2ND Centre's Oku Ampofo Memorial conference

THEME:
herbal medicine research; a panacea for economic transformation

Date: 7-10th Nov. 2023

Venue:
AH Hotel and Conference, East Legon

IMMULATE HERBAL SUPPLEMENT

ACTIVE INGREDIENTS: *Mangifera indica* (25%), *Acacia nilotica*. (55%) and *Azadirachta indica* (20%).

INDICATION: Immune system support and General well-being.

DOSAGE ADMINISTRATION: For oral administration only.

Adults: three table spoonful (45mls) three times daily after meals. Children (twelve years and above): two table spoonful (30mls) three times daily after meals.

For supportive treatment, allow one hour interval between Immulate and other medications.

CONTRAINDICATION: Product is not recommended for children below twelve (12) years old, pregnant women and lactating mothers. Patients with hypersensitivity to active ingredients in IMMULATE, patients on blood thinning medications and drugs with narrow therapeutic index.

Manufactured in Ghana by:

Kantanka Herbal Pharmaceuticals and Research Centre

Gomoa Mpota – Central Region

For bulk purchase, contact +233-303-966-429/+233-535-112-873

www.kantankapharma.com

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GENERAL INFORMATION

Health/Travel Information

Delegates using the Kotoka International Airport (KIA) are reminded to carry their yellow fever cards. If you need visa on arrival, kindly proceed to the visa on arrival desk at the airport and process your visa. You'll be required to pay the required visa fee and visa processed for you instantly.
All delegates arriving via Kotoka International Airport will be picked on arrival by the Hotel. Thus, delegates need to provide their travel itinerary to the Local Organizing Committee (LOC) for the necessary arrangement for pick up to be made. The AH Hotel and Conference is located at HSE No. 84/86 1st Boundary Road, American House, East Legon, and contacted via telephone +233500016062.

Accommodation & Conference Venue

Both accommodation and venue for the conference is at the AH Hotel and Conference, East Legon in Accra (https://ahhotelafrica.com). East Legon is a serene and safe neighborhood in Accra. The environment around the conference venue is generally safe although participants are advised to be vigilant.

Registration Desk

Registration Desk will be situated at the entrance of the main Hall of the conference venue on the first day 7th November, 2022 at 1:00pm to 8:00pm local time. All delegates who have paid in advance will be issued with receipt and be given their conference package including the book of abstracts.
Identification of Delegates
Upon registration, delegates will receive conference materials and identification badge that must be worn for the duration of the conference.

Meals and Refreshments

There will be reception dinner on the arrival day for international delegates on 6th of November, 2023 from 6:00pm to 10:00pm at the Hotel. Delegates arriving after 10:00pm local time and need to be served dinner should inform the LOC for arrangements. There will be breakfast, coffee break and lunch on the rest of the days for the conference. On the 9th there will be a special dinner.

Security and Emergencies

The LOC assures the delegates of a secured and serene environment. In case of emergency, delegates should report to the Protocol Officers at the registration desk area where they will be promptly attended to. Police emergency numbers: 112/ 191/ 1855. These are toll free numbers on all networks.

Facilities

The Hotel has a Wi-Fi and delegates are encouraged to take the Wi-Fi password at the front desk of the Hotel or the registration desk. The Hotel has a gym and a swimming pool. Both facilities are free for delegates and there are instructors who aid patrons to use same. Life guards at the swimming pool close after 6:00pm.

Cell Phones

Delegates are requested to put their cell phones, pagers and tablets on silence during the course of the conference.

Instruction to Presenters

MS Power Point presentation should be given to the technical assistants at the relevant venue at least 30 minutes before the start of the session in which the delegate is presenting. Details of the periods allocated to presenters are indicated in the program.

Instructions to Moderators

Chairpersons / Moderators of sessions should adhere to the program outline to prevent sessions from extending beyond the allocated time.

Posters

There will be no poster sessions for the conference.

Conference Dinner

The conference dinner will be held on 9th November, 2023 at Junction 5 Lounge at Adenta at 7:00pm local time. Means of transportation will be provided for delegates.

WELCOME ADDRESS BY BOARD CHAIRMAN, CENTRE FOR PLANT MEDICINE RESEARCH

A very warm welcome to all of us as we gather for our highly anticipated conference with the theme "Medicinal Plant Research; A Panacea for Economic Transformation." It is my distinct privilege to welcome you as the Board Chair of this distinguished institution.

The theme of our conference today, encapsulates the spirit and essence of the work that has been at the core of our mission for decades. It is a theme that resonates deeply with the values we hold dear and the vision we have for the future.

Our journey as a Centre for research into plant medicine has been a remarkable one. For close to 5 decades, we have committed ourselves to exploring the immense potential of nature, seeking solutions to some of the most pressing healthcare and economic challenges of our time.

As we gather here today, we are joined by esteemed experts, researchers, policymakers, and professionals who share our commitment to the potential of natural product research as a catalyst for economic transformation. Your presence at this conference is a testament to the global significance of our cause.

This conference presents an opportunity for us to come together, to share our knowledge and experiences, and to explore innovative strategies for leveraging natural product research to stimulate economic growth and sustainable development. We anticipate lively discussions, the exchange of ideas, and the forging of collaborations that will extend far beyond these walls.

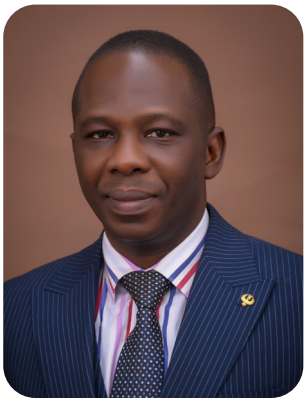
As we embark on this collective journey, let us remember that the transformation we seek goes beyond monetary gain. It extends to the well-being of our communities, the preservation of our environment, and the elevation of human health. Natural product research, when harnessed responsibly, has the potential to address a myriad of challenges, from healthcare access and environmental sustainability to poverty alleviation and economic empowerment.

I wish us all a productive and enlightening conference. May our discussions and collaborations be as transformative as the natural products we study. Together, we can pave the way for a brighter, healthier, and more prosperous future.

Thank you!

Mr. Thomas Boateng Appiagyei
Board Chairman, Centre for Plant Medicine Research

WELCOME MESSAGE FROM THE EXECUTIVE DIRECTOR, CENTRE FOR PLANT MEDICINE RESEARCH (CPMR), MAMPONG-AKUAPEM



I am highly delighted to welcome you to the second Oku Ampofo Memorial Conference at the AH Hotel and Conference from 8th to 10th November, 2023. The conference is being organized in honour of Dr. Oku Ampofo, a great medical practitioner, artist and pan-Africanist. Dr. Oku Ampofo is the founder and first Director of the Centre for Plant Medicine Research. The Centre therefore deems it necessary to honour him after this conference.

The Centre for Plant Medicine Research which initially started as a small outpatient clinic (known as Obikyere) managed by Dr. Oku Ampofo is now a fully-fledged agency under the Ministry of Health. The Centre has worked over the past 48 years to employ the best scientific methods to modernize traditional medicine. In addition to its laboratories (including an animal experiment unit), the Centre has an outpatient clinic, a production facility, and medicinal plant farms. The Centre has so far developed 37 herbal products for management of both communicable and non-communicable diseases. Work is in progress at improving the quality, repackaging and branding of these products for the ultimate satisfaction of our clients. The Centre has also started research into other important areas such as veterinary herbal medicine and herbal soaps and shampoos for skin care. The Centre is also supporting the vaccine initiative of the Government of Ghana through vaccine potency testing, and will lead in the search for plant vaccines. These are but a few of the many achievements and initiatives of the Centre that was started in 1975 by Dr. Oku Ampofo.

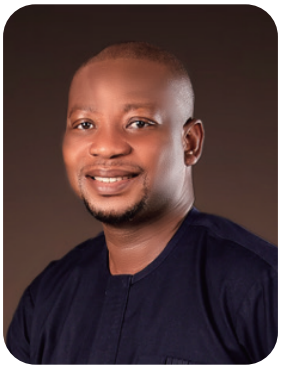
The 1st Oku Ampofo Memorial Conference was successfully organized last year at this same venue under the theme "Medicinal Plant Research- innovation and prospects in a Pandemic Era". The theme for this year is "Herbal Medicine Research-a Panacea for Economic Transformation". Certainly, the prospects of herbal medicine in economic transformation cannot be overemphasized. This year's conference was preceded by a symposium on integrative medicine that was held yesterday (7th November, 2023) at the British Council. The symposium speakers drawn from diverse backgrounds elaborated on the importance of integrative healthcare including the role of herbal (plant) medicine in achieving sustainable healthcare and economic transformation. For the next two days, conference participants will also deliberate on innovative and demand-driven research on plant medicine that will contribute towards achieving the sustainable healthcare and economic transformation agenda. I therefore welcome all conference participants to contribute to the discussions, debates and ask thought-provoking questions throughout the conference.

The Oku Ampofo Memorial Conference has come to stay! It has become a formidable platform for which research scientists, practitioners, manufacturers, policy makers and other key stakeholders across the world will converge to network, deliberate, collaborate, exchange ideas and partner concerning plant medicine. This year we are excited to have an excursion to Aburi Botanic Gardens and the Centre as part of the conference package for our esteemed participants. The Centre for Plant Medicine is really proud to host this memorable conference.

On this note, I would like to welcome you all to the 2nd Oku Ampofo Memorial Conference. I wish you all a memorable stay and a grand experience. Thank you and welcome.

Prof. Alex Asase
Executive Director
Centre for Plant Medicine Research

MESSAGE FROM THE CHAIRMAN, LOCAL ORGANIZING COMMITTEE



Dearest Fellow Delegates and Invited Guests

I am overwhelmed with joy to welcome you to the second COAM Conference being held at AH Hotel, East Legon, Accra from 7th to 10th November, 2023. The Founder of the Centre, Dr. Oku Ampofo, is an exceptional multi-talented artist, scientist and medic. To give us an insight into his life, we will have a short choreography on him during the opening session of the conference. This year's conference is under the theme, 'Herbal medicine research; a panacea for economic developing'. One of the glaring lessons Covid-19 thought the world is the need to have a resilient healthcare system in each country. Pharmaceuticals are a critical aspect of a reliable healthcare system and their cost in developing countries are humongous. Thus, a well-researched and productive herbal medicine industry will not only promote health and well-being but a catalyst for economic transformation. These shall be the focus of our deliberation throughout this conference.

In line with the above, this year's conference begins with a national dialogue on integrative healthcare at the British Council on the 7th of November, 2023 under the theme, 'Sustainable and safe integrative healthcare, towards universal health coverage and economic transformation'. This workshop aims at discussing strategies which will form the basis for developing a national policy on integrative health care to ensure the highest attainable level of health for all in Ghana.

The LOC received more than 100 abstracts from 16 countries but we will have close to 70 papers presented. But is there not a cause? Proverbs 26:2 says 'the curse causeless shall not come'. Firstly, Travel cost especially within Africa is prohibitive and it is impossible for young graduate students to finance these trips. I will urge colleague senior scientists to start exploring the possibility of making travel grants available and accessible to brilliant young graduate students. Aside travel cost, we are stubbornly adamant that against all odds and escalating costs, the COAM conference will remain an in person and residential event. This is because at CPMR, we believe in endless possibilities and we are determined to create a platform where seasoned and burgeoning scientists can meet and interact thus building collaborative networks. This conference will have delegates from Barbados, India, USA, Germany, South Africa, Zimbabwe, Uganda, DR Congo, Nigeria and Ghana and online presentations from the UK and Barbados.

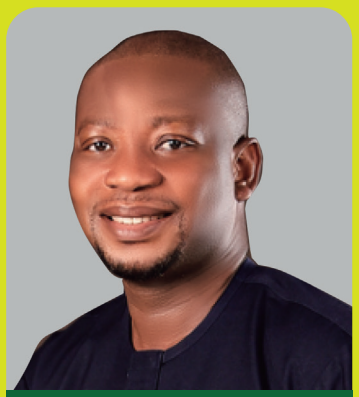
I want to sincerely thank the Management of the Centre, in particular, the Executive Director and all members of the Local Organizing Committee. I also want to offer my profound gratitude to our participants and special guests who honored our invitation. Our Scientific Committee members who spent precious time assessing abstracts, are very much appreciated. There is one debt I will be sadly lacking in courtesy if I do not acknowledge. Donations from our partners, and sponsors including COA-RMCL, KHPMRC, GIZ, Export Barbados, Inqaba Biotec, UHH, Special Ice, Presbyterian Press and many other organizations made all these possible.

Finally, I wish all delegates and participants a fruitful scientific deliberation and wonderful experience in the home of true hospitalities, Ghana.

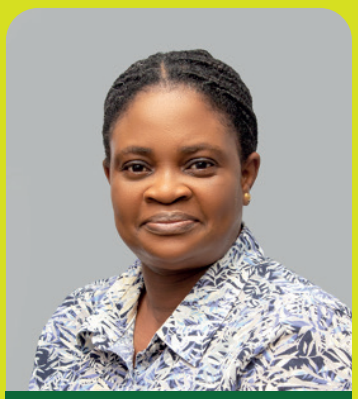
Thank you all and Akwaaba

Dr. Kofi Donkor
Chair, Organizing Committee, COAM 2023

MEMBERS OF LOCAL ORGANIZING COMMITTEE



Dr. Kofi Donkor
(HoD, CORI)



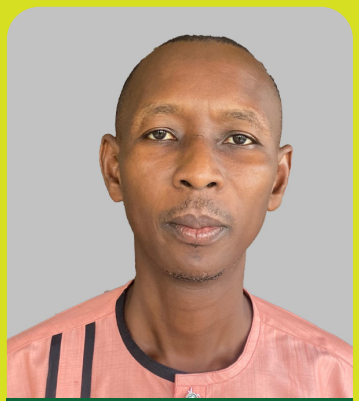
Dr. Olga Quasie
(HoD, Pharmacology)

Dr. Orleans Martey
(HoD, Scientific & Tech. Serv.)

Mrs. Susana Oteng Mintah
(HoD, Microbiology)

Mr. Stephen Antwi
(Head, Animal Experimentation)

Mrs. Genevieve Yeboah
(HoD, Pharmaceutics)



Mr. Kwadwo Asare
(PRO)

Dr. Mavis Boakye-Yiadom
(HoD, Clinical Research)

MEMBERS OF SCIENTIFIC COMMITTEE

Prof. Emelia Bekoe Oppong
Dept. of Pharmacognosy & Herbal Medicine
UG-Legon, Ghana

Prof. Mohamed Mutocheluh
Dept. of Medical Microbiology
KNUST, Ghana

Dr. Ademola Oyagbemi
Dept. of Veterinary Medicine,
University of Ibadan, Nigeria

Dr. Damian Cohall
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Dr. Maxwell Sakyiamah
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Mampong-Akuapem, Ghana

Dr. Mavis Boakye-Yiadom
Dept. of Clinical Research, CPMR,
Mampong-Akuapem, Ghana

CONFERENCE PROGRAMME

CONFERENCE PROGRAM

Monday, 6th November, 2023	
12:00	Arrival of International Delegates
19:00-22:00	Dinner
Day 1: Tuesday 7th November, 2023	
05:30-06:30	Gym
07:00-8:00	Breakfast
08:30-09:00	Arrival and Registration of Delegates (At British Council)
09:00-15:00	Symposium
17:00- 20:00	Conference Registration
Day 2: Wednesday 8th November, 2023	
05:30-06:30	Gym
07:00-8:00	Breakfast
08:30-09:00	Arrival and Registration of Delegates and Dignitaries
09:00-11:00	Opening Ceremony
11:00-11:30	Cocktail reception
Plenary Session 1 Chair: Dr. Archibald Sittie	
11:45-12:15	**Keynote Address:** **The Role of Research in Integrative Health Care Practices in Germany and Brazil** **Prof. Dr. Seifert, G. J.**
12:15-12:30	Perspectives on Animal Experimentation in Herbal Medicine Research: Ethical Dilemmas and Scientific Progress **- Busia, K.**
13:15-13:30	Anti-SARS-CoV-2 Activity of Immunim™ and Partitioned Fractions.

	- Ayertey, F.	
12:45-13:00	Caution and Considerations for Conservation and Sustainability, and the Potential for Economic Revolution through Traditional Herbal Medicine - Bromley, F. A.	
13:00-13:15	The need for parity in quality standards for international pharmaceutical products - Cole, M.	
12:30-12:45	Case Report: Immulate Herbal Supplement reduces Hepatitis B Virus infection - Safo, K.	
13:30-14:15	Lunch	
	Parallel Session 1A **Analytical & Phytochemistry** **Moderator:** **Prof. Isaac Amponsah** **Main Conference Hall**	**Parallel Session 1B** **Nutraceutical and Pharmaceutics** **Moderator:** **Dr. Alfred Appiah** **Breakaway Hall**
14:30-14:45	Secondary metabolites from *Sterculia lychnophora* Hance (Pangdahai) - Mahmood, B. O.	Edible Plants used during pregnancy and how they contribute to Supporting the Health of Mother and Foetus – A Study in Northern Ghana - Adom, E.

14:45-15:00	Phytochemical analysis, elemental content, and fibroblast proliferation activity of the hydro-ethanolic extract of *Moringa oleifera* Lam leaves - Bekoe, E. O.	Cardio-protective effect of Sesame seed-based Diet in Lipopolysaccharides-induced Preeclampsia in Wistar Rats - Adesoji, P. A.
15:00-15:15	Phytochemical composition and antimicrobial activity of *Tapinanthus bangwensis* leaves hosted by the branches of *Persea americana* - Sakyiamah, M. M.	Formulation and evaluation of conventional mono-herbal capsules containing hydroethanolic extract of *Capparis erythrocarpos* Isert. - Kyene, M. O.
15:15-15:30	Phytochemical and antimicrobial activity of ten medicinal plants used for the management of skin disorders in Uganda - Omujal, F.	Determining the optimal host for affordable production of recombinant biopharmaceuticals exemplified by SNAP-tag antibody fusion proteins targeting Triple-Negative Breast Cancer (TNBC) - Ndebele, P. T.
15:30-15:45	Effect of extraction techniques on the anti-inflammatory, antioxidants and antimicrobial activities of the stem bark of *P. robusta* (oliv) - Brew-Daniels, H.	Scientific research and development at the service of African traditional medicines: CSIR case - Bareetseng, S.
	Parallel Session 2A **Biological Activity** **Moderator:** **Prf. Charles Ansah**	**Parallel Session 2B** **Ethnobotany, Cultivation & Conservation** **Moderator:** **Prof. Gabriel Ameka**

	Main Conference room	**Breakaway Hall**
15:45-16:00	Antioxidant Activities of Aqueous and Ethanol Extracts of *Curcuma Longa* and its ameliorative Effects on Lead-induced Toxicities in Wistar Rats - Azeez, O. I.	Prostate Cancer: Causes and medicinal plants used in Africa for twenty years (2001-2021) - Agboola, O. O.
16:00-16:15	Antimalarial Activity of Aqueous Extract of *Solanum nigrum* L. Leaves against *Plasmodium berghei* in Mice: A Focus on Placental Malaria - Femi-Olabisi, F. J.	Herbs Used in Antimalarial Medicines: A Study in the Greater Accra Region of Ghana - Nortey, N. N. D.
16:15-16:30	*In-vitro* Antischistosomal Activity of *Bridelia ferruginea, Clausena anisata, Khaya senegalensis* and *Vernonia amygdalina.* - Kuevi, D. N. O.	Plants of Importance in Infertility Control in Some Communities within the Mpohor-Wassa East District, Ghana - Dali, G. L. A.
16:30-16:45	Clinical evidence of the efficacy of ArtiCovid (*Artemisia annua* extract) on Covid-19 patients in DRC. - Jerome, N. M.	The Potential of Natural Alkaline Sources in the Reduction of Aflatoxin in Groundnut and Maize - Opoku, N.
16:45-17:00	Evaluating the antibacterial, antioxidant and wound healing properties of the stem bark extract of *Khaya grandifoliola* (Welw) CDC (Meliaceae) (African mahogany)	Conservation of Medicinal Plants through the establishment of Twin Medicinal Plant Gardens in Ghana and Barbados

	- Quartey, A. K.	- Asafo-Agyei, T.
17:00-17:15	*Rauwolfia vomitoria* and Metoserpate: Promising Interventions for Alzheimer's Disease Therapy - Tettevi, E. J.	Influence of Poultry Manure on the Growth and Phytochemicals of *Lippia multiflora* Moldenke, and a Comparison of Wild and Cultivated Samples - Domestication. - Atta-Adjei, P. J.
Day 3: Thursday 9th November, 2023		
05:30-06:30	Gym	
07:00-8:30	Breakfast	
Plenary Session 2 **Chair: Prof. Mohamed Mutocheluh**		
09:00-9:30	**Keynote Address:** **Repurposing an Age old Traditional Medicine, PHELA, for current pandemic – SARS-COV-2** **Prof. Matsabisa, M. G.**	
09:30-09:45	Traditional Practices in Modern Societies: Infant Oil Massage for Growth and Development **- Chaturvedi, S.**	
	Parallel Session 3A **Biological Activity** **Moderator:** **Dr. Damian Cohall** **Main Conference room**	**Parallel Session 3B** **Toxicology** **Moderator:** **Dr. Joy Femi-Olabisi** **Breakaway Hall**
09:45-10:00	Antimicrobial Effect of *Zanthoxylum zanthoxyloides* Leaf Extracts on Selected Oral Pathogens	Protective effects of silymarin on cobalt chloride-induced cardiovascular and renal toxicities in rats

