mycotoxins also cause health problems. It causes mycotoxicosis which result in an acute or chronic disease when ingested. Mycotoxins have caused huge losses due to ban on importation of some Nigerian products that fail to meet the quality standards. Food safety in Nigeria can be achieved by observing Good Agricultural Practice, i.e. soil preparation, proper use of insecticides, fungicides, herbicides, Proper storage of harvested crops and biological control are also effective ways to reduce the presence of Mycotoxins in food. There is also removal of Mycotoxins using the physical method which mostly involves clean up and segregation. Government agencies should provide more strict regulations to ensure food safety in Nigeria.

Keywords: Mycotoxins, fungal

OCCURRENCE OF AFLATOXINS IN SELECTED SAMPLES OF COCOA POWDER

*Onifade D.A ., Bolarinwa O.O AND ANIFOWOSE O.A
The Polytechnic Ibadan, Science Laboratory Technology Department 2 The Polytechnic
Ibadan,
Corresponding authors address: olajok2001@gmail.com, olajok2001@yahoo.com
08067730824

ABSTRACT

The cocoa tree (*Theobroma cacao* L.), belonging to the Malvaceae family is a tropical plant cultivated for its beans. Its derived products such as cocoa powder, cocoa liquor and chocolate are a very rich source of bioactive components. However the cocoa beans is usually susceptible to fungi contamination during certain stages of processing on the farm. In this study eleven samples of cocoa powder were purchased in Ibadan and taken to the laboratory for determination of proximate and aflatoxin content .The proximate analysis was carried out using standard analytical methods while aflatoxin analysis was carried out using the enzyme-linked immunosorbent assay (ELISA). The proximate analysis showed that the percent moisture content of the samples ranged from 4.38-19.82%, percent ash ranged from 4.87-11.32%, crude fat ranged from 3.22-14.15%, oil content ranged from 2.1-4.55 while carbohydrate content ranged from 59.87-80.28. The aflatoxin analysis of the cocoa powder in part per billion ranged from 10-55. In conclusion, the proximate composition of the cocoa powder justifies its claim that it is highly rich in bioactive components which are vital for health but highly shown to be contaminated with aflatoxins hence poses serious health risk to its consumers.

Key words: bioactive, aflatoxin, proximate

BIOMEDICINE

NEW SCHIFF BASE COPPER(II) COMPLEXES: SYNTHESIS, CHARACTERIZATION AND ANTIBACTERIAL POTENTIALS

F. N. Ejiah^{1,2}, T. M. Fasina¹, N. Revaprasadu², F. T. Ogunsola³ and O. B. Familoni¹

¹Department of Chemistry, University of Lagos, Lagos, Nigeria

²Department of Chemistry, University of Zululand, Private Bag X1001, KwaDlangezwa, South Africa

³Department of Medical Microbiology, College of Medicine, University of Lagos, Lagos, Nigeria

*fejiah@unilag.edu.ng

ABSTRACT

Resistance of microorganisms against existing antibiotics has necessitated the need to search for new compounds with potential effects against pathogenic organisms. Schiff bases and their metal complexes have shown interesting biological activities. New copper (II) complexes with Schiff bases derived from substituted benzaldehydes and 2-aminophenol have been synthesized using condensation method. The compounds were characterized using elemental analysis, atomic absorption spectroscopy, infrared spectroscopy, ¹H NMR, electronic absorption spectroscopy, magnetic susceptibility measurements and thermal gravimetry analysis. The Schiff bases and their metal complexes were screened for *in-vitro* antibacterial activities against human pathogenic bacteria; *Escherichia coli* (ATCC 8739), *Staphylococcus aureus* (ATCC 6538), *Pseudomonas aeruginosa* (ATCC 19582), *Bacillus cereus* (10702), *Enterococcus faecalis* (ATCC 29212) and *Klebsiella pneumonia* (ATCC 10031). Ampicillin was used as a reference compound. The result showed that Schiff bases exhibited moderate inhibitory activity against the tested microorganisms. The Schiff base metal complexes exhibited higher antibacterial activity compared to ampicillin. From our results, we have shown that these complexes can be employed as active ingredients in development of broad-spectrum antibacterial agents.

