PKFOKAM-CAP
CONFERENCES APPLIED SCIENCES PLATFORM

10th Edition of the KFokam Conference on Science, Technology, Economics & Management

13 – 15 June 2023
PKFokam at Emana Campus, Yaoundé – Cameroon

"KFokam conference & Journal: 10 years later. What have we missed? Are we on the right track? What next?"

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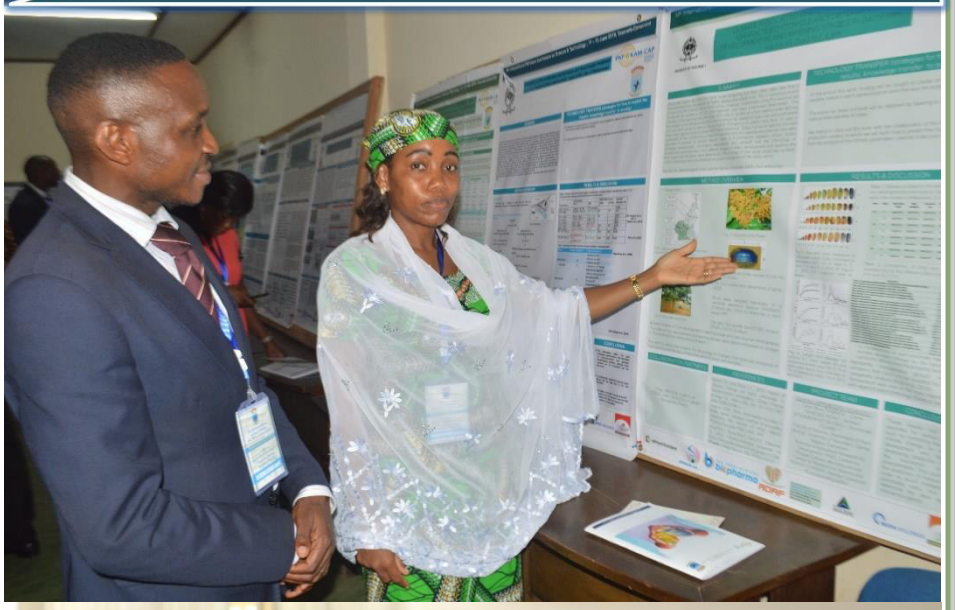

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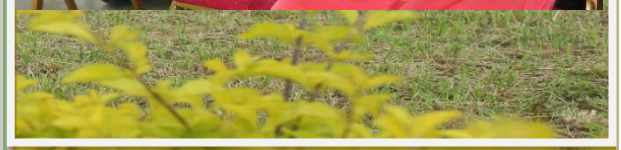

Conference Program 13 – 15 June 2023

	Tuesday, June 13	Wednesday, June 14	Thursday , June 15
7:30 – 8:30	Conference Check-in and Registration open	Conference Check-in	Conference Check-in
8:30 – 9:00	**Opening session** **Chair: Dr. Kamdem Nestor** Welcome messages: Prof. Dr. Thomas NJINE, the rector Prof. Dr. MEUTCHIEYE Félix, Chairman of the scientific committee	**Session 5** **Chair: Prof. Dr. NANA Paulin**	**Session 9** **Chair: Dr. Kamdem Nestor** Dr. MBOG MBOG Séverin ***(P.2)***
	Session 1 **Chair: Dr. BATE-EYA HANS**		
09:00 –9:20	Dr. TCHAKOUNTE Hyacinthe ***(P.6)***	Prof. Dr. MEUTCHIEYE Félix ***(P.28)***	MEDUEGHUE FOFOU Apollin ***(P.23)***
09:25 – 09:45	Dr. TCHE Jacob ***(P.67)***	Dr. FOKAM Paul Ernest ***(P.13)***	**Roundtable**: KFokam conference & Journal: 10 years later. What have we missed? Are we on the right track? What next? **Chair:** Dr. SIMO DJOM Maurice Prof. Dr. MEUTCHIEYE Félix Dr. TEMEGNE Carine Epse DJOB DJOB Dr. MBOG MBOG Sévérin Dr. KAMDEM Nestor
09:50 – 10:10	Dr. NGOMO Orleans ***(P.54)***	TOLEFACK KALZEMBO Christabel ***(P.15)***	
10:15 – 10:35	Dr. Gebremariam Birhanu ***(P.47)***	KANJAM Venissa Bi NSANGLI ***(P.26)***	
10:35 – 10:55	Coffee break		
	Session 2 **Chair: Prof. Dr. TOGUE KAMGA Fulbert**	**Session 6** **Chair: Dr. FTATSI MBETMI Guy-de-patience**	**Session 10** **Chair: Dr. FONKWA Georges**
11:00 – 11:20	NGADJUI N. Laurence ***(P.31)***	MBENG Ghislain NYEMB ***(P.38)***	ABBA GARBA ABBA Moussa ***(P.40)***
11:25 – 11:45	TIOGO KAMGNI S. Schuller ***(P.61)***	TADJUIDJE Jules Delain ***(P.37)***	KOMGUEM Francine Vanelle ***(P.49)***
11:50 – 12:10	WAKAYANSAM BOUBA Roméo ***(P.44)***	NGEONKOU Maxime Carlos ***(P.42)***	TCHAKOUAMO MATEFO Ornella Ingrid ***(P.50)***
12:15 – 12:35	Dr. TABAKAM TCHANGOU Gaétan ***(P.45)***	SOUBGUI MOGUEM Arlette Flore ***(P.43)***	ETOGA MBARGA Paul ***(P.56)***
12:40 – 13:00	NGOUANA TCHINDA Laura Scottie ***(P.27)***	DAWAYE AMANI Daniel ***(P.48)***	BAKAM YENGWA Berlise ***(P.57)***
13:00 – 14:00	**Lunch**		
	Session 3 **Chair: Dr. SIPPING Marius**	**Session 7** **Chair: Dr. TCHAKOUNTE Hyacinthe**	**Session 10** **Chair: Dr. NSOE MENGUE Jean Jacques Nestor**
14:00 – 14:20	WOTCHUEN Chanas ***(P.4)***	Dr. FTATSI MBETMI Guy-de-patience ***(P.3)***	Prof. Dr. DEFO Celestin **(P.16)**
14:25 – 14:45	TCHAMBA KEUWE Gérard ***(P.63)***	Dr. GNIDAKOUONG NGOUANOM R. Joel ***(P.10)***	Dr. FONKWA Georges ***(P.33)***
14:50 – 15:10	POSSI DJILA Franck Landry ***(P.59)***	Dr. NSOE MENGUE Jean Jacques Nestor ***(P.5)***	Dr. KPOUMIE NSANGOU Amidou ***(P.24)***
15:15 – 15:35	OLOUGOU ENYOE Noela Marie ***(P.32)***	KAFACK SOKENG ***(P.9)***	MVONGO DANG Victor ***(P.30)***
15:35 – 15:50	**Coffee break**		
	Session 4 **Chair: Dr. TEMEGNE Carine Epse DJOB DJOB**	**Session 8** **Chair: Prof. Dr. MEUTCHIEYE Félix**	**Closing session**
15:55 – 16:15	MENATCHÉ NJOPNU Joël ***(P.53)***	Prof. Dr. TOGUE KAMGA Fulbert ***(P.19)***	TEMGOUA Marc et al ***(P.8)***
16:20 – 16:40	MEPONG Franklin ***(P.58)***	Prof. Dr. NANA Paulin ***(P.21)***	**Guest speaker**: Mr. KAN African Somebodiness and Networking: Their importance for Science and Economy in Africa.
16:45 – 17:05	NOUBOU TAKAM Daïna ***(P.35)***	NANDOU TENKEU Muller ***(P.64)***	
17:10 – 17:30	EGBE Leonel Enow ***(P.11)***	MENINGUE Rosine ***(P.66)***	
17:35 – 18:35	Poster session - 1	Poster session -2	Prizes and closing remarks

Afriland First Bank

Scientific Commitee

Chairperson: Prof. Dr. MEUTCHIEYE Félix, University of Dschang,Cameroon
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Dr. TCHE Jacob, PKFokam Institute of Excellence
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Dr. KAMDEM Nestor, PKFokam Institute of Excellence
Prof. Dr. NJINE Thomas, The Rector of the PKFokam Institute of Excellence

World of welcome of the Chairperson of the Scientific Commitee

Dear valued and highly esteemed collaborators and participants,
It is a great honor to have you all again, new comers or regular attendees for this other PKFokam conference. This conference is the 10th edition which is a real milestone for the community of practices started few years back on this same PKFokam Institute of Excellence.

Beside the promotion of science turned into problem solving platform, time also gives room to strategic thinking and critical thinking in order to do better. The world is a wide space of giving and sharing, and indeed we are here together to bring and take along.

During this 10th anniversary occasion, your curiosity will be surely teased and we are all excited to see new ideas popping up for the better of human communities, here and there.

Again we are here to promote excellence particularly in togetherness. For this last reason, sessions will be intermingled to help interdisciplinary conversations throughout and beyond the conference.

While wishing you all the best stay in this fast growing evergreen Yaoundé, we do hope we all will enjoy and make this conference an event to be told! Feel at the best place to be during this few days!

Félix MEUTCHIEYE, PhD
Chair of the Scientific Committee (10th edition)

Dear colleagues, students, innovators, inventors and friends,
The main goal of the KFokam conference on Science,Technology, Economics and Management is to bridge the gap between theory and practice by stimulating a new motivation within the African ***«Sci-Tech»*** community worldwide. Our conference mobilizes researchers, scientists, engineers, inventors, and contributors who have shown commitment in various ***«technological arts»*** or ***«research activities»***. They are invited to share the results of their achievement during our conference, and more importantly to go beyond scientific publications by developing ***„spin-of“*** to translate the results of their research activities. In addition, high quality papers submitted to KFokam conference in full text are invited by the editors of the KFokam Journal of Applied Science, Technology, Economics and Management (https://www.kfokam-jast.org). It´is been 10 years already. We need to assess ourselves. ***What have we missed? Are we on the right track? What next?*** Thank you to all attendees of the 2023 KFokam conference.

Dr. KAMDEM Nestor
The conference coordinator
The Secretary General of the PKFokam Institute of Excellence.

MBOG MBOG Séverin

Design and Realization of a Pilot System for the Production of Gas and Very Low Voltage Electric Current using Biodiesel from the Recovery of Used Edible Oils

Poster – P1

Romaric Quentin Teunkoua Njiwa[1, 2]; *Séverin MBOG MBOG[1, 2*]; Dieudonné Bitondo[1, 2]; Ruben Mouangue[1, 2]*

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In recent years, international issues have mainly focused on energy issues and environmental preservation. Energy production from fossil resources accounts for more than 70% of total global energy production with negative environmental impacts. this work focuses on used edible oils, the impacts of which pose a problem for our environment; the spillage of one liter of these oils is estimated at 1000 m^2 of oily film on the surface of the water, thus preventing proper oxygenation of the latter. The objective of this study was to design and build a pilot system for the production of gas and very low voltage electricity using biodiesel from the recovery of used cooking oils. The methodological approach here has a particular interest for the methods of transesterification and thermoelectricity by Seebeck effect, implemented in real life after digital simulation of the system, for the realization of the pilot system. The results obtained show that the KOH catalyst has much more advantage than NaOH where we obtained a percentage of glycerin (34 %). The highest yield (89.82 %) is obtained with the KOH catalyst at a temperature of 65° C., a molar ratio of 6: 1 and a reaction time of 120 min; and in the electricity production phase, the results were low (5 volts) due to the thermoelectric components which have low voltage production efficiency and wind flows in the environment of the pilot system causing inconstancy of the flame leading to poor heating of the different modules. A constructive voltage boost solution has been provided to compensate for this variation in the heat flow in order to have a considerable voltage; this allowed us to reach 48 volts.

Keywords: Renewable energies; Biodiesel; Thermoelectricity; transesterification.

FTATSI MBETMI Guy-de-patience

Design and manufacture of a versatile mini 6-axis robot arm
Poster – P2

Ftatsi Mbetmi Guy-de-patience [1], Voudansou Mirkamdi Rodrigue [1], Tamo Chekam François Juvenaul [1]
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Background and methods: Robotics have significantly enhanced productivity, safety, and time efficiency in various industries by performing precise and consistent work. Moreover, robots help reduce the risk of injury or exposure to dangerous environments. In order to start mastering some robotics technology, we were interested in designing and manufacturing a versatile mini robot arm that can be used for training, and with multiple functionalities. In this project, design and manufacturing tools have been used.

Results: The mechanical part of our robot have been designed and simulated on the CAD software Solidworks. We then exported the needed files to manufacture the different parts with a laser cutting machine in a local plywood material. The corresponding assembling components and six servomotors have been mounted to the manufactured parts to obtained an assembled robot arm. For the control of this arm, an electronic circuit have been designed and simulated on Proteus software. Its artwork has been generated and its circuit board realized. The microcontroller has been programmed on Arduino IDE and the circuit mounted on the robot arm. The first tests bring some modifications to the prototype. After implementing the different needed corrections, and going through the manufacturing process again, we obtained good results.

Conclusion: The versatile mini 6-axis robot arm designed and manufactured have been tested successfully. It has a maximum working radius of 0,5m and can be obtained at the price of 100 000 cfa f. Later, we will integrate some artificial intelligence functions based on computer vision in our robot arm.

Keywords: Design and manufacture, mini 6-axis robot arm, training material, local materials.

Ing WOTCHUEN Chanas
Hoist system
Poster - P3

Ing Chanas WOTCHUEN

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A hoist system is a crucial device in the field of civil engineering, enabling the lifting and transportation of materials and equipment in a highly efficient and time-saving manner. Introducing this innovative project is a promising investment opportunity, as it addresses the growing need for productivity, work safety, and efficiency in the construction industry.

The primary objective of implementing a hoist system on construction sites is to significantly reduce the physical strain on workers by minimising manual labour. This not only results in improved overall productivity, but also leads to a considerable decrease in workplace injuries, thus promoting a healthier working environment.

Another noteworthy advantage of incorporating a hoist system into civil engineering projects lies in its remarkable ability to expedite work processes. By swiftly moving heavy materials and equipment between different levels on a construction site, the project's completion can be considerably accelerated, ultimately benefiting all parties involved.

Furthermore, the hoist system is designed using high-quality building and mechanical components, ensuring durability, resistance, and reliable operation throughout the project's lifespan. This guarantees an optimal return on investment, as the system's low maintenance requirements contribute to its cost-effectiveness.

In conclusion, the implementation of a hoist system in civil engineering projects is a highly profitable and advantageous venture, as it addresses the crucial factors of worker wellbeing, project efficiency, and speed of execution. By investing in this innovative solution, stakeholders can reap the benefits of enhanced productivity, safety, and accelerated project timelines in the rapidly evolving construction industry.

NSOE MENGUE Nestor

Antimicrobial activated carbon (E-Coli) based on silver nanoparticles for drinking water purification in rural regions

Poster – P4

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The aim of this study was to develop a filter material with the properties to inhibit microorganisms. Activated carbon (AC) was prepared from coconut shells using a physico-chemical process, followed by chemical activation with H_3PO_4 at 1.2 and 3 M. Silver nanoparticles (Ag-NPs) were prepared by the polysaccharide reduction method. Silver nitrate was used as the metal precursor and glucose as the reducing agent. Activated carbon (AC) granules were coated with silver nanoparticles by impregnating AC with a fixed concentration of Ag-NPs in supersaturated solution. The resulting AC and Ag-NPs/AC were characterized by methyl blue adsorption and the iodine index test gave the best results at activator concentrations of 2 M with values of 231.85 and 225 mg/g for MB adsorption and 965.2 mg /g and 977.9 mg/g iodine index for AC and Ag-NPs/AC respectively. The antimicrobial susceptibility of the synthesized Ag-NPs/AC was tested against E. coli (prepared as a suspension) using column techniques. The test was carried out at filter depths of 10 cm and 20 cm. At the outlet, the flow rate of the column was regulated and the turbidity measured at time intervals. Turbidity was used as an indicator of microorganism retention. The effect of contact time, flow rate and bed filtration depth on retention efficiency was examined. At an average flow rate of 0.062 ml/s, the outlet turbidity was 0.01 NTU, while the inlet water had an average turbidity of 0.85 NTU. The results reflects the high efficiency of Ag-NPs coated on AC granules for water disinfection by retaining microorganisms in a short time. Ag-NPs applied to AC granules showed an efficient effect in reducing bacterial turbidity of the bacterial suspension.

Keywords: coconut shell, activated carbon, silver nanoparticles, microorganism.

TCHAKOUNTÉ Hyacinthe
Design and Realization of a Solar Cocoa Dryer used in the Western Region of Cameroon
Poster – P5

Arnaud Nzendjang Mbakouop[1], Hyacinthe Tchakounté [2, 3,], Claude Nzoundja Fapi [2, 4, 5], Awoh Innocentia Ankungha[1]*

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Background and methods: The west region of Cameroon is a region whose climate allows the cultivation of a good number of agricultural products, notably cocoa. However, the drying of cocoa is currently carried out in a traditional way, which can cause losses of quality and quantity of the harvest. Our project therefore aims to improve the drying process by using an innovative solar dryer. After conducting a survey in the city of Bafoussam, which validated the problematic of the work, the design and implementation steps were undertaken. First, a solar dryer was designed according to the needs and constraints of the region. Then, the dryer was realized by using local materials and by taking care of its accessibility for the local farmers. The experimental part consisted in studying the characteristics of the drying air when it arrives in the drying chamber, that is, its temperature, humidity level, speed and flow rate as well as their evolution during a typical day.