	- Owusu, D.	- Ajibade, T. O.
10:00-10:15	Fungistatic activity of methylparaben-ethanol-glysterol mixture on some predominant fungal isolates from six Ghanaian herbal medicinal products - Appenteng, M. A.	Chronic toxicity evaluation of *Prostat-60*, herbal medicine for BPH and urine retention, in Sprague Dawley rats - Agbo, R. T.
10:15-10:30	Bacteriological assessment of aqueous herbal teas sold in Amakom, Kumasi - Baidoo, E. A.	Effect of YN, an ethanolic plant extract on gastric mucosa - Yeboah, J.
10:30-10:45	The synergistic effects of *Cannabis sativa* L. terpenes and Cisplatin in Cisplatin-resistant cervical cancer cells: an *in vitro* and *in silico* study - Mangoato, I. M.	Assessment of the potential dermal toxicity and wound healing activity of *Cnestis ferruginea* Vahl Ex Dc roots - Ankomah A. D.
10:45-11:00	Naringin and quercetin abrogate fipronil-induced cardiovascular and renal dysfunctions in Wistar rats - Oyagbemi, A. A.	Subacute Toxicity Studies of Immulate Herbal Supplement for Chronic Conditions - Martey, O.
	Parallel Session 4A **Pharmacology** **Moderators:** **Prof. Oppong Bekoe /** **Dr. Ademola Oyagbemi** **Main Hall**	**Parallel Session 4B** **Nanoparticles, Essential Oil and Phytomedicine** **Moderators:** **Prof. Alex Boye /** **Dr. Maxwell Sakyiamah** **Breakaway Hall**
11:15-11:30	*Citrus reticulata* Fruit Peel Extract Ameliorates	Studying the Effectiveness of Biologically Synthesized

	Testosterone-Induced Prostatic Hyperplasia in Rats - Agroh, W.	Gold Nanoparticles on *Bacillus anthracis In vitro* - Davids, J. S.
11:30-11:45	*Pyllanthus amarus* Ethanol Extract Downregulates Pro-Inflammatory Cytokines and Prolonged Blood Coagulation in Lipopolysaccharides-Induced Inflammation Rat Model - Opeyemi, O. A.	Investigating the antibacterial potential of biosynthesized *Xylopia aethiopica* mediated silver nanoparticles against urinary tract infections pathogens - Ibrahim, S.
11:45-12:00	The antioxidant, anti-inflammatory and wound healing activities of the leaf extract of *Aspilia helianthoides* - Barffour, A. F.	*Argania spinosa* essential oil ameliorates colonic damage and extra-intestinal alterations in a rat model of acetic acid-induced colitis by suppressing oxidative stress and inflammation - Akinrinde, A. S.
12:00-12:15	*Solanum nigrum* Leaf Modulates Reproductive Functions associated with Anastrozole-induced polycystic ovarian syndrome in Rats - Oludare, O. D.	Determination of consistency in pH of some commercial herbal formulations in Ghana - Kumadoh, D.
12:15-12:30	The Hydro-ethanolic Extract of *Scoparia dulcis* Inhibits Allergic Airway Inflammatory Responses in Murine Asthma Models. - Ofori-Amoah, J.	Anthelminthic, anti-inflammatory, antioxidant, and antimicrobial activities and FTIR analyses of *Vernonia camporum stem-bark*. -Amankwah, F. K. D
12:30-12:45	Intervention by Ekart 1122, an herbal remedy in the case of a 57-Year old man with	Semen Characteristics and Testicular Morphology of Male Albino Rats Treated

	Persistent high blood pressure, severe inflammatory pain and swollen feet - Ansah, C.	with Aqueous and Methanol Leaf Extracts of *Newbouldia Laevis* - Oyeyemi, M. O.
12:45-13:00	The inhibition of Dipeptidyl Peptidase-IV by an extract of Periwinkle (*Catharanthus roseus* (L.) G Don) and its potential antidiabetic effects in a Streptozotocin-induced type 2 *Diabetes mellitus* in Sprague Dawley Rats - Cohall, D.	A Review of the Role of Algae in Human Health - Ameka, G. K.
13:00-13:15	Association of Rs9939609 and Rs1421085 Fat Mass and Obesity Associated (FTO) GENE Variants with Obesity among Selected Ghanaian Children. - Lewis, C.	Standardization and conformity assessment of herbal medicines in Ghana - Adarkwa-Yiadom, M.
13:15-14:00	**Lunch**	
	Parallel Session 5A **Biological Activity** **Moderator:** **Dr. A. S. Akirinde** **Main Conference Hall**	**Parallel Session 5B** **Pharmacognosy & Phytomedicine** **Moderator:** **Dr. Nelson Opoku** **Breakaway Hall**
14:15-14:30	Herbal medicines for use in managing the increasing burden of inflammation-driven disease conditions.	Pharmacognostic characterization and development of standardization parameters for the quality control of the

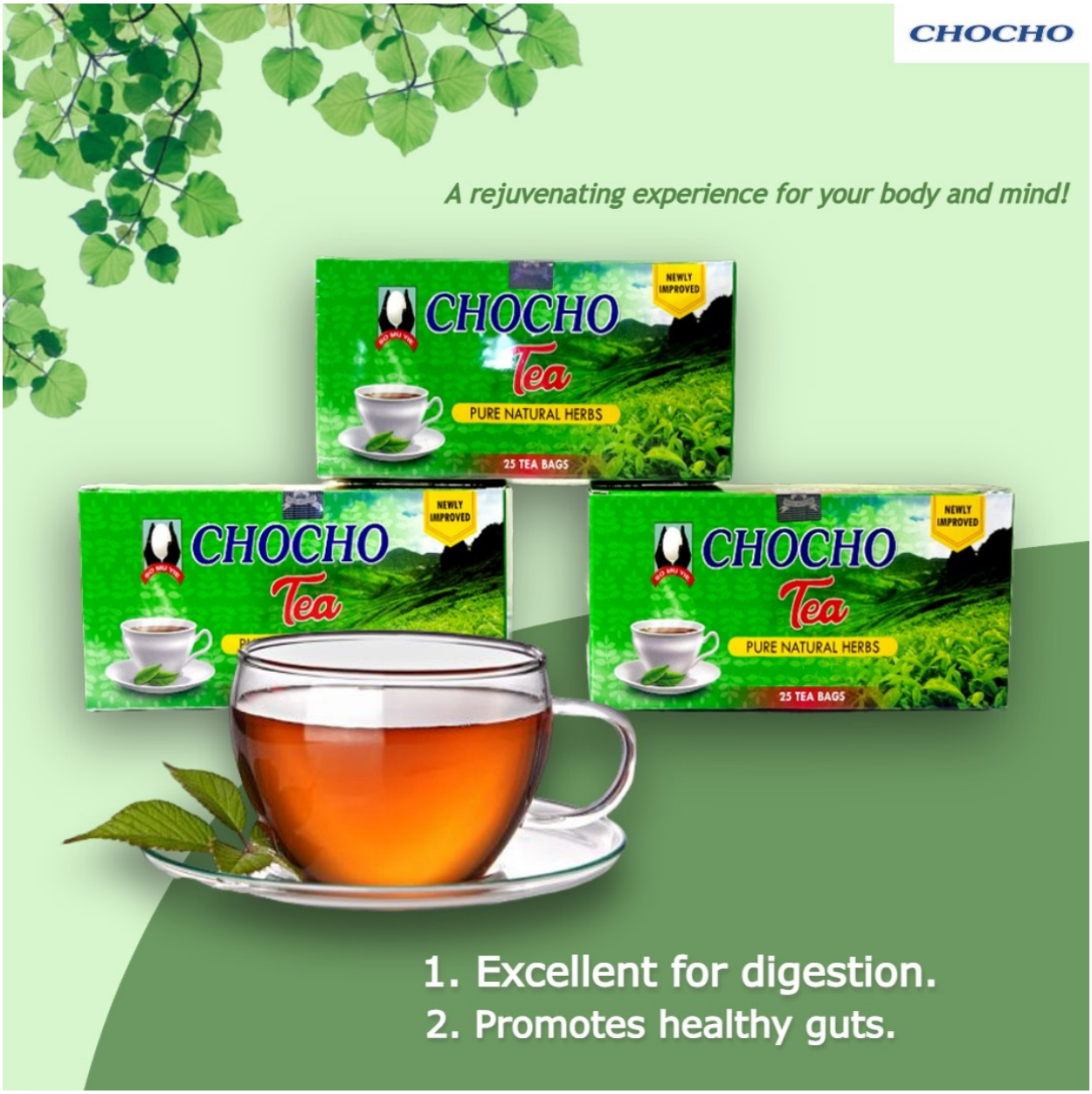
	- Oduro-Mensah, D.	leaf and stem bark of *Antiaris africana* - Baidoo, M. F.
14:30-14:45	Antibacterial effect of methanol extract of *Lagenaria breviflora* fruit on salmonellosis infection in African catfish; *Clarias gariepinus* - Adeoye, B.O.	Predictors of Herbal Medicine Use among Pregnant Women Accessing Prenatal Care from the Kumasi South Hospital in Ghana - Tetteh, W. A.
14:45-15:00	Analgesic activity of the ethanol extract of *Morinda citrifolia* leaves in alloxan-induced diabetic neuropathic pain in rats. - Oteng-Boahen, K.	The Use of Herbal Medicine Among Women in Africa: A Scoping Review. - Ramalepe, L. M.
15:00-15:15	An Assessment of the Antifertility and Toxicity Effects of the Ethanolic Leaf Extract of *Calotropis gigantea* on Male and Female Albino Rats. -Twum-Mensah, P.	Care Cannabis: Medical Cannabis Patient Education by Community Health Workers - Barret, R.
15:15-15:30	Immulate, an herbal supplement, reverses secondary isotretinoin/itraconazole-induced liver injury in a 30-year-old patient - Atia, F.	The role of research and development in the herbal medicine industry - Lessons from the story of COA RMCL - Addo-Owusu, R.
15:30-15:45	Coffee Break	
16:00-17:00	Closing Ceremony	
19:00-	Special Dinner	
Day 4: Friday 10th November, 2023		
05:30-06:30	Gym	

07:00-8:30	Breakfast
9:00-14:00	Excursion
14:00-15:00	Lunch
15:00-	Departure

PROGRAM FOR OPENING CEREMONY

PROGRAM FOR OPENING CEREMONY OF 2ND COAM CONFERENCE VENUE: AH HOTEL AND CONFERENCE, EAST LEGON, DATE: 8TH NOVEMBER, 2023

Time	Activity	Facilitator/Speaker
8:00am –	Arrival of participant and guests	
8:30am –	Cultural display	Abibigroma
9:00am –	Opening prayer	Dr. Maxwell Sakyiamah
9:05am –	Introduction of special guests and chairperson	Mrs. Genevieve Yeboah
9:10am –	Purpose of gathering	Chair, LOC
9:15am –	Welcome address	Prof. Alex Asase, Director CPMR
9:20am –	Chairperson's address	Nana Kobina Nketsia V
9:25am	Poetry Recitals on Dr. Oku Ampofo	Nana Asaase
9:30am –	Developing vaccine and therapeutic platforms as tools for combating pandemics-The role of developing partners	Dr. Holger Till (Head, GIZ Vaccine Ghana Project)
9:40am –	Presentation by special invited guest	Prof. Simmonds (Deputy Director, Kew)
9:55am	Keynote address	Dr. Anthony Nsiah-Asare (Presidential advisor on health)
10:15am-	Address by Export Barbados CEO	Mr. Mark Hill (CEO, Export Barbados)
10:25am-	Awards	Baord Chairman, CPMR
10:30am	Chairman's Closing Remarks	Nana Kobina Nketsia V
10:35am	Vote of thanks	
	Group Photograph	



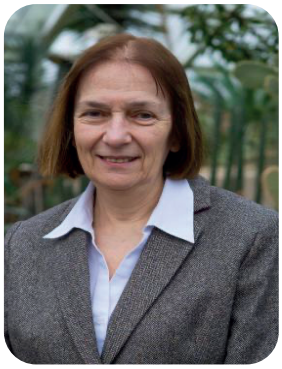
BIOS OF SPECIAL GUESTS & KEYNOTE SPEAKERS

BIOS OF SPECIAL INVITED GUESTS AND KEYNOTE SPEAKERS

Nana Kobina Nketsia V is known in private life as Dr. Kojo Baffoe Maison. Dr. Maison holds BA (Modern History) from the University of Ghana and PhD (History) from the University of Calabar in Nigeria. He was enstooled on 15th October, 1996 as the Paramount Chief (Omanhen) of the Essikado (British Sekondi) Traditional Area in the Western Region of Ghana and President of the Traditional Council. Nana Kobina Nketsia V is a University lecturer and his areas of special interests and research are Pan-Africanism, African Culture and Religion, Governance, Law and Philosophy. Nana authored the book titled "African Culture in Governance and Development: The Ghana Paradigm" published by Ghana University Press. Nana has served and continues to serve on many national and international committees and boards including; Commissioner of Public Utilities and Regulatory Commission (PURC), Chair of Advisory Committee of Care International (Ghana); Chair of Ghana Museums and Monuments Board; Chair of Ghana Broadcasting Corporation, Chair of Kwame Nkrumah Mausoleum Governing Board; Chair of Water Aid (Ghana); Member of Western Region House of Chiefs (Ghana); Member of National House of Chiefs (Ghana); National Patron ATUU Festival; Director of Pan African Festival (Panafest) Foundation; and Chair of African Regional Conference on Education for Cultural Heritage Development by UNESCO.

Dr. Anthony Nsiah-Asare is presently the Presidential Advisor on Health, at the Office of the President of Ghana. Having worked in leadership roles as Medical Superintendent at District hospital, Medical Director at the Regional hospital, Chief Executive Officer at the Teaching Hospital, and Director General of Ghana Health Service, Dr. Nsiah-Asare has created a balance of strategic, operational, business, clinical and health system reform expertise. He qualified from University of Ghana Medical School, Accra with MB, ChB. He is an alumni of the Boston University, School of Public Health in USA where he obtained his Certificate in Management Methods in International Health. Dr Nsiah-Asare is a Fellow of the West African College of Surgeons (FWACS), Fellow of the Ghana College of Surgeons, (FGCS) and a Fellow of the International College of Surgeons (FICS). He is also a Fellow of Ghana Medical Association. He serves as a Member of the Ghana COVID-19 Taskforce, Member Ghana's Vaccine Production Committee, Chairman of Health-GIIF for the implementation of government's Health Infrastructural Development (Agenda 111), Member of Garden City University College Council, and Chairman of the Cosmopolitan Health Insurance Board. He served on the Ghana Health Service Council, the Ghana College of Physicians and Surgeons Council, National Health Insurance Board and Ghana AIDS Commission.

Prof. Monique Simmonds OBE



I research the traditional and economic uses of plants and fungi, their potential as cosmetic, novel food, pharmaceutical and agrochemical leads, and as sources of sustainably-harvested products. The research also involves the authentication of plants entering the trade and assisting different enforcement authorities identify plants.

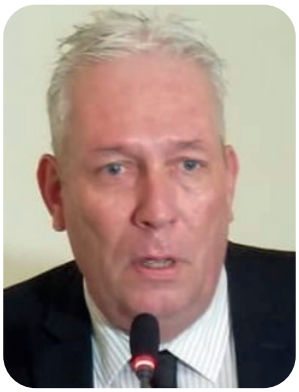
I have a long-term interest in furthering our understanding of the role plant-derived compounds play in plant-animal interactions. This fundamental knowledge can assist with the identification of plant-derived compounds used in pest control as well as in pharmaceutical research. As Deputy Director of Science, I co-ordinate projects with different business sectors that promote and utilise plant and fungal-based solutions to meet current global challenges.

Furthering our knowledge about the historical uses and potential new uses of plants assists support plant conservation and it is vital that there is dissemination of this knowledge in ways that engage with the public. The majority of the work of this group is funded through research grants and commercial contracts.

As Deputy Director of Science I am also involved in the development and implementation of a new science strategy for Kew, to focus and enhance its world-leading science and conservation work, strengthen its position as a global resource for plant and fungal knowledge, and promote plant and fungal-based solutions to current global challenges.

Prof. Georg Seifert is a senior physician in paediatric oncology and holds Europe's first professorship for integrative medicine in paediatrics at the Charité – Universitätsmedizin Berlin, Germany and at the University of São Paulo, Brazil (Visiting Professor), where he researches Brazilian naturopathy and traditional medicine. Prof. Seifert is currently heading a project to establish a centre at Charité that aims to translate experience-based traditional and integrative medicine into evidence-informed medicine based on scientific data – seeking to broaden the options for individual health promotion, prevention and therapy in society, with particular emphases on children and adolescents, mind-body medicine, nutrition and whole medical systems. Of particular interest is the use of Traditional, Complementary and Integrative Medicine for innovative and sustainable health care delivery in modern health systems and the crosstalk between TCIM and these health systems.

Dr. Sarika Chaturvedi graduated in Ayurvedic medicine and took to health systems management for her masters. She trained at the Karolinska Institutet, Sweden for her PhD in Public Health. Her interest areas are integrative health, quality of care, women's and children's health, traditional health practices and public health policy. She is currently a Scientist at Dr D Y Patil University, Pune, India exploring Ayurveda and yoga based traditional practices for their preventive and promotive potential. Dr. Chatuevedi is an evaluator for health and development programmes by the Government of India and UN agencies. She is a Commission fellow for the Lancet Citizen's Commission for Reimagining India's health system.



Dr. Holger Till (MD, DPHTM, MSc)

Team Leader, GIZ Support to Vaccine Manufacturing in Ghana

Team Leader, GIZ Development Partnerships in Health

Health Advisor, GIZ Ghana

Dr. Holger Till is an Engineer and a Medical Doctor. Over the last 27 years Dr. Till has been in the health sector in West Africa in various capacities. From 1996 to 2014, he served at various levels of health care facilities in Ghana. He did 6 years of clinical work (surgery and gynecology) in district, regional and university hospitals. He spent another 6 years working in the area of Public Health (HIV therapy, Prevention of Mother to Child Transmission, public private partnership) at the national level (Ministry of Health, CIM/GTZ). He became Team Leader in the area of HIV/Health and Social Protection (GIZ), where he served for 5 years. Later he was appointed the Deputy Country Director, Operations of GIZ, Ghana, where he served for 2 years.

Between 2015 to 2022, he served in Guinea as the Head of the Reproductive and Family Program, and also as Representative of the Country Director in Guinea. Dr. Till returned to Ghana in 2020 and has since been Team Leader "Development Partnerships in Health" and Health Advisor for GIZ Ghana. In 2021, he led in the set-up of the GIZ "Support to Vaccine Manufacturing in Ghana" Project.

KEYNOTE ADDRESSES

KEYNOTE ADDRESS DAY 1: THE ROLE OF RESEARCH IN INTEGRATIVE HEALTH CARE PRACTICES IN GERMANY AND BRAZIL

Prof. Dr. med. Georg J. Seifert
Charité - Universitätsmedizin Berlin

Abstract

Integrative medicine and healthcare in Germany and Brazil has gained attention. Tha talk explores research's role in legitimizing these approaches. Despite differing healthcare models and cultures, both countries aim to blend complementary therapies with conventional medicine for better patient outcomes. In Germany, integrative healthcare addresses holistic patient needs and is partially integrated into the health care system. Limited research supports modalities like acupuncture, naturopathy, and herbal medicine, ensuring safe, effective treatments with standardized protocols and professional training. In Brazil, integrative care is part of the Unified Health System (Sistema Único de Saúde or SUS), promoting accessibility. Research aims to demonstrate cost-effectiveness and efficacy, drawing from herbal medicine and traditional medicine. Both countries face regulatory challenges in integrative healthcare while an overwhelming majority of the population demands integrative medicine methods. Research helps policymakers, providers, and the public make informed decisions. This abstract highlights ongoing research's importance, enhancing patient outcomes, safety, and integrative healthcare access. It serves as a model for a integrative, patient-centric global healthcare approach.

KEYNOTE SPEAKER DAY 1: PERSPECTIVES ON ANIMAL EXPERIMENTATION IN HERBAL MEDICINE RESEARCH: ETHICAL DILEMMAS AND SCIENTIFIC PROGRESS

Dr. Kofi Busia
Editor-in-Chief Journal of Herbal Medicine

Abstract

Animal experimentation has long been an integral part of biomedical and cosmetics research, with historical roots dating back to ancient Greece. During that period, physicians constrained by cultural taboos that forbade the use of human cadavers, turned to the dissection of animals for their anatomical studies. The use of specific animal models in research has often been justified by the remarkable biological similarities between animals and humans. However, there are instances where animal models, such as fish and frogs, are used, despite significant disparities in their anatomy and physiology compared to humans. In herbal medicine research, animal experimentation has found various applications. Numerous plant species from diverse global regions, including the United Kingdom, United States, China, India, and Africa, have been studied to identify their pharmacological properties and therapeutic indications. Nevertheless, the use of animals in these studies, while offering undeniable advantages, remains a subject of intense debate and contention, mainly arising from the ethical challenges it presents, as well as the financial burden it imposes, and its inability to reliably predict human responses. This study, therefore, proposes a comprehensive list of research methodologies that are ethical, practical, cost-effective, and consistent with the real ethos of herbal medicine. These alternative methods, which include in vitro studies, human cell cultures, computational modelling, culturally sensitive clinical trials, and ethnobotanical surveys, have the potential to provide cost-effective healthcare solutions, without subjecting animals to unnecessary suffering.

KEYNOTE SPEAKER DAY 2: PERSPECTIVES ON ANIMAL EXPERIMENTATION IN HERBAL MEDICINE RESEARCH: ETHICAL DILEMMAS AND SCIENTIFIC PROGRESS

Prof. Motlalepula G. Matsabisa
University of the Free State,

Abstract

In 2019, coronavirus has made the third apparition in the form of SARS-CoV-2, a novel strain of coronavirus that is extremely pathogenic and it uses the same receptor as SARS-CoV, the angiotensin converting enzyme 2 (ACE2). However, not than 182 vaccine candidates were announced; and vaccines have been approved for use, although, even vaccinated individuals are still vulnerable to infection.

Plant products could be a good place to start looking for and developing anti-COVID-19 treatments. Herbal medicines have also been used to treat viral diseases like SARS-CoV but also more importantly herbal medicines have been used as immunemodulators and could play are significant role in the cytokine storm.

In this study, we investigated PHELA, recognized as an herbal combination of four exotic African medicinal plants namely; Clerodendrum glabrum E. Mey. Lamiaceae, Gladiolus dalenii van Geel, Rotheca myricoides (Hochst.) Steane & Mabb, and Senna occidentalis (L.) Link; as a candidate therapy for COVID-19 as well as COVID-19 related effect of long COVID.

