GHANA SCIENCE ASSOCIATION

34th Biennial CONFERENCE

Programme and Book of Abstracts

THEME

Leveraging Innovative Science to Strengthen Public-Private Partnerships for Sustainable Development in Ghana

DATE

Tuesday, 23rd - Thursday, 25th
September 2025

VENUE

Dr. Andani Andan Academic Board Chamber
University for Development Studies, Tamale

ENERGY COMMISSION · PETROLEUM COMMISSION, GHANA · GSA GHANA STANDARDS AUTHORITY · NPA NATIONAL PETROLEUM AUTHORITY · IITA Transforming African Agriculture · CGIAR · CSIR SCIENTIFIC AND INDUSTRIAL RESEARCH GHANA · The Ghana Chamber of Mines · CROP RESEARCH INSTITUTE OF GHANA · Times NEW TIMES CORPORATION · PUMPTECH The Pump Masters

PROUD SPONSORS

ENERGY COMMISSION

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IITA Transforming African Agriculture

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COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH CSIR GHANA

The Ghana Chamber of Mines

COCOA RESEARCH INSTITUTE OF GHANA NEW TAFO - AKIM

GHANAIAN Times

NEW TIMES CORPORATION

PUMPTECH

The Pump Masters

UNIVERSITY FOR DEVELOPMENT STUDIES UDS

SPECIAL GUEST/KEYNOTE SPEAKER

Hon. Julius Debrah

Chief of Staff, Republic of Ghana

34TH BIENNIAL CONFERENCE

OF THE GHANA SCIENCE ASSOCIATION

THEME

Leveraging Innovative Science to Strengthen Public-Private Partnerships for Sustainable Development in Ghana

HOSTED BY

Tamale Branch of GSA

DATE & VENUE

Tuesday, 23rd – Thursday, 25th September 2025
at the Dr. Andani Andan Academic Board Chamber
(University for Development Studies)

PROGRAMME AND BOOK OF ABSTRACTS

GHANA SCIENCE ASSOCIATION

34th Biennial CONFERENCE

THEME

Leveraging Innovative Science to Strengthen Public-Private Partnerships for Sustainable Development in Ghana

GUESTS

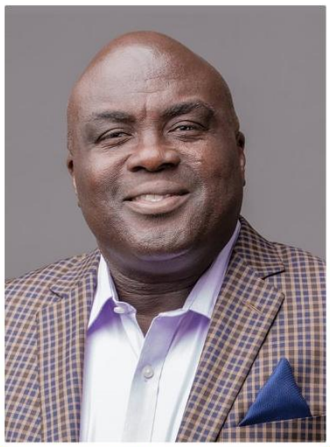
CHAIRMAN

Prof. Seidu Al-hassan
(Vice-Chancellor, UDS)

SPECIAL GUEST

Hon. Haruna Iddrisu
(Minister, Education)

KEYNOTE SPEAKER



Hon. Julius Debrah
(Chief of Staff, Republic of Ghana)

SPECIAL GUEST

Hon. Eric Opoku
(Minister, Food & Agriculture)

SPECIAL GUEST

Hon. Ali Adolf John
(Minister, Northern Region)

SPEAKERS

Prof. Felix Kofi Abagale
(Director, WACWISA UDS)

Sustainable Agriculture Innovations for Food Security

Dr. Winfred Baah
(Ag. Registrar, HeFRA)

Biomedical and Health Innovations for Enhanced Access to Quality Healthcare

Prof. Nana Ama Browne Klutse
(CEO, EPA)

Environmental Conservation for Sustainable Ecosystem Management

Prof. Augustine Ocloo
(Dep. DG, GTEC)

Science Education and Policy for Accelerated National Development through Problem-Solving Curriculum

Mr. Osman Sahanoon Kulendi
(MD, Pumptech)

Sustainable Water Resource Management

Dr. Dramani Bukari
(Dep. CEO, NPA)

Proactive Public-Private Partnership for the Reset Ghana Agenda

VENUE

Dr. Andani Andan Academic Board Chamber
University for Development Studies, Tamale

DATE

Tuesday, 23rd - Thursday, 25th
September 2025

info@ghanascience.gov.gh
www.ghanascience.gov.gh
+233 500 456667
+233 244 986310
Ghana Science Association

TABLE OF CONTENTS

ABOUT GHANA SCIENCE ASSOCIATION

Motto: Advancing Science, Technology and Innovation

The Ghana Science Association (GSA), a voluntary, non-profit making and multidisciplinary organisation of scientists, technologists, and mathematicians was formed in 1959. The Association traces its origin to the West African Science Association (WASA) which was formed in 1953 at the University College of the Gold Coast. WASA was formed to provide West African scientists the forum to advocate the importance of Science and Technology as a necessity and bedrock for national development. The formation of GSA broadened the scope of activities from reading scientific papers to involvement in national and international affairs. The Association is placed on government subvention under the Ministry of Education as far back as 1961 by a Presidential Fiat. Hence the Association is supported through a budgetary allocation from the Ghana Government. Other sources of income include membership dues and proceeds from workshops and conferences. The GSA is mandated to promote, popularize, and demystify science and create a scientific culture in the country. The Association has made tremendous contributions to National Development, Health, and Economic Growth through scientific interventions. The Secretariat is a point where scientific and technological information, and research findings are obtained by individuals and corporate bodies.

Membership of the Association is drawn from the Universities, Research Institutes, Industry, Government, and Persons interested in the promotion of Science and Technology.

Vision

To become a dominant voice in Science and Technology advocacy by promoting and popularizing Science and Technology to meet national developmental needs.

Mission

Advancing Science, Technology, Engineering and Mathematics (STEM) through interaction and cross-fertilization of ideas of all interested people to: -

- Popularize, promote, and disseminate scientific information and technology transfer for national development.
- Contribute to the development of national Science and Technology policy.
- Collaborate with industry to set national research agenda.
- Establish linkages with industry to promote the transfer and application of science.
- Seek affiliation and foster cooperative links with other national and international organizations.

Activities

- Organization and Participation in Scientific Conferences, Workshops, Seminars, Symposia, Public Lectures, Quizzes and Science Fairs.
- Promotion of Carrier Development of Scientists in Universities and Research Institutes in Ghana and elsewhere.
- Publication of the Scientific Journal, Magazines and Books (e.g., Journal of the Ghana Science Association and Everyday Science for Schools Magazine)
- Training Programme for Mathematics and Science Teachers to Improve the Teaching and Learning of These Subjects in Schools and Colleges of Education

Contribution to National Development

Issues of national importance have been regularly and consistently highlighted at biennial workshops, conferences, etc. Communiqués had been submitted to Government and other stakeholders on very topical themes to help shape national policies.

PETROLEUM COMMISSION, GHANA

Regulating, Managing & Coordinating Upstream Petroleum Activities

What We Do

- Promote Ghana's hydrocarbon potential
- Promote sustainable and cost efficient petroleum activities for the overall benefit and welfare of Ghanaians
- Monitor and ensure compliance with national policies and laws related to upstream petroleum activities
- Promote local content and local participation in Ghana's upstream petroleum industry
- Ensure compliance with Health, Safety, and Environmental (HSE) standards in petroleum activities
- Issue permits to companies seeking to operate in Ghana's upstream petroleum industry

Head Office: +233(0) 302 550933 |+233(0) 302 550959
Western Region Office: +233(0) 303 962089

Petroleum Commission Ghana
www.petrocom.gov.gh

JOURNAL OF THE GHANA SCIENCE ASSOCIATION

The JGSA is currently listed on Scopus with an assigned ISSN Number.

Guidelines for Authors for Publication of Articles in the Journal of the Ghana Science Association (JGSA)

General

The editorial office requires a soft copy of a Manuscript, preferably in a Microsoft Word format, previously unpublished, complete with title, name(s), and address(es) of the author(s) and abstract of not more than 250 words in English. Manuscripts should be typed using Times New Roman font, size 12, and double-spaced. Pages must be numbered, beginning from the Title Page. Unless otherwise stated, the first-named author of a joint publication will be taken as the corresponding author. Please provide phone numbers and e-mail, if available. Manuscripts should be sent to the email: gsasecretariat@gmail.com

Text Preparation

The structure of the main text should be in the following order: Abstract, 1. Introduction, 2. Method, 3. Results, 4. Discussion, and 5. Conclusion. These headings should be typed in lowercase but boldface (left aligned) and numbered 1, 2, 3, etc. Subsections of these (except conclusion) should be numbered, e.g., 1.1 (heading typed normally) and 1.1.1 (heading typed in italics), etc. for further subsections. The above order should be followed by Acknowledgements and References.

Abstract

The abstract should be typed in a block, i.e., without paragraphs or subdivisions; and should give a comprehensive summary of the paper. It should be able to stand by itself and should incorporate objective, methodology results, and conclusion. Keywords are not required.

References

References should be given in the text by indicating author(s) and year of publication. When a reference is part of a sentence it should be cited as Menyeh and O'Reilly, (1991); Menyeh et al. (1997), but when it is inserted within a sentence it should be: (Menyeh and O'Reilly, 1991); (Menyeh et al., 1997), etc. Only references cited in the text should be listed in alphabetical order (with names of all contributors, not, for example, Menyeh et al…) at the end of the paper. In other words, references that are not cited in the text cannot be listed.

The following are examples:

Book Reference: [In the following order: Name of author(s), year of publication, the title of a book, publisher, place of publication, and the numbers for the referenced pages, e.g., "O'Reilly, W. (1984). Rock and Mineral Magnetism, Blackie, Glasgow, pp. 120-125"].

Journal Reference: [e.g., Menyeh, A. and O'Reilly, W. (1991). The magnetization process in monoclinic pyrrhotite particles containing few domains, Geophysical Journal International, 104, 387399]. Names of periodicals should be abbreviated according to the World List of Scientific Periodicals. However, if in doubt, the full name of the journal should be given. The above journal, for example, should be abbreviated as Geophys. J. Int.

Conference Proceedings: [e.g. Ofosu-Asiedu, A. (1997). "The Wood Industry and the Environment". In: A. Menyeh, S. Osafo Acquaah and W. O. Ellis (Eds.), Proceedings of the 20th Biennial Conference, Kumasi, 4th August 1997, pp.19-34].

Reference from a book edited by one or more persons [e.g., Kullerud, G. (1971). "Experimental techniques in dry sulfide research". In: G. C. Ulmer (Ed.), Research techniques" for high pressure and high temperature, Springer-Verlag, New York, pp.288-315].

Tables

The maximum size for a table should be 150 mm x 200 mm and it should be without an outside border as well as lines for row and column entries. However, only headings for the columns should be enclosed between the top and bottom borders: Tables should be numbered consecutively and referred to in the text [e.g., (Table 1)]. The titles should be typed on top in Boldface [e.g., Table 1. Variation of Temperature with…]. Indicate in pencil in the right-hand margin, the desired location of Tables.

Dimensions

S.I. units should be used throughout the text. Use negative indices instead of / and leave a space between numbers and symbols [e.g. 1.5 m s-1, not 1.5 ms-1 or 1.5 m/s]

Equations

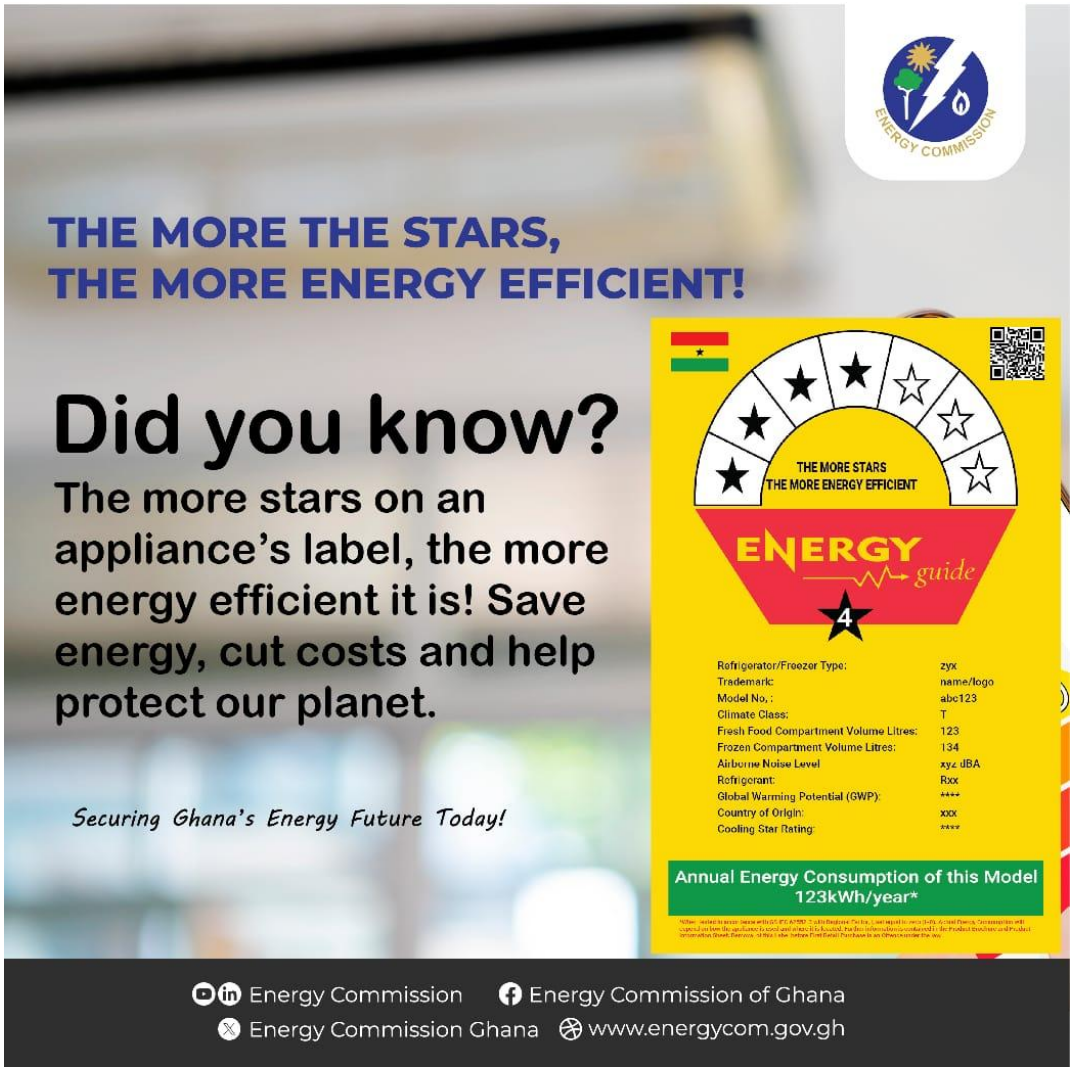
Equations should be typed in Math. Mode [i.e. z = ax + by]. If there is more than one equation, they should be numbered consecutively [e.g. z = ax + by … (1)]. For clarity, indicate in words, in the righthand margin, the name of any Greek symbol the first time it is used in the text.

Referees

Each manuscript will be refereed by at least two reviewers.

Proofs

Proofs will be sent to the authors. They must be returned quickly to ensure a high speed of publication.


ENERGY COMMISSION
THE MORE THE STARS,
THE MORE ENERGY EFFICIENT!
Did you know?
The more stars on an appliance's label, the more energy efficient it is! Save energy, cut costs and help protect our planet.
Securing Ghana's Energy Future Today!
THE MORE STARS
THE MORE ENERGY EFFICIENT
ENERGY guide
4
Refrigerator/Freezer Type: zyx
Trademark: name/logo
Model No.: abc123
Climate Class: T
Fresh Food Compartment Volume Litres: 123
Frozen Compartment Volume Litres: 134
Airborne Noise Level xyz dBA
Refrigerant: Rxx
Global Warming Potential (GWP): ****
Country of Origin: xxx
Cooling Star Rating: ****
Annual Energy Consumption of this Model
123kWh/year*
Energy Commission
Energy Commission of Ghana
Energy Commission Ghana
www.energycom.gov.gh


ENERGY COMMISSION
NO LABEL, NO GOOD –
KNOW WHAT YOU'RE BUYING!
Don't settle for less! Always check for the energy efficient label before you buy. Buy new instead of used appliances for efficiency – it's the smart way to shop for energy-efficient appliances!
Securing Ghana's Energy Future Today!
Energy Commission
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PROGRAMME OUTLINE

MONDAY, 22ND SEPTEMBER 2025

4:00 pm – 6:00 pm	Registration of Participants

TUESDAY, 23RD SEPTEMBER 2025

7:30 am – 8:00 am	Arrival of Participants at the conference venue
8:00 am – 8:30 am	Registration of Participants continue.

Plenary Session I/Presentations

8:30 am - 9:00 am	**Topic 1:**	**Sustainable Agriculture Innovations for Food Security**
	Speaker:	**Prof Felix Kofi Abagale** Director, West African Centre for Water, Irrigation and Sustainable Agriculture (WACWISA), UDS
9:00 am – 9:30 am	**Topic 2:**	**Biomedical and Health Innovations for Enhanced Access to Quality Healthcare**
	Speaker:	**Dr. Winfred Korletey Baah** Consultant Physician/Acting Registrar Health Facilities Regulatory Agency
9:30 am – 10:00 am	Discussions	
10:00 am – 10:20 am	**Presentation/Message** Ghana Standards Authority	
10:20 am – 10:40 am	Snack Break	

Formal Opening

11:00 am – 11:05 am	Prayer
11:05 am – 11:10 am	Introduction of Chairman and other Dignitaries **Dr. Francis Addy, Honorary National Secretary**
11:10 am – 11:20 am	**Chairman's Opening Remarks** **Prof. Seidu Al-hassan** Vice-Chancellor, University for Development Studies
11:20 am – 11:35 am	**Address by GSA Honorary National President** **Prof. Gideon Kofi Helegbe**
11:35 am – 11:45 am	*Fraternal Messages*
11:45 am – 11:50 am	**Statement by Special Guest I** **Hon. Ali Adolf John** Northern Regional Minister
11:50 am – 11:55 am	**Statement by Special Guest II** **Hon. Eric Opoku** Hon. Minister for Food & Agriculture
11:55 am – 12:00 pm	**Statement by Special Guest III** **Hon. Haruna Iddrisu** Hon. Minister for Education
12:00 pm – 12:30 pm	**Keynote Address** **Hon. Julius Debrah** Chief of Staff, Republic of Ghana
12:30 pm – 12:35 pm	Chairman's Closing Remarks
12:35 pm – 12:40 pm	Vote of Thanks **Dr. Esther Marfo-Ahenkora, Honorary National Treasurer**
12:40 pm – 12:45 pm	Closing Prayer
12:45 pm – 1:00 pm	Group Photograph
1:00 pm – 1:20 pm	Formal Opening of Exhibition
1:20 pm – 2:30 pm	Lunch for Invited Guests and Registered Participants

Plenary Session II/Presentations

2:30 pm – 3:00 pm	**Topic 3:**	**Environmental Conservation for Sustainable Ecosystem Management**
	Speaker:	**Mr. Roger Yelsong Pondorh** Assistant Program Officer Environmental Protection Authority
3:00 pm – 3:30 pm	**Topic 4:**	**Science Education and Policy for Accelerated National Development through Problem-Solving Curriculum**
	Speaker:	**Prof. Augustine Ocloo** Deputy Director General Ghana Tertiary Education Commission
3:30 pm – 4:00 pm.	Discussions	

WEDNESDAY, 24TH SEPTEMBER 2025

7:30 am – 8:30 am	Arrival of Participants at the conference venue

Plenary Session III/Presentations

8:30 am – 9:00 am	**Topic 5:**	**Sustainable Water Resource Management**
	Speaker:	**Dr. Fredrick Logah** Senior Research Scientist Council for Scientific and Industrial Research (CSIR)
9:00 am – 9:30 am	**Topic 6:**	**Proactive Public-Private Partnership for the Reset Ghana Agenda**
	Speaker:	**Mr. Joseph Awan** Director of Risk National Petroleum Authority
9:30 am – 10:00 am	Discussions	
10:00 am – 10:30 am	Cocoa Break/Exhibition	
10:30 am – 1:00 pm	**Biennial General Meeting (BGM) I**	
1:00 pm – 2:30 pm	Lunch	
2:30 pm – 5:30 pm	Scientific Session I	
5:30 pm	Cocktail	

THURSDAY, 25TH SEPTEMBER 2025

6:30 am – 8:30 am	Arrival of participants
8:30 am – 11:00 am	**Scientific Session II**
11:00 am – 1:30 pm	Biennial General Meeting (BGM) II/Release of Communiqué
1:30 pm – 3:30 pm	Lunch
3:30 pm – 6:00 pm	Excursion

FRIDAY, 26TH SEPTEMBER 2025

Departure

GHANA'S PREFERRED TESTING CENTRE

Talk to us today!

0302-500065/6

Ghana Standards Authority offers Conformity Assessment services i.e. Testing, Inspection and Certification.

Our Testing Services ensure that goods/products produced in Ghana, whether for local consumption or for export, are safe, reliable and are of good quality.

We currently have Five (5) ISO/IEC 17025:2017 Accredited Testing Laboratories and they are:

1. Microbiology Laboratory
2. Metallic Contaminants Laboratory
3. Mycotoxin and Histamine Laboratory
4. Food and Drinks Laboratory
5. Pesticide Residues Laboratory

Range of products we test are:

- Plastics, leather and rubber products
- Building and construction materials
- Electrotechnical products
- Mechanical products (including metal fabrications)
- Petroleum products
- Packaging materials (including paper, cards and boards)
- Textiles, garment and relatyed products
- General and household products
- Drugs
- Food
- Alcoholic and non-alcoholic beverages (including water)
- Cosmetics, soaps and detergents
- Toxicological and forensic samples and specimens
- Industrial raw materials
- Pesticides residue levels in fruits and vegetables
- Histamine levels in fish
- Aflatoxins and mycotoxins in cereals and nuts
- Metallic contaminants in foods and grains

MAIN WORKING HOURS: MONDAY - FRIDAY (8:30AM - 4:30PM)

LIST OF SPONSORS

1. Energy Commission
2. Petroleum Commission, Ghana
3. Ghana Standards Authority
4. National Petroleum Authority (NPA)
5. International Institute of Tropical Agriculture (IITA), Ghana
6. Council For Scientific and Industrial Research (CSIR)
7. The Ghana Chamber of Mines
8. The New Corporation
9. Cocoa Research Institute of Ghana (CRIG)
10. Pumptech Limited
11. University for Development Studies

LIST OF STAFF

1. Mr. Forson Dzotor	-	Scientific Coordinator (Head of Secretariat)
2. Ms. Ramatu Hajia Balah	-	Senior Scientific Administrative Officer
3. Mr. Daniel Kojo Gidi	-	Senior Administrative Officer
4. Mr. Eric Ayisi Essel	-	Senior Accountant
5. Mr. Bennet Ansong Boateng	-	IT/Publications Officer
6. Mr. Eugene Hammond	-	Procurement/Marketing Officer
7. Ms. Henrietta Anang	-	Accounting Assistant
8. Mr. Ernest Megbenu	-	Security Guard
9. Mr. Kenneth Amuh Akrebeto	-	Security Guard
10. Mr. Gideon Acquaye Obuobi	-	Security Guard
11. Mr. Solomon Adjei	-	Security Guard
12. Mr. Isaac Adu	-	Driver/Messenger
13. Mr. Ebenezer Owadie	-	Driver/Messenger
14. Ms. Mary Martey	-	Cleaner
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GPS Code	-	GA-037-1703
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Website	-	https://www.ghanascience.gov.gh/
Journal of the Ghana Science Association	-	https://jgsajournal.org/index.php/jgsa/index

LIST OF NATIONAL EXECUTIVE COMMITTEE MEMBERS (NEC) 2023 - 2025

1.	Prof. Gideon Kofi Helegbe	-	Hon. National President (Chairman)
2.	Dr. Francis Addy	-	Hon. National Secretary
3.	Dr. Esther Marfo-Ahenkora	-	Hon. National Treasurer
4.	Dr. Thomas Tagoe	-	Hon. President, Accra Branch
5.	Dr. Benjamin Aboagye	-	Hon. President, Cape Coast Branch
6.	Dr. Jude S. Bayor	-	Hon. President, Navrongo Branch
7.	Dr. Anokye Acheampong Amponsah	-	Hon. President, Sunyani Branch
8.	Dr. Kwame Opare-Asamoah	-	Hon. President, Tamale Branch
9.	Prof. Nii Korley Kortei	-	Hon. President, Ho Branch
10.	Prof. Eric Sampane-Donkor	-	Editor-in-Chief, Journal of the GSA
11.	Prof. Alexander Kwarteng	-	Hon. President, Kumasi Branch Editor, Everyday Science for Schools
12.	Mr. Stephen Opoku	-	Hon. President, Koforidua Branch
13.	Dr. Denis D. Yar	-	Hon. President, Asante Mampong
14.	Prof. Michael Osae	-	Immediate Past Hon. National President
15.	Rev. Thomas K. Arboh	-	Ghana Association of Science Teachers
16.	Dr. Kwaku Opoku Yeboah	-	Hon. President, Winneba Branch
17.	Mr. Forson Dzotor	-	Scientific Coordinator (SC)

LIST OF NATIONAL OFFICERS (NO) 2023 - 2025

1.	Prof. Gideon Kofi Helegbe	-	Hon. National President (Chairman)
2.	Dr. Francis Addy	-	Hon. National Secretary
3.	Dr. Esther Marfo-Ahenkora	-	Hon. National Treasurer
4.	Mr. Forson Dzotor	-	Scientific Coordinator (Head of Secretariat)

LIST OF BRANCH EXECUTIVES 2023 - 2025

The following were introduced as new branch executives:

1. Accra Branch

• Dr. Thomas Tagoe	-	President
• Dr. Ernest Biempuo	-	Secretary
• Dr. Elmer Ametefe	-	Treasurer

2. Kumasi Branch

• Prof. Alexander Kwarteng	-	President
• Dr. Kwadwo Boampong	-	Secretary
• Dr. Amma Aboagyewa Larbi	-	Treasurer

3. Tamale Branch

• Dr. Kwame Opare-Asamoah	-	President
• Dr. Frederick Sarfo-Antwi	-	Secretary
• Ms. Victoria Awuni	-	Treasurer

4. Sunyani Branch

• Dr. Anokye Acheampong Amponsah	-	President
• Mr. Killian Asampana Asosega	-	Secretary
• Dr. Charles Kwofie	-	Treasurer

5. Asante-Mampong Branch

• Dr. Denis D. Yar	-	President
• Dr. Papa Kofi Amissah-Reynolds	-	Secretary
• Dr. (Mrs.) Janice Dwomoh-Abraham	-	Treasurer

6. Koforidua Branch

- Steven Opoku - President
- Prof. John Owusu - Secretary
- Esther Anokye - Treasurer

7. Cape Coast Branch

- Dr. Benjamin Aboagye - President
- Dr. Peter Osei-Wusu Adueming - Secretary
- Dr. Margaret Fafa Awushie Akwetey - Treasurer

8. Navrong Branch

- Dr. Jude Simons Bayor - President
- Dr. Melvin-Guy Adonadaga - Secretary
- Dr. Mary-Magdalene Pedavoah - Treasurer

9. Winneba Branch

- Dr. Yeboah Kwaku Opoku - President
- Dr. Prince Owusu Adoma - Secretary
- Dr. Felicity Bentsil-Enchill - Treasurer

10. Ho Branch

- Dr. Nii Korley Kortei - President
- Prof. Maxwell Selasie Akple - Secretary
- Dr. Rukiya Naa Amerley Laryea - Treasurer

THE GHANA CHAMBER OF MINES

PUBLISH-WHAT-YOU-PAY 2024

In line with its commitment to promoting transparency and accountability in the extractive sector, the Ghana Chamber of Mines is pleased to announce the publication of mining sector-related payments to the government, along with disclosures of expenditure by its producing member companies on key mining inputs and corporate social investments for the year 2024.