Keyword: 2-aminophenol, antibacterial, benzaldehyde, copper complexes, Schiff bases

MITIGATING EFFECTS OF WALNUT OIL ON DOXORUBICIN-INDUCED CARDIOTOXICITY IN MICE

Adegboyega Adenike. M,^{1,2} Olalude C.B² and Olowokere K.A²

¹Cancer Research and Molecular Biology Laboratories, Department of Biochemistry, College of
Medicine, University of Ibadan, Nigeria

²Chemistry Department, The Polytechnic of Ibadan, Oyo State, Nigeria.

Email:tijanimadinatu@yahoo.com

ABSTRACT

The use of medicinal plants increased considerably as it is necessary for producing more effective drugs with fewer side effects. Walnut has different properties with therapeutic potential in traditional medicine. The aim of this study is to determine the *in vitro* antioxidant activity of walnut oil and its cardioprotective effect against doxorubicin induced cardiotoxicity in mice. The *in vitro* antioxidant activity of the oil was analyzed using ferric reducing antioxidant power (FRAP) and 1,1--diphenyl- β -picrylhydrazyl (DPPH) assay. The FRAP and DPPH scavenging activity of the oil increased with increase in concentration. Twenty mice were divided into five groups of four animals each, group A was given 0.3ml of 0.9% normal saline; group B was given only doxorubicin; group C was given walnut oil only; group D was given 20mg/kg body weight of walnut oil and doxorubicin; and group E was given 10mg/kg body weight of oil and doxorubicin. The walnut oil was administered orally daily while doxorubicin was administered intraperitoneally. At the end of three weeks, the lipid profile was assessed and the histopathological examination of the heart assessed. It was observed that in group B, cholesterol, triglyceride (TG) and high-density lipoprotein (HDL) increased when compared with the negative control (group A). Pretreated groups also showed a decrease in cholesterol and TG. The histopathological examination showed multiple foci of myofiber coagulation necrosis and inflammation as observed in group B however, the toxicity level was mild on the heart tissues of the pretreated groups with no observable changes in the heart morphology of group C when compared to group B. This study therefore shows that the walnut oil has cardioprotective effects against doxorubicin induced toxicity possibly by enhancing the antioxidant status in the Wistar rats.

Key words: Cardioprotective, Doxorubicin, Toxicity, Lipid profile, Walnut oil, *in vitro* antioxidant.

CROP PRODUCTION AND PROTECTION

COMBINED EFFECTS OF SOME PLANT EXTRACTS AGAINST FUSARIUM WILT (*Fusarium oxysporum f. sp. lycopersici*) OF TOMATO

AKINBODE, O. A.,^{1*} OMISORE, B. O.² AND OLAGUNJU, Y. A¹

¹Institute of Agricultural Research and Training, Obafemi Awolowo University, Moor Plantation, Ibadan. ²Federal College of Agriculture, Moor Plantation, Ibadan

* Corresponding author: folakeakinbode1@gmail.com

ABSTRACT

Tomato productivity is generally reduced due to its high susceptibility to Fusarium wilt disease caused by *Fusarium oxysporum f. sp. lycopersici*. The constraints associated with the use of chemical control and other control measures brought about the use of plant extracts. This experiment was conducted at the Pathology laboratory and Screenhouse of the Institute of Agricultural Research and Training, Moor Plantation, Ibadan. The efficacy of combination of plant extracts of neem leaves, bamboo leaves and rice husk was examined at these concentrations: 2.4%, 7.2% and 12% in the laboratory and applied at a volume of 50ml for either single or combined treatments in the screenhouse. The experiment was laid out in a 2 x 3 factorial in Completely Randomised Design for the Screenhouse trial. All treatments used had inhibitory effect on the growth of the pathogen in the laboratory experiment, while there were variations in the response of the pathogen to the treatments in the screenhouse experiment. The most effective of all the plants used was the bamboo leaves, and followed by neem singly or in combination in the *in-vitro* test. On the other hand, combination had no significant effect on the disease during an *in-vivo* test. Ibadan local variety showed the highest resistance when neem and bamboo leaves were used singly. It is however recommended that bamboo and neem leaves extracts could be used in controlling the disease both *in-vitro* and *in-vivo*.