PHELA is made by combining these distinct plants in a precise ratio of specific parts of these constituent plants. A combination of these plants historically has been used to treat an ancient disease known as "Muyaga". Patients that contracted Muyaga were characterized by the following symptoms and signs: cough, shivering fever with headache, weight loss and loss of appetite, gastrointestinal disturbances, body rigidity and pains, and mouth ulcers.

These plants have traditionally been used as a remedy for wasting conditions, as an energy booster, and of recent, some traditional health practitioners claim that the preparation can help HIV/AIDS patients. In a clinical observational study, between 2005 – 2007, involving 500 HIV/AIDS patients, utilizing PHELA as an immune booster revealed an increase in appetite, 23% weight gain, and 80% reduction in viral load, and 200 percent increase in CD4 cell counts in HIV+ patients. PHELA is presently under development by the University of Free State as an immune modulation product for those diseases affecting the immune system and its formulation has been confirmed to have immune-reconstitution properties.

In vitro testing found that PHELA inhibited >90% of SARS-CoV-2 and SARS CoV infection at concentration levels of 0.005 mg/ml to 0.03 mg/ml and close to 100% of MERS-CoV infection at 0.1 mg/ml to 0.6 mg/ml. The in vitro average IC50 of PHELA on SARS-COV-2, SARS-CoV and MERS-COV were ~ 0.01 mg/ml. Secondly in silico docking studies of compounds identified in PHELA showed very strong binding energy interactions with the SARS-COV-2 proteins. Compound 5 showed the highest affinity for SARS-COV-2 protein compared to other compounds with the binding energy of − 6.8 kcal ¬mol−1.

PHELA reversed decreased white blood cell count, neutrophils, lymphocytes, and thymus weight in drug-suppressed immune system in rat models and had no harmful effects on the test animals in a subchronic toxicology study in vervet monkeys. In another study we conducted PHELA reversed both Dexamethasone and Cyclosporine induced immune suppression in study rats and was found to have no effect on a normal immune system. PHELA, in other studies, has been shown to have a general antibacterial activities and disrupted biofilm formation in bacterial growth.

Accumulating the previous reports on PHELA, here in this study we investigated PHELA as a repurposed product as a candidate therapy for COVID-19 in in vitro study and in silico docking study to evaluate its cytotoxicity, efficacy, and binding affinity to SARS-CoV-2 proteins. It is based on these data that we proposed PHELA to be repurposed for COVID-19.

KEYNOTE ADDRESS DAY 2: TRADITIONAL PRACTICES IN MODERN SOCIETIES: INFANT OIL MASSAGE FOR GROWTH AND DEVELOPMENT

Dr Sarika Chaturvedi,
Pune, India

Abstract

INewborn care practices are important determinants of newborn health. Topical application of emollients to infants has been proven to reduce risk of serious infections and improve growth in preterm and low birth weight infants. Transcutaneous absorption of lipids is known, and vegetable oils are found to be safer than mineral oils. Evidence suggests potential for infant oil massage to be an impactful intervention to improve infant nutrition, growth, and development in low resource settings where it is also a popular traditional practice. However, fewer studies have evaluated oil massage in full term infants in community settings. Exceptions include the Shivgarh emollient trial in Uttar Pradesh, India that found regular massage with cold pressed sunflower seed oil (SSO) improved neonatal growth and reduced mortality and morbidity; SSO improved nutrition in severely undernourished infants in Bangladesh. To determine prevalence and specifics of infant massage practices in India and develop appropriate guidance on practices for infant massage. Cross sectional study in two states of India (n= 1497) followed by an e Delphi study. Infant oil massage is a highly prevalent (97%) practice in Maharashtra state, sesame oil based proprietary traditional medicine oil (38%) and coconut oil (18%) are popularly used and there are variations in the practice. The technique and medium of massage are important to the outcomes. We hence developed a protocol for infant massage in home settings with consensus of experts from modern and traditional medicine. This protocol provides guidance on detailed procedure for massage and recommends sesame oil and coconut oil in warm and cold weather respectively. Infant oil massage is a highly prevalent traditional practice in Indian states. Testing the protocol for infant massage developed by traditional and conventional medicine experts in healthy full-term infants has potential to inform culturally acceptable practices for improved infant health outcomes.

PLENARY PRESENTATIONS

ABSTRACTS

Plenary Presentations

Anti-SARS-CoV-2 Activity of Immunim™ and Partitioned Fractions.

Frederick Ayertey[1,2], James Odame Aboagye[2,3], Sylvester Kaminta[2,4], Prince Peter Wormenor[2], Araba Abaidoo-Myles[2,5], Christopher Zaab-Yen Abana[2,5], Anthony Twumasi Boateng[2,5], Prince Adom Nartey[2], Charlotte Borteley Bortey[2], Dzidzor Attoh[2], Helena Lamptey[6], Evelyn Yayra Bonney[2], Kofi Donkor[7], Alex Asaase[1], George Boateng Kyei[2,3,8]

[1]*Department of Phytochemistry, Centre for Plant Medicine Research, Mampong-Akuapem*
[2]*Department of Virology, Noguchi Memorial Institute for Medical Research, College of Health Sciences, University of Ghana*
[3]*Medical and Scientific Research Directorate (MSRC), University of Ghana Medical Centre (UGMC) Limited*
[4]*Department of Microbiology, Centre for Plant Medicine Research, Mampong-Akuapem*
[5]*West African Centre for Cell Biology of Infectious Pathogens (WACCBIP), University of Ghana*
[6]*Department of Immunology, Noguchi Memorial Institute for Medical Research, College of Health Sciences, University of Ghana*
[7]*Department of Pharmacology/Toxicology, Centre for Plant Medicine Research, Mampong-Akuapem*
[8]*Department of Medicine, Washington University School of Medicine in St Louis, MO, USA*

Abstract

Immunim™ is an herbal tincture developed by the Centre for Plant Medicine Research in Ghana, and used as an immunomodulatory agent. Notably, it has garnered attention for its clinical efficacy in alleviating COVID-19 symptoms and expediting patient recovery without complications. Our study sought to determine the phytochemical composition of Immunim™ and assess its potential as an anti-SARS-CoV-2 agent. The total phenolic (TPC) and flavonoid (TFC) contents in Immunim™ and fractions were assessed using a calorimetric method. Subsequently, the anti-SARS-CoV-2 activity was evaluated by subjecting Immunim™ and fractions to in vitro experiments using Vero TMPRSS2 cells for viral inhibition by both crystal violet staining technique and a fluorescence assay with antibodies targeting the ORF3a region of the virus. The results revealed that Immunim™ and its chloroform fraction exhibited remarkable efficacy in preventing virus-induced cytopathic effects, with a minimum inhibitory concentration of 0.31 µg/ml. Moreover, the hexane and ethyl acetate fractions displayed promising virus inhibitory activity, demonstrating minimum inhibitory concentrations of 1.20 µg/ml and 20.00 µg/ml, respectively. The effective concentrations required to inhibit 50% (EC_{50}) of the viral ORF3a were 5.55 µg/ml for Immunim™, 5.20 µg/ml for the chloroform fraction, and 6.22 µg/ml for the hexane fraction. The TPC of Immunim™ was determined to be 9.006±1.075 mg/100 mg GAE, while the TFC was found to be 16.741±1.386 mg/100 mg QE. The ethyl acetate fraction exhibited particularly high phenolic and flavonoid contents. This study provides compelling evidence that Immunim™ possesses potent anti-SARS-CoV-2 properties, suggesting its potential as a therapeutic agent against COVID-19. Further research, encompassing detailed phytochemical analysis, mechanistic investigations and clinical trials, is imperative to comprehensively understand its role in managing COVID-19, including emerging variants.

Key words: Immunim, COVID-19, anti-SARS-CoV-2, Vero TMPRSS2 cells, ORF3a region,

Caution and Considerations for Conservation and Sustainability, and the Potential for Economic Revolution through Traditional Herbal Medicine

F. Afua Bromley, DACM, MSOM, Dipl Ac (NCCAOM) (USA)

Abstract

The use of plants as medicine has been recorded throughout the written and oral history of humankind. Nearly 40 % of pharmaceuticals are derived from plant sources, yet the rising cost of pharmaceuticals and wariness of side effects, have made many prescriptions drugs undesirable or financially unattainable. In recent times, the economic impact of the global herbal and supplement market has grown exponentially and is expected to surpass 347 billion USD by 2030. The World Health Organization elevated the use of plant medicines through its Traditional Medicine Strategy, recognizing the role of herbs and traditional healing practices as the primary or supplemental means of affordable medical care. As profits from plant medicines have grown, so has the potential for exploitation of countries and communities rich with medicinal plant biodiversity. This paper examines the: 1) utilization of herbal medicine as a means of maintenance of traditional culture, 2) potential cautions surrounding the impact of geography, climate change and pollutants on soil biodiversity 3) current best agricultural practices to minimize the potential negative impact of monoculture plant cultivation on the medicinal properties of herbs, 4) necessity of conservation in the role of economic development for individual and family farms and developing countries.

Keywords: Biodiversity, traditional herbal medicine, plant medicine, conservation, sustainability, rural economic development

The need for parity in quality standards for international pharmaceutical products.

Paul Cummings[1] and Michael Cole[2], *

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2. Forensic and Investigative Sciences, School of Life Sciences, Faculty of Science and Engineering, Anglia Ruskin University, East Road, Cambridge, CB1 1PT, United Kingdom.
* Corresponding author: michael.cole@aru.ac.uk

Abstract

Within the pharmaceutical industry it is essential that all manufacturers meet a minimum quality standard. This research sought views on the parity, with respect to safety and quality, of internationally manufactured drug products when contrasted against domestically manufactured products. Using a mixed methods approach of questionnaire and interviews of subject matter experts and regulators, in conjunction with data harvested from regulatory agency publications and under freedom of information requests from The United States of America Food & Drug Administration, The United Kingdom's Medicines and Healthcare Products Regulatory Agency and Australia's Therapeutical Goods Administration views were sought on quality standards. The interviews and surveys demonstrated a high level of concern that there are different levels of quality standards. Participants in this research study overwhelmingly felt that the issues on non-parity were due to a number of factors including ambiguous and conflicting regulations, poor or decreasing regulatory agency oversight, a lack of expertise and a lack of engagement and sharing of best practice. The research concluded that the generation of a model for total product quality and global standards would be beneficial for the formation of a global framework for a minimum quality standard which would aid industry and regulators in assessment of quality and, ultimately, improve patient safety.

Key words: Pharmaceutical regulation, globalisation, safety, efficacy, MHRA, FDA, TGA.

Case Report: Immulate Herbal Supplement reduces Hepatitis B Virus Infection

Kwabena Safo[1], Festus Buobu[1], Akua Safo[1], Kofi Donkor[2]

[1]Kantanka Herbal Pharmaceutical and Research Centre, Gomoa Mpota, Central Region

[2]Department of Pharmacology/Toxicology, Centre for Plant Medicine Research, Mampong-Akuapem

Abstract

WHO estimates that there about 296 million people living with chronic Hepatitis B infection in 2019, with 1.5 million new infections each year. In 2019, Hepatitis B resulted in an estimated 820,000 deaths mostly from cirrhosis and HCC (Primary Liver Cancer). The morbidity and mortality associated with Hepatitis B infection makes it a public health concern. Medical pluralism is high among HBV patients for several reasons. Resolution of damaged liver functions from HBV infection with significant HB Viral suppression is necessary for improvement in morbidity and mortality associated with HBV. A female nurse, non-alcoholic, no scarification marks, asymptomatic with Hepatitis B virus DNA copies of 1,240 cp/ml (213 IU/ml) was refused visa to the UK because her HBV titre was high. All liver function indices (BIL, AP, GT, ALT, AST ALB) were above reference range for females. She tried several medications in the bid to lower the HBV copies in order for her to travel to the UK but to no avail. After 8 weeks of treatment with Immulate Herbal Supplement, HBV DNA copies were suppressed significantly by 60 % to 512 cp/ml (88 IU/ml). similarly, the liver function indices (BIL, AP, GT, ALT, AST ALB) were returned to within normal range. She eventually travelled to the UK after the treatment with Immulate herbal supplement. It could be concluded that, Immulate Herbal Supplement may be useful in treatment of viral Hepatitis B Infection.

Key words: Hepatitis B Virus, HBV DNA copies, Immulate Herbal Supplement, AST, ALT

PARALLEL SESSION 1

PARALLEL SESSION 1A

Secondary metabolites from *Sterculia lychnophora* Hance (Pangdahai)

Mahmood Brobbey Oppong[1,2], Bing-Yang Zhang[1], Shi-Ming Fang[1], Feng Qiu[1]

[1]Tianjin State Key Laboratory of Modern Chinese Medicine and School of Chinese Materia Medica, Tianjin University of Traditional Chinese Medicine, 10 Poyanghu Road, Jinghai District, Tianjin, 301617, China
[2]Department of Pharmaceutical Chemistry, School of Pharmacy, College of Health Sciences, University of Ghana, P.O. Box LG 43, Legon, Ghana

Abstract

Scaphium affine (Mast.) Pierre is a flowering plant belonging to the family Malvaceae. It is however recorded in the Chinese Pharmacopoeia by its scientific synonym, *Sterculia lychnophora* Hance Pierre. Pangdahai is the matured, ripened, and dried seeds of *Scaphium affine* (Mast.) Pierre. It is widely used in managing several diseases in countries like China, Vietnam, Japan, and India. The seeds are traditionally used to treat pharyngitis in China. This study employed various chromatographic techniques to isolate the secondary metabolites from ethanol extracts of Panghahai. The isolates were then characterized using their NMR and MS data. A total of twenty-two (22) compounds were isolated and characterized. These included one lignan, three phenylpropanoids, two flavonoid glycosides, two sesquiterpenoids, two nucleosides, three nitrogenous bases, three phenolic acids, two heterocyclic aromatic acids and two phytosteroids. For eighteen out of the 22 compounds, there is no report of their presence in *S. lychnophora.* There is no report of sixteen of them being present in the *Sterculia* genus, hence the first report. The isolated compounds showed a significant taxonomic relationship between *S. lychnophora* and other species of genus *Sterculia.* Two of these compounds might serve as important taxonomic markers for the *Sterculia* genus.

Keywords: Pangdahai; Secondary metabolites; taxanomic marker; chromatography

Phytochemical analysis, elemental content, and fibroblast proliferation activity of the hydro-ethanolic extract of *Moringa oleifera* Lam leaves

Emelia Oppong Bekoe*[1], Emmanuel Orman[2], Nicholas Awuku Offei[3,4], Kofi Donkor[5], Anastasia Rosebud Aikins[3,4]

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[2]Department of Pharmaceutical Chemistry, University of Health and Allied Sciences, Ghana.
[3]Department of Biochemistry, Cell and Molecular Biology, University of Ghana
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Abstract

Moringa oleifera is one plant that is widely used for the prevention and treatment of numerous diseases. This study analyzed the phytochemical and elemental contents of *M. oleifera* leaf extract and evaluate its effect on fibroblast proliferation, which is crucial for wound healing. *M. oleifera* leaf samples were collected, identified, and extracted using different solvents. High-performance thin-layer chromatography (HPTLC) and ultra-high-performance liquid chromatography (UPLC) were employed to analyze the phytochemical composition, while inductively coupled plasma-optical emission spectrometry (ICP-OES) was used to determine the elemental content. The effect on proliferation of the hydroethanolic extract was investigated on Hs27 fibroblast skin cells by the MTT assay. Water extraction yielded the highest extract of 13.0±3 %w/w, while petroleum ether extraction yielded the least of 3.03±0.8 %w/w. HPTLC fingerprinting of the 50% hydroethanolic extract identified bioactive compounds including flavonoids, phenol carboxylic acids fatty acids, and sterols. UPLC analysis confirmed the presence of rutin and kaempferol in the extract. Elemental analysis using ICP-OES showed a high concentration of Ca, K, Br, Mg, and P and the presence of high concentrations of heavy metals. Furthermore, the extract exhibited significant fibroblast proliferation activity at concentrations of especially 0.1 and 1 µg/mL. The presence of bioactive compounds and essential elements in *M. oleifera* along with the evaluation of Hs27 fibroblast proliferation, highlights its possible role in enhancing wound healing and possible therapeutic applications. The documented fingerprints are also essential for quality control.

Keywords: *Moringa oleifera*, phytochemical analysis, elemental analysis, fibroblast proliferation, wound healing.

Phytochemical composition and antimicrobial activity of *Tapinanthus bangwensis* leaves hosted by the branches of *Persea americana*

Maxwell Mamfe Sakyiamah[1*], Paa Kwesi Gordon[2], Peter Bolah[1], Prince Kyei Baffour[1], Ebenezer Ehun[1], Olga Quasie[3], Doris Kumadoh[4], Mary-Ann Archer[5], Susana Oteng Mintah[2] and Alfred Ampomah Appiah1

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[2]Department of Microbiology, Centre for Plant Medicine Research, Mampong-Akuapem, Ghana.
[3] Pharmacology and Toxicology Department, Centre for Plant Medicine Research, Mampong-Akuapem, Ghana.
[4]Production Department, Centre for Plant Medicine Research, Mampong-Akuapem, Ghana.
[5]Department of Pharmaceutics, School of Pharmacy and Pharmaceutical Sciences, University of Cape Coast, Cape Coast, Ghana.

Abstract

Medicinal plants represent a valuable source for new effective and safe antimicrobial drugs making them an alternative therapy. Existing antimicrobial agents are costly and mostly associated with possible side effects. The aim of the study was to assess the antimicrobial property and phytochemical composition of hydroethanolic extract of *Tapinanthus bangwensis* leaves and its fractions. *T. bangwensis* leaves (harvested from its host plant, *Persea americana*) was extracted by cold maceration with 70% ethanol and further fractionated with different organic solvents using the solvent partitioning method to obtain the crude extract, petroleum ether, chloroform, ethyl acetate and the resulting aqueous fractions. The phytochemical constituents of the extracts were screened and quantified. Also, the TLC of the extracts were analyzed to serve as a fingerprint. Using the agar diffusion and broth dilution methods, the antimicrobial properties of the extracts were assessed. The study showed that the hydroethanolic (70%) crude extract of *T. bangwensis* leaves and its fractions contain phenolic compounds, flavonoids, saponins, phytosterols and reducing sugars. The phytoconstituents were well extracted into the ethyl acetate fraction than the other fractions evidenced in the high levels ($p < 0.0001$) of saponins (66.47 ± 1.72% w/w), phenolic compounds (77.75 ± 1.06 mg/100 mg GAE) and flavonoids (44.34 ± 0.06 mg/100 mg QE) contents. All the microorganisms tested exhibited varying degrees of susceptibility to the extracts with MIC values between 0.78 to 12.5 mg/mL. The crude extract of *T. bangwensis* leaves, its ethyl acetate and chloroform fractions also exhibited lethal antimicrobial activity with MLC between 6.25 to 50 mg/mL. The crude extract of *T. bangwensis* leaves and its fractions demonstrated antimicrobial properties against *Escherichia coli*, *Staphylococcus aureus*, *Staphylococcus saprophyticus* and *Candida albicans,* thereby representing a potential source of natural antimicrobial agent. Further study is required to identify and isolate antimicrobial compounds from the plant for the development of natural bioactive antimicrobial agents.

Keywords *Tapinanthus bangwensis*, Phytochemical composition, Antimicrobial properties, Alternative therapy

Phytochemical and antimicrobial activity of ten medicinal plants used for the management of skin disorders in Uganda

Omujal Francis[1], Okello Joseph[1], Agwaya Moses Solomon[1], Nakyejwe Janet[1], Eragu Richard[1], Nambejja Cissy[1], Komakech Richard[1], and Nambatya Kyeyune Grace[1]

[1]Natural Chemotherapeutics Research Institute

Abstract

Plant-based ingredients have become potential candidates as anti-microbial agents for skin infections. This study evaluated the phytochemical ingredients and antimicrobial activity of ten medicinal plants used for the management of skin disorders in Uganda. The plants including *Albizia coriaria* (**AC**) Welw, *Psorospermum febrifugum* (**PF**) Spach*, Acacia hockii* (**AH**) De Wild*, Momordica foetida* (**MF**) Schumach*, Biddens pilosa* **(BP)** L.*., Lannea barteri* (**LB**) Engl.*, Entada abyssinica* (**EN)** Steud, *Aloe vera* (**AV**) L., *Erythrina abbysinica* **(EA**) L. and *Vernonia amygdalina* (**VA**) Del. were extracted with petroleum ether (PE), 96% ethanol (ET) and water (WA), and analysed for phytochemical ingredients using qualitative and quantitative methods, thin layer chromatography (TLC) and Gas chromatography –mass spectroscopy (GC-MS) techniques. Antimicrobial activity was determined using Agar well diffusion method against *Staphylococcus aureus* ATCC29213, *Escherichia coli* ATCC25922 *and* *Candida albicans* with erythromycin, ampicillin, chloramphenicol, streptomycin, ketoconazole and fluconazole as controls. The extractive values of the plants decreased in the order of water (3-14.9%)>ethanol (1.22-14.20%)> petroleum ether (0.02-7.36%). Qualitative phytochemical screening showed abundance of tannins, reducing compounds, saponins and anthracenocides and coumarins in **PF, LB, AC** and **AH**. Total phenols, Total flavonoid and Total alkaloids were highest in **PF** (161.29±67.25 mg/100g Garlicacid Equivalent), **AV** (164.54±0.99mg/100gRutin Equivalent) and **AH** (1.70±0.77 g/100g), respectively. TLC analyses showed the highest number of spots (10) in **EA** detected under visible and UV lights (366nm). The GC-MS had **PF** and **EN** each with 54 compounds as the highest number. The WA and ET extracts of **AC**, **PF** and **AH** exhibited strong antibacterial activity against *S. aureus* that were comparable to erythromycin (10mg/ml). However, PE extracts of **PF** and **AH** showed moderate antimicrobial activity against *S. aureus* and *C. albican*. The ET extracts of **AC, PF, LB, EN** and **AH** had the best Minimum Inhibitory Concentration (MIC) against *S. aureus* of 3.125mg/ml while that for WA extracts at this concentration (3.125mg/ml) were exhibited by **AC, PF** and **AH** . The PE extracts of **PF**, **AC** and A**H** registered the best antimicrobial activity against *S. aureus* at MIC of 3.125 mg/ml, but the best MIC against *C. albican* of 6.25mg/ml was observed in PE extract of **AC**. However, The WA, ET and PE extract had MIC against E.coli being >100 mg/ml except for PE extracts of **PF** and **AV** that registered 100 mg/ml. In conclusion, WA and ET extracts of **PF, AC, AH, LB** and **EN** have significant antimicrobial activity against *S. aureus* which supports their use as antimicrobial agent for skin infections.