The total fiscal payments attributable to the mining and quarrying sector amounted to **GHC17.7 billion in 2024,** which translates into **24.3 percent of direct domestic tax revenues.** This performance reaffirmed the sector's position as the largest contributor to tax revenue from economic activities.

In the same vein, mineral export proceeds remained the largest source of foreign exchange earnings for the country in 2024. The mining sector generated **US$11.9 billion in revenue,** surpassing the combined export earnings from crude oil (US$3.9 billion) and cocoa (US$1.9 billion), and exceeding inflows from inward remittances (US$6.7 billion). According to the Bank of Ghana, the sector accounted for **58.4 percent of gross merchandise export earnings in 2024.** This underscores the mining sector's central role in Ghana's external trade performance.

Out of the **US$7.1 billion in mineral revenue** generated by the Chamber's producing member companies in 2024, a total of **US$4.9 billion was returned to Ghana** through the Bank of Ghana and commercial banks. This represents **70.8 percent of their earnings in 2024.** These proceeds remain a major source of foreign exchange liquidity for the domestic financial system. The inflows to the central bank comprised forex sales under the Mandatory Surrender Requirement regime and the voluntary forex purchase initiative, while the inflows to the commercial banks were made exclusively through voluntary forex sales.

Additionally, the Chamber's producing member companies sold **358,218 ounces of gold to the Bank of Ghana** under its Domestic Gold Purchase Programme (DGPP) in 2024. The Chamber's continued support for the Bank's voluntary forex and gold purchase initiatives significantly contributed to bolstering the Bank's reserve position and enhancing the relative stability of the Ghanaian Cedi.

US$7.1Bn

of mineral revenue was generated by the Chamber's producing member companies

GHS17.7 billion

was total fiscal payments attributable to the mining and quarrying sector

358,218 ounces of gold

were sold to the Bank of Ghana under its Domestic Gold Purchase Programme by the Chamber's producing member companies

As part of its efforts to deepen local content and leverage the mining sector to catalyse broad-based socio-economic development, the Chamber's producing members spent **US$5.5 billion on procuring goods, services, fiscal obligations, and initiatives**. Of this amount, US$3.5 billion was spent on goods and services and US$28 million on corporate social investments in 2024. Table 1.0 provides a summary of mining sector-related payments and key expenditure of the Chamber's producing mines.

LIST OF TOPICS FOR PLENARY SESSIONS

1. Sustainable Agriculture Innovations for Food Security
2. Biomedical and Health Innovations for Enhanced Access to Quality Healthcare
3. Environmental Conservation for Sustainable Ecosystem Management
4. Science Education and Policy for Accelerated National Development through Problem-Solving Curriculum
5. Sustainable Water Resource Management
6. Proactive Public-Private Partnership for the Reset Ghana Agenda

LIST OF SPEAKERS FOR PLENARY SESSIONS

1.	Prof. Felix Kofi Abagale	-	**Director** WACWISA, UDS
2.	Dr. Winfred Korletey Baah	-	**Consultant Physician/Acting Registrar** Health Facilities Regulatory Agency
3.	Mr. Roger Yelsong Pondorh	-	**Assistant Program Officer** Environmental Protection Authority
4.	Prof. Augustine Ocloo	-	**Deputy Director General** Ghana Tertiary Education Commission
5.	Dr. Fredrick Logah	-	**Senior Research Scientist** CSIR
6.	Mr. Joseph Awan	-	**Director of Risk** National Petroleum Authority

LIST OF GUEST SPEAKERS

1.	Prof. Seidu Al-hassan	-	**Chairman** Vice Chancellor University for Development Studies
2.	Hon. Ali Adolf John	-	**Special Guest I** Hon. Minister Northern Regional Minister
3.	Hon. Eric Opoku	-	**Special Guest II** Hon. Minister Ministry of Food & Agriculture
4.	Hon. Haruna Iddrisu	-	**Special Guest II** Hon. Minister Ministry of Education
5.	Hon. Julius Debrah	-	**Keynote Speaker** Chief of Staff Republic of Ghana

LIST OF LOCAL ORGANIZING COMMITTEE

1. Dr. William Walana - Chairman
2. Dr. Kwame Opare-Asamoah - Co-opted Member (Host)
3. Dr. Frederick Sarfo-Antwi - Co-opted Member
4. Ms. Victoria Awuni - Co-opted Member

ICT

5. Prof. Seth Mensah Abobi
6. Dr. Gideon Adjorlolo
7. Dr. Lawrence Tandoh
8. Seth Oware

Publicity Sub-committee

9. Anthony Klu
10. Dr. Emmanuel Amponsah Adjei
11. Yine Lawrence
12. Shuaib M. A. Husein
13. Afua Kobi Ampem Genfi
14. Dr. Seidu Zakaria
15. Nana Aboagye Acheampong

Venue, Accommodation and Catering Services

16. Dr. Wilhemina Asare
17. Helene A. Z. Garti
18. Dr. Karim Abdul Rahman
19. Dr. Mrs Flora Amagloh
20. Samuel Yankson
21. Patience Kanyiri Gaa

Protocol, Programme and Rapporteurs

22. Dr. Williams Walana
23. Dr. Flora Amagloh
24. Dr. Godwin Nsoh Anabire
25. Victoria Awuni
26. Dr. Lydia Quansah
27. Alice Ziyaaba
28. Joseph Lambon

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29. Prof. Joseph Korese
30. Prof. Alhassan Abdul-Barik
31. Prof. Ebenezer Owusu-Sekyere
32. Dr. Seidu Zakaria
33. Dr. Godwin Nsor Anabire
34. Dr. Gifty Apiung Aninanya
35. Dr. Julius Dongdem
36. Dr. Ezekiel Kofi Vicar
37. Dr. Jennifer Suurbaar

LIST OF CHAIRPERSONS FOR PLENARY SESSION

NO.	CHAIRPERSONS	PLENARY SESSION
1	Prof. Francis Amaglo	I
2	Prof. Alexander Kwarteng	II
3	Prof. Michael Setor Osae	III

ABSTRACTS CATEGORIES

SESSION I			
CATEGORY	**TITLE**	**ROOM**	**VENUE**
B	Biological, Biomedical & Health Innovations	1	Dr Andani Andan Academic Board Chamber
P	Physical, Technological and Engineering Sciences	2	Council Chamber – Room 104
A	Agriculture, Food Science and Food Security	3	Board Room, School of Allied Health Sciences
S	Science Education, Policy and Public Private Partnership	4	Boardroom, School of Medicine, UDS
W	Water Resources Management and Environmental Sciences	5	WPD Conference Room
B/A	Biological, Biomedical & Health Innovations / Agriculture, Food Science & Food Security	6	Council Chamber 2 – Room 147

SESSION II			
CATEGORY	**TITLE**	**ROOM**	**VENUE**
B	Biological, Biomedical & Health Innovations	1	Dr Andani Andan Academic Board Chamber
B	Biological, Biomedical & Health Innovations	2	Council Chamber – Room 104
A	Agriculture, Food Science & Food Security	3	Board Room, School of Allied Health Sciences
A	Agriculture, Food Science & Food Security	4	Boardroom, School of Medicine, UDS
W	Water Resources Management & Environmental Sciences	5	WPD Conference Room
P/W	Physical, Technological & Engineering Sciences / Water Resources Management & Environmental Sciences	6	Council Chamber 2 – Room 147

LIST OF CHAIRPERSONS FOR SCIENTIFIC SESSIONS

SESSION	NAME	CATEGORY	DATE	TIME
I	i. **Prof. Alexander Kwarteng** Department of Biochemistry and Biotechnology, KNUST - Kumasi	B	24/09/2025	02:30 pm – 05:30 pm
	ii. **Dr. Jude Simon Bayor** Dept. Of Applied Physics CK TEDAM – UTAS	P	24/09/2025	02:30 pm – 05:30 pm
	iii. **Dr. Matthew Amekpewu** Department of Physics, Faculty of Physical Sciences, UDS	A	24/09/2025	02:30 pm – 05:30 pm
	iv. **Dr. Kwaku Opoku Yeboah** Department of Biology Education, University of Education, Winneba	S	24/09/2025	02:30 pm – 05:30 pm
	v. **Dr. (Mrs) Janice Dwomoh-Abraham** Department of Biological Sciences Education, AAMUSTED	W	24/09/2025	02:30 pm – 05:30 pm
	vi. **Prof. Michael Nii Korle Clottey** University of Ghana	B/A	24/09/2025	02:30 pm – 05:30 pm
II	i. **Prof. Alexander Kwarteng** Department of Biochemistry and Biotechnology, KNUST - Kumasi	B	25/09/2025	08:30 am – 11:00 am
	ii. **Dr. Elmer Ametefe** Department of Biochemistry, Cell and Molecular Biology, University of Ghana	B	25/09/2025	08:30 am – 11:00 am
	iii. **Dr. George Akumfi Ameyaw** Plant Pathology Division Cocoa Research Institute of Ghana	A	25/09/2025	08:30 am – 11:00 am
	iv. **Dr. Anokye Acheampong Amponsah** Department of Molecular Biology and Biotechnology, UCC	A	25/09/2025	08:30 am – 11:00 am
	v. **Prof. Ebenezer Owusu-Sekyere** Department of Environment and Sustainability Sciences, UDS	W	25/09/2025	08:30 am – 11:00 am
	vi. **Dr. Ernest Sanyare Warmann Beinpuo** Emergency Preparedness & Response Department Nuclear Regulatory Authority	P/W	25/09/2025	08:30 am – 11:00 am
I & II	Poster Boards	All Sessions	24/09/2025 – 25/09/2025	Throughout Sessions

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BIOLOGICAL, BIOMEDICAL AND HEALTH INNOVATIONS

WEDNESDAY, 24TH SEPTEMBER 2025

BIOLOGICAL, BIOMEDICAL AND HEALTH INNOVATIONS

Scientific Session I - Oral

Chairman: Prof. Alexander Kwarteng Time: 02:30 pm – 05:30 pm

Room: 1 (B)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
1.	02:30 pm - 02:40 pm	**Zakaria Seidu**, Christiana A. Assah, Naporo Mathias, Belinda Acculey, Helena Lamptey, and Michael F. Ofori	*Plasmodium* parasite smear staining potential of plant-based extracts of *Hibiscus sabdariffa*, *Sorghum bicolor* and *Daniellia oliveri*
2.	02:40 pm - 02:50 pm	**Abubakari Zarouk Imoro**, Yakubu Latifatu, Abd-Allah Salwah Winpini, Nana Aboagye Acheampong, and Abraham Kusi Obeng	Isolation and Characterization of Indigenous Fungi and Substrates for the Production of Mycelium-Based Leather
3.	02:50 pm - 03:00 pm	**Ekene Kwabena Nwaefuna**, Francis Djabeng, Rofela Combey, and Alexander Egir-Yawson	Cuticular Hydrocarbon Profile of *Bactrocera Dorsalis* from Ghana: Implications for Population Structure
4.	03:00 pm - 03:10 pm	**Abukari Yussif,** Atongo L. Ayinbono, Sambo S. Ali, Naporo Mathias, Helena Lamptey, Michael F. Ofori, Gideon K. Helegbe and Zakaria Seidu	Retrospective Malaria Rapid Diagnostic Test Outcome of Clinically Confirmed Malaria Patients and its Association with Parasitaemia and Full Blood Count Indices
5.	03:10 am - 03:20 am	**Mubarak Abdulai,** Mubaric Yakubu and Anthony Wemakor	Association between Dietary Diversity and Micronutrient Intake Adequacy of Women of Childbearing Age in Nanton District, Ghana
	03:20 pm - 3:40 pm	**Questions & Discussion**	
6.	03:40 pm - 03:50 pm	**Nsoh Godwin Anabire**, and Abdul-kudus Wunpini Abdallah	Role of Retinol Binding Protein 4 (RBP4) in the Development of Type 2 Diabetes in a Ghanaian Population
7.	03:50 pm - 04:00 pm	**Seth Oware,** Jacob Banuonaa Doozie, Franklina A. Anyaana, Abdullah Suhuyini Abdul-Mumin, Godfred Obed Cudjoe annd Courage S. K. Saba	Assessment of Microbial Quality of Dishware used by Students in Selected Hostels at the University for Development Studies
8.	04:00 pm - 04:10 pm	**Abdulai Alidu**, Fatima Amponsah Fordjour, Nana Aboagye Acheampong and Abraham Kusi Obeng	Influence of Vagina Microbiome on the Reproductive Health of Women of Child-Bearing Age in the Tolon District
9.	04:10 pm - 04:20 pm	**Osei Thompson,** Nana Yaa Awua-Boateng, Denis Dekugmen Yar, Patrick Addae, Asoah Ebenezer And Enoch Yeboah	Epidemiological Trends of Schistosomiasis in Oforikrom Municipality, Ghana
10.	04:20 pm - 04:30 pm	**Wilberforce Orlando Aduguba,** Nelson Opoku and Abrahim Kusi-Obeng	Evaluation of Antifungal Activity of Modified Low Molecular Weight Chitosan with Plant Extracts against Plant Pathogenic Fungi in Vitro
	04:30 pm - 05:00 pm	**Questions & Discussion**	

WEDNESDAY, 24TH SEPTEMBER 2025

BIOLOGICAL, BIOMEDICAL AND HEALTH INNOVATIONS

Scientific Session I - Oral

Chairman: Prof. Michael Nii Korle Clottey Time: 02:30 pm – 05:30 pm

Room: 6 (B/A)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
11.	02:30 pm - 02:40 pm	**Mubarak Abdulai** and Anthony Wemakor	Dietary Patterns and their Associated Factors Among Women of Childbearing Age in Rural Communities of Nanton District, Ghana
12.	02:40 pm - 02:50 pm	**Fuseini Ziblim,** Abubakari Iddrisu, Halid Sulemana, Aliu Alhassan and Zakaria Seidu	Formulation and Evaluation of Mosquito Repellent Potential of Neem Seed Oil-Based Soap
13.	02:50 pm - 03:00 pm	**George Doopaar Billak,** Nsoh Godwin Anabire And Lucas Amenga-Etego	Kinetics and Fluctuations of Holotranscobalamin across Malaria Disease Stages in Ghanaian Children
14.	03:00 pm - 03:10 pm	**Abdul-Rauf Sugri,** Michael F. Ofori And Nsoh Godwin Anabire	Serum Iron and Inflammatory Biomarkers among Pregnant Women Stratified by Malaria and Anaemia Status
15.	03:10 am - 03:20 am	**Kenneth Owusu Agyemang Jnr,** Nsoh Godwin Anabire, Iris Dzifa Adzah, Osbourne Quaye and Gideon Kofi Helegbe	Seroprevalence of Hepatitis B and Burden of Anaemia Among Pregnant Women Visiting Akatsi South Municipal Hospital for Antenatal Care
	03:20 pm - 3:40 pm	**Questions & Discussion**	
16.	03:40 pm - 03:50 pm	**Emmanuel Antwi Boasiako Frimpong,** Jacob Nii Otinkorang Ankrah, Fredrick Gyilbagr, Rukaya Alhassan Baanah, Vicar Kofi Ezekiel, Ibrahim Sibdow Baako, Samuel Addo Akwetey, Baba Sulemana Mohammed and Williams Walana	Comparative Genotypic Expression of T Cell Exhaustion Markers in Children with Malaria, Diarrhoea and Malaria-Diarrhoea Coinfection

THURSDAY, 25TH SEPTEMBER 2025

BIOLOGICAL, BIOMEDICAL AND HEALTH INNOVATIONS

Session II - Oral

Chairman: Prof. Alexander Kwarteng Time: 08:30 am – 11:00 pm
Room: 1 (B)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
17.	08:30 am - 08:40 am	**S. M. Ayariga** and P. T. Birteeb	Assessment of Phenotypic Characteristics of Indigenous Chicken in Northern Ghana
18.	08:40 am - 08:50 am	**Isaac Adjei,** and Holy Kwabla Zanu	Ameliorative Effects of *Senna siamea* Leaf Decoction in Loperamide-Induced Constipated Rats
19.	08:50 am - 09:00 am	**Daniel Twene Gyasi** and Holy Kwabla Zanu	Ameliorative Effect of Basil Leaves Extract (*Ocimum Basilicum*) on Growth, Hematology, Serum Biochemistry, and Organ Histology in Male Albino Rats Fed High Dietary Fat
20.	09:00 am - 09:10 am	**Kyeremeh Osei** and Holy Kwabla Zanu	The Impact of Bitter Leaves on the Reproductive Performance of Albino Rats Fed High-Fat Diet
21.	09:10 am - 09:20 am	**Holy Kwabla Zanu** and Simon Ndebila	Effects of Different Levels of Virgin Coconut Oil on Growth, Haematology, Serum Biochemistry, and Reproductive Parameters in Albino Rats
	09:20 am - 09:40 am	**Questions & Discussion**	
22.	09:40 am - 09:50 am	**Charity Odumale Roberts,** Mr. Kwasi Sarfo, Joan Thompson, Rev. Fr. Dr. Konaku Kuusegmeh and Prof. David Millar	The Influence of Occupational Stress on University Staff from Gender and Generational Perspective
23.	10:00 am - 10:10 am	**Thomas Ansong Agyei,** Shadrack Kwadwo Amponsah, Joseph Oppong Akowuah And Ahmad Addo	Impact of Smoking Kiln Technology on Polycyclic Aromatic Hydrocarbon (PAH) Contamination and Consumer Health Risks
24.	10:10 am - 10:20 am	**Yusif Mubarik,** Seth A. Domfeh, Patrick W. Narkwa, Anastasia R. Aikins, And Mohamed Mutocheluh	Ochratoxin A Enhances Hepatitis B Virus Replication by Inhibiting the Type I Interferon Response Pathway
25.	10:20 am - 10:30 am	**Stephen Wilson Kpordze,** Victor Atunga Mobegi, Gideon Mutie Kikuvi, Joseph Kangangi Gikunju, Courage Kosi Setsoafia Saba, Jackan Moshe and James Hungo Kimotho	Generation and Preclinical Evaluation of Chicken-Based IgY Antibodies Against Black Mamba (*Dendroaspis Polylepis*) Venom
26.	10:30 am - 10:40 am	**Rafatu Tahiru,** Mary Amoako and Charles Apprey	Effect of a Ginger-Spiced Millet-Soya Drink and Breastfeeding Education on Prolactin Levels and Breast Milk Volumes in Postpartum Mothers in Northern Ghana: A Randomized Controlled Trial
	10:40 am - 11:00 am	**Questions & Discussion**	

THURSDAY, 25TH SEPTEMBER 2025

BIOLOGICAL, BIOMEDICAL AND HEALTH INNOVATIONS

Session II - Oral

Chairman: Dr. Elmer Ametefe Time: 08:30 am – 11:00 pm

Room: 2 (B)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
27.	08:30 am - 08:40 am	**Seth Oware,** Abdullah Suhuyini Abdul-Mumin, Franklina A. Anyaana, Jacob Banuona Doozie and Courage S. K. Saba	*Escherichia Coli* and Other Coliforms Load on Food Utensils at Food Joints on a University Campus in Northern Ghana
28.	08:40 am - 08:50 am	**Patrick Addae,** Denis Dekugmen Yar, Nana Yaa Awua-Boateng, Asoah Ebenezer and Osei Thompson	Heat Stress and Mitigation Trategies for Construction Workers: A Case Study of the Tema Port Expansion Project, Ghana
29.	08:50 am - 09:00 am	**Emmanuel Ndezure,** Sumaila Mohammed, Joseph Agyin, Francisca Dery, Ekua Amoah And Kwadwo Boampong	*In Vitro* Antimicrobial Activities of Vernonia *Amygdalina* and *Senna Siamea* Against Esbl-Producing and Non-ESBL Bacteria
30.	09:00 am - 09:10 am	**Fatima Amponsah Fordjour,** Manchaya Yakubu Ahmed Zakaria and Alexander Kwarteng	Assessment of Genital Complications, Knowledge, and Compliance of Women from a Schistosomiasis Endemic Area in Ghana: A Cross-Sectional Study
31.	09:10 am - 09:20 am	**Adams Dramani,** Amadu Yakubu and Wahab Mashud	Modelling and Forecasting Infant Mortality Rate in Ghana Using Markov Chains and Trend Analysis
	09:20 am - 09:40 am	**Questions & Discussion**	
32.	09:40 am - 09:50 am	**Gifty Apiung Aninanya,** John Azaare, Abdul Muizz Muktar Tikumah, Emmanuel Dometieru Sodekuu, Robert Kokou Dowou, Faisal Gunu Abdul-Samed, Collins Gbeti and Paul Armah Aryee	Adolescents Condom Use and its contextual correlates in Jirapa Municipality, Ghana
33.	10:00 am - 10:10 am	**Joseph Yakubu,** Haruna Umar and Gilbert Abotisem Abiiro	The Prevalence of Hepatitis B Virus Infection in Pregnancy and its Prevention Strategies: A Mixed Methods Study in the Savelugu Municipality
34.	10:10 am - 10:20 am	**Alhassan Mahama,** Ashish Kumar, Fernando Albericio, and Betarize Garcia De La Torre	Synthesis of Tirzepatide Using Ps-Peg Resin: A Success Story
35.	10:20 am - 10:30 am	**Prince Twum Boateng,** Dorcas Ohui Owusu and Matthew Addo-Glover	Prevalence, Characterization, Risk Factors and Treatment-Seeking Patterns of Vulvovaginal Candidiasis among Women of Reproductive Age in Kwahu-West Municipality, Nkawkaw

36.	10:30 am - 10:40 am	**Ibrahim Sibdow Baako,** Emmanuel Antwi Boasiako Frimpong, Jacob Nii Otinkorang Ankrah, Fredrick Gyilbagr, Rukaya Alhassan Baanah, Vicar Kofi Ezekiel, Samuel Addo Akwetey and Williams Walana	The Dynamics of T Cells Exhaustion Markers in Chronic Hepatitis B Patients in Northern Ghana
	10:40 am - 11:00 am	**Questions & Discussion**	

WEDNESDAY, 24TH - THURSDAY, 25TH SEPTEMBER 2025

BIOLOGICAL, BIOMEDICAL AND HEALTH INNOVATIONS

Poster Session

Chairman: LOC Time: All Day

Room: Main Room

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
37.		**Gifty Apiung Aninanya**, Mohammed Karima, Gilbert A. Abiiro, Robert Dowuo Kukuo and Frank Dadzie	Prevalence of Self-Breast Examination and its Associated Factors among Female Nursing Trainees in the Gushegu Municipality, Ghana
38.		**Florence Akua Koblaji** and Paul Armah Aryee	Husbands' Intentions Towards Involvement in their Spouses' Utilization of Maternal Care Services During Antenatal, Intrapartum and Post-Natal Care Periods
39.		**Barma Laribick Dujin**	Strategies for Engaging Men for Enhanced Support for Infant and Maternal Health Care in Northern Ghana
40.		**Josephine Anoa Barnor,** Patrick Opare Sakyi, Daniel Boison, Stephen Asare Asamoah, Ekow Sekyi Etwir, Samuel Kojo Kwofie, and Michael Buenor Adinortey	Harnessing Phytochemicals from Broccoli and Kale Vegetable Leaves: In-Silico Discovery of Natural Xanthine Oxidase Inhibitors for Safer and Novel Anti-Gout Therapy
41.		**Isreal Patkuan Gamba** and Emmanuel Kofi Amponsah	Effect of COVID-19 on Health Trainees' Education: A Case of The College of Health and Well-Being, Kintampo
42.		**Simpson Emmanuela**, Agbeti Enyonam Akua and Ackam Princea	Evaluation of the Diagnostic Performance of Four Malaria Rapid Diagnostic Test Kits to Microscopy at the Ayeduase Health Center in the Ashanti Region
43.		**Nana Ayisha Mahama,** Dennis Bomansang Daliri, and Gifty Apiung Aninanya	Perceptions, Challenges, and Coping Strategies of Caregivers of Children Living with Sickle Cell Disease in Northern Ghana: A Qualitative Study
44.		**Sonia Quansah,** Mary Adams, Selina Ama Saah and Nathaniel Owusu Boadi	Microplastics and Human Health: A Bibliometric Review of Emerging Risks and Research Trends
45.		**Christian Duah**, Addison Duodu, Masahudu Mohammed, William K.J. Kwenin, and Helen Djang-Fordjour	Effect of Sex on Growth Performance Indices and Carcass Traits in Captive African Giant Rats (*Cricetomys Gambianus*)
46.		**Mary Ann Nunoo,** Charles Apprey, Linda Nana Esi Aduku, Herman Erick Lutterodt And Reginald Adjetey Annan	Consumption of Selected Indigenous Ghanaian Food Crops and their Implications for Nutritional Status and Health: A Cross-Sectional Study
47.		**Irene Assina Gai,** Lydia Quansah and Benjamin Karikari	Identification of Molecular Markers and Candidate Genes for Growth and Yield of Mung Bean in Northern Ghana by Genome-Wide Association Study

48.	**Axandrah Etornam Emmanuel,** Christopher Larbie and Frederick Sarfo-Antwi	Hepatoprotective Effects of Watermelon Rind Extract Against Lead Acetate-Induced Liver Injury in Wistar Rats
49.	**Lawrencia Semireka Amo,** Joseph Believe Dordor, Sarah Clark, Siobhan Morris, Maik Bischoff and Mark Peifer	RNAI-Based Identification of Cadherin-Proximal Proteins Regulating Collective Cell Migration in the Drosophila Testis
50.	**Dorcas Ohui Owusu,** Rapheal Obeng and Mattew Addo Glover	Prevalence, Antimicrobial Susceptibility and Genotypic Characteristics of *Staphylococcus Aureus* Isolated from Grilled Fish (Tilapia, *Oreochromis Niloticus*) in the Kumasi Metropolis, Ashanti Region, Ghana

PHYSICAL, TECHNOLOGICAL AND ENGINEERING SCIENCES

WEDNESDAY, 24TH SEPTEMBER 2025

PHYSICAL, TECHNOLOGICAL AND ENGINEERING SCIENCES

Scientific Session I - Oral

Chairman: Dr. Jude Bayor Time: 02:30 pm – 05:00 pm

Room: 2

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
51.	02:30 pm - 02:40 pm	**Emmanuel Proven-Adzri,** Nia Imara, Theophilus Ansah-Narh, Joseph Bremang Tandoh, Evaristus Iyida, Diana Klutse and Wonder Sewavi	Big Science, Bold Partnerships: Ghana's 32m Radio Telescope and the New Frontier of Innovation
52.	02:40 pm - 02:50 pm	**George Owusu Aduenin,** Owusu Nyarko Boateng and Adebayor Felix Adekoya	Enhancing Cloud Data Security Using a Lightweight Optimized Symmetric Algorithm
53.	02:50 pm - 03:00 pm	**Bensille Bruce Aburinya,** Mohammed Ibrahim Daabo And Callistus Ireneous Nakpih	Enhanced Dynamic Grey Wolf Optimization Algorithm for Cloud Load Balancing
54.	03:00 pm - 03:10 pm	**Abdul-Manan Issahaku,** John Azaare and Gilbert Abotisem Abiiro	National Health Insurance Scheme Membership Sustainability: A Mixed Methods Study of the Mobile Phone-Based Membership Renewal System in the Tamale Metropolis
55.	03:10 am - 03:20 am	**Anokye Acheampong Amponsah,** Eldad Antwi-Bekoe, Williams Asiedu, Fuseini Inusah and John Kwao Dawso	Enhancing Security and Transparency in Ghana's Cocoa Supply Chains through Blockchain and Machine Learning Technologies
	03:20 pm - 3:40 pm	**Questions & Discussion**	
56.	03:40 pm - 03:50 pm	**Isaac Baiden,** Owusu Nyarko-Boateng, Patrick Kwabena Mensah and Benjamin Asubam Weyori	Machine Learning-Driven Adaptive Detection and Mitigation Strategies for DDoS Attacks
57.	03:50 pm - 04:00 pm	**Ibrahim Hamidu,** Israel Shalom Mensah, And Godson Teddyson Sarpong	Leveraging Low-Cost Sensors and IoT for Air Quality Assessment in Aboadze, Ghana: A Comparative Study of Industrial Environments
58.	04:00 pm - 04:10 pm	**Owusu Nyarko-Boateng,** Alfred Elolo Konglo, Isaac Kofi Nti, Samuel Boateng, Benjamin Asubam Weyori and Faiza Umar Bawah	Cron-Based Lightweight Detection Framework for Social Engineering Attacks in Linux Enterprise Networks
59.	04:10 pm - 04:20 pm	**Selina Ama Saah,** Nathaniel Owusu Boadi, Sonia Quansah, Mary Adams and Mandela Toku	Facile synthesis of 1D ZnO nanocrystals exploiting zinc oleate single source precursor
60.	04:20 pm - 04:30 pm	**Benedictus Komla Horlu Agbemavor,** Erick Yao Kumaza, Adwoba Edjah and Kwadwo Anokye Dompreh	Innovative Green Building and Solar Panel Integration for Sustainable Development
	04:30 pm - 05:00 pm	**Questions & Discussion**	