Keywords: Ecofriendly control, botanical, tomato wilt

INFLUENCE OF PLANT GROWTH PROMOTING RHIZOBACTERIA ON THE GROWTH AND YIELD OF *Celosia argentea* AND *Amaranthushybridus*

¹Oyedele Adedayo Omowumi, ²Ezekiel-Adewoyin Dorcas, ¹Ezaka Emmanuel, ¹Taiwo Lateef Bamidele

¹Institute of Agricultural Research and Training, Moor Plantation, Ibadan

²Federal University of Technology Minna

Corresponding address: adeedii@yahoo.com; 08028252701

ABSTRACT

The application of Plant growth promoting rhizobacteria (PGPR) to improve agricultural production is gaining attention due to their various plant growth promoting traits such as phytohormone production. Their use can therefore reduce the global dependence on agrochemicals which have consequences. In this present study, bacteria were isolated from rhizosphere soils of maize, screened for phytohormone production (gibberellic acid (GA) and indole-3-acetic acid (IAA)) and characterized by sequencing of their 16S rRNA genes. Their effectiveness to influence the growth and yield of two leafy vegetables; *Celosia argentea* and *Amaranthushybridus* were assessed and data obtained were statistically analysed. A total of 68 rhizobacteria showed either GA or IAA production, while only 16 produced both GA and IAA. The amount of GA and IAA produced by the isolates ranged from 21.80±2.07 to 63.45±4.13 µ/mL and from 38.30±3.79 to 113.74±6.91 µ/mL, respectively. Three most efficient PGPR were identified as *Pseudomonas aeruginosa* and *Stenotrophomonas maltophilia*. Green house result showed that inoculation of seeds with PGPR isolates resulted in ≥93% and ≥95% seed germination of *Celosia argentea* and *Amaranthushybridus* respectively. Inoculation of leafy vegetables with phytohormone producing bacteria significantly ($P \geq 0.05$) influenced the growth of the plants compared to the un-inoculated control. *Stenotrophomonas maltophilia* showed the highest growth stimulation and yield of *Celosia argentea* (5050.0 kg/ha) while the consortium of the two strains of *Pseudomonas aeruginosa* showed the highest stimulation of growth and yield of *Amaranthushybridus* (5333.33 kg/ha). The three phytohormone producing PGPR are promising biofertilizers for leafy vegetable production in agro-ecosystems.

Keywords: Phytohormone, Rhizobacteria, leafy vegetables, biofertilizer

OBSERVATION AND MEASUREMENT OF THE GROWTH CHANGES OF RICE SHOOTS UNDER GRAVITY AND MICROGRAVITY

Funmilola A. Oluwafemi^{1*} and Omotayo O. Oyewole²

¹Astrobiology Unit, Space Life Sciences Division, National Space Research and Development Agency(NASRDA), Obasanjo Space Centre, Km 17 Airport Road, P.M.B. 437, Garki, Abuja, Nigeria.

²Space Research Initiative Unit, Technical Support and Allied Sciences Division, Centre for Atmospheric Research, NASRDA, Kogi State University Campus, Anyigba, Nigeria.

*Correspondence: oluwafemifunmilola@gmail.com; +2348065035799.