Key words: Phytochemistry, antimicrobial, medicinal plants, skin disorders, Uganda

Effect of extraction methods on some biological activities of *P. robusta* (oliv)

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Abstract

The effect of extraction methods (cold maceration and Soxhlet) on the yield, phytochemical composition, anti-inflammatory, antioxidant, and antimicrobial potential of *P. robusta* stem was investigated in this study. The cold maceration technique resulted in a 2.70% w/w yield of extraction compared to a lower yield of 1.73% w/w by the Soxhlet technique. Phytochemical constituents remained the same for both extraction methods. Anti-inflammatory (Protein denaturation) and Antioxidant (DPPH) assays revealed IC_{50} of 17.32µg/ml and 11.01µg/ml respectively for the cold maceration extract and IC_{50} of 33.18µg/ml and 16.15µg/ml respectively for the Soxhlet extract, projecting the cold maceration extract as a better anti-inflammatory and antioxidant agent. The microbial inhibition analysis had both extracts exhibiting the same MIC values against three of the six selected bacteria namely, *S. saprophyticus*, *E. faecalis,* and *S.* Typhi. Regarding the other three bacteria, *P. aeruginosa*, *S. aureus,* and *E. coli*, the Soxhlet extract recorded a better and lower MIC value against *P. aeruginosa* while that of the cold extract showed a better and lower MIC value against *S. aureus* and *E. coli*. The MBC or bactericidal activity of the cold maceration extract was observed to have lower and better MBC values against, *S. aureus, S. saprophyticus,* and *E. faecalis* while that of the Soxhlet exhibited bactericidal activity against only *S. saprophyticus* with a poor MBC value. In the case of fungi inhibition, both extracts showed the same MIC values against the selected fungi, *A. fumigatus*, *C. albicans,* and *A. flavus* except in the case of *C. albicans* where the Soxhlet extract displayed a better and lower MIC value. Both extracts showed no fungicidal activity against any of the test fungi. In conclusion, the types of extraction methods employed has an effect on the selected biological activities of *P. robusta*.

Keywords: *P. robusta*, Extraction techniques, Anti-inflammation, Antioxidant, Antimicrobial

PARALLEL SESSION 1B

Edible Plants used during pregnancy and how they contribute to Supporting the Health of Mother and Foetus – A Study in Northern Ghana

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Abstract

The growth and development of a foetus during pregnancy rely on the overall well-being of the expectant mother, who serves as the primary source of nutrients for the foetus. Pregnant women often incorporate specific plant materials into their meals as condiments, aiming to improve their general well-being or manage certain medical conditions. This study aims to identify the plants commonly used by pregnant women in a city in northern Ghana for culinary purposes and examine the scientific literature supporting the reported benefits. A total of 370 pregnant women voluntarily participated in this cross-sectional study. The participants were selected from 28 randomly chosen suburbs in the Tamale metropolis. Data collection was carried out using semi-structured questionnaires. The collected data were analyzed using Microsoft Excel and SPSS version 21.0. Results were presented in tables and a pie chart. Literature was comprehensively reviewed to confirm or otherwise the usefulness and safety of the plants these women are used during pregnancy. Seventeen different plants were reportedly used for food preparation during pregnancy, with *Parkia biglobosa* (Dawadawa) fermented seeds, *Amaranthus cruentus* and *Corchorus olitorious* leaves, *Hibiscus sabdariffa*, and *Zingiber officinale* rhizome being used by over 70% of respondents. The most commonly used plant families were Malvaceae (23.0%) and Fabaceae (17.0%). *Allium sativum* (Garlic) and *Zingiber officinale* (Ginger) were the predominant plant materials employed for culinary purposes. The primary reasons for using these plant materials in cooking and local beverage preparation were to enhance overall health and vitality, serve as a nutrient source, and act as a blood tonic. Interestingly, *Allium sativum* was reported to be used for spiritual protection during pregnancy. The findings of this study align with existing literature, providing evidence that supports the reported benefits associated with the usage of these plant materials by pregnant women in northern Ghana.

Key words: Edible plants, pregnancy, *Zingiber officinale, Hibiscus sabdariffa*, *Allium sativum*

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Cardio-protective Effect of Sesame seed-based Diet in Lipopolysaccharides-induced Preeclampsia in Wistar Rats

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Abstract
Preeclampsia (PE), pregnancy-induced hypertension, is a significant contributor to maternal and fetal mortality globally. It ranks as the second most prevalent cause of death linked to pregnancy and childbirth worldwide, affecting approximately 2-8% of pregnancies. Metabolic conditions such as cardio-enzymes abnormal concentrations, obesity and dyslipidemia are associated with Preeclampsia. Sesame (*Sesamum indicum*) seed contains beneficial phyto-compounds such as polyunsaturated fatty acids and minerals which has potentials to mitigate metabolic syndromes. This study was aimed to investigate the effects of sesame-based diet on cardio-metabolic parameters associated with lipopolysaccharide-induced Preeclampsia in rats. The formulated diet was composed of sesame flour, maize flour, defatted soya bean, sesame oil, sugar, ginger, cloves, and garlic in the ratio of 0.35: 0.29: 0.25: 0.05: 0.1: 0.006: 0.002: 0.002 respectively. The effect of this Sesame-based diet on angiotensin converting enzyme (ACE), creatine kinase (CK) and serum lipid profile (HDL-C, LDL-C, Trig and Total cholesterol) were assessed. Thirty-five female Wistar rats (182.45±3.11g) were divided into 7 groups (A-G), of 5 animals each. Except for groups A and F, the pregnant (gestation day 8) rats were intraperitonially injected 20 µ/kg body weight of lipopolysaccharide to induce PE. Groups A, B, C, F, and G were maintained on standard diet, while Groups D and E were maintained on sesame-based and basal diets respectively before and after PE induction. Group C was administered Amlodipine (reference drug). The serum ACE activity of sesame-fed rats compared favourably ($p>0.05$) with the control while the CK activity was significantly decreased when compared to the untreated PE rats. The serum TG, and LDL-C concentrations significantly decreased in the sesame-fed PE rats while HDL-C significantly ($p<0.05$) increased when compared to the control. Therefore, the sesame-based diet displayed prophylactic effects against cardio-metabolic disorders associated with lipopolysaccharide-induced Preeclampsia, suggesting its potential as a management option for pregnancy-induced hypertension.

Keywords: Cardio-metabolic, Lipopolysaccharide, Preeclampsia, *Sesamum indicum*

Formulation and evaluation of Sirrapac, monoherbal capsules, containing hydroethanolic extract *of Capparis erythrocarpos* Isert.

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Abstract

Sirrapac is a powered root bark of *Capparis erythrocarpos* produced by the Centre for Plant Medicine Research, Mampong-Akuapem for the management of arthritis. The plant is used to treat various diseases such as rheumatoid arthritis, blurred vision, partial male impotence, urogenital pain and piles. The current formulation of Sirrapac which uses the powdered root bark of the plant is bulky, bitter and has a challenge with the accuracy of dosing. In this study hydroethanolic root extract were formulated into capsules by the wet granulation method using maize starch, LMC, MCC and lactose as adsorbents (F1-F4). The formulated capsules were evaluated for their pharmaceutical qualities using parameters such flow properties of granules, weight variation test, disintegration time, compatibility with excipients and *in-vitro* dissolution analysis. All four formulations had good flow properties and *in-vitro* release properties. However, F3 failed the compatibility test as well as the content analysis. The minimum disintegration time was 3.48 minutes and the maximum time observed was 6.13 minutes. All the formulation had good dissolution characteristics (F1; 76.14 ± 0.46%, F2; 86.23 ± 0.43%, F3; 86.72 ± 0.98% and F4; 76.14 ± 2.40%) at 45 minutes. The findings indicate that F1, F2 and F3 passed all the evaluated parameters and can be used as a good substitute for the current formulation.

Key Words: rheumatoid arthritis; formulation; arthritis; Sirrapac; flow properties; dissolution test

Determining the optimal host for affordable production of recombinant biopharmaceuticals exemplified by SNAP-tag antibody fusion proteins targeting Triple-Negative Breast Cancer (TNBC)

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Abstract

Triple Negative Breast Cancer (TNBC) remains one of the most complex cancers to treat. The absence or low expression (<1%) of be-known receptors such as the estrogen receptor (ER-), progesterone receptor (PR-), and human epidermal growth factor receptor 2 (HER2-), excludes TNBC patients from traditional endocrine therapies and HER2 targeting antibodies. The heterogeneous subpopulation of cells in TNBC, has been shown to be reflected by the expression of tumor-associated cell surface antigens such as chondroitin sulphate proteoglycan 4 (CSPG4) which can be targeted for immunodiagnostic and immunotherapeutic purposes. Recently CSPG4 targeting human (ized) antibodies have been described and medical biotechnology tools to generate recombinant fusion proteins enable the use of SNAP-tag technology for a specific targeting approach. SNAP-tag fusion proteins have impacted the immunodiagnostic and immunotherapy of cancer. However efficient production of this protein family is still a major issue. Here, we are evaluating *Pichia pastoris*, *Escherichia coli*, human embryonic kidney (HEK293T) cells, and Chinese hamster ovary cells (CHO-K1) as potential hosts for the expression and production of a portfolio of recombinant biopharmaceuticals as exemplified for SNAP-tag based antibody fusion protein. Additionally, data from lab scale experiments and a computationally derived 50 mg/L base case scale-up were used to estimate the cost of production. The results revealed that the ease of protein extraction, the final yield following protein production and the relative purity of the protein following primary purification using Immobilized metal affinity chromatography (IMAC) were major drivers controlling the manufacturing costs. Expression in *Pichia pastoris* was conducted over 4 days requiring medium labour. The protein was secreted into the medium and a yield of 8 mg/L was obtained with a percentage purity of 80%. Based on these results the optimal host for affordable production of SNAP-tag fusion proteins was *Pichia pastoris.*

Keywords: Triple Negative Breast Cancer, Immunotherapy, Recombinant protein production, cost of production, Antigen biomarker targeting, Immunodiagnostics

Scientific research and development at the service of African traditional medicines: CSIR case

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Abstract

Traditional health practitioners in South Africa struggle to expand their market reach due to a lack of resources and skills to develop traditional medicine products that conform to acceptable standards of safety and quality as there are no guidelines or regulations on traditional medicines in South Africa. What role can science and technology play in changing this? The sector will benefit from regulations of traditional medicines, but what is needed to regulate African traditional medicines in South Africa? The South Africa' Council for Scientific and Industrial Research shares its experiences following a pilot project, titled "Scientific Research and Product Development to Support the Traditional Health Practitioners in South Africa", funded by the South Africa' National Department of Science and Innovation, in which six plant-based traditional medicine products used by the traditional health practitioners were selected through a competitive process which involved, among others, expression of interest and selection criteria. The THPs were equipped with the relevant knowledge and skills on product development including quality control and quality assurance. Safe, high quality and standardized traditional medicines were developed through scientific research and development, namely (1) Lenong, (2) Umpetha, (3) Moshumasekgwa, (4) Areka Ya Makgoma, (5) Prijap and (6) Kgopa.

Keywords: Traditional Health Practitioners, African traditional medicines, scientific research and product and process development and regulations

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PARALLEL SESSION 2A

Antioxidant Activities of Aqueous and Ethanol Extracts of *Curcuma Longa* and its ameliorative Effects on Lead-induced Toxicities in Wistar Rats

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Abstract

Lead is a common heavy metal in the environment, and constant exposure to lead induced toxicity is still a regular occurrence among artisanal miners and workers in lead battery and paint factories. The current study was designed to investigate the ability of *Curcuma longa* rhizome (Tumeric) extracts, a spice, which has been reported to possess medicinal activities, to correct lead-induced changes in haematological parameters, oxidative damage and organ specific toxicities in Wistar rats. Thirty-five adult male Wistar rats used for the study were grouped into seven, A to G consisting of five rats per group. Group A, (control) was treated with 5% TWEEN 80, Group B rats was administered a dose of 150 mg/kg lead acetate only, which serves as the toxicity model. Groups C to G were daily administered orally with both lead acetate and extract/standard antioxidant in 5% TWEEN 80, for 28 days. Specifically, Groups C – D rats were all treated with 150 mg/kg lead acetate concurrently with 100 and 200 mg/kg of *Curcuma longa* aqueous extracts, respectively. Similarly, rats in Groups E and F were treated with a dose of 150 mg/kg lead acetate with 100 and 200 mg/kg of *Curcuma longa* ethanol extracts, respectively. Finally, group G rats were treated with a dose of 150 mg/kg lead acetate and 100 mg/kg gallic acid. Blood samples were collected on days 14 and 28, while histology and markers of oxidative stress were determined at day 28. The result of the study showed that exposure to lead resulted in mild macrocytic hypochromic anaemia, reduced erythrocyte osmotic resistance, mild liver and kidney damages but significant oxidative stress, which were ameliorated by *Curcuma Longa* aqueous and ethanol extracts, especially at 200 mg/kg dosage and gallic acid. The study demonstrated that exposure to lead toxicity can be corrected by *Curcuma longa*/Tumeric due to the presence of flavonoids and phenolic compounds with antioxidant activities in the extracts.

Key word: heavy metals, toxicity, oxidative stress and *Curcuma longa.*

Antimalarial Activity of Aqueous Extract of *Solanum nigrum* L. Leaves against *Plasmodium berghei* in Mice: A Focus on Placental Malaria

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Abstract

A prominent condition resulting into poor outcomes of pregnancies is placental malaria, which is caused by the presence of malaria parasites in the placenta. The aqueous extract of *Solanum nigrum* leaves (AESNL) have been ethno-botanically used for nurturing pregnancies and ensuring proper fetal development. This study aims to investigate the antimalarial activity of the aqueous leaf extract of *Solanum nigrum* against *Plasmodium berghei* in pregnant mice and evaluating percentage maternal parasitaemia, birth weight, placental weight, placental histo-achitecture and fetal development. Twenty female pregnant albino mice (weighing 19.15 ± 24.73g) were randomly divided into 4 groups (I-IV) of five animal each. Group I served as control and group II-IV received distilled water, 500/25mg/kg body weight of Sulfadoxine-pyrimethamine and 100mg/kg of AESNL orally for 3 days respectively. Thin Blood Films smear was carried out to estimate the number of parasitized red blood cells. The animals were sacrificed under di-ethyl anesthesia on day 18 of gestation and the fetus was weighed and preserved in Bouin solution while placenta and spleen in 10% formalin. The result obtained revealed a significant ($P \leq 0.05$) increase in spleen weight, % parasitaemia, placenta weight in the untreated malaria group while there was a significant ($P \leq 0.05$) decrease in the fetal weight compared to the control mice. The placenta histology of the untreated malaria revealed severe neutrophilic infiltration of the maternal blood vessels and the spleen with splenic congestion with haemosiderin-laden macrophages (moderate) and numerous neutrophils. The administration of AESNL increased the fetal weight and decreased the spleen and the maternal % parasitaemia and improved the theilery developmental features. The findings of this study reveals that *S. nigrum* elicited antimalarial effect and validated the ethnobotanical usage at the dose investigated, therefore, the AESNL can be explored in the development of antimalarial drug targeting placenta malarial subject to further experimentations.

Keywords: Fetus, Malaria, Placenta, *Solanum nigrum*

In Vitro Antischistosomal Activity of *Bridelia ferruginea, Clausena anisata, Khaya senegalensis* and *Vernonia amygdalina.*

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Abstract

Schistosomiasis is caused by parasitic flatworms and the disease is endemic to most countries in Sub-Saharan Africa including Ghana. The current therapeutic agent for managing this disease solely relies on praziquantel. The continual dependence on this single available drug could lead to possible drug resistance. This study seeks to evaluate the antischistosomal activity of the following Ghanaian medicinal plants: *Khaya senegalensis, Vernonia amygdalina, Clausena anisata* and *Bridelia ferruginea.* Ethanolic extracts of the selected medicinal plants were tested against newly transformed schistosomula (NTS) and adult *Schistosoma mansoni*. At 100 µg/mL and 50 µg/mL, all extracts showed strong activity against NTS, thus mortality effects of 98.08%, 100%, 80.77% and 100% for Clausena, Vernonia, Bridelia and Khaya respectively. Strong activity was recorded when the extracts underwent testing against *Schistosoma mansoni* adults at 100 µg/mL; 96.35%, 100% and 94.55% for Vernonia, Bridelia and Khaya respectively, except for Clausena which exhibited weak activity: 56.02%. At 100 µg/mL, *Khaya senegalensis, Vernonia amygdalina* and *Bridelia ferruginea* extracts demonstrated strong activity against both schistosomula and adult *Schistosoma mansoni*. This data can serve as baseline information in the quest to find alternative therapeutic agents to treat schistosomiasis.

Keywords: *Schistosoma mansoni, Khaya senegalensis, Vernonia amygdalina, Bridelia ferruginea, Schistosomula.*

Clinical efficacy of ArtiCovid (*Artemisia annua* extract) on Covid-19 patients in DRC.

MUNYANGI WA NKOLA Jerome MD;Msc;MPH PhDs

Abstract

Severe Acute Respiratory Syndrome-Coronavirus 2 (SARS-CoV-2) a contagious respiratory disease popularly known as COVID-19, (ArtiCovid) has caused a lot of harm in recent years. Majority of people infected with SARS-CoV-2: are asymptomatic or mildly ill. 14% of patients will develop severe illness requiring hospitalization and oxygen support, and 5% of these will be transferred to an intensive care unit. Hence there is an urgent need for new treatments that can be used quickly to prevent transfer of patients to intensive care unit and death. The aim of the study was to evaluate the clinical efficacy of ArtiCovid (a standardized solution of *Artemisia annua*). Ethical clearance for the study was granted by the health authorities of the province of Central Congo. A pilot study using a standardized solution of *Artemisia annua* (ARTICOVID) was conducted. Study participants were recruited from the Kinkanda Hospital. All participants were administered one teaspoon of ARTICOVID three times daily. 50 patients who completed the treatment were aged between 2 and 70 years with an average age of 36 years More than half were male (56%). One in four patients was a health professional (25%). Of the 12 health professionals, 4 were physicians. For those who reported the date of onset of the disease, the average duration between the appearance of the first symptoms and the medical consultation was 5 days. The 50 patients put on ARTICOVID were discharged alive with CRP levels substantially normalized After seven to eight days, the control test came back negative. This pilot study suggests that ARTICOVID may be effective against COVID-19 infection.

Keywords: ArtiCovid, SARS-CoV-2, *Artemisia annua,* ethical clearance, pilot study

Evaluating the antibacterial, antioxidant and wound healing properties of the stem bark extract of *Khaya grandifoliola* (Welw) CDC (Meliaceae) (African mahogany)

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Abstract

The study was conducted to evaluate the antibacterial, antioxidant, and wound healing properties of the stem bark of *Khaya grandifoliola* (Welw) CDC (Meliaceae). A preliminary phytochemical screening conducted showed the presence of tannins, alkaloids, saponins, reducing sugars, flavonoids, terpenoids, and phenols in the stem bark (KG) as well as its ethanol extract (KGE). The antibacterial activity of KGE was evaluated using agar well diffusion method against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli*, and *Klebsiella pneumoniae*. In-vitro antioxidant activity of KGE was also evaluated using the total phenolic content, DPPH radical scavenging activity, and total antioxidant capacity assays. In the wound healing activity test, topical formulations of varying concentrations of KGE (1-15% w/w) with Emulsifying Ointment BP were used in an excision wound model involving Wistar albino rats. KGE demonstrated in-vitro antibacterial activity against all test microorganisms in a dose-dependent manner. It also showed good antioxidant effects, with a strong correlation between the antioxidant capacity and phenol content ($r = 0.9898$); indicating that the observed effects may be due to the phenolic compounds initially detected. KGE showed significant wound healing effects as compared to the untreated group ($p < 0.05$). Additionally, the observed wound healing effects from the adopted doses were showed to be comparable ($p > 0.05$). In effect, the smallest dose was as effective as the highest dose. These outcomes showed that KG was effective as an antibacterial and antioxidant agent, and a wound healing promoter, justifying its reported traditional uses for infections and wound management.

Key words: Wound healing activity, antibacterial agent, antioxidant effects, tannic acid, medicinal plant, African mahogany.

Rauwolfia vomitoria and metoserpate: promising interventions for Alzheimer's disease therapy

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Abstract

Alzheimer's disease (AD) is a highly prevalent neurodegenerative disorder. AD accounts for 60 to 80% of dementia cases globally. According to the World Health Organization, there were approximately 50 million people living with dementia worldwide in 2020, and this number is expected to triple by 2050. Thus, the incidence of AD is anticipated to double over the next two decades. Despite significant progress in unraveling its pathological mechanisms, the development of efficacious treatments remains elusive. Current therapeutic modalities primarily focus on mitigating symptoms rather than halting disease progression. However, the exploration of natural phenolic compounds derived from ethnomedicinal plants presents a promising avenue for neurodegeneration therapy. Additionally, repurposing existing drugs through compound structural similarity screening represents another strategy for the discovery of therapeutic agents. Exploring African ethnomedicinal plants for AD management, we identified Rauwolfia vomitoria as a potential neuroprotective candidate based on usage frequency and its promising properties. The therapeutic potential of R. vomitoria was evaluated in the 3xTg-AD mice. An active compound in R. vomitoria was used as a base-compound for structural similarity search and repurposing of FDA-approved drugs for AD treatment using molecular docking and dynamics simulations techniques. A total of 23 ethnomedicinal plant families with potential for managing AD-related symptoms and dementia were retrieved. Remarkably, R. vomitoria demonstrated the ability to enhance working memory in 3xTg-AD mice while positively modulating the abundance of beneficial gut bacteria, suggesting its prebiotic properties. Through molecular docking and dynamics simulations, Metoserpate exhibited a favorable and robust interaction with TNF-alpha, highlighting its reliability as a therapeutic candidate. Rauwolfia vomitoria improved cognition in Alzheimer's mice and increased beneficial gut bacteria, showing promise for cognitive disorders. Metoserpate is a viable TNF-alpha inhibitor for AD.