THURSDAY, 25TH SEPTEMBER 2025

PHYSICAL, TECHNOLOGICAL AND ENGINEERING SCIENCES

Scientific Session II - Oral

Chairman: Dr. Ernest Sanyare Warmann Beinpuo Time: 08:30 am – 11:00 pm

Room: 6 (P/W)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
61.	08:30 am - 08:40 am	**Fuseini Nyagsi Abdul Gafaru,** Dzigbodi Adzo Doke, and Samuel Jerry Cobbina	Spatiotemporal Risk Intensification from Encroachment on Underground Oil Pipelines: A Proximity-Based Indexing Approach in Savelugu Municipality, Ghana
62.	08:40 am - 08:50 am	**Obed Appiah,** Kelvin Mensah-Abormpa, Alex Owusu, Jerry John Adusei, Christopher Bombie Ninfaakang, Jonas Lantam and Ezekiel Ataakore	EchoVision: Enhancing Ultrasonic-Based Obstacle Detection in Assistive Devices for the Visually Impaired
63.	08:50 am - 09:00 am	**Matthew Amekpewu,** Sulemana Seidu Abukari, Rabiu Musah and Samuel Owusu	Nonlinear Electrical Conductivity in Zigzag Carbon Nanotubes under Combined DC and Quasi-Static AC Fields with Hot Electron Injection
64.	09:00 am - 09:10 am	**Muhaisin Tiyumba Nantogmah,** Abdul-Barik Alhassan and Salamudeen Alhassan	Cross-Attention Multimodal Fusion for Breast Cancer Diagnosis: Integrating Mammography and Clinical Data with Explainability

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AGRICULTURE, FOOD SCIENCE AND FOOD SECURITY

WEDNESDAY, 24TH SEPTEMBER 2025

AGRICULTURE, FOOD SCIENCE AND FOOD SECURITY

Scientific Session I - Oral

Chairman: Dr. Matthew Amekpewu Time: 02:30 pm – 05:00 pm

Room: 3 (A)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
65.	02:30 pm - 02:40 pm	**Peter Akanfah Asodewine,** Shirley Lamptey, Isaac Kwahene Addai and Abeku Tetteh	Effect of Location, Variety, and Spacing on Sorghum Growth and Yield in the Guinea and Sudan Savannahs of Ghana
66.	02:40 pm - 02:50 pm	**Martin Aduah,** Adamu Yusuf Kabiru, Abubakar Asmau Niwoye, Frederick Adzitey, Helen Shnada Auta, Hadiza Lami Muhammad, Hussaini Anthony Makun and Nurul Huda	Occurrence of Antibiotic-Resistant Salmonella enterica in Smoked Donkey Meats Consumed in Ghana
67.	02:50 pm - 03:00 pm	**Fauziatu Mohammed,** Yaw Gyau Akyereko, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Development of Complementary Food from Fonio, Soybean and Carrot
68.	03:00 pm - 03:10 pm	**Osborn-Jnr Doetser Apeku,** Joseph Adubofuor†, Yaw Gyau Akyereko, Vida Batsa, Isaac Amoah and Charles Diako	Nutrient Composition and Physical Properties of Two Orange Seed Varieties
69.	03:10 am - 03:20 am	**Abdul-Aziz Adam,** Dzigbodi Adzo Doke, Anne Mette Lykke, Rikke Reisner Hansen, Felix Kofi Abagale and Albert Kojo Quainoo	Effect Of Pretreatment and its Duration on Germination and Growth of Adansonia Digitata Seeds from Three Zones in Ghana
	03:20 pm - 3:40 pm	**Questions & Discussion**	
70.	03:40 pm - 03:50 pm	**Justice Opare Odoi,** Rita Ohene Larbi, Elvis Fiam Ameyigabor, Wilson Ba-Era, Phanuel Mawuli Nunekpeku, Richael Odarkor Mills and Matilda Ayim-Akonor	Silent Carriers: Prevalence and Antimicrobial Resistance Profile of ESBL-Producing *Escherichia Coli* Isolated from Local Chickens in Kpone Katamanso Municipal Assembly, Ghana
71.	03:50 pm - 04:00 pm	**Bawah Juliana,** Ansah Terry and Allegye-Cudjoe Emmanuel	Relationship Between Climate Variability and Mortality in Livestock in the Savanna Agro Ecological Zone
72.	04:00 pm - 04:10 pm	**Listowell Aditwin Akologo,** Harrison Kwame Dapaah, Margaret Esi Essifie and Julius Yirzagla	Yield, Productivity and Economic Benefits of Component Crops in a Maize-Cowpea Intercrop System in the Savannah Zone in Ghana
73.	04:10 pm - 04:20 pm	**Sophia Yayra Ganiyu,** Emmanuella Atsufui Mensah and Sefakor A. Ofosuhene	Formulation and Evaluation of a Plant-Based Non-Dairy Milk Blend
74.	04:20 pm - 04:30 pm	**Grace Adzo Motey,** Nana Yaa Asombra Sekyi and Lucy Addico	Microbial Quality and Antimicrobial Resistance of *Escherichia Coli* and *Salmonella* Species Isolated from Spicy Millet Drink (*Zomkom*) Sold in Navrongo
	04:30 pm - 05:00 pm	**Questions & Discussion**	

WEDNESDAY, 24TH SEPTEMBER 2025

AGRICULTURE, FOOD SCIENCE AND FOOD SECURITY

Scientific Session I - Oral

Chairman: Prof. Michael Nii Korle Clottey Time: 02:30 pm – 05:00 pm

Room: 6 (B/A)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
75.	03:50 pm - 04:00 pm	**Sampson Konlan,** Godfred K. Awudzi, Amos Kojo Quaye, Elvis Frimpong Manso, Patricia Adu-Yeboah, Jacob Danso and Moses Kwame Aidoo	Robusta Coffee-Fruit Tree Intercropping Systems Sequester More Carbon and Support Biodiversity
76.	04:00 pm - 04:10 pm	**Miriam Yayra Ameworwor,** Ruby Asmah, Emmanuel Tetteh-Doku Mensah, Acheampong Addo and Adelina Akuamoah-Boateng	Assessing the Aquaculture Potential of Small Reservoirs: A Case of the North-East Region of Ghana
77.	04:10 pm - 04:20 pm	**Solomon Odoi Anim,** Yaw Gyau Akyereko, Maxwell Adu, William Odoom, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Quality and Safety of Cassava Roots Produced from Reclaimed and Non-Mine Sites
78.	04:20 pm - 04:30 pm	**Enoch Sapey,** Shan Yuan, Bingjun Jiang, Kinsley Ochar, Shi Sun and Tianfu Han	CRISPR/Cas9-Mediated targeted Mutagenesis of J/GmELF3 Gene in Soybean delays Flowering Time in Soybean Under Long-Day Conditions and Improves Field Performance Across Diverse Environments
	04:30 pm - 05:00 pm	**Questions & Discussion**	

THURSDAY, 25TH SEPTEMBER 2025

AGRICULTURE, FOOD SCIENCE AND FOOD SECURITY

Scientific Session II - Oral

Chairman: Dr. George A. Ameyaw Time: 08:30 am – 11:00 am

Room: 3 (A)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
79.	08:30 am - 08:40 am	**Deborah Amegatse,** Latif Iddrisu Nasare, Dorothy Wepdam, Fuziema Mbecha, Ebenezer Gafah, Abdulai Fuseini, Tom-Dery Damian and Benjamin K. Badii	Composition and Distribution of Shea Fruit-Infesting Flies (*Tephritidae*) in the Kumbungu District
80.	08:40 am - 08:50 am	**Isaac Kodzo Amegbor,** Gloria Boakyewaa Adu, Kwabena Darkwa, Charles Nelimor, Joseph Adjebeng-Danquah, Richard Oteng-Frimpong, Francis Kusi and Maryke Labuschagne	Genetic Analysis and Carotenoid Composition of Provitamin a Maize Inbreds and Hybrids Under Drought and Low Soil Nitrogen Conditions
81.	08:50 am - 09:00 am	**Beatrice Annerboi,** Yaw Gyau Akyereko, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Air-Frying of Traditional Snacks (*Kelewele*, *Chin-Chin*): A Healthier Alternative
82.	09:00 am - 09:10 am	**Sheila M. A. Tagoe,** Matthew J. Dickinson And Mary M. Apetorgbor	Using Terminal-Restriction Fragment Length Polymorphism (T-RFLP) to Identify Microorganisms Contaminating Oil Palm Fruits and Palm Oil From Processing Mills in Ghana
83.	09:10 am - 09:20 am	**Esther Gyedu-Akoto,** Stephen Y. Opoku And Margaret Aduama-Larbi	Cocoa (*Theobroma cacao*) pulp juice: An Emerging Tropical Fruit Juice for the Beverage Industry in Ghana
	09:20 am - 09:40 am	**Questions & Discussion**	
84.	09:40 am - 09:50 am	**S. M. Abobi,** D.J. Sandow, E.H. Alhassan, E.D. Abarike, D.N. Akongyuure, S.O. Dandi, K. Baidoo and A. Ampofo-Yeboah	Examining the Reproductive Potentials of *Auchenoglanis Occidentalis* in Bontanga Reservoir, Ghana
85.	10:00 am - 10:10 am	**Sheila M. A. Tagoe,** Patience Karbo, Aaron T. Asare and Ephraim Ekloh	Exploring The Efficacy of Four Plant Species on Disease-Causing Organisms of Cowpea *In Vitro*
86.	10:10 am - 10:20 am	**J.A Ayamdoo,** R. A. Atuna, A. Bawa and S. N. Yakubu	Nutritional Composition of Two Dishes of Pearl Millet (Hausa Koko and Zimkom) in Ghana
87.	10:20 am - 10:30 am	**Frederick Ajigetina Avereyireh,** Benjamin Karikari and Lydia Quansah	Mapping of Genomic Regions Associated with Phenological Traits in Soybean (*Glycine max* L. Merr.) using Genome-Wide Association Study in the Guinea Savannah Tropical Zone

88.	10:30 am - 10:40 am	**Georgina Appiah,** Yaw Gyau Akyereko, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Effect of Drying Techniques on the Color and Nutritional Qualities of Ghanaian Butt Cheek Pepper
	10:40 am - 11:00 am	**Questions & Discussion**	

THURSDAY, 25TH SEPTEMBER 2025

AGRICULTURE, FOOD SCIENCE AND FOOD SECURITY

Scientific Session II - Oral

Chairman: Dr. Anokye Acheampong Amponsah Time: 08:30 am – 11:00 am
Room: 4 (A)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
89.	08:30 am - 08:40 am	**Felix Frimpong,** Richard Kofi Peprah, Mary Otiwaa Osei Asante, Believer Norsi, Charles Afriyie-Debrah, Kirpal Agyemang Ofosu, Daniel D. Gamenyah, Yameen Huss Cole, Jacob Kporku, Kenneth Korfietor, Ebenezer Ewusie, Razak Mohammed and Maxwell Darko Asante	Applying Biofertilizers with NPK Enhances Growth and Yield Performance of Rice Under Ghanaian Agroecological Conditions
90.	08:40 am - 08:50 am	**Shamhuna Alidu,** Shirley Lamtey And Gloria Boakyewaa	Location and Planting Date Influence on Fall Armyworm Infestation and Maize Yield in the Guinea and Sudan Agroecological Zones of Ghana
91.	08:50 am - 09:00 am	**George. A. Ameyaw,** Owusu Domfeh and Ebenezer A. Gyamera	Towards Efficient Cocoa Swollen Shoot Virus Disease (CSSVD) Integrated Management in West Africa: The Complementary Role of Sensitive and Reliable Molecular Diagnostic Tools
92.	09:00 am - 09:10 am	**Yaw Gyau Akyereko,** Ryan Osei-Asibey, Dhailly Araba Arkorful, Maxwell Adu, Solomon Odoi Anim, Abena Frimpomaa Abeka, Brown Edward Asare, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Consumer Perception and Quality Characterization of Wild Grasscutter (*Thryonomys Swinderianus*) Digesta
93.	09:10 am - 09:20 am	**Yusif Wilson Ismaela,** Shirley Lamptey and Mustapha Mohammed	Varietal Response of Soybean to Different Rates of Inoculant under Rainfed and Irrigation Systems in Northern Ghana
	09:20 am - 09:40 am	**Questions & Discussion**	
94.	09:40 am - 09:50 am	**Damba Yahaya,** Tawakatu Perigrino Brimah, Mardiya Hakibu, Afi Agbanyo, Mohammed Hafiz, Mbielayim Iddrisu and Osman Abdulai Seidu	Comparative Nutritional Profiling of Traditional and Modified Dawadawa (African Locust Bean) Formulations
95.	10:00 am - 10:10 am	**Yvonne Nyame,** Solomon Kofi Chikpah and Joseph Kudadam Korese	Innovative and Sustainable Processing of Shea (*Vitellaria Paradoxa*) Fruit By-Products into Value-Added Leather: Effects of Gelatin and Hot-Air Drying
96.	10:10 am - 10:20 am	**Mendy, I.,** Amoah, K. O., Achiamaa, A. A. A., Bumbie, G. Z. and Njie, J.	Unlocking the Feed Potential of *Pterocarpus erinaceus*, Anacardium Occidentale, and Gmelina Arborea for Sustainable Livestock Production in The Gambia

97.	10:20 am - 10:30 am	**Yaw Gyau Akyereko,** Faustina Dufie Wireko-Manu, Francis Alemawor and Mary Adzanyo	Nutritional Composition, Antioxidant Activity and Microbiological Quality of Non-Alcoholic Cashew Apple Wine
98.	10:30 am - 10:40 am	**Eric Opoku Mensah**, Hyeonseok Oh, Jeongho Baek and Jiseon Song	Exploring Imaging Techniques for Detecting Tomato Spotted Wilt Virus (TSWV) Infection in Pepper (*Capsicum* Spp.) Germplasm
	10:40 am - 11:00 am	**Questions & Discussion**	

WEDNESDAY, 24TH - THURSDAY, 25TH SEPTEMBER 2025

AGRICULTURE, FOOD SCIENCE AND FOOD SECURITY

Poster Session

Chairman: LOC Time: All Day
Room: Main Room

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
99.		**Mbooso Emmanuel Yennemore,** Yaw Gyau Akyereko, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Effect of Treatment Methods on Oxalate Levels in Taro Leaves (*Colocasia Esculenta* L.)
100.		**Maxwell Adu,** Yaw Gyau Akyereko, Solomon Odoi Anim, Ryan Kusi Osei-Asibey, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Assessment of Food Safety and Hygiene Situations of Tertiary Institutions in Koforidua from the Consumers' Perspectives
101.		**Dzigbodi Adzo Doke,** Raphael B. H. Gameli and Joseph Bandanaa	Evaluation of the Impact of Agroecological Practices on Flora Diversity in the Central Gonja District
102.		**Abdul Rahim Mustapha,** Mahama Alhassan and Oppong E. K.	Investigating Oxalate Content of Some Indigenous Vegetables in the Eastern Region of Ghana
103.		**Latif Iddrisu Nasare,** Peter K. Kwapong, Damian Tom-Dery and Jane C. Stout	Morphological and Phenological Variation of Shea (*Vitellaria Paradoxa*) Flowering in Northern Ghana
104.		**Regina Amoah,** Yaw Gyau Akyereko, Georgina Benewaa Yeboah, Faustina Dufie Wireko-Manu, Agyare L.A. and Coffie-Mawugbe S.E.	Effect of Drying Methods on the Quality Characteristics of Ginger (*Zingiber Officinale*)
105.		**Sampson Konlan,** Jerome Agbesi Dogbatse, Moses Kwame Aidoo, Diana Donkor Ntiamoah, Patricia Adu-Yeboah, Amos Kojo Quaye, Elliot Kwaku Anyidoho, Prince Pobee and Maame Adjoa Segbefia	Growth and Yield Response of Coppiced Robusta Coffee to Application of Different Combinations of Nitrogen and Potassium
106.		**Nancy Nabor,** Zeenatu Suglo Adams, Yaw Gyau Akyereko, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Scaling-Up Shelf-Stable Local Drinks: Industry Perspectives and Challenges
107.		**Abraham Aminanor Teye,** Yaw Gyau Akyereko, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Assessment of Contamination and Extraneous Materials in Peeled and Unpeeled Ready-to-Eat Roasted Peanut Kernels

108.	**Patrick Adjei Mantey,** Yaw Gyau Akyereko, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Quality Characteristics and Consumer Acceptability of Composite Wheat and Orange-Fleshed Sweetpotato Bread
109.	**Ray Adomako Johnson,** Yaw Gyau Akyereko, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Utilisation of Cashew Apple Powder in Bread Production
110.	**Jacob Amenano,** Jacinta Ochere, Churchlife A. Agbetum, Samlafo V. Bobonkey, Emmanuel K. Oppong and Mahama Alhassan	GC-MS Composition of Morinda Lucida Benth and Phytotoxicity Activity of Ethyl Acetate Extracts of the Bark
111.	**M. R. A. Deku,** F. Appiah, I. Idun and D. Atorqui	Effect of Different Ripening Stages and Storage Conditions on the Physico-Chemical Characteristics of Shea (*Vitellaria Paradoxa*) Fruits
112.	**Solomon Kofi Chikpah,** Charles A. Akan-Uge and Joseph Kudadam Korese	Sustainable Processing and Development of Functional Aerial Yam (*Dioscorea Bulbifera*) Flour for Gluten-Free Shortbread Cookies
113.	**Georgina Darkey,** Yaw Gyau Akyereko, Georgina Benewaa Yeboah and Faustina Dufie Wireko-Manu	Development of Herbal Tea from Mango Peels and Other Natural Spices
114.	**Suolo B.B,** Gandaa Z.B and Blege, P. K	Climate Variability and its Effect on the Sustainability of Maize Production in Northern Ghana
115.	**Ray J.K. Adomako,** Stephanie A. Aboagye, Belinda B. Ntow and Jacob K. Agbenorhevi	Valorization of Okra
116.	**Fatima Adam,** Muyiwa Abiodun Okusanya and Samuel Dare Oluwagbayide	Hydroponic Farming: A Modern Way of Addressing Production Constraints of Tomato Farming
117.	**Yaw Gyau Akyereko,** Faustina Dufie Wireko-Manu, Francis Alemawor and Mary Adzanyo	Fermentation Kinetics and Physicochemical Characterization of Non-Alcoholic Wine Produced From Cashew Apple Juice
118.	**Mendy Isack,** Amoah Kwame Owusu, Sottie Edmund Tei, Achiamaa Asafu-Adjaye Koranteng, Bumbie Gifty Ziema, Njie John and Divine Dora	The Nutritive Potential of Fermented Pineapple Pulp Residue (PPR) as a Feed Resource in Livestock Production
119.	**Miriam Yayra Ameworwor,** Ruby Asmah, Emmanuel Tetteh-Doku Mensah, Acheampong Addo and Adelina Akuamoah-Boateng	Assessing the Water Quality of Small Reservoirs in North-East Region of Ghana: Implications for Cage Aquaculture

SCIENCE EDUCATION, POLICY AND PUBLIC PRIVATE PARTNERSHIP

WEDNESDAY, 24TH SEPTEMBER 2025

SCIENCE EDUCATION, POLICY AND PUBLIC PRIVATE PARTNERSHIP

Scientific Session I - Oral

Chairman: Dr. Kwaku Opoku Yeboah Time: 02:30 pm – 05:00 pm

Room: 4 (S)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
120.	02:30 pm - 02:40 pm	**John Ekow Mbir Amoah,** Cosmos Eminah and Sophia Ackorlie	Challenges of Teaching and Learning Biology in Selected Senior High Schools in the Eastern Region, Ghana
121.	02:40 pm - 02:50 pm	**Phyllis Bernice Kwarteng Donkor**	Integrating Education for Sustainable Development across Ghanaian Schools' Curricula
122.	02:50 pm - 03:00 pm	**Ruth Asiamah Ampadu-Daaduam,** Prof. Ruby Hanson, Dr. James Azure and Prof. Sakina Acquah	Integrated Science Teachers Willingness and Attitudes Toward Implementation of the Activity Methods
123.	03:00 pm - 03:10 pm	**Thomas Amatey Tagoe,** and Hephzi Angela Tagoe	Creating a Pipeline of Talent to Feed the Growth of Neuroscience: Lessons from Ghana
124.	03:10 am - 03:20 am	**Ismail Coffie,** Mariam Amponsah, James Kwame Kagya-Agyemang and William Kojo Jima Kwenin	Integrated One Health Approaches to Livestock Disease Surveillance and Control: Fostering Innovation Through Public-Private Partnerships for Enhanced Food Security in Ghana
	03:20 pm - 3:40 pm	**Questions & Discussion**	
125.	03:40 pm - 03:50 pm	**Abotoworo Samuel,** Eric Erebakyere and Dr. Goza Eric Kwam	Investigating the Influence of Teaching Pedagogies on the Spatial Reasoning Abilities of Junior High School Pupils in Krachi East, West and Nkwanta South
126.	03:50 pm - 04:00 pm	**Derrick Kwabena Mintah** and Rama Osei-Bonsu	Engineering Policy and Management in Plastic Waste Management: Bridging Innovation, Governance, and Strategic Impact
127.	04:00 pm - 04:10 pm	**Dominic Mensah,** Emmanuel Kwaku Opoku, Ismail Abdul Kabiru, Paul Beeton Damoah, Patrick Kojo Ahiabor, Dorcas O. Owusu And Matthew G. Addo	The Burden of Comorbidities of HIV, Tuberculosis and Chronic Kidney Disease Among Patients in the Sekyere South Municipal, Ghana
128.	04:10 pm - 04:20 pm	**Nazir Kizzie-Hayford,** Jerry Ampofo-Asiama, Claudia Asantewaa Gyimah, Salifu Seidu-Larry, Rosemond Godbless Dadzie and Gifty Serwaa Otoo	Effects of Non-Use of Weighing Scales on the Retail of Agri-Foods in Some Local Markets in the Cape Coast Municipality of Ghana
129.	04:20 pm - 04:30 pm	**Bismark Ofosu-Bamfo,** Patrick Addo-Fordjour and Ebenezer J.D. Belford	Quantitative Ethnobotany and Ecosystem Services Valuation of Woody Climbing Plants
	04:20 pm - 05:00 pm	**Questions & Discussion**	

WEDNESDAY, 24TH - THURSDAY, 25TH SEPTEMBER 2025

SCIENCE EDUCATION, POLICY AND PUBLIC PRIVATE PARTNERSHIP

Poster Session

Chairman: LOC Time: All Day

Room: Main Room

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
130.		**Ismail Coffie,** Mariam Amponsah, James Kwame Kagya-Agyemang and William Kojo Jima Kwenin	The Use of Innovative Reproductive Technologies and Disease Management Systems Through Strategic Public-Private Partnerships: A Transformative Approach to Sustainable Livestock Development in Ghana
131.		**Yahaya Sumara Sulley** and Lydia Quansah	Innovating Forensic DNA Education in Low-Resource Settings Through a Contextual Toolkit


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WATER RESOURCES MANAGEMENT AND ENVIRONMENTAL SCIENCES

WEDNESDAY, 24TH SEPTEMBER 2025

WATER RESOURCES MANAGEMENT AND ENVIRONMENTAL SCIENCES

Scientific Session I - Oral

Chairman: Dr. (Mrs.) Janice Dwomoh Abraham Time: 02:30 pm – 05:00 pm

Room: 5 (W)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
132.	02:30 pm - 02:40 pm	**Zakaria Sumani,** Abudu Ballu Duwiejuah and Abraham Kusi Obeng	Adsorption of Tetracycline and Metronidazole Residues from Landfill Leachate using Shea Nut Shell Biochar
133.	02:40 pm - 02:50 pm	**Alhassan Sulemana,** Abudu Ballu Duwiejuah and Abraham Kusi Obeng	Moss as a Bioindicator of Toxic Metals in Forest Ecosystems in Tamale Metropolis
134.	02:50 pm - 03:00 pm	**Mary Antwi** and Sandra Yamoah	Spatial Explicit Modeling of the Influence of *Broussonetia Papyrifera* on Soil Properties Within the Tinte Bepo Forest Reserve, Ashanti Region, Ghana
135.	03:00 pm - 03:10 pm	**Gertrude Lucky Aku Dali,** Emmanuel Amookwaw, Ernest Kofi Amankwa Afrifa and Frank Kwekucher Ackah	Home Gardening on a University Campus: Implication for Plant Diversity Conservation and Environmental Sustainability
136.	03:10 am - 03:20 am	**Noel Bakobie,** Helen M. K. Essandoh, Sampson Oduro-Kwarteng and Emmanuel Kwame Appiah-Adjei	Assessment of Human Health Risks from Fluoride, Nitrate and Trace Metals in Shallow Groundwater in Kotei and Moshie Zongo, Kumasi, Ghana
	03:20 pm - 3:40 pm	**Questions & Discussion**	
137.	03:40 pm - 03:50 pm	**Ibrahim Abubakari Imoro,** Wilhemina Asare and Ebenezer Owusu-Sekyere	Insights from Tamale Metropolis on Gender Roles and Dynamics in Solid Waste Management Toward Circular Economy Practices
138.	03:50 pm - 04:00 pm	**Eric Dominic Forson,** Prince Ofori Amponsah and Samuel Nunoob	Groundwater Prospectivity Modeling Using Bivariate Data Driven Approaches Over Ghana's Northeastern Voltaian Basin
139.	04:00 pm - 04:10 pm	**Benjamin Darko Asamoah,** Lily Lisa Yevugah, Lawrence Sheringham Borquaye, Matt Dodd and Godfred Darko	Receptor Modelling, Ecological Risks, and Human Health Impacts of Mercury in Some Ghanaian Topsoils due to Mining and Commercial Activities
140.	04:10 pm - 04:20 pm	**Osei Agyemang Richard,** Precious Twumasi Ankrah, Thomas Apusiga Adongo, Yayra Kwame Agbemabiese And Felix Kofi Abagale	Treatment of Aquaculture Wastewater Using Hybrid Vertical Flow Constructed Wetlands for Agricultural Reuse
141.	04:20 pm - 04:10 pm	**Narcisse Yehouenou,** Charles Lamoussa Sanou, Latif Iddrisu Nasare, Alhassan Lansah Abdulai, Dzigbodi Adzo Doke and Kwame Oppong Hackman	Sustainable Intensification and Biodiversity: ISFM Outperforms Conventional Agriculture for Underground Arthropod Diversity in Northern Ghana
	04:20 pm - 05:00 pm	**Questions & Discussion**	