ABSTRACT

Onboard spaceflight microgravity experiments are expensive and scarce. One of the simulated-microgravity instruments–Clinostat was used as ground-based research to investigate the shoot-morphology of rice seedlings. Rice is a monocotyledon and a grain. Plant shoot-morphology is important for gravi-responses. Growth-rate analysis was done on the seedling shoots of rice. Rice seeds were soaked overnight and afterwards planted into 2 petri-dishes using plant-substrate called agar-agar in a wet-chamber in vertical-positions. The following conditions were maintained throughout the experiment; humidity within 85%, temperature of 25°C and light of 100lx. After 3 days of germination under normal earth gravity, the petri-dishes were labeled "gravity-treated" and "microgravity-treated". The gravity-treated sample in vertical position was left under normal earth gravity to serve as the control experiment. The microgravity-treated sample was mounted on Clinostat under the following conditions: fast rotation-speed of 90rpm, rotational-axis angle of 90° and rotation-direction was clockwise. The photos of the 2 samples were taken every one hour. This observation was done for 4 hours. After observations, the shoot-morphology of the seedlings was studied using specialized-software called ImageJ to measure the shoots-lengths from the two sets of pictures taken. The grand average shoot-lengths of the seeds per hour were calculated to give the growth-rates. The results showed an increased growth-rate per hour for the microgravity-treated than the counterpart gravity-treated control. The growth-rates of the gravity-treated were 0.09cm/hr while the microgravity-treated was 0.13cm/hr. These results serve as preparation for future-space experiments on rice and further research is needed as to ascertain the nutritional composition.

Keywords: Gravity; Microgravity; Clinostat; Rice; Shoot.

**EFFICACY OF ANTIMICROBIAL EXTRACTS OF SAWDUST ON MYCELIA
GROWTH OF *COLLECTOTRICHUMGLOEOSPORIODES* CAUSAL PATHOGEN OF
LEAF ANTHRACNOSE IN KENAF (*Hibiscus cannabinus*)**

*¹ODUWAYE, O.F. AND ¹AKINBODE, O. A.

¹Institute of Agricultural Research and Training (IAR&T), ObafemiAwolowo University, Moor
Plantation, Ibadan, Nigeria.

*Corresponding author Email: bussyfa@gmail.com

Kenaf is a multipurpose crop which has numerous industrial and domestic applications. The crop though native to Africa, its cultivation is limited to few areas as a result of disease incidence. Previous studies have reported leaf anthracnose infestation as reducing the production of kenaf drastically. This study aimed at identifying associated fungal pathogens of the disease and assessing extracts of some tropical tree sawdust in the control of the causal pathogen. Three concentrations of sawdust extract of *Gmelinaivorensis*, *Triplochitonscleroxylon*, *Chlorophoraexcelsa*, *Cola nitida*, *Funtumiaelastica*, *Anageissusleicarpus* and *Albiziazygia*(10g/L, 7.5g/L and 5g/L) were prepared, 1 ml of each sawdust extract was mixed with 9 ml molten potato dextrose agar (PDA). Each modified PDA was inoculated with seven-day old pure culture of the pathogen and growth monitored daily through perpendicular lines drawn at the reverse of each plate. Experiment was laid out in a completely randomized design with three replicates. Data collected were subjected to analysis of variance and means were separated using Duncan Multiple Range Test. *Collectotrichumgloeosporioides*, *Beltraniasp*, *Fusariumoxysporum*, *Peniciliumoxalicum*, and *Corynesporacassicolla* were isolated from the leaves showing anthracnose disease symptom on kenaf. *C.gloeosporioides* was confirmed as the pathogenic fungi through koch's postulate. Highest inhibition percentage was observed with *Azygia* at 10 g/L sawdust extract concentration (93%), 89% and 85% inhibition of mycelial growth was also observed with 7.5 g/L of *A. zygia* and 10 g/L of *C. nitida* respectively. The study concluded that eco-friendly waste product can be utilized as biopesticides.

Key words: Kenaf, *Collectotrichumgloeosporioides*, Extracts, Sawdust

COMPARATIVE EFFICACY OF TWO PLANT EXTRACTS AND CYPERMETHRIN AGAINST FIELD INSECT PESTS OF *Amaranthus hybridus* L.