KEYWORDS: TNF-alpha, Molecular Docking, Molecular Dynamics Simulation, *Alzheimer's disease, Neurodegeneration, Dementia, Ethnomedicinal, Prebiotic*

PARALLEL SESSION 2B

Prostate Cancer :Causes and Medicinal Plants Used in Africa for Twenty Years (2001-2021)

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Abstract

Prostate cancer is one of deadliest cancers in the universe especially in Africa. A lot of work has been done on the treatment and control of breast cancer, colon/colorectal cancer, skin cancer, etc. Only a few works on prostate cancer has been published in literature. The conventional method of treatment used is almost not affordable by many cancer patients due to high cost of drugs and therapy. Also, the cumulative side effects arising from the treatment is enormous to patients. Hence, there is need to exploit local herbs that contain active anticancer ingredients that are readily available and affordable with little or no side effects. The present review was carried out to evaluate published works on medicinal plant species used for treatment and control of prostate cancer in Africa for twenty years (2001-2021). A total number of 48 plant species with 40 families were retrieved from database using ScienceDirect, Google scholar, Web of Science, Springerlink, Scopus, PubMed, and BioMed. All the plant species were reported to possess cytotoxic activity against prostate cancer cell lines *in vitro* and *in vivo.* The most cited plant species according to literature sources are *Hypoxis hemerocallidea*, *Plumbago zeylanica, Gongronema latifolium* and *Mangifera indica*. Plant families that were used more in treating prostate cancer were Apocynaceae, Fabaceae, Asteraceae, Cucurbitaceae, Bignoniaceae, Lamiaceae. We conclude that more research be carried out on the medicinal plants' usage on the treatment of prostate cancer and further bio-prospecting drugs from the enlisted plants should explored by the pharmaceuticals in Africa.

Key words: Cure, Death, Ethnobotany, Families, Phytomedicine, Tumour.

Herbs Used in Antimalarial Medicines: A Study in the Greater Accra Region of Ghana

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Abstract

Ghana is one of the many Sub-Saharan African countries battling malaria. The disease is treated with orthodox medication as well as some home-grown remedies, mainly from plants. This study sought to identify these local remedies being marketed, focusing on the active ingredients being used. Pharmacy shops were randomly scouted and products were observed. The active ingredients were documented, and their frequencies were determined. Forty-four (44) plant species belonging to twenty-eight (28) families were recorded for the treatment of malaria in the survey. The predominant families were the Leguminosae and Meliaceae families. *Cryptolepis sanguinolenta* (Ghanaian quinine or yellow dye root) and *Azadirachta indica* (neem tree) were the most cited plants. *Cryptolepis* and neem trees were used 17 and 15 times in the finished herbal products for treating malaria. *Cryptolepis sanguinolenta* and *Azadirachta indica* (neem tree) are important herbs for the treatment of malaria in Ghana. Locally manufactured herbal antimalarials are important for the treatment of malaria in urban and rural communities in Ghana.

Key words: *Cryptolepis sanguinolenta*, *Azadirachta indica*, anti-malarial, Leguminosae, Meliaceae.

Plants of Importance In Infertility Control in Some Communities Within The Mpohor-Wassa East District, Ghana

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Abstract

Infertility is one of the global public health problems and medicinal plants have been used to increase fertility in men and women throughout human history. Despite the continuous use of plants to manage infertility, few studies have documented information on these plants. This study aimed at gathering information on plants of importance in infertility control, in both males and females in some communities within the Mpohor-Wassa East District in the Western Region of Ghana. Ethnobotanical survey was conducted in 22 communities adjoining the Subri River Forest Reserve. Visits were made to homes, where information on plants of importance for infertility were gathered from people with experience in herbal medicine, using interview schedules, through purposive and snowball sampling techniques. A total of 61 respondents, comprising 38 males and 23 females provided information on 68 plants used for infertility control in both males and females. These plants belonged to 66 genera and 38 families. The families with the highest number of species were Euphorbiaceae (7), Meliaceae (6) and Papilionaceae (5). *Cyperus esculentus* was cited as the most frequently used plant for infertility control in males, while *Alchornea cordifolia* and *Kigelia africana* were cited as the two most frequently used plants for infertility control in females. Majority (67.6 %) of the plants were woody, comprising trees, shrubs and lainas. The most frequently used plant parts were roots (35.7 %) and barks (34.8 %). The remedies were generally prepared in the forms of infusions, decoctions, extracts or juice, which were mainly taken orally or by enema. The results from this study indicated that there was still patronage of traditional medicine by the rural inhabitants for fertility control. There should be effective training for traditional medical practitioners to enhance reproductive health care in the rural areas.

Keywords: Infertility, Wassa East District, *Cyperus esculentus*

The potential of natural alkaline sources in the reduction of aflatoxin in groundnut and maize

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Abstract

Groundnut and maize are part of staple crops consumed mostly in Ghana but gets contaminated easily by aflatoxin. Consumption of aflatoxin contaminated food causes several adverse health effects including liver cancer. Several detoxification methods and techniques have been employed to reduce aflatoxin levels in groundnut but these have not been fully effective. The study was carried out to assess the potential of saltpetre, whitewash and wood ash in reducing aflatoxin in contaminated groundnut and maize. Two separate experiments were carried out in this study. The first experiment was conducted in a completely randomized design with the concentrations of 0%, 1%, 5%, and 10% (w/v) and soaking time of 12 h, 18 h, and 24 h. The second experiment was factorial in a completely randomized design with the concentrations of 0%, 1%, 5%, and 10% (w/v), cooking times of 5, 10, 15 minutes, and steeping time of 0 h, 6 h, 12 h. All experiments were replicated thrice. Total aflatoxin level was determined using Rapid Test Kit for a Quantitative Test with Mobile Diagnostic Reader (Mobile Assay Inc., Boulder, CO). Alkaline concentration and soaking time significantly (p = 0.002) affected aflatoxin levels in both maize and groundnut. The result revealed that at 5% concentration, saltpetre solution reduced aflatoxin level by 89% in groundnut and 90% in maize, while wood ash solution resulted in 28% total aflatoxin reduction in groundnut. In maize, whitewash and wood ash solutions at 5% resulted in total aflatoxin reduction of 94% and 91%, respectively. Consumer sensory analysis carried on the final product showed an overall acceptability of texture, colour, taste, and aroma by the consumers. Saltpetre (5%, 10%, w/v) was able to detoxify aflatoxin and maintained the proximate and sensorial quality in groundnut suggesting its potential to be used as aflatoxin decontamination agent in groundnuts.

Keywords: Aflatoxin, Groundnuts, Maize, Saltpetre, Whitewash, Wood-Ash

Conservation of Medicinal Plants through the establishment of Twin Medicinal Plant Gardens in Ghana and Barbados.

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Abstract

The period of slavery in Barbados saw about 387 000 Africans being transported to the island to work under the inhumane conditions of forced labor. Many slaves were taken from their homeland in Ghana and Nigeria. The biocultural traditions such as plant use for treatment of diseases was also transported from the African homeland. The aim of this study was to (1) Compare the useful medicinal plants in Ghana with that of Barbados to determine the species we share in common and those that are lacking in the floral list of both countries. (2) To establish twin medicinal plant gardens, one in each country, with same medicinal plant species to promote the use of herbal medicines in Ghana and Barbados. (3) To use the twin gardens as vital centers for the cultivation and conservation of medicinal plants in Ghana and Barbados. A total of 57 species belonging to 37 families and 53 genera were extracted from Handler and Jacoby's "Slave Medicine and Plant Use in Barbados" (Popularly known as the Barbados Pharmacopoeia) to form the medicinal plant list of Barbados. On the other hand, the medicinal plants list of Ghana was extracted from the first and second editions of the Ghana Herbal Pharmacopoeia which documents 100 species within 45 families and 97 genera. A total of twelve genera namely: *Carica, Cassia, Euphorbia, Datura, Desmodium, Ocimum*, *Paullinia, Zanthoxylum, Abrus, Solanum, Cajanus and Chromolaena* were identified in the species lists of both countries. Again, seven species namely: *Abrus precatorius, Cajanus cajan, Chromolaena odorata, Carica papaya, Cassia occidentalis, Euphorbia hirta* and *Solanum torvum* were identified to be commonly shared by both countries. It is clear that, 93% of useful medicinal plants in Ghana are absent in the flora of Barbados whiles 88% of useful medicinal plants in Barbados are absent in the flora of Ghana although Ghanaians and Barbadians are genetically and culturally related. To have similar useful medicinal plants in both countries, the idea of twin medicinal plant gardens, one in each country evolved. It is anticipated that, the twin gardens when completed, shall not only make similar useful medicinal plants available to improve healthcare in both countries, but shall also attract tourists and researchers from all over the globe for research, training and recreational purposes in Ghana and Barbados.

Key words: Twin gardens, Ghana, Barbados, conservation, cultivation, useful medicinal plants, pharmacopoeia.

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Influence of Poultry Manure on the Growth and Phytochemicals of *Lippia Multiflora* Moldenke, and a Comparison of Wild and Cultivated Samples - Domestication.

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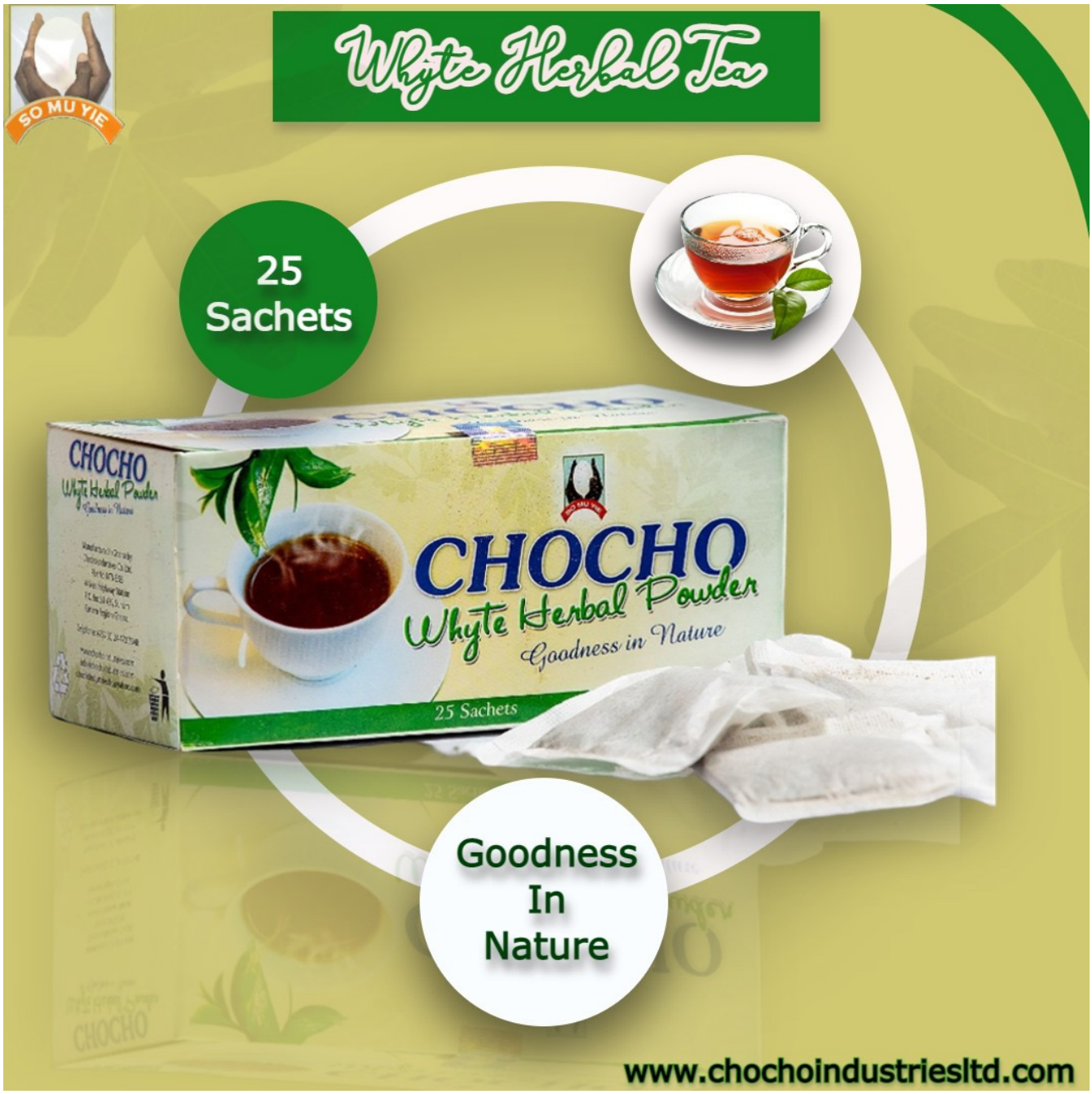
Abstract

The success of medicinal plant domestication is basically to achieve good and timely physiological response, reproductivity, and appreciable phytochemicals comparable to the wild species that are required to executed the expected biological activity. *Lippia multiflora* is considered an important aromatic medicinal plant due to its usage as a remedy for several disorders including stress, fever, and management of mild hypertension. This study investigated the cropping cycle of *L. multiflora* by exploring the germination responses, effect of poultry manure on the growth and phytochemicals, influence of age and comparison of phytochemicals of wild and cultivated samples. First, germination assessment was conducted to ascertain time of seed emergence, a propagation experiment was set out in a Completely Randomized Block Design (CRBD). Healthy *L. multiflora* seedlings of the same age were planted in four blocks with three treatments of different levels of manure (5, 10 and 15 t/ha) and a control (without manure). Wild collections of *L. multiflora* across different ecological zones in Ghana were done for comparative phytochemical screening with cultivated sources. Seeds of *M. multiflora* germinated between 7 and 15 days after sowing. The performance of 10 and 15 t/ha treatments on the growth parameters were very similar and makes 10 t/ha economical. The phytochemical screening revealed the presence of Polyuronide, Phenolic compounds, Reducing sugars, Alkaloids, Phytosterols, and Flavonoids in both wild and cultivated samples. The influence of age was observed through monthly periodic collections and quantification of phytochemicals was hence done for the best harvest periods.

Keywords: Propagation, Phytochemicals, Domestication, Economical, and Wild species.



PARALLEL SESSION 3

PARALLEL SESSION 3A

Anti-microbial Effect of *Zanthoxylum zanthoxyloides* Leaf Extracts on Selected Oral Pathogens

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Abstract

Oral infections continue to be a major health problem with serious implication in conditions such as colorectal cancer, gum bleeding, toothache, preterm birth among pregnant mothers, arterial hardening, myocardial infarction and stroke. Conventional treatments for oral infections are often ineffective due to anti-microbial resistance and may mar taste. *Zanthoxylum zanthoxyloides* is used in ethnodentistry as chewing stick to maintain oral hygiene, however, this folk claim remains to be validated scientifically. The study assessed anti-microbial activity of three leaf extract fractions of *Zanthoxylum zanthoxyloides* against three selected oral pathogens (*Lactobacillus acidophilus, Aggregatibacter actinomycetemcomitans* and *Candida albicans*) implicated in oral infections. The crude extract of *Z. zanthoxyloides* leaf was prepared, and increasing concentrations of each extract fraction and respective standard antibiotics were tested against the growth of each selected oral pathogen by using serial broth dilution. After 24 hours culturing, absorbance of each test broth was measured spectrophotometrically at 450 nm. Percentage inhibition by each extract fraction, vehicle and standard antibiotics (Fluconazole, FLUCO; amoxicillin and metronidazole, AMOX & MET; and ciprofloxacin, CIPRO for *C. albicans*, *A. actinomycetemcomitans* and *L. acidophilus* respectively) were determined indirectly from absorbance values by proportions relative to an untreated standard broth. The IC_{50} of each drug was determined from log concentration - response curve whilst MIC values for each fraction was determined using scatter plot with line of best fit. The extract fractions produced concentration-dependent inhibition of growth. Except in the case of *Lactobacillus acidophilus* where growth inhibitory effect of the extract fractions was lower compared to standard antibiotic (ciprofloxacin), for the remaining pathogens, the extract fractions produced comparable growth inhibitory effects at higher (in the case of *Candida albicans*) and lower (in the case of *Aggregatibacter actinomycetemcomitans*) concentrations relative to standard antibiotics (Amoxacillin & Metronidazole and Fluconazole). *Z. zanthoxyloides* leaf extracts have anti-microbial activity against the three studied oral pathogens; thus, it can be explored for active anti-microbial agents against oral infections in which the studied pathogens may be implicated.

Keywords: *Zanthoxylum zanthoxyloides*; Oral pathogens; *A. actinomycetemcomitans; L. acidophilus; C. albicans.* ***Correspondence:*** *aboye@ucc.edu.gh; Tel.: +233543007221*

Fungistatic activity of methylparaben-ethanol-glysterol mixture on some predominant fungal isolates from six ghanaian herbal medicinal products

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Abstract

The incessant occurrences of toxigenic mycoflora in some preserved Ghanaian liquid herbal medicinal products received at the Centre for Plant Medicine Research (CPMR), Mampong-Akuapem, for mycological safety analysis necessitated a study into the antifungal activity of methylparaben-ethanol-water mixture acting as preservative in six of such products sold on the local markets in Ghana *(NB, AS, ET, TO, PM*, and *MB*). Two different vegetative growth assays with five predominant resident mycoflora (*Aspergillus flavus, A. niger, A. sulphureus, penicillium digitatum* and *P. expansum)* from the products were carried out. In the first, susceptibilities of the test fungi to varied concentrations the methyl paraben-ethanol-water mixture (undiluted, 1:10, 1:30, 1:50, 1:70, 1:90, and 1:100 v/v were evaluated using the conventional agar well diffusion method with miconazole (50 µg/ml) and sterile distilled water as positive and negative controls respectively. In the other, mycelia dry weights and pH of culture filtrates of incubated of samples of the six liquid herbal medicinal products inoculated with discs of mycelia plug from actively growing pure cultures of the test fungi were assessed. Vegetative growths of all five test mycoflora were totally inhibited in higher concentrations (undiluted, 1:10, and 1:30 v/v) of the methyl paraben-ethanol-water mixture; partially inhibited in 1:50, 1:70 v/v but was not visibly affected by 1:90 v/v concentration and above. The media made from the liquid herbal medicines however exhibited varied fungistatic activity against the three test fungi, The highest vegetative growth attained by the fungal species in the herbal medicinal products was 30.00 mg (*A. niger* in *TO*) and the lowest growth was 11.32 mg (*A. flavus* in *PM*). In all instances, the pH of the culture filtrate generally shifted to the neutral and basic side during the period of incubation. Conclusion was drawn that the concentration of the preservative used for the six decoctions (approximately 1:28 v/v) was inappropriate to preclude growth of the test fungi.

Keywords: Fungistatic activity, Vegetative growth of fungi, Antifungal activity, Methyl-paraben-water-mixture.

Bacteriological assessment of aqueous herbal teas sold in Amakom, kumasi

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Abstract

Although many herbal tea remedies have been known and employed for centuries, there has been a rise in their use lately due to a trend towards using natural medicine. Some of these herbal teas which are usually prepared and consumed in homes are now commercially prepared and sold from flasks or packaged in plastic bottles or sealed cups. The increased usage and sale of these herbal teas have raised safety concerns. This study sought to assess the bacteriological quality of aqueous herbal teas sold in Amakom, Kumasi. A total of sixteen (16) samples of three different types of aqueous herbal teas were collected from different vendors on the streets of Amakom, Kumasi. The samples were microbiologically analyzed using the standard plate count technique and selective media. Of the 16 samples analyzed, 14 (87.5%) of them contained microorganisms. The bacterial load ranged from $2x10^3$ cfu/mL to 1.56×10^8 cfu/mL**.** Microorganisms identified in the samples included *Staphylococcus aureus, Escherichia coli, Enterobacter spp., Klebsiella spp* and *Proteus spp.* Of all the bacterial isolates identified, *Staphylococcus aureus* (43.8%) was the most occurring and *Escherichia coli* (6.3%) was the least occurring. This study revealed that herbal teas prepared and sold on the streets of Amakom are contaminated with pathogenic microorganisms which may pose a health risk to consumers.

Keywords: herbal teas, microbial contamination, health, safety, herbal products, standards

The synergistic effects of *Cannabis sativa* L. terpenes and Cisplatin in Cisplatin-resistant cervical cancer cells: an *in vitro* and *in silico* study

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Abstract

A significant challenge in the treatment of cervical cancer (CC) is the development of resistance to cisplatin (DDP) which remains a major factor contributing to the failure of chemotherapy in cancer patients (Bhattacharjee et al., 2022). Consequently, there is a pressing need to develop new chemotherapeutics in combination with DDP to overcome DDP-resistance and enhance its anticancer efficacy. Finding innovative approaches to address DDP resistance is crucial in improving the outcomes of cancer treatments, especially in the context of CC. To assess the effect of *C. sativa* L. terpenes alone and in combination with DDP in cervical cancer cells *in vitro* and by using network pharmacology. A network-pharmacology based *in silico* analysis was employed to predict the potential molecular interactions. DDP-resistant cells (HeLa-DDP) were developed by incremental administration of DDP *in vitro*. Cell viabilities of fibroblast (BJ), HeLa and HeLa-DDP cells following exposure to Mixed (CSL-C) and Beginning (CSL-F) terpene fractions were evaluated using resazurin assay at 24h and 48h. The nature of the combined effect of DDP with terpenes was determined using the CompuSyn and Synergy finder software. *In-silico* analysis showed that GLI1 & KMT2A genes are implicated in multiple oncogenic signaling pathways. In experimental tests, DDP, CSL-C and CSL-F demonstrated anticancer activity in a time-dose-dependent manner. Terpene fractions showed no toxicity towards BJ cells indicating their potential safety. CSL-C and CSL-F combinations displayed synergism in HeLa-DDP and HeLa cells, respectively. Overall, this study suggests that GLI1 and KMT2A genes are significant players in oncogenic pathways. Furthermore, the *Cannabis sativa* terpenes exhibit promising anticancer properties when used in combination with DDP with potential synergistic effects. This research provides valuable insights into potential therapeutic strategies for Cisplatin-resistant CC treatment.