THURSDAY, 25TH SEPTEMBER 2025

WATER RESOURCES MANAGEMENT AND ENVIRONMENTAL SCIENCES

Scientific Session II - Oral

Chairman: Prof. Ebenezer Owusu-Sekyere Time: 08:30 am – 11:00 am

Room: 5 (W)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
142.	08:30 am - 08:40 am	**Rahmat Asantewaa Aboagye,** Latif Iddrisu Nasare, Amos Amponsah, Damian Tom-Dery and Bernard N. Baatuuwie	Land Cover Patterns and Dynamics of Nyankpala Campus of the University for Development Studies
143.	08:40 am - 08:50 am	**Francis Ninkpel,** Emmanuel Delwin Abarike, and Emmanuel Osman Kombat	Galamsey and Livelihood Disruption: A Case Study of Fishing Households in Banda District, Ghana
144.	08:50 am - 09:00 am	**Zakari Osman,** Gyamfi Charles, Ofosu Samuel-Anim, Boakye Ebenezer and Baatuuwie Bernard Nuoleyeng	Effects of Land Cover Changes on Ecosystem Services and Functions in the Kulpawn River Basin of Ghana
145.	09:00 am - 09:10 am	**Latif Iddrisu Nasare,** Alhassan Issahak, Eric Adjei Lawer, Bernard N. Baatuuwie, Prince Cobbinah, Goerge Dery, William J. Asante and Damian Tom-Dery	Mistletoe Prevalence and Infestation Severity are Influenced by Land Use and Stand Structure in Shea Parklands
146.	09:10 am - 09:20 am	**Michel Dorleku** and Collins Tay	Evaluating the Integrity of Treated Water from the Daboase Plant to Nearby Settlements
	09:20 am - 09:40 am	**Questions & Discussion**	
147.	09:40 am - 09:50 am	**Abdulai Alidu,** Nana Aboagye Acheampong, Abubakari Zarouk Imoro, And Abraham Kusi Obeng	Isolation and Characterization of Plastic, Heavy Metals, and Crude Oil Degrading Fungi
148.	10:00 am - 10:10 am	**Yasmin Alhassan,** Dzigbodi A. Doke, and Margaret Akuriba	Impact of Agroecological Practices on Soil Health in Nabdam, Ghana
149.	10:10 am - 10:20 am	**Nana Kobea Bonso Portia,** Annabelle Opoku, Raymond Webrah Kazapoe, Noah Kwaku Baah, Abass Gibrilla, and Geophrey Kwame Anornu	Uncovering Nonlinear Patterns in Groundwater Pollution Using Variational Autoencoders and Self-Organising Maps: A Case Study from Ghana
150.	10:20 am - 10:30 am	**Wisdom Agartaba Akugri,** Brenda Chalfin and Abdul-Mumeen Iddrisu	Water Storage Polytank Urban Metabolism: A Holistic Approach to Understanding the Nexus Between Microbes, Insects, Plants, and Polytanks
151.	10:30 am - 10:40 am	**Uchua Terkula Donald,** Baatuuwie N. Bernard and Cobbina J. Samuel	Variability of Climatic Factors on Sustainable Rice Production in the Tolon and Kumbungu Districts of Northern Ghana
	10:40 am - 11:00 am	**Questions & Discussion**	

THURSDAY, 25TH SEPTEMBER 2025

WATER RESOURCES MANAGEMENT AND ENVIRONMENTAL SCIENCES

Scientific Session II - Oral

Chairman: Dr. Ernest Sanyare Warmann Beinpuo Time: 08:30 am – 11:00 am

Room: 6 (P/W)

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
152.	09:10 am - 09:20 am	**Noel Bakobie,** Helen M. K. Essandoh, Sampson Oduro-Kwarteng and Emmanuel Kwame Appiah-Adjei	Shallow Groundwater Chemistry and its Implications for Domestic Usage: A Case Study of Kotei and Moshie Zongo Communities in Kumasi, Ghana
	09:20 am - 09:40 am	**Questions & Discussion**	
153.	09:40 am - 09:50 am	**Mawunyo M. Alorwu,** Abena Boakye, Ibok N. Oduro And Ellis W. Otoo	Investigating the use of Plastics by Food Service Providers and Consumers on the Kwame Nkrumah University of Science and Technology (KNUST) Campus
154.	10:00 am - 10:10 am	**Kenneth Agbemehia,** Bernard Nuoleyeng Baatuuwie and Dzigbordi Adzo Doke	Land Use and Land Cover Trends in Sakumo Wetland, Accra-Ghana over the Past 40 Years (1984-2024)
155.	10:10 am - 10:20 am	**Amedio Dininibe Kuunipol,** Alidu Abdulai, Ramadan Danna Zakaria, Farouk Hamdia Neena And Joan Shine Davids	Nanomaterials for Sustainable Remediation of Pharmaceutical Contaminants in Water: A Systematic Review
156.	10:20 am - 10:30 am	**Joseph Payne,** Yakubu Sulemanu, Mustapha Kasim, Doreen F. Tsin, Faustina Ayua, Mahama Japheth, Yakubu M. R. Wumpini, Setor A. Lotsu, Ishawu Alhassan And Abudu B. Duwiejuah	Profile and Characterisation of Culturable Microorganisms from Abattoir Wastewater for Bioremediation Purposes
157.	10:30 am - 10:40 am	**Emmanuel Oppong,** Henry Oppong Tuffour and Awudu Abubakari	Soil and Water Management in Arid Regions of Africa – A Review
	10:40 am - 11:00 am	**Questions & Discussion**	

WEDNESDAY, 24TH - THURSDAY, 25TH SEPTEMBER 2025

WATER RESOURCES MANAGEMENT AND ENVIRONMENTAL SCIENCES

Poster Session

Chairman: LOC Time: All Day

Room: Main Room

NO	TIME	AUTHOR/PRESENTERS	TITLE OF PAPER
158.		**Michael Kwesi Menyah**	Managing Municipal Waste (Litter/Refuse/ Trash) for Recycling Instead of Improper Burning and Indiscriminate Disposal - A Case for Sorting in Small Volumes
159.		**Michael Kwesi Menyah**	Effects of Crimes on Research - Lessons from Personal Experiences and Others
160.		**John Larbi,** Seth Oware, Forson Esther, Asante Bridget, Gyasi Esther, Annor Philip and Gyarteng Sandra	Diversity of Gastrointestinal Helminth Parasites Present in Soils from the Mole National Park of Ghana
161.		**Selasi Dzitse,** Joseph Kwasi Afrifa, Damian Tom-Dery, Latif Iddrisu Nasare, William J. Asante and Bernard N. Baatuuwie	Bird Species Abundance and Richness within Three Community Resource Management Areas in the Western Wildlife Corridor

THE GHANA CHAMBER OF MINES

SUMMARY STATISTICS ON PAYMENTS

Revenue

Total Mineral Revenue	Total Mineral Revenue Returned to the Country	Percentage of Mineral Revenue Returned
$7.05Bn	$4.99Bn	70.8%

Fiscal Payments

Corporate Tax	₵10.3Bn
Mineral Royalties	₵4.89Bn
Employee Income Tax Payments (PAYE)	₵1.46Bn
Dividend	₵1.03Bn
Others (Self-Employed)	₵75.3K
Total Fiscal Payments to the State	₵17.68Bn

The Mining sector is the largest Tax contributor in Ghana

Local Expenditure

$2.86Bn
Payments for Goods and Services (excluding diesel and electricity)

$370.4M
Payments for Diesel

$264M
Payment for Electricity

$3.5Bn
Total Expenditure

Other Big-Ticket Expenditure

Capital Expenditure (Capex)	Expenditure on imported consumables	Amortising of loans, including interest payments
$973M	$241M	$111.3M

Social Investment Spending

$28M
Expenditure on Corporate Social Investment

358,218 ounces of gold
were sold to the Bank of Ghana under its Domestic Gold Purchase Programme by the Chamber's producing member companies

Human Resource

Number of Ghanaians in Direct Employment
11,303

Number of Expatriates in Direct Employment
69

Compensation to Employees of Producing Member Companies
$615M

Share of Expatriates in Total Direct Employment
0.6%

Total Direct Employment - 11,372

Scan for 2024 Ghana Mining Industry Performance

Data Source: Ghana Chamber of Mines (2025), Ghana Revenue Authority (2025), Ministry of Finance (2025) | Phone: (0)302-516170 | Email: chamber@ghanachamberofmines.org

FULL ABSTRACTS

1. *PLASMODIUM* PARASITE SMEAR STAINING POTENTIAL OF PLANT-BASED EXTRACTS OF *HIBISCUS SABDARIFFA, SORGHUM BICOLOR* AND *DANIELLIA OLIVERI*

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Abstract
Traditional synthetic dyes are known to be effective and faster in colouring biological samples but pose environmental and health risks. Cells need to be fixed and stained to increase visibility and the appearance of morphological features. This study was carried out to investigate the potential of plant-based dyes for the staining of *Plasmodium* parasite blood smears. Six plantdye extracts were prepared from *Hibiscus sabdariffa*, *Sorghum bicolor* and *Daniellia oliveri* using water (aqueous) and methanol as separate solvents, and the concentrated extracts were reconstituted in phosphate buffered saline solution (PBS) at 70 mg/mL for the staining. Thin smears from a 3D7 culture were prepared and stained with the extracts for 15 minutes, and Giemsa-stained uninfected RBCs and iRBCs used as negative and positive controls respectively. All six extract-dyes successfully stained the red blood cells. However, the parasites were stained by all but the methanolic extracts of the H. sabdariffa and aqueous extracts of S. bicolor. Among the four extracts that successfully stained the parasites, aqueous extracts of Hibiscus sabdariffa (sobolo leaves) offered the best staining potential, comparable to the Giemsa stain. The findings of this study provide a promising potential for the consideration of these plant extracts as safer alternative stains to Giemsa stain.

Keywords: Giemsa staining, *Plasmodium* parasites, malaria, *Hibiscus sabdariffa*, *Sorghum bicolor* and *Daniellia oliveri*

2. ISOLATION AND CHARACTERIZATION OF INDIGENOUS FUNGI AND SUBSTRATES FOR THE PRODUCTION OF MYCELIUM-BASED LEATHER

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Abstract
Mycelium leather is a sustainable alternative to synthetic and bovine leather made from fungi, helping reduce the carbon footprint of the leather industry. Although this product is increasingly gaining popularity in the Global North, it remains underexplored in the Global South, particularly in Africa, where its feedstocks are abundant. Thus, this study sought to isolate and characterize indigenous fungi and substrates for the sustainable production of mycelium-based leather. Fungi were isolated from dumpsites and farmlands within the Tolon District and identified by both morphological and molecular techniques. Cellulose-degrading ability of fungi was assessed on carboxymethyl cellulose using the substrate degradation assay. Various agar-based media were formulated to assess their impact on mycelium production. A total of thirteen isolates were obtained and were distinctively identified as Rhizopus delemar, Trametes polyzona, Epicoccum sorghinum and Rhizopus sp. Although E. sorghinum emerged as the most performant cellulolytic fungi (enzymatic index >2), Rhizopus spp. recorded the fastest growth rate on PDA. Out of ten (10) media formulations, PDA proved to be the best growth medium for producing and harvesting mycelium from R. delemar. Findings from this study suggest the possibility of mycelium leather production locally from indigenous fungi, offering a sustainable and eco-friendly alternative to animal leather for the manufacture of leather-based products.

Keywords: Fat, fiber, rats, blood, and organs.

3. CUTICULAR HYDROCARBON PROFILE OF Bactrocera dorsalis FROM GHANA: IMPLICATIONS FOR POPULATION STRUCTURE

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Abstract
This study investigates the cuticular hydrocarbon (CHC) profiles of Bactrocera dorsalis, an invasive fruit fly pest, across four Agro-ecological zones in Ghana: Coastal Savannah, Forest, Transition, and Guinea Savannah. We used solvent extraction with hexane and Gas Chromatography-Mass Spectrometry (GCMS), Principal Component Analysis (PCA) and t-distributed stochastic neighbour embedding (t-SNE) were used to analyse the data. We identified a total of 54 hydrocarbons, including both saturated and unsaturated compounds. The analysis revealed indistinctive qualitative variations in CHC profiles among the different ecological zones, with seven hydrocarbons exclusively present in the Coastal Savannah zone. A heat map was used to visualize the data. The data demonstrated distinct clustering patterns, indicating chemical differentiation correlating with ecological origins. A dendrogram further supported population structuring, showing clear relationships among samples from different ecological zones. These findings suggest that CHC profiles are influenced by local environmental conditions and can serve as reliable markers for distinguishing populations based on their Agro ecological zones. The study highlights the importance of understanding CHC composition for developing targeted pest management strategies tailored to specific ecological contexts. Future research should focus on the functional roles of specific hydrocarbons in adaptation and communication and explore the potential for using CHC profiles in integrated pest management programs.

Keywords: Insect chemical ecology, Intraspecific variation, Invasive species, Fruit fly, Tephritidae

4. RETROSPECTIVE MALARIA RAPID DIAGNOSTIC TEST OUTCOME OF CLINICALLY CONFIRMED MALARIA PATIENTS AND ITS ASSOCIATION WITH PARASITAEMIA AND FULL BLOOD COUNT INDICES

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Abstract
Malaria Rapid Diagnostic Tests (RDTs) are widely used for prompt diagnosis, to inform treatment of malaria, especially in resource-limited settings. However, the growing threat of Histidine-Rich Protein 2 (HRP2) gene deletion in Plasmodium falciparum parasites and emergence of substandard RDTs poses a risk to the accuracy and performance of HRP2-based RDTs. Considering that HRP2-based RDTs are the most commonly used in Ghana, there is a need to continuously evaluate their diagnostic performance. In line with the foregoing concern, this study evaluated the performance of a HRP2-based malaria RDT using plasma from clinically confirmed malaria patients. A cross-sectional study was carried out at the Tamale Teaching Hospital to recruit 255 clinically confirmed malaria patients (microscopy positive parasitaemic patients) between the ages of a day old to 88 years. Venous blood samples were collected from adults and older children, and heel-prick samples from neonates. Portions of the blood were used to run Full Blood Count (FBC) and remain used to prepare thick and thin smears for microscopy and plasma separation. The plasma was used to test Pf/Pan combo RDT to retrospectively confirm the malaria diagnosis of the patients. The aggregated RDT positives were only 40 individuals (15.7%), with a higher proportion reacting positively to the Pan band (35/255, 14.5%) compared to the Pf band (30/255, 11.8%). The Pan/Pf dual positives were 27 (10.6%), 10 individuals (3.9%) reacted positively to Pan only, and only 3 (1.2%) samples were Pf mono positive. A significantly higher parasitaemia was observed among the RDT positive compared to the RDT negative individuals (p<0.0001). In contrast, all FBC indices but eosinophils and basophils were significantly lower in those with the positive RDT test. Our results suggest that most clinical or symptomatic malaria cases might not be detectable by malaria RDT, and that most clinical malaria cases are likely caused by mixed infections. Altogether, the findings indicate a potential risk of under-detection of malaria cases in areas where RDT is solely used for malaria diagnosis.

Keywords: HRP2 gene deletion, Malaria RDT, Tamale Teaching Hospital

5. ASSOCIATION BETWEEN DIETARY DIVERSITY AND MICRONUTRIENT INTAKE ADEQUACY OF WOMEN OF CHILDBEARING AGE IN NANTON DISTRICT, GHANA

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Abstract
Adequately diversified diets supply sufficient levels of micronutrients, supporting good health and fertility. This study aimed to determine the association between dietary diversity and micronutrient intake adequacy of women of childbearing age (WCA) in Nanton District of Ghana. A stratified multi-stage random sampling technique was used to select 403 non-lactating and non-pregnant WCA. Data was collected on socio-demographic characteristics, dietary intake, knowledge, attitude and practices on micronutrients of respondents. Minimum dietary diversity–women (MDD-W) indicator was derived as consumption of 5 food groups. Mean Adequacy Ratio (MAR) was calculated as the arithmetic mean of the nutrient adequacy ratios of eleven micronutrients assessed, and an indicator variable constructed based on the median MAR. Multivariable binary logistic regression analysis was fitted to determine the association of MDD-W with MAR of respondents. The mean age and dietary diversity score of the respondents were 31.1 ± 8.31 years and 5.87 ± 1.16 respectively and 89.1% of the respondents achieved MDD-W. The median MAR of the 11 micronutrients assessed was 0.78 (Interquartile range: 0.68, 0.87). We did not find evidence of an association between MDD-W and MAR in this study population (AOR = 2.25, $p < 0.173$) but consumption of dark-green leafy vegetables (AOR = 6.90; $p < 0.001$); meat, poultry and fish (AOR = 3.50; $p < 0.001$); and other fruits (AOR = 1.68; $p = 0.037$) were associated with MAR. There was no evidence of an association of dietary diversity with adequacy of micronutrient intake, but consumption of specific food groups was associated with MAR in this study population. Women should consume a variety of food groups to ensure micronutrient adequacy.

Keywords: Minimum Dietary Diversity-Women, Mean Adequacy Ratio, Women, Nanton, Ghana

6. ROLE OF RETINOL BINDING PROTEIN 4 (RBP4) IN THE DEVELOPMENT OF TYPE 2 DIABETES IN A GHANAIAN POPULATION

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Abstract
Type 2 diabetes mellitus (T2DM) is a complex multifactorial metabolic disorder characterized by insulin resistance and impaired insulin secretion. Recent studies have mentioned the potential role of retinol binding protein 4 (RBP4) in the development of metabolic disorders. High RBP4 levels have been associated with insulin resistance, obesity and metabolic syndrome which are all precursors of T2DM and cardiovascular diseases. This study evaluated the association between RBP4 levels and the development of T2DM using well characterizedcohorts at the diabetic clinic at the Tamale Teaching Hospital, Ghana. A total of 105 participants were grouped into four categories; T2DM + Hypertension, T2DM, Prediabetes (PD) and Controls. 5ml of fasting blood samples were drawn from the participants into fluoride and EDTA tubes. RBP4 levels were measured using Q-Plex Human Micronutrient v2 Elisa. The analysis showed a statistically significant difference ($p < 0.05$) in RBP4 levels between T2DM and PD groups and between T2DM + Hypertension and PD groups. Specifically, the PD had higher RBP4 levels as compared to the other groups. The findings suggest that elevated RBP4 levels may be associated with the progression of glucose metabolism disorders, from prediabetes to T2DM. Low levels of RBP4 seen in T2DM and T2DM + Hypertension groups may be due to the usage of hyperglycemic drugs. Further research is needed to explore the potential role of RBP4 in insulin resistance which is the leading cause of T2DM.

7. ASSESSMENT OF MICROBIAL QUALITY OF DISHWARE USED BY STUDENTS IN SELECTED HOSTELS AT THE UNIVERSITY FOR DEVELOPMENT STUDIES

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Abstract
Foodborne illnesses caused by microbial contamination remain a global public health challenge, particularly in environments with inadequate hygiene practices. In Ghana, university students use dishware that may be exposed to unsanitary conditions. This study assessed the microbial quality of dishwares used at the University of Development Studies, Nyankpala campus, and examined their handling approaches. The research alligns with SDG 2 by by addressing food safety concerns, SDG 3 by promoting healthier living and SDG 4 by advocating for health education. A mixed-methods design was employed. Structured questionnaires (n = 244) gathered data on students' knowledge and practices related to dishware hygiene from three hostels: all male, all female and mixed gender. Microbial analyses were performed on dishware swabs (n = 61) and ambient indoor air samples (n = 61). Although majority (52.50%) of students demonstrated awareness of microbial risks, poor handling practices were observed, including the reuse of washing (57.40%) and rinsing (56.10%) water and reliance on unwholesome water sources such as (37%) dams. Microbial loads in male and mixed hostels exceeded the recommended thresholds. The highest mean dish plates microbial load was recorded in the male hostel (7.73 log10 cfu/ml) while that of ambient indoor air was observed in the mixed hostel (2.82 log10 cfu/hr). These findings reveal a significant gap between knowledge and practice, highlighting the need for targeted interventions. The study recommends sustained hygiene education, improved access to clean water, and better sanitation observation in such facilities to mitigate foodborne illness risks and foster healthier safer learning environments.

Keywords: Microbial contamination, food safety, hygiene practices, SDGs, dishware

8. INFLUENCE OF VAGINA MICROBIOME ON THE REPRODUCTIVE HEALTH OF WOMEN OF CHILD-BEARING AGE IN THE TOLON DISTRICT

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Abstract
The vagina hosts a complex ecosystem known as the vaginal microbiome, comprising various microorganisms, including bacteria, fungi, and viruses. It primarily consists of commensal species that humans acquire at birth, which maintain a harmonious relationship with the host. However, changes in pH, hormones, socio-cultural conditions or antibiotic abuse can alter these microorganisms, thereby leading to infections. An imbalance in this microbiome can result in serious gynecological issues, such as pregnancy loss, spontaneous bleeding and infertility. Globally over 175 million women are diagnosed with gynecological diseases. This research was conducted to investigate the vagina microbiome of women, and to assess the impact on their reproductive health. This was a cross-sectional study conducted in the Tolon District among adult women. Gram staining and microscopy were used in conjunction with CHROMagar orientation for isolation and identification. In all 72 women were recruited with mean age of 32.21 ± 10.90 (p = 0.0362). About 90% of the women were farmers with rest been traders. A prevalence of 14% was recorded for yeast infection among participants, with the younger age group (18-27 years) having the highest prevalence. Molds were identified in few of the participants (1.5%). Different bacteria species identified were *Staphylococcus* species, *Bacillus spp*, *E. coli*, *Klebsiella*, *Enterococcus*, and *Acinetobacter*. Generally, Bacillus spp were the most predominant among the various bacteria groups. This research will contribute to the management and treatment of microbial genital complications among women especially in the Tolon district of Ghana.

9. EPIDEMIOLOGICAL TRENDS OF SCHISTOSOMIASIS IN OFORIKROM MUNICIPALITY, GHANA

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Abstract
Water and Schistosomiasis, presents serious public health issues worldwide, particularly in sub-Saharan Africa. Despite efforts to manage this disease, Ghana, a known endemic nation, continues to experience recurrent cases. This study examined the prevalence and ten-year trend of schistosomiasis in Ghana's Oforikrom Municipality in the Ashanti Region. A retrospective review of hospital records was conducted for the years 2014-2023. Information on all identified cases of schistosomiasis was gathered from three major medical facilities in Oforikrom: Graceland Hospital, Aninwa Medical Centre, and University Hospital, KNUST. SPSS version 20 was used to analyse the records for demographic patterns and temporal trends, and chi-square tests were used for group comparisons. The study reported an overall prevalence of Schistosomiasis to be 15.7% within the ten years, with substantial facility-specific variations (18.1% at KNUST Hospital, 17.3% at Aninwa, and 11.5% at Graceland; χ^2=23.816, p=0.006). There was a small gender predominance, with 51.1% of cases being female and 48.87% being male. Prevalence was higher (45.3%) occurred in older participants (aged >15 years), followed by children aged 5–10 (20.7%) and 11–15 (20.8%), with children under the age of 5 having the lowest percentage (13.2%). Annual case trends peaked in 2022 and generally indicated an upward trend. Transmission was probably impacted by environmental variables such as seasonal flooding and reliance on exposed water sources. Due to their frequent exposure to tainted water, school-aged children and adult women were found to be particularly vulnerable, highlighting the necessity of focused interventions to lower transmission in these high-risk groups.

Keywords: Schistosomiasis, Endemic, Parasite, Prevalence, Trend

10. EVALUATION OF ANTIFUNGAL ACTIVITY OF MODIFIED LOW MOLECULAR WEIGHT CHITOSAN WITH PLANT EXTRACTS AGAINST PLANT PATHOGENIC FUNGI IN VITRO

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Abstract
Fungal pathogens pose a threat to vegetable yields; chemical fungicides are useful but harmful, showing the need for sustainable disease control alternatives. The study aimed to evaluate the antifungal activity of low molecular weight chitosan (LMWCS) modified with ethanol extracts of *Moringa oleifera* and *Azadirachta indica* (neem) seeds against three plant-pathogenic fungi isolated from tomato and pepper plants: *Mucor indicus*, *Rhizomucor* spp., and *Mucor* spp., under in vitro conditions. Phytochemical analysis showed Moringa and Neem seed extracts contain alkaloids, flavonoids, tannins, terpenoids, and glycosides; Neem had higher alkaloid and glycoside, while Moringa had higher flavonoid and saponin levels. Using modified low molecular weight chitosan (MLMWCS) at 50 and 100 ppm in combination with seed extracts at 5%, 10%, and 20%, antifungal activity was evaluated using agar well diffusion and poisoned food techniques. Results showed that modified LMWCS exhibited significant variation ($p<0.05$) in inhibition of fungal mycelial growth compared to unmodified LMWCS and controls. Among treatments, LMWCS 100 ppm with 20% Neem extract ($LMWCS_{100}N_{20\%}$) recorded the highest inhibition against *Mucor indicus* (71.05% and 48.33% inhibition in agar well diffusion and poisoned food techniques, respectively) and *Rhizomucor* spp. (60.83% and 73.44% inhibition). Similarly, LMWCS 100 ppm with 20% Moringa extract ($LMWCS_{100}M_{20\%}$) exhibited strong inhibition against *Mucor* spp., with 58.92% and 49.92% inhibiting, respectively. Unmodified LMWCS at 100 ppm showed strong antifungal activity, with inhibition percentages of 72.52% and 75.35% for *Mucor indicus*. The findings indicate that modified LMWCS with Neem and Moringa extracts enhances antifungal activity, showing potential as an eco-friendly alternative to synthetic fungicides.

Keywords: Mycelial growth; biocontrol agent; *Moringa oleifera;* low molecular weight chitosan; *Azadirachta indica*

11. DIETARY PATTERNS AND THEIR ASSOCIATED FACTORS AMONG WOMEN OF CHILDBEARING AGE IN RURAL COMMUNITIES OF NANTON DISTRICT, GHANA

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Abstract
Urbanization, market integration, and changing lifestyles are shifting consumption patterns towards processed foods in resource poor countries. The primary objective of this study was to identify the dietary patterns and their associated factors among women of childbearing age (WCA) in the Nanton District of Ghana. A stratified multi-stage random sampling was used to select 403 WCA in the Nanton District. The dietary intake data of respondents were collected using a 24-hour dietary recall. Using 14 food groups, Principal Component Analysis identified the dietary patterns. Multivariable binary logistic regression analysis was used to determine the factors associated with dietary patterns. The mean age of the respondents was 31.1 ± 8.3 years. Five distinct dietary patterns, namely: "dairy and plant-based", "sea foods and vegetables", "energy-dense", "animal foods and soft drinks", and "sweet taste" diets were identified. The regression analysis identified fair [AOR = 1.87 (95% CI: 1.15, 3.05), p = 0.011], and good [AOR = 2.52 (95% CI: 1.52, 4.18), p < 0.001] micronutrient practice, and Minimum Dietary Diversity-Women (MDD-W) [AOR = 2.04 (95% CI: 1.02, 4.09), p = 0.045] as determinants of "sweet taste" dietary pattern. Also, MDDS-W was identified as a determinant of "dairy and plant-based" dietary pattern [OR = 2.10 (95% CI: 1.09, 4.05), p = 0.027] and "energy-dense" dietary pattern [OR = 0.39 (95% CI: 0.20, 0.77), p = 0.007]. Dietary diversity and micronutrient practice were identified as the determinants of specific dietary patterns. While "energy-dense" and "dairy and plant-based" dietary patterns were associated with dietary diversity, "sweet taste" dietary pattern was associated with both dietary diversity and micronutrient practice.