¹*Ugwu J.A., ²Umeh V.C and ³Kareem K. T

¹ Federal College of Forestry Ibadan, Forestry Research Institute of Nigeria, P.M.B.5087 ,
Jericho Hills, Ibadan, Oyo State, Nigeria

²National Horticultural Research . Institute.P.M.B. 5432, Idi-Ishin, Jericho Reservation Area,
Ibadan, Nigeria

³Institute of Agricultural Research and Training Ibadan , Obafemi Awolowo University , Ile
ifeIbadan

* Corresponding author : dr.amaka2013@gmail.com,

ABSTRACT

Insect infestations are major constraints to vegetable production in Nigeria causing low yield and poor quality of produce. A study was conducted at the experimental farm of the National Horticultural Research Institute (NIHORT)Ibadan, Nigeria to compare the efficacy of ethanolic seed extracts of *Azadirachta indica*Juss, *Annona muricata* L and Cypermethrin against field insect pests of *Amaranthus hybridus* under raid fed condition. Application of the extracts commenced three weeks after planting at the rate of 10ml/L of water and cypermethrin was applied at 5ml/L, all at two weeks intervals. Four major insect species observed causing damage to *A.hybridus* during the study include; *Heliothis armigera*, *Syleptaderogata*, *Lagriavillosa* and *Zonocerus variegatus*. Ethanolic seed extracts of *A. indica* was more effective than Cypermethrin and *A. muricata* seed extracts in protecting *A.hybridus* against insect damage. Plots treated with *A.indica* extracts recorded least leaf damage (16.3%), followed by Cypermethrin (19.58%) reducing insect damages on *A. hybridus* by 54.31 % and 45.12% respectively compared to control. Plots treated with *A. indica* extracts significantly ($p < 0.05$) reduced observed insect density compared to other treatments and control. There is no significant difference ($p > 0.05$) between *A. muricata* and Cypermethrin treated plots on insect density recorded. *Heliothis armigera* was the most important insect pest of *A. hybridus* ranking first in the population of the four insect species observed during the study. *A. indica* has proved to be very effective biopesticide and can be successfully used in the control of field insect pests of *A. hybridus*.

Keywords: Biopesticides, efficacy, insect pests, vegetables, control

EVALUATION OF SOME BIO-PESTICIDES IN THE MANAGEMENT OF *Meloidogyne incognita* AND INCIDENCE OF VIRAL SYMPTOMS IN FOUR TOMATO CULTIVARS
(*Solanum lycopersicum* L.)

¹*Elufisan, T. S., ¹Atungwu, J. J. and ²Adegbite, A. A.

¹Institute of Agricultural Research and Training, Moor Plantation, PMB 5029, Moor Plantation, Ibadan Nigeria. ¹Department of Crop Protection, Federal University of Agriculture, P.M.B 2240, Abeokuta, Nigeria. ²Institute of Agricultural Research and Training, Moor Plantation, PMB 5029, Oyo State, Apata Ibadan Nigeria.

*Corresponding author's e-mail: tobielufisan@gmail.com

ABSTRACT

Field experiments were conducted in 2019 at Federal University of Agriculture, Abeokuta and Institute of Agriculture Research and Training, Ibadan on the efficacy of *Tithonia diversifolia*, *Azadirachta indica*, *Lantana camara*, *Chromolaena odorata* slurries each at 1% w/v against *Meloidogyne incognita* infection in four varieties of tomato namely Roma VF, U.C82, Beske, and Ibadan local. This experiment was a 5 x 4 factorial experiment laid out in a Randomized Complete Block Design (RCBD) with three replicates on the field. Tomato seeds were sown for the period of four weeks and were dipped in biopesticides slurries for 4-5 minutes and were directly transplanted on the field. Data were collected on agronomic parameters, incidence and severity of *Tomato leaf curl virus*. At 60 DAP root and shoot weights, nematode population, root galls and gall indices were assessed. Data collected were subjected to Analysis of Variance and means of statistically significant variables were separated by Duncan Multiple Range Test at 5% level of probability. The four tested biopesticides significantly ($p \leq 0.05$) suppressed nematode population and number of galls compared with the control in both locations. Application of *T. diversifolia* significantly gave more reduction in nematode population from 10% – 8% at Abeokuta and 15% - 10% at Ibadan and number of galls with the least value at Abeokuta (27.00) and at Ibadan (31.67). The results indicated that application of *T. diversifolia* gave more reduction in nematode population. It is recommended that *T. diversifolia* can be used for combating *M. incognita* in tomato for improved yield.