Results: About 80% of the local farmers agreed with the need for a solar dryer as a solution to the problem of poor quality of their cocoa. The design and implementation of a solar dryer for cocoa in the west region of Cameroon was positive. The solar dryer has made it possible to dry cocoa in a more efficient and environmentally friendly way, using solar energy. With this dryer, we were able to dehydrate about 10kg of cocoa beans in an environment where the drying temperature reached an average of 55°C and the relative humidity about 60%. The moisture content after fermentation varied from 53.4% to 4.6% in two days of drying.

Conclusion: Results showed that the solar dryer improved the quality of the cocoa harvest, while reducing costs and environmental impact. This project illustrates the importance of technological innovation for sustainable development and the improvement of the living conditions of local populations.

Keywords: Solar dryer, local materials, cocoa, equatorial climate, design.

TCHAKOUNTÉ Hyacinthe
Photovoltaic Module Performance in a Tropical Climate: Case of the City of Bandjoun
Poster – P6

Hyacinthe Tchakounté [2, 3,] , Arnaud Nzendjang Mbakouop [1], Aimé Tchoffo,Claude Bertin Nzoundja Fapi [2, 4, 5]*

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Background and Methods: The city of Bandjoun is characterized by a hot and humid climate, with significant rainfall during the rainy season. It is therefore important to study the performance of a photovoltaic field in this environment before installing solar panels. The methods used to study the performance of the PV array consisted of measurements of the power output of the PV array, as well as measurements of the ambient temperature and humidity. Meteorological data was also collected to analyze the local weather conditions. Afterwards the diode model of solar PV module has been used to predict the energy production in the considered region.

Results: The results were analyzed using statistical tools to evaluate the impact of temperature and solar radiation on the performance of the photovoltaic field. The results of the study showed that the solar panels produced less electricity during periods of high temperature and high humidity. On average, the PV array efficiency was 12.3% during the study. However, it was observed that the yield could drop to 9.5% during periods of high temperature and high humidity. The results also showed that the temperature of the solar panels was higher than the ambient temperature during the hottest hours of the day. This explains this reduction in solar panel performance, especially in hot and humid climates.

Conclusion: This study shows the importance of adapting solar installations to local climatic conditions, and taking into account temperature and humidity variations to optimize solar panel performance. The results of this study can be useful for the development of solar energy in tropical climates. Recommendations were made to improve the performance and durability of the photovoltaic field in this tropical climate, taking into account the results of the study.

Keywords: Performance, solar photovoltaic, experimentation, tropical climate.

TEMGOUA et al

Design and implementation of a low cost CNC Machine for a start-up

Poster – P7

Temgoua Marc[1], Youmbi Marc[1], Zambou Steve[2], Tekou Tambou Lucien[1], Nematchoua Francis[1]

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In the manufacturing process there is more and more a need for higher accuracy and reduction of production's time in order to put in the market place competitive and cheaper products. In Africa continent in general, and in Cameroon in particular, many industrial domains like carpentry, welding, mechanic, electronics just to name a few, are not competitive in the international market due to poor design and finished products and to too much time consumption during the manufacturing phase; this cause a great dependence of Africa's industries on developed countries. It can be observed that the above constraints, namely accuracy, time consumption and precision in the final product are resolved in the western industries by the aid of high end automation and Artificial Intelligence, these solutions may be too costly if applied to African's industries hence the design and implementation of a low cost CNC (Computer numerical control) machine for industrial applications. The proposed CNC machine is an automated control of machining tools like drills, 3D printers, mills or routers, by means of a computer. It processes most commonly used material like wood, plastic, metal and ceramic and can make high volumes of accurate mechanical parts for rapid prototyping or production. The CNC machining process starts with designing the parts in CAD software and a CAM (computer-aided manufacturing) software which prepares the model for the whole fabrication process. That software will provide a G-code to tell the machine how to move. The proposed CNC machine has the particularity to play the role of 3 different types of CNC machine: CNC plotter, CNC milling and 3D printer, this peculiarity not only make it cheaper compared to the cost of three separated standard CNC machine of distinct functions but also increase the features found on a standard CNC machine. The obtained results are quite good and cheaper and the product can be used for a professional work even though it still has limited performances.

Key words: G-code, cnc milling, cnc plotter, 3d printer, Low-cost

KAFACK SOKENG

Sizing, production and evaluation of the performance of a belt-driven tiller with tensioner roller.

Poster – P8

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This work presents a motorized cultivator as a means to overcome the arduousness of agricultural work and ensure compliance with the agricultural calendar among small agricultural producers in Cameroon. We have, designed on SOLIDWORKS , produced and evaluated this tiller. This tiller works through a belt tensioner clutch system with a 7.5 hp gasoline engine. A ploughshare plow can be hitched to this tiller with a variable height which can influence the depth of plowing. The performance test was done on sandy clay soil and the result was quite interesting. However, future work will focus on a tiller that uses a motor reducer. This tiller is more profitable compared to manual labor because it allows agricultural operations to be carried out on time and at a very low cost. Apart from plowing work, this tiller can be used for other agricultural tasks such as tracing lines for sowing, ridging and weeding. Its total production cost, including that of labor, is estimated 342,510 CFAF.

Keywords: Plow, engine, tiller, performance tiller and moldboard plow.

GNIDAKOUONG NGOUANOM Renaud Joel

MANUFACTURING AND MECHANICAL CHARACTERIZATION OF A RECYCLED FORGED ALUMINUM-COPPER ALLOY

Poster – P9

Mbelle Samuel Bisong[1], Joel Renaud Ngouanom Gnidakouong[2], Wirkom David Kongnyuy[3]

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Nowadays, there has been a high increase in the disposal of metallic scraps which could be transformed to other useful products especially for our local consumption and in modern technology where high performance materials are needed in airframe and automobile system. Using recycled metals can lead to low cost while combining to the light weight nature of aluminum. Recycled Aluminum and copper were all melted together using a charcoal-induced heat system to obtain homogeneous suspensions of different alloys (Al-Cu) in various ratios (100% Aluminum-0% Copper, 91% Aluminum-9% Copper and 88% Aluminum-12% Copper) Subsequently, sand casting technique was used to mold samples of different ratios as specified above. The obtained samples were forged prior to their mechanical testing, namely the flexural test. Forged samples (125×12.7×3.2) were obtained as well as a control sample to validate the effects of forging. The control sample had 100% aluminum. Results show that the sample comprising 91% Aluminum-9% Copper has the best mechanical properties. When comparing the recycled metal mechanical properties with the commercially available ones, we discovered that there was a drop for the recycled alloy. This was attributed to the presence of impurities, and probably the sand quality which significantly affected the sample surface.

Keywords: recycling, Aluminum-Copper and alloy.

EGBE Leonel Enow
Effect of Harvesting Cycle and Duration of Fermentation on the Quantity and Quality of Palm Oil
Poster - P10

Egbe Leonel Enow[1*], Oben Tom Tabi[1,2], Nkongho Raymond Ndip[1,2]

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Palm oil is an important vegetable oil used worldwide in food, oleo chemical and biodiesel industries. These industries require high grade palm oil in order to perform sufficiently. Unfortunately, smallholders that constitute a greater proportion of producers in Cameroon in terms of plantation surface area are not able to compete with large agro-industries in producing high quantity and quality of palm oil needed by these stakeholders. Numerous factors are responsible, among them harvesting cycle and duration of fermentation are of high importance. This study therefore was aimed at evaluating the effect of harvesting cycle and duration of fermentation of fresh fruit bunches on the quantity and quality of palm oil in Kumba III Municipality, in order to improve on palm oil from artisanal mills.

This study was conducted from March to October, 2022 on nine years old tenera oil palms. The experimental design was a Randomized Complete Block Design with four treatments for harvesting cycle and Completely Randomized Design with four treatments for duration of fermentation, giving a treatment combination of sixteen. The quantity of palm oil, oil extraction efficiency and quality parameters such as FFA content, peroxide value, moisture content, impurity content, saponification value, iodine value, were assessed after processing. Also, microorganisms commonly found in palm oil were identified. Data was subjected to two-way and one-way ANOVA test, respectively and treatment means compared using Tukey's HSD test, at 5% probability.

Results showed highest quantity of palm oil was obtained at 14 days harvesting cycle followed by 1 day and 3 days fermentation. This was significantly ($p<0.05$) higher (3.24 tons) than those for 7 days, 21 days and 28 days. The level of FFA content in palm oil was commendable with permissible standard when harvesting was done at 14 days and fermented for 1 and 3 days (0.038% and 0.046%). With regards to peroxide value, results showed that palm oil obtained at 14 days harvesting cycle followed by 1 and 3 days fermentation was below maximum standard (8.11mEq/kg and 8.36mEq/kg). The level of moisture content in palm oil obtained at 14 days harvesting and fermented for 1 and 3 days was below allowable limit. Saponification value of 102.05mg/g and 169.26mg/g and iodine value of 42.46g/100g and 54.52g/100g was obtained when harvesting was done at 14 days followed by 1 and 3 days fermentation. At all harvesting cycles and

fermentation durations, results revealed impurity content exceeding permissible limit of 0.05%. *Staphylococcus aureus* was identified on palm oil sample from all the treatments.

Harvesting cycle and duration of fermentation significantly affected the quantity and quality of palm oil. It is recommended that smallholder farmers should harvest at 14 days and ferment for 1 or 3 days in order to obtain high quantity of palm oil that is of good quality.

Keywords: Palm oil, Artisanal mill, Harvesting cycle, Fermentation duration, Physicochemical properties

FOKAM Paul Ernest

Determination of the sensitivity and morphological and biochemical analysis of watermelon (*Citrullus lanatus*) after mutagenesis induced by gamma rays.
Poster – P11

Fokam Paul Ernest [1], *Mafouasson Apala Hortense* [2], *Zambou*[1], *Bell Joseph Martin*[1]
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Background and methods: Crop genetic improvement is a crucial component of efforts to achieve food security. Watermelon is a fruiting vegetable, subject to little improvement due to a lack of genetic variability, the keystone of any improvement system. The main objective of this work is to broaden the genetic base of watermelon using mutagenesis by means of gamma rays. Initially the seeds of the Kaolack variety were irradiated at several doses of irradiation (0, 100, 200, 300, 400 and 600 Gy) and the LD50 was determined from linear regression based on the parameters of growth. Secondly, the seeds were subjected to irradiation with the single LD50 dose and then sown in the field. Morphological parameters such as plant length, number, of flowers and fruits per plant as well as biochemical parameters such as chlorophyll, protein and phenol content were evaluated on the M1 and M2 generations compared to the control M0 generation.

Results: The results obtained on the sensitivity show an LD50 of 200 Gy. Concerning the agromorphological parameters, the results show an average height of 86.67 cm in M0, 89.13 cm in M1 and 95.70 in M2 at 6 SAS. For the number of female flowers, an average of 1.5 in M0, 1.73 in M1 and 1.3 in M2 was noted. For the biochemical parameters, the analysis of total chlorophyll shows averages of 39.04 mg/l in M0; 39.94 mg/l in M1 and 28.42 in M2.

Conclusion: The results obtained show perfect sensitivity of the Kaolack watermelon variety to mutagenesis induced by gamma rays. This sensitivity is much more felt in M2 for several agromorphological and biochemical parameters with highly significant differences compared to M0 and M1.

Keywords: watermelon, irradiation, induced mutagenesis, gamma rays

FONOU TADIESSE Lavoisier

Light exposure impairs hematological characteristics and oxidative stress markers in male African Giant Pouched Rat (*Cricetomys gambianus*) reared in captivity

Poster – P12

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Background: African Giant Pouched Rat (AGPR) is widely exploited for research projects and meat consumption. However, being a nocturnal animal, light exposure requires a specific attention in order to improve their rearing environment.

Aims/Purpose: This study aimed to appreciate the effects of light exposure on hematological and oxidative stress parameters in AGPR bred in captivity.

Methods: Twenty adult males AGPR weighing 945 ± 171g were randomly allocated into four photoperiod regimes either: 0L/24D, 12L/12D, 18L/06D, 24L/0D. Housed singly during 56 days, animals received food and water *ad libitum*. At the end of the trial, blood and serum were collected for studied parameters analysis.

Results: Study revealed a significant ($p<0.05$) increase of the number of red blood cell (RBC), white blood cell (WBC), hemoglobin (HGB) and hematocrit (HCT) in animals kept in the darkness condition compared to those reared under extended photoperiods. Except for malondialdehyde (MDA) level which was not affected by photoperiod, catalase (CAT) and superoxide dismutase (SOD) activity increased significantly ($p<0.05$) for any light exposure up to 12 hours per day.

Conclusion: Photoperiod affects the most hematological characteristics measured and exhibits stressful effects in AGPR. So, for a comfortable rearing environment, daily light exposure should be no more than 12 hours per day.

Key words: African Giant Pouched Rat, blood parameters, oxidative stress markers, photoperiod, rearing environment

TOLEFACK KALZEMBO Christabel

Effects of Different Planting Dates on Pests, Diseases and Performance of Cowpea in Buea, Cameroon

Poster – P13

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Cowpea (*Vigna unguiculata*, (L) Walp) is an important grain legume which is widely grown in sub-Saharan Africa including Cameroon, providing food for human consumption and fodder for livestock. Its productivity is considerably low due to a wide range of constraints among them pests and diseases are of utmost importance. Timing of planting is an important cultural practice that mitigate pest/diseases, thereby increasing plant growth and yields. This study therefore, was aimed at growing cowpea in different planting dates in order to determine the most appropriate planting time for this crop in terms of performance, yield/quality and incidence/severity of pest and disease in Buea. This research was carried out in the first and second cropping seasons of 2022. It was a Randomized Complete Block Design with four replications in which, a medium maturing cowpea variety "Fekem" was obtained and sown appropriately at four planting dates in both seasons. Data for pests included identification, abundance, incidence and prevalence while that for diseases are symptoms, incidence and severity, fungal identification and prevalence. Growth and yield components were evaluated. Data was subjected to descriptive analysis, analysis of variance using the SPSS statistical package and means separated using Duncan test at 5% probability.

Four pests including aphids, thrips, snails and birds were identified. There was a significance difference (P>0.05) in aphid abundance during the second season compared to that of first season. This trend is similar to that of thrips and birds but on the contrary snails had a significantly higher number in the first season compared to the second season. Aphids incidence was significantly different (P>0.05) in the second season compared to that of the first season. Thrips were most prevalent (36.9 %) while birds were least (12.9 %) in first season and this trend was same for cowpea grown during the second season. Leaf spot, blight and mosaic were the prominent symptoms. Disease incidence on leaf spot was significantly different (P>0.05) in the number of leaf spots in the first season compared to that of the second season. This trend is similar to that of leaf spot severity but on the contrary mosaic incidence and severity was significantly higher in the second season compared to that of the first season. Three fungal pathogens were identified microscopically and they include *Fusarium oxyporum*, *Colletotrichum truncatum* and *Fusarium venenatum* with *Fusarium oxyporum*, being the most prevalent. Number of leaves and weight of plant biomass was significantly higher (P>0.05) in the first season compared to those of the second. Flowers and pods numbers were significantly higher in the second season than the first.

Second planting season is more preferred for cowpea production. Farmers will generate more income when planting is done in the second season. The use of pest/disease resistant cowpea varieties will increase yield and grain quality.

Key Words: Planting Dates, Pest, Diseases, Cowpea Performance.

DEFO Celestin

Diagnosis of the plant infrastructure performances and analysis of the strategies for improving the productivity of mineral water in tropical urban environments: A case study of a company based in Douala, Cameroon (Central Africa)

Poster – P14

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Background and methods: This study aimed at contributing to the improvement of mineral water production in a tropical urban area, especially in Cameroon, Central Africa. More specifically to diagnosing the production infrastructures, evaluating the performance of the plant and analysing the rehabilitation of dysfunctional equipments. For this purpose, direct observations, interviews of managers and factory workers helped to identify the factory's infrastructures and the production systems. The various readings of existing water meters (production and consumption) helped to diagnose the service status of the equipments and to assess the performance of the plant while identifying its current needs. The use of AutoCAD and VISIO softwares helped to reproduce the technical representations of the various equipments (stainless steel pipes, metal posts and tanks).

Results: The main results showed that the plant's performance was averagely indicated by an efficiency of 67% inducing losses of 33%. Losses were mainly due to leaks (60%) and the water wastage (40%). The causes of these losses were due to archaic pipes (set up in 1985), poor pipe installations (mostly unburied) and overpressures in some places. These failures were associated with poor production management such that the plant was unable to supply secondary stations (laboratory, households, and toilets) with water. To optimize the profitability of plant production and the supply of these bodies with water, the total requirements were estimated at 75,643,682 l/month. Partially satisfied (80%) by the catchment structures in place (03 boreholes). In order to fully cover total needs, it was suggested to build an additional storage tank, improve the productivity of the three (03) existing boreholes (cleaning, air lift development, pumping tests, water quality analysis), perform search and repair campaigns for leaks. The total cost of the project was estimated at 34,754,600 FCFA.