Keywords: Dietary patterns, Dietary diversity, Determinants, Women, Nanton

12. FORMULATION AND EVALUATION OF MOSQUITO REPELLENT POTENTIAL OF NEEM SEED OIL-BASED SOAP

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Abstract
Mosquito-borne illnesses, the most well-known of which is malaria, are among the major causes of human deaths worldwide. Vector control is a very important part of the global strategy for management of mosquito-associated diseases, and insect repellent application is the most important component in this effort. The rising cost of mosquito repellents, the possible toxicity and detrimental effects on the environment have rekindled the desire for affordable, ecologically friendly mosquito repellents. In line with such efforts, this study explored the mosquito-repellent potential of neem seed oil-based formulated soap. The neem seed oil was extracted using indigenous or local extraction method and mixed with a commercial vegetable oil to formulate a soap with 15% neem seed-oil content, using the indigenous black soap formulation processes. Ten (10) pieces of neem seed oil-based soap and 10 pieces of similarly formulated soap without neem oil (control soap) were then given to 20 volunteers in a blinded experiment to evaluate their mosquito-repellent potential. Only two of the 10 volunteers (20%) provided with the neem seed oil-containing soaps reported no protection from mosquito bites after bathing with the soaps. All the remaining 8 volunteers (80%) were reportedly protected against mosquito bites after bathing with the soaps. None of the volunteers that bathed with the control soap observed any protection against mosquito bites. The findings demonstrate a promising potential of how a simple soap containing neem oil could serve as an affordable bio-repellent that could mediate protection against mosquito bites and argument mosquito-borne disease, such as malaria control efforts, especially in rural communities.

Keywords: Neem seed oil, bio-insecticide, mosquito-repellent, black soap, Nyankpala

13. KINETICS AND FLUCTUATIONS OF HOLOTRANSCOBALAMIN ACROSS MALARIA DISEASE STAGES IN GHANAIAN CHILDREN

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Abstract
Holotranscobalamin (HoloTC), the biologically active form of vitamin B12, plays an important role in supporting immune function, cellular metabolism, and neurodevelopment. Its clinical relevance as a metabolic biomarker in infectious diseases such as malaria remains underexplored, particularly in children. This study assessed the variation in HoloTC levels across different malaria disease states: symptomatic infection, spontaneous parasite clearance, and asymptomatic carriage. HoloTC concentrations were measured using plasma samples collected at baseline and follow-up time points for each group. In the symptomatic group, HoloTC levels declined significantly from baseline to the symptomatic stage (mean difference = 13.6 fmol/L; p = 0.005). For individuals who spontaneously cleared infection, HoloTC increased from 48.4 fmol/L to 114.2 fmol/L, although this change was not statistically significant (p = 0.224). Among asymptomatic individuals followed at Months 1, 2, and 3, HoloTC levels remained largely stable over time with no significant change observed across the visits. Correlation analyses revealed strong associations between baseline and early follow-up values, which diminished over longer time intervals. These findings suggest that HoloTC may be sensitive to the inflammatory and metabolic stress of symptomatic malaria, with potential recovery following spontaneous clearance. However, stability in asymptomatic children indicates metabolic homeostasis in the absence of clinical disease. Routine monitoring of HoloTC may provide early insights into disease progression and recovery during malaria infection.

Keywords: Holotranscobalamin, Vitamin B12, Symptomatic, Asymptomatic, Spontaneous Clearance

14. SERUM IRON AND INFLAMMATORY BIOMARKERS AMONG PREGNANT WOMEN STRATIFIED BY MALARIA AND ANAEMIA STATUS

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Abstract
Asymptomatic *Plasmodium* falciparum infection during pregnancy poses significant risks to both maternal and neonatal health. This study aimed to determine whether concentrations of serum ferritin, soluble transferrin receptor (sTfR), C-reactive protein (CRP), and α-1 acid glycoprotein (AGP), vary with malaria and anaemia status among pregnant women. A cross-sectional study was conducted during both rainy and dry seasons. Malaria status was determined by PCR, haemoglobin levels were assessed, and serum levels of ferritin, sTfR, CRP, and AGP were measured. Pregnant women were grouped into four disease phenotypes: (i) No Malaria + No Anaemia, (ii) Malaria + Anaemia, (iii) Malaria + No Anaemia, and (iv) No Malaria + Anaemia. Anaemia prevalence was 68.4% in the dry and 75.2% in the rainy season. Malaria prevalence was 48.8% and 43.9% in the dry and rainy seasons respectively. Mean levels of sTfR, ferritin, CRP, and AGP were higher in malaria-infected groups, particularly those without anaemia, although differences were not statistically significant ($p > 0.05$ for all biomarkers). The combination of malaria and anaemia was associated with elevated inflammatory and iron-related biomarker levels. This study underscores the high burden of anaemia and malaria in pregnancy and their likely synergistic impact. Though not statistically significant, biomarker patterns suggest a possible link between anaemia and inflammation in malaria-endemic settings.

Keywords: Asymptomatic malaria, serum iron, inflammatory biomarkers, Anaemia

15. SEROPREVALENCE OF HEPATITIS B AND BURDEN OF ANAEMIA AMONG PREGNANT WOMEN VISITING AKATSI SOUTH MUNICIPAL HOSPITAL FOR ANTENATAL CARE

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Abstract
Prevention of mother-to-child transmission (PMTCT) of infections such as hepatitis B virus (HBV) is a World Health Organization (WHO) priority implemented through antenatal care (ANC) services. This retrospective study assessed the seroprevalence of HBV and the burden of anaemia among pregnant women attending ANC at the Akatsi South Municipal Hospital between January 2024 and June 2025. A total of 1,969 pregnant women were screened for HBV using HBsAg rapid diagnostic tests. A subset of 308 clients was further evaluated for anaemia and sickle cell disease using full blood count (FBC) via the ABX Micros ES 60 Automated Hematology Analyzer, and sodium metabisulphite reducing method, respectively. Anaemia was defined as haemoglobin (Hb) <11.0 g/dL and classified as mild (10.0–10.9 g/dL), moderate (7.0–9.9 g/dL), or severe (<7.0 g/dL). The HBV seroprevalence was 3.1% (61/1969). Among the 308 clients assessed for anaemia, 13.0% (40/308) of HBV-positive women were anaemic (4.9% mild anaemia, 7.8% moderate anaemia and 0.3% severe anaemia), while 53.2% (164/308) of HBV-negative women were anaemic (19.5% mild anaemia, 32.1% moderate anaemia and 1.6% severe anaemia). Sickle cell positivity was 2.3% among HBV-positive clients and 7.1% among HBV-negative clients. The study highlights a measurable HBV burden and high anaemia prevalence among pregnant women. Routine HBV and anaemia screening at ANC facilities ensures early interventions for both maternal and neonatal health through PMTCT and supportive care strategies.

Keywords: Seroprevalence, Hepatitis B infection, Anaemia, PMTCT

16. COMPARATIVE GENOTYPIC EXPRESSION OF T CELL EXHAUSTION MARKERS IN CHILDREN WITH MALARIA, DIARRHOEA AND MALARIA-DIARRHOEA COINFECTION

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Abstract
T cell exhaustion can markedly hinder the immunological response in both malaria and diarrhoea. The surge of inhibitory receptors, such as PD-1, LAG-3, CD244, and CTLA-4 on T cells leads to the downregulation of activation markers and the impairment of effector cytokine production. In this study, we compared the genotypic expression of T cell exhaustion markers in children with either malaria, diarrhoea, or malaria-diarrhoea coinfection. Blood samples were taken from clients with confirmed malaria, diarrhoea, and both conditions (malaria and diarrhoea). Control samples were taken from healthy clients. Peripheral blood mononuclear cells were isolated from whole blood, RNA extracted, and cDNA synthesised. Polymerase chain reaction was performed using targeted exhaustion marker primers. A gel electrophoresis was run, and the amplicons were visualised using a gel illuminator. The expressed genes were quantified using ImageJ software, and statistical analysis was performed with GraphPad Prism. Generally, the exhaustion markers were significantly lower in the control groups compared to the diseased groups. In the malaria-only group, the expression of CD244, LAG-3, and PD-1 was considerably higher compared to the control. However, there were inconsistencies in the expression of CTLA-4. Compared to the control groups, CD244, PD-1, and LAG-3 were less expressed in diarrheal cases, while inconsistent observations were made in malaria cases with diarrheal presentation. Our findings suggest that T cell exhaustion plays a role in the pathogenesis of malaria and diarrhoea cases. Further investigations are required to establish the roles of these exhaustion markers in malaria and its associated presentation, particularly in children.

Keywords: T Cell Exhaustion; Malaria; Diarrhoea

17. ASSESSMENT OF PHENOTYPIC CHARACTERISTICS OF INDIGENOUS CHICKEN IN NORTHERN GHANA

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Abstract

Indigenous chicken populations are crucial for household economies and food security in rural Northern Ghana, yet detailed data on their phenotypic characteristics are limited. This study aimed to evaluate the morphological variability of indigenous chickens across the five regions of Northern Ghana. The survey was conducted by sampling 150 farmers and 1000 indigenous chickens from the Upper East, Upper West, Northern, Savannah, and North East regions. Live body weight and various morphological measurements (including wingspan, body length, chest circumference, shank length, wattle length, thigh circumference) were recorded. Qualitative traits, such as plumage colour, comb type, and skin colour, were also observed. Data was analysed using statistical methods including GLM, correlation, and path analysis. Morphological characterization revealed that region significantly influenced nearly all quantitative traits, including live body weight and linear body measurements, underscoring the impact of geographical location. Chickens from the Savannah region exhibited the highest body weight and largest dimensions, while those from the Northern region were lighter but had longer shanks. Comb size was a major determinant of overall body size, with larger-combed chickens consistently showing greater weight and dimensions. Sex significantly affected shank length and wingspan, indicating sexual dimorphism in those traits. A strong association was observed between sex and skin colour. Path analysis identified chest circumference and body length as the most influential direct predictors of live body weight, highlighting their importance in breeding programs. These findings emphasize the importance of considering environmental and genetic factors in breeding programs to ensure resilient and sustainable local poultry production.

Keywords: Morphological Variability, Live Body Weight, Quantitative Traits, Qualitative Traits, Body Measurements, Plumage Colour, Skin Colour.

18. AMELIORATIVE EFFECTS OF *Senna siamea* LEAF DECOCTION IN LOPERAMIDE-INDUCED CONSTIPATED RATS

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Abstract

This study assessed the ameliorative effects of *Senna siamea* leaf decoction (SSLD) in constipated rats. Twenty (20) Albino rats were randomly assigned to four treatments (T) with five replications. The rats received the treatments as follows: T_1 (normal saline), T_2 (0.75 mg of loperamide in 5ml of water; 5 mg/kg BW) to induce constipation, T_3 (5 ml of SSLD; 33.33 g/kg BW), T_4 (0.75 mg of loperamide in 5ml of water of 5 mg/kg BW plus 5 ml of SSLD; 33.33 g/kg BW). The variables measured were feed intake, water intake, fecal pellets, fecal moisture, kidney and liver morphology. The results indicated that there was no impact on feed and water intake during the period of constipation. While SSLD increased ($p < 0.05$) feed intake it reduced water intake. The constipated-induced rats (T_2) recorded a higher ($p < 0.05$) water intake and fewer fecal pellets compared to the control. Treatments 2, 3, and 4 recorded lower seral urea ($p < 0.05$) compared to the control. Treatments 3 and 4 recorded more ($p < 0.05$) fecal pellets. The least fecal moisture ($p < 0.05$) was observed in T_2. No differences were observed in the liver function parameters among the treatments. The morphology of the kidney and liver tissues showed normal architecture among the treatments. Overall, the findings suggest that SSLD may have a laxative effect in constipated Albino rats.

Keywords: *Senna siamea* leaf, decoction, constipation, and rats

19. AMELIORATIVE EFFECT OF BASIL LEAVES EXTRACT (*Ocimum basilicum*) ON GROWTH, HEMATOLOGY, SERUM BIOCHEMISTRY, AND ORGAN HISTOLOGY IN MALE ALBINO RATS FED HIGH DIETARY FAT

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Abstract
the risks posed on body weight, haematology, lipid profile, and the histology of the liver and kidney from the intake of high levels of fat. Twenty-four (24) male Albino rats were randomly assigned to four treatments in a 2 x 2 factorial arrangement in a completely randomized design. The factors were dietary fat (normal or high) and basil leaf extract (no or yes). The results indicated that rats on a high-fat diet without basil extract had higher weight gain ($P < 0.05$) by d 56. In contrast, rats on the high-fat diet with BLE had lower ($P < 0.05$) weight gain. There was an increase in Red Blood Cell count associated with BLE plus high fat. The BLE increased ($P < 0.05$) HDL-C levels but did not affect VLDL-C levels. High fat plus BLE reduced ($P < 0.05$) Total Bilirubin, AST, GGT, and ALP levels. The BLE was associated with low ($P < 0.05$) serum creatinine, urea, and BUN levels. High fat plus no BLE led to fatty infiltration, swollen hepatocytes, and inflammation in liver and kidney tissues while high fat with BLE showed reduced fatty infiltration and inflammation. In Summary, the findings suggest that BLE might be effective in lowering body weight and reducing the adverse effects of high intake of dietary fat.

Keywords: Basil leaves, dietary fat, lipid profile, hematology, Serum, kidney and liver.

20. THE IMPACT OF BITTER LEAVES ON THE REPRODUCTIVE PERFORMANCE OF ALBINO RATS FED HIGH-FAT DIET

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Abstract
This study investigated the interactive effects of dietary fat and bitter leaf extracts (BLE) on body weight, hematological and biochemical parameters, and reproductive health in Albino rats. Twenty-four (24) male Albino rats were randomly assigned to four treatments in a 2 x 2 factorial arrangement in a completely randomized design. The factors were dietary fat (standard or high) and BLE (no or yes). Body weight, hematological and biochemical parameters, lipid profiles, reproductive health indicators, and sperm quality were assessed. The rats fed high fat had higher ($p < 0.05$) weight gain than those not given BLE. However, rats on the high - at plus BLE gained less ($p < 0.05$) weight. The rats on a high fat had higher ($p < 0.001$) levels of triglycerides (TG) and total cholesterol ($p < 0.001$) levels. The ALT and AST were higher in rats on the high fat without BLE indicating a possible liver stress. But these levels were lower in rats that received BLE. The sperm count, progressive motility ($p < 0.011$) and morphology were significantly higher ($p < 0.05$) in the group offered BLE. Tissue analysis of the liver and tests also showed less damage in the groups that received BLE compared to those on high fat without BLE. The overall findings suggest that BLE mitigates the adverse effects of high dietary fat improving biochemical health, and reproductive parameters.

Keywords Bitter leaf, fat, reproductive health, hematological and biochemical parameters.

21. EFFECTS OF DIFFERENT LEVELS OF VIRGIN COCONUT OIL ON GROWTH, HAEMATOLOGY, SERUM BIOCHEMISTRY, AND REPRODUCTIVE PARAMETERS IN ALBINO RATS

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Abstract
This study investigated the dose-dependent effects of virgin coconut oil (VCO) on Albino rats over 56 days. Twenty-five (25) Albino rats were assigned five dietary treatments of different VCO levels. A completely randomized design with 5 rats per treatment was employed. The treatments were: Negative control, T_1 (0 % VCO); positive control, T_2, (1.71 % soyabean oil); T_3 (1.80 % VCO); T_4 (4.93 % VCO); and T_5 (7.50 % VCO). The results showed that body weight was influenced ($p < 0.05$) by diet on day 14, with T_5 exhibiting the highest gain. The heart, liver, stomach, spleen, kidneys, and lungs were higher ($p < 0.05$) in rats fed T_4 and T_5. The WBC, lymphocyte, and granulocyte counts were higher ($p < 0.05$) in T_3 and T_5. There was no treatment effect ($p > 0.05$) in glucose, RBC, total cholesterol, triglycerides, HDL-C, LDL-C, and VLDL-C. The coronary risk was lowest ($p > 0.05$) in the group on T_5. The T_5 reduced the blood urea while increasing ($p < 0.05$) the chloride. However, the creatinine, sodium, potassium, and urea-to-creatinine ratios were unchanged by the diets. The AST, ALT, GGT, Globulin, and total bilirubin decreased ($p < 0.05$) in T_5 while globulin and indirect bilirubin reduced ($p > 0.05$) in T_4. The albumen was higher ($p > 0.05$) in the group on T_4. The ALP, total protein, or direct bilirubin was also changed by the treatments. The testicular weight, sperm concentration, and motility increased in the rats fed T_4. Sperm morphology was unchanged by diets. Overall, this study suggests that moderate (4.93 % VCO) consumption of VCO may not have a detrimental effect on the health of Albino rats.

Keywords: Basil leaves, dietary fat, lipid profile, hematology, Serum, kidney and liver.

22. THE INFLUENCE OF OCCUPATIONAL STRESS ON UNIVERSITY STAFF FROM GENDER AND GENERATIONAL PERSPECTIVE

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Abstract
Employees with gender and generational differences in higher institutions experience severe stress as a result of restructuring of human resources, impractical institutional policies, inadequate teaching and learning materials, inconsistent priorities by management and the use of technology. The study aims to investigate the factors that influence occupational stress of university staff in the Bono Region of Ghana from gendered and generational perspectives. The theoretical framework underpinning the study is the Transactional Stress Model. The study employed a mixed method research approach involving qualitative and quantitative designs for data collection, analysis and presentation. Through stratified random sampling, 182 staff members were sampled and included in a survey, whilst 12 management members from the three universities were purposively selected for -semi-structured interviews. The collected data was analysed using cross tabulation and analysis of variance (ANOVA) to show the relationship between the variables and compare means respectively. Content analysis was used to categorise and measure the recurring patterns in the respondents' statements. The findings of the study revealed that university staff experience major occupational stress which influences their performance and health status. The study further found that the major factors influencing occupational stress on academic and non-academic staff, gender, and generation are not significantly different. This study contributes to the stress debate by highlighting the influence of stress on academic and non-academic staff in universities from a gender and generational perspectives. The study recommends the organization training programmes and implementation of gender and generation specific polices to promote the well-being of the staff.

Keywords: occupational stress, influence, health, gender, generation

23. IMPACT OF SMOKING KILN TECHNOLOGY ON POLYCYCLIC AROMATIC HYDROCARBON (PAH) CONTAMINATION AND CONSUMER HEALTH RISKS

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Abstract

This study evaluated the impact of three smoking kilns traditional Barrel smoker (BA), Ahotor stove (AH), and CSIR-Charcoal oven (CH) on polycyclic aromatic hydrocarbon (PAH) and heavy metal levels in smoked catfish and rabbit meat in Ghana. The aim was to assess the health risks associated with consuming these products and compare the safety and efficiency of the kilns. Fresh catfish and rabbit meat were smoked using BA, AH, and CH kilns. Moisture and fat content were analysed using standard methods. PAHs were quantified via GC/MS, and heavy metals (Cd, Pb, Hg) were measured using Anodic Stripping Voltammetry. Health risks were assessed using Target Hazard Quotient (THQ) and Incremental Lifetime Cancer Risk (ILCR) models. The CH kiln achieved the lowest moisture content (4.13 g/100g for catfish; 19.64 g/100g for rabbit) and moderate fat levels. PAH4 concentrations in CH-smoked catfish (6.33 µg/kg) and rabbit (10.13 µg/kg) complied with EU limits, while BA and AH exceeded thresholds (e.g., PAH4 in BA-smoked catfish: 40.72 µg/kg). Benzo(a)pyrene was undetectable in CH products but exceeded limits in BA and AH. Heavy metals were below detection limits. ILCR for CH-smoked catfish (1.41×10^{-7}) indicated negligible risk, whereas BA and AH posed higher risks (up to 1.09×10^{-5} for rabbit). The CSIR-Charcoal oven produced safer smoked products with lower PAH levels and minimal health risks compared to traditional methods. Promoting improved kilns like CH can enhance food safety in Ghana.

Keywords: PAHs, smoking-kilns, health-risk, smoked meat

24. OCHRATOXIN A ENHANCES HEPATITIS B VIRUS REPLICATION BY INHIBITING THE TYPE I INTERFERON RESPONSE PATHWAY

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Abstract

Ochratoxin A (OTA) is a mycotoxin which contaminates foodstuffs worldwide. OTA is recognized for its immunosuppressive, nephrotoxic and hepatotoxic effects. The type I interferon (IFN-I) response pathway is a critical component of innate immunity with antiviral and anticancer activities. Disruption of the IFN-I response pathway may contribute to increased viral replication and cancer risk. This study aims to test the hypothesis that OTA enhances hepatitis B virus replication by inhibiting the IFN-I response pathway. Cells were treated with or without OTA or fludarabine (FLUD) (used as positive control) and simultaneously stimulated with or without IFN-α. The effect of OTA on IFN-I response was evaluated using an interferon-stimulated response element (ISRE)-based dual luciferase reporter assay (DLA) in HEPG2, HEPG2/2.2.15 and HEK293 cells. Additionally, the effect of OTA on hepatitis B virus (HBV) antigen production and viral DNA replication in HEPG2/2.2.15 cells were evaluated using ELISA and quantitative PCR (qPCR), respectively. Results: OTA(4µM) significantly inhibited IFN-I pathway activity in HEPG2 ($p = 0.021$), HEPG2/2.2.15 (P = 9.928*10 - 5) and HEK293 ($P = 0.039$) cells. Also, OTA(4µM) significantly enhanced HBV DNA replication in HEPG2/2.2.15 cells (P = 9.928*10 - 5). In support, OTA(4µM) promoted the expression of HBV surface antigens (HBsAg) ($p=0.004$), HBV core antigens (HBcAg) ($p = 0.022$) and HBV envelope antigens (HBeAg) ($p=0.017$) in HEPG2/2.2.15 cells. These findings indicate that OTA promotes HBV replication and may contribute to HCC development through suppression of the IFN-I response pathway. This highlights a potential novel mechanism underlying OTA-induced hepatocarcinogenesis.

Keywords: Ochratoxin A, immunosuppression, interferons

25. GENERATION AND PRECLINICAL EVALUATION OF CHICKEN-BASED IgY ANTIBODIES AGAINST BLACK MAMBA (*DENDROASPIS POLYLEPIS*) VENOM

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Abstract

Life-threatening medical issues associated with snakebites have been a public health concern for decades at the global level. Black mamba, *D. polylepis*, is a venomous snake found in Kenya, accounting for some snakebite incidents. Kenyan Ministry of Health data reveals 15,000 annual snakebite occurrences. Also, 1 in 147 of these individuals die yearly. Traditionally, antivenoms for treatments are produced from horses but have complicated and expensive production issues. Alternative approaches, such as IgY antibodies from chicken egg yolks, may overcome these disadvantages. This study generated and functionally characterized chicken-based IgY polyclonal antibodies against Black mamba snake venom and assessed its efficacy vis-à-vis commercial antivenoms. In this study, *D. polylepis*-specific IgY polyclonal antibodies were purified from egg yolks of immunized chickens. These antibodies were assessed for their in-vivo neutralizing capacity versus commercial antivenoms, PANAF-Premium and VINS. IgY antibodies were purified by ammonium sulfate precipitation and affinity chromatography, with quality and specificity determined by SDS-PAGE and ELISA. The LD_{50} of D. polylepis venom was 0.54 mg/kg in chicks and 0.34 mg/kg in mice. Extracted IgY yielded 2.8 mg/mL concentration. Purified IgY exhibited a single-protein band of about 183 kDa and two bands (67 kDa and 25 kDa) under non-reducing and reducing conditions, respectively. The minimum-edematogenic dose was 0.05 µg. Anti-D. polylepis IgY antibodies and two anti-venoms demonstrated capacity to neutralize toxic activities of *D. polylepis* venom. This study demonstrates, for the first time, the successful generation of IgY antibodies against Dendroaspis polylepis venom. The findings highlight IgY's potential as a cost-effective and scalable alternative for next generation antivenom development.

Keywords: IgY antibodies; Black mamba (*Dendroaspis polylepis*) venom; Snakebite envenoming; Polyclonal antibody production; In vivo neutralization assay

26. EFFECT OF A GINGER-SPICED MILLET-SOYA DRINK AND BREASTFEEDING EDUCATION ON PROLACTIN LEVELS AND BREAST MILK VOLUMES IN POSTPARTUM MOTHERS IN NORTHERN GHANA: A RANDOMIZED CONTROLLED TRIAL

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Abstract
Insufficient milk supply is a significant barrier to exclusive breastfeeding globally. This study investigated the efficacy of a ginger-spiced millet-soya drink (Zim-So drink), a traditional galactagogue rich in phytoestrogens, and structured breastfeeding education on breast milk volume and prolactin levels in postpartum mothers in Northern Ghana. A 14-day randomized controlled trial was conducted with 75 participants from five maternal and child health clinics in Tamale, Ghana. Participants were randomly assigned to three groups (n = 25 each): the Zim-So drink (300 mL once daily), breastfeeding education, or control. Breast milk volume was measured using a manual pump, and serum prolactin levels were assessed via ELISA at baseline, Day 7, and Day 14. Statistical analysis involved ANOVA and Tukey's post hoc tests. Baseline characteristics were comparable across all groups. By Day 7 and Day 14, both intervention groups demonstrated significant increases in breast milk volume and prolactin levels compared to the control group ($p < 0.001$). The Zim-So drink group showed the most pronounced improvements, with mean breast milk volume increasing by 24.9 mL and prolactin levels by 25.0 ng/mL at Day 14 compared to the control, indicating a stronger and sustained lactogenic effect. The breastfeeding education group also showed significant gains, though of a slightly lesser magnitude. This study highlights the effectiveness of both the Zim-So drink and breastfeeding education in enhancing lactation outcomes. Integrating culturally familiar dietary supplementation with structured breastfeeding education offers a practical and cost-effective approach to improving breastfeeding rates in resource-limited settings.

Keywords: Galactagogue, Exclusive breastfeeding, Millet, Soya, Ginger

27. *ESCHERICHIA COLI* AND OTHER COLIFORMS LOAD ON FOOD UTENSILS AT FOOD JOINTS ON A UNIVERSITY CAMPUS IN NORTHERN GHANA

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Abstract
Contaminated food utensils can transmit pathogenic microorganisms, posing serious public health risks. *Escherichia coli* and other coliforms are widely recognized as indicators of fecal contamination and poor sanitation. On university campuses, where many students depend on local food joints, assessing utensil contamination is vital for food safety. This study evaluated microbial contamination of food utensils at selected eateries on the UDS Nyankpala campus. A cross-sectional design was applied, involving three highly patronized food joints. Thirty-six utensils (knives, ladles, plates, spoons) and nine ambient air samples were randomly collected and analyzed. Microbial assessments were complemented by questionnaires administered to food handlers on hygiene practices. Statistical tests were conducted to examine differences in contamination across utensil types and food joints. Results demonstrated widespread microbial contamination of utensils. Ladles and knives carried the highest loads, with *E. coli*, *Citrobacter spp*., and *Enterobacter spp.* being the predominant microbial isolates. Air samples revealed *E. coli*, *Listeria spp*., and *Staphylococcus aureus*. While utensil type did not significantly influence microbial loads ($p > 0.05$), poor washing, drying, and storage practices were linked to higher contamination. The findings highlight substantial microbial risks associated with both utensils and ambient environments in campus food joints. These results underscore the need for improved hygiene practices and stricter monitoring to protect public health.

