PKFokam Conference on Science & Technology
7th Edition
November 26, 2020
Online Conference

CONFERENCE PROGRAM Thursday, November 26, 2020		
8:45 – 9:00	***Online conference Check-in and Registration open***	
SESSION 1		**Chair: Dr. Nestor KAMDEM, PKFokam Conference Coordinator**
9:00 - 9:10	**Prof. Dr. Thomas NJINE** The Rector of the PKFokam Institute of Excellence	*Welcome speech*
9:10 – 9:20	**Prof. Dr. Maurice D. AWOUAFACK** Faculty of Science, University of Dschang	*Scientific coordinator of the 7th edition of the PKFokam conference*
9:20 – 9:40	**Dr. Carine N. TEMEGNE** Department of Plant Biology, University of Yaounde I	*Mycorrhization and soluble phosphate influence the growth and phosphorus content of Bambara groundnut (Vigna subterranea (L.) Verdc.)* ***P.6***
9:45 – 10:05	**Dr. Hippolyte MEKUIKO WATSOP** Department of Animal Production, School of Veterinary Medicine and Sciences, University of Ngaoundere	*Effect of the Callistemon viminalis essential oil on the in vitro digestibility of Pennisetum clandestinum hay on the Djallonké sheep*
10:10 -10:30	**Amelie MBOUNA DJOUDA** Laboratory for Environmental Modelling and Atmospheric Physics (LEMAP), Department of Physics, Faculty of Science, University of Yaoundé I	*Assessing rainfall, temperature and population impacts on malaria incidence in Cameroon and use to validate the VECTRI malaria model* ***P.13***
10:35 – 11:00	**Daniel AMANI DAWAYE** Department of Biological Sciences, Faculty of Science, University of Maroua	*Diversity of synanthropic flies and their potential for transmission of diarrheal deseases in Maroua (Farth Nord Region, Cameroon)* ***P.11***
11:00 – 11:15	**COFFEE & TEA / B2B**	
SESSION 2		**Chair: Dr. Moussa DJAOUDA, Univ Maroua**
11:15 – 11:35	**Laurence N. NGATA** Department of Plant Biology, Faculty of Science, University of Yaounde 1	*Evaluation of the quality and quantity of tomato fruit (Lycopersicon esculentum Mill.) exposed to chemical fertilizers and pesticides* ***P.33***
11:40 – 12:05	**Parfait Gildas NDJOUONDO** Department of Biology, Higher Teacher Training College, The University of Bamenda	*Characterisation and ecology of macrophytic flora of the Batika river (Yabassi, Cameroon)* ***P.18***
12:10 – 12:30	**Prof. Dr. Marc K. KOUAM** Animal Physiology and Health Research Unit, Faculty of Agronomy and Agricultural Sciences, University of Dschang	*Brucellosis as a veterinary and public health risk on cattle farms in Nde Division, Cameroon: a prospective study* ***P.34***
12:35 – 13:00	**Ernest P. FOKAM** Université of Yaoundé 1	*Radio-sensitivity of two watermelon varieties (Citrullus lanatus), the most cultivated and the most marketed in Cameroon to different doses of gamma radiation* ***P.27***
13:00 – 14 :00	**LUNCH BREAK**	
SESSION 3		**Chair: Dr. Carine N. TEMEGNE**
14:00 – 14:20	**Derrick F. NGUEGUIM** Animal Physiology and Health Research Unit, Faculty of Agronomy and Agricultural Sciences, University of Dschang	*Parasites diversity of farmed Oreochromis niloticus fish in the West region of Cameroon* ***P.24***

14:25 – 14:45	**Laure Ariane CHIMEZE KOUANANG** Environmental physics laboratory, Department of Physics, Faculty of Science, University of Yaoundé I	*Investigation and evaluation of water quality in the farth-Nord Cameroon-region: case of the locality of Minawao* ***P.16***
14:50 – 15:10	**Patrice ZEMKO NGATSI** Department of Plant Biology, Laboratory Plant Pathology, Faculty of Science, University of Yaoundé 1	*Production of hydrolytic enzymes by Stictococcus vayssierei Richard (Hemiptera: Stictococcidae) during nutrition and varietal response of cassava (Manihot esculenta Crantz) following infestation* ***P.39***
15:15 – 15:35	**Trésor Marius SIPPING K.** Laboratory of Phytoprotection and Plant Valorization, Biotechnology Centre, University of Yaoundé I	*Anti-tumor promoting effects of polysaccharides from Ganoderma resinaceum against Diethylnitrosamine induced Hepatocarcinoma in Wistar rats* ***P.7***
15:40-16:00	**Claudine TEKOUNEGNING TIOGUE** The University of Dschang, School of Wood, Water and Natural Resources ; Laboratory of Applied Ichthyology and Hydrobiology, Ebolowa ,Cameroun	*Preliminary data of Life history traits of Mormyridae (Actinopterygii: Teleostei) in Upper Sanaga River; Central Region of Cameroon* ***P.41***
16:00-16:15	**COFFEE & TEA / B2B**	
SESSION 4		**Chair : Prof. Dr. Maurice D. AWOUAFACK , UDs**
16:15-16:35	**Dr. Séverin MBOG MBOG** Département Hygiène, Sécurité et Sûreté Industrielle, Faculté de Génie Industriel, Université de Douala	*Evaluation du niveau de prise en compte des aspects Hygiène, Sécurité et Environnement (HSE) au sein d'une industrie de savonnerie : Cas du Partenaire Financier avec Christ (PAFIC)* ***P.23***
16:40-17:00	**Roméo BOUBA WAKAYANSAM** Department of Biological Sciences, Faculty of Science, University of Maroua	*Factors affecting the persistence of cholera epidemics in Bibemi (North cameroon)* ***P.10***
17:05-17:25	**Prisca C. MEFFOWOET** Animal Physiology and Health Research Unit, Faculty of Agronomy and Agricultural Sciences, University of Dschang	*Parasites diversity of an edible African giant snail (Achatina fulica) in tree locality of Cameroon* ***P.35***
17:30-17:50	**Norbert W. KUATE TUEGUEM** Laboratory of Plant Pathology, Department of Plant Biology, Faculty of Science, University of Yaoundé I	*Stimulating effects of Foliar Application of 24-Epibrassinolide on Growth and Induction of Resistance of Maize Plants to Helminthosporiosis* ***P.31***
17:50-18:00	**Closing remarks**	**Prof. Dr. Thomas NJINE**

Scientific Committee

Prof. Dr. Thomas NJINE, PKFokam Institute of Excellence, The rector
Prof. Dr. Maurice D. AWOUAFACK, University of Dschang, The Chair of the scientific committee
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Dr. Séverin MBOG MBOG , University of Douala
Dr. Nestor KAMDEM , PKFokam Institute of Excellence

The 7th edition of the PKFokam international conference on science and technology is organized this year online in order to combine the need to continue to respect this important annual meeting, on the one hand, and the demands of the health crisis linked to the covid-19 pandemic, on the other hand. Your participation in this virtual meeting via the zoom platform underlines your desire to make scientific and technological research prosper in Africa. We are happy to have you among the participants in this new experience.

Prof. Dr. Thomas NJINE
The Rector of the PKFokam Institute of Excellence

Dear colleagues and friends,

we have all noticed the ongoing discussions worldwide concerning medicines for the treatment of coronavirus infection COVID-19. Many of us have probably realized that solutions coming from African countries are barely accepted. What could be the meaning of this rejection? What is your feeling as an African scientist and researcher? ***Good-For-Nothing? of course, the answer is no.*** *The rejection could be due to the fact that bad working conditions of researchers in Africa are well known. Researchers in Africa need to fight for their rights. The right to get funded for their research activities. Therefore, the question to be answered is: how to convince governments to insert research among priorities sector in Africa? I am afraid that there is still a long way to go if researchers do not stand up for their rights. Never forget that nothing is granted.*

The PKFokam Conference on Science & Technology (http://www.pkfokam-cap.org/conference-on-science-technology/) main goal is to bridge the gap between theory and practice by stimulating a new motivation within the african «Sci-Tech» community. Our conference mobilizes scientific talents, engineers, inventors and contributors who have shown commitment in various «technological arts». They are invited to share the results of their achievement, and more importantly to go beyond scientific publications by developing „spin-of"to valorize on the ground the results of their research activities.

*A crucial question has been raised during previous editions of our conference: "**Research for Publication or Research for Development?**"*

It has been emphasized to focus on wealth-creating research activities to boost our economy. In this regard, the PKFokam Journal of Applied Sciences & Technology (https://pkfokam-jast.org/) , which is especially dedicated to the exploitation of results of applied research has been created. The PKFokam-Jast seeks to:

- *Promote and disseminate results of applied research.*
- *Disseminate the knowledge and findings that researchers have developed.*
- *Create connection between society and researchers, link that enables their results to attract more attention.*
- *Serve as information carrier for industrialists, companies or business actors who are willing to transfer the results of applied research out of laboratories into practical application.*

We welcome your submissions to the PKFokam-Jast

Thank you for your participation to the 7th edition of the PKFokam Conference on Science & technology.

Dr. Nestor KAMDEM
The PKFokam Conference Coordinator

Dear Scientists and friends,

the PKFokam conference on Science and Technology, 7Th edition is an important scientific event as others previous editions that give opportunity to multidisciplinary researchers working on science and technology to share and valorize their findings. Due to the pandemic of COVID-19, this edition is going to be an online meeting. Knowing that several similar events have been postponed to next year or cancelled around the word, we are very grateful to the administration of PKFokam Institute of Excellence specially Prof. Dr. Njine and Dr. Fokam for facilitating the organization of this event and promoting the development of Science and Technology for young African researchers. We have a total number of 38 abstracts including 17 oral and 21 poster communications, respectively. Main participants are mostly from Cameroon, and some of their co-authors are from several countries around the word such as Italy, USA, Denmark, Ghana, DRC and Botswana. On behalf of the Scientific Committee of the 7Th edition of The PKFokam Conference on Science and Technology, it is my pleasure to wish you a warm welcome to this event and I believe that good discussions and knowledge exchanges will be our achievement.