Keywords: Mineral water, boreholes, water losses, maintenance

KAMEGNE KAMTOH Auguste Landry

Assessment of the impact of lithology on the watertightness of aerated lagoon systems, case of an oil factory company in Littoral-Cameroon
Poster – P15

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This study aims to assess the impact of soil lithology in the watertightness of aerated lagoon basins by comparative study in two geological and pedological contexts in Cameroon. More specifically, it is a question to underline the flaws presented by the geotextile membrane of the water-resistance systems of lagoon basins in the case of an oil mill in Cameroon, to determine the influence of soil lithology in the filtration/retention of pollutants on the two factory sites of the oil mill company in Edéa and Dibombari (Cameroon), and find out the types of soil suitable for improving the water-resistance of lagoon systems with geotextile membrane. The main primary data were obtained by sampling and analysing wastewater in the first basin, soils at various depths and groundwater after construction of the piezometers. Data processing consisted of comparing wastewater parameters and first soil parameters, analyzing and comparing the evolution of soil parameters for each site studied by calculation of the reductions in the levels of pollutants on the basis of lithological sections drawn up and finally the comparison of the parameters of the groundwater of the two sites studied. The results show that the lagoons systems with geotextile membrane, although quite effective, have shortcomings concerning in particular total nitrogen and phosphates. Due to its lithology, the Dibombari site provides better watertightness than that of Edéa. The types of soils with purifying and filtering properties that caught our attention here are laterite and clays. The use of these types of soils by association with the geotextile membrane in the local context during the implementation of lagoon basins could improve water-resistance quality of these with the direct interest of better groundwater protection and indirect interest in opening up possibilities in terms of optimization of this waterproofing technology.

Keywords: *soil lithology, watertightness, lagoon systems, groundwater protection.*

NDJOUONDO Gildas Parfait

Weeds Diversity and Physiognomy in some Maize (Zea mays) Farms in Bambili (North-West, Cameroon)

Poster – P16

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Background and methods: Weed management constitutes a major operation and cost in maize production in the North-West Cameroon. The study contributes to the knowledge of weeds diversity and physiognomy from farms in the North-West Region to find ecological methods for a sustainable management of these farms. Specifically, a floristic survey made to003Adss determine their invading level; analyse weeds globally in the area. The study took place from January to June 2022 through two approaches: qualitative and quantitative. The qualitative approach was based on the observation of weeds (systematic) in all the farms with the aim of making as complete an inventory as possible of the weed flora. The quantitative approach made it possible to determine the density and proportions of weeds present in each survey.

Results: The study permitted to collect 15 families divided in 32 genera and 37 species showing that the most diverse family is Asteraceae with 11 species (29.72%), followed by Poaceae with 6 species (16.21%) and Amaranthaceae with 3 species (08.10%). These three families contributed 54.03% of the weed flora species of maize crop. As far as the distribution pattern of the weeds was concerned, there were 5 dominant weeds: *Oxalis latifolia*, *Conysa sumatrensis*, *Paspalum* sp., *Bidens pilosa* and *Ageratum conyzoides.* The rest of the weeds were however occasional and did not have consistent and dominant distribution.

Conclusion: The distribution of weed species was diverse and important for the botanists and weed scientists to formulate a long term weed management strategy in the locality in light of the weed flora recorded in maize crop.

Key words: Weeds diversity, Maize farm, Bambili.

TOGUE KAMGA Fulbert

Mapping flood risk zones, the case of the Lom-Pangar dam impoundment (East Cameroon).

Poster – P17

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Flood risk areas downstream of the Lom Pangar dam were mapped to get an idea of their extent and the vulnerability of the populations in these areas. For this reason, a study campaign was carried out during the period from 15 March to 30 June 2019. The parameters for mapping these areas such as pedology, topography, hydrography and land use were obtained by various methods (photogrammetry, remote sensing, standard field measurements, documentation and document digitization). The topographic map presented three different areas according to slope, the soil map showed three different soil types in the study area, the land use map showed that more than a certain number of people live in areas at high risk of flooding, the rainfall map showed three rainfall areas in the study area. As a result, it was found that 109 km² of the areas were high flood risk, 434 km² in the study area were at medium flood risk, and 445km² of these areas are at low flood risk.

Key words: Flooding, photogrammetry, topography, precipitation.

BIYONG Franck

Microbiological quality, nutritional value and sensorial properties of lemon-enriched appertized tomato peels

Poster – P18

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Food waste and post-harvest losses are factors that lead to food insecurity today. This study aims to provide an effective and sustainable solution associated with the tomato value chain. The effects of adding lemon juice at different concentrations (1%, 3%, 5%, and 10%) on the antioxidant, physicochemical, microbiological, and nutritional properties of tomato peels were evaluated. The study led to undeniably satisfactory results, and for the most part significant ($p<0.05$) with the improvement of many properties of the tomato. In particular, the parameters such as pH and titratable acidity obtained to comply with those recommended by various standards and are sometimes close to other previous studies. The results show a clear increase in the nutrient content in the occurrence of proteins and carbohydrates, and minerals such as iron, calcium and magnesium at different concentrations of lemon juice. It also emerges from this study that depending on the concentration of lemon juice, the microbiological quality of the product is ensured by the inhibition of pathogens such as Escherichia coli, Clostridium, and Salmonella or by the destruction of yeasts and molds (476-0 UFC). On the sensory level, the panelists found these formulations extremely pleasant. At the end of this work, samples of 100 g of tomato peels with 3 g of lemon juice each gave the best properties and characteristics.

Practical applications: using natural source of bio conservator as lemon juice in place of synthetic one, could be useful to enhance the shelf-life, nutritional value and sensorial properties of canned tomatoes.

Keywords: Canning, peeled tomatoes, lemon juice, microbiological quality, nutritional value and sensorial properties.

NANA Paulin
From agricultural waste to valuable animal feed through insect technology
Poster – P19

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Background and methods: Management of municipal solid waste (MSW) in low and middle-income countries remains a challenging and neglected key issue. Especially in urban and peri-urban areas, the household waste often remains uncollected on streets and drains, thereby attracting disease vectors and causing water blockages. The organic fraction, often amounting to 80% of the total municipal waste, is frequently looked upon as a waste without market value and therefore ignored by the informal waste recycling sector. Even if collected, MSW typically ends up in uncontrolled dumpsite where the material decomposes in large heaps under anaerobic conditions. We investigated the potentials of the black soldier fly (BSF) and house fly (HF) to recycle fruit waste into larval biomass which can be used as a highly rich protein source in broilers diet. Fruit waste was collected from a local market in Yaounde 6, Cameroon, and subjected to different treatments with the two insects at the rearing unit situated at Simbock in Yaoundé. Black soldier fly larvae (BSFL) and house fly larvae (HFL) biomasses from recycling activities were sampled and analyzed for proximate and mineral composition and then used to replace fishmeal in a standard control broilers diet.

Results: HFL achieved a bioconversion rate of 12.03% compared to 08.35% with BSFL, and the larval meal from HFL was more concentrated in protein and lipid than that from BSFL. However, the two products are not entirely comparable since the two insect larvae were reared on partly different substrates.

Conclusion: Diets investigated did not affect the growth parameters and health conditions of broilers, and no mortality was recorded. Based on these results, BSFLM and HFLM can be used as an alternative source of animal protein in monogastric animal diet.

Keywords: Black soldier fly, Feed production, House fly, Waste recycling

DZOKOU Victor Joly

Entomofauna of cocoa-banana and cocoa-*Inga edulis* (Fabaceae) cropping systems in Nkolandom: issues of shade tree selection in Cameroon

Poster – P20

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Background and methods: Cocoa production in Cameroon has been declining for decades and the country, once the world's second largest producer behind Côte d'Ivoire, is now in fifth place. One of the causes of this decline is attributed to pests, which are also vectors of disease. Cocoa trees are generally grown under shade. *Inga edulis* is one of the most widely used shade trees in the Central and Southern regions of Cameroon. In order to investigate the possible causes of reduced productivity and heavy pest outbreaks, the entomofauna of cocoa-based cropping systems was assessed in Nkolandom. Weekly collections were made for two months and the fauna and their status identified.

Results: A total of 592 individuals were collected of which 579 were Insecta and 13 Araneae. This fauna is composed of 501 pests and 91 beneficial insects. The cocoa-banana system had 15.97% of pests, cocoa-Inga edulis 46.51% and *Inga edulis* alone 37.52%. These observations confirm that Inga edulis, as a shade tree in cocoa, attracts pests especially Miridae. Coleoptera-Curculionidae and Hemiptera-Miridae represent 54.89% of the pests.

Conclusion: When establishing new cocoa farms, ensure that shade trees are not hosts to cocoa pests. Gradual replacement of *Inga edulis* with non-host trees of Miridae is recommended, removal of all dead pods before fruiting would limit inoculum.

Key words: Cocoa, cropping systems, Miridae pests, *Inga edulis*, Cameroon

MEDUEGHUE FOFOU Apollin

A useful pathway for *Gnetum* spp seeds production: effect of exogenous auxin on roots and shoots expression from *Gnetum spp* cutting

Poster – P21

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Gnetum africanum and *Gnetum buchholzianum* are two lianas species neither domesticated nor cultivated, despite their economic and industrial interests, which derive from the nutritional values and therapeutic virtues. Rooting and budding failiure of cuttings are the main limiting factors to domestication and cultivation of *Gnetum spp* in order to meet the increasing demand and preserve their biodiversity. The present investigation studied the effect of exogenous indol-3-acetic acid (IAA) and indol-3-butyric acid (IBA) on roots and buds induction and development from cuttings of *G. africanum* and *G. buchholzianum*. Fresh cuttings of *G. africanum* and *G. buchholzianum* were soaked for 12 h in DKW mineral solution complex supplemented with varying concentrations (0, 50, 100, 150 and 200 mg L^{-1}) of IAA and IBA. The above treated cuttings were sown in propagators and monitored for eight weeks. Results indicate that pre-treatment of cuttings with both auxins induces the development of roots and buds from cuttings of both liana species. First buds were observed 25 days after cutting culture with the IBA 100 mg L^{-1} treatment in *G. africanum*. Rooting rate was significantly higher only in *G. buchholzianum* (IAA: 20.56±3.01 (p=0.009), IBA: 17.75±2.38 (p=0.021)) compared to the control (11.06±1.60) and budding rate in *G. africanum* with IBA and in *G. buchholzianum* with IAA. The best rooting (25%) and budding (30%) rates were obtained with IAA 50 mg L^{-1}. IBA also allowed the development of the longest root (9.2 cm) and the highest number of roots (12 roots/stock) respectively with 100 mg/L and 150 mg L^{-1}. These results revealed that exogenous IBA (100 mg $L^{-1}$and 150 mg L^{-1}) and IAA (100 mg L^{-1}) promote efficient roots induction and expression in *G. africanum* and *G. buchholzianum*. However, IBA (100 mg L^{-1}) appeared to be more efficient at stimulating budding in *G. africanum* and *G. buchholzianum*. This technical pathway could be used for seeds production from *G. africanum* and *G. buchholzianum* cuttings and for farm establishment.

Keys words : *Gnetum*, rooting, buds, auxins, propagator,

KPOUMIE NSANGOU Amidou

Effect of cow dung and urea on the physicochemical characteristics of water, survival and growth of *Oreochromis niloticus* associated with *Clarias gariepinus* in rice-fish farming

Poster - P22

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In order to contribute to the improvement of the productivity of rice-fish farming systems, a study on the evaluation of growth performances and the survival rate of *Oreochromis niloticus* and *Clarias gariepinus*, through the use of local organic fertilizers in comparison with mineral fertilization has been carried out. The trial was conducted in the Western Highlands of Cameroon between May and October 2022. Thus, 3 treatments namely TB (cow dung at 1000kg/h/week), TU (urea at 80kg/ ha) and a control (T0, i.e. non-fertilized), were repeated twice in a complete random design. Physico-chemical parameter readings were taken every two weeks and periphyton samples collected at the end of the test. A sample of 30% of the total number of each species of fish was weighed and measured at the start and end of the test. Ultimately, fertilization with cow dung leads to a drop of oxygen levels (2,94 mg/l) as well as nitrogenous nutrient salts and an increase of water conductivity. Regarding periphytons, 6 genera divided into 3 families have been identified. The density was influenced ($p<0.05$) by the 2 fertilizers and was higher ($p<0,05$) with dung (35.10^5) than with urea ($1,42.10^6$). The highest growth performances and survival rates were obtained whatever the species in the batches having received cow dung as well as the yields of the two speculations (rice-fish).

Key words*: Oreochromis niloticus*, *Clarias gariepinus*, physicochemical characteristics, periphyton, growth performances, survival, yield, rice-fish culture.

OBEN TOM TABI

Potential of *Piper* in maize-soybean, maize-okra intercropping systems in mitigating maize pests, improving soil fertility and ameliorating yield

Poster – P23

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Maize (*Zea mays*) is an important staple grown worldwide including Cameroon, for its carbohydrate rich grains in addition to minerals and vitamins, therefore providing food for human consumption, and fodder for livestock. Production in Cameroon especially Buea is constraint by several factors among them, the fall armyworm (FAW), Snail (*Limicolaria* sp.) and soil infertility are of high importance. The use of botanicals has been successful as an eco-friendly and sustainable measure in mitigating pests on crops while intercropping economic crops with legumes increase soil fertility. This study therefore, aimed at evaluating the efficacy of extract of *Piper guineense* on maize-okra, and maize-soybean intercropped on the incidence and severity of these pests and soil primary macronutrients thereby increasing yield

The experiment was conducted at the Faculty of Agriculture and Veterinary Medicine of the University of Buea between March - September 2021. It was a randomized complete block design with six treatments replicated three times. FAW, snail incidence and severity, maize grain weight, and soil primary macronutrients were recorded. Data collected was subjected to descriptive statistics, analysis of variance using SPSS statistical package and means separated using Duncan test at $P<0.01$ and $P< 0.05$ probabilities

FAW and snail incidence and severity differed significantly ($P<0.05$). FAW incidence was highest in the control (69.2 %) and lowest in Maize + soybean + *Piper* (21.8 %) while snail was highest in control (62.8 %) and lowest in Maize + soybean + *Piper* (15.4 %). The severity of fall armyworm was highest in control (41.3 %) and lowest in Maize + soybean + *Piper* (12.7 %), while that of snail was highest in control (18 %) and lowest in Maize + soybean + *Piper* (4.3 %). The maize grain yield differed significantly ($P<0.05$), with the highest in Maize + soybean + *Piper* (5.2 t/ha) and lowest in Maize + okra (2.8 t/ha). Total nitrogen differed significantly with the highest in Maize + soybean + *Piper* (0.19 %) and lowest in Maize + okra (0.13 %).Maize yield was positively correlated with total nitrogen (r = 0.77) and negatively correlated with maize pests (r = -0.73 for FAW, r = -0.76 for snail).

Thus maize-soybean intercropping using *Piper* as insecticide is of high importance and a good sustainable alternative to synthetic chemicals for maize pest control, optimizing primary macronutrient and maize yield.

Keywords: fall armyworm, snail, nitrogen fixation, secondary metabolites, total nitrogen

KANJAM Venissa Bi NSANGLI

Improving the performance of tissue-cultured banana plantlets by priming with biofertilizer and biopesticide under different organic substrate conditions

Poster – P24

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Background and methods: A major challenge for banana production in Cameroon is lack of quality planting material, and various options are being explored, including the use of tissue-culture technique to produce healthy plantlets. However, nursery adaptation of plantlets is constraint by substrate type and nutrient amendments. Cameroon Development Corporation (CDC) that is the major banana producer uses coffee husk and agro-chemicals, which are either expensive or not environmentally friendly. Therefore, this study aimed to evaluate alternative substrates and microbial amendments (biofertilizers and biopesticides) as best-fit options that can be adopted to boost the performance of banana plantlets at the nursery. This two-phase study conducted at the banana nursery of CDC plantation in Tiko, with eighteen treatments including three organic substrates (e.g., empty palm fruit bunch, coffee husk, and cocoa pod) and two nutrient sources (chemical and biological), in relation to a no-input control.

Results: Results demonstrate comparable performance of the three organic substrates on banana plantlet performance ($P<0.05$), implying that CDC can use empty palm fruit bunches, which are readily available at their plantations at almost no cost. The response of tissue-cultured plantlets differed significantly ($P<0.05$) between nutrient sources, with chemical fertilizer providing the best plantlet growth, followed by microbial treatments as compared to control. Synthetic and biological pesticides caused significant variations on infestation and corm damage by banana borer weevils ($P<0.05$), with the lowest in biological (7%) and synthetic pesticides (15%), when compared to control (33%).

Conclusion: These results demonstrate effective alternative substrates that can be used by CDC, especially empty palm fruit bunch at almost no cost. Also, biofertilizers and biopesticides demonstrated strong potentials to enhance the health of banana plantlets, offering a sustainable option compared to agro-chemicals. Overall, these findings provide valuable insights on sustainable practices that can simultaneously improve economic gains and environmental stewardship.