Key Words: *Meloidogyne incognita*, Biopesticides, Tomato, Organic agriculture,

LAND PREPARATION METHODS AND CROPPING SYSTEMS: EFFECT ON MAIZE (*ZEA MAYS*) VIRAL DISEASES

Kehinde T. Kareem^{a*}, Adedayo O. Oyedele^b and Olubusola F. Oduwaye^a

¹*Kenaf and Jute Improvement Programme, Institute of Agricultural Research and Training,
Obafemi Awolowo University, P.M.B. 5029, Moor Plantation Ibadan

²Land and Water Resources Management Programme, Institute of Agricultural Research and
Training, Ibadan

*E-mail address of corresponding author: kt_kareem@yahoo.com

ABSTRACT

Maize is an important staple crop utilized by both rural and urban communities in sub-Saharan Africa. However, its production is limited by biotic and abiotic factors, and viruses are one of the major biotic factors reducing maize yields. The study investigated the effects of land preparation methods and cropping systems on the incidence and concentration of *Maize streakvirus* (MSV) and *Maize stripe virus* (MStV) in maize grown in three locations during 2015 and 2016 cropping seasons. Oloyin (ART98-SW1) maize variety was planted in a split-plot design with replications. The incidence of MSV was very low in 2015 compared to 2016. In 2016, highest MSV incidence (57.3%) was obtained from the herbicide-sprayed plot in Ibadan while the least incidence (12%) was recorded from Ilora under slash and burn. Under the cropping system, highest MSV incidence (69%) was obtained from Ibadan under sole cropping while the least was obtained from mixed cropped plot in Ilora with a value of 7.5%. There was no mixed infection by MSV and MStV in 2015 and 2016 in all the locations. Positive and significant correlation occurred between MSV incidence and MSV titers (0.605**) as well as MStV incidence and MStV titers (0.346*). The study concludes that methods of land preparation and cropping systems are integral part of Integrated Disease Management (IDM) strategies. However, an holistic approach involving all the IDM methods coupled with favourable climatic condition would give the best management approach.

Keywords: Incidence, intercropping, maize, slash and burn, virus titer

GRAVITY VARIATION EFFECTS ON THE GROWTH OF MAIZE SHOOTS

Funmilola A. Oluwafemi¹ and Omotayo O. Oyewole²

¹Astrobiology Unit, Space Life Sciences Division, National Space Research and Development Agency(NASRDA), Obasanjo Space Centre, Km 17 Airport Road, P.M.B. 437, Garki, Abuja, Nigeria. ²Microgravity and Human Space Technology Department, Centre for Atmospheric Research, Kogi State University Campus, Anyigba, Nigeria.

*Correspondence: oluwafemifunmilola@gmail.com; +2348065035799.