Prof. Dr. Maurice D. AWOUAFACK
Scientific Coordinator of the 7th edition of The PKFokam Conference on Science and Technology

DONGMO NANFACK Albert

Extraction, biochemical characterization and biocontrol activity of an aqueous extract and essential oil of Tithonia diversifolia leaves against rice seed-borne pathogens

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The high cost of chemical pesticides and their negative impact on the environment makes it imperative to look for natural pesticides from plants. Our objective involves using aqueous extract, and essential oil of Tithonia diversifolia leaves to control rice seed pathogenic fungi and bacteria. We obtained aqueous extract and essential oil, respectively, by maceration and hydrodistillation. The antimicrobial activities were determined in vitro. The secondary metabolites were determined by qualitative and quantitative assays. The chemical composition of the essential oil obtained from Tithonia diversifolia was studied using gas chromatography coupled with mass spectrometry. The results show that phenols, tannins, flavonoids, alkaloids, terpenoids, sugars and saponins were present in the aqueous extract. The essential oil contained mainly hydrocarbonated, oxygenated monoterpenes, terpenoids and sesquiterpenes. Regarding antimicrobial activities, all bacteria were sensitive to aqueous extract and essential. The activity of the aqueous extract on the fungi showed an inhibitory concentration 50 (IC50) of 100 mg/ml corresponding to 68.44 % inhibition against *Bipolaris oryzae* and 70.69 % inhibition against *Fusarium moniliforme*. The activity of the essential oil on bacteria and fungi showed MIC of 125 µg/ml and 2500 µg/ml respectively. These results allow us to consider *Tithonia diversifolia* as a potential source of biopesticides.

Keywords: *Bipolaris oryzae*, biocontrol, *Fusarium moniliforme*, plant secondary metabolites, rice,.

TOGUE KAMGA Fulbert

Comparison of two Numerical Schemes (Crank-Nicolson Scheme (C-NS) and Runge Kutter of order four): the case of one-dimensional dispersion phenomena in a coastal aquifer

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In this study Burgers' equation arising in longitudinal dispersion phenomenon in fluid flow through porous media is solved by using Crank-Nicolson and Runge Kutta 4 finite difference scheme with appropriate initial and boundary conditions. Longitudinal dispersion phenomenon plays an important role to control the salinity of the soil in the western seashore region all over the world. The problem of miscible fluid flow through porous media can be seen in the coastal areas, where freshwater beds are gradually displaced by seawater. Burgers' equation is solved numerically to find the concentration C(X, T) of salty or contaminated water dispersion in uni-direction. It is concluded, that an unconditionally stable Crank-Nicolson finite difference scheme underestimate the concentration C(X, T) as distance X as well as time T increases. In numerical analysis, an appropriate method should be used for numerically solving partial differential equations.

Keywords: advection, Crank-Nicolson, Dispersion, Fourth-order Runge Kutter (RK4), miscible fluids.

TEMEGNE N. Carine

Mycorrhization and soluble phosphate influence the growth and phosphorus content of Bambara groundnut (Vigna subterranea (L.) Verdc.)

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Background and methods: Management of soil fertility and increasing yields in agriculture are becoming a major issue in view of the malnutrition problems. Tropical ferralitic soils are phosphorus (P)-deficient. The arbuscular mycorrhizal fungi (AMF) could form symbiotic associations with plants to enhance their hydro-mineral nutrition. This study aimed to evaluate the effect of mycorrhization and P supply on growth of Bambara groundnut (*Vigna subterranea* (L.) Verdc.). Seedlings of two landraces (V1: ivory cream seed coat and V2: ivory cream seed coat with grey eyes) were inoculated with AMF composite (*Gigaspora margarita* and *Acaulospora tuberculata*). P was administered by Hoagland solution (0 and 1000 µMPi). Two months after sowing, plants were harvested, and parameters (fresh and dry biomass, number of nodules, leaf P-content, frequency and intensity of mycorrhization, mycorrhizal dependence, and weight gain) were evaluated.

Results: The results show that, with or without phosphate, the number of nodules was three times ($p<0.001$) higher in the mycorrhized plants compared to the controls. Phosphate increased ($p<0.001$) the leaf P-content by 21 and 54% for the control and mycorrhized plants, respectively. Soluble phosphate did not affect the frequency and intensity of mycorrhization. Soluble phosphate and AMF significantly improved the growth and leaf P-content. Landraces influenced the number of leaves and the plant's height. Thus, the number of leaves of V1 exceeded that of V2 by 15%, two weeks after sowing (WAS). But, the plant's height of V2 was significantly higher than V1 from 4 WAS.

Conclusion: P can be associated with AMF for optimal yield and sustainable agriculture. The study of the effect of different doses of phosphate fertilizers on the mycorrhization of Bambara groundnut in the field is considered in perspective.

Keywords: arbuscular mycorrhizal fungi, biomass, nutrient solutions, phosphate, plant height, Voandzou

SIPPING K.M.T

Anti-tumor promoting effects of polysaccharides from Ganoderma resinaceum against Diethylnitrosamine induced Hepatocarcinoma in Wistar rats.

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Hepatocellular carcinoma (HCC) remains one of the most common and lethal diseases worldwide. The limitedness of treatment and severe prognosis have favored the emergence of preventive control. In that side, natural compounds as mushroom-derived polysaccharides can be exploited because of their less toxicity and biological properties. Accordingly, the present study was initiated to investigate anti-tumor effects of from *G. resinaceum* polysaccharide fractions against a clinically relevant rodent model of HCC. Proteins, phenol compounds and total neutral sugars contents were assayed spectrophotometrically. To assess in vivo antitumor activities, Sixty-three rats were divided into seven groups of nine animals each as follows, Normal group: untreated control; Negative control: DEN (100 mg/kg bw); Positive control: DEN+DOX (10 mg/kg bw); GRP I/II 125: DEN+GRP I/II (125 mg/kg bw); GRP I/II 250: DEN+GRPI/II (250 mg/kg bw). Biochemical, histological and antioxidant markers were performed. Statistical analysis was performed by one way ANOVA followed by Dunnett's post hoc test. $P < 0.05$ was considered to be significant. As results, GRP I and GRP II are cross-linked to proteins and phenol compounds. They have shown concentration-dependent cytotoxicity against Hela, MDA-MB 231 and HepG2. In comparison with negative control, a depletion of serum parameters including alanine aminotransferase, aspartate aminotransferase, alpha-fetoprotein and creatinine was observed in GRP treated groups. The hepatic enzymatic and non-enzymatic system antioxidant defenses were improved. GRP I and GRP II have restored the architecture of liver tissue after DEN intoxication. Our results indicate clearly that *G. resinaceum* polysaccharides exhibit significant chemopreventive effects of DEN induced hepatocellular carcinoma by modulating oxidative markers and inhibiting cell proliferation.

Keywords: chemoprevention, diethylnitrosamine, *G. resinaceum* polysaccharides, hepatocellular carcinoma, Oxidative stress.

AMOLA Adoum LIOUNA

Response surface methodology applied to the optimization of the preparation of activated carbons based on shea nut shells (Vitellaria paradoxa), physico-chemical characterization

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Context and method: Faced with the challenges of water pollution on which a lifetime depends on earth, this study is designed to develop activated carbons (decontamination materials) based on shea residues (vitellaria paradoxa), a Chadian plant recognized by its therapeutic and socioeconomic virtue. The Central Composite Design was used to optimize the conditions of preparations by chemical activation to phosphoric and sulphuric acid whose factors influenced by concentration (1-5 M), pyrolysis temperature (400-700 °C) and stay time (30-120 min). Activated carbons that have distinguished themselves by their considerable iodine index have been variously characterized by physicochemical analysis techniques: EDX analysis, zero-load pH (pHpzc), bulk density, moisture content, Boehm titration, Fourier transformed infrared (IR-TF), BET adsorption and scanning electron microscopy (SEM).

Results: The analysis of the experimental yield and iodine number values by Statgraphics software plus 5.0, presents low residues with R2 > 91 % coefficients of determination. Under optimal preparation conditions, yields are 51.45 and 42.35 % and iodine number at 709.45 and 817.36 mg.g-1 respectively for CAK-P (phosphoric acid-activated coal) and CAK-S (sulphuric acid-activated coal). The EDX analysis shows a rate of 44.87 and 53.49 % carbon, the bulk density of 0.796 and 0.849 g.cm-3 and the moisture content of 5.00 and 4.62 % respectively for CAK-P and CAK-S. The pH at the zero charge point (pHpzc), Boehm titration, IR-TF revealed the acidity of the CAK-P and CAK-S carbons, which have a specific microporous surface of 522.55 and 570.65 m2.g-1 respectively, and the SEM adds that both carbons have a heterogeneous surface area.

Conclusion: This study result in activated carbons whose physico-chemical characteristics indicate that they are of good quality and can be used as decontamination materials to fix small and medium-sized molecules in solution.

Keywords: activated carbon, central composite design, optimization, residue, shea.

BAPONWA Odile

Potential role of Musca domestica (Muscidae) and Lucilia sp. (Calliphoridae) in the propagation of enteric diseases in Maroua (Far North, Cameroon)

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Background and methods: Synanthropic flies, by their responsibility in the transmission of pathogenic germs, constitute a serious human health problem. In Maroua town, *Musca domestica* (Muscidae) and *Lucilia* sp. (Calliphoridae) are the most abundant and frequent synanthropic flies. This work aimed at determining the role of *M. domestica* and *Lucilia* sp. as mechanical vectors of enteric diseases to humans in this town. Seven types of environment, each with two fly capture sites, were chosen. The flies were captured during four campaigns, in the 8:00 am to 10:00 am time slot, using an entomological net previously sterilized. The abundances of aerobic and mesophilic bacterial flora and enterobacteria were determined by plating 100 µl of saline where flies were inoculated, on PCA and BCP agars. The isolated enterobacterial species were identified using the usual biochemical tests.

Results: The abundances of aerobic and mesophilic bacterial flora and enterobacteria carried by M. domestica did not show any significant difference between the different types of sites ($p > 0.05$). The abundances of total coliforms linked to these flies were significantly lower in healthy houses than unhealthy ones and places far from homes ($p < 0.01$; $p < 0.05$). The aerobic and mesophilic bacterial flora, as well as the total coliforms transported by *Lucilia* sp., were significantly higher than those counted on *M. domestica* from the same site ($p < 0.05$). Six species of non-coliform enterobacteria: *Serratia* sp., *Providencia* sp., *Salmonella* spp., *Edwardsiella tarda*, *Morganella morganii* and *Enterobacter* sp. were isolated from *M. domestica* and *Salmonella* spp. on *Lucilia* sp.

Conclusion: The studied flies carry many potential bacterial pathogens, which can be transmitted to humans through their foods. To avoid health risks associated with pathogenic bacteria carried by flies, food must be protected from any visit by these insects.

Keywords: Enterobacteriaceae, *Lucilia* sp., Maroua, *Musca domestica*.