Key words: Cervical cancer, Terpenes, HeLa, Cannabis sativa and Cisplatin resistance

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Naringin and quercetin abrogate fipronil-induced cardiovascular and renal dysfunctions in Wistar rats

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Abstract

Fipronil is an ectoparasiticide that is widely used in agricultural practices for the cultivation of farm crops and for the control of fleas and ticks on domestic and wild animals. The present study investigated the synergistic effects of naringin and quercetin on fipronil-induced cardiovascular and renal dysfunctions in Wistar rats. Thirty healthy male Wistar rats were divided into five groups with six rats in each group. The rats were acclimatized for one week before the commencement of the experiment. Group A was the control group, administered with distilled water, Group B was administered with 10 mg/kg of Fipronil, Group C was administered with 10 mg/kg of Fipronil and 100 mg/kg of Naringin, Group D was administered with 10 mg/kg Fipronil and 50 mg/kg Quercetin, while Group E was administered with 10 mg/kg of Fipronil together with 100 mg/kg of Naringin and 50 mg/kg. The experiment lasted for 28 consecutive days. Urinalysis and Blood pressure parameters, biochemical assays, histology, and immunohistochemistry were carried out on the cardiac and renal tissues of rats. The results showed that fipronil intoxication, compared with the control, caused significant ($p < 0.05$) increase in systolic blood pressure, diastolic blood pressure and mean arterial pressure, oxidative stress biomarkers, blood urea nitrogen (BUN) and creatinine. The Immunohistochemistry results revealed that fipronil increased the expression of cardiac troponin 1 (CTn1), and matrix metalloperoxidase -2 (MMP2) in cardiac tissue of rats. Naringin and quercetin increased the expression of angiotensin converting enzyme 2 (ACE2) but decreased the expression of neutrophil gelatinase-associated lipocalin (NGAL) in the renal tissues of rats. In conclusion, the combination of naringin and quercetin effectively mitigated the cardiovascular and renal toxicities associated with fipronil exposure in a synergistic manner, probably through the inhibition of oxidative and inflammatory processes.

Keywords: Fipronil, immunohistochemistry, nephrotoxicity, oxidative stress

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PARALLEL SESSION 3B

Protective effects silymarin on cobalt chloride-induced cardiovascular and renal toxicities in rats

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Abstract

Silymarin is an extract of *Silybum marianum* that is used traditionally for the treatment of several diseases due to its high constituent of flavonoids with potent antioxidant activities. In this study, forty rats were randomly divided into four groups of 10 rats each as follows: control; 300 mg/kg cobalt chloride ($CoCl_2$); $CoCl_2$+100 mg/kg silymarin; and 100 mg/kg silymarin only. At the end of the experimental period (7 days), blood pressure parameters, markers of oxidative stress, antioxidant defence status, renal function test, histopathology and immunohistochemical expressions were evaluated on the heart and kidney tissues. Silymarin significantly ($p<0.05$) decreased Cobalt chloride toxicity significantly ($p<0.05$) decreased $CoCl_2$-induced alterations in blood pressure parameters, glutathione (GSH), glutathione peroxidase (GPx), superoxide dismutase (SOD), hydrogen peroxide (H_2O_2), malondialdehyde (MDA), myeloperoxidase (MPO), xanthine oxidase (XO), nitric oxide (NO), blood urea nitrogen and creatinine. Histopathological evaluation revealed area of infiltration of the myocardium by inflammatory cells and haemorrhages in the kidney of rats exposed to $CoCl_2$ without silymarin treatment, but these lesions were absent in the control and silymarin groups. Increased immunohistochemical expression of cardiac troponin I and matrix metalloproteinase-2 (MMP-2) was observed in the cardiac tissues of rats exposed to $CoCl_2$ without silymarin treatment. The immunohistochemical expression of cystatin was heightened, while that of angiotensin converting enzyme (ACE2) was attenuated in the $CoCl_2$ untreated group compared with the control and silymarin groups. In conclusion, silymarin effectively mitigated the toxic effects of cobalt chloride on the heart and kidney tissues of rats due to its ability to positively modulate the activities of endogenous antioxidants and neutralize reactive oxygen species in cardiac and renal systems.

Keywords: Silymarin, Cobalt Chloride, Oxidative Stress, Heart, Kidney.

Chronic toxicity evaluation of P*rostat-60*, herbal medicine for bph and urine retention, in Sprague Dawley rats

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Abstract

The safety of *Prostat-60*, an herbal medicine used as remedy for benign prostate hyperplasia (BPH) and urine retention, was investigated in male Sprague-Dawley rats (SDRs). The median lethal dose (LD_{50}) was estimated after a single oral. A chronic toxicity study (daily oral administration for a period of six months) of *Prostat-60* was evaluated at the therapeutic dose (5.0 mg/kg), ten times the therapeutic dose (50 mg/kg) and at twenty times the therapeutic dose (100 mg/kg). Growth rate together with serum biochemical, haematological and urine indices were determined following daily oral administration for a six-month period. Histopathological analyses were determined at the termination of study. The LD_{50} was estimated to be beyond 5000 mg/kg. The results further showed no significant difference in the growth rate ($P > 0.05$) of the rats following oral administration of *Prostat-60*. There were no clinically significant differences ($P > 0.05$) between the test groups and the control in urine parameters, selected clinical biochemistry and haematological parameters determined. The mean organ wet weights of the treated animals did not show significant differences ($P > 0.05$) when compared to control animals. These findings of the urine and biochemical analyses corroborated the histopathological findings which showed no morphological changes in the liver, kidneys, lungs and the heart, indicating the absence of damage microscopically to the cells of these organs. *Prostat-60* may therefore, be safe when administered to patients.

Keywords: Prostat-60, benign prostate hyperplasia, urine retention, biochemical, liver, haematological

Effect of YN, an ethanolic plant extract on gastric mucosa

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Abstract

Non-selective nonsteroidal anti-inflammatory drugs (NSAIDs) which inhibit both cyclooxygenases (COX)-1 and - 2 are commonly associated with upper gastrointestinal peptic ulcer disease and gastric bleeding. This study explored the ulcerative potential of YN, an anti-inflammatory herbal agent which has been previously reported as a candidate for prophylactic and long-term administration. Male Sprague Dawley rats were grouped and treated with doses of Diclofenac sodium (DS, 16 mg/kg), YN (50, 100, 200 mg/kg), Celecoxib (CX, 17 mg/kg) or vehicle. In one experiment, the rats were fasted for 36 hours with access to water *ad libitum*, before a one-time dose treatment with extract/drugs/vehicle. The rats were euthanized after six hours, and the stomach was excised. In another experiment, rats with no diet/water restrictions were dosed daily for four weeks. Feed and water intake, body weight and hematological parameters were determined weekly. Ulcer index was determined using the scoring system by Takagi and Okabe (1968) for both experiments. Serum levels of COX-1 and -2 were determined after four weeks by ELISA. Treatment with DS resulted in erosion and/or lesions in gastric mucosa. YN groups showed no signs of ulceration, with intact gastric mucosa for both the single dose and daily administration. After four weeks of treatment, significant ($P < 0.05$) reductions in peripheral levels of the white blood cells were observed for the YN (36.36 - 2.25%), DS (25.30%) and CX (42.48%) groups relative to untreated controls. Lymphocyte and haemoglobin levels were also reduced (not significant) with DS and YN (100 and 200 mg/kg) treatment. COX-1 for DS (0.15ng/mL) was lower compared to YN groups (0.18-0.22ng/mL) which were similar to untreated controls (0.18ng/mL). COX-2 levels were higher for YN groups (1.97-0.91ng/mL) compared to DS (0.70ng/mL) and untreated control (0.76ng/mL). YN increased measured COX-2 levels, indicative of safer activity compared to the current Coxibs and had no effect on COX-1 over four weeks leading to the protection of gastric mucosa in Sprague Dawley rats.

Keywords: Gastric mucosa, NSAIDS, Gastrointestinal peptic ulcer disease, Cyclooxygenase-2

Assessment of the potential dermal toxicity and wound healing activities of *Cnestis ferruginea* vahl ex dc roots.

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Abstract

Antibiotic-resistant microorganisms can infect wounds and propel them into chronic states with associated increased mortality and morbidity rates. *Cnestis ferruginea* is a tropical plant, which is traditionally used in the management of various skin infections including wounds without scientific evidence. The aim of this study was to investigate the dermal toxicity and wound healing potential of *C. ferruginea*. Ten millimeter full-thickness mucosal wounds were created on the dorsal mid-portion of the Sprague Dawley rats. Aqueous creams (10, 5 and 2.5% w/w) were prepared from the methanol extract of the root bark of *C. ferruginea* (CFM). Six groups of five rats each were created. Three groups received treatment with CFM creams, one with normal saline, another with silver-sulfadiazine and the last group was left untreated. The wound tissues were harvested on day 21 for histology studies. Compared with the untreated group, 10, 5, and 2.5% w/w CFM-treated wounds significantly reduced the wound size over the study period ($P < 0.0001$). Tissue histology revealed a healed wound with well-regenerated collagen and skin appendages with no pus cells. A skin irritation test conducted on CFM, as well as its dermal toxicity potential in a repeated dose and acute dermal toxicity bioassays revealed that CFM showed no toxic effect on the skin and showed that CFM was not a skin irritant. *C. ferruginea* exhibited wound healing activity, which gives credence to its folkloric use.

Keywords: wound healing, *Cnestis ferruginea,* histology,

Subacute Toxicity Studies of Immulate: Herbal Supplement for Chronic Disease Conditions

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Abstract

Immulate is a clear-aromatic herbal distillate used as a supplement for patients with chronic disease conditions. It is a polyherbal formulation from *Magnifera indica*, *Acacia nilotica*, *Azadirachta indica. Immulate* has been produced and used by the Kantanka Herbal Pharmaceutical and Research Centre over a long period of years, however there is no pre-clinical toxicological data to support its safety. Hence, the safety of *Immulate* was investigated in male Sprague-Dawley rats (SDRs) following oral daily dose administration over a period of fourteen (14) days at a determined therapeutic dose of 0.17 mg/kg, a mid-dose of 1,7 mg/kg and a high dose of 3.4 mg/kg body weight. Growth rate, feed and water intake, urine indices with haematological and serum biochemical analysis were determined following the daily oral administration. The results showed no significance in the growth rate ($P > 0.05$) *at* 0.17 mg/kg compared to control. However, an increase weight was observed at the 1.7 mg/kg and 3.4 mg/kg even though there was no evidence in the feed intake and water intake. Generally, there were no significant differences ($P > 0.05$) between the test groups and control in urine parameters, haematological parameters and selected clinical biochemical determined. These findings corroborated with the gross pathological examination of the heart, liver, kidneys, lungs, spleen and pancreas with no significant differences ($p < 0.05$) in organ wet weights of the treated animals compared to control animals. *Immulate* is therefore safe preclinically in SDRs following the subacute toxicity studies, however clinical monitoring for any possible adverse effect at the therapeutic dose is recommended.

Keywords: *Immulate*, Subacute toxicity, Sprague-Dawley rats, Haematology, Biochemistry

PARALLEL SESSION 4A

Citrus reticulata Fruit Peel Extract Ameliorates Testosterone-Induced Prostatic Hyperplasia in Rats

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Abstract

Prostatic hyperplasia is a major risk factor for prostate cancer development. Treatment outcome of prostatic hyperplasia with conventional therapies remains poor. Use of herbal therapies has emerged and remains promising. Fruit peels of *Citrus reticulata* contain bioactive compounds claimed to exhibit anti-inflammatory properties and used against inflammation-related cancers such as prostate cancer. This study assessed prophylactic anti-prostatic hyperplasia properties of *Citrus reticulata* fruit peel extract (CRE) in a rat model of testosterone-induced benign prostatic hyperplasia. Healthy adult male Wister rats (150 – 200 g) were randomly assigned into six groups of five rats each. Except the control and model groups which respectively received normal saline (5 mg/kg, *po*) and testosterone (5 mg/kg, *ip*) daily for 28 days, the remaining treatment groups, Finasteride (1 mg/kg, *po*) and CRE (50, 100, and 200 mg/kg, *po*) received testosterone in the morning and their respective treatments in the afternoon daily for 28 days. On the 28th day, the rats were sacrificed following deep anesthesia. Prostate specific antigen (PSA), testosterone, C-reactive protein (CRP), and histology of the prostate gland were assessed. Serum PSA, testosterone, CRP, and WBC count were elevated in the model relative to the control group. Mean prostatic weight increased in the model group relative the control group. Shrunken prostatic glands with scanty glandular secretions, and stromal fibrosis with severe mast cell infiltration was observed in the model group. However, CRE treatment reduced PSA, CRP, and improved atresia of the prostatic glands, stromal fibrosis, mast cell infiltration, and increased glandular secretion relative to model group. CRE has demonstrated prophylactic anti-prostatic hyperplasia properties and this finding highlights the potential use of citrus fruit peels as anti-cancer therapy against prostate cancer.

Keywords: α-fetoprotein; Benign prostatic hyperplasia; C-reactive protein; Citrus reticulate; inflammation

***Pyllanthus amarus* ethanol extract downregulates pro-inflammatory cytokines and prolonged blood coagulation in lipopolysaccharides-induced inflammation rat model**

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Abstract

Blood coagulation, inflammatory, and immune responses are biochemical processes activated in the tissue due to infections, injury, and other stimuli. These responses are abnormal in several disease conditions. Medicinal plants are relevant sources of novel therapeutic agents. The effect of ethanol extract of *Phyllanthus amarus* aerial part (PAE) on systemic inflammation, blood coagulation, and liver function parameters was investigated in this study. Thirty Wistar rats (either sex) were grouped into six groups of five rats each and administered with different doses of PAE (100 and 200 mg/kg), n-hexadecanoic acid (100 mg/kg), and ibuprofen (positive control) orally once daily for 21 days before lipopolysaccharide (LPS; 1 mg/kg) intraperitoneal injection. The control groups received 1 mL phosphate buffer saline. The animals were sacrificed under anesthesia, 24 hours after LPS injection, and blood samples were collected via ocular puncture and processed to assess the coagulation, immunological and biochemical parameters. The serum concentrations of interleukin-6 and TNF-α were significantly ($p < 0.05$) lowered in the PAE-treated groups compared to the negative control (LPS only). At the same time, no significant difference was recorded with n-hexadecanoic acid. Fibrinogen concentration was significantly ($p<0.05$) lowered in the treated groups compared to the normal and positive groups and activated partial thromboplastin time (aPTT)was prolonged in the treatment groups against the controls. The coagulation parameters (except aPTT) were significantly shortened in the LPS-only group. There was no significant difference ($p>0.05$) in the PCV of the experimental animals. The concentrations of Alanine and Aspartate aminotransferases, creatinine, and urea were significantly ($p< 0.05$) lowered in groups pre-treated with PAE compared to the LPS-only. The study revealed that *P. amarus* is relatively safe at tested concentrations, possesses anticoagulant activity, and down-regulates the levels of pro-inflammatory cytokines. The plant could thus be a novel natural source of anticoagulant and anti-inflammatory agents**.**

Keywords: Blood coagulation, Inflammation, Interleukin-6, Lipopolysaccharide, *Phyllanthus amarus,* TNF-α.

The Antioxidant, Anti-inflammatory and Wound Healing Activities of The Leaf Extract of *Aspilia Helianthoides*.

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Abstract

A wound develops when the integrity of the skin, mucosal surfaces, or organ tissue is compromised. To restore tissue integrity after an insult, several mechanisms are simultaneously triggered in a coordinated manner. Factors affecting these processes, result in delayed wound healing and increases the risk of morbidity and mortality. An ideal agent for wound treatment has good antioxidant, anti-inflammatory, and good wound healing activities. *Aspilia helianthoides* is a herb known to possess all these properties, it is native to Africa and Latin America, it is commonly used for the treatment of coughs, headaches, anaemia and wound care. The aim of this research was to investigate the wound healing, antioxidant and anti-inflammatory properties of the aqueous leaf extract of *Aspilia helianthoides.* The Antioxidant and Anti-inflammatory activities were determined using the DPPH radical scavenging assay and the carrageenan induced foot oedema in chick model respectively. The wound healing activity was determined using the excision wound model. The extract was formulated into two ointments of concentrations 2% $^{w}/_{w}$ and 4%$^{w}/_{w}$ and used in the wound healing assay. The plant extract was able to reduce the wound size better than that of the control drug silver sulphadiazine ($P< 0.05$) with a percentage wound contraction of 92.45% and 94.03% for the 2% $^{w}/_{w}$ and 4% $^{w}/_{w}$ formulations respectively. This implied the least concentration *A. helianthoides* is as effective as the highest concentration in wound healing. The anti-inflammatory activity of the extract at the end of the 6th hour was able to reduce the oedema significantly ($P < 0.05$). The plant extract did not demonstrate appreciable antioxidant activity when compared to gallic acid. This research shows *Aspilia helianthoides* has significant wound healing and anti-inflammatory activity and justifies its folkloric use.

Key words: Wound healing activity, anti-inflammatory, carrageenan, antioxidant activity, medicinal plants.

Solanum Nigrum Leaf Modulates Reproductive Functions associated with Anastrozole-induced Polycystic Ovarian Syndrome in Rats

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Abstract

Polycystic Ovary Syndrome (PCOS) is a prevalent endocrine disorder characterized by hormonal imbalances, ovarian dysfunction, and metabolic disturbances. Anastrozole, an aromatase inhibitor, has been implicated in the induction of PCOS-like symptoms in animal models due to its impact on estrogen levels. *Solanum nigrum*, a wild vegetable, (Black nightshade) has numerous ethnomedical applications. *S. nigrum* has been reported to possess medicinal properties in the treatment of metabolic and infectious illnesses. This study evaluated the therapeutic effects of *Solanum nigrum* leaves on the reproductive functions associated with anastrozole-induced PCOS in rats. Sixteen female Wistar rats (190.56 ± 5.35g) were randomly divided into four groups of four animals each (A-D). Anastrozole (1mg/kg/day) was administered orally for 14 days to induce PCOS in group B-D. The animals in Group A (control) received 0.5ml of distilled water while the groups B,C and D were treated with 0.5ml distilled water, 7.14mg/kg of metformin co-administered with 2mg/kg clomiphene citrate (CC) and 200mg/kg body weight of AESNL respectively for 14 days. The phytochemical screening revealed the presence of secondary metabolites such as saponins, alkaloids, flavonoids, quinones, phenols, terpenoids and glycosides. The GC-MS chromatogram of AESNL showed n-Tetracosanol ($C_{24}H_{50}O$), as the major phytoconstituent with a retention time of 13.147. The trend of acyclicity in the estrous cycle with evidence of persistent metaestrus and estrus phases in PCOS rats was slightly reversed by AESNL similar to the rats administered metformin and CC. With the administration of AESNL at 200mg/kg B. W. to PCOS rats, progesterone and FSH decreased significantly ($p<0.05$) while LH and testosterone concentrations were significantly increased ($p>0.05$) compared to the control. The prolactin concentration was considerably ($p>0.05$) favorable when compared to the control. *Solaniun nigrum* leaves exhibited ameliorative effects on the reproductive functions, suggesting its potential as an alternative remedy in treating reproductive disorders associated with PCOS.

Keywords: Polycystic Ovarian Syndrome, Anastrozole, *Solanum nigrum*, reproductive function

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The Hydro-ethanolic Extract of *Scoparia dulcis* Inhibits Allergic Airway Inflammatory Responses in Murine Asthma Models.

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Abstract

Airway inflammatory responses, including airway inflammation, hyper-responsiveness, mucus hyper-secretion, increase in Th2 cytokines and infiltration of immune cells in the airway submucosa, frequently occur in allergic respiratory disorders. This study aimed at investigating the effects of the hydro-ethanolic extract of *Scoparia dulcis* (SDE) on allergic airway inflammation, airway hyper-responsiveness, goblet cell hyperplasia and mucus hypersecretion, Th2 cytokines and prostaglandin D_2 (PGD_2) levels using the ovalbumin-induced murine asthma model. Healthy guinea-pigs and mice were exposed to ovalbumin (OVA) sensitization and challenge for a period of 22 days to induce allergic asthma, followed by treatment with either 2 ml/kg Normal saline, 10 mg/kg Salbutamol, 10 mg/kg Prednisolone, or 50, 100 or 250 mg/kg of SDE *per os*. Histopathological examinations of guinea-pig lung tissues were conducted to assess airway inflammation, inflammatory cell infiltration, goblet cell hyperplasia, and mucus hypersecretion. Percentage protection against pre-convulsive dyspnoea after methacholine challenge in OVA-induced asthmatic guinea-pigs was determined for each treatment regime. Lung tissue homogenates and serums from OVA-induced asthmatic mice, for the same treatment regimen, were also assayed for PGD_2, interleukins (IL)-5 and -13 levels using monoclonal antibody-based mouse ELISA kits. Lung sections from OVA-induced animals showed that the extract significantly inhibited ($p \leq 0.05 – 0.01$) pulmonary infiltration of leukocytes, inflammatory cell accumulation, airway smooth muscle thickening and goblet cell hyperplasia. SDE treatments also prolonged pre-convulsive time after methacholine challenge; indicative of a positive activity against airway hyper-reactivity to allergens. Serum and lung tissue concentrations of PGD_2, IL-5 and IL-13 significantly elevated ($p \leq 0.01$) after induction of allergic asthma in mice were significantly reduced ($p \leq 0.05$) back to within normal levels. SDE reduced the severity of allergic inflammation and hyper-reactivity in the airways, and inhibited PGD_2, IL-5 and IL-13 expressions; signifying its anti-inflammatory ability and therapeutic value in asthma management.