ABSTRACT

Gravity-variation effects on plants give definite changes. Normal-earth-gravity (1G) and microgravity are possible variations for experimental purposes. On-board spaceflight microgravity-experiments are rare and expensive, as microgravity-environment is an outstanding platform for research, application and education. Clinostat was used for ground-based microgravity-experiment to investigate the shoot-morphology of maize plants at the Space-Agency of Nigeria. Maize was selected because of its nutritional and economic importance; and its usability on the Clinostat. Plant shoot-morphology is important for gravi-responses. Shoot-curvature and shoot growth-rate analyzes were done on the shoots of maize. The seeds were planted into 3petri-dishes (in-parallels) in a wet-chamber using plant substrate–agar-agar. After 3days of germination under 1G, two of the petri-dishes were left under 1G serving as controls for shoot-curvature and shoot growth-rate analyzes. The clinorotated-sample was mounted on Clinostat under: rotation-speed (80rpm), horizontal rotation-position and clockwise rotation-direction. The images of the samples were taken 30min interval for 4h. After observations, the shoot-morphology of the seedlings were studied using ImageJ-software. The grand-average shoot-angles and shoot-lengths of all the seedlings were calculated following the experimental-period to give the shoot-curvatures and shoot growth-rates respectively. The results showed that the clinorotated-sample had reduced response to gravity with 50.77°/hr for the shoot-curvature while the 90⁰-turned sample had 55.49°/hr. The shoot growth-rate for the 1G-sample was 1.25cm/hr while the clinorotated was 1.26cm/hr. The clinorotated had increased growth-rate per hour than the 1G. These analytical results serve as a preparation for future real-space experiments on maize and could be beneficial to agriculture-sector.

Keywords: Gravity; Microgravity; Clinostat; Maize; Shoot.

MICROGRAVITY RESEARCH IN BIOLOGY AND BIOCHEMISTRY OF PLANTS

Funmilola A. Oluwafemi^{1,3*}, Bolanle M. Olalekan-Ajayi², Babatunde Rabi², Omodele Ibraheem³, Helen A. Lawal-Akinlami²

¹Astrobiology Unit, Space Life Sciences Division, Engineering and Space Systems (ESS) Department, National Space Research and Development Agency (NASRDA), Abuja, Nigeria.

²Centre for Atmospheric Research (CAR) – National Space Research and Development Agency (NASRDA), Kogi State University Campus, Anyigba, Nigeria.

³Plants for Biotechnological Resources Research Group, Department of Biochemistry, Federal University Oye-Ekiti, Ekiti State, Nigeria.

*Correspondence: oluwafemifunmilola@gmail.com, +2348065035799.

ABSTRACT

Microgravity science is the study of the physical occurrence whereby the Earth's gravity is significantly decreased. Microgravity research encompasses a wide range of disciplines including biological systems. Spaceflight microgravity experiments are rare and quite expensive; this led to the development of simulated microgravity equipment such as the Clinostat. Biological samples provide a means for investigating the physiological responses to spaceflight. One of these biological samples is plant. Growing plants for food in space and on other planets will be necessary for exploration of our universe. Gravity has constantly influenced both physical and biological phenomena through Earth's history. A justification for microgravity research in the biological sciences is the anticipation that new knowledge will be accumulated. This review provides an overview of the space microgravity conditions that have influence on selected plant's morphology, physiology, phenotype and growth. The results of real and simulated microgravity research show that the environment of space has significant scientific, technological and marketing/commercial prospects on plants.

Keywords: Microgravity, Biology, Biochemistry, Plant.

SOCIOECONOMICS AND POLICY FORMULATION

SOCIOECONOMIC IMPORTANCE AND PHYTOCHEMISTRY OF AFRICAN NUTMEG [*Pycnanthus angolensis* (WELW)] IN IBADAN METROPOLIS, OYO STATE

^aAdedokun M. O, ^{*ab}Kareem I. A. ^aAdegbenjo E. A. ^aOjo T. M, and ^aAdesuyi F.