Keywords: Banana, Biofertilizer, Biopesticide, Pest infestation, Substrate and plant nutrition.

NGOUANA TCHINDA Laura Scottie
Current status of strawberry (*Fragaria* spp.) cultivation and marketing in Cameroon
Poster – P25

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Background: Strawberries are among the most consumed fruits in the world, with a multitude of health benefits. All its assets have increased its economic. The insufficiency of strawberry yields in Cameroon is materialized by their importation and the high cost on the market. The strawberry therefore becomes a luxury consumption and is not within the reach of the average citizen. This study carries out the inventory of the production techniques and marketing of strawberries in Cameroon.

Method: One hundred and one strawberry growers were surveyed in three regions: the Center, the West and the South in 2021. Information on the socio-demographic characteristics of strawberry growers, cultivation practices and yields was obtained. Supermarkets, pastry chefs and canvassers were also surveyed to obtain information on the marketing of strawberries.

Results : Male strawberry growers (83.17%) predominate over females (16.83%); the majority cultivate strawberries in mix cropping (65.35% vs 34.65% in monoculture) especially with tomatoes; back pain and pests are the major constraints; the educational level and age are the factors that influence the proposals of strawberry growers for the improvement of yields; the kilogram of strawberries in Cameroon costs on average 10,000 XAF; the major customers being canvassers, supermarkets and pastry chefs. These are based more on the size of the fruit when buying.

Conclusion: The number of strawberry growers is higher in the West region. It takes up to 1,000,000 XAF to initiate cultivation when the area is as from 1,000 m2. The high cost of strawberries is due to their scarcity.

Keywords: Cameroon, cultivation, marketing, strawberry.

MEUTCHIEYE Félix

Biological Conservation and agrotourism using rare taurine breed in Cameroon

Poster – P26

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Background and methods: Cameroon West Highlands have a variety of bio cultural vestiges that could be oriented for long term entrepreneurship. Food systems have been relying mostly of commercial products for export. Therefore, production systems had failed to maintain agro biodiversity, while native species, populations and breeds (crop and livestock) have been disappearing. Beside this, it was observed a trend of conserving few ancient animal breeds, becoming rare and thus of scientific and cultural importance. Among these, the short horn cattle, documented as *Bamileke* taurine was neglected in the region. The current paper aims at investigating the present status and prospects of its potential use for agro tourism and conservation in two communities where they are found. The survey was undertaken in 2019.

Results: Findings showed that the only owners of *Bamileke* taurine in the Western Cameroon Highlands were Baleng and Bamougoum Chiefs. Herd was acquired through inheritance and kept for prestige. It was traced back that the parent stock was bought from Westerners in late 19th century. Technical follow-up was very lacking though herds (12 and 28 respectively) were kept extensively with little care. The herding system is not designed properly and little interest was given for the future, thus inbreeding is probably very high. The animals were hardy with tendency to wilderness, because of little human interactions. The decline of the herd because of periodic ritual slaughtering was the main threat in the context of no other *Bamileke* breed provision system.

Conclusion: The *Bamileke* taurine breed is peculiar to Baleng and Bamougoum palaces where are known to be bio-archives. Though the breed is threatened, it harbors huge potential for touristic aspects and therefore needs appropriate conservation strategies for the communities. This breed may become a touristic symbol if managed properly and inserted in agro touristic package.

Keywords: Social technology, Tourism, Biodiversity, Cattle, Cameroon

GADJOU Bertino & MEUTCHIEYE Félix
The development of a friendly-user platform for beekeepers in Central Africa
Poster – P27

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Background and methods: The Cameroonian beekeeping sector is booming as income generation activity. Meanwhile, it is also facing various gaps because of technical issues. Beekeeping as professional occupation is little known and valued by communities because of difficulties or stereotypes attached to accessibility to practical technologies. The present work was carried out from December 2020 to July 2021, aimed at contributing to the extension of best practices of beekeeping through the establishment of a mobile apiary management application. To achieve this, a design protocol was elaborated, a web application built and evaluated. The design of this web application was based on the data acquired, first through documentary consultation (3 manuals, 10 books and 27 articles in the field) and a field-oriented survey (with 50 beekeepers chosen according to their availability). Thus, a database made up of contextual information on: honey bees (3 breeds), hives (3 types), beekeeping flora (75 plant species), main beekeeping pathologies (7 diseases and 5 bio pests of hives), and practical advices on running an apiary in context. Computer software such as WordPress, MYSQL, Photoshop and other software extensions were mobilized for the project.

Results: The web application was tested with 25 users freely recruited upon request. At the end of the test phase, it emerged that the designed web application (nhwah.fm.org) is a set of easily accessible modules which functionality (to be optimized) allowed navigation in the various informative pages. The information obtained from the testers showed that the web application will meet the different needs of already established beekeepers as well as novices, directly on the implemented internet platform.

Conclusion: The platform was functional and accessible to French-speaking users. A full-scale test is planned with a view to better deployment of the results within beekeeping organizations in Cameroon in current languages.

Keywords: Applied Computing, beekeeping, database, extension, Cameroon

MVONGO DANG Victor

Quantifying the non-revenue water problem in a sub-Saharan African environment: a practical application in the Republic of Cameroon (Central Africa)

Poster – P28

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Background and methods: A water distribution network faces a number of problems associated with its continuous aging process, including water losses. Non-revenue water (NRW) is the water that is produced by the water utility but not sold to customers. This study aims to update non-revenue water (NRW) estimations in the water supply network in Cameroon in order to identify challenges to reducing NRW in the country, with applicability in sub-Saharan Africa environments with similar affinity patterns. Data on water supply access in Cameroon were collected on the databases of the Joint Monitoring Program of WHO and UNICEF, IBNET, the Central Bureau of the Census and Population Studies of Cameroon, and the Demographic Health Survey. Microsoft Excel was used to assess NRW volume based on Wyatt/IDB methodology, including the calculation of the supplied population, the domestic consumption, the non-domestic consumption, the system input volume, and the NRW.

Results: Results indicate that the global volume of NRW in the water supply network in Cameroon was 84.7 million cubic meters per year, including 82.4 million cubic meters in urban areas and 2.2 million cubic meters in rural areas. The cost/value of the water lost per year were 28.6 billion CFA francs (USD 47.6 million). This high level of water loss, particularly in urban areas, had an impact on the financial viability of the Camwater. Indeed, as of December 31, 2020, the liquidity ratio of 0.89 indicates that Camwater's activities do not generate enough cash to meet short-term commitments, while the solvency ratio of 2.2 indicates high long-term debt relative to the level of equity. By cutting Cameroon's NRW to half its present level, about 1.2 million people could be supplied, including 1.1 million in urban areas and 100,000 in rural areas. Findings also suggest that the high level of NRW is influenced by rapid urbanization, outdated infrastructure, a high level of poor operation and maintenance, including an ineffective record-keeping system, and inadequate technical skills and technology.

Keywords: non-revenue water, water loss, Cameroon

NGADJUI NGATA Laurence

Evaluation of the antifungal potential of extracts of *Thevetia peruviana* (Pers.) K. Schum on the *in vitro* development of *Alternaria solani*, the causal agent of alternariose in tomatoes (*Lycopersicon esculentum* Mill)

Poster – P29

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Alternaria solani is a phytopathogenic fungus causing important economic losses in tomato cultivation. Currently, the disease is controlled mainly by the use of synthetic pesticides, which are unhealthy for the environment and affect the food security of the populations. The present study aimed to evaluate *in vitro* the antifungal potential of aqueous and organic extracts of *Thevetia peruviana* seeds against *Alternaria solani*. Two strains of *A. solani* were isolated from diseased leaves from the localities of Foumbot and Mbalmayo and identified.

Four extracts (methanol, ethyl acetate, acetone and aqueous) were used as solvents. For the experiment, four concentrations of extracts (C1, C2, C3 and C4 respectively 12.5; 25; 50 and 100 µL/mL of extract); a control C0 = 0 µL/mL and two synthetic fungicides (Plantineb 80WP and Jumper D) used at the recommended doses (respectively C5 = 5.33 µg/mL and C6 = 3.75 µg/mL) were used, with three replicates for each strain. The spore germination test was performed and the mycelial growth of these different strains was determined. It was found that all extracts had a significant influence on the mycelial growth of the strains and the spore germination rate.

For these two parameters the inhibition was proportional to the different concentrations tested, with a total inhibition (100%) obtained for the highest concentrations of the organic (100 µL/mL) and aqueous (100 µg/mL) extracts. Regarding spore germination, the lowest MIC50 and MIC90 were obtained with the acetone extract on the Mbalmayo strain (6.38 and 53.8 µl/ml, respectively) and the highest with ethyl acetate on the Foumbot strain (31.4 and 66.2 µL/mL). For mycelial growth, 100% inhibition with all extracts at the highest concentration of 100 µL/mL was obtained with the Mbalmayo strain making it the most sensitive to extracts. At the highest concentration tested, all extracts were fungicide in the same way as the synthetic fungicides used. Formulations based on these extracts would be a commendable alternative in the integrated control of tomato diseases.

Key words: *Alternaria solani*, *Thevetia peruviana*, extract, stain, inhibition.

OLOUGOU ENYOE Noela Marie

Improving soil health through microbial priming of plantain-bean cropping systems in Cameroon

Poster – P30

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Background and methods: Cameroon experiences food/nutrition insecurity that will likely rise with projected global population increase to 9.7 billion by 2050, which translates to more food demands. However, crop productivity is limited by poor soil health as reflected by soil acidity and nutrient deficiency stresses, which are commonly alleviated through chemical inputs that are expensive with negative effects on the environment and humans. Therefore, biological inputs and intercropping systems are encouraged. Plantain (*Musa spp.*) production is a source of livelihood and income for many Cameroonians, but productivity is low with over 30% yield gap between the actual and attainable potential. Common bean (*Phaseolus vulgaris*) is a nitrogen-fixing grain legume with high nutritional value that is widely consumed in Cameroon, but production is also low. Hence, intercropping bean in plantain fields will not only promote soil health but also increase plantain productivity and diversify the food source with nutrient rich beans, which represents viable contribution to food and nutrition security. This field study investigated the potential of beneficial microbes including plant growth-promoting bacteria (PGPB1 and PGPB2) and endophytic fungi (*Trichoderma* and *Beauveria*) on plantain and bean performances in Buea and Akonolinga.

Results: The observed effect of moderately acidic soil pH in Buea compared to strongly acidic pH in Akonolinga is reflected in the higher plantain performance in Buea than Akonolinga, but microbial inputs and plantain-bean intercropping systems demonstrated significant potential to buffer the acidic soil pH. Similarly, bean yield and root nodulation increased with application of beneficial microbes with higher performance in Buea than Akonolinga that further reflect differential soil health. Accordingly, soil enzyme bio-indicators correlated positively with plantain growth, indicating significant soil functional relationships that highlight variable treatment effects on plantain performance. Overall, priming with beneficial microbes demonstrated strong potential to alleviate soil acidity and plant nutrient deficiency stresses.

Keywords: Acidity, beans, bio-fertilizers, plantain, enzymes

FONKWA Georges

Determining Factors and Zootechnical Output of Biosecurity Practices in Fish Farms in Wouri Division, Cameroon

Poster – P31

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Background and methods: Biosecurity practice limits the occurrence of diseases and economic losses in fish farms. The objective of this study was to characterize fish farming in the Administrative Division of Wouri-Cameroon (3°97'04''- 3°58'13''N; 9°76'78''- 9°46'4.3''E) and assess the biosecurity practices. A cross-sectional biosecurity audit was then conducted in 33 fish farms from March to May 2022. The "snow ball" technique, on-farm observations and face-to-face interviews of farm managers using a semi-structured questionnaire were used for data collection.

Results: Most of the fish farmers were between 18 and 40 years old (63.64%) and not trained in fish farming (60.61%). The lack of finance (57.57%) was the main constraint to biosecurity practice. High fish mortality rate (> 15%) was recorded in 66% of the farms. Overall, the compliance rate (CR = 40.52±14.70%) and adoption rate (AR = 40.40±30.10%) of biosecurity measures were intermediate. No type C farm or at minor risk level of contamination was recorded. Farmers of 18 to 40 years old (45.24±14.75%) who attended higher school (43.83±14.44%) and received training in fish farming (47.44±14.39%) recorded a significant higher CR. The CR and AR were significantly higher for the isolation component (CR = 60.17±19.81%; AR = 60.17±25.68%) followed by traffic control (CR = 53.53±25.87%; AR = 53.53%±34.86) and sanitation (CR = 27.70±19.70%; AR = 29.84±26.00%). A strong (R^2 = 0.725), positive and significant (p = 0.019) linear relationship was found between the level of education of fish farmers and the biosecurity compliance rate while the health status of fish was weakly (R^2 = 0.207), positively and significantly (p = 0.017) influenced by the compliance rate.

Conclusions: Fish farming is an income-generating activity that still requires socio-economic, technical and institutional efforts for optimal productivity. The Cameroonian government should emphasize on the education, training and capacity building of farmers on biosecurity practices to minimise the introduction, establishment and spread of diseases.

Key words: fish farming, biosecurity, audit, compliance rate, diseases

GUEDIA TAZO & MEUTCHIEYE Félix

Stingless bees wild colonies successful adaptation in artificial hives in Cameroon: promising report

Poster – P32

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Background and methods: Stingless bees are an alternative in world food security through pollination and other multiples services and products. In Africa in general as well as in Cameroon, stingless bees' exploitation is very limited, mostly made of wild harvest. *Meliponula* has appeared among the genera investigated one with larger diversity with 8 species which honey production could be valuable. On the international marketplaces, a liter of some the species from this genus is sold at USD79. Nests' excavations, continuous deforestation and periodic bush fires threaten the survival of these bees. The objective of the current work was to contribute to the sustainable exploitation of these bees. The work consisted to collection and proceed to installation of wild colonies in artificial individual hives and evaluate the adaptation after 14 days.

Results: A total of 12 viable wild colonies was extracted from natural forest environment in East Cameroon (Nomedjoh). Based on classical taxonomic keys, it was observed a large specific diversity of the genus investigated. Species identified were namely (number of colonies) *Meliponula nebulata* or *Apotrigona nebulata* (1), *Meliponula lendliana* or *Plebeiella lendliana* (3), *Meliponula feruginea* or *Axestotrigona feruginea* (4) and at last *Meliponula bocandei* (4). These were observed in all colonies transferred in wood artificial hives: nest construction, comb building and brood constitution which are all signs of an adaptation rate of 100% in peri-forest environment.

Conclusion: The natural diversity of genus *Meliponula* constitutes a rich ecological and economic potential for the study zone and beyond. The survival of *Meliponula bocandei* species under artificial conditions opens in the Cameroon context the avenue for Meliponiculture value chain, given the fact that individual colony may yield annually up to 10 liters. These preliminary findings expand perspectives of genuine and sustainable insects' genetic resources.

Keywords: Meliponiculture, stingless bees, domestication, honey, Cameroon.

NOUBOU TAKAM Daïna

Centesimal characterization of the pericardium of Garcinia mangostana harvested in Moungo Cameroon

Poster – P33

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Mangosteen (Garcinia mangostana) is an exotic fruit of Cameroonian flora grown mainly in the Littoral region. Composed of three main parts, it is appreciated for the tangy sweet taste of its aril. Named Queen of fruits, mangosteen is only exploited for its consumption of its aril in Cameroon. Considered waste, it pericard is a reservoir of secondary metabolites and could be used for the formulation of new products. The aims of this work is to characterize the mangosteen pericard harvested in Cameroon. The samples were collected from a few plantations in the Moungo, dried and analyzed to determine the biochemical composition according to AOAC methods (1990).

This characterization shows average water contents ranging from 65 to 68%. Protein, fat, and carbohydrate values were 0.46±0.03%, 3.2 ± 0.24%, and 28.34±0.24%, respectively, with an energy value of 143.99±1.93KCal. It contains some minerals among others Na, Ca, P, K, Mg, Fe and Zn respectively 141.67±0.55, 211.72±1.00, 36.52±0.34, 665.34 ±0.34, 27.72±0.19, 0.84±0.03 and 0.88±0.02 mg/100g.

The pericard of *Garcinia mangostana* thus demonstrates a great potential that requires better valorization to contribute to food and nutritional security.

Keywords : mangosteen, valorisation, pericard.

GHISLAIN MBENG NYEMB

Protective effects of Sardinella maderensis oil on diabetes mellitus type-2 and cardiovascular diseases in obesity-induced rats

Poster – P34

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Background and methods: This research aimed at evaluating the protective effect of *Sardinella maderensis* oil on insulin resistance and biomarkers of cardiovascular function in obesity-induced albino rats receiving high fat diet. The *S. maderensis* oil was extracted by the Bligh and Dyer method and its quality indices analyzed using the standard methods of the AOAC. Thirty six male albino rats aged 3 to 4 months, were randomly and evenly distributed into six groups of six animals each, namely: Normal group (healthy rats fed with normal rodent chow), negative control (obesity-induced + 250mg/kg BW of distilled water), positive control (obesity-induced rats receiving 20 mg/kg BW of Orlistat), test groups 1, 2 and 3 all obesity-induced and received 250, 500, 1000mg/kg BW of *S. maderensis* oil respectively by oral gavage. After 28 treatment days, oral glucose tolerance test was performed, fasting blood glucose, lipid profile and serum markers were measured using commercial kits.