WAKAYANSAM BOUBA Roméo

Factors affecting the persistence of cholera epidemics in Bibemi (North Cameroon)

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Introduction: The survival and persistence of Vibrio cholerae in the environment are believed to be responsible for the endemicity of cholera. Bibémi is highly endemic to this disease. The objective of this study is to investigate the aquatic reservoirs of V. cholerae and cholera transmission factors in the city of Bibémi to contribute to the strengthening of disease surveillance strategies.

M**ethodology**: The microbiological quality of 16 water sources located in areas regularly affected by cholera in Bibémi, grouped into three categories, namely wells, boreholes and surface water (mayo) was studied through the search and isolation of *V. cholerae*. The membrane filtration technique was used for the isolation of bacteria from the water. The culture of *V. cholerae* was carried out on TCBS agar after enrichment in EPSA broth. Bacterial identification was performed using biochemical tests from the Api20E gallery. A household survey was conducted to determine the factors of contamination of water points and cholera transmission. Multiple Correspondence Analysis (MCA) and Multiple Factor Analysis (MFA) were used to determine the relationship between the parameters studied.

Results: Surface water samples, including mayo Barka, were positive for *V. cholerae*. The presence of *V. cholerae* in this medium would be due to faecal contamination. Isolates from these different reservoirs were resistant to Amoxicillin + clavulanic acid (89%), Amoxicillin (89%), Amikacin (78%), Imipenem (56%), Norfloxacin (22%), Cefotaxime (33%) and sensitive to Cefalexin (60%). The ACM and AFM have shown that the low level of education, poor hygiene, insufficient and poorly managed water points and the absence of a sanitation system are major contributors to the emergence and spread of cholera in the town of Bibémi.

Conclusion: This work proved the existence of water reservoirs of V. cholerae in Bibémi, moreover these isolates of V. cholerae were sensitive to Cefalexin, Trimethoprim and resistant to Amoxicillin + clavulanic acid, Amoxicillin, Amikacin, Imipenem, Norfloxacin, Cefotaxime. Environmental and social factors are conducive to the occurrence and rapid spread of cholera epidemics.

KEYWORDS: antibiotic, aquatic environments, Bibémi, epidemic, *Vibrio cholera*.

AMANI DAWAYE Daniel

Diversity of synanthropic flies and their potential for transmission of diarrheal deseases in Maroua (Farth Nord Region, Cameroon)

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Background and methods: Diarrheal diseases have been more recurrent, constituting a major concern for public health. These diseases are very often transmitted by synanthropic flies as principal vectors. The purpose of this research was to investigate the varieties of synanthropic flies and their potential implication in the transmission of diarrheal diseases in the city of Maroua. Flies were collected per season from 12 quarters, in 5 different areas. To evaluate the biodiversity and the carrying of microorganisms, the collection was done in 3 different periods of the day corresponding to the three levels of sunshine.

Results: Eight species of synanthropic flies belonging to four families were identified in the town of Maroua. The repartition and the abundance of these species varied according to seasons, quarters, and period of the day of their collection. *Musca domestica* and *Chrysomya putoria* were the most abundant species in quarters where activities related to food industries and breeding are highly practiced; notably the Hardé, Pont-vert, Doualaré, Kongola and Makabaye neighborhoods.

Conclusion: *M. domestica* and *C. putoria* are the most suitable carriers of microorganisms. Escherichia coli bacterium was more carried than Salmonella sp. The carrying of bacteria by synanthropic flies was abundance-dependent.

Keywords: diarrheal diseases, Maroua, synanthropic flies.

LIKENG-LI-NGUE Benoit Constant

Potential for gene contamination between Gossypium hirsutum and Abelmoschus esculentus by the morphological study of flowers and interspecific hybridization

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Background and methods: The cotton sector in Cameroon is facing many problems, such as controlling various cotton diseases and parasites. The control of all these to improve yields has enabled Cameroon to introduce trials on BT cotton since 2012. The present work aimed to study the potential contamination of transgene between cotton and okra through a floral study and interspecific hybridizations. A total of 160 interspecific crosses were carried out between *Gossypium hirsutum* and *Abelmoschus esculentus* in comparison to 75 intraspecific crosses.

Results: The result shown that both species present Malvaceae characteristics. Flowering progressing from the base to the tip of the fruiting branches in the horizontal direction on the same branch and in the vertical direction on successive branches in identical position started 65 and 68 days after sowing respectively for the two varieties Q 302 and L 484, unlike in okra where it started in vertical direction 32 days after sowing for 28 days. The interspecific crosses in both directions resulted in failures which occurred three days after pollination when okra was used as the female parent and 11 days afterwards when *Gossypium hirsutum* was used as the female parent. The intraspecific crosses showed knotting rates without significant difference. The A E × A E crosses showed the fruit set rate of about three fruits containing well-formed seeds per day, the fruit set rate of the cross between Q 302 × L 484 being 1.5 fruits formed per day whereas the crosses L 484 × Q 302, Q 302 × Q 302, L 484 × L 484 were 1.6, 1.7 and 2 fruits per day respectively.

Conclusion: It was found that interspecific crossing results in a failure which can be explained by pre or post-zygotic barriers as well as environmental conditions and the chromosomal difference between the two species. Future research should cover several crops related to cotton.

Keywords: *Abelmoschus esculentus*, gene flow, *Gossypium hirsutum*, intraspecific hybridization, interspecific hybridization, transgene.

MBOUNA DJOUDA Amelie

Assessing rainfall, temperature and population impacts on malaria incidence in Cameroon and use to validate the VECTRI malaria model

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Background and methods: A major health burden in Cameroon is malaria, a disease that is sensitive to climate, environment and socio-economic conditions but whose precise relationship with these drivers is still uncertain. An improved understanding of the relationship between the disease and its drivers, and the ability to represent these relationships in dynamic disease models, would allow such models to contribute to health mitigation and adaptation planning. This work collects surveys of malaria parasite ratio and entomological inoculation rate. It examines their relationship with temperature, rainfall, population density in Cameroon and uses this analysis to evaluate a climate-sensitive mathematical model of malaria transmission.

Co-located, climate and population data are compared to the results of 103 surveys of Parasite ratio (PR) covering 18011 people in Cameroon. A limited set of campaigns which collected year-long field-surveys of the Entomological Inoculation Rate (EIR) are examined to determine the seasonality of disease transmission, three of which are close to the Sanaga and Mefou rivers while others are not close to any permanent water feature. Climate-driven simulations of the VECTRI malaria model are evaluated with this analysis.

Results: The analysis shows the PR peaking at temperatures of approximately 22◦C to 26◦C, in line with recent work that has suggested a cooler peak temperature relative to the established literature, and at precipitation rates at 7 mm day−1, somewhat higher than earlier estimates. The malaria model is able to reproduce this broad behaviour, although the peak occurs at slightly higher temperatures than observed, while the PR peaks at a much lower rainfall rate of 2 mm day−1. The transmission tends to be high in rural and peri-urban relative to urban centres in both model and observations, although the model is oversensitive to population which could be due to the neglect of population movements, and differences in hydrological conditions, housing quality and access to healthcare. The EIR follows the seasonal rainfall with a lag of one to two months, and is reproduced by the model well, while in three locations near-permanent rivers the annual cycle of malaria transmission is out of phase with rainfall and the model fails.

Conclusion: Malaria prevalence is maximum at temperatures of 24 to 26oC in Cameroon and rainfall rates of approximately 4 to 6 mm day−1. The broad relationships are reproduced in a malaria model, although the prevalence is highest at a lower rainfall maximum of 2 mm day−1. In locations far from water bodies malaria transmission seasonality closely follows that of rainfall with a lag of 1 to 2 months also reproduced by the model, but in locations close to a seasonal river the seasonality of malaria transmission is reversed due to pooling in the transmission to the dry season, which the model fails to capture.

Keywords: Cameroon, climate, entomological inoculation rate, malaria, parasite ratio;

POKAM KOUNÉ Judith

Evaluation of the contamination with Salmonella sp. of groundwater in Maroua (Far North, Cameroon)

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Introduction: This study aimed at evaluating the contamination with *Salmonella* sp. of well and borehole waters consumed in the Maroua metropolis, in view of preventing waterborne diseases caused by these bacteria.

Methodology: Water samples were collected, from June to July 2017, from wells and boreholes of three subdivisions (Maroua 1, Maroua 2 and Maroua 3) representative of the study region and submitted to bacteriological and physicochemical analyses. Those samples were analysed for *Salmonella* sp. contamination and to enumerate qualitative microbial indicators according to the standard methods.

Results: The obtained results revealed that these water sources are not always of good quality, though they are highly consumed in the study zone. The abundance of coliforms varied from $6.55x10^2$ to $6.84x10^3$ CFU/100 mL and $3.15x10^2$ to $6.55x10_2$ CFU/100 mL in well and borehole waters, respectively. The abundance of *Escherichia coli* varied from 2.5×10^1 UFC/100mL and 3×10^2 UFC/100mL in well and borehole waters of the 29 water sources investigated, 7 (5 wells and 2 boreholes) were positive for Salmonella sp. The water provided from all water sources is unsafe for consumption with regard to microbial indicators. The detection of *Salmonella* sp. in well waters was sporadic and depended on the geographical position of the well. Bacterial contamination of groundwater in Maroua would be favored by extensive uses of traditional latrines and poor management of sewage and solid wastes.

Conclusion:
The presence of faecal and pathogenic bacteria such as *Salmonella sp*. in groundwater of Maroua, would be due to poor sanitation and represents an important health risk for the local population.

Impact of the study: This study contributed to highlighting the main concerns regarding the quality of drinking water and the sanitation issues to suggest appropriate solutions to prevent salmonellosis in Maroua.

Keywords: bio-indicators of faecal contamination, boreholes, *Salmonella* sp., wells.

KOUANANG CHIMEZE Ariane Laure

Investigation and evaluation of water quality in the Far-Nord Cameroon-region: the case of the locality of Minawao

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The present work consists of finding the best possible sites for the implantation of boreholes. It has been noted that the far north is one of the regions of Cameroon which suffers from adequacy between the available water and the use that is made of it, especially in areas with a high concentration such as the camp refugees from Minawao. Faced with this difficulty, the populations have recourse to groundwater. For this, geoelectric and geochemical methods were used on the one hand to examine the internal structure of the subsoil and on the other hand, to assess the concentrations of the different ions in the subsoil. During the analysis of the results obtained, using the JOINTEM software, it was noted that as one leaves the surface towards the depth, the resistivity increases considerably, which characterizes the presence of a resistant base. By also considering the following different true resistivity values: 12 Ωm; 22 Ωm; 400 Ωm; 900 Ωm; 1800Ωm, corresponding to five layers of terrain with respective thicknesses: 0.6m; 8.4m; 10m; 25m and a plinth roof located 45m deep; it appears that this analysis would best correspond to reality. These results show the importance of studying the subsoil well to locate suitable sites for the establishment of boreholes.