Keywords: Microbial contamination, food safety, food utensils, hygiene practices, *Escherichia coli*

28. HEAT STRESS AND MITIGATION STRATEGIES FOR CONSTRUCTION WORKERS: A CASE STUDY OF THE TEMA PORT EXPANSION PROJECT, GHANA

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Abstract

This study assessed heat stress and mitigation strategies among construction workers at Ghana's Tema Port Expansion Project. Employing a cross-sectional design, data were collected from 84 consenting participants and analysed using SPSS (version 27). Descriptive statistics, chi-square tests, and logistic regression were employed to investigate the associations between sociodemographic factors, knowledge, and heat stress outcomes. The study revealed high (93%) awareness of heat stress; nonetheless, 40.7% had not received formal training, and 20.9% had no induction related to heat stress. Gender and educational level were linked to heat stress exposure ($p = 0.044$; $p = 0.025$, respectively). Female workers were four times more likely to experience heat stress compared to males (AOR = 4.2, $p = 0.036$). Workers with tertiary education were 68% less likely to suffer heat stress compared to those with lower educational status (AOR = 0.32, $p = 0.027$). Furthermore, work experience was significantly associated with the presence of a heat stress mitigation plan ($p = 0.019$). Workers with 3–5 years of experience were 93.3% less likely to acknowledge the existence of a mitigation plan compared to their counterparts (AOR = 0.067, $p = 0.016$). While awareness of heat stress was high among construction workers, formal training remains inadequate, particularly among female, less-experienced, and less-educated workers. The study underscores the need for targeted training programs, scheduled rest breaks, and gender-sensitive interventions to mitigate heat stress risks in construction settings.

Keywords: Heat stress, Headache, Heat rashes, Foot rot, and Construction workers.

29. *IN VITRO* ANTIMICROBIAL ACTIVITIES OF *VERNONIA AMYGDALINA* AND *SENNA SIAMEA* AGAINST ESBL-PRODUCING AND NON-ESBL BACTERIA

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Abstract

Antimicrobial resistance, especially in extended-spectrum beta-lactamase (ESBL)-producing bacteria, poses a major threat to global health. This study explored the antibacterial, synergistic, and antibiofilm potential of *Vernonia amygdalina* and *Senna siamea* leaf extracts against both ESBL-producing and non-ESBL strains of *Staphylococcus aureus*, *Salmonella typhi*, *Escherichia coli*, and *Klebsiella pneumoniae*. The hypothesis was that these plant extracts possess phytochemicals capable of inhibiting resistant bacterial growth and biofilm formation. Phytochemicals were screened using standard qualitative assays. Antibacterial activity was determined by agar well diffusion, minimum inhibitory concentration (MIC), minimum bactericidal concentration (MBC), and synergy testing with ciprofloxacin. Biofilm inhibition was assessed by crystal violet staining. Phytochemical screening revealed alkaloids, flavonoids, tannins, saponins, coumarins, triterpenoids, and phytosteroids in both extracts. *Vernonia amygdalina* exhibited antibacterial activity with inhibition zones ranging from 14.23 ± 3.39 mm to 21.33 ± 4.45 mm, strongest against E. coli and lowest against non-ESBL K. pneumoniae. Moderate inhibition was noted for ESBL *K. pneumoniae* and *S. typhi*. In contrast, Senna siamea showed stronger effects, with zones spanning 15.97 ± 2.32 mm to 27.83 ± 3.87 mm, highest against non-ESBL *K. pneumoniae* and substantial activity against *S. typhi*, *S. aureus*, and *E. coli*. ESBL strains were less susceptible but still inhibited. MIC values ranged from 6.25–25 mg/mL for *S. siamea* and 12.5–50 mg/mL for V. amygdalina. Both extracts enhanced ciprofloxacin activity and achieved biofilm inhibition above 99%. Both extracts demonstrated strong antibacterial and antibiofilm activity, validating their potential as eco-friendly alternatives against resistant and biofilm-forming pathogens.

Keywords: Antimicrobial Resistance, Phytochemicals, Biofilm Inhibition, Extended-spectrum beta-lactamase, Synergistic activity

30. ASSESSMENT OF GENITAL COMPLICATIONS, KNOWLEDGE, AND COMPLIANCE OF WOMEN FROM A SCHISTOSOMIASIS ENDEMIC AREA IN GHANA: A CROSS-SECTIONAL STUDY

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Abstract

Schistosomiasis is a neglected tropical disease with global public health concern. *Schistosoma haematobium* is the causal agent for genital complications in women through a condition known as female genital schistosomiasis (FGS). This study was conducted to assess the prevalence of genital complications caused by schistosomiasis, and compliance with mass drug administration (MDA). This study was a cross-sectional study conducted in the Tolon District of Ghana. Participants (women) were recruited to be part of the study after passing the inclusion criteria and giving informed consent. Participants were examined for the presence of *Schistosoma haematobium* eggs in their urine. Women who tested positive for the parasite were taken through gynecological examination. Focus group discussions (FGDs) were organised among participants to assess MDA compliance, knowledge of disease transmission, symptoms and how the disease affects an individual. About 250 women were screened with mean age of 35.11 ± 11.48 years. A prevalence of 48.0% for *Schistosoma haematobium* infection was recorded in this study. The younger age group (18-27 years) recorded the highest mean egg count, with the least reported in the older group (58 years and above). Women who were positive for the parasite undergone genital examination by a gynecologist. Findings from the gynecological examination reported a 36.4% prevalence of severe genital complication among the women. Thematic analysis from the FGDs indicated that 90% of women had never taken MDA. This study shows that schistosomiasis remains endemic in the Tolon District, despite several rounds of MDA with alarming prevalence of 48% with some experiencing severe genital complications. Almost all the women had never taken MDA in their lives showing non-compliance and neglect in MDA policies.

Keywords: Schistosomiasis, Genital, Gynecological, Women, complications

31. MODELLING AND FORECASTING INFANT MORTALITY RATE IN GHANA USING MARKOV CHAINS AND TREND ANALYSIS

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Abstract

Infant mortality remains a significant public health challenge in Ghana, with the country's infant mortality rate (IMR) standing at 35.4 deaths per 1,000 live births in 2025, which is higher than the global average of 14 deaths per 1,000 live births. This study analyzes infant mortality trends in Ghana (1960 – 2019) using Markov chain modeling and time series analysis with data from the World Bank database. The study employed a quantitative research approach using secondary data on Ghana's infant mortality rate from 1960 to 2019, obtained from the World Bank database. Employing Minitab, SPSS, and R software, the research examines state transitions (high, moderate, and low), sojourn times, and trend patterns using Linear, Quadratic, Exponential, and S-curve models. Findings indicate that the S-curve model best fits the data, showing a gradual decline in infant mortality. Markov analysis reveals that transitioning from high to moderate mortality takes 15 years, while moderate to low takes just two years. Once a low mortality rate is achieved, it is sustained indefinitely. The study highlights the importance of maternal healthcare, immunization, and healthcare equity in reducing infant deaths. While progress has been made, rural disparities persist, requiring sustained policy interventions. These findings offer insights for policymakers to enhance healthcare investments and regional child survival strategies for long-term impact.

Keywords: Infant Mortality, Markov Chains, Trend Analysis, Forecasting, Ghana.

32. ADOLESCENTS CONDOM USE AND ITS CONTEXTUAL CORRELATES IN JIRAPA MUNICIPALITY, GHANA

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Abstract
Consistent condoms use effectively prevents STIs and unintended pregnancies, but adoption among adolescents remains inconsistent. In Ghana's Upper West Region, adolescents are at increased risk, affecting their health and education, and there is limited research on the factors influencing condom use in this area. This cross-sectional study aims to fill that gap by examining the determinants of condom use among 379 adolescents from four randomly sampled sub-districts within Jirapa Municipality. Data was collected on condom use and its associated factors. Both descriptive and inferential analyses were conducted using SPSS. The study found that while a majority of adolescents (56.4%) had positive attitudes toward condoms, only 41.2% reported using them. A significant majority (63.6%) also demonstrated poor knowledge of condoms and their correct use. Key predictors of condom use were urban residence (AOR = 2.22, 95% CI: 1.35–3.64) and good knowledge of condoms (AOR = 6.89, 95% CI: 3.84–12.35). The findings suggest that despite positive attitudes, low condom usage is largely influenced by poor knowledge and geographical location. The study underscores the critical need for targeted educational interventions to improve condom awareness, correct misconceptions, and address socio-cultural barriers to promote safer sexual practices among adolescents.

Keywords: Condom use, Adolescents, Ghana, Knowledge, Attitudes.

33. THE PREVALENCE OF HEPATITIS B VIRUS INFECTION IN PREGNANCY AND ITS PREVENTION STRATEGIES: A MIXED METHODS STUDY IN THE SAVELUGU MUNICIPALITY

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Abstract
Hepatitis B Virus (HBV) poses a significant public health challenge in sub-Saharan Africa, particularly due to its vertical transmission risk, affecting maternal and neonatal health. This study investigated the prevalence and correlates of HBV infection among pregnant women and examined the implementation of HBV-related policies in the Savelugu Municipality, Ghana. A mixed-methods approach was used, involving a structured survey with 406 pregnant women and in-depth interviews with 15 key informants. Quantitative data were analyzed using chi-square tests, while qualitative responses were analyzed using thematic analysis. The results showed an HBV prevalence of 2.0% and a statistically significant association between infection rate and educational level. The key HBV-related policies included mandatory antenatal screening, HBV education and counseling, administration of hepatitis B immune globulin (HBIG), timely neonatal immunization, and infection control practices. The implementation of these policies was facilitated by committed healthcare workers, mobile outreach services, NGO support, and cross-sector collaboration. However, several barriers were noted including limited funding for HBIG and vaccines, inconsistent availability of supplies, insufficient staff training, low public awareness, stigma, and weak health information systems. In conclusion, addressing systemic challenges—such as integrating HBV services into the National Health Insurance Scheme (NHIS), improving healthcare worker training, and strengthening public education are critical to preventing and eliminating HBV among pregnant women in rural Ghana.

Keywords: Hepatitis B virus, mother-to-child transmission, Policies, Health facility-level, Ghana

34. SYNTHESIS OF TIRZEPATIDE USING PS-PEG RESIN: A SUCCESS STORY

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Abstract
Tirzepatide is a novel therapeutic agent that functions as a dual agonist of the glucagon-like peptide-1 (GLP-1) and gastric inhibitory polypeptide (GIP) receptors. It has demonstrated substantial promise in the treatment of type II diabetes, nonalcoholic steatohepatitis (NASH), and chronic weight management, owing to its significant impact on lowering HbA1c levels and promoting weight loss in clinical trials. Structurally, Tirzepatide is composed of a 39-amino acid peptide backbone, incorporating 37 naturally occurring amino acids and two noncoded aminoisobutyric acid residues at positions 2 and 13, along with a functional side chain at residue 20. Despite its therapeutic potential, the large-scale manufacture of Tirzepatide presents considerable challenges. Synthesize Tirzepatide using PS-PEG resin. Solid-phase peptide synthesis (SPPS) technique was employed to develop a novel and patent-compliant synthetic route. Resin substitution (mmol/g) 0.13, Swelling in DMF (mL/g) 7, Swelling in DMF (mL/g) 5.2 and swelling in H_2O (mL/g) 4.6. The final Tirzepatide product achieved a purity exceeding 85%. Tirzepatide a longer and difficult to make peptide, has been successfully synthesized using PS-PEG resin manufactured by Sunresin with excellent purity of 85%.

35. PREVALENCE, CHARACTERIZATION, RISK FACTORS AND TREATMENT-SEEKING PATTERNS OF VULVOVAGINAL CANDIDIASIS AMONG WOMEN OF REPRODUCTIVE AGE IN KWAHU-WEST MUNICIPALITY, NKAWKAW

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Abstract
Vulvovaginal candidiasis (VVC) is a common fungal infection that mostly affects women who are of reproductive age. It is caused by an overgrowth of the *Candida* species. This study examines the prevalence, risk factors, and treatment-seeking behaviors related to vulvovaginal candidiasis (VVC) among women of reproductive age in the Kwahu West Municipality, Ghana. In a cross-sectional study, 255 high vaginal swab samples from women, aged 15-49, who visited selected health facilities within the municipality between February and April 2024, were subjected to a direct Gram stain smear and culture for the isolation of *Candida* species. Using Sabouraud Dextrose agar and HiChrome *Candida* differential agar, isolates of *Candida* were identified. Chi-square analysis and logistic regression were used to explore the significant correlation between the sociodemographic characteristics of the study participants and their clinical presentations to VVC. The findings showed that the prevalence of VVC was 26.7%, and the most commonly isolated *Candida* species was Candida albicans (55.9%), followed by Candida glabrata (27.9%), *Candida krusei* (10.3%), and *Candida parapsilosis* (5.9%). Key risk factors included diabetes and frequent antibiotic use, both significantly correlated with VVC occurrence. The study also identified a significant association between VVC and symptoms such as vaginal discharge, itching and irritation. The study emphasized the high incidence of VVC in the Kwahu West Municipality, the predominance of *Candida* albicans, the rising incidence of non-*Candida albicans*, and the crucial function of diabetes and antibiotics as risk factors.

Keywords: Vulvovaginal candidiasis, HiCrome differential agar, *Candida albicans*

36. THE DYNAMICS OF T CELLS EXHAUSTION MARKERS IN CHRONIC HEPATITIS B PATIENTS IN NORTHERN GHANA

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Abstract

T cells exhaustion (TCE) markers are regulatory genes in chronic diseases such as hepatitis b viral infection. These exhaustion markers could serve as markers to monitor the treatment dynamics and inform treatment outcomes. In this study, we assessed the pattern of TCE in different groups of patients who have chronic HBV. Blood samples were collected from targeted clients into EDTA tubes. Peripheral blood mononuclear cells were isolated from whole blood, RNA extracted, and cDNA synthesised. Polymerase chain reaction was performed using targeted exhaustion marker primers. A gel electrophoresis was run, and the amplicons were visualized using a gel illuminator. The expressed genes were quantified using ImageJ software, and statistical analysis was performed with GraphPad Prism. Generally, compared to health controls, PD1, CTLA4, and LAG-3 were significantly expressed in HBeAg+ with high HBV DNA load and HBeAg- with high HBV DNA without treatment. However, relatively low expressions were observed in HBeAg- with no detectable HBV DNA, suggesting an inversely proportion in the expression of TCE in low HBV DNA. The high levels of TCE correspond to decline in inflammatory markers such as TNF-a, IL-2, and INF-g. In conclusion, TCE markers have varied expressions in chronic HBV. Possibly, exploring these markers could help identify novel therapeutic mechanism for the cure of HBV, especially in chronic conditions.

Keywords: T Cell Exhaustion; Hepatitis B Virus; Chronic Hepatitis B Virus

37.PREVALENCE OF SELF-BREAST EXAMINATION AND ITS ASSOCIATED FACTORS AMONG FEMALE NURSING TRAINEES IN THE GUSHEGU MUNICIPALITY, GHANA

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Abstract

Breast cancer remains a significant global public health challenge, yet research focusing on Nursing and Midwifery students is limited, despite extensive studies on self-examination behaviors among health professionals. While most nursing trainees are aware of breast self-examination (BSE), many are unable to perform it correctly. This study aimed to identify the predictors of knowledge and practice of BSE among female trainee nurses at Gushegu Nursing and Midwifery Training College, Ghana. Employing a cross-sectional design and quantitative methodology, data were collected from 137 nursing students using a structured questionnaire. Findings revealed that nearly all participants (94.9%) were aware of breast cancer, predominantly through media sources (38%). Additionally, a majority (95.6%) knew about BSE, with 65.2% demonstrating good knowledge regarding the procedure. Approximately 71.5% of participants reported practicing BSE. Factors significantly associated with BSE practice included program of study, engagement in physical exercise, family history of breast cancer, awareness of breast cancer and BSE, source of knowledge about BSE, and perceived importance of BSE. Compared to registered midwifery students, registered nurse assistant clinicals were 0.08 times less likely to practice BSE. Conversely, participants who engaged in physical exercise were 16.7 times more likely to practice BSE, and those with a family history of breast cancer were 6.54 times more likely to perform BSE than those without such a history. While most students demonstrated good knowledge and practice of BSE, there is a need to reinforce education on the appropriate frequency of BSE to enhance early detection efforts.

Keywords: breast cancer, breast self-examination, nursing students, predictors, Ghana.

38. HUSBANDS' INTENTIONS TOWARDS INVOLVEMENT IN THEIR SPOUSES' UTILIZATION OF MATERNAL CARE SERVICES DURING ANTENATAL, INTRAPARTUM AND POST-NATAL CARE PERIODS

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Abstract

Women's low utilisation of health services contributes significantly to high maternal mortality. While male involvement in spouses' healthcare services improves utilisation, it, nevertheless, remains low. The aim of this study was to investigate the intentions of husbands' involvement and perceived barriers to support their spouses' pregnancy through antenatal (ANC), intrapartum (IPC) and post-natal (PNC) care attendance in the Tamale metropolis. The study was cross-sectional, conducted among 119 husbands 18 years and above and living within the metropolis, with pregnant partners. A mixed-methods approach with two (2) focus group discussions (FGDs) was employed. Data was analysed using both descriptive and inferential statistics, with significant differences accepted at p<0.05. FGDs were analysed thematically. Husbands' intentions for involvement and perceived barriers to support during ANC, IPC and PNC were measured using composite scores. Generally, intentions for involvement were higher in PNC (89.1%) than in ANC (61.3%) and then IPC (45.4%). For perceived barriers to support their spouses' healthcare services, the order was IPC (69.7%), ANC (48.7%) and PNC (15.1%). Husbands' educational level significantly influenced their intentions for involvement at ANC ($p = 0.017$) and IPC ($p = 0.015$). Also, employment status was significantly associated with intentions for involvement in PNC ($p = 0.013$), whilst religion served as a significant perceived barrier in PNC ($p = 0.035$). Some discussants had this to say: *"I do not have a motor bike, so I give her transport to go alone…."*. Another said, *"The reception of nurses would make you decide to either go to the health facility or not……."* A third person also said; *"I cannot be present in the delivery/labour room, my wife would be in there with other people's wives, and I can see the nakedness of these women because it is not culturally acceptable"*. Generally, socio-economic, cultural beliefs and health facility factors served as perceived barriers hindering husbands' intentions for involvement in their spouses' healthcare activities, most likely accounting for the low levels of actual male involvement.

Keywords: Antenatal care, intrapartum care, postnatal care, husband's involvement, maternal health care.

39. STRATEGIES FOR ENGAGING MEN FOR ENHANCED SUPPORT FOR INFANT AND MATERNAL HEALTH CARE IN NORTHERN GHANA

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Abstract

The specific objective of this paper is to assess the gender specific, age-hierarchy and decision-making roles of husbands in providing care for mothers and their children; and assess community based social and cultural networks and practices of husbands that support the care of mothers and their children under five years in northern Ghana. The study adopted a survey approach with a cross-sectional design. In addition, the study utilised the experiential phenomelogical and focus ethnographic approaches to collect data. Focus group discussions and indepth interviews with husbands and key informants were used to collect data from 236 husbands and grandfathers for the study. Data was analysed in themes. Results revealed that there existed some form of social support networks and that providing any form of care is dependent on the gender- specific and age hierarchy of caregivers in the households and by culture. This assertion is confirmed from the study's results on the importance of Indigenous social networks as follows: *"… I think that encouraging men to form social networks specially to discuss issues of infant and maternal care could enhance men's support of infant and maternal care…"* (*Husband, 59 years*). This paper concludes that gender specific roles, age hierarchy and decision making still form an important aspect of caregiving practices.

Keywords: Caregivers, Children under Five, Feeding, Northern Ghana, Nutritional Status

40. HARNESSING PHYTOCHEMICALS FROM BROCCOLI AND KALE VEGETABLE LEAVES: IN-SILICO DISCOVERY OF NATURAL XANTHINE OXIDASE INHIBITORS FOR SAFER AND NOVEL ANTI-GOUT THERAPY

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Abstract
Inhibitors of xanthine oxidase (XO), a key enzyme involved in uric acid production, could be utilized as drugs to prevent the enzyme's overactivity. This study aimed to explore the bioactive compounds in *Brassica oleracea var*. italica (broccoli) and *Brassica oleracea var*. acephala (kale) for their potential anti-gout properties via XO inhibition through an in-silico approach. Computational screening offers a cost-effective and efficient method for identifying promising XO inhibitors that may contribute to the development of novel anti-gout therapies. Broccoli and kale leaves were subjected to solvent extraction, and phytochemicals from the extracts were identified using GC-MS analysis and subsequently docked against the XO receptor. ADMET and medicinal chemistry analyses were conducted on selected compounds to assess their pharmacological and safety profiles, and molecular interactions with XO. High throughput virtual screening of the 28 compounds identified seven hit compounds with favorable binding affinities lower than –7.0 kcal/mol. Among these, butylated hydroxytoluene and benzyl benzoate emerged as lead compounds, exhibiting favorable pharmacodynamic properties and minimal predicted toxicity. They interacted hydrophobically with key residues of the target protein, including Glu802 and Glu1261, and were predicted to possess several biological activities, including oxidoreductase inhibition, antioxidant, anti-inflammatory, antiarthritic, uric acid excretion stimulant, and potential for gout treatment. These findings underscore the therapeutic potential of *Brassica oleracea* as a valuable source of natural xanthine oxidase inhibitors and highlight the need for further *in vitro* and *in vivo* studies to validate their clinical efficacy.

Keywords: Gout; kale; broccoli; xanthine oxidase; in-silico

41. EFFECT OF COVID-19 ON HEALTH TRAINEES' EDUCATION: A CASE OF THE COLLEGE OF HEALTH AND WELL-BEING, KINTAMPO

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Abstract
This study examined the effect of COVID-19 on health trainee education at the College of Health and Well-Being, Kintampo. A qualitative case study design and in-depth interview was employed to collect data from a purposely sampled population including management, tutors, and students. The demographic characteristics were presented using frequencies and percentages. Thematic analysis was done using themes developed based on the study objectives. The study revealed that the College did not have a learning management system though the institution had the funds to support such a system for teaching and learning during the pandemic. However, the school had access to a data connectivity network. Tutors shared that they used their data by hotspot from their phones to organize online lectures. They had not received training in any form regarding online teaching system and simulation of practical aspects of lectures was a challenge. Finally, students complained about the challenges of buying data packages for online lectures. Students perceived the online sessions to be boring and not interactive as compared to the traditional teaching system as they could not interact with their colleagues and carry out practical sessions. The College lacked a learning management system, despite having a functional internet network though it was not accessible to all departments. Tutors and students relied on inconsistent personal hotspots, limiting student participation due to data costs and distractions. These findings underscore the need for institutions in Ghana to prioritize sustainable learning management systems beyond the pandemic.

Keywords: Learning management system, College of Health and Well-Being, Coronavirus Disease 2019

42.EVALUATION OF THE DIAGNOSTIC PERFORMANCE OF FOUR MALARIA RAPID DIAGNOSTIC TEST KITS TO MICROSCOPY AT THE AYEDUASE HEALTH CENTER IN THE ASHANTI REGION

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Abstract

Malaria is a deadly parasitic disease common in the tropics. It is endemic in 85 countries, with about 4 billion people at risk. According to the World Health Organization (WHO), malaria recorded 247 million cases, with 619,000 mortalities globally in 2021. Over 90% of the global disease burden occurs in sub-Saharan Africa (SSA). Light microscopy remains the gold standard of diagnosis, but malaria rapid diagnostic tests (RDTs) have become the primary diagnostic tool. Patronage of RDTs remains high globally because they are easy to use and do not require much expertise. The accuracy of malaria diagnosis with RDT is critical for treatment and malaria control outcomes. This cross-sectional study compared the diagnostic performance of two WHO-prequalified and two WHO-non-prequalified test kits to microscopy. Venous blood samples were taken from 300 participants. Thick blood films were prepared, air dried, stained with 10% Giemsa stain, and observed under the microscope for malaria parasite identification. The WHO prequalified First Response and Parahit test kits recorded 42% and 40% of sensitivity. Also, Beacon and Oscar, WHO non-prequalified, recorded 42% and 38%. All the test kits recorded specificities above 90%. Microscopy recorded a malaria prevalence of 16.7% compared to an average of 6.7% for the test kit. The study highlights the challenges posed by malaria elimination and control posed by sub-standard test kits, possibly due to poor transport and storage conditions or the phenomenon of HRP-2 deletions or its polymorphisms.

Keywords: Rapid diagnostic tests, HRP-2, Lactate Dehydrogenase; Geimsa Stain: Light Microscopy

43. PERCEPTIONS, CHALLENGES, AND COPING STRATEGIES OF CAREGIVERS OF CHILDREN LIVING WITH SICKLE CELL DISEASE IN NORTHERN GHANA: A QUALITATIVE STUDY

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Abstract

Sickle cell disease (SCD) is one of the most common genetic disorders in Sub-Saharan Africa, imposing profound psychosocial and economic burdens on families. Ghana faces a significant burden of SCD, with thousands of infants born with the condition annually. This chronic genetic blood disorder requires lifelong management, often resulting in frequent hospitalizations, pain, and severe complications. Despite extensive clinical research, little is known about the lived experiences of family caregivers, particularly in Ghana's Northern Region, where the disease's impact is profound. This phenomenological study conducted at Tamale Teaching Hospital involved semi-structured interviews with 15 caregivers, revealing critical insights into their perceptions and challenges. Many caregivers held misconceptions about SCD, attributing it to witchcraft or spiritual causes, viewing it as a tool used by enemies to cause hardship. Caring for a child with SCD was identified as highly stressful, compounded by the inability of many caregivers, including public sector workers and self-employed individuals, to maintain employment, leading to financial strain. Despite these Difficulties, caregivers employed various coping mechanisms, predominantly relying on religious faith, which fostered resilience. Spousal support, family, social networks, and healthcare workers also played vital roles in alleviating some burdens. To improve the lives of families affected by SCD, policymakers should prioritize targeted education campaigns to dispel myths and misconceptions about the disease, reducing stigma and promoting understanding.

Keywords: Sickle Cell Disease, Caregivers, Misconceptions, Coping Strategies, Tamale Teaching Hospital.

44. MICROPLASTICS AND HUMAN HEALTH: A BIBLIOMETRIC REVIEW OF EMERGING RISKS AND RESEARCH TRENDS

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Abstract
The widespread accumulation of plastics in the environment has led to growing concern about the potential health risks posed by microplastics. This study presents a comprehensive bibliometric analysis of global research on microplastics, with a particular focus on their implications for human health. Analysis of publication trends reveals a marked increase in scientific output over the past decade, reflecting heightened global awareness and concern. The study identifies key emerging health issues associated with microplastic exposure, including inflammatory responses, endocrine disruption, and possible carcinogenicity. By mapping current research efforts and thematic trends, the review highlights critical knowledge gaps and areas requiring deeper scientific exploration. The findings underscore the urgent need for interdisciplinary and mechanistic studies to better understand and mitigate the human health risks linked to microplastics.

45. EFFECT OF SEX ON GROWTH PERFORMANCE INDICES AND CARCASS TRAITS IN CAPTIVE AFRICAN GIANT RATS (*CRICETOMYS GAMBIANUS*)

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Abstract
This study aimed at assessing sex-based effect on some growth performance indices, carcass traits and proximate compositions in the meat of African giant rats (Cricetomys gambianus) raised in captivity. Forty rats (20 per sex), aged 2–4 months, were monitored for feed intake, bi-weekly body weight, and feed conversion ratio up to 24 weeks, and later slaughtered for some carcass evaluation. Data collected were analyzed using t-test embedded in GenStat (11th Edition Software 2008). Sex had a significant influence on bi-weekly weight, with males recording higher weight and hence higher final weights to their female counterparts, while feed intake and feed conversion ratio did not differ significantly by sex. Carcass analysis showed males having heavier primal cuts, though females had higher kidney weight. Also, sex had no significant effect on measured proximate compositions of meat; except ash content, where females recorded a higher value relative to their male counterparts. These findings emphasize the influence of sex on specifically body weight and carcass traits in African giant rats (AGRs), suggesting to their producers and breeders the need to consider sex differences in management practices aimed at optimizing meat production.