Results: The results from *S. maderensis* oil quality indices revealed that the FFA content (0.98 ± 0.27%), IV (118.41±5.83gI2/100g), PV (7.94±0.39meqO_2/kg), P-AV (18.57±0.30) and TOTOX (34.24±0.80) were all within the Codex Alimentarius Commission recommended range for safety. *Sardinella maderensis* oil significantly ($P<0.05$) decreased body weight, food intake and serum lipids (TC, TG and LDL-c) but increased HDL-c. AST and ALT were significantly decreased ($P<0.05$) unlike creatinine and LDH which both showed no significant change ($P>0.05$). Serum insulin level and HOMA-IR were significantly decreased ($P<0.05$) in treated groups.

Conclusion: This data may be useful for proving that *S. maderensis* oil supplementation alleviates the metabolic disorders accompanying obesity such as hyperlipidemia, cardiac biomarkers and insulin resistance thereby aiding in diabetes mellitus type 2 and cardiovascular diseases. Therefore, this *S. maderensis* oil should be used in the dietary management of these diseases.

Keywords: *Sardinella maderensis*, oil, Protection, diabetes, obesity

TADJUIDJE Jules Delain

Contribution to the study of the chemical constituents and evaluation of the antimicrobial activity of the leaves and stems of *Caloncoba dusenii* (Flacourtiaceae).
Poster – P35

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Caloncoba dusenii, a medicinal plant of the Flacourtiaceae family, is used in Cameroon in particular as a purgative, and to treat skin inflammation. Successive chromatographies on a silica gel column of the AcOEt extract obtained after trituration of the methanol extract of the stems and leaves of this plant led to the isolation, nine compounds indexed from CD1 to CD9. The structures of these compounds were identified either by the interpretation of their spectroscopic data followed by their comparison with literature data, or by simple comparison on analytical TLC plate with reference samples available in our Research Unit. Thus CD1, CD2, CD3, CD4, CD5, CD6, CD7, CD8 and CD9 have been identified respectively to friedelan-3-one, 3-acetoxyglaucalactone, trichadenic acid B, lupeol, a mixture of phytosterols probably consisting of stigmasterol and *β*-sitosterol, 3-O-*β*-D-glucopyranoside of sitosterol, betulinic acid and 28-methyl ester of dusenic acid.

In addition, the methanol (CDM), ethyl acetate (CDA) and ethyl acetate residue (RCDA) extracts of the leaves and stems of *C. dusenii* as well as the fractions indexed A to F were evaluated for their antimicrobial activity by the microdilution method. The microorganisms used consisted of four strains of bacteria (*Pseudomonas aeruginosa* PA01, *Escherisha coli* ATCC 8739, *Staphylococcus aureus* 56 and *ATCC* 25923). The CDM, RCDA extracts, and the B and F fractions showed refractory activities against certain microorganisms tested with MIC = 512 µg/ml.

Key words : *Caloncoba dusenii*, antimicrobial activity.

NZEPANG ANICET

Chemical investigation and evaluation of antiplasmodial activity of two Cameroonian medicinal plants: *Combretum zenkeri,* (Combretaceae) and *Cedrela odorata* (Meliaceae

Poster – P36

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Background: Natural plant constitute a rich source of diverse and non-toxic bioactive substances that have been very instrumental in the management of human diseases including malaria. Malaria is an infectious disease caused by protozoan parasites from *Plasmodium* family that can be transmitted by the bite of the Anopheles mosquitoThe estimated number of malaria deaths stood at 409 thousand in 2019 compared to 405 thousand in 2018 and 416 thousand in 2017. Over 93% of cases and deaths occur in the WHO African region, with pregnant women, children aged under five years and naïve travellers from non-malarious areas representing the most vulnerable groups. The aim of our research work is the search of bioactive extracts, fractions and compounds against *Plasmodium falciparm* from the different parts of these plants and preformulation of a phytodrug against malaria.

Methods: The stem bark of *Cedrela odorata* and twigs extracts methanolic of *Combretum zenkeri* were subjected to antiplasmodial activity screening in vitro against chloroquine-sensitive *3D7* and multidrug resistant *Dd2* strains of *Plasmodium falciparum* using a SyBr Green fluorescence-based assay. These extracts were then fractionated using difrent solvent such as: *n*-hexane, methylene chloride, ethyl acetate and *n*-butanol and, the resulting fractions were submitted to antiplasmodial activity. Hexane (45g) and mixture of ethyl acetate-methylene chloride (34g) fractions active of the stem barks of *Cedrela odorata* were purified lead to pure compounds whose structures were elucidated using their spectroscopic and spectrometric analysis.

Results: *n*-hexane fraction from the stem-bark of *Cedrela odorata* shown an antiplasmodial activity with IC_{50} values 12,5µg/ml on chloroquine-sensitive (*3D7*) strain. The chemical investigation on the extracts of the stem bark of *Cedrela odorata* and the twigs of *Combretum zenkeri*. afforded a total of eighteen compounds among which nine were fully characterized. Two from the mixture of ethyl acetate-methylene chloride (34g) fraction of the stem barks of *Cedrela odorata* which are 11β,19-diacetoxy-l-deacetyl-l-epidihydronomilin and a new derivative of Delevoyin C, seven from the ethyl acetate fraction of *Combretum zenkeri* among which stigmasterol glucoside, stigmasterol, two phenolic compounds, *alphitolic acid, arjunolic acid and a previously undescribed compound.*

Conclusion: Due to we are obtained nine compounds with two news compounds. The antiplasmodial testing on isolated compounds are ongoing.

Keywords: *Combretum zenkeri, Cedrela odorata, antiplasmodial activities.*

NZETCHUEN Gédéon KOUAHOU

Optimized Preparation of activated carbon with high porosities based on puck shells (*afrostyrax lepidophyllus)* by response surface methodology and physico-chemical characterization

Poster – P37

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Research has demonstrated that lignocellulosic materials are good precursors for the manufacture of highly carbonaceous and porous materials. Hence, the perspective of this work is the preparation of activated carbons based on puck shells (*afrostyrax lepidophyllus)*. To achieve this, chemical activation using phosphoric acid and sodium hydroxide was carried out. The Box-Behnken design with three center points was used to optimize the preparation conditions. The factors whose influences have been studied are the concentration of activating agent (0.5 - 1.5 mol.L^{-1}), the carbonization temperature (300 - 500˚C) and the residence time (30 - 100 min). The activated carbon obtained by phosphoric acid was named CRP and that impregnated with sodium hydroxide CRB. Under optimal conditions the iodine number was 647.29 and 575.15 mg/g for CRP and CRB respectively. These two materials of considerable iodine number were characterized by pH at the point of zero charge (pHpzc), bulk density, moisture content, Boehm titration, Fourier transform infrared spectroscopy, BET method, Raman spectroscopy and scanning electron microscopy, which confirmed the acidic nature and microporous of CRP and the basic nature of CRB carbons. The specific surface of the micropores was 509.05 and 27.53 $m^2 \cdot g^{-1}$ respectively.

Keywords: Activated Carbon, Box-Behnken Design, Optimization, Puck Shells.

Abba Garba Abba MOUSSA

Chemical investigation of a Cameroonian medicinal plant for their antiplasmodial potency: *Jatropha curcas* (Euphorbiaceae)

Poster – P38

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Background: *Jatropha curcas* (Euphorbiaceae) is Cameroonian medicinal plant, commonly used in traditional medicine to treat malaria, fever and associated symptoms. However, the antiplasmodial potency of their chemical constituents has never been reported. The aim of this work is to search for active, non-toxic extracts and fractions which could be used for the formulation of an antiplasmodial phyto-drug and/or active secondary metabolites for the development of new antiplasmodial agents to fight malaria. Different parts (leaves, twigs, roots, fruits and fruit shells) of the *J. curcas* was prepared by maceration using ethanol and water and screened *in vitro* for their antiplasmodial activity on chloroquine-sensitive (*3D7)* strain of *P. falciparum* using the SyBr Green fluorescence-based assay. The isolation of bio-active compounds was achieved using different chromatographic technics (semi preparative HPLC, LC-MS, preparative HPLC and preparative TLC).

Results: Out of the five extracts screened, hydro-ethanolic (EtOH/H_2O (7:3)) extract from leaves of *J. curcas* exhibited a good activity with IC_{50} of 19.91 µg/ml on *Pf*3D7. Its liquid-liquid partition led to four fractions out of which the *n*-Hexane and ethyl acetate fractions displayed good activity with IC_{50} values of 2.75 µg/mL and 5.44 μg/mL on *Pf*3D7, respectively. Additionally, column chromatography-based chemical profiling of both antiplasmodial fractions led to sixteen compounds among which, the chemical structure of nine was elucidated (two flavonoids, one triterpene, one mono-glyceride derivative, one alkaloid and four steroids derivatives). The antiplasmodial activity of isolated compounds is still ongoing.

Conclusion: The present study provides for the first time the antiplasmodial potency of extracts and fraction from *Jatropha curcas* using bio-guided approach. We can emphasis that, *Jatropha curcas* are promising source of novel antimalarial drug candidate.

Keywords: Malaria, *Jatropha curcas*, Antiplasmodial activity, *Plasmodium falciparum*, Column chromatography.

TCHASEP WANDJI Nadège

Effect of *Jatropha curcas* L. (Euphorbiaceae) seeds extracts on the *in vitro* development of two pathogenic fungi of cowpea (*Vigna unguiculata* L.)

Poster – P39

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Cowpea (*Vigna unguiculata* (L). Walp.) is one of the most popular grain legumes native to Africa, grown in almost all tropical and subtropical regions and subject to pathogen attacks. To control them, chemicals are often used, which are not only expensive but are a source of environmental pollution with a negative impact on human health. Hence the search for alternative control methods including the use of plant extracts with a pesticidal effect such as *Jatropha curcas* (Euphorbiaceae). The trials focused on gas chromatography by mass spectrometry and the evaluation of these extracts on the growth of pathogens (*Fusarium oxysporum* and *sclerotinia sclerotiorum*). Spectral interpretation was based on compound identification. The effects of *J. curcas* plant extract were compared with those of a chemical fungicide with active ingredient 80 g/kg Metalaxyl and 640 g/kg Mancozeb and a PDA control on these fungi. Observations were made on the measurement of the radial growth diameter. The experimental set-up applied was the Fisher completely randomised block design with three replicates. The aqueous and acetone extracts considerably inhibited the mycelial growth of the strain with a percentage inhibition of 100% at the highest dose (C5= 120 µl/ml). This inhibition was more pronounced with the aqueous extract, a very high inhibition (78.64%) was observed at the lowest concentration (C1= 7.5 µl/ml) in contrast to the organic extracts. *Jatropha curas* seed extract could be recommended for the protection of cowpea.

Key words : Cowpea; *Jatropha curcas*; radial growth; *Fusarium oxysporum* and *sclerotinia sclerotiorum.*

NGEONKOU Maxime Carlos

Chemical study and evaluation of antiplasmodial activity of *jacaranda mimosifolia* D. Don (Bignoniaceae)

Poster – P40

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Background: Malaria is a disease caused by Anopheles female mosquitoes. Despite the existence of preventive methods, the number of cases and deaths due to malaria remains high in several countries especially in tropical Africa and particularly in Cameroon. The need to develop an alternative treatment has become urgent. The aim of this work is to search for active extract, fractions and compounds from *Jacaranda mimosifolia*, which can be used for a preformulation of phytodrug and as a lead compounds for the development of a drug to fight against malaria. *Jacaranda mimosifolia* leaves were extracted with ethanol. The extract obtained was evaluated for its antiplasmodial activity using the SYBR green-I base inhibition growth test with artemisinin and chloroquine as reference drugs. This extract was fractionated to give four fractions which were assayed for their antiplasmodial properties. These fractions were subsequently purified to give compounds whose structures were established by NMR techniques or by comparison of their data with those described in the literature.

Results: The ethanolic leaves extract and fractions showed good and moderate activity with IC_{50} values between (8.73 - 58.07) μg/mL on *PfDd2* and *Pf3D7* strains respectively. These fractions were subjected to successive silica gel and Sephadex column chromatography. Nineteen compounds were obtained, including a mixture of sterols, one saponin, four triterpenoids, one phenylaldehyde, one fatty acid, three phenylethanoyls, and seven flavonoids among which two mixture. Some isolated compounds showed good (IC_{50} = (6.45 – 16.30) μM) and moderate (IC_{50} = (22.26 – 97.55) μM) activity against tested strains *Pf3D7* and *PfDd2* of *Plasmodium falciparum*.

Conclusion: In conclusion, these results obtained on extracts, fractions and compounds could partially justify the antiplasmodial activity of *Jacaranda mimosifolia* and it use in folk medicine for the treatment of malaria.

Keywords: Bignoniaceae, *Jacaranda mimosifolia*, antiplasmodial activity

SOUBGUI MOGUEM Arlette Flore

Heamatological profile of patients suffering from SARS-CoV-2 infection, in Douala the most populated and heterogeneous town of Cameroon

Poster – P41

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Background / Objective. The current coronavirus disease 2019 pandemic (COVID–19) is caused by severe acute respiratory syndrome Coronavirus 2 (SARS–CoV–2). Current data on COVID-19 are still rare in Africa especially in Cameroon. This study aimed to determine the impact of SARS–CoV–2 infection on hematological parameters of patients in Douala the most populated and heterogeneous town of Cameroon.

Materials and Methods. A cross sectional study was conducted from January to September 2022 at seven health districts in Douala (*Bangue, Boko, Bonassama, Cité des Palmiers, Deido, New-Bell, Nylon*). A questionnaire was used to collect socio-demographic and clinical data from 420 participants. Retrotranscriptase quantitative polymerase chain reaction was used to detect SARS–CoV–2 in nasopharyngeal samples while blood samples were used to perform the Complete Blood Count using hematometer. Statistical analyses were done ($\alpha = 5$ %).

Results. The prevalence of SARS-CoV-2 infection was 8.1%. Hematological parameters were decreased in SARS-CoV-2 positive patients especially lymphocytes ($p < 0.0001$), red blood cells ($p = 0.0025$) and platelets ($p = 0.02$). Six types of hematological disorders were identified (anemia, lymphopenia, lymphocytosis, thrombocytopenia and thrombocytosis) with higher prevalence in SARS-CoV-2 positive patients. Only, NLR had stable clinical performances (AUC ≥ 0.70) regardless of stratification by gender, age, COVID–19 vaccination status but with increased clinical value in patients with comorbidities (obesity, diabetes and hypertension).

Conclusion. Epidemiological surveillance of SARS-CoV-2 infection must continue in Douala.

Keywords: Heamatological modifications, SARS-CoV-2 infection, Douala-Cameroon

WAKAYANSAM BOUBA Roméo

Growth response of *Vibrio cholerae* O1 and *V. cholerae* non O1/non O139 strains to algae extracts from stream water in Far north Cameroon

Poster – P42

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Background and methods: *Vibrio cholerae* O1 or non O1/non O139 is found in water ecosystems where it colonizes phytoplankton and has different lifestyle. Here we present the impact of some algae extracts on the survival/growth of environmental (non O1/non O139) and clinical (O1) strains of *V. cholerae.* Algae extracts consisting of three fractions, F1 containing chlorophyll-a, F2 containing chlorophyll-b, and F3 containing carotenoids, were obtained from the algal bloom collected in the Kaliao River (Maroua, Far North Cameroon). Microcosms consisting of sterile saline to which F1, F2, F3, raw algal extract (Rae) and peptone (Pep) at concentrations of 0.01, 0.05 and 0.1 mg/L added respectively were used. Three other microcosms consisting of the respective 50/50 mixtures F1+F2, F2+F3, and F2+Pep at a concentration 0.05 mg/L were used. A control consisting of sterile saline (Ctrl) was added in both experiments. *V. cholerae* O1 and *V. cholerae* non O1/non O139 were separately inoculated into each microcosm at the concentration of 3.97 log(CFU/mL). The incubation period ranged from 0 to 24h

Results: The microcosms F2 and Rae did not support the growth of O1 strain; *V. cholerae* non O1/non O139 count in all algae extract microcosms ranged from 3.97 log(CFU/mL) to 5.2 log(CFU/mL). In all Pep microcosms, the counts of both strains reached an uncountable value. Microcosms F1+F2 and F2+F3 supported the growth of *V. cholerae* O1 and *V. cholerae* non-O1/nonO139 strains

Conclusion: F2 and Rae inhibited the growth of *V. cholerae* O1, while the growth of the non O1/non O139 strain was promoted by all algae compounds.