Keywords: drilling, geoelectric method, survey, water.

YONTI MADIE Calvia

Numerical simulation of the transport of solutes in porous media with distance-dependent adsorption coefficient: The case of saline intrusion in coastal aquifers

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Coastal areas are subject to the intrusion of mineral-type pollutants that may be of natural origin (salt) or be deposited in water from other sources. In these areas, seawater is gradually moving to freshwater, transporting pollutants across the continent. This can therefore affect human health through the consumption of water from boreholes, but also affects the development of vegetation. For this reason, the advection-dispersion equation with the distance-dependent dispersion and adsorption coefficient has been solved analytically by the LAPLACE transform method and numerically by the fourth-order Runge Kutta methods (RK4) to determine the spatiotemporal evolution of salinity in coastal aquifers. When analysing the results using Matlab coding, it was found that saltwater intrusion is very sensitive to the distance-dependent adsorption coefficient. The Results obtained show that by considering 1g/L of salinity as a guide value in the aquifer and by considering an initial source of sinusoidally variable pollutant as a function of time. The service time of a drinking water point is extended when the dispersion coefficient is dependent on the distance and the constant adsorption coefficient. These results show the importance of measuring these parameters before using them in models.

Keywords: advection, boreholes, dispersion, human health, salinity.

NDJOUONDO Gildas Parfait

Characterisation and ecology of macrophytic flora of the Batika river (Yabassi, Cameroon)"

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Human activities are responsible for the degradation of the wetlands of the Batika river. The aim of the study was to contribute to the knowledge of the macrophytes of the Batika river to propose ways of managing this river for the conservation of biodiversity. The study took place from February 15, 2019, to January 20, 2019. Floristic surveys were carried out using the coefficient of abundance-dominance of Braun-Blanquet. Physico-chemical parameters were measured. The results reveal that the species richness of the study area is 44 species distributed in 23 families and 39 genera. The most diverse family is that of the Poaceae. The bedrock of the stream is composed of rocks on the rhitron (upstream) and sand on the potamon (downstream) with a natural dam structure in station 3. The riparian cover gradually decreases from rhitron to potamon, where it completely disappears. The vegetation of the study area consists essentially of helophytes, except *Ottelia ulvaefolia*, hydrophyte (upstream). The Shannon-Weaver index is weak and varied by 1.01 (upstream) to 2.62 (downstream). The riparian cover is the main factor affecting the distribution of macrophytes in the Batika stream. This study shows a stronger influence of phytosociological parameters on the distribution of macrophytes than that of the physicochemical parameters of the water of Batika river.

Keywords: anthropic, Batika river, diversity, macrophytes, physico-chemistry.

NKUIKA FANYA Arnaud

Software of a robotic factory for feed and concentrate n%

Independent researcher, Works validated by the Agricultural Research Institute for Development (IRAD) and recognized by the specialized services of the Ministry of Scientific Research (MINRESI) Cameroon
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Background and methods: This software is a combination of the concentrate n% and feeds mathematical algorithms (ISBN: 978-620-34983-3, ISBN: 978-620-2-34845-4) functioning system of neurons in the human brain (artificial intelligence). How to produce at low cost, maximizing profit and quickly? Faced with these challenges, I researched for 08 years which allowed me to set up this calculator which will allow industrialists and peasant breeders to make a feed and concentrate n% of good quality with local ingredients while respecting standards internationally. One of the major objectives being, to provide breeders and industrialists with an ultra-sophisticated tool to perform the calculations. The online version of software coded in PHP is available on www.ltia.cm. Desktop (PC) versions coded in PYTHON also available.

Results: The use of this software gives results and automatic readjustments with surprising accuracy and speed.

Conclusion: This software coded in PYTHON will allow the creation of robotic factories to produce international standards and in large quantities of feed and concentrate n%, which will lead to poverty reduction at an acceptable level, the invention will accelerate growth, will create new jobs in farming areas.

Keywords: artificial intelligence, robotic, software, PYTHON.

DZOKOU J. Victor

Sustainable management of edible insects of Yaounde rural area: biodiversity, host plants and socio-economic interests

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Background and methods: The objective of this work is to contribute to the safeguarding of the forest ecosystem of six villages in Yaounde through the mastery of edible insects/host plants relationships and the sustainable exploitation of feeding trees larvae and caterpillars consumed and marketed. The insects were captured manually and with the use of a net on their host plants thus preserved in 70% ethanol and icurl-papers. The collection of dendometric parameters, the inventorying of products and services and a socio-economic investigation were carried out. Shannon and Simpson diversities indices and the equitability of Pielou were used to highlight the specific diversity of the ligneous hosts of edible insects.

Results: The insects consumed in Yaounde belong to 4 orders of 6 families of 10 species associated with the host plants belonging to 8 families of 10 genera and 10 species: The Lepidoptera-Saturniidae with Imbrasia genus of 7 species living on 5 host plants families (Lecythidaceae, Euphorbiaceae, Meliaceae, Fabaceae, Anacardiaceae) of 7 species. The polyphagous Orthoptera-Acrididae (*Acrida* sp.) and Orthoptera-Pyrgomorphidae (*Zonocerus variegatus*). The Isoptera-Termitidae (*Macrotermes falciger*) associated with a termite mound. The Coleoptera-Curculionidae (*Rhynchophorus phoenicis*) associated with Palmaceae. Two thousand two hundred and ten host plants are listed and are used locally as medicinal plants, food, coal trees, firewood and sawlog. Among the causes blocking the durability and the productivity of these edible insects are slash-and-burn farming (37.78 %), saw down of the host plants during harvests (30%), the firewood (11.11%) and the coal industry (3.33%). These insects represent a running ingredient in the local preparation of dishes. They are mainly eaten as additional food by all the surveyed populations (100%).

Conclusion: This work showed that the biotope of the edible insects is threatened by human action on the ecosystem and proposed durable management means.

KEMKA NGUIMATIO François Xavier

Preventive effects of Aframomum melegueta extracts on the reproductive complications of propylthiouracil-induced hypothyroidism in male rat

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Background and objectives: Studies of the last decades have demonstrated that hypothyroidism is associated with decrease in fertility. This study was undertaken to evaluate the protective effects of *Aframomum melegueta* on testicular functions and fertility of hypothyroid male rats.

Methods: Sexually experienced male rats were orally treated with propylthiouracil (10 mg/kg) in combination with plant aqueous or methanolic extract (20 and 100 mg/kg) for 56 days. Vitamin E and clomiphen citrate served as positive controls while saline solution served as normal control. On days 46 of treatment, each male was mated with two adult females of proven fertility for fertilization potential evaluation. At the end of the treatment, body and organ weights, sperm characteristics, testicular histology, oxidative status, plasmatic hormones and fertility were evaluated.

Results and discussion: Results indicated that oral administration of PTU brought out the hypothyroid status characterized by a significant increase of TSH along with the reduction of T3 and T4 compared to normal control. PTU also lowered genital sex organs weight, sperm count, viability and motility, plasmatic levels of luteinizing hormone, follicle-stimulating hormone and testosterone and, increased prolactin, cholesterol and testicular oxidative stress. Alterations in sperm morphology, testis histology and fertilization potential were also noticed. Co-administration with *A. melegueta* extracts successfully reversed PTU-induced reproductive complications without any effect on TSH and thyroid hormones.

Conclusion: These results provide evidence that *A. melegueta* extracts have a protective effect on fertility in hypothyroid status.

Keywords: *Aframomum melegueta*, fertility, hypothyroidism, oxidative, rat, stress, testis.

NGONKEU L M Eddy

Relaunching of wheat production in Cameroon and processes for bread 'made in Cameroon'

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Background and methods: Wheat is a strategic crop for a country's security and stability. This basic commodity is the most consumed food before rice, maize or cassava. It is a rich cereal made of 70% starch, 10 to 15% proteins and 8 to 10% pentosans. This cereal is highly used in flour processing as well as bread, spaghetti and beer making. Moreover, it is at the root of the prosperity of the food and animal industry all over the planet. However, wheat flour importation in Cameroon heads over 145 billion FCFA for over 850 000 tons of flour. After a basic participatory diagnosis, we identified the causes and understood the reason behind this mess since the closure of SODEBLé in Cameroon, a real currency chasm for the country. Fortunately, research has overcome weather challenges and improved production technics.

Results: Since 2013, about 20 improved and promising varieties adapted to the different agroecological zones of Cameroon have been developed; these varieties can produce about 2 to 4 tons/ha of grains against 75centners/ha in 1981. A biofertilizer has been developed to produce biologically grown wheat; with regards to quality, gluten levels have been corrected in certain varieties. Production processes for bread 'made in Cameroon' are on the way to obtain patents at OAPI.

Conclusion: Performance of the improved varieties in terms of yield and tolerance to biotic and abiotic constraints has been optimized with biofertilizers. This study will enable the relaunch of wheat farming in all the agroecological zones of Cameroon. The vulgarization of the selected and adapted varieties would bring about better availability and access to this cereal for Cameroonians and a reduction of Cameroon's dependency on importation.

Keywords: improved varieties, organic fertilizer, processing, bread, vulgarization, wheat.

MBOG MBOG Séverin

Evaluation du niveau de prise en compte des aspects Hygiène, Sécurité et Environnement (HSE) au sein d'une industrie de savonnerie : Cas du Partenaire Financier avec Christ (PAFIC)

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The general aim of the study carried out within the soap factory during six months was to assess the level of consideration of health, safety and environmental aspects (HSE), as well as to identify the risks within the plant. the Company called PAFIC with an action plan.

In this perspective, the methodology used to conduct the present work is based on the documentary review of all the work related to this subject. Moreover, the data collection was done through semi-structured interviews, administration of the questionnaires, direct field observations and shots to support these analyzes.

Results: It appears that hygiene and safety measures exist but are insufficient and suggest the poor state of the art of soap. Interviews with one hundred and twenty-seven employees show that 20,7% of employees have a notion in HSE, 79,3 % of employees have no notion in HSE, 86,5% have a notion in hygiene, 51,4 % have a concept in hygiene safety, 15,3 % have a concept in environmental hygiene, 12,6 % have a concept in a safety environment, 58,87 % of PPE are non-compliant. According to the activities carried out in the various work units, 41,73% were found during six months with occupational accidents, 14,96 % are victims of occupational diseases, 27,55 % suffer from other diseases, 15,73 % have no case cited above. According to the forty-three (43) risks identified for seventeen (17) activities, the risk varies with 62,79 % majority in the workplace. However, no HSE action plan has been considered.