Keywords: Captive African giant rats, growth performance, proximate compositions, feed intake, carcass traits, slaughtered, body weight.

46. CONSUMPTION OF SELECTED INDIGENOUS GHANAIAN FOOD CROPS AND THEIR IMPLICATIONS FOR NUTRITIONAL STATUS AND HEALTH: A CROSS-SECTIONAL STUDY

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Abstract
Indigenous food crops form the nutritional foundation for rural Ghanaian diets, yet their role in nutrition and health remains poorly understood amidst rapid dietary transitions. This study assessed the consumption of three selected indigenous food crops (tomato, cassava, and Bambara groundnut) and their implications for nutritional status and health. Using a purposive, stratified random sampling technique, a cross-sectional study was conducted on 384 participants aged 14 years and above in Techiman and Kintampo in the Bono East Region of Ghana. Data was collected on socio-demographic characteristics, anthropometric parameters, physical activity, dietary intake and haemoglobin levels. Cassava and tomatoes were the most consumed, while bambara groundnut was consumed by fewer than 15% of participants. The prevalence of underweight and overweight/obesity was 7.8% and 36.7% respectively. Anaemia prevalence was50.3%. There was increased risk of abdominal obesity among adolescents (55.6%) and participants ≥ 20years (36.2%), with 42.3% of females and 31.6% of males falling into high-risk waist-to-hip ratio categories. Four distinct dietary patterns were identified using Principal Component Analysis. Cassava and Bambara-based diets were inversely associated with BMI (β = -0.029, p = 0.029) and waist circumference (β = -0.050, p = 0.009), and processed cassava and tomato-enhanced diets were inversely associated with waist-to-hip ratio (β = -0.009, p = 0.033). Dietary pattern adherence was strongly shaped by socio-demographic factors. Findings suggest that intake of selected indigenous food crops has a potential protective role against adiposity and metabolic risk. Strengthening dietary education and promoting indigenous crop utilisation could contribute to better health outcomes.

Keywords: Indigenous food crop, nutritional status, health outcome, Ghana

47. IDENTIFICATION OF MOLECULAR MARKERS AND CANDIDATE GENES FOR GROWTH AND YIELD OF MUNG BEAN IN NORTHERN GHANA BY GENOME-WIDE ASSOCIATION STUDY

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Abstract
This study assessed the genetic bases of growth and yield in Mung bean (Vigna radiata L.), a climate-smart, nutritious, and yet orphaned pulse. A field trial was conducted in Nyankpala, using 262 mini core accessions of Mung bean from World vegetable Centre, Taiwan. and phenotypic data combined with genotypic data, (SNPs) for analysis in R software to understand the genomic bases of growth and yield. Significant phenotypic variations were observed with a high level of broad sense of heritability ranging from 71% to 91%. Population structure analyses revealed five subpopulation and Genome wide association study revealed 39 SNP markers and 16 putative candidate genes identified through in silico means. These identified markers serve as valuable genomic resource for further genomic study including functional validation experiments through gene expression, CRISPR/Cas, Virus-induced gene silencing, and other marker-assisted breeding programs to develop improved Mung bean varieties with enhanced growth and yield traits. The findings support SDGs 1, 2, 3 and 13 by contributing to poverty reduction, zero hunger, good health and climate actions respectively.

Keywords: Mung bean, marker-assisted breeding, genetics

48. HEPATOPROTECTIVE EFFECTS OF WATERMELON RIND EXTRACT AGAINST LEAD ACETATE-INDUCED LIVER INJURY IN WISTAR RATS

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Abstract
This study investigated the hepatoprotective effects of Citrullus lanatus (Kaolack variety) rind extract against lead acetate-induced liver injury in Wistar rats and evaluated the phytochemical profile of the extract. Watermelon rind was dried, ground, and extracted using 50% hydroethanol. Phytochemical screening was conducted on both raw powder and crude extract. Wistar rats were divided into groups and administered lead acetate with or without extract treatment. Parameters assessed included body weight, liver enzyme levels (ALT, AST), oxidative stress biomarkers, and liver histology. Lead acetate administration led to elevated ALT and AST levels, reduced antioxidant enzyme activity, and histological signs of necrosis and inflammation. Treatment with the rind extract significantly reversed these effects, restoring enzyme levels and liver architecture toward normal. Phytochemical analysis showed high concentrations of tannins, flavonoids, and saponins in the extract, which may have contributed to the observed hepatoprotection. Watermelon rind extract exhibited significant hepatoprotective activity against lead-induced liver damage in rats, likely due to its phytochemical content. The findings suggest a sustainable, cost-effective, and safer alternative to conventional hepatoprotective agents.

49. RNAI-BASED IDENTIFICATION OF CADHERIN-PROXIMAL PROTEINS REGULATING COLLECTIVE CELL MIGRATION IN THE DROSOPHILA TESTIS

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Abstract
Collective cell migration is essential for morphogenesis, tissue repair, and disease processes such as cancer metastasis. Our lab uses Drosophila testis myotubes as a model to study this phenomenon. During development, nascent myotubes migrate from the seminal vesicle onto the pupal testis, forming its characteristic spiral shape. Cadherins, such as E-cadherin and N-cadherin, mediate cell–cell adhesion and interact with intracellular proteins to link junctions to the actin cytoskeleton. While E-cadherin is associated with static epithelia, N-cadherin is more prominent in migratory cells. We hypothesized that E- and N-cadherin recruit distinct cytoplasmic partners to support these differing behaviors. To explore this, our lab identified 75 candidate proteins enriched at cadherin-based junctions using proximity proteomics. After I used RNA interference to silence the expression of candidate genes under the muscle-specific Mef2-GAL4 driver, we tested 128 shRNA lines targeting 72 genes for roles in myotube migration and testis morphogenesis. I crossed the males of the RNAi line with virgin females of mefGAL4, dissected adult testes from male progeny, fixed the tissues with formaldehyde, stained with phalloidin and observed under confocal microscope. I identified four genes, disc large, scribble, dystrophin, and CG7600, whose knockdown disrupted myotube adhesion and testis shaping. Observed phenotypes included altered testis morphology, dilated tips with muscle discontinuities, and general shaping defects. These findings highlight key N-cadherin-associated proteins required for coordinated myotube migration, deepening our understanding of how cadherin-proximal complexes regulate tissue-specific morphogenesis. They also provide insights into how similar mechanisms may be co-opted during cancer progression, as tumor cells migrate and remodel their microenvironment.

50. PREVALENCE, ANTIMICROBIAL SUSCEPTIBILITY, AND GENOTYPIC CHARACTERISTICS OF *STAPHYLOCOCCUS AUREUS* ISOLATED FROM GRILLED FISH (TILAPIA, *OREOCHROMIS NILOTICUS*) IN THE KUMASI METROPOLIS, ASHANTI REGION, GHANA

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Abstract

Food safety is a global public health concern especially in developing countries due to rising foodborne illnesses linked to poor hygiene, limited knowledge, and negligence by street food vendors. This study aimed to (1) determine the prevalence of *Staphylococcus aureus* in grilled fish in the Kumasi Metropolis, (2) assess the link between food safety knowledge, practices, and microbiological quality, (3) determine the antimicrobial susceptibility of S. aureus isolates, and (4) determine the genotypic characteristics of methicillin-resistant *S. aureus* (MRSA) isolates. A cross-sectional study was conducted among 32 grilled tilapia vendors, mostly female (90.6%), using a structured questionnaire to assess knowledge, attitude, and hygiene practices (KAP). Bacteriological analysis using Mannitol Salt Agar was used to isolate S. aureus, followed by antibiotic susceptibility testing and PCR to detect the mecA gene in cefoxitin-resistant isolates. Although 81.3% of vendors showed adequate knowledge, 87.5% good attitudes, and 75% good hygiene practices, these factors were not significantly associated with reduced microbial loads, which exceeded acceptable limits (≤4.0 log10 CFU/g). Marital status (P = 0.006) was the only demographic factor significantly linked to KAP outcomes. S. aureus prevalence was 62.5%, with high resistance to tetracycline (68.8%) and cefoxitin (65.6%), while gentamicin (96.9%) and ciprofloxacin (93.8%) were most effective. Of 20 cefoxitin-resistant isolates, 95% harbored the mecA gene, confirming MRSA. Cefoxitin disc diffusion showed strong agreement with PCR, suggesting it as a cost-effective detection method. The study highlights the need for training, monitoring, and food safety enforcement.

Keywords: Food safety, MRSA, Antibiotics, Grilled fish

51. BIG SCIENCE, BOLD PARTNERSHIPS: GHANA'S 32M RADIO TELESCOPE AND THE NEW FRONTIER OF INNOVATION

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Abstract

Ghana faced the challenge of lacking large-scale research infrastructure in radio astronomy, which limited national participation in global space science and constrained opportunities for advanced skills development. To address this, a redundant 32-metre telecommunications antenna at Kutunse was repurposed into the Ghana Radio Astronomy Observatory (GRAO). The conversion involved upgrading the mechanical systems, installing new receivers and digital backends, and conducting commissioning experiments such as pulsar monitoring, methanol maser studies, and integration into international Very Long Baseline Interferometry (VLBI) networks. These technical milestones demonstrate the telescope's readiness for frontline science. The study highlights how the establishment and operation of GRAO were achieved through collaborations between international agencies, local universities, private engineering firms, and ICT providers, creating a platform for knowledge transfer and innovation. The significance lies not only in advancing radio astronomy in Africa but also in demonstrating how research infrastructure can stimulate workforce training, data-driven industries, and high-tech engineering capacity. By leveraging GRAO's capabilities, Ghana positions itself as a regional hub for space science while showcasing a model in which investment in "big science" drives socio-economic growth through innovation-led partnerships. This approach illustrates a pathway by which countries can transform dormant assets into engines of scientific excellence and national development.

Keywords: astrophysics, 32-metre radio telescope, innovation, sustainable development, science infrastructure

52. ENHANCING CLOUD DATA SECURITY USING A LIGHTWEIGHT OPTIMIZED SYMMETRIC ALGORITHM

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Abstract

Cloud computing has transformed the digital ecosystem by providing scalable, on-demand access to computing resources, data storage, and applications via internet-connected devices. This paradigm shift has enabled individuals, enterprises, and governments to reduce infrastructure costs, improve efficiency, and leverage ubiquitous access to information through smartphones, tablets, and other mobile devices. However, despite its many advantages, cloud computing continues to face critical challenges in safeguarding sensitive data. Issues such as data breaches, insider threats, insecure APIs, and vulnerabilities in multi-tenant architectures have heightened the need for robust security mechanisms. Traditional cryptographic approaches, while effective, often come with heavy computational overhead, significant energy consumption, and large memory requirements—factors that are impractical for resource-constrained environments such as mobile devices, embedded systems, and IoT platforms. Lightweight cryptography has emerged as a promising solution to bridge this gap by offering efficient security with minimal computational demand. Although a variety of lightweight algorithms have been proposed, many still struggle to balance security strength with performance efficiency. This paper introduces GeO_04, a novel lightweight symmetric encryption algorithm specifically designed to enhance data security in cloud environments while minimizing memory usage, energy consumption, and latency. The core innovation of GeO_04 lies in its integration of XOR-based logic with nonlinear substitution layers to achieve high entropy and strong resistance to cryptanalysis, while maintaining exceptional speed. In addition, the design incorporates entropy injections through pseudo-random masking and chaotic XOR chaining to maximize confusion and diffusion properties, thereby ensuring robust protection against statistical and differential attacks. The algorithm was implemented in Python 3.10 and tested across real-world datasets representing three key application domains: finance (100KB), healthcare (500KB), and agriculture (1MB). To evaluate performance, six cryptographic metrics were measured: entropy, avalanche effect, throughput, memory usage, sensitivity, and decryption time. Comparative analysis was conducted against both widely deployed standard ciphers (AES) and lightweight cryptographic schemes (SPECK, PRESENT, HIGHT, CHASKA, ASCON), as well as post-quantum approaches such as SPHINCS+. Results demonstrate that GeO_04 consistently achieves superior outcomes. Specifically, it attains entropy values of ≥ 7.84 bits, placing it on par with AES and ahead of other lightweight counterparts. Its encryption speed, averaging ≤ 0.001 ms, makes it exceptionally well-suited for real-time applications, while memory usage remains as low as 8KB, a significant advantage for low-resource environments. Furthermore, GeO_04 achieves an avalanche effect of 94%, surpassing AES and all benchmarked lightweight algorithms, and delivers throughput of 115 Mbps—exceeding even high-performance schemes like SPECK. These findings validate GeO_04 as an efficient, secure, and practical encryption solution for cloud-based systems. Its lightweight design ensures compatibility with mobile and IoT devices, while its strong cryptographic metrics make it a reliable choice for securing sensitive information across multiple domains. Beyond performance improvements, the novelty of GeO_04 lies in its ability to merge lightweight design principles with advanced cryptographic techniques to strike an optimal balance between resource efficiency and data protection. This positions GeO_04 as a significant advancement in the field of lightweight symmetric cryptography. GeO_04 not only addresses the persistent challenges of cloud data security but also sets a foundation for future exploration into post-quantum lightweight designs. Its demonstrated efficiency and robustness

Keywords: Cloud computing, lightweight encryption, data security, symmetric cryptography, mobile computing.

53. ENHANCED DYNAMIC GREY WOLF OPTIMIZATION ALGORITHM FOR CLOUD LOAD BALANCING

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Abstract

The dynamic and heterogeneous nature of cloud computing demands the use of efficient load balancing to optimize resource utilization while ensuring responsiveness. In this paper, an Enhanced Dynamic Grey Wolf Optimization (EDGWO) algorithm is proposed to address the limitations of the standard Grey Wolf Optimization (GWO) in terms of premature convergence, stagnation in local optima and a poor balance between exploration and exploitation. EDGWO introduces two key mechanisms including (1) a dynamic elite archive with 30% probabilistic elite blending to solve diversity to enhance convergence and (2) a 10% chance stochastic Levy flight perturbation to escape local optima. The algorithm was benchmarked using the CEC2020 test suite (F1-F10) and evaluated against six variations of the GWO before a CloudSim deployment, which is evaluated against GWO, GA, PSO and ABC algorithms. The proposed EDGWO achieved best fitness values in 7 out of 10 test functions with a mean standard deviation of 0.31 across five cloud workload simulations. The EDGWO improved utilization by 29.30%, 42.05%, 37.01% and 18.53% over GWO, Artificial Bee Colony (ABC), Genetic Algorithm (GA), Particle Swam OptimiPSO and EDGWO. The proposed algorithm has demonstrated strong potential for application in real-world optimization problems, particularly in the cloud computing and load balancing domain by enhancing convergence while balancing exploration and exploitation.

Keywords: Grey Wolf Optimization, Cloud Computing, Load Balancing, Levy flight

54. NATIONAL HEALTH INSURANCE SCHEME MEMBERSHIP SUSTAINABILITY: A MIXED METHODS STUDY OF THE MOBILE PHONE-BASED MEMBERSHIP RENEWAL SYSTEM IN THE TAMALE METROPOLIS

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Abstract

The National Health Insurance Scheme (NHIS) has faced challenges with the sustainability of its membership since its establishment. The NHIS introduced the mobile-based membership renewal system in 2018 to improve membership sustainability. Objective: This study assessed the trends in uptake of the mobile phone-based renewal policy and the factors affecting its implementation in the Tamale Metropolis. A mixed methods approach was used. Quantitative data on annual NHIS membership renewal between 2014 and 2023 were extracted from the NHIS Biometric Membership Solution (BMS) database and analyzed descriptively. Qualitative data on factors affecting the implementation of the Mobile-based renewal policy were gathered through in-depth interviews with a purposive sample (n = 35) of stakeholders. The interviews were audio-taped, later transcribed and thematically analyzed. The results show a consistent increase in NHIS membership renewal through the mobile phone-based system as compared to the in-person renewal between 2018 and 2023. The uptake of the mobile phone-based renewal system increased from 1% in 2018 to 49% in 2019, 64% in 2020, 72% in 2021, and 76% in 2022. However, a decline of 16 percentage points in mobile phone-based system membership renewal was recorded between 2022 and 2023. Access and ownership of mobile phones, reliability of telecommunication network, and availability of technical support systems emerged as enablers, whereas digital illiteracy, inadequate health system digital infrastructure, and the absence of prompting notice were identified as inhibitors to the mobile phone-based membership renewal system. The study recommends public awareness campaigns, system prompting notice, and network providers collaboration to improve connectivity for easy digital membership renewal.

Keywords: National Health Insurance Scheme, NHIS membership renewal, Mobile phone-based membership renewal, NHIS subscription sustainability, Digital NHIS subscription renewal

55. ENHANCING SECURITY AND TRANSPARENCY IN GHANA'S COCOA SUPPLY CHAINS THROUGH BLOCKCHAIN AND MACHINE LEARNING TECHNOLOGIES

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Abstract
Ghana's cocoa value chain is a cornerstone of its economy and a livelihood source for hundreds of thousands of smallholder farmers. Despite its global importance, the industry faces persistent challenges such as low productivity, lack of price transparency, limited traceability, and vulnerability to fraud. These inefficiencies are compounded by the absence of reliable data across the supply chain, hindering sound policy making and access to fair trade markets. This research proposes the integration of machine learning (ML) and blockchain technology to address these structural issues. This work proposes the use of advanced ML algorithms like XGBoost, Neural Network, and popular algorithms like Random Forest, and Decision Tree, can be used for the cocoa beans quality classification, and farmer segmentation to offer predictive insights to enhance decision-making and resource allocation. Hybrid blockchain technology, on the other hand, can provide an immutable, decentralized ledger to track transactions, ensure product traceability, and automate processes through smart contracts. Together, these technologies can significantly enhance transparency, trust, and operational efficiency across the cocoa supply chain. Benefits include improved farmer profiling, quality assurance, fraud reduction, and fairer pricing. Moreover, blockchain-based traceability can support compliance with international standards and sustainability certifications. Ultimately, this dual-tech approach promises a more equitable, efficient, and resilient cocoa sector in Ghana.

Keywords: Cocoa Supply Chain, Machine Learning, Blockchain Technology, security, transparency

56. MACHINE LEARNING-DRIVEN ADAPTIVE DETECTION AND MITIGATION STRATEGIES FOR DDoS ATTACKS

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Abstract
This research introduces a novel hybrid framework that integrates a Feature Tokenizer Transformer (FT-Transformer) model with Snort, an open-source intrusion detection system, to enhance real-time detection and mitigation of Distributed Denial of Service (DDoS) attacks. The system captures live network traffic and applies advanced preprocessing, including one-hot encoding for categorical features and principal component analysis for numerical dimensionality reduction. An optimized FT-Transformer model is then employed for binary classification of benign versus malicious traffic, while Snort provides signature-based validation to strengthen detection reliability. The framework supports real-time alerting through GUI prompts and notifications and automatically logs attack metadata into CSV files, which are later used for model retraining. Experimental evaluation on benchmark datasets demonstrated high effectiveness, achieving a detection accuracy of 99.83% with a false positive rate of only 0.17%. Real-time testing confirmed the system's ability to identify various DDoS variants, including coordinated attacks, with an average response latency under two seconds. Compared to standalone AI or Snort systems, the proposed hybrid approach significantly improves detection accuracy, reduces false positives, and enhances adaptability to evolving attack patterns. Its real-time monitoring interface, rapid response alerts, and logging mechanisms further support incident handling and forensic traceability. The study concludes that architecture is scalable, efficient, and well-suited for deployment in both enterprise and ISP environments. Future enhancements may incorporate additional cyber threats and explore reinforcement learning for autonomous decision-making, making the system more adaptive to Ghana's digital infrastructure and beyond.

57. LEVERAGING LOW-COST SENSORS AND IoT FOR AIR QUALITY ASSESSMENT IN ABOADZE, GHANA: A COMPARATIVE STUDY OF INDUSTRIAL ENVIRONMENTS

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Abstract
This study investigated the impact of industrial activities on air quality in Aboadze, Ghana, by deploying a custom-built low-cost ambient air quality monitoring system that utilizes Internet of Things (IoT) technology for real-time data reporting. We measured ambient concentrations of CO, NOx, SOx, PM_{10}, $PM_{2.5}$, and O_3 using a 24-hour minute-by-minute monitoring approach, leveraging low-cost sensors and IoT-enabled data transmission. Our results show significant variations in air pollutant concentrations across three distinct environments: Low, Medium, and High. The Low Environment exhibited favorable air quality conditions, with minimal pollutant concentrations (CO: 0.007 ppm ± 0.006 ppm, NOx: 0.012 ppm ± 0.000058 ppm, SOx: 0.001 ppm ± 0.000639 ppm, PM_{10}: 0.051 µg/m^3 ± 0.043 µg/m^3, and $PM_{2.5}$: 0.033 µg/m^3 ± 0.035 µg/m^3). In contrast, the Medium Environment showed elevated levels of NOx (mean: 3.176 ppm ± 7.666 ppm), SOx (mean: 1.612 ppm ± 4.561 ppm), and O_3 (mean: 4.345 ppm ± 9.301 ppm). The High Environment was characterized by high particulate matter concentrations, with mean values of 23.883 µg/m 3 ± 1.290 µg/m 3 for PM_{10} and 17.908 µg/m 3 ± 0.813 µg/m 3 for $PM_{2.5}$. The findings suggest that industrial activities substantially impact local air quality, posing health risks to nearby communities and highlighting the need for targeted emission reduction strategies. This study demonstrates the effectiveness of low-cost IoT-based air quality monitoring systems in tracking industrial emissions and informing policy decisions on air quality management in industrial areas.

Keywords: Air quality, industrial pollution, criteria pollutants, low-cost sensors, Ghana.

58. CRON-BASED LIGHTWEIGHT DETECTION FRAMEWORK FOR SOCIAL ENGINEERING ATTACKS IN LINUX ENTERPRISE NETWORKS

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Abstract
The research aims to develop a lightweight, automated defense mechanism against social engineering-based intrusions in enterprise Linux networks. The goal is to detect suspicious login behaviors such as brute-force attacks, unauthorized privilege escalations, and off-hour access attempts without relying on expensive Security Information and Event Management (SIEM) systems. The framework focuses on open-source tools and cron-based log analysis to provide early threat identification in real-time. The proposed system employs rule-based detection scripts written in Bash and Python to monitor Linux authentication logs (/var/log/auth.log). These scripts are triggered every 5 minutes using cron jobs, allowing for near real-time analysis. Suspicious events, such as logins from blacklisted IPs or failed login bursts, generate alerts that are sent through email and Slack webhooks. A simulated enterprise environment was created with attackers, victims, and monitoring nodes, and a dataset of 6,000 events was generated to evaluate performance. The system achieved an average detection accuracy of 95.26% and a mean time-to-detection of 3.4 minutes. Brute-force SSH attempts were detected with 100% accuracy, while off-hour logins and misconfigured automated jobs accounted for most false positives due to VPN and legitimate scripts. Resource usage remained minimal, with CPU utilization under 3% and memory consumption around 37MB, proving the framework's viability for deployment in low-resource enterprise environments. This study demonstrates that effective intrusion detection and behavioral analysis can be achieved using lightweight, open-source tools. The cron-based detection model offers a cost-effective, scalable, and interpretable solution for defending against social engineering threats. It provides organizations with a practical alternative to complex SIEM platforms, especially beneficial in budget-constrained or resource-limited settings.

59. FACILE SYNTHESIS OF 1D ZnO NANOCRYSTALS EXPLOITING ZINC OLEATE SINGLE SOURCE PRECURSOR

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Abstract
This study explores the solventless synthesis of zinc oxide (ZnO) nanostructures using zinc oleate as a precursor. The process offers a simple and stable route to produce ZnO with controlled morphologies. Thermal decomposition at 350°C resulted in incomplete conversion, while complete transformation to the zincite phase with a preferred (101) orientation occurred at 400 and 450°C. Scanning electron microscopy revealed nanowires (~90 ± 9 nm diameter, 12 ± 2 µm length) at 400°C and nano-petals at 450°C, highlighting the effect of temperature on morphology. Energy-dispersive X-ray (EDX) analysis confirmed a near 1:1 Zn to O atomic ratio in both samples. Optical studies showed band gaps of 4.76 eV (nanowires) and 4.73 eV (nano-petals), both blue-shifted from the bulk ZnO value of 3.44 eV, suggesting quantum size effects. These findings indicate that zinc oleate is a promising precursor for ZnO nanostructures with potential applications in optoelectronic devices.

60. INNOVATIVE GREEN BUILDING AND SOLAR PANEL INTEGRATION FOR SUSTAINABLE DEVELOPMENT

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Abstract
This project introduces an innovative green building design that integrates solar photovoltaic systems to generate clean, renewable energy, thereby significantly reducing carbon emissions and lowering energy costs. The project focuses on the development of sustainable buildings equipped with solar-powered solutions that efficiently support lighting, heating, and cooling needs while minimizing overall energy consumption. By advancing eco-friendly living, enhancing energy efficiency, and decreasing reliance on fossil fuels, projects aim to establish a benchmark for environmentally responsible construction practices. Targeting residential and commercial property owners, government agencies, and environmentally conscious consumers, the project balances environmental sustainability with strong economic benefits. It anticipates steady growth over the next five years as demand for green infrastructure and climate-resilient solutions continues to rise.

Keywords: Green buildings, solar panels, sustainable development, renewable energy

61. SPATIOTEMPORAL RISK INTENSIFICATION FROM ENCROACHMENT ON UNDERGROUND OIL PIPELINES: A PROXIMITY-BASED INDEXING APPROACH IN SAVELUGU MUNICIPALITY, GHANA

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Abstract

This study investigates the spatiotemporal intensification of infrastructure encroachment on underground oil pipelines in Savelugu Municipality, Ghana, by applying a Proximity-Based Risk Index (PBRI). Using multitemporal satellite imagery (2008–2024), pipeline vector data, and field-validated infrastructure coordinates, spatial analysis was conducted in QGIS. Infrastructure proximities were classified into High-, Moderate-, and Low-Risk Zones based on PHMSA's Potential Impact Radius. Trend detection used Mann–Kendall tests, Sen's slope estimation, and Bai–Perron breakpoint analysis. Kernel Density Estimation (KDE) was applied to identify encroachment hotspots. Results: Infrastructure within the High-Risk Zone (<50 m) increased by 545%, with PBRI values rising from 102.5 (Low) to 106.5 (Moderate). The mean distance to the pipeline in this zone declined from 31.34 m to 27.65 m. A significant monotonic trend was observed ($\tau = 0.959$, $p < 0.0001$), with an annual PBRI growth of 0.268 units. Structural breakpoints occurred in 2012, 2016, and 2020, correlating with intensified urbanisation. KDE revealed progressive clustering along central and northern pipeline segments. The findings highlight urgent needs for enhanced spatial planning, community sensitisation, and GIS-informed regulatory enforcement. The PBRI framework provides a replicable risk assessment tool for data-scarce regions. Future research should integrate socio-economic and real-time remote sensing data to strengthen pipeline safety management.