Keywords: *Vibrio cholerae*, strains, algae extracts, survival, growth, water

TABAKAM TCHANGOU Gaétan

Eriosema glomeratum had interesting cytotoxic constituents and semisynthetic derivatives with good biosynthetic relationship and chemotaxonomic significance

Poster – P43

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Background and methods: *Eriosema glomeratum* used in folk medicine to treat many diseases afforded seventeen compounds (**1**-**17**) isolated from the leaves and roots extracts as well as eight derivatives (**18**-**25**) using chromatographic, semisynthetic and spectroscopic techniques. The cytotoxicity of these samples was evaluated on human cancer cell lines.

Results: Two isolated compounds (**1** and **2**) and seven derivatives (**18** - **24**) were new. The methanolic leaf extract (IC_{50}, 8.4 to 13.1 μg/mL); *n*-hexane leaf extract (IC_{50} 11.2 μg/mL); as well as compounds **14** (IC_{50} 7.4 μM) and **18** (IC_{50} 6.3 μM) were potentially active on some cell lines. Compounds **1**-**8** were isolated from *E. glomeratum* for the first time whereas **2-6** and **8** were new from the *Eriosema* genus. Compounds **9-12** were previously isolated from *E. glomeratum;* **13** and **14** from *E. montanum* and **15a** and **15b** from *E. robustum*. Previous studies on plant species of the genus *Eriosema* revealed mostly the presence of flavonoids. Our results on the isolation of compounds **1**, **2**, **9**, **10**, **13** and **14** from *E. glomeratum* compared to those of other *Eriosema* species, isoflavonoids and dihydrochalcones had chemotaxonomic importance at the genus level. A good biosynthetic relationship is observed between classes of compounds isolated from *E. glomeratum* such as alkyl caffeate (**28**), dihydrochalcones (**30-32**) and isoflavones (**33-36**). Their occurrence starts from the phenylalanine ammonia-lyase the enzyme that catalyzes the first step of general phenylpropanoid pathways in plants, catalyzing the conversion of L-phenylalanine (**26**) to *trans*-cinnamic acid (**27**) via a non-oxidative deamination reaction.

Conclusion: We believe that the search of bioactive compounds from plant species of the genus *Eriosema* is relevant. From their biosynthetic relationship, phenolic compounds and flavonoids in *E. glomeratum* could be good chemotaxonomic markers for this plant and other species of the genus *Eriosema*.

Keywords: *Eriosema glomeratum*, Fabaceae, Biosynthesis, Chemotaxonomy, Cytotoxicity.

TEMEGNE NONO Carine

Effects of extracts from leaf, stem and root of *Mimosa pudica* (L.) on seeds germination of *Abelmoschus esculentus* (L.) Moench

Poster – P44

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Background: *Mimosa pudica* is an important invasive species in nature. It is a menace in crops as it competes for light, water and nutrients and harbor diseases and insects. The aim of this study was to assess the allelopathic effect of *Mimosa* on okra germination. Methods: The experiment was done in the laboratory where the seeds (20/Petri dishes) of two okra varieties (Clemson: V1 and Hire: V2) were watered with the different concentrations (C1:25%, C2:50%, C3:75%, C4:100%) of aqueous extracts of the root (RAE), stem (SAE) and leaf (LAE) of *Mimosa*. Control seeds were watered with sterile distilled water (C0:0%). Germination parameters were evaluated. Results: The extraction yield was 160, 150 and 240 mL for roots, stems and leaves respectively. The aqueous extracts of *Mimosa* significantly ($P<0.05$) reduced the germination of okra seeds. With increasing extract concentration from C1 to C4, a gradual decrease in seed germination parameters was observed in both varieties regardless of the type of extract. Thus, at V2, the highest germination% was recorded for the control (C0:86.67%) and the lowest at C4:33.3% for LAE. The mean length of radicles observed after the 9th day in V2 was 2.33a, 1.33bc, 0.21d, 0.18d and 0.13d cm respectively for C0, C1, C2, C3 and C4 for RAE. Okra showed seed germination inhibition of 85.42-100% for RAE, 75.49-97.54% for SAE and 22.80-86.83% for LAE in V1; 21.18-96.16% for RAE, 30.89-91.87% for SAE and 7.73-61.55% for LAE at V2. At C0, the germination index and seed vigor were higher and the latency time lower. Inhibition was significantly stronger with RAE and SAE. The seeds of V2 were less affected by the extracts compared to those of V1. Conclusion: This work reports the inhibitory effect of *Mimosa* on okra seed germination parameters depending on the concentration of root, stem or leaf extracts.

Keywords: allelopathic activity; aqueous extract; germination; *Mimosa pudica*; okra; weeds.

Gebremariam BIRHANU

ZINC OXIDE NANOPARTICLES SYNTHESIZED USING MORINGA STENOPETALA LEAF WATER EXTRACT FOR CIPROFLOXACIN DELIVE

Poster - P45

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Background and method: Therapeutic drug molecules have different limitations like poor solubility, non-specificity, and faster clearance from the body. One approach to solving these limitations is using an inorganic nanoparticle-based drug delivery system. Here we synthesized zinc oxide nanoparticles (ZnONPs) using *Moringa Stenopetala* leaf water extract and assessed its drug delivery potential for ciprofloxacin. ZnONPs were synthesized from zinc nitrate hexahydrate solution using water extract of *M. Stenopetala* leaf at optimized physicochemical parameters. Then, the nanoparticles (NPs) were loaded with ciprofloxacin. Both free and drug loaded ZnONPs were characterized by different instrumental methods. For drug-loaded nanoparticles, drug loading content, drug entrapment efficacy, and releasing behavior at four different pH conditions (1.2, 6.0, 6.8, and 7.4) were also evaluated.

Results: Initial characterization using UV/Vis. spectrophotometer showed the successful synthesis of ZnONPs. The synthesized NPs were predominately spherical in shape and pure crystalline. Their estimated crystallite size was 25.4 nm and their average diameter was 58 nm. Their hydrodynamic radius was 134 nm, later changed to 148 nm when they are loaded. The drug loading content and drug entrapment efficacy were 49.1% and 96.5 % respectively. Finally, the loaded ciprofloxacin was efficiently released from ZnONPs at the site of *E.coli* infected uroepithelium environment (pH of 6.0) in a sustained manner and sufficiently stable in physiological pH conditions.

Conclusion: The findings indicated that synthesized ZnONPs could be a potential carrier for ciprofloxacin delivery.

Keywords: Ciprofloxacin; Drug delivery; Moringa Stenopetala; Zinc oxide nanoparticles.

DAWAYE AMANI Daniel

Biodiversity and dynamics of synanthropic fly communities in the Sudano-Sahelian zone of Cameroon

Poster – P46

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Background and methods: The Sudano-Sahelian zone of Cameroon is caracterized by a hot tropical climate and poor sanitation; favorable to the proliferation of synanthropic flies. Through their activities, proliferating flies can increase the transmission of diarrheal diseases in a region with high endemicity. This study aimed at determining the factors that influence the variation in diversity and dynamic of synanthropic flies in order to contribute in controlling the diarrheal diseases. A monthly capture of synanthropic flies was carried out in 66 sites over nine months covering both rainy and dry seasons. Three baits of 40g each were used to attract the flies. All the flies attracted by each baits were captured using a trap after 5 min of exposure, and identified using the usual identification keys. The data on altitude, rainfall, temperature, humidity and wind speed of each capture site were collected for their potential impact on flies' activities.

Results: Sixteen species of synanthropic flies were identified. These insects were more abundant in July and August; in endemic cholera and in high human density areas. They are less abundant in January and February; in low-human density and agriculture areas. M. domestica was the must abundant species (Simpson dominance diversity index D=0.57). The diversity of these insects was heterogeneous and sparsely distributed (Shannon diversity index H'=1.57 and Equitability of Pielou index J=0.63).

Conclusion: The human density and the rainfall were major factors that influenced the structure of synanthropic fly communities in the Soudano-Sahelian area.

Keywords: Synanthropic flies, diversity, dynamics, factors, Sudano-Sahelian

KOMGUEM Francine Vanelle

INVESTIGATING THE CUMULATIVE RISK OF DEVELOPING HIV-ASSOCIATED CANCERS IN THE CONTEXT OF HBV AND HPV VIRAL CO-INFECTIONS AND CO-MORBIDITIES IN YAOUNDE CAMEROON.

Poster – P47

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Background and Methods

Globally, about 36million people are living with HIV (UNAIDS, 2020). In Cameroon, 3.7% of the adult population are living with HIV with approximately 1% dying from the disease each year. With antiretroviral therapy, PLWHIV live longer and are predisposed to acquiring other co-infections and comorbidities. The risk of developing these co-infections and comorbidities are not clearly stated hence the need of more sensitization within these populations. Blood samples were collected in EDTA tubes from 90 women, centrifuged and plasma aliquots made. These aliquots were used for laboratory analyses of HBV rapid diagnostic test (RDT) and HPV IgG test using ELISA Test kits and confirmed by an HPV genotyping at CRESAR. Data was analyzed using SPSS 23 software, Microsoft excel and Graph illustrations. We also used the Pearson Chi square statistical test to determine the relationship between these co-infections and comorbidities.

Results

We obtained 4 positive samples for HBV and 86 were negative which gave us a percentage of 4.4% for HIV/HBV co-infection. Upon HPV Igg testing by ELISA, we had 6 positive samples and 84 negative which gave us a percentage of 6.6. Results were significant for p-value<0.05 (0.001) at 95% CI for the correlation between the triple infection using the Pearson Chi square test.

Conclusion

HPV and HBV co-infections are still on the trend among PLWHIV especially women of the age trend 30-65 whose immune system is weaker than those of the younger age hence high risk of co-infections.

Key words; co-infections, comorbidities, HBV, HPV, HIV.

TCHAKOUAMO MATEFO Ornella Ingrid

Chemical investigation and antiplasmodial potential a Cameroonian medicinal plant : *Voacanga thouarsii* Roem. & Schult (Apocynaceae)

Poster – P48

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Background and methods: Malaria is a life-threatening disease which affects an estimated 247 million people worldwide with approximately 95% of cases in African regions alone (WHO, 2022). Artemisinin-based Combination Therapies (ACTs) are recommended as first-line treatment for malaria but their efficacy has decreased with the development of *Plasmodium falciparum* resistance to these drugs. Knowing the relevance of plants in folk medicine, and the fact that most antimalarial drugs are of plant origin we aimed to do the bioguided investigation of the EtOH/H_2O (7:3) extract of *Voacanga thouarsii* stem bark which displayed a promising antiplasmodial activity (IC_{50} = 7.08 µg/mL) against the chloroquine sensitive *P. falciparum* strain (*Pf*3D7) during a preliminary screening. The active fractions were purified using usual chromatographic methods. The structures of the isolated compounds were characterized by spectroscopic technics. The *in vitro* antiplasmodial activity of the extracts, fractions and compounds was perfomed using the SYBR green I-based fluorescent microdilution assay against the chloroquine sensitive *Pf*3D7 strain of *P. falciparum.*

Results: Bioguided investigation of this extract yielded 10 iboga type alkaloid with one new derivative, 3 iridoids with one new and one undescribed, 4 steroids, and 1 triterpenoid. Their structures were elucidated using NMR spectral data, and mass spectrometry. The compounds were tested for their antiplasmodial and antioxydant activities.

Conclusion: This work provides insight into the chemical constituents and antiplasmodial potential of *V. thouarsii* and show that the stem bark could be used a raw material for the preparation of ameliorated agents for the treatment of malaria, subject to further study.

Keywords: *Voacanga thouarsii*, antiplasmodial, iboga type alkaloid, iridoids

AMAHNDONG MATHILDA LOINSEBOH

BIO-GUIDED INVESTIGATION OF A CAMEROONIAN MEDICINAL PLANT WITH ANTISALMONELLA ACTIVITY: *Paullinia pinnata* (SAPINDACEAE)

Poster – P49

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Background and methods: Typhoid fever is a systemic infection caused by the bacteria *Salmonella typhi*, spread through the ingestion of contaminated food or drink. Globally, around 16-33 million infected cases with about 500,000 to 600,000 deaths annually were reported in 2021, with many cases coming from Africa. Due to the alarming increase in the resistance of microorganisms to antibiotics, bacteria have developed mechanisms of resistance including target modification, biofilm formation, drug inactivation, which plays an important role in multi-drug resistance (MDR). The emergence and spread of *Salmonella* resistance to ciprofloxacin, ceftriaxone, azithromycin, has rendered these drugs less effective. However, plants contain secondary metabolites, which are responsible to fight against most diseases. Therefore, there is an urgent need to tackle this drug resistance plaguing our society by using plants. So in line with this, the leaves of *P. pinnata* were extracted with EtOH/H_2O (7:3) to obtain a crude extract, which was tested on *salmonella* strains. The extract was fractionated using a liquid-liquid partition to obtain different fractions, which were tested on six strains of *salmonella* using a 96 well plate micro dilution method. All the active fractions were purified using different chromatographic methods, all structures reported herein were elucidated using spectroscopic methods (1D and 2D NMR, MS). The isolated compounds were also tested on six strains of salmonella.

Results: The bio-guided investigation of the EtOH/H_2O (7:3) crude extract led to the isolation and characterization of 22 compounds. The extracts, fractions and compounds from this plant showed a significant to moderate activity on some strains of salmonella with Minimum Inhibition Concentration values between 7.8-500 μg/mL.

Conclusion: The results obtained confirms the use of this plant in traditional medicine and suggest that it could be a good candidate for the pre-formulation of a phytodrug against typhoid fever.

Keywords: *Paullinia pinnata*, antisalmonella activity, compounds

KENEMBENI KAMERU Marie

Antibacterial bio-guided investigation of a Cameroonian medicinal plant: *Olax latifolia* (Olacaceae)

Poster – P50

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Background and Methods: Infectious diseases caused by bacteria are one of the leading causes of deaths in the world. Some respiratory tract infections are caused by bacteria and are considered as one of the major public health problems leading to morbidity and mortality. Thus, in recent years there has been increased of the use of plants and their derivatives in treatment of cough, tuberculosis and bronchitis. *Olax latifolia* is one of this plant used traditionally for the treatment of these ailments. The aim of this work is to obtain active extracts, fractions, or compounds with less toxicity which could serves for a trial formulation of a phytodrug against respiratory tract infection. The stem bark (OLS) and roots extracts (OLR) of *Olax latifolia* were prepared and screened against four bacterial strains using Gentamycin as positive control. By trituration of these extracts using *n*-hexane, acetone and MeOH solvents, three fractions were obtained and then, submitted to the antibacterial testing on *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella Pneumoniae* and *Escherichia coli* using the microdilution method described by Ellof in 1998 with a slight modification. Active fractions were submitted to chromatography separations using silica gel and sephadex LH-20 to afford pure compounds, which were characterized by spectroscopic and spectrometric analysis.

Results: Extracts and fractions from roots and stem-bark of *Olax latifolia* displayed a significant to non-activity with MICs ranging from 15.6 µg/mL to 1000 µg/mL. The most active fractions were recorded in the *n*-Hexane and ethyl acetate fractions from roots with MIC values of 15.6 µg/mL and 62.5 µg/mL against *Escherichia coli* and *Staphylococcus aureus* respectively. The acetone fraction recorded the best activity with the value of 62.5 µg/mL against *Staphylococcus aureus*. Chemical investigation on this acetone fraction afforded five compounds which were fully characterized among which two phytosterols and three flavonoids

Conclusion: Bio-guided investigation of *Olax latifolia* can lead to the formulation of an effective standardized phytomedicine that can be integrated into our health care system for sustainable development.

Keywords: Keywords: Respiratory tract infection, *Olax latifolia*, Olacaceae, antibacterial activity, *Staphylococcus aureus*.

MENATCHÉ NJOPNU Joël

ANTIPLASMODIAL ACTIVITY OF EXTRACTS OF *ANTROCARYON MICRASTER* (ANACARDIACEAE) AND THEIR CHEMICAL CONSTITUENTS.

Poster - P51

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Background and methods: Malaria is a parasitic disease widespread in tropical and subtropical regions of the world. According to the lastest WHO report, the number of case of malaria was estimated at 247 million with 619.000 deaths worldwide in 2021 (WHO, 2022). Nearly 95% of these cases have been recorded in the WHO Africa region. Recent studies have reported that *Plasmodium falciparum* has developed resistance to many of the available antimalarials. This therefore calls for urgent need to search for new antimalarial drugs. In line with this, we undertook the bioguided investigation of the CH_2Cl_2/MeOH (1:1) extract of the different parts of *Antrocaryon micraster*. The extracts were fractionated by column chromatography and by liquid-liquid partition. The structures of isolated compounds were established based on their spectroscopic (1D and 2D NMR) data. The *in vitro* antiplasmodial assay was performed following the method using SYBR Green-I based with chloroquine as reference drug described by Smilkstein and collaborator in 2004.

Results: The stem barks, fruits and leaves of *A. micraster* showed highly to prominsingly activity against *P. falciparum* 3D7 strain with IC_{50} values of 4.36, 8.08 and 7.82 µg/mL, respectively. The chemical investigation of stem bark, fruits and leaves of this plant led to the isolation and identification of 28 compounds among which 8 flavonoids, 3 anthraquinones, 5 ellagic acid derivatives, 4 steroids, 5 triterpenoids, 1 lignan and 2 benzoid acid derivatives.