^aDepartment of Forestry and Wildlife Management

^bAgricultural Media Resources and Extension Centre

Federal University of Agriculture, Abeokuta, Ogun State Nigeria

*Corresponding author: kareemia@funaab.edu.ng

ABSTRACT

This study examined the socioeconomic importance, phytochemistry, profitability and utilization of *Pycnanthus angolensis* in the study area. A total of 100 respondents in Bode, Bodija, Oja-Oba, Beere and Oje markets in Ibadan metropolis were interviewed using a structured questionnaire. The data were analyzed using descriptive, econometric and inferential statistical tools. Budgetary analysis was used to estimate the profitability of the trade. The result showed that 70% of the respondents were females and 51% had secondary education while 43% had primary education. The study showed that, African nutmeg fruit has very short shelf life and the utilization of the fruit is majorly for treatment of fever and other ailment while the method of preparation is majorly by soaking with ethanol. Result also showed that the average monthly revenue generated from the trade of *P. angolensis* in all markets visited was N600, 000 (\$1560) and the net profit was N255, 000 (\$663). *P. angolensis* had 80.4% profitability in all the markets visited. The phytochemical analysis of the bark and seed indicated the presence of flavonoid, alkanoid, steroid, tannin, saponin, triterpenoid, phenol, glycoside and anthroquinone in varying percentages. The study revealed that steroids is the most active ingredient and higher in the plant bark while flavonoid is the least present in the bark at 0.015%. It can be concluded from this study that the plant is a good remedy for health care and welfare of mankind. The use of African nutmeg bark should be adopted for treatment of various ailments like fever, diabetic and other internal ailment in mankind.

Keywords: Profitability, Utilization and Economic Analysis

SOCIO- ECONOMIC CHARACTERISTICS OF BITTER YAM PRODUCTION (*DIOSCOREADUMETORUM*) IN OYO STATE, SOUTHWEST NIGERIA

O.E Aworinde¹, *R.KEgberongbe, and R.O Awodoyin¹

*National Horticultural Research Institute, Jericho, Ibadan, Nigeria.

¹ Department of Crop Protection and Environmental Biology, University of Ibadan.

*Corresponding author: *kehinde_egberongbe@yahoo.com*

ABSTRACT

Bitter yam is one of the six species of yam that is widely utilized as food in West Africa and the most nutritious. Unfortunately, the production has not received the needed attention despite its importance in the diets of people. The study investigated the socio- economic characteristics of bitter yam production in Oyo state. Data were obtained from sixty-five (65) bitter yam farmers using random sampling method. The socio- economic characteristics were investigated using carefully structured questionnaires and scheduled interview sessions. The respondents were also asked to indicate if the bitter yams were grown solely or intercropped on their farms. The lists of constraints facing the production were identified. Data were collected on trends of production from 2010-2014. Descriptive statistical tools like frequency counts, percentage tables were used for data presentation. Results showed that the cultivation of bitter yam is mostly done by men (88.7%), majority were fairly old and are literates (61.9% and 50.8%) who engaged in farming as their primary occupation but earn low income. Many of the respondents (43%) grow two varieties (white and yellow). Generally the trends in production have been unstable, size of land, cost of input and income generated have been fluctuating. This implies that considerations have not been put in place and that majority grow bitter yam for subsistence only. There is need to increase awareness on economic and medical importance of bitter yam in Nigeria.

Keywords: Socio-characteristics, Primary occupation, Subsistence, Low income, Bitter yam

ADOPTING APPROPRIATE POLICIES AND TECHNOLOGIES FOR IMPROVED PERFORMANCE AMONG FEMALE AGRICULTURISTS

Adenegan-Alakinde, Taiwo Ayomipo
Adeyemi College of Education, Ondo State
Email Address: taiwoadeneganalakinde@gmail.com

ABSTRACT

Women are involved in almost every aspect of agriculture; from land cultivation to value addition as well as marketing. Women are found in every stage of the agricultural activities. Most times a woman may be involved in two or more stages of the activities. Some carry out all the activities. These activities are sources of livelihood for the women. The activities are cumbersome; they are most carried out manually and therefore stressful. The challenges women in agriculture face are enormous and these include poor technologies; few have access to finances; unfavourable market systems, poor rural infrastructures especially poor roads. This paper suggests that for women performance in the agricultural sector to be enhanced, there is the need to formulate policies that focuses on women farmers such as provision and adoption of appropriate technologies for each aspect of the agriculture women are into. Policies that will make the market systems better should be made.

Key words: Agricultural activities, Market systems, policies, technologies and women