Keywords: HSE, Activity, Industry, soap making, PAFIC.

NGUEGUIM F. Derrick

Parasites diversity of farmed Oreochromis niloticus fish in the West region of Cameroon

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Background and methods: parasitic diseases are among the leading causes of farmed fish unproductiveness worldwide. The impact of parasitism is usually worsened by the jeopardizing effect of some farm, animal and management-related factors. Therefore, a cross-sectional study was undertaken between December 2018 and December 2019 in the West region of Cameroon to determine parasites fauna of farmed tilapia (Oreochromis niloticus). A semi-structured questionnaire was administered to 51 fish farmers to collect data on farm and management characteristics. At the same time, 969 fish specimen were collected from 9 fish farms and examined for ecto- and endo-parasites.

Results: The study revealed that the fish farming system is mixed in the region with *Oreochromis niloticus* being the predominant fish species (100%) farmed under a semi-intensive system in earthen ponds. Fish parasites recovered were firstly the helminth namely *Acanthocephalus* spp. (2.8%) in the intestines, *Cappilaria* spp. (1.3%), Eustrongyles (1.1%), *Contracaecum* spp. (0.4%), and the monogeneans *Gyrodactylus* spp. (11.5%) and *Dactylogyrus* spp. (4.6 %). Secondly, the parasites were the protozoa *Myxozoa* spp. (10.5%) and *Trichonella* (4.6%). Thirdly, the crustaceans *Argulus foliaceus* (5.4%), *Ergasilus sielboldi* (4.9%) and *Lernea cyprinaceus* (2.6%) on the eyes, gills, operculum and skin were also found. The fish infestation rate in the dry season (42.80%) was significantly higher ($p < 0.05$) compared to the wet season (24.49%). Females were highly infected (61.6%) than males (38.4%).

Conclusion: The parasitic fauna of farmed *Oreochromis niloticus* in the West region is diversified, and made up of helminths, protozoa and crustaceans. Ectoparasites are those with a higher infection rate.

Keywords: ; farmed fish, infection rate, parasites, West region.

DJUISSI MOTCHEWO Nadège

Reproductive characteristics, serum metabolites and oxidative status in the female guinea pig (Cavia porcellus) feed with ethanolic extract of Dichrostachys glomerata

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Background and methods: *Dichrostachys glomerata* is an aromatic plant from Fabaceae family, used in traditional medicine for the treatment of infertility in men. The paucity of scientific results on D. glomerata effects in animal production, especially on reproduction motivated this work. Forty-eight adult female cavies 4 months old, averagely weighing 400 ± 10 g were divided into four groups of 12 cavies each. Group 1 (control group) orally received daily distilled water and group 2 to 4 received by the same method 50; 100; 200 mg/kg body weight of *D. glomerata* extract respectively. The experience lasted 90 days, including 60 days of gestation. At the end of the treatment, data were collected on reproductive characteristics, serum metabolites and oxidative stress markers.

Results: Results revealed that ethanolic extract of *D. glomerata* had induced significant ($p < 0.05$) decrease of the number of post-implantation resorption, the total number of resorption and ovaries weight. Animals exposed to 100 and 200 mg/kg b.w. showed a significant ($p < 0.05$) increase number of foetus per dam, viable foetus and placenta weight relative to control. The serum level of progesterone significantly ($p < 0.05$) decreased at 200 mg/kg b.w. the treated group as compared to other *D. glomerata* treated groups. The extract at 100 mg/kg b.w. showed a significant ($p < 0.05$) increase of fœtus weight, fœtus and rump length relative to control. *D. glomerata* at 100 and 200 mg/kg b.w. increased the level of AST and urea compared to control. Catalase activity significantly ($p < 0.05$) increased in control as compared to *D. glomerata* treated groups.

Conclusion: In conclusion, ethanolic extract of *D. glomerata* minimized reproductive stress and subsequently improved the guinea pig reproductive performances.

Keyword: *Dichrostachys glomerata*, oxidative stress, reproduction, serum metabolites.

ESSOME SALE Charles

Evaluation of antifungal activities of Thevetia peruviana extracts against three strains of Phytophthora colocasiae, the causal agent of late blight of taro (Colocasia esculenta (L.) Schott) in Cameroon

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Objective: Taro leaf blight caused by *Phytophthora colocasiae* is the most devastating disease in taro production in Cameroon since one decade now. This study was conducted to evaluate the antifungal activities of extracts from *Thevetia peruviana* seeds on the *in vitro* growth of the fungus as well as on detached taro leaf fragments infected artificially.

Methodology and Results: Aqueous and methanolic extracts of *T. peruviana* were prepared and used at concentrations of 12.5, 25, 50 and 100 mg/ml. *P. colocasiae* was isolated from infected taro leaf cultivars "Macumba or Ibo coco" located in three different regions: west, Littoral and Centre region. The different explants were put in V8 agar medium and maintained in pure culture from which a suspension of 5 x 104 sporangia/ml was prepared. Mycelial fragments of *P. colocasiae* of about 0.8 cm in diameter were cut and placed in sterile Petri dishes containing Potato Dextrose Agar (PDA) medium supplemented with different concentrations of plant extracts and incubated at 23±1°C for seven days for the evaluation of the radial growth. *In vivo* sensitivity of the pathogen to plant extracts was done by application of 20 µl of sporangial suspension followed by 20 µl of each extract. The results obtained showed that the methanolic and aqueous extracts have completely inhibited the growth of the strains of West and Littoral at 25 mg/ml while total inhibition of the pathogen was not obtained with strain Centre region. No symptoms were observed on leaf fragments that received a drop of the fungus and aqueous extract.

Conclusion and potential application: The aqueous extract at the concentration of 25 mg/ml inhibited the in vitro radial growth of *P. colocasiae*, and significantly delayed the development of the disease on leaf fragments. This extract, active against *P. colocasiae* could be used as an alternative to fungicides for the control of taro leaf blight.

Keywords: antifungal activities, extracts of *Thevetia peruviana*, , *Phytophthora colocasiae*, taro.

FOKAM Paul Ernest

Radio-sensitivity of two watermelon varieties (Citrullus lanatus), the most cultivated and the most marketed in Cameroon to different doses of gamma radiation

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Genetic improvement by induced mutagenesis appears today alongside hybridization as an alternative method of creating new varieties of plants. However, the success of this approach is determined by the application of an appropriate and ideal dose of mutagen. In Cameroon, watermelon (Citrullus lanatus) is one of the most popular fruits of the populations, but its extreme sensitivity to parasites and climatic hazards makes its cultivation demanding chemical inputs which can have negative impacts on human health and the environment. No improvement study by induced mutagenesis has been carried out for watermelon. The present study, therefore, aims to assess the sensitivity of the two most cultivated and most commercialized watermelon varieties in Cameroon to gamma radiation from 60Co to determine an optimal dose or lethal dose 50 for the induction of the genetic variability necessary for improvement. Thus the seeds of these two varieties of watermelons (Kaolack and Crimson sweet) were irradiated with five doses of gamma radiation (100, 200, 300, 400 and 600 Gy) at the International Atomic Energy Agency in Austria. These seeds were cultivated in a greenhouse following a completely randomized block system with three replications and certain parameters such as germination rate, survival rate and the size of the plants were evaluated. Data are analyzed to estimate the ideal dose of LD50. The results show that the two varieties studied are radio sensitives. This radiosensitivity is clearly expressed at the level of the parameters evaluated, where the values decrease with the increase of irradiation dose. Germination showed high rates of 90% and 75% respectively for the Kaolack and Crimson sweet varieties for control and the lowest rates were 35% at 600 Gy for the Kaolack variety, and 30% at 400Gy for Crimson sweet. There is no lethal dose, however, the results of linear regression analyses based on the shoot length analysis allowed to estimate the lethal doses 50 for each variety which is respectively 225.40 Gy and 221.56 Gy for Kaolack and Crimson sweet. These two doses being close to 200 Gy, the 200 Gy dose is considered to be the optimal dose and will be applied for the induction of the genetic variability of these varieties of watermelon.

Keywords: gamma radiation, induced LD50, mutagenesis, radio-sensitivity, watermelon.

FONOU Lavoisier

Effects on photoperiod on the sexual cycle of African Giant Rat (Cricetomys gambianus: Waterhouse)

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Photoperiod is well know to affect reproduction functions such as the sexual cycle. The present work aimed to evaluate the effects of photoperiod on sexual cycle of African Giant Rat. This study was conducted during four weeks at the teaching and research farm of the University of Dschang. Twenty-eight animals were assigned to four treatments (24 h light / 0 h dark, 18 h light / 06 h dark, 12 h light /12 h dark and 0 h light /24 h dark) with a comparable weight. Animals were housed individually and fed ad libitum. Studies parametres were the duration of the sexual cycles and also feed intake, body weight, weight gain. Growth parameters were recorded weekly while the duration of the sexual cycles was performed using the vaginal smears method, which was carried out daily between 07: 00 and 08: 00 a.m and observed under a microscope. Results showed that photoperiod didn't has significant ($p>0.05$) effect on growth parameters, but an upward has observed in animals submitted to long daily light exposure. Photoperiod didn't affect sexual cycle duration but seem to drop with increasing daily light exposure. Regardless of treatments, duration of the sexual cycle has ranged between 5.5 and 6.4 days and showed an irregular pattern. The maximal oestrus duration was 1.67 day (40 hours). In the future, further studies are necessary to investigate the effects of photoperiod on real fertility of AGR.

Keywords: African Giant rat, growth parameters, photoperiod, sexual cycle, vaginal smears.

BIEKOP M.F.Herman

Phytochemical and in vivo antisalmonellal activity of Zehneria scabra on Salmonella enteritidis

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Background and methods: Salmonellosis remains endemic and still poses health problems both in farm animals and humans in developing countries due to the misuse of antibiotics and, or the emergence of drug-resistant Salmonella. Therefore, the need for new means of treatment is obvious. Medicinal plants are a good source for the production of new substances accessible to all layers of the society. Thus, the leaves of *Zehneria scabra* were air-dried, powdered to coarse particles and submitted to aqueous, ethanolic and hydroethanolic extraction. Phytochemical screening was then performed using standard methods. The in vivo antisalmonellal activity of the leaves extracts was carried out using *Salmonella enteritidis*-infected quail's model.