Conclusion: The highly to prominsingly antiplasmodial activity of leaves, stem bark and fruits of *A. micraster* can justified the used of this plant in traditional medicine to treat malaria.

Keywords: *Antrocaryon micraster*, antiplasmodial activity, bioguided investigation.

NGOMO Orléans

FORMULATION OF AN ANTISEPTIQUE CREAM WITH CHITOSAN EXTRACTED FROM SCALE FROM TILAPIA OF NILE (Oreochromis niloticus)

Poster – P52

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The formulation of an antiseptic cream with the active ingredient chitosan was carried out. Chitosan is obtained from chitin extracted from scale of tilapia of Nile (Oreochromis niloticus) by the chemical method, the yield of 21.2% was obtained, representative a mass of 10.6 g after deacetylization. Chitosan was characterized by solubilization and antibacterial activity test using the disc method. The results obtained show good solubilization of chitosan and reveal antibacterial activity on E. coli colonies for the concentration of 1.5 g/l and no activity on S. aureus. An antiseptic cream was prepared and evaluated for its antibacterial properties after introduction of the active principle; the cream obtained shows antibacterial activity on E. coli (gram negative) and S. aureus (gram positive) respectively with inhibition diameters of 5 mm and 3 mm at the minimal inhibition concentration of 1.5 g identical for the two bacteria.

Keywords*: chitosan, Nile tilapia, cream, antiseptic.*

NGUEMBU TCHONENG Larissa

CHEMICAL INVESTIGATION OF *ERYTHRINA SIGMOIDEA* (FABACEAE) AND ANTIPNEUMONIAL POTENTIAL OF THE CONSTITUENTS

Poster - P53

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Background and methods: Pneumonia is an acute lower-respiratory infection that occurs secondary to airborne infection which includes bacteria, virus, fungi, and parasites, among others. Worldwide, pneumonia affects 120 million children under 5 years old with an estimated 1.3 million death every year. In Cameroon, pneumonia accounts for 18% of deaths in children under 5 years old. Antibiotics used to treat pneumonia such as Doxycycline, Levaquin and Amoxicillin are ineffective in 30% of patients suffering from pneumonia as a result of bacterial resistance. There is therefore an urgent need of new antibiotics. Thus the main objective of this work is to search for active extracts/fractions with potent antipneumonial activity and isolate secondary metabolites in view of their antipneumonial potential. In line with this, the stem bark of *Erythrina sigmoidea* was extracted with MeOH to obtain the crude extract, which was screened for antibacterial activity. The crude extract was fractionated using liquid-liquid partition and the fractions obtained were screened for antibacterial activity against *Pseudomonas aeruginosa*, *Klebsiella pneumonia*, *Echerichia coli* and *Staphylococcus aureus*. LC-MS/MS analysis was performed on the CH_2Cl_2 fractions for identification of compounds. Fractions were purified using usual chromatographic methods to obtain pure compounds whose structures were elucidated using different spectroscopic methods (1D and 2D NMR, MS).

Results: The crude extract and fractions showed significant to moderate antibacterial activity with Minimum inhibitory values ranging from 31.2-500 μg/mL. The LC-MS/MS analysis of the methylene chloride fraction let to the identification of 02 compounds.Chemical investigation of the methylene chloride fraction let to the isolation of 09 compounds amongst which 05 flavonoids, 03 sterols and 01 triterpenoid.

Conclusion: The results obtained may justify the use of this plant in traditional medicine to treat pulmonary trouble and could be a good candidate for phytodrug preformulation.

Keywords: *Erythrina sigmoidea*, bacteria, pneumonia, flavonoids.

MBARGA ETOGA Paul

Chemical studies of two Cameroonian medicinal plants: *Macaranga hurifolia* (Euphorbiaceae), *Conyza aegyptiaca* (Asteraceae) and evaluation of their potential against *Staphylococcus Aureus.*

Poster – P54

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Introduction: *Staphylococcus aureus* is a bacterial pathogen that causes a wide range of infections ranging from soft tissue and skin infections, bacteremia, bloodstream, ear inflammation to digestive tract and lethal pneumonia. Since 1944, the work done by many research groups showed that *S. aureus* develop successively penicillin, methicillin and vancomycin resistance. Nowadays, the increasing of infections cause by *S. aureus* is due to drug resistance to the available treatment developed by this bacterium. So there is an imperative need to research for new antibiotic agents with a less side effect. Our main goal is to obtain active extracts and fractions then, study their chemical composition.

Methodology: Areal parts of *Macaranga hurifolia* (seeds, roots and stem bark) and the whole plant of *Conyza aegyptiaca* were dried, powdered and extracted by maceration twice with the appropriate solvents. The different crude extracts obtained were evaluated regarding their potential against three strains of *S. aureus* using microdilution method. Extracts were fractionated and purified through column chromatography and the fractions were also evaluated for their *S. aureus* potential. The structures of isolated compounds were determined by spectroscopic methods and by comparison with reported data.

Results: Twenty compounds were isolated and entirely characterized among which, two new compounds named conyflavone and conyditerpene from *C. aegyptiaca* along with eight known compounds, one new flavonoid along with nine known compounds from *M. hurifolia*. Extracts and compounds from *C. aegyptiaca* displayed a moderate activity with MIC values ranging from 125 to 500 µg/mL, when extract and fractions from *M. hurifolia* displayed good activity with their MIC value ranging from 3.9µg/mL to 500µg/mL

Conclusion: The results of this study show that extracts from both plants can be candidate for an attempt of pre-formulation.

Impact of the study: As a chemist, working on plants with activity against *S. aureus*, our work, if well conduct we will have contributed to the implementation of at least 4 of the 17 SDGs goals.

Keywords: *Macaranga hurifolia, Conyza aegyptiaca, Staphylococcus aureus*

BAKAM YENGWA Berlise

Cucumis sativus (Curcubitaceae) inhibits prostate carcinoma cell growth and prevents the testosterone-induced benign prostatic hyperplasia in Wistar rat

Poster - P55

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Pumpkin seeds are claimed to treat prostate inflammation/tumour. The *in vitro* and *in vivo* antiproliferative effects of six edible pumpkin seeds found in Cameroonian were then assessed. Their ability to inhibit prostate cancer cell growth was determined by MTT assay. *In vitro*, *C. sativus* seeds oil exhibited a potent antiproliferative effects on DU145 and PC3 prostate cancer cells.. *In vivo*, a 28-day consecutive administration of testosterone significantly increases prostate relative mass and volume, prostate epithelium height, total protein level, PSA and testosterone as compared to normal rats. *C. sativus* seeds counteracted the effects of testosterone by significantly decreasing all these parameters with an optimal effect at the dose of 500 mg/kg BW. Furthermore, it significantly decreased IL-1β, IL-6 and TNFα level compared to rats treated with testosterone only. In sum *C. sativus* seeds has anti-proliferative effects on prostate; which could justify its use by Cameroonian male against prostate ailments.

Key words: *Curcumis sativus*; pumpkin seeds; benign prostatic hyperplasia; antiproliferative; antioxidant.

MEPONG N.F

ANTIMICROBIAL AND ANTIOXIDANT ACTIVITIES OF *STREPTOMYCES* SP. PFK4: ITS POTENTIAL MODES OF ACTION AND BIOACTIVE SECONDARY METABOLITES.

Poster - P56

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Background and methods: Bacteria of *Streptomyces* genus are a promising source of bioactive products, with application in medicine, industry, agriculture and environment. The aim of this study was to evaluate the antimicrobial and antioxidant properties of methanolic *Streptomyces* sp. PFK4 extract, the mode of action and its bioactive metabolites. Zone of inhibition (ZI), minimum inhibition concentration (MIC), minimum bactericidal concentration (MBC) were conducted to determine antibacterial activity. Potential mode of action of extract was assayed. The antioxidant activity was determined by 2,2-diphenyl-1-picryl-hydrazyl-hydrate (DPPH), 2,2-Azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radical scavenging and Ferric reducing assays. The gas chromatography coupled with mass spectrometry (GC-MS) was used to identify bioactive compounds.

Results: The mean ZI (mm) ranged from 11.00 to 20.60 mm with highest ZI observed against *S. typhi*, *S. aureus* and *S. typhimurium*. The MIC ranged from 0.25 to 0.5 mg/ml and MBC from 0.25 to 1 mg/ml against bacterial pathogens. PFK4 extract showed ability to inhibit bacteria cell wall, protein synthesis; exhibited DPPH and ABTS scavenging activities at concentration 50 µg/ml with the highest inhibition concentrations 83.74 ± 2.10% and 72.97 ± 2.67%, IC50 values of 100.8 µg/ml and 15.69 µg/ml respectively. The highest FRAP reducing power was 8.04 ± 0.85 µg/ml at the concentration of 200 µg/ml. From the GC-MS analysis, twenty-three biological compounds were identified and 2-Hydroxy-3,5,5-trimethyl-cyclohex-2-enone is one of the compound with antioxidants and antimicrobial activities.

Conclusion: The results of this study indicates that methanolic PFK4 extract possesses antibacterial activities by cells lysis and protein inhibition; antioxidant activities; and contains mostly fatty acids and their derivatives which are recognized as therapeutic agents that cover a wide range of indications such as cancer, bacterial infections, parasitic infection, inflammations to name a few.

Keywords: *Streptomyces* sp. PFK4, antimicrobial, modes of action, antioxidant, GC-MS, bioactive compounds.

POSSI DJILA Franck Landry

Chemical investigation of Holarrhena floribunda (Apocynaceae) and evaluation of its antiplasmodial activities
Poster – P57

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Background and methods: Malaria is a life-threatening disease caused by Plasmodium parasites transmitted through a bite of female Anopheles mosquitoes. This disease remains a serious health problem in sub-Saharan countries with the greatest number of cases of death. Therefore, there is need to search for new therapeutic agents. That is why, we undertook a study to investigate Holarrhena floribunda used in folk medicine to treat malaria. Our main aim is to search for extract, fractions or compounds with potent antiplasmodial activity.

The stem barks of H. floribunda were extracted with ethanol to afford crude extract which were screened for its in vitro antiplasmodial activity toward chloroquine sensitive 3D7 and multi-drug resistant Dd2 strain of P. falciparum using SYBR Green-I based Growth Inhibition Assay with chloroquine and artemisinin as reference drugs. Fractionation were done using liquid-liquid partition with n-hexane, CH2Cl2 and n-BuOH. The structures of isolated compounds were determined thanks to spectrometric (1D and 2D and spectroscopic methods.

Results: The crude extract of H. floribunda showed good and moderate activities toward P. falciparum 3D7 and Dd2 strains with IC50 values of 14.89 and 25.38 µg/ml respectively. Its n-hexane fraction showed moderate activity toward the same strain of P. falciparum with IC50 of 16.61 and 47.16 µg/ml respectively and CH2Cl2 alkaloid fraction showed promising activity with IC50 of 0.77 µg/ml toward P. facilparum 3D7. The crude extract of H. floribunda stem afforded thirteen compounds, including five triterpenoids, one phenolic acid derivative, three steroids and three alkaloids. Amongst the tested compounds, just Ethylorsalinate showed good activity toward chloroquine sensitive strain of P. falciparum 3D7 with an IC50 =10 µM while Others were inactive.

Conclusion: These results obtained confirmed partially the use of H. floribunda stems in traditional medicine to treat malaria.

Keywords: Chemical investigation, Apocynaceae, Holarrhena floribunda, Antiplasmodial activity

SAIDOU TSILA Sylvestre

Chemical investigation of *Ziziphus mauritiana* and evaluation of the antiplasmodial activity
Poster – P58

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Background and Methods: Malaria is a serious and sometimes fatal disease caused by a parasite that commonly infects a certain type of mosquito, which feeds on humans (CDC, 2022). Since 2001, ACTs (combined treatments based on artemisinin) replaced old molecules (such as chloroquine or sulphadoxine-pyrimethamine), which had become ineffective because the Plasmodium, the parasite responsible for malaria, was increasingly resistant to them (MSF, 2016). The aim of this work is to search for non-toxic extracts, fractions with potent antiplasmodial activity that can be used in the preformulation of phytodrugs and active secondary metabolites for the development of new antiplasmodial agents. The extracts of the roots of Z. mauritiana were obtained after maceration using ethanol and ethyl acetate, respectively. The extracts were screened for antiplasmodial assay and analyzed using LC-MS. An acid-basic liquid-liquid partition was performed with dichloromethane and ethyl acetate, and the fractions screened and submitted to LC-MS/MS analysis. Successive column chromatographies were performed on the fractions using different solvents hexane/ethyl acetate and hexane/acetone with increasing polarity. The structures reported herein were elucidated using usual spectroscopy methods (1D and 2D NMR, MS).

Results: The investigation of the roots of Z. mauritiana led to the identification of 10 compounds among, which 10 were isolated, fully characterized, and sorted into 07 terpenoids, 02 alkaloids, and 01 saponin. The ethanol extract showed a moderate antiplasmodial activity with an IC50 value of 32.70 µg/mL. The ethyl acetate and dichloromethane fraction showed a good and promising antiplasmodial activity against Pf 3D7 with an IC50 value of 11.35 and 4.75 µg/mL, respectively.

Keywords: Ziziphus mauritiana, antiplasmodial activity, LC-MS, malaria.

TIOGO KAMGNI Steveng Schuller

Bioguided investigation of a Cameroonian medicinal plant: *Carapa macrantha* (Meliaceae) with anti-Leishmanial activity

Poster - P59

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Background and methods: Leishmaniasis is a neglected tropical disease caused by the *Leishmania* genus. About 20 different species of *Leishmania* have been discovered to be pathogenic to humans, including *Leishmania donovani* that causes the deadliest leishmaniasis. The aim of our work is to search for active and non-toxic extract, fractions and compounds from *Carapa macrantha* with anti-Leishmanial activities for the pre-formulation of phytomedicine against Leishmaniasis. The fruits, wood methylene chloride-methanol (1/1) as well as methanol extract of stem bark of *C. macrantha* were obtained by maceration during 48 hrs. These extracts were evaluated for their anti-Leishmanial activities against *L. donovani*. The fractions and compounds were obtained by liquid-liquid partition and column chromatography respectively, and tested for their anti-*Leishmania* activities.

Results: The methylene chloride-methanol (1/1) extract of fruits of *C. macrantha* showed good activity against *L. donovani* with IC_{50} value of 31.07 ± 1.49 μg/ml. Also, methanol extract of stem bark and methylene chloride-methanol (1/1) extract of the wood of *C. macrantha* showed good and moderate anti-leishmanial activity with IC_{50} value of 40.57 ± 2.42 μg/mL and 52.13 ± 1.71 μg/mL respectively. The purification of methylene chloride and ethyl acetate fraction from methanol extract of stem bark and ethyl acetate fraction from wood led to isolation of ten compounds like: CMS22 (15 mg); CMS31 (3 mg); CMS32 (1.5 mg); CMS33 (1mg); CMS34 (2.5mg); CMS35 (5mg); CMS36 (6mg); CMS23 (1 mg); CMB32 (158 mg) and CMB33 (6 mg). Three compounds have been identified as β-sitosterol (CMS22), 3-*O*-β-*D*-glucopyranoside of β-sitosterol (CMS35) and lupeol (CMS32).

Conclusion: The phytochemical investigation of stem bark and wood of *C. macrantha* led to isolation of ten compounds. The good activity of extract of fruits and stem bark of *C. macrantha* could justify the uses in traditional medicine to treatment of Leishmaniasis.

Keywords: *Carapa macrantha*, bioguided, anti-Leishmanial; Leishmaniasis

YOUMBI Tatiana Gwladys

Chemical investigation of extract of *Macaranga monandra* (Euphorbiaceae) leaves and antimalarial activity

Poster - P60

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Background and methods: *Macaranga* is one the largest genera of *Euphorbiaceae* family. In literature review different classes of secondary metabolites have been isolated from this genus including terpenes, coumarins, flavonoids, diterpenes, steroids, tannins, stilbenes and phenols. (Magadula, 2014). These compounds particucularly flavonoids and stilbenes are responsible of the activities found in the plant in this genus such as antimalarial activity (Magadula, 2014). In fact the leaves of *M. monandra* is used in folk medicine to treat fever, so we focus our attention on it to evaluate antimalarial activity of extract, fractions and isolated compounds. To perform this goal the crude of leaves of *M. monandra* were partitioned with *n*-hexane, dichloromethane, ethyl acetate and *n*-butanol. The extract and fractions were assessed for their antimalarial activities and compounds had obtained by repeated column chromatography on silica gel and sephadex using differents solvents. The structures of pure compounds were established using physical and spectroscopic data.

Results: Separation and purification of the different fractions afforded twenty compounds including four steroids, six flavonoids, one diterpene, six pentacyclic triterpenes, one xanthone, one ellagic acid and glycerol. Apigenin exhibited moderate activity against malaria with IC_{50} value of 3,47 µg/mL.

Antimalarial bioassay on extract and fractions of *M. monandra* shown interesting antiplasmodial activity. In fact, extract exhibited promise antimamarial activity with IC_{50} value of 5.27 µg/mL; when *n*-hexane, dichloromethane, ethyl acetate and *n*-butanol fraction exhibited also moderate and good activity with IC_{50} values of 13.97 µg/mL; 12.95 µg/mL; 3.27 µg/mL; 2.57 µg/mL respesctively.