Keywords: Allergic Airway Inflammation; Airway Hyper-responsiveness; Goblet cell hyperplasia; Th2 cytokines; Prostaglandin D_2.

INTERVENTION BY EKART 1122, AN HERBAL REMEDY IN THE CASE OF A 57-YEAR OLD MAN WITH PERSISTENT HIGH BLOOD PRESSURE, SEVERE INFLAMMATORY PAIN AND SWOLLEN FEET.

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Abstract

Mr. A, a 57-year old hypertensive man on hydralazine and nifecard was observed to have a BP of 224/162 in a routine screening of staff in May 2020 and was rushed tohospital. Despite a change in medication to methyldopa, bendrofluazide and lisinopril, the BP persisted at 175/110. Mr. A had swollen and dark colored ankles and feet **with blisters and sores, severe pain and stiffness in the knees and ankles that affected his mobility. Following additional diagnosis for osteoarthritis, a knee replacement therapy was recommended. Meanwhile, a conventional therapy of oxycodone, nifecard, lisinopril, hydrochlorothizide and furosemide was maintained. Subsequently, the oxycodone was replaced by Doloforte and colchicine but no significant improvement was observed in Mr A's condition. In November 2022, an herbal practitioner introduced Mr. A to EKART 1122. Mr. A in addition to the prescribed medications took EKART 1122 from November 2022 to February 2023. Noticing a profound improvement in his condition with a BP of 158/98, Mr A discontinued all medications in March 2023 and decided to take EKART 1122 only, at an oral dose of 50mg/kg/day to date. Significant changes in Mr A's clinical condition between February 2023- September 2023 included eGFR from 67 to 81mL/mm/1.73m^2**, creatinine 112 to 102µmol/L, AST 40 – 34U/L and ALP from 250-98 U/L. Mr. A's BP is presently 139/88 – 140/90 with the pain and edema completely resolved, improved mobility and a general feeling of well-being. We were prompted by the improved condition in Mr. A to screen in the first instance EKART 1122 for anti-nociceptive and anti-inflammatory actions. For anti-nociceptive action, the Tail immersion and the Acetic Acid writhing tests in rats were used. The carrageenan-induced foot edema model in chicks was used for anti-inflammatory testing. Diclofenac (30mg/kg) was used as the control in both models. In the tail immersion and acetic acid writhing tests for pain, Diclofenac (30 mg/kg) and EKART 1122 (50, 80, 100mg/kg) significantly and dose-dependently caused an increase in anti-nociceptive activity and a reduction in the number of writhing respectively. Similarly, EKART 1122 (50, 80 and 100mg/kg) and Diclofenac (30mg/kg) caused profound reductions in inflammatory activity. Together the results indicate a strong anti-nociceptive and anti-inflammatory activity for EKART 1122. We propose here that the improvement in Mr. A's condition can be ascribed at least in part to the potent anti-nociceptive and anti-inflammatory actions of EKART 1122. The EKART 1122 project is ongoing.

The Inhibition of Dipeptidyl Peptidase – IV by an Extract of Periwinkle (*Catharanthus roseus* (L.) G Don) and its Potential Antidiabetic Effects in a Streptozotocin-Induced Type 2 Diabetes Mellitus Model in Sprague Dawley Rats

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Abstract

The treatment of type 2 diabetes mellitus continues to be a global concern with increased cases of chronic non-communicable disease and less than equitable access to efficacious and safe anti-diabetic drugs. This study is follow-up on the preclinical assessment of extracted inhibitors of Dipeptidyl Peptidase – IV (DPP - IV), an enzyme that deactivates incretin hormones and can down-regulate postprandial insulin levels.
Catharanthus roseus (L.) G Don was identified at the herbarium at The University of the West Indies, Cave Hill. The dried plant material was extracted using a series of solvents across the polarity series. The acetone extract and two eluted fractions of the acetone extract from a silica column using a 50% hexane: 40% dichloromethane: 10% acetone mobile phase were tested for inhibitory effects on the DPP-IV enzyme *in vitro*. Type 2 diabetes mellitus was induced in Sprague Dawley rats by feeding the animals a high-fat diet and administering streptozotocin at a dose of 40 mg/Kg intraperitoneally. The rats were randomly assigned to three treatment groups in which they were treated with daily doses of 3 mg/Kg Vildagliptin (positive control), 250 mg/Kg acetone extract and vehicle (negative control) for four (4) weeks by gastric gavage. Fasting blood glucose was monitored over the treatment period. *In vivo* assessments on glucose tolerance, Glucagon Like Peptide – 1 (GLP-1), insulin and *in vivo* DPP-IV activity were done on the animals at the end of the treatment period.
Results: The acetone and two semi-pure fractions of the acetone extract showed IC_{50} values of 2.2 µg/ml, 2.1 µg/ml and 2.4 µg/ml respectively against the activity of DPP-IV *in vitro*. Fasting blood glucose levels were significantly lower post-treatment with the crude acetone extract and vildagliptin compared to the baseline readings for the diabetic rats (Student's t-test; $p < 0.05$). The fasting blood glucose values of the diabetic rats in the vehicle-treated group were not significantly different from the baseline values in weeks 2, 3 and 4 (Student's t-test; $p > 0.05$). Preliminary biochemical data confirmed impairment of glucose metabolism in the diabetic groups treated with Vildagliptin and the plant extract. GLP-1 levels in the rats were 770 pg/ml for the disease control, 745 pg/ml for the diabetic rats treated with acetone extract, 773 pg/ml for the diseased treated with Vildagliptin and 479 pg/ml for diseased rats treated with semi-pure extract. Insulin levels were 283.3 pg/ml for the disease control, 27.8 pg/ml for the diseased rats treated with Vildagliptin and 14.4 pg/ml for the diseased rats treated with semi-pure extract. *In vivo* DPP-IV percentage activity was 100 % in the diabetic rats treated with placebo, 38.6 % in the extract treated diabetic rats, 61.5 % in the Vildagliptin treated group and 49.9 % in semi-pure extract treated diabetic rats.
Conclusions: The acetone extract and its semi-pure fractions demonstrate inhibition of the DPP-IV *in vitro*. Diabetic rats treated with Vildagliptin and the crude acetone extract demonstrated antidiabetic effects. Preliminary DPP-IV activity, GLP-1 and insulin levels were assessed and were consistent with the antidiabetic effects observed in the treated rats. Further studies are required to isolate and characterise the anti-diabetic compounds with the DPP-IV inhibition activity.

Association of rs9939609 and rs1421085 fat mass and obesity associated (FTO) gene variants with obesity among selected Ghanaian children.

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Abstract

The prevalence of obesity and overweight, globally have increased dramatically in the last decade. Many studies indicate that single nucleotide polymorphisms (SNPs) in the fat-mass and obesity-associated (FTO) gene, primarily rs1421085, rs17817449, and rs9939609 are associated with obesity traits. This study investigated the association between rs9939609 and rs1421085 FTO gene variants and obesity in selected school children in Accra. A total of 86 children from two primary schools, University of Ghana Basic School (Legon) and GAEC Basic School (Atomic), were recruited for the study. Buccal rinse samples were collected from the children after assessment of their body mass indices (BMIs). DNA was extracted from the buccal rinse samples and FTO gene variants were analysed by amplification refractory mutation system polymerase chain reaction (ARMS-PCR). Correlation between FTO gene variants and obesity in the children were determined. Out of the 86 children sampled, 26 were obese (cases) and 60 were non-obese (controls). There were more females (70.93%) compared to males (29.07%). The ages of the cases (11.77 ± 1.50 years) and controls (11.58 ± 1.45 years) were not statistically different from each other ($p = 0.5822$). BMI for cases and controls were significantly different (all ps < 0.0001) for both males and females. PCR amplification were successful in all the children. No significant differences emerged between the rs9939609 and the rs1421085 genotype polymorphism frequencies for the two BMI groups assessed.

Key words: obesity, single nucleotide polymorphisms (SNPs), amplification refractory mutation system polymerase chain reaction (ARMS-PCR)

PARALLEL SESSION 4B

Studying the Effectiveness of Biologically Synthesized Gold Nanoparticles on *Bacillus anthracis* In Vitro

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Abstract

Public health is significantly concerned about the zoonotic pathogen *Bacillus anthracis*, responsible for causing disease in both animals and humans. Scientists are actively searching for methods to eliminate it. While conventional means for dealing with this issue are available, there is an obvious demand for novel alternatives. One such alternative involves the use of biosynthesized gold nanoparticles. These nanoparticles are characterized by their environmentally friendly nature, compatibility with biological systems, ability to degrade naturally, and cost-effectiveness when compared to their chemical and physical counterparts. In this research, the synthesis of bulk gold metal into nanoparticles was achieved using extracts derived from Parkia leaves and stems. Prior to this, phytochemical screening was conducted, revealing the presence of alkaloids and flavonoids in these plant extracts. Characterization was carried out to ascertain the nanoparticles' formation after an optical color change observation from dark brown to ruby red. The NPs were characterized by UV-Vis spectrophotometer, which exhibited a plasmon resonance at 540nm and 530nm for Ps-AuNPs and PL-AuNPs respectively. Transmission electron microscope also revealed the morphology of the AuNPs spherical, triangular, irregular, and nanorod shapes with the sizes of 2nm-26nm. X-ray diffraction also demonstrated a successful reduction of the chloroauric gold to gold nanoparticles with a cubic structure. Electron diffraction spectrophotometer also suggests the reduction of Chloroauric gold to AuNPs. Fourier transmission infrared also registered the presence of OH stretch (Phenols) and amines which could be responsible for both the reduction and stabilization of the gold nanoparticles. The various biosynthesized AuNPs were used as an antibacterial agent on *Bacillus anthracis* and the zone of inhibition observed was 45 mm for PS-AuNPs and 40 mm for PL-AuNPs. Consequently, this research suggests that biosynthesized gold nanoparticles (AuNPs) hold promise as innovative therapeutics inclusion in pharmaceutical, medical, and related fields.

Keywords: Biosynthesis, *Parkia biglobosa*, Gold nanoparticles, *Bacillus anthracis*.

Investigating the antibacterial potential of biosynthesized *Xylopia aethiopica* mediated silver nanoparticles against urinary tract infections pathogens.

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Abstract

Antibiotic resistance to uropathogenic organisms is a global concern, although it is particularly prevalent in developing countries. Due to the increasing emergence of antibiotic resistance, a condition associated with antibiotic usage and abuse that causes kidney stones, Urinary Tract Infections (UTI) therapy remains primarily empirical. This study explores the environmentally friendly, economically viable, and reliable fabrication of silver nanoparticles utilizing the aqueous leaf extract of *Xylopia aethiopica*, with a focus on their potential antibacterial efficacy against pathogens associated with (UTIs). Preliminary phytochemical screening of the methanolic extract of *X. aethiopica* leaves revealed the presence, of flavonoids and alkaloids which could be responsible for the reduction and capping of silver ions during nanoparticle synthesis. The successful nanoparticle synthesis was indicated by an observable color change. The confirmation of nanoparticle formation is substantiated by various analytical methods, including Ultraviolet-visible Spectrophotometer analysis, which detects an absorbance peak at 383nm, and Fourier Transform Infrared (FTIR) analysis, which revealed the presence of OH bonds. Transmission Electron Microscope (TEM) images showcase well-dispersed silver nanoparticles which were predominantly spherical and rod-shaped, with an average diameter of approximately 18 nm. The antibacterial properties of the synthesized silver nanoparticles were assessed in conjunction with standard antibiotics Gentamicin (GM) and Sulfamethoxazole Trimethoprim (SXT) against a panel of gram-negative and gram-positive bacteria implicated in UTIs, encompassing *Staphylococcus aureus*, *Klebsiella pneumonia*, *Enterococcus faecalis*, and *Pseudomonas aeruginosa*. The findings revealed a substantial inhibition zone, underscoring the potential of the nanoparticles to counteract these bacterial strains. In conclusion, *Xylopia aethiopica*-mediated Silver nanoparticles have the potential as a coating agent for antimicrobial resistance drugs. The study emphasizes simple, green techniques for creating nanoparticles with antibacterial efficiency, indicating a potential for nanomedicine application. This discovery offers a sustainable method for treating UTIs and potentially expands to wider applications in the fight against antimicrobial resistance, adding to the growing body of research on biosynthesized nanoparticle-mediated antimicrobial methods.

Keywords: Biosynthesis, Antibacterial, Silver nanoparticles, *Xylopia aethiopica.*

Argania spinosa essential oil ameliorates colonic damage and extra-intestinal alterations in a rat model of acetic acid-induced colitis by suppressing oxidative stress and inflammation

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Abstract

The present study was designed to elucidate the prophylactic and therapeutic potential of argan oil (AO) (from the kernels of the argan tree, *Argania spinosa*) against acetic acid (AA)-induced colitis and associated alterations in the liver and kidneys of rats. Colitis was induced by intra-rectal administration of 4% AA solution for 3 consecutive days. Some groups of rats were treated orally with AO (5 mL/kg) for 5 consecutive days before and after AA administration, while other groups were treated with either the vehicle or AO alone. Macroscopic and microscopic lesions in the tissues were assessed, while oxidative stress, antioxidant parameters and myeloperoxidase (MPO) activity were determined by biochemical methods. Haematological and serum chemistry parameters were also evaluated. Administration of AO before or after AA induction produced improvements in body weight gain, faecal consistency, macroscopic and histologic scores of the colonic mucosa compared to rats treated with AA alone. Furthermore, AO treatment caused significant ($p<0.05$) reduction in colonic levels of hydrogen peroxide (H_2O_2), malodialdehyde (MDA), advanced oxidation protein products (AOPP) and serum myeloperoxidase (MPO) activity, while glutathione S-transferase (GST) and superoxide dismutase (SOD) activities were increased in the colon and kidneys, compared to the colitis control. Acetic acid treatment resulted in significant reduction in erythrocyte and leucocyte indices in relation to healthy controls, while pre-treatment with AO showed improvement in these parameters. Taken together, treatment of rats with AO protected colonic tissues from acetic acid-induced inflammation and suggests that the oil may be considered for preventive and therapeutic purposes against inflammatory bowel diseases.

Keywords: _Argania spinosa,_ acetic acid, inflammation, oxidative stress, colitis

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Determination of consistency in pH of some commercial herbal formulations in Ghana

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Abstract

There are no strict pH standards for herbal formulations; however, pH can affect the characteristics of drugs and herbal formulations. In this study, the pHs of different herbal formulations produced in the past two batch years at the Centre for Plant Medicine Research (Mampong-Akuapem, Ghana) were analyzed. The study aimed to evaluate pH consistency among the formulations and suggest suitable pH ranges for the different product classes. The formulations analyzed were 17 decoctions, 3 ointments, and 9 powders. Suitable ointment and powder samples were prepared before pH was measured, whereas decoctions were analyzed directly. The results showed that 93.1% of the preparations had average pH < 7 over the two years. The pH values for the decoctions, ointments, and powders were 3.507−6.755, 5.153−5.700, and 5.413−10.719, respectively. Differences in pH over the two production years were not statistically significant for all the powder and ointment formulations as well as for majority of the decoctions (82.4%). This indicates pH consistency for approximately 90% of the products, possibly pointing to consistencies in plant material compositions, formulation conditions, and process parameters. From the data and reported literature, it is recommended that the labels of oral herbal preparations with pH < 5.5 should include an instruction to dilute the product before intake or to drink water or rinse the mouth after intake to prevent enamel erosion. Decoctions may also be taken after food. Additionally, pH ranges of 4.6−7.0 and 4.0−6.0 may be suitable for rectal and topical herbal formulations, respectively.

Anthelminthic, anti-inflammatory, antioxidant, and antimicrobial activities and FTIR analyses of *Vernonia camporum stem bark*.

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Abstract

Vernonia camporum is used ethnomedicinally to treat diseases such as malaria, fever, hypertension, mouth sores, pains, inflammation and skin rashes in Africa. This study aims at investigating the anthelminthic, anti-inflammatory, antioxidant and antimicrobial activities of the methanol crude extract and some separated fractions of the *Vernonia camporum* stem-bark. The phytochemical analyses revealed the presence of secondary metabolites such as alkaloids, phenols, tannins, saponins, terpenoids, flavonoids, steroids, phytosterols, proteins and amino acids, phlobatannins, glycosides, cardiac glycosides, coumarins, and anthocyanins. The methanol and hexane extracts showed a higher concentration-dependent anthelminthic activity. The extracts exhibited high concentration-dependent anti-inflammatory activities with IC50 values of 35.83 ± 3.984 and 53.91 ± 5.8413 µg/mL, respectively. The IC50 values for methanol and hexane extracts in the DPPH assay were 17.70 ± 3.430 and 29.54 ± 1.5437 µg/mL and that of the H_2O_2 assay were 243.20 ± 0.1528 and 352.20 ± 12.64 µg/mL, respectively. TAC results for methanol and hexane extracts were recorded as 31.592 ± 1.682 and 30.232 ± 0.445 gAAE/100 g, respectively. The extracts also exhibited antimicrobial activity against test organisms with MICs ranging from 0.1953 to 25.00 mg/mL. FTIR analysis indicated the presence of various functional groups in the purified fractions of the methanol extract that confirms the presence of the phytochemicals identified in the screening test.

Keywords: *Vernonia camporum,* anthelminthic, anti-inflammatory, antioxidant and antimicrobial and test microorganisms.

Semen characteristics and testicular morphology of male albino rats treated with aqueous and methanol leaf extracts of *Newbouldia laevis*

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Abstract

Antimalarial. antimicrobial, anti-inflammatory, effects on fertility hormones and anti-cancer properties of Newbouldia laevis have been reported in the literature. In this study, the effects of aqueous and methanol extracts of Newbouldia laevis on haematology, semen characteristics and morphology of male Wistar rats were investigated. Sixty matured adult male Wistar rats aged 18 weeks and weighed between 160 and 180g were grouped into 6, A-C for aqueous extract and D-F for methanol extract with each group having 10 rats. Group A (Control) received distilled water while groups B and C were treated with 200 and 400mg/kg aqueous extract then, group D (Control) received DMSO and E and F were treated with 200 and 400mg/kg methanol extract. All the groups were treated orally for 28 days while blood and semen samples were collected on days 1, 14 and 28 post-treatment for analysis. The results revealed that the testicular weights of the aqueous treatment on days 1,14, and 28 were not affected. The left and right testicular weights of animals treated with methanol extract showed a significantly different ($p>0.05$) when compared with the control on days 14 and 28. Spermiogram showed high values in aqueous on days 14 and 28 than the methanol extract though the differences were not significant ($P<0.05$) at 200mg/kg while at 400mg/kg, the methanol extracts treated groups were higher than the aqueous on days 14 and 28. Sperm livability values were increased as the dose increased in both extracts. There was no disruption in the cytoarchitecture of the testis in all the groups. This study showed that the methanol extract for 14 days will potentiate sperm characteristics more than other treatments, all the treatments are found not to be harmful or have inhibitory effects on the semen characteristics and fertility of the adult Wistar rats

KEY WORDS: *Newbouldia leavis,* sperm motility, testicular biometry, sperm liveability

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A review of the role of algae in human health

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ABSTRACT
In recent years, in drug discovery research from natural sources, algae have been described as promising organisms to provide novel bioactive compounds in human health. Algae are a heterogeneous assemblage of organisms united by their ability to carry out oxygenic photosynthesis. Eukaryotic and prokaryotic algae often occur in a consortia in the environment performing the important role of primary production. The only prokaryotic organisms that evolve oxygen during photosynthesis are the cyanobacteria. Eukaryotic algae comprise micro- and macro-algae (seaweeds). Seaweeds are usually confined to the marine ecosystem, while other algae are ubiquitous, occurring in freshwater, estuarine and marine habitats. Cellular metabolic processes of the algae lead to the production of primary and secondary metabolites. Metabolic processes such as photosynthesis and carotenogenesis result in the production of primary metabolites including lipids (such as polyunsaturated fatty acids (PUFAs)), antioxidants (carotenoids) and some proteins (primary proteins). Although primary metabolites are used for normal developmental processes by algal cells, they may also be useful in industrial applications when converted into, for example, bio-fertilizers, nutrient supplements, and dyes. Algal secondary metabolites are also important sources of enzymes, vitamins, antibiotics, and pharmaceuticals. Metabolic pathways in algae have led to the production of important bioactive compounds which have diverse applications, in human health due to the high nutritional quality of algae compared to conventional plants. In algae, apart from proteins, other nutritional compounds include peptides, carbohydrates, lipids, vitamins, pigments, minerals, and other important trace elements. Thus, algae are not only useful in human nutrition but also animal diets and plant health. With regard to human health, algae play many roles including healing of chronic wounds, as antibiotics, antibacterial and antifungal agents. Data were collected from online databases, mainly PubMed, Google Scholar, Science Direct, and Scopus, considering books, book chapters, research articles, and reviews. The topics searched included the following combinations: microalgae, macroalgae, seaweeds, human health, nutraceuticals, food supplements, medicine, and drug discovery. Others included wound healing, blood coagulation, and pharmaceuticals. In this review the main pathways and algal biosynthesized compounds with potential in food industry (supplements, nutraceuticals), pharmaceutical industry, and public health, are highlighted and discussed.

Key words: Algae, Drug Discovery, Human Health, Nutraceuticals, Pharmaceuticals

STANDARDIZATION AND CONFORMITY ASSESSMENT OF HERBAL MEDICINES IN GHANA

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Abstract

Herbal medicine is the use of plants to treat disease and enhance general health and wellbeing. In countries like Ghana, Mali, Zambia and Nigeria, the first line of treatment for 60% of children with high fever resulting from malaria is the use of herbal medicine. About 70% of the population in Ghana depends primarily on Traditional Medicine (TM). One of the main aims of GSA is to ensure consumer protection and safety. GSA has available standards on some traditional medicines and is also open to developing standards for new herbal medicines whenever the need arises. The Ghana Standards Authority also undertakes conformity assessment activities (inspection, testing and certification) to ensure that traditional medicines meet required specifications. Certification ensures quality hence certifying herbal medicines is one of the key mandates of GSA. GSA has state-of-the-art equipment such as Liquid Chromatographic-Mass Spectrometer (LC-MS) and Gas Chromatographic-Mass Spectrometer (GC-MS) used in the analysis of herbal medicines. These herbal medicines also go through microbiological, pesticide residue and metallic contaminant testing. These analyses are done based on the requirements of the standards. Standardization is the process of developing and promulgating standards. A standard is a document that provides requirements, specifications, guidelines, or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose. Standards have requirements or specifications based on scientific justification using scientific tools and methods. Standardization of herbal medicines will provide security, industrial growth, facilitate trade and ensure the safety of products and services. Standardization is necessary to resolve the numerous challenges in the traditional/herbal medicine sector. Furthermore, these standards are incorporated into regulations for regulatory and enforcement purposes to ensure that products and services are fit for purpose.