Results: Phytochemical screening of extracts revealed the presence of flavonoids, phenol, tannins, and triterpenes in all the extracts while alkaloids, steroids and anthraquinone were absent. The oral administration of the ethanolic extract (most active extract) showed a dose-dependent decrease of the bacterial load as the extract at 37, 18 and 9 mg/kg bw were able to eradicate the salmonella infection after 9 to 13 days of treatment. The infection resulted in a significant increase in serum levels of ALAT, Triglycerides, Total Cholesterol and White Blood Cells.

Conclusion: The leaves extract of Z. scabra was effective against Salmonella in quails (therapeutic dose: 37mg/kg bw) and showed no toxicity. This plant can be recommended for the treatment of *Salmonella enteritidis* in poultry and other susceptible animals.

Keywords: antisalmonellal, phytochemical screening, quails. *Zehneria scabra*.

KIAMBON Tarcey

In vivo antihelmintic effect of ginger (Zingiber officinale) powder on the parasitic load and biochemical parameters of pigs experimentally infected with L3 nematode larva

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Background and methods: Antihelminthic resistance remains a major hindrance to effective animal productivity. Therefore, there is a need to seek for alternative medicines against helminths. This includes plant derivatives which are more ecofriendly and readily affordable. The objective of the work was, therefore to evaluate the anthelmintic effect of *Zingiber officinale* (ginger) powder on the parasitic load and biochemical characteristic of pigs experimentally infected with gastrointestinal nematodes. This experiment consisted of 24 pigs of about two months old and of approximately equal weights. The pigs were divided into four groups of 6 pigs each: Group 1 (T0-, the negative control) was infected with 2500L3 larva and not treated; Group 2(T0+, the positive control) was infected with the same number of the larva and treated with albendazole; Group 3(T1) was infected with the same number of larva but treated with 250g of ginger powder; Group 4(T2) was infected with same larva number and treated with 500g of ginger powder. Drug treatment was administered at least 7 weeks after parasite inoculation when the egg load was at least 200 epg in all animals. Egg load was then monitored twice a week for three months. Serum samples were collected and examined using standard methods.

Results: Ginger(T2) significantly (P≤0.05) reduced the parasitic load of *Strongyloides ramsomi* and Strongyle eggs at 48hrs, 1 week, and 7 weeks post-treatment. T2 was most efficient as it recorded the lowest mean egg per gram of faeces (epg) throughout these three periods followed by T1, T0+ and T0- respectively. At the 2nd week post-treatment, the urea value (26.45mg/dl) was significantly reduced with T2 compared to T0+ (30.19mg/dl). T2 also recorded the smallest values for ALAT, ASAT, Total cholesterol, red blood cells, haematocrit, haemoglobin, and mean corpuscular volume (mcv) for all collections. There was a significant increase (P≤0.05) in creatinine and albumin values with T0+ throughout the four collections. T2 recorded the smallest values for total protein, albumin and globulin for all the four collections. T0- constantly recorded the highest values of ALAT, ASAT and Total cholesterol for all the four collections.

Conclusion: Ginger powder can therefore be used as an antihelmintic since it was more, effective than the reference drug (albendazole) and did not show any toxicity but rather improves the renal and hepatic functions.

KUATE TUEGUEM W. Norbert

Stimulating effects of Foliar Application of 24-Epibrassinolide on Growth and Induction of Resistance of Maize Plants to Helminthosporiosis

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This work evaluated the role of 24-epibrassinolide (EBR) on the growth and resistance of two maize varieties CMS 90-15 and CMS85-01 to helminthosporiosis in natural conditions. The experiment used completely randomized factorial split-plot consisting of five treatments and two varieties repeated three times each. The study was carried out during two successive seasons of 2015 and 2016. The agro-morphological, epidemiological and production parameters of the maize plants were evaluated under the application of the treatments used. The results showed a significant effect of EBR on plant growth, yield, disease resistance, synthesis of secondary metabolites and defense proteins and a significant correlation between all parameters evaluated ($p<0.05$). EBR significantly reduced grain losses, promoting a gain of about 1.5 t/ha compared to the control and NPK treatments with 1 t/ha for the two varieties studied. Its effect on maize greatly reduced these verities with a technical efficiency of 42.3 % for the variety CMS 90-15 and 37.3 % for the variety CMS 85-01. It also induced resistance of plants to helminthosporiosis, synthesis of secondary metabolites and defense proteins. These results show that 24-epibrassinolide could be used in the control of helminthosporiosis in cultivated plants.

KWAYEP NYAH Cédric

Energetic production requirements of giant Gambia rat (Cricetomys gambianus)

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Background and methods: The present study was carried out between December 2017 and June 2018 at the teaching and research farm of the University of Dschang to evaluate the growing energy needs in giant rats (Cricetomys gambianus). Forty young cricetomys including 20 males and 20 females aged 3 months, of comparable live weight (352.72 ± 79.27 g) were randomly divided into four lots (T1, T2, T3 and T4) of 10 animals including 5 males and 5 females in individual cages. All animals were fed R1, R2, R3 and R4 containing respectively 3600, 3800, 4000 and 4200 Kcal/kg of energy level and corresponding to the 4 batches respectively. Throughout the study (7months), animals of the set (T1 ,T2, T3 and T4) were fed with R1, R2 ,R3 and R4 containing each as energy level 3600,3800,4000 and 4200 kcal/kg.DM respectively. The studied parameters were feed intake, the evolution of live weight, weight gain, consumption index, feeding efficiency, body measurement, and the total concentration of proteins, albumin, globulin, cholesterol and triglycerides.

Results: The main results showed that regardless of sex, the AC, PV were comparable and higher ($P < 0.05$) in rats fed R2 diets and R3 relative to the R1 and R4. Body measurements were significantly higher ($P < 0.05$) for snout length in R2 rats (2.45 ± 0.01 cm) and tail diameter in R4 females (1.54 ± 0.18 cm). In females, GB, HGB and HCT levels were comparable and higher ($P < 0.05$) in R2 treatments and R3 compared to those of and. As for biochemical parameters, only the albumin content was significantly ($P < 0.05$) higher in R2 females compared to animals in the other lots.

Conclusion At the end of this study, the best zootechnical performances of the Gambian rat, were obtained with energy level 3600 Kcal / Kg MS.

Keywords: biochemical parameters, Gambia rat, growth performance, hematological parameters.

NGATA N. Laurence

Evaluation of the quality and quantity of tomato fruit (Lycopersicon esculentum Mill.) exposed to chemical fertilizers and pesticides

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Tomatoes are the most consumed vegetable and food in the world after potatoes. However, its production is subject to several constraints. The purpose of this work on the campus of Yaounde I University was to assess the effect of the use of chemical fertilizers and pesticides in tomato production. A variety of tomato (Rio Grande VF) was used, six (6) treatments namely T0 Witness ; T1 - N(12) P(11)K(18) - 2, 7 MgO - 20 S (complex chemical fertilizer) ; T2- Plantineb (Chemical fungicide-nematicide) ; T3- Furaplant Super (Chemical Insecticide); T4 - (N(12)P(11)K(18) - 2, 7 MgO - 20 S - Plantineb 80 WP - Furaplant Super - Cyperplant 100 EC) and T5 - Cyperplant 100 EC (Chemical Insecticide) were applied in a fully randomized block device.

Growth parameters (height, number of leaves, leaf surface) yield, different diseases and biochemical tests on harvested fruit were evaluated. The T4 treatment showed better results in average plant height (34.88 cm), leaf number (8.69 - 0.16), leaf area (40.9 cm2) and yield (18.73 t/ha). In terms of diseases, T2 plants were most attacked by bacterial wilt, T3 by fusariosis and T5 by leaf coil virus.

After evaluating the biochemical tests, it appears that the T4 treatment showed the best result for total protein content (1.73 mg/g of Fresh Matter) than in T0 (1.12 mg/g MF). The T0 control (24 mg/g of MF) showed the best result for total sugar content, and the lowest content was observed in T2 (10 mg/g MF). These results show that the use of chemicals in the production of Rio Grande tomato is a contributory approach to increasing production yield but is derailing fruit quality.

Keywords: chemical fertilizers, chemical pesticides, *Lycopersicon esculentum* Mill., sugars,proteins

KOUAM K. Marc

Brucellosis as a veterinary and public health risk on cattle farms in Nde Division, Cameroon: a prospective study

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Background and methods: Brucellosis, a zoonotic disease, is an economically important disease in livestock production. It is involved in reproductive problems both in humans and livestock. Thus, the objective of the study was to assess the occurrence of this disease on cattle in Nde division, one of the highest cattle production areas of the West region. To this aim, the disease was clinically diagnosed through a questionnaire survey (for disease history) and direct examination of animals. Then, 400 and 92 serum samples were respectively collected on cattle farms and the municipal slaughterhouse of the Division, and analyzed using the Rose Bengal test.

Results: Brucellosis is locally known as "Bakaklé". The following clinical signs of brucellosis were reported by farmers: abortion (53.33% (24 out of 45), placental retention [40% (18 out of 45)], hygroma [31.11% (14 out of 45)], and infertility [73.33% (33 out of 45)]. Also, 80% (36/45) of farmers reported drinking crude, unpasteurised milk as food. Two clinical cases were recorded on the field during the survey: one case of placental retention on a farm and one case of hygroma at the municipal slaughterhouse. The seroprevalence was 15.5 and 23.9%, respectively on farms and the municipal slaughterhouse. The seroprevalence varied per Subdivision, and two groups could be distinguished based on the level of infection: group 1 (Tonga, Bazou and Bassamba) with relatively higher seroprevalence from 20 to 27.6%, and group 2 (Bangangté), with a smaller seroprevalence (7.7%).

Conclusion: Though the rose Bengal test is a screening test, the reported and observed clinical signs of brucellosis suggest that this zoonotic disease is endemic in the Nde Division. Given that brucellosis is a reportable disease, we recommend that a well designed epidemiological study using specific diagnostic tests be conducted throughout the West region to conclude on the true status of this disease in the region.

Keywords: cattle, brucellosis, Nde Division, seroprevalence, zoonosis.

MEFFOWOET C. Prisca

Parasites diversity of an edible African giant snail (Achatina fulica) in tree locality of Cameroon

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Background and methods: snails occupied a very important place in the mass of game increasingly farmed and consumed as food or otherwise used for their multipurpose health benefits. Yet little data on their diseases are available in Cameroon. to identify the parasites likely to infest the edible African giant snail (*Achatina fulica*) in Cameroon, a total of 240 snails were sampled in three localities of the Littoral, West and Center regions during the dry and rainy seasons. The snails were macroscopically observed, then clean and dissected. The hepatopancreas, digestive tract, sex organs, slime and haemolymph, were isolated and examined using the flotation and direct smear techniques.