Conclusion: the compounds isolated from *M. monandra* leaves are largely consistent with those previously isolated from different parts of plants in the same genus.

Keywords: *Macaranga monandra*, Euphorbiaceae, chemical constituents, antimalarial activity.

TCHAMBA KEUWE Gérard

Potentializing effects of the mixture of aqueous extracts of *Crassocephalum crepidioides* and *Cinnamomum zeylanicum* in L-NAME induced hypertension rat.

Poster – P61

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Hypertension or high blood pressure (HBP) is the major risk factor for cerebrovascular, cardiovascular and renal morbidity and mortality. Its treatment remains a great challenge. To potentialize effects or reduce the doses, the mixture of drugs was recently recommended. The current study investigates the preventive effects of the mixture of the aqueous extracts of *Crassocephalum crepidioides (Cc)* and *Cinnamomum zeylanicum (Cz)* in hypertension induced by L-NAME, an NO inhibitor.

The hypotensive effects of each plant and the mixture were evaluated at the dose of 5, 10, 20 and 40mg/kg using invasive method in normal rats (n = 5). For antihypertensive effects, 9 groups of 5 rats each were used. The group 1 received distilled water (*p o*) and Nacl 9% (*ip*). The other groups received L – NAME (25mg/kg *ip*) simultaneously with, distilled water, captopril (20mg/kg) ,*C c, C z* and the mixture (150mg/kg and 300 mg/kg) respectively. After 21 days of treatment, blood pressure and heart rate were recorded by invasive method. The rats were sacrificed; serum and some organs (aorta, heart, kidney and liver) were moved to evaluate biochemical parameters and histological analysis.

The results coming out showed that each plant effect presents the hypotensive effect with the maximum at the doses 20mg/kg but the mixture presented its maximum effects at the dose of 10 mg/kg. All the extract raised significantly ($P < 0,001$) the high blood pressure induced by the L–NAME, with the better effect at the doses of 150mg/kg with the mixture. These results can afford the use of the mixture of these plants in folk medicine to cure hypertension.

Keywords: *Mixture, C. crepidioides, C. zeylanicum L-NAME, Hypertension,Rat*

NANDOU TENKEU Muller

Contribution to the fight against unsalubrity and deforestation of mangroves through the production of ecofriendly coal in Douala

Poster – P62

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To fight the insalubrity and deforestation of the mangrove of the Cameroon estuary, a study was conducted in two sites of Youpwe and monkey wood between 2017 and 2022. A social-economical study and environmental survey related 98 operators of woody trees of the genera *Rhizophora* and *Avicennia* was made. An ethnobotanical inventory on 04 transects of 50 × 10 m was also carried out. Results demonstrate that three nationalities dominate the using of mangroves trees: Cameroonian at 91%, Nigerian 6% and Central African 3% leading this area. The apparent exploitability diameter of the genera *Rhizophora* and *Avicennia* varies between 0.5 ±0.01 and 1.15±0.01 cm. Trees of diameter less than 5 cm have undergone extinction at these sites. The area of the territory decreased from 4.24 ±0.01 m^2 in 2017 to 1.58 ±0.01 m^2 in 2022. The volumes exploited also experienced a decline from 239.85 ±0.001 m^3 in 2017 to 100.1 ±0.001 m^3 in 2022. The average densities per site are 805 N/ha in 2017 and 454 N/ha in 2022. Fisher's test showed a significant difference between these two sites. The fisher value obtained 60.50 in this site is higher than the theoretical value 2.04 at 3.25×10^{-50} freedom. These results show that the mangroves of the Wouri estuary are on the verge of extinction. To prevent this extinction an eco-friendly coal was produced from six biomass. Calorific values range from 16 MJ/kg, 25 MJ/kg, to 32 MJ/kg. 80% of the 98 operators have agreed to substitute this charcoal for species of the genera *Rhizophora* and *Avicennia* for cooking meals and for wood energy. These results contribute to the fighting against unhealthy and deforestation of mangroves and are in line with the sustainable development goal, in particular number 7 and 13.

Keywords: deforestation, ecological charcoal, extinction, mangrove, sustainable development, unsanitary

NGO BELL Danielle Jeanne & DJUIDJE KOUOMOU Peguy Flora

Environmental and health risks associated with grilled food vendors, exposure to fumes generated by non-periodic grilling in Nkolbisson, Cameroon

Poster – P63

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Background and methods: Grilling is an activity of the informal sector in Cameroon and one of the main activities carried out in Yaoundé. It constitutes a source of income for the local population. Despite the importance of this activity, it is not without risks for humans and their environment. This study aimed to identify the risks for the environment and the health of grilled food vendors related to fumes generated by non-periodic grilling in the neighborhood of Nkolbisson, A socio-economic survey was conducted among 47 grilled food vendors over five days, during the day (17), and in the evening (30). Fume samples were collected in two measurement sites in Nkolbisson during four (04) consecutive days using a fumes sensor, two (02) days per measurement site, and eight (08) hours per day followed by laboratory analysis. Results: The majority of grilled food vendors surveyed, aged between 31-40 years, were exposed to grilled food fumes 10-13 hours a day and 6 to 7 days a week. Fumes analysis revealed a concentration of smoke of 458.22 ± 20.39a ppm in site 1 (wood) and 352.52 ± 16.40b ppm in site 2 (coal), carbon dioxide of 294.1± 93.75a ppm in site 1 and 352.52 ± 16.40b ppm in site 2, carbon monoxide (CO) of 178.47 ± 45.21a mg/m^3 in site 1 and 64.3 ± 23.90b mg/m^3 in site 2 and fine particles ($PM_{2.5}$) of 316.73 ± 25.74a $\mu g/m^3$ in site 1 and 62.16 ± 18.31b $\mu g/m^3$ in site 2. These concentrations greatly exceed the WHO guidance value (100 ppm, 2500 ppm, 4 mg/m^3, and 15 $\mu g/m^3$ respectively).

Conclusion: Grilling exposes these food vendors to high health risks and contributes to environmental degradation. Several mitigation measures have been proposed both at the organizational and individual levels to remedy this.

Keywords: Risk, health, environment, grilled food vendors, grill smoke, Nkolbisson

MENINGUE Rosine

Financial and Socioeconomics impacts of pig diseases in pig production in Menoua Division, West Region of Cameroon.

Poster – P64

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Pork, a white meat, is the emblem of traditional dishes in Bamileke land. It is always found during social ceremonies and is also sold as roosted meat in streets all over the country. However, the sustainable supply of pork is regularly threatened due to massive mortality of pigs incurred by diseases such as African swine fever. In order to draw the attention of decision-makers on the harm caused by diseases on pig industry, the socioeconomic impact of swine diseases in pigs in Menoua Division was analyzed. The study was carried out from March to July 2021 using a structured questionnaire which was administered to 60 breeders selected via the snowball sampling technique. The results showed that pig farming is an activity dominated by men (68.3%) with average age between 40 and 60 years, Christians (78.3%) and educated (40.3%). Pig keeping is associated with other income-generating activities such as agriculture (50%), commerce (6.7%), and civil service (11.7%). Pig keepers used family labor (81.7%) and almost all produced piglets and fattened pigs of exotic breeds (96.7%). About 2722 pigs were reported dead in 2020 due to disease and categorized as follows: suckling piglets (1419), weaned piglets (292), young growing pigs (250), reproductive boar (119), reformed boar (52), growing young sows (167), pregnant sows (227), suckling sows (117), and reformed sows (79). The financial value (market value) attributable to the 2,722 dead pigs is estimated at 220,889,600 CFA francs ($ 401,617.45 USD). The economic loss incurred by this massive mortality of pigs (2,722 dead) is estimated at 161,249,408Fcfa (293,180.74 USD). The average financial loss attributable to each sampled farm worth 3,932,089.7082 Fcfa (6556.41 USD), which is a huge financial loss with severe socioeconomic consequences in Cameroon where the PBI / capital is very low (1499, 373USD in 2020).

Keywords: Socio-economic impact, Pig farming, financial and economic losses, mortalities, Swine diseases.

TCHE Jacob

THE IMPACT OF TECHNOLOGICAL INNOVATION, EDUCATION SPENDING, ENTREPRENEURSHIP ON UNEMPLOYMENT AND INCLUSIVE GROWTH IN AFRICA

Poster – P65

Jacob TCHE
University of Yaounde II, Cameroon.

The major contribution of this paper is to have bridged the gap between Keynes technological unemployment in and its impact on inclusive economic growth in Africa. Little research by economists has been addressed in relation to Keynes technological unemployment, the effectiveness of public education expenditures, entrepreneurship and inclusive growth in Africa.

The phrase "technological unemployment" was popularized by John Maynard Keynes in the 1930s, who said it was "only a temporary phase of maladjustment". In modern terminology, it refers to the effective substitution of capital for labor. Therefore, when machines and other forms of technology become more efficient than labor in terms of productivity, companies increase their capital and decrease the workforce, thereby increasing unemployment.

From a heterogeneous sample of African countries, we specify and estimate a panel data model using the method of fixed effects, Grouped Least Squares (Driscoll and Kraay), kiviet (2020), the System Generalized Moments Method (MMG), the mediating effect of technological innovation, over the period from 2000 to 2021. The results will be revealing overall, robust and stable.

Three main hypotheses will be tested in the present study:

1. Technological advances cause the unemployment rate to rise

2. There is a link between technological advances, expenditure on education and employment?

3. There is a relationship between technological advances, expenditure on education, entrepreneurship and inclusive growth.

From the perspective of effective economic policy involving shared prosperity, we suggest technological advances, entrepreneurship, greater professionalization of secondary and university education, for better diversification of economic growth in Africa.

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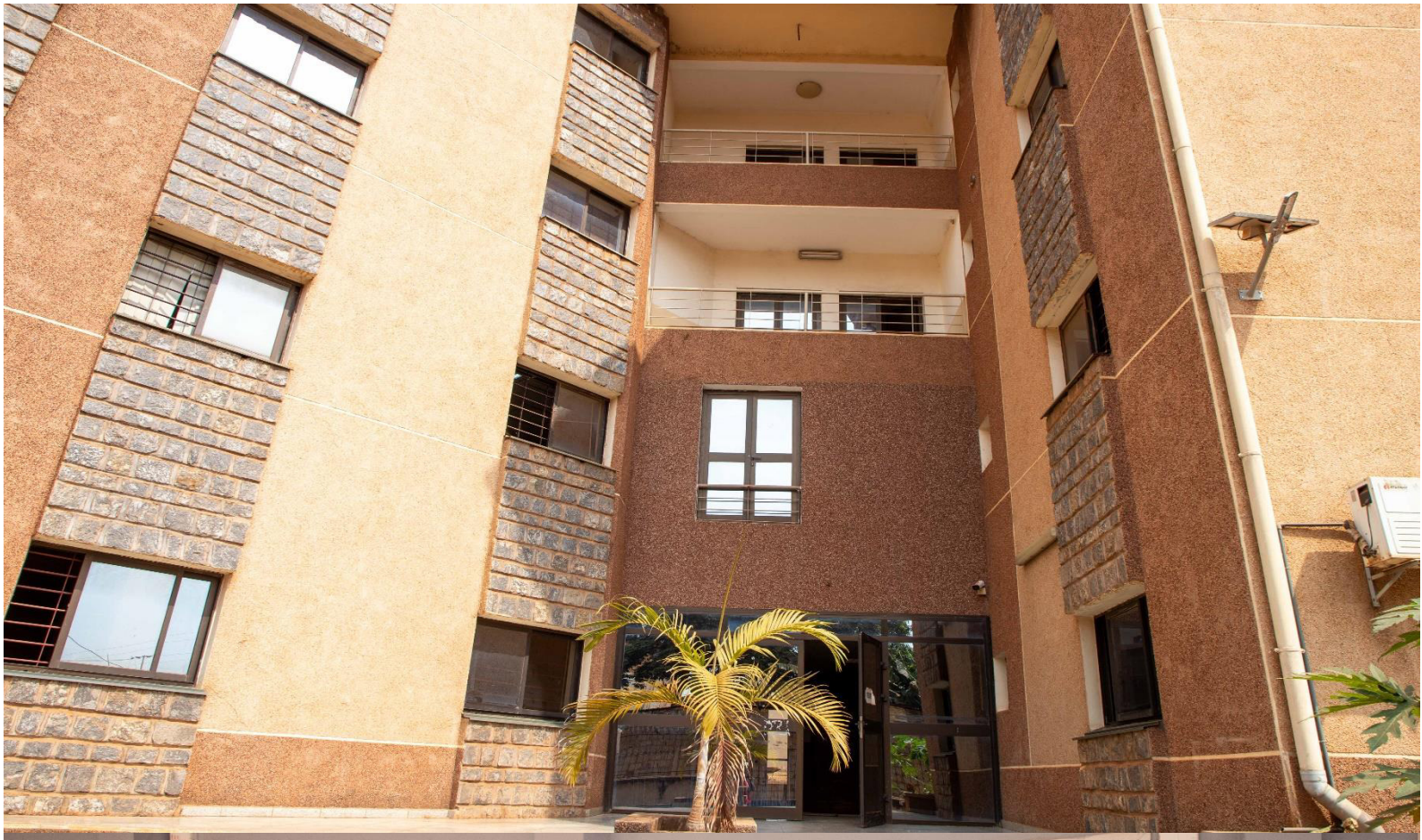

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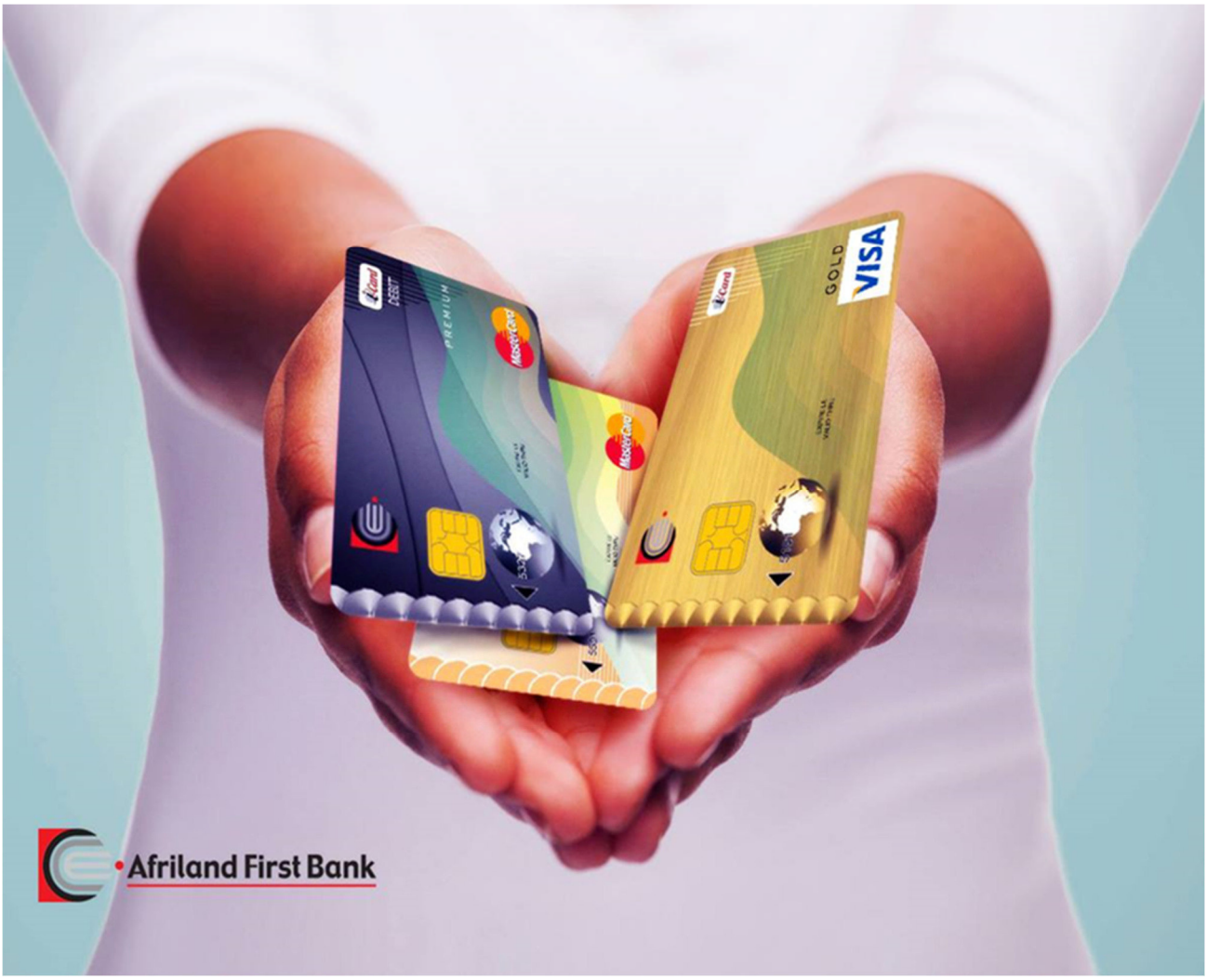
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