KEY WORDS: Standardization, Consistent, Fit for purpose, Conformity Assessment, Inspection, Certification

PARALLEL SESSION 5

PARALLEL SESSION 5A

Herbal medicines for use in managing the increasing burden of inflammation-driven disease conditions.

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Abstract

Presently, there is growing global incidence of chronic inflammatory diseases, accompanied by the increasing recognition of post-infection long-term inflammatory sequelae as a public health challenge. Although the need for anti-inflammatory therapies is well acknowledged, even the most preferred agents today are associated with debilitating side-effects. This underscores the need for work aimed at developing anti-inflammatory/immunomodulatory agents that would be suitable for long-term use. The scientific literature is replete with data on anti-inflammatory natural products, including many of herbal origin. This report discusses data from one such candidate herbal, SD10, and its suitability for long-term use and/or prophylaxis. In acute and chronic murine inflammation studies, SD10 demonstrated both therapeutic and prophylactic activities, suggesting that the extract interacts with key events and mediators of inflammation pathways including immune cell degranulation, cytokine, histamine, and serotonin signaling. The extract consistently showed two times better prophylactic suppression (74%) of Complete Freund's Adjuvant-induced arthritis than when administered therapeutically, better than dexamethasone (61%) and without leukopenia as observed with dexamethasone administration. SD10 was practically non-toxic and interacted with inflammation mediators (IL-6, IL-10, histamine, serotonin, and TNF-α) which are important in the progression of inflammatory sequelae. Taken together, these suggest a potential to harness SD10 and similar others for mainstream long-term immunomodulatory use.

Keywords: Inflammation-driven disease conditions, Natural products, Prophylactic.

Antibacterial effect of methanol extract of *Lagenaria breviflora* fruit on salmonellosis infection in African catfish; *Clarias gariepinus*

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Abstract

Africa's most commonly cultured mudfish, *Clarias gariepinus,* is prone to bacterial infection and this been a source of concern because it is the leading cause of financial loss in fish farms. The cost of treating bacterial infections in catfish is too expensive, justifying the need for cheaper and natural alternatives. This study was designed to evaluate the antibacterial effect of *Lagenaria breviflora* on Salmonellosis infection in *Clarias gariepinus* juveniles as a possible low-cost, safe, and natural remedy for the treatment of bacterial infections in aquaculture. Thirty healthy juvenile (n = 30) with an average weight of 19.0 ± 0.81 g, length of 11.7 ± 0.6 cm of *Clarias gariepinus* were distributed in a population of 5 juveniles in 2 L of water, and each group were labeled and kept in static culture in 6 plastic tanks; a control group and five test groups. The control group was fed commercialized feed pellets only, while three of the groups were infected with *Salmonella enterica* for 24 hours and administered varying concentrations of *Lagenaria breviflora* (6.25 mg/L, 12.5 mg/L, 25.0 mg/L, respectively) for 4 days, the fourth group was infected for 24 hours and administered 12.5 mg/L standard Enrofloxacin for 4 days and the last group is the infected untreated group. A significant ($p<0.05$) dose-dependent increase in packed cell volume (PCV), red blood cell (RBC), haemoglobin concentration (Hb), and white blood cell (WBC) was observed in catfish juveniles treated with *L. breviflora* extract at concentrations of 6.25 mg/L and 12.5 mg/L when compared to the Enrofloxacin treated group and the infected untreated group. The ethnomedicinal use of *Lagenaria breviflora* as an antibacterial remedy is justified in this study and can be recommended for use in aquaculture, particularly at 6.25mg/L for optimum result.

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Analgesic activity of the ethanol extract of *Morinda citrifolia* leaves in alloxan-induced diabetic neuropathic pain in rats.

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Abstract

Diabetic neuropathic pain (DNP) is a painful condition that results from chronic nerve injury due to diabetes. DNP is a major cause of amputations and mortality in Africans with diabetes. Clinical management of diabetic neuropathic pain has been successful however medications such as pregabalin, gabapentin and tricyclic antidepressants used in the treatment are expensive and have severe side effects. It is therefore imperative to identify newer alternatives to these chemical therapeutics. *Morinda citrifolia* is used traditionally as a dietary supplement to prevent and treat pain, diabetes, and cancer**.** The aim of this study was to investigate the analgesic activity of the leaves of *Morinda citrifolia* in alloxan-induced diabetic neuropathic pain in rats.36 Male Wistar rats of body weights 150- 200g were used for the study. Alloxan monohydrate (200 mg/kg) was used to induce diabetes by intraperitoneal injection. Two (2) different doses of *M.Citrifolia* extract (400 and 800 mg/kg); and Pregabalin (75 mg/kg) were used as treatment and standard drug respectively. Cold allodynia and thermal hyperalgesia were assessed in these groups after 14 days of diabetes induction. The pain assessment and treatments were conducted over a period of 7 days. Extract treatment groups significantly and dose dependently decreased pain responses to thermal hyperalgesia and cold-water stimuli ($P< 0.05$) in comparison to the standard treatment group (pregabalin 75 mg/kg). This confirms the inherent analgesic properties in *Morinda citrifolia* leaf extract. The ethanol extract of the leaves of *Morinda citrifolia* has analgesic activity and improves thermal hyperalgesia and cold allodynia in alloxan-induced diabetic neuropathic pain.

Key words: Diabetes, neuropathic pain, analgesia, alloxan monohydrate, *Morinda citrifolia*

An Assessment of the Antifertility and Toxicity Effects of the Ethanolic Leaf Extract of *Calotropis gigantea* on Male and Female Albino Rats.

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Abstract

There are over 137 million women in the developing world who wish they can discontinue childbirth but are unable to do so due to unmet contraceptive needs. Many Ghanaian women believe contemporary contraceptives to be hazardous because of their potential side effects. It is therefore necessary to seek safe, plant-derived alternatives to aid fertility regulation. The objective of this study was to evaluate the antifertility and toxicity effects of ethanolic leaf extract of Calotropis gigantea on male and female albino rats. The ethanolic extract was prepared using the cold maceration method. An acute oral toxicity study was carried out by administering a single dose of 2000mg/kg and the extract was safe up to a dose of 2000mg/kg. No mortality was recorded after 48 hours. The treatment period for the male and female antifertility study was 30 days and 20 days respectively. The effect of ethanolic leaf extract of C. gigantea on male and female antifertility was determined by administering distilled water, 200mg/kg, and 500mg/kg to three groups of five rats. In both male and female studies, no significant difference was observed in the weekly body weights taken throughout the treatment period ($p>0.05$). Also, there was no significant difference in the weight of organs of treated rats in comparison to the control group for both studies ($p>0.05$). The plant extract caused a significant reduction in sperm motility in the 200mg/kg treatment group ($p<0.05$). Based on the findings of this study, this plant has antispermatogenic effects and is a potential antifertility agent for males. Further histopathological studies should be conducted to analyze the effects of the plant extract on reproductive organs.

Keywords: Anti-Fertility, Contraceptives, *Calotropis gigantea*, ethanolic

Immulate, an herbal supplement, reverses secondary isotretinoin/itraconazole-induced liver injury in a 30-year-old patient.

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Abstract

The morbidity and mortality associated with Hepatitis B infection makes it a public health concern. Secondary drug-induced liver injury is common in patients with multiple and concomitant drug usage. Due to high cost and long-term treatment requirement for HBV infections, as well as treatment-associated adverse effects, many patients choose either to supplement antiviral medications with herbal products or reject conventional therapy and rely solely on herbal medicine as an alternative form of therapy. A 30-year-old single female who works for an IT company who was well until three days prior to presentation when she noticed a gradual onset of yellowish discolouration of her eyes. There was associated intense pruritus and deep yellowish discolouration of her urine. There was associated intractable vomiting, the vomitus was non-bilious and non-bloody. In addition, client had lost appetite and had profound body weakness which made it impossible for her to ambulate. Laboratory analysis showed HIV, hepatitis B and C were negative while liver enzymes were deranged. She was diagnosed of liver injury secondary to itraconazole use possibly compounding an initial adverse effect of isotretinoin use. She was started on Immulate Herbal Supplement four (4) days after the onset of symptoms. Client noticed a significant improvement in her condition within 24 hours of commencement of Immulate and could ambulate by 48 hours. By day eight, she regained complete physical wellness and the liver indices (BIL, AP, GT, ALT, AST, PRO, ALB) returned to normal range. It could be concluded that Immulate herbal supplement, reversed secondary isotretinoin/itraconazole-induced liver injury in the patient.

Key Words: Immulate herbal supplement, AST ALT, isotretinoin, itraconazole-induced liver injury

PARALLEL SESSION 5B

Pharmacognostic characterization and development of standardization parameters for the quality control of the leaf and stem bark of *Antiaris africana*

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Abstract

Antiaris africana of the family Moraceae is used traditionally in Ghana for the management of several diseases including rheumatic pain, sexually transmitted, and throat infections, neurological disorders amongst others. The widespread folkloric uses of the plant in Ghana and other African countries have led to increased demand of the plant for the treatment of several disease conditions. This has led to the adulteration of the plant by unscrupulous individuals. It is therefore necessary to establish pharmacognostic standards for the correct identification and authentication of the plant. The macro and micromorphological features, physicochemical, phytochemical and spectroscopic evaluation of the leaf and stem bark were established as part of our aim. The leaf is simple oblong with glabrous adaxial surface and pubescent abaxial surface with short petiole. The mean length of the leaf is 10.8 cm and width 5.8 cm. Microscopical examination of the leaf shows hypostomatic with anomocytic stomatal cells surrounded by wavy epidermal cells, unicellular unbranched covering trichomes and bean-shaped collaterally closed vascular bundle. The powdered leaf and stem bark sample microscopy revealed cuboidal and rhombic calcium oxalate crystals, fibres, pitted and spiral xylem vessels. Tannins, glycosides, flavonoids, saponins, and triterpenoids were detected in both plant samples whilst alkaloids were absent. Physiochemical parameters such as the moisture content, ash content, mineral content and pH values determined were within the WHO permissible limits. The leaves had a higher polar constituent than the stem bark. Characteristic fluorescent colours were analysed. FTIR and UV spectroscopic fingerprints were also developed for the hydroethanolic extracts which revealed a similar constituent present in the leaf and stem bark. The results obtained from the study provide standards for correct identification, detection of adulteration and information for quality control assessment of *A. africana* or herbal products containing the plant

Keywords: *Antiaris Africana*, morphology, phytochemistry, physicochemical, spectroscopic, fluorescence

Predictors of Herbal Medicine Use Among Pregnant Women Accessing Prenatal Care from the Kumasi South Hospital in Ghana.

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Abstract

Herbal medicines are valuable for the sustenance of human health. The use of these products among Ghanaian women during pregnancy is well documented. This study determined the predictors of herbal medicine use among pregnant women accessing care from a Ghanaian public health facility. A quantitative cross-sectional study was undertaken. A systematic sampling method was used to select the participants. Primary data were collected from 367 consenting participants using semi-structured questionnaires. A total of 37.0% of the respondents confirmed that they had used herbal medicine during pregnancy. Respondents' level of education (AOR = 19.3, 95% CI = 2.67 - 139.24), religion (AOR = 2.7, 95% CI = 1.23 - 5.95), ethnic background (AOR = 5.3, 95% CI = 1.71 - 16.31) and household income (AOR = 2.2, 95% CI = 1.21 - 4.09) predicted the use of herbal medicine during pregnancy. The study concludes that level of education, religion, ethnic background and household income were the predictors of herbal medicine use among pregnant women. Also, awareness about the existence of an herbal medicine unit at the hospital was very poor; hence there was no reliance on the unit as a source of advice on herbal medicine use during pregnancy.

Keywords: Herbal medicine, Integration, Pregnancy, Socio-demographic predictors, Socio-economic predictors, Traditional

The Use of Herbal Medicine Among Women in Africa: A Scoping Review.

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Abstract

Complementary and Alternative Medicine, including herbal medicine and natural remedies, are popular in Africa. Women who still carry the burden of disease on the continent are more likely to access herbal medication than any other population. However, the use of herbal medicines among women in Africa has received little attention. This study aimed to explore women's use of herbal medicines, including natural remedies in Africa and to synthesise the literature on the use of herbal medicine and women in Africa. The study comprehensively analysed peer-reviewed journal articles published between 2013 and 2023, focusing on using herbal medicine among women in Africa. A systematic search of Google Scholar, Sabinet, Medline and PsycINFO was conducted. The reviewed literature identified *n=18* peer-reviewed journal articles which met the search criteria. Studies were identified from three African regions: West Africa (*n=5*), East Africa (*n=6*) and Southern Africa (*n=7).* The study identified seven themes from the literature about the use of herbal medicine among women in Africa. The themes identified were prevalence and pattern of herbal medicine use; diverse herbal medicines and substances; purposes of herbal medicine use; limited disclosure and safety concerns; factors influencing herbal medicine use; and safety and efficacy concerns. The scoping review findings highlighted the need to have a comprehensive understanding of this practice in various African contexts. Women in many African communities turn to traditional remedies at a significant rate. One notable concern arising from these findings is the limited disclosure of herbal medicine use to healthcare professionals, a recurring theme in several studies. The review offers suggestions for future research in the field of herbal medicines, particularly among women and provides implications for the lack of inclusive healthcare interventions which are culturally sensitive.

CareCannabis: Medical Cannabis Patient Education by Community Health Workers

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Abstract

This presentation will highlight a pilot program aimed at training and deploying Community Health Workers (CHWs) to provide medical cannabis patient education for Morehouse Healthcare. This innovative initiative addresses the need for improved patient care, education, and engagement surrounding medical cannabis usage. The integration of medical cannabis into mainstream healthcare practices has gained significant attention due to its potential therapeutic benefits for various medical conditions (1, 2). However, the successful utilization of medical cannabis hinges on patient education and informed decision-making (3). A growing body of literature highlights the importance of providing comprehensive patient education about medical cannabis, particularly through the involvement of Community Health Workers (CHWs) (4,5). Patient Medical Cannabis Education: Medical cannabis holds promise for managing chronic pain, epilepsy, nausea, and various other conditions. However, its effectiveness depends on factors such as appropriate dosing, consumption methods, and potential interactions with other medications. Numerous studies emphasize that patients often lack accurate information about medical cannabis, leading to suboptimal outcomes, safety concerns, and uninformed usage (6,7). CHWs play a pivotal role in bridging the gap between patients and healthcare systems, particularly when addressing sensitive and complex topics such as medical cannabis. Their role extends beyond traditional healthcare settings, encompassing patient advocacy, education, and cultural sensitivity10. Several studies have shown that CHWs effectively enhance patient engagement, understanding, and health literacy by providing personalized, relatable, and culturally competent information (11,12). Incorporating patient education on medical cannabis into healthcare practices is crucial for optimizing patient outcomes and safety. Community Health Workers offer a unique opportunity to bridge the knowledge gap, enhance patient-provider communication, and promote informed decision-making. As demonstrated by a growing body of literature, the collaboration between patient education and CHWs has the potential to transform medical cannabis usage from a source of uncertainty to a well-informed and empowered healthcare choice.

Key words: Medical Cannabis, Pain management, Medical Education, Patient Education, Community Health Workers

The role of research and development in the herbal medicine industry- Lessons from the story of COA RMCL

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Abstract

COA RMCL since its incorporation in 2020 has been a major stakeholder in the herbal medicine industry in Ghana. The company seeks to become one of the leading plant medicine producer globally. To this end we are working to get accredited for ISO 9001-2015 within the next 2 years to enable the company reposition itself as a global player in the natural products industry. In this presentation we share our experiences in the continuous improvement of our quality management system through regular engagement with the Food and Drugs Authority and Ghana Standards Authority, research and development through collaboration with research institutions and adoption of environmentally sustainable practices in the procurement of raw materials as well as recycling of waste products as organic manure for vegetable farmers in our area of operation. We highlight the importance of investing in research and development to develop new products in the rapidly evolving market of herbal medicines. We believe that the lessons shared will enhance the operational sustainability of any herbal medicine industry in the face of the prevailing economic challenges and climate change.

Keywords: COA RMCL, herbal medicine, Food and Drugs Authority, Ghana Standards Authority

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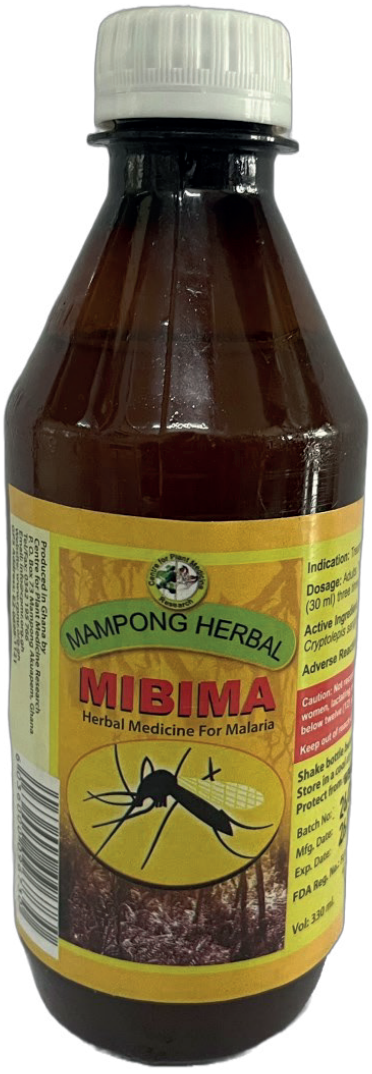

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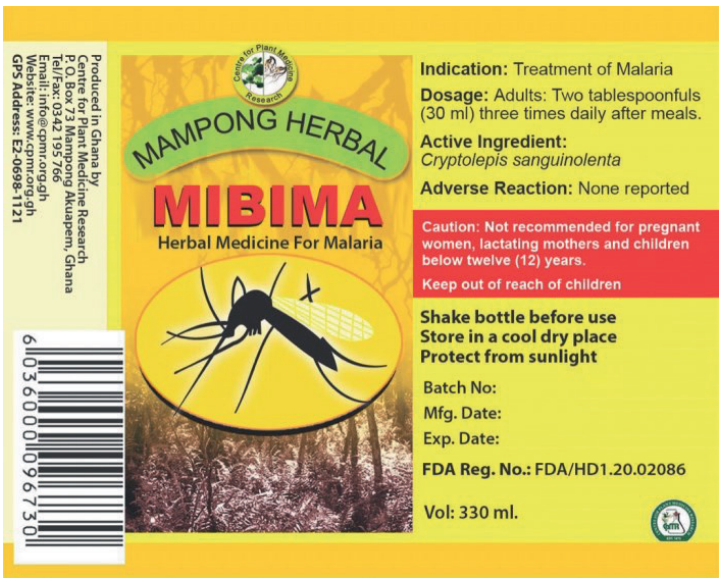

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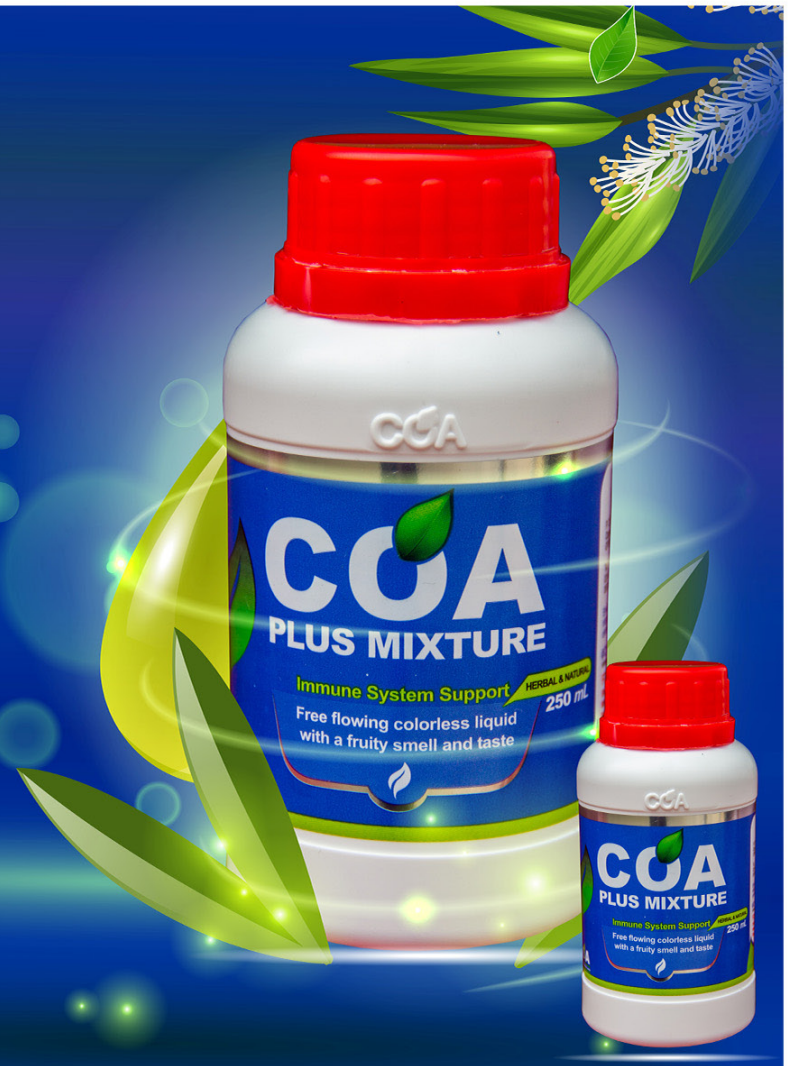

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