Results: Seven-teen parasite species were recorded which included; *Trichodina achatinae* (7.1%), cyst of *Balantidium coli* (17.1.7%), *Strongyloides stercoralis* (4.2%), kyst of *Isospora* sp. (13.8%), the larva of *Enterobius vermicularis* (9.2%), mesocercariae of Alaria sp. (12.1%), cyst of *Cryptosporidium* sp. (12.1%), cyst of *Enteromonas* sp. (7.1%), the larva of *Angiostrongylus cantonensis* (2.9%), the larva of *Protostrongylus* sp. (1.2%), an egg of *Fasciola* sp. (4.2%), an egg of *Hyostrongylus rubidus* (0.8%), unidentified mite (2.5%), *Ricardoella limacum* (1.2%), an egg of *Globocephallus urosubulatus* (0.4%), an egg of *Dicrocoelium dendriticum* (1.7%) and egg of *Schistosoma mansoni* (0.4%). Of the 240 snails sampled, 114 (47.5%) were infested, that is 66 (36.7%) during the rainy season and 48 (80.0%) during the dry season. The highest infection rate was found in protozoa (32.9%), followed by a nematode (15.8%). The most infested host were snails collected in Lekie (51.2%), followed by snails from Santchou (46.2%) and finally snails from Wouri (45.0%). The weight has a significant influence on the infection rate of the parasite ($p < 0.05$).

Conclusion: The edible snail *A. fulica* is a carrier of many parasites, some of which are known to be zoonotic. The host-parasite relationship between the snails and the recorded parasites needs to be studied, and the impact of these parasites on snail productivity evaluated.

Key words: *Achatina fulica*, Cameroon, infection rate, parasites.

MEKUIKO WATSOP Hippolyte

Effect of the Callistemon viminalis essential oil on the in vitro digestibility of Pennisetum clandestinum hay on the Djallonké sheep

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Background and methods: This investigation was conducted to evaluate the potential of using *Callistemon viminalis* the essential oil to improve ruminal fermentation and feed digestibility of *Pennisetum clandestinum* hay in Djallonké sheep. The study was undertaken at the Experimental Farm, and in the Laboratory of Animal Production and Nutrition of the University of Dschang. Sheep ruminal fluid was used for this study. Essential oil was extracted from the leaves of *Callistemon viminalis* by the hydrodistillation technique. Ration included *Pennisetum clandestinum* hay (90%) and concentrates (10%). Four doses (0, 100, 200 and 400 mg/kg of dry matter) of this essential oil were used during the incubation of different rations. The in vitro digestibility was evaluated by the Hohenheim Gas Method.

Results: The results of this study showed that the gas production (GP) after 24h of incubation, volatile fatty acid (VFA), metabolizable energy (ME) and the *in vitro* digestibility of the organic matter (IVDOM) of the *P. clandestinum* hay significantly increased ($p<0,05$) with the addition of 100 or 200 mg of essential oil of *Callistemon viminalis*. The highest values of these parameters (34.21ml/500 mg; 0.75 mmol/40 ml; 7.7MJ/kg DM and 54.33% respectively) were obtained with the ration containing 100 mg essential. The addition of 400 mg of this oil significantly ($p<0.05$) lowered the concentration of these components. The microbial mass (MM) significantly ($p<0.05$) dropped with the addition of the essential oil of the leaves of *Callistemon viminalis* in the rations.

Conclusion: This study shows that the addition of 100 or 200 mg of essential oil of *Callistemon viminalis* leaves per kg of dry matter in the rations-based of the *Pennisetum clandestinum* hay contributes to improve ruminal fermentation and feed digestibility in Djallonké sheep.

Keywords: *Callistemon viminalis*, essential oil, *In vitro* digestibility, *Pennisetum clandestinum* hay.

MOLO Thierry

Assessment of the risk of genetic flow between cotton and gombo: species related through hybridization

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The mastering control of the parameter in thecotton sector in Cameroon such as the resistance of the *Helicoverpa armigera* caterpillar to pyrethroids, of the whitefly, aphids to oaganophosphorus, and the grassing gave way to the introduction of Bt cotton in 1992 by Bayer. Crop. Science firm. However, this was done without the environmental risk assessment. As a follow up to this, the present study assessed the risk of contamination between cotton and okra through hybridization. Methodology and Results. To achieve this, a study of the flower and that of the flowering of each species was made, and then a hybridization between the two species was carried out in both direction. The two plants have all the characteristics of Malvaceae that of cotton refers to *Gossypium hirsutum*, while that of okra refers to Abelmoschus esculentus. Flowering in the cotton plant began 65 days after sawing and took 62 days for the Q 302 variety while that for the L 484 variety began 68 days after sawing for 68 days. The flowering progresses from the base towards the end of the fruiting branches in the horizontal direction on the same branch and the vertical direction on the successive branches in the identical position. In okra, flowering began 32 days after sowing for 28 days. The direction of the floral progress is vertical to the axis of the leaf. Interspecific crosses in both directions resulted in failures occurring three days after fertilization when the okra is a female parent. The intrachromosomique crosses all showed fruit set rates without any significant difference. **Conclusion and potential application**: The interspecific crossing between *Gossypium hirsutum* and *Abelmoschus esculentus* and vice versa in the opposite direction fails. These results must be taken up in the Nord Cameroon region because the environmental factor could be one of the causes of the results.

Keywords: *Abelmoschus esculentus*, GMO, *Gossypium hirsutum*, hybridization,

MOUCHILI Mama

Effects of fertilization levels of poultry manure and cutting times on Moringa oleifera production

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Background and methods: The effect of different fertilization levels of poultry manure and cutting times were evaluated on the growth of *Moringa oleifera* Lam in western Cameroon from 2017 to 2018. *Moringa oleifera* seeds originating from Northern Cameroon were soaked for 12 hours in cold water and sown on plots of 3 m2 made on a clay texture soil. A factorial design comparing six levels of poultry manure (0, 50, 100, 150, 200 and 250 kg N/ha) and three cutting times (4, 6 and 8 months) in four replicates was used. One month after sowing, fertilization was done. At each cutting time, 20 plants were collected per treatment for height and diameter measurements. Stem, leaf and whole plant of *M. oleifera* biomass were assessed on each plot based on the level of fertilization of poultry manure and cutting times.

Results: The results showed that irrespective of the cutting time, the highest plant height and diameter were obtained with 200 kg N/ha (160.37 cm and 2.37 cm respectively). The biomass of stems, leaves and the entire plant increased with the level of nitrogen fertilization. The best biomass was obtained at 6 months of cutting and with 200 kg N/ha (1.51, 0.90 and 2.41 t MS/ha respectively for leaves, stems and the whole plant).

Conclusion: This investigation led to the characterization of secondary metabolites with several biological activities with some samples that could be useful in the process of drug discovery.

Keywords: cutting times, diameter and biomass, fertilization, height, *M. oleifera*.

NGATSI ZEMKO Patrice

Production of hydrolytic enzymes by Stictococcus vayssierei Richard (Hemiptera: Stictococcidae) during nutrition and the varietal response of cassava (Manihot esculenta Crantz) following infestation

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Background and methods: Cassava (*Manihot esculenta* Crantz) grown for its starchy roots, which ensure food security, is heavily attacked by the African Root and Tuber Scale (ARTS) *Stictococcus vayssierei* in Central Africa. Several control strategies have already been used. The natural defense of plants in the cell wall reinforced by the production of secondary metabolites is a promising approach. To detect the activity of some hydrolytic enzymes produced by the scale during its nutrition and to evaluate some biochemical markers for the defense of cassava varieties screened against *Stictoccoccus vayssierrei*; a comparative study on six cassava varieties, four improved and two local was conducted in the Central region of Cameroon. The completely randomized Fisher block design with four replications was used to screen varieties in the field.

Results: Scale insect is capable of producing the hydrolytic enzymes of the cell wall (cellulase, protease and amylase). The improved Excel variety (105.12 ARTS/P) recorded the highest average number of root scale per plant. High activity of catalase, phenylalanine ammonia-lyase and total cyanide in the tuberous root cortex was observed in improved varieties 96/0023 and 92/0057. The local variety Douma has a high content of phenolic compounds (phenols and flavonoids) and the highest yield (23.8±2.9 t ha-1). The production of secondary metabolites depends on the variety and level of ARTS infestation.

Conclusion: The improved varieties 96/0023, 92/0057 and the local variety Douma showed a high tolerance to ARTS attacks as well as a good response to the stress caused by the latter as did the improved variety Excel.

Keywords: an antioxidant enzyme, hydrolytic enzyme, *Manihot esculenta*, phenolic compounds, *Stictococcus vayssierei*, yield.

TCHAKOUNTE FRANK Mael

Effects of dietary calcium level on zootechnical performances of African giant snail Archachatina marginata

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Background and method: This study was designed to evaluate the effects of dietary calcium level on zootechnical performances of African giant snail *Archachatina marginata*. The snails were fed on 4 diets containing graded calcium content (12%, 14%, 16% and 18%) for thirty-two weeks. They were organized in completely randomized design replicated five times.

Résults: Growth performances were higher ($p<0.05$) with the highest calcium content in the feed (18%), followed by 16%. The cumulative mortality rate was higher (24.64%) in snails fed on a diet containing the lowest amount of calcium (12%), while snails fed on the highest calcium level (18%) recorded the highest survival rate (89.41%). Except for the body weight at the first laying, no significant difference was recorded between treatment groups for reproductive performances. The highest ($p<0.05$) number of eggs laid were recorded with 16% (27 eggs) and 18% (26 eggs) of calcium. Concerning carcass characteristics, the results revealed that the proportion of meat and shell increased with the increasing level of calcium in the ration. The highest shell yield (36.5%) were recorded with the highest content of calcium (18%). The highest viscera yield was recorded with the lowest calcium level (24.48%), while the proportion of the shell increased with increasing level of calcium ($R^2=0.9752$). The highest meat yield (45.70%) was achieved with 16% calcium, while the lowest meat (38.47%) and the highest shell yield (36.50%) were achieved with 18% calcium. Meat content in proteins increased ($p<0.05$) with increasing level of calcium from 45.85%, 50.52%, 55.22% to 57.30% respectively with 12%, 14%, 16% and 18% calcium. Meat content in fat and carbohydrates significantly ($p<0.05$) decreased with increasing level of dietary calcium.

Conclusion: It was concluded that the calcium needs for better growth and nutritional value of *Archahatina marginata* is 16% and 18% of the calcium in the diet about reproductive performances.

Keywords: *Archachatina marginata*, calcium, growth, reproduction.

TIOGUE TEKOUNEGNING Claudine

Preliminary data of Life history traits of Mormyridae (Actinopterygii: Teleostei) in Upper Sanaga River; Central Region of Cameroon

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Background and methods: The present study on the biocharacterisation of Mormyridae endogen fish family from Cameroun, was conducted between May and August 2015 in the Upper Sanaga, with the aim to its domestication. For this purpose, 125 specimens collected from local fishers were used. In the laboratory, fishes were identified and measured; feeding and reproductive parameters were obtained after dissection. At the end of the study, it appears that:

Results: The catch composition of four species of Mormyridae identified in the region was very low (between 17 and 30%). The mean total weight and total length were respectively 103.14 ± 37.83 g and 27.47 ± 4.84 cm. The minimum size (21.1 cm) was recorded from *Campylomormyrus phantasticus* whereas the maximum (43cm) was from *Mormyrus anguilloides*. The mean relative length and mass of the digestive tract were 0.35 ± 0.20 and 5.27 ± 23.20%, respectively confirming that Mormyridae fish species have a strictly carnivorous diet and consume prey that is difficult to digest. The size-frequency distribution of Mormyridae showed that the majority of the fish caught are small sizes in classes 23-26 and 26-29 cm in *C. phantasticus*, *Mormyrus macrophthalamus* and *Mormyrus tapirus*. *M. anguilloides* did not record small specimens; however, it recorded larger sized specimens (41-44 cm) compared to the rest. The sex ratio (ranged from 1M: 1.14F to 1M: 4F, mean 1M: 2.04F) has been generally in favour of females. The gonadosomatic index was generally low in all species. However, it was higher in females of *Campylomormyrus phantasticus* and *Mormyrops anguilloides* compared to other species. The hepatosomatic index was weakly correlated with the gonadosomatic index in these Mormyridae fish species.

Conclusion: This study let us know that there are several species of Mormyridae in the Sanaga River. More studies are needed to select domesticable species.

Keywords: diet, Mormyridae, reproduction, Sanaga River, size structure.

ZEKENG Jules Christian

Land use and land cover changes in the Doume communal forest of Cameroon: implication for its sustainable management

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Background and methods: Large-scale identification of land use and land cover change in a tropical forest is a challenge to landscape designers and forest ecologists. Here, Landsat images acquired during the years 2000, 2009, and 2018 were used to assess the spatial-dynamics of land use and land cover (LULC) during the last two decades (2000-2018) using the post-classification approach. A classification system composed of six classes – dense forest with (high tree density and low tree density), swampy Raphia forest, swampy flood forest and savanna were designed as LULC for this study. A maximum likelihood classification was used to classify Landsat images into thematic areas. Elsewhere, Landsat based LULC mapping, post-classification at the per-pixel scales and self-knowledge on the land cover change processes were combined to analyze LULC change, forest loss and change trajectories in Doume communal forest in eastern Cameroon.

Results: The results show that half of the study area changed in 2000-2009 and that the different types of LULC changes increased and involved more diverse and characteristic trajectories in 2009-2018 compared to 2000-2009. Degradation to a dense forest with low tree density and swampy Raphia forest was dominant, and the forest was mostly lost due to trajectories that involved conversion to agroforestry systems (10%), and a lesser extent due to trajectories that involved deforestation to grasslands (7%). About 99% of total LULC change involved multiple-step trajectories.

Conclusion: The trajectory analyses of this study showed important interlinkages between LULC and thus contribute to a more comprehensive analysis of LULC change and the drivers of forest loss. It is a necessity to further understand and account for such interlinkages and processes of change to guide management in more sustainable ways.

Keywords: Cameroon; Geographic Information systems; land cover changes; land management; land use Multi-temporal Landsat imagery; remote sensing; tropical rainforest;.

DONGMO NANFACK Albert Extraction, biochemical characterization and biocontrol activity of an aqueous extract and an essential oil of Tithonia diversifolia leaves against rice seed-borne pathogens *Department of Biochemistry, University of Yaounde 1, Cameroon* *adongmonanfack@yahoo.com*	**TOGUE KAMGA Fulbert** Comparison of two Numerical Schemes (Crank-Nicolson Scheme (C-NS) and Runge Kutter of order four): the case of one-dimensional dispersion phenomena in a coastal aquifer *Institute of Fisheries and Aquatic Sciences at Yabassi, University of Douala, Box 2701 Douala,* *Camerounkamgafulbert@yahoo.fr* *+237 690 980 854*	**DZOKOU Victor J.** Sustainable management of edible insects of Yaounde rural area: biodiversity, host plants and socio-economic interests *Phytopathology and Agricultural Zoology Research Unit, Crop Protection , 1aCrop Production, 1bAnimal Production, Faculty of Agronomy and Agricultural Sciences, University of Dschang, P.O. Box 222, Dschang, Cameroon* *victor.dzokou@univ-dschang.org* *+237 698710070*	**KEMKA NGUIMATIO F. Xavier** Preventive effects of Aframomum melegueta extracts on the reproductive complications of propylthiouracil-induced hypothyroidism in male rat *Animal Physiology and Phytopharmacology Laboratory, University of Dschang. P.O. BOX. 67, Cameroon.* *kemkaxavf@gmail.com* *(00237) 675026996/698725912*
AMOLA ADOUM Liouna Response surface methodology applied to the optimization of the preparation of activated carbons based on shea nut shells (vitellaria paradoxa), physico-chemical characterization *Laboratory of Noxious Chemistry and Environmental Engineering, Department of Chemistry, University of Dschang P.O. Box 67, Dschang, Cameroon* *amolaliouna@gmail.com* *+237657435627 +23752864589*	**BAPONWA Odile** Potential role of Musca domestica (Muscidae) and Lucilia sp. (Calliphoridae) in the propagation of enteric diseases in Maroua (Far North, Cameroon) *Department of Life and Earth Sciences, Higher Teachers' training College, University of Maroua, P.O. Box 55, Maroua, Cameroon.* *baponwaodile@gmail.com,* *+237698988196/+237677919873*	**SIPPING KEMEGNE Marius T.** Anti-tumor promoting effects of polysaccharides from Ganoderma resinaceum against Diethylnitrosamine induced Hepatocarcinoma in Wistar rats *Laboratory of Phytoprotection and Plant Valorization, Biotechnology Centre, University of Yaoundé I, P.O Box 3851, Messa-Yaoundé Cameroon* *marius.kemegne@gmail.com*	**NGONKEU L.M. Eddy** Relaunching of wheat production in Cameroon and processes for bread 'made in Cameroon *Institute of Agricultural Research for Development, PO BOX 2067 Yaounde Cameroon ; University of Yaounde I , PO BOX 812 Yaoundé Cameroun* *ngonkeu@yahoo.fr* *699872598*
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MEFFOWOET C. Prisca Parasites diversity of an edible African giant snail (Achatina fulica) in tree locality of Cameroon *Animal Physiology and Health Research Unit, Faculty of Agronomy and Agricultural Sciences, University of Dschang, P.O. Box 188, Dschang, Cameroon. Chekamprisca@yahoo.fr ; 699366311/676879291*	**MEKUIK WATSOP Hippolyte** Effect of the Callistemon viminalis essential oil on the in vitro digestibility of Pennisetum clandestinum hay on the Djallonké sheep *Department of Animal Production, School of Veterinary Medicine and Sciences, University of Ngaoundere, P.O. Box: 454 Ngaoundere, Cameroon. hippolytewatsop87@gmail.com Tel. +237 699 058 224*	**MOLO Thierry** Assessment of the risk of genetic flow between cotton and gombo. A species related through hybridazation *Genetic and plant breeding Unit, Department of Plant Biology. Faculty of Sciences, University of Yaounde1, P.O. Box 812, Yaounde, Cameroon thierrymolo@yahoo.fr +237 652340793/698578269*	**MOUCHILI Mama** Effects of fertilization levels of poultry manure and cutting times on Moringa oleifera production *Laboratoire de Nutrition Animale, Département des Productions Animales, FASA, Université de Dschang. B.P: 222 Dschang, Cameroun. mamamouchili@yahoo.fr Tél : (237) 674 90 56 53.*

NGATSI ZEMKO Patrice Production of hydrolytic enzymes by Stictococcus vayssierei Richard (Hemiptera: Stictococcidae) during nutrition and varietal response of cassava (Manihot esculenta Crantz) following infestation *Department of Plant Biology, Laboratory Plant Pathology, Faculty of Science, University of Yaoundé 1, Yaoundé, Cameroon* *ngatsipatrice@gmail.com* *(237) 675974551*	**NKUIKA FANYA Arnaud** Software of robotic factory for feed and concentrate n% *Independent researcher, Works validated by the Agricultural Research Institute for Development (IRAD) and recognized by the specialized services of the Ministry of Scientific Research (MINRESI) Cameroon.* *fanyaarnaud@yahoo.fr Tel. +237 697789204.*	**TCHAKOUNTE FRANK Mael** Effects of dietary calcium level on zootechnical performances of African giant snail Archachatina marginata. *Animal Production and Nutrition Research Unit, Department of Animal Sciences, Faculty of Agronomy and Agricultural Sciences, University of Dschang, Cameroon.* *frank.tchakounte@yahoo.com*	**TEMEGNE NONO Carine** Mycorrhization and soluble phosphate influence the growth and phosphorus content of Bambara groundnut (Vigna subterranea (L.) Verdc.) *Department of Plant Biology, University of Yaounde I, P.O. Box 812 Yaounde, Cameroon,* *carine.temegnenono@alumni.uliege.be, nonocarine2003@yahoo.fr* *Tel. +237 651 32 34 56*
TIOGUE TEKOUNEGNING Claudine Preliminary data of Life history traits of Mormyridae (Actinopterygii: Teleostei) in Upper Sanaga River; Central Region of Cameroon The University of Dschang, Faculty *of Agronomy and Agricultural Sciences, School of Wood, Water and Natural Resources; Laboratory of Applied Ichthyology and Hydrobiology, P.O. Box 786, Ebolowa ,Cameroun* *claudinetiogue@gmail.com*	**ZEKENG Christian** Land use and land cover changes in the Doume communal forest of Cameroon: implication for it sustainable management *1-Laboratory of Forest Ecology, Department of Plant Biology, Faculty of Science, University of Yaounde I, PO. Box: 812 Yaounde, Cameroon;/2-Department of Environmental Science, Faculty of Science, University of Botswana, Private Bag UB 0704 Gaborone, Botswana;* *juleschris006@yahoo.fr TEL: (+237) 697 754 244*		