62. ECHOVISION: ENHANCING ULTRASONIC-BASED OBSTACLE DETECTION IN ASSISTIVE DEVICES FOR THE VISUALLY IMPAIRED

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Abstract

Advancements in assistive technology have significantly enhanced the mobility and independence of individuals with visual impairments. One common approach involves the use of low-cost ultrasonic sensors like the HC-SR04, often mounted on smart canes or wearable accessories to detect obstacles. However, these sensors are highly sensitive to environmental factors such as temperature, sound interference, and lighting, especially in outdoor conditions, leading to unreliable distance estimates and inconsistent user feedback, ultimately compromising usability and safety. This project proposes a wearable obstacle detection device based on the HC-SR04 ultrasonic sensor, integrated with advanced filtering algorithms to improve distance measurement reliability. To address the sensor's environmental sensitivity, we implemented and compared Kalman filters, moving average filters (with various window sizes), and median filters. These filters enable real-time processing of sensor data. Field experiments were conducted in both indoor and outdoor environments, across distances of 100 cm to 400 cm, under varied temperatures, sounds, and space. Results showed that the Moving Average filter with a maximum window size of 15 consistently produced the most stable readings, with an average error margin of ±20 cm. In the final test phase, a reference distance of 210 cm was used to validate performance, incorporating a median-of-medians technique to further optimize smoothing. This study demonstrates that integrating filtering algorithms significantly enhances the reliability of low-cost ultrasonic sensors, making them more viable for real-world assistive applications and contributing to safer, more dependable navigation aids for the visually impaired.

63. NONLINEAR ELECTRICAL CONDUCTIVITY IN ZIGZAG CARBON NANOTUBES UNDER COMBINED DC AND QUASI-STATIC AC FIELDS WITH HOT ELECTRON INJECTION

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Abstract
A semiclassical framework was employed to analyse nonlinear electrical conductivity in metallic and semiconducting zigzag carbon nanotubes (CNTs) under the influence of DC and quasi-static AC fields (i.e., when the frequency of the AC field is much less than the scattering frequency or $\omega\tau \ll 1$, where is the relaxation time) with hot electron injection. The current density was obtained through a semiclassical solution of the Boltzmann transport equation, accounting for both the presence and absence of hot electron injections. Negative differential conductivity (NDC) was observed at higher electric fields in the normalised current density versus electric field plots for both metallic and semiconducting CNTs, but only without hot electrons. When hot electrons were introduced, a shift from NDC to positive differential conductivity (PDC) emerged once the injection rate exceeded a critical limit. The stability offered by PDC, which suppresses the domain instabilities typically associated with NDC, paves the way for its application in generating non-ionising terahertz radiations relevant to contemporary technological and scientific fields. The study further revealed that in semiconducting zigzag (n, 0) CNTs, increasing the chiral index n led to enhanced performance, while in metallic counterparts, the opposite was true—lower n values yielded better results. These outcomes offer valuable direction for optimising carbon nanotube electronic applications.

64. CROSS-ATTENTION MULTIMODAL FUSION FOR BREAST CANCER DIAGNOSIS: INTEGRATING MAMMOGRAPHY AND CLINICAL DATA WITH EXPLAINABILITY

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Abstract
A precise assessment of the risk of breast lesions can greatly lower it and assist physicians in choosing the best course of action. To categorise breast lesions, the majority of current computer-aided systems only use characteristics from mammograms. Although this method is practical, it does not completely utilise clinical reports' valuable information to attain the best results. When compared to utilising mammography alone, will clinical features greatly enhance the categorisation of breast lesions? How can clinical features and mammograms be combined most effectively? In what ways may explainable AI approaches improve the interpretability and reliability of models used to diagnose breast cancer? To answer these basic problems, a comprehensive investigation is desperately needed. In order to integrate mammography and categorical clinical characteristics, this study examines a number of multimodal deep networks grounded on feature concatenation, co-attention, and cross-attention. The model achieved an AUC-ROC of 0.98, accuracy of 0.96, F1-score of 0.94, precision of 0.92, and recall of 0.95 when tested on publicly accessible datasets (TCGA and CBIS-DDSM). Furthermore, explainability methods such as Grad-CAM, SHAP, and LIME were applied to highlight critical regions and features influencing the model's decisions, thereby improving transparency and supporting clinical trust.

Keywords: Breast Cancer Diagnosis; Multimodal Fusion; Cross-Attention; Mammography; Explainable Artificial Intelligence (XAI)

65. EFFECT OF LOCATION, VARIETY, AND SPACING ON SORGHUM GROWTH AND YIELD IN THE GUINEA AND SUDAN SAVANNAHS OF GHANA

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Abstract

Sorghum (*Sorghum bicolor* L. Moench) is a significant grain crop in the Guinea and Sudan savannahs, yet its output is below potential because of a combination of traditional low-yielding cultivars, inadequate plant spacing, and severe weed competition. The study was to assess how Sorghum growth and yield were impacted by location, variety, and spacing in the Kassena-Nankana East Municipality and Binduri District. A 2 × 4 × 4 factorial experiment was carried out during the 2024 cropping season. Two locations (Natugnia and Manga), four Sorghums varieties (two improved varieties, {Kapaala and Dorado}, and two local landraces, {Belko and Kandaboa}), and four plant spacings (75 × 30 cm, 75 × 40 cm, 75 × 50 cm, and no specific spacing (farmer's practice)) were used in a randomized complete block design with three replications. The findings revealed significant interactions between location, variety, and spacing as well as main effects on important agronomic traits. Natugnia location continuously recorded a higher leaf area index, grain yield (2594 kg/ha versus 749 kg/ha) and biomass weight compared to Manga. Improved varieties (Kapaala and Dorado) had more productive tiller counts compared to local landraces (Belko and Kandaboa). Kandaboa recorded the greatest grain yield, followed by Kapaala. Dorado had the highest harvest index, whereas Belko had the driest biomass and chaff weight. The 75 × 30 cm improved leaf area index and plant stand. To improve grain yield and overall crop performance, farmers in the savannahs of Guinea and Sudan could plant Kandaboa and Kapaala with 75 × 30 cm spacing.

Keywords: Sorghum, Location, Variety, Spacing, Guinea savannah, Sudan savannah

66. OCCURRENCE OF ANTIBIOTIC-RESISTANT *Salmonella Enterica* IN SMOKED DONKEY MEATS CONSUMED IN GHANA

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Abstract

Antimicrobial-resistant foodborne infections are a major challenge to public health globally through the consumption of contaminated foods including meat. This study assessed the occurrence of *Salmonella enterica* in smoked ready-to-eat (RTE) donkey meats consumed in Ghana. A total of one hundred and fifty samples were obtained from smoked donkey meats at various vending shops mainly in the Doba and Bolgatanga areas in the Upper East region. The samples were examined for the occurrence of *Salmonella enterica* according to the procedures in the USA-FDA Bacteriological Analytical Manual. All data were analyzed using SPSS (version 20) and $P < 0.05$ was considered significant. The results showed that the occurrence of Salmonella enterica in the smoked meat samples was 6% (9) while 141 (94%) tested negative. Physical examination of the meats' environment revealed that the vendors largely did not observe high hygienic standards and microbiological safety practices. Out of the nine (9) *Salmonella enterica* isolates tested against nine commonly used antibiotics following the Kirby-bauer disc diffusion method, and the Clinical laboratory standards institute (CLSI) guidelines, 23.5% were resistant, and 54.3% were susceptible with 22.2% exhibiting intermediate resistance. All the isolates exhibited different antibiotic resistance patterns with TecCnSxtCip (4 antibiotics) being the highest resistance profile recorded. Furthermore, 67% (6/9) of the isolates showed multiple antibiotic resistance (MAR), with index ranging from 0.22 to 0.44. The study revealed that smoked RTE Donkey meats sold in Ghana are generally safe for human consumption but can be a potential source of highly resistant Salmonella enterica. This calls for strict microbiological safety surveillance and monitoring to help achieve sustainable development goals (SDGs) on global health.

Keywords: Read-to-eat (RTE), Occurrence, *Salmonella enterica*, Smoked donkey meat

67. DEVELOPMENT OF COMPLEMENTARY FOOD FROM FONIO, SOYBEAN AND CARROT

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Abstract
This study aimed to produce complementary foods from fonio, soybean, and carrot flour blends and evaluate their nutritional composition and sensory characteristics. The flours of the various ingredients were blended in a ratio of 80:10:10 (FSC1); 70:20:10 (FSC2); 60:20:20 (FSC3); 50:30:20 (FSC4) fonio, soybean, and carrot flours respectively. The nutritional properties of the four formulations were determined using standard methods and they were prepared into gruel to evaluate the sensory attributes using 30 nursing mothers. Analysis of Variance (ANOVA) was used to establish significant differences at 95% confidence level. The results showed that the moisture content was very low, 2.27–2.82%; the total ash content was 1.70–3.22%; crude protein was 10.01-16.73%; crude fat content of 8.82-10.89%; crude fiber was 0.19-1.89%; total carbohydrate was 64.23-76.99% and energy value of the complementary flour formulations ranged 427.38–451.19 kcal/100g. The vitamin A composition of the four samples ranged from 50.05–76.09 µg RAE and the Vitamin C content ranged from 3.89–4.98 mg/100g. For sensory evaluation, the formulation FSC2 with the ratio of 70:20:10 of fonio, soybean, and carrot flour respectively, had the highest score in terms of overall acceptability. It could be concluded that complementary food made from fonio/soybean/carrot flour has good nutritional quality and can therefore be used as alternatives to the complementary foods in the Ghanaian market as well as other countries to improve the nutritional status of children. The shelf-life study and microbial analysis of the formulations are
recommended.

Keywords: Complementary food, Nutritional quality, Consumer acceptability, Vitamins

68. NUTRIENT COMPOSITION AND PHYSICAL PROPERTIES OF TWO ORANGE SEED VARIETIES

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Abstract
Orange is mainly consumed as fresh fruit, concentrated juice or thin dried slices, while the seeds are usually discarded by consumers and orange juice processing companies. This study was carried out to determine the physical, frictional, nutritional and antinutritional properties of the Late Valencia and Red Blood orange seeds using standard methods. The mean length, width, thickness, geometric and arithmetic mean diameter of the Late Valencia orange seeds were significantly higher ($p < 0.05$) than Red Blood seeds. An angle of repose 39.620 and 38.620, coefficient of friction of 0.63 and 0.61 on wood, 0.33 each on mild steel and 0.41 and 0.43 on Teflon were recorded respectively for the Late Valencia and Red blood orange seed varieties. Seeds from Late Valencia and Red Blood orange variety contained 547.39 mg/100g and 693.87 mg/100g of oxalate respectively. The proximate and vitamin C contents of Late Valencia were significantly higher ($p < 0.05$) than the Red Blood orange. The high fat content (55.77 - 57.45%) of the orange seeds makes them a potential source of oil for both food and non-food product applications. Ca, P and K were predominantly found in the two orange seed varieties. Physical and frictional properties obtained from this work could aid in the design of equipment for harvesting, processing, transporting, separating, packaging and storage of orange seeds from Late Valencia and Red Blood orange varieties. Further research is required to determine the suitability of orange seed flours for value-added products.

Keywords: Orange seeds, nutrient composition, antinutrient, physical and frictional properties

69. EFFECT OF PRETREATMENT AND ITS DURATION ON GERMINATION AND GROWTH OF ADANSONIA DIGITATA SEEDS FROM THREE ZONES IN GHANA

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Abstract
The baobab (Adansonia digitata) is a significant indigenous species that provides substantial socio-economic and ecological benefits across sub-Saharan Africa. However, the tree has a low natural regeneration capacity, mainly due to a seed coat–imposed dormancy, which results in poor germination under natural conditions. This study investigated the effects of pretreatment methods, soaking durations, and seed sources on germination and early growth performance of A. digitata. Four pretreatment methods, including scarification, as well as varying soaking durations in acid, hot water, and ambient water, were applied to seeds sourced from three agroclimatic regions in Ghana: Kassena Nankana, Kumbungu, and Nandom. Scarification achieved the highest germination percentage (90%), the fastest emergence (7 days), and the highest mean germination rate (1.9 seeds/day), indicating rapid seedling establishment. Ambient water soaking for 48 hours was the most successful duration-based treatment, resulting in early emergence (8 days), a mean germination rate of 1.0 seed/day, and 60% germination. Acid and hot water treatments produced noticeably poorer results. Seed provenance also influenced germination outcomes, with seeds from Kassena-Nankana showing the highest germination percentage (54.6%). Pretreatment improved seedling growth parameters, including height, stem girth, and leaf number, indicating benefits beyond germination and into early seedling establishment. These findings have important implications for the conservation, domestication, and propagation of A. digitata.

Keywords: Pretreatment, scarification, conservation, germination, *Adansonia digitata*.

70. SILENT CARRIERS: PREVALENCE AND ANTIMICROBIAL RESISTANCE PROFILE OF ESBL-PRODUCING ESCHERICHIA COLI ISOLATED FROM LOCAL CHICKENS IN KPONE KATAMANSO MUNICIPAL ASSEMBLY, GHANA

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Abstract
Local chickens play a vital role in household nutrition, income generation, and food security across many Ghanaian communities. However, their close interaction with humans and the environment can facilitate the transmission of antimicrobial-resistant bacteria. This study assessed the prevalence and antimicrobial susceptibility of extended-spectrum beta-lactamase-producing *Escherichia coli* (ESBL-Ec) in local chickens raised in the Kpone Katamanso Municipal Assembly. A total of 100 pooled fecal samples were collected from 100 households. Screening for ESBL-Ec was performed on MacConkey agar supplemented with cefotaxime (MAC-CTX), and confirmation was done using the combination disc diffusion test. Antimicrobial susceptibility testing was carried out using the Kirby-Bauer disc diffusion method against ampicillin (AMP), cefoxitin (CFX), chloramphenicol (CHL), ciprofloxacin (CIP), gentamicin (GEN), imipenem (IMP) and tigecycline (TGC). ESBL-Ec was detected in 61% (n = 61/100) of the samples. All 61 isolates demonstrated resistance to AMP (100%). Resistance to CIP and TGC was observed in 32.8% and 29.5% of isolates, respectively, while resistance to CHL was relatively low (8.2%). Multidrug resistance was identified as 18% (n = 11) of isolates. Importantly, high susceptibility was observed to IMP, CFX, and GEN, with 98.4% of isolates remaining sensitive. The high prevalence of ESBL-Ec in local chickens highlights a potential public health concern, especially in densely populated communities. However, the relatively low multidrug resistance and retained susceptibility to key antibiotics offer some reassurance. These findings underscore the need for continued surveillance, prudent antibiotic use, and public education on hygiene and safe handling of backyard poultry to reduce risks at the community level.

Keywords: Antimicrobial resistance, Extended spectrum beta-lactamase, Local chicken

71. RELATIONSHIP BETWEEN CLIMATE VARIABILITY AND MORTALITY IN LIVESTOCK IN THE SAVANNA AGRO ECOLOGICAL ZONE

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Abstract
The study was carried out to investigate the effect of climate variability on the causes of mortality in livestock in the Savanna Agro-Ecological zone of Ghana. Climate data (rainfall, temperature, and humidity) and post-mortem (PM) reports of livestock (N=1366) spanning a period of eleven years were obtained from the Northern Regional Meteorological Agency and the Pong Tamale Central Laboratory, respectively. The PM reports on the causes of mortality were categorized into four main groups: Mortality due to bacterial infection, viral infection, parasitic causes, and other causes. The diseases were also categorized according to the most affected body systems, which were the digestive, reproductive, respiratory, nervous, and circulatory. The mean temperature ranged from 26.3 and 31.4°C. Rainfall and humidity were in the ranges of 0.0 and 212.1 mm and 27.9 and 81.2% respectively. The temperature humidity index was in the range of 23 and 28. Mortality due to bacteria and parasites was found to be higher when rainfall exceeded 100 mm. In the case of temperature, mortality due to bacteria was highest between 26 and 28°C, while that of parasite remained stable with changes in temperature. The mortality due to bacteria was lowest when the humidity was relatively lower (53-62%), while that due to parasites increased when humidity exceeded 65%. In conclusion, increasing temperature and rainfall were found to have a strong influence on the cause of mortality, with bacterial infection being the most affected. Disinfection and observance of improved biosecurity measures are recommended to curb the spread of parasites. Also, enhanced feeding practices may help reduce exposure of animals to the ingestion of poisonous substances leading to death.

Keywords: Climate variability, bacteria, mortality, parasitic infestation, livestock.

72. YIELD, PRODUCTIVITY AND ECONOMIC BENEFITS OF COMPONENT CROPS IN A MAIZE-COWPEA INTERCROP SYSTEM IN THE SAVANNAH ZONE IN GHANA

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Abstract
A maize-cowpea intercrop multi-location study was conducted at the experimental fields of the CSIR-SARI at Manga, Binduri District and at the PAS at Garu, Garu District from July – October 2021 and July – October 2022. The study aimed at evaluating the effects of a maize-cowpea intercrop system on the yield, productivity and economic benefits/profitability of component crops in a multi-location trial as a regenerative cropping system to increase crop productivity. The study was a 3 x 3 factorial experiment laid out in a Randomized Complete Block Design (RCBD) with four replications. The factors studied included (A) Row arrangements: - [(i)1 row maize altenating with 1 row cowpea (1M:1C), (ii) 2 rows maize altenating with 2 rows cowpea (2M:2C) and (iii) 3 rows maize alternating with 3 rows cowpea (3M:3C)] and (B) Relative times of planting: - [(i)Simultaneous planting of maize and cowpea (SIM), (ii) maize planted 2 weeks before cowpea (M2WBC) and cowpea planted 2 weeks before maize (C2WBM)], plus sole maize and cowpea. The yield and yield components of both crops were significantly higher ($P < 0.05$) than the sole crops. Planting maize and cowpea simultaneously (SIM) at 2M:2C produced the largest maize yield (13.33t/ha), followed by 2WBC at 2M:2C (8.27t/ha), with 2WBM at 1M:1C producing the highest cowpea yield of 3.79t/ha. LER for the intercrops ranged 0.93-2.67 and 1.23-2.18. The intercrop systems were economically profitable with the Benefit- Cost Ratios ranging 37.77-69.78 compared with sole crops (11.36-33.08) and 31.27-60.29 compared with sole crops (18.65-22.77). Both crops were productive and profitable, with 2M:2C SIM maize and 1M:1C cowpea recommended.

Keywords: Agro-Ecological, Ecosystem services, phenological development, component crops

73. FORMULATION AND EVALUATION OF A PLANT-BASED NON-DAIRY MILK BLEND

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Abstract

The desire for plant milks has become a necessity as they provide a healthy alternative for individuals with health conditions such as lactose intolerance, cow's milk allergy and hypercholesterolemia. Using soybean (S), tigernut (T), rice (R) and coconut (C), this research aimed to develop an inexpensive nutrient-rich non-dairy milk blend. Nine milk formulations F1 (17.5% C, 17.5% R, 17.5% S and 47.5% T), F2 (47.5% C, 17.5% R, 17.5% S and 17.5% T), F3 (17.5% C, 47.5% R, 17.5% S and17.5% T), F4 (10% C, 70% R, 10% S and 10% T), F5 (10% C, 10% R, 70% S and 10%T), F6 (10% C, 10% R, 10% S and 70% T), F7 (17.5% C, 17.5% R, 47.5% S and 17.5% T), F8 (25% C, 25% R, 25% S and 25% T) and F9 (70% C, 10% R, 10% S and 10% T) were developed using Mixture Design and assessed through physicochemical analyses of pH, titratable acidity and total soluble solids. Sensory evaluation was conducted using a 90-member consumer panel, a Balanced Incomplete Block design and a 9-point hedonic scale. The mean scores for pH ranged from 6.4 ± 0.00 to 6.8 ± 0.06 whilst titratable acidity and total soluble solids ranged from 0.005% to 0.011% and 9% to 15% respectively. Formulation F6 (10% C, 10% R, 70% T and 10% S) exhibited favourable milk-like characteristics in both its sensory and physicochemical properties. This suggests that F6 can serve as a suitable alternative for individuals unable to consume cow's milk.

Keywords: plant-based, milk blend, non-dairy, sensory

74. MICROBIAL QUALITY AND ANTIMICROBIAL RESISTANCE OF *ESCHERICHIA COLI* AND *SALMONELLA* SPECIES ISOLATED FROM SPICY MILLET DRINK (*ZOMKOM*) SOLD IN NAVRONGO

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Abstract

The traditional production of Zomkom, (a popular millet drink in Northern Ghana) exposes the product to various hazards. This study investigated manufacturing practices by *Zomkom* producers, the microbial load and antibiotic resistance of E. coli and Salmonella spp isolated from *Zomkom* samples in Navrongo. Ten *Zomkom* producers were surveyed for information about the manufacturing practices during production. *Zomkom* samples from six (6) randomly selected vendors were assessed for total heterotrophic, *E. coli* and *Salmonella* spp counts on Plate Count agar, Salmonella-Shigella agar and MacConkey agar, respectively. Ninety (90) isolates of E. coli and Salmonella spp were randomly selected and assessed for their susceptibility to five antibiotics using the Kirby Bauer disk diffusion method. Findings revealed total mean heterotrophic counts ranging from 4.55 ± 0.13 to 7.25 ± 0.15 log cfu/mL. The mean *E. coli* and *Salmonella spp* counts ranged from 3.14 ± 0.20 to 5.69 ± 0.38 log cfu/mL and 2.60 ± 0.00 to 5.49 ± 0.68 log cfu/mL, respectively. Twenty-four *Salmonella spp* and three *E. coli* isolates were resistant to all five antibiotics, whereas one *Salmonella spp* and ten *E. coli* isolates were susceptible to all the antibiotics. The other twenty *Salmonella spp* and thirty-three *E. coli* isolates were resistant to at least one of the antibiotics tested. The high microbial contamination recorded in the sampled beverages and multiple antibiotic resistance (MAR) among the isolates require that good manufacturing practices be enforced during production and further investigations be done on the isolates to determine the public health risk to consumers.

Keywords: *Zomkom*, microbial quality, antibiotic resistance

75. ROBUSTA COFFEE-FRUIT TREE INTERCROPPING SYSTEMS SEQUESTER MORE CARBON, AND SUPPORT BIODIVERSITY

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Abstract

A study was conducted in a rejuvenated coffee fruit tree intercropping system to determine their contributions to CO_2 sequestration and other ecological benefits. The cropping systems investigated were sole coffee, coffee + coconut, coffee + citrus and coffee + avocado intercrops. Data on carbon stocks, growth of coffee and fruit trees, ant species complexes and their populations and nesting by birds were collected. The results showed that intercropping coffee with the fruit trees had no adverse effects on growth and carbon sequestration by the coffee plants. However, the introduction of the fruit trees into coffee plantations increased soil carbon stocks through higher levels of CO_2 sequestration and biomass return to the soil from prunings and leaf fall. Even though the fast-growing larger avocado species sequestered more CO_2 in individual trees annually (0.64 Mg tree^{-1}) and in 17 years (10.83 Mg tree^{-1}), its introduction into coffee plots did not result in the highest sequestration per unit area. The coconut species with its higher planting density sequestered more CO_2 per unit area annually (46.47 Mg ha^{-1}) and in 17 years (794.04 Mg ha^{-1}). Consequently, the highest total annual (49.49 Mg ha^{-1}) and 17-year (805.14 Mg ha^{-1}) CO_2 sequestration were achieved in the coffee + coconut system. Though all the fruit trees increased CO_2 sequestration per unit area, the coffee + coconut system was more desirable for attracting higher carbon credit (US$24.15 ha^{-1} year^{-1}). The implications of these systems for farm sustainability, farmer income and livelihood, and biodiversity conservation are discussed.

Keywords: Carbon credit, Climate change, Biodiversity, Ecosystem Services, Resilience, Sustainability

76. ASSESSING THE AQUACULTURE POTENTIAL OF SMALL RESERVOIRS: A CASE OF THE NORTH-EAST REGION OF GHANA

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Abstract

Aquatic foods are an important component of the global food system and provide benefits for the growing population globally. Small reservoirs are prominent features in northern Ghana and most of them are underutilized. The objective of the study was to assess the suitability of these reservoirs for cage fish farming for enhanced fish production for food security. The study was carried out in the Langbinsi, Nalerigu, Nansoni, and Tombu reservoirs in the North-East Region of Ghana. Temperature, dissolved oxygen, pH, water depth, and conductivity of the reservoirs were measured in situ. Water samples were collected from each reservoir for analyses of nutrients, major ions and plankton occurrence and composition. Data was analyzed using multivariate techniques. The results of the study showed that turbidity, total suspended solids (TSS), colour, and nitrate significantly contributed to water quality at the reservoir surface. Turbidity and nitrate were significant in determining water quality at the reservoir bottom. Based on results, Nansoni and Tombu reservoirs could better support cage aquaculture. It was recommended that cages need to be relocated after each production circle to reduce the effect of high nitrate concentration on the cultured fish.

77. QUALITY AND SAFETY OF CASSAVA ROOTS PRODUCED FROM RECLAIMED AND NON-MINE SITES

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Abstract
While the reclamation of mine sites is a laudable initiative, the quality and safety of food crops produced from such reclaimed fields is rarely known. This study aimed to determine and compare the safety and quality of cassava roots produced from reclaimed and non-mine sites in Ghana. Purposive and simple random sampling techniques were employed to collect cassava samples from reclaimed and non-mine fields at the study locations for quality and safety analysis using standard methods. The result indicated that the various cassava samples from reclaimed fields in Pameng contained higher amounts of moisture (63.60%), fat (2.34%), and protein (1.75%) as compared to those of non-mine fields (55.23, 1.38, and 0.88% respectively). Nonetheless, in Gyadam, all proximate parameters except ash (5.53%), were higher in samples collected from reclaimed mine sites. Whereas all the heavy metal levels in samples fell within acceptable limits, Lead (Pb) quantities in cassava roots from reclaimed mine sites exceeded WHO/FAO maximum permissible limits due to the mining activities that had occurred on the field. Mercury was not detected in all the cassava samples. Cyanide was generally present in higher quantities (61.05-156.07 mg/kg) for cassava samples from reclaimed mine sites than non-mine sites (41.76 and 79.04 mg/kg) in both study locations, though they were both above permissible limits. The nutritional quality of cassava roots from the reclaimed and non-mine sites were comparable; however, those from reclaimed mine sites had unacceptable levels of cyanide and heavy metals, indicating possible safety issues concerning its consumption.

Keywords: Cassava, Heavy metals, Cyanide, Proximate, Reclaimed mines

78. CRISPR/Cas9-MEDIATED TARGETED MUTAGENESIS OF J/GmELF3 GENE IN SOYBEAN DELAYS FLOWERING TIME IN SOYBEAN UNDER LONG-DAY CONDITIONS AND IMPROVES FIELD PERFORMANCE ACROSS DIVERSE ENVIRONMENTS

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Abstract
Soybeans are an important oil crop in the world, with growing production demand in tropical regions. However, most high yielding temperate cultivars flower prematurely when grown in the tropics, resulting in reduced yield. The presence of the long juvenile (LJ) trait associated with the J gene ensures sufficient vegetative growth before flowering. In this study, CRISPR/Cas9 genome editing was employed to mutate the J/GmELF3 gene in soybean variety carrying a functional J gene to delay flowering under short day (SD) condition. The mutation efficiency was 18% but not all the homozygous mutations were transferable from T_0 to T_1 generation. However, all homozygous mutations were stably inherited from T^1 to T_2 generation. Phenotypic evaluation under both SD and long day (LD) conditions showed delayed flowering in mutant lines compared to the wild type. Gene expression analysis revealed different J gene expression patterns between wild type and transgenic lines under both photo periods, though no statistically significant differences at any time point were observed. However, delayed flowering was more pronounced under LD conditions, possibly due to the genetic background of the tested genotype. Field evaluations conducted across diverse environments further confirmed the stability of the delayed flowering phenotype, with stronger effects observed under longer day lengths and no significant yield penalties under short-day conditions. These findings underscore the potential of targeted genome editing of J for improving soybean adaptation to tropical and subtropical regions.

79. COMPOSITION AND DISTRIBUTION OF SHEA FRUIT-INFESTING FLIES (*TEPHRITIDAE*) IN THE KUMBUNGU DISTRICT

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Abstract
Shea is a major economic tree which occurs in the arid and semi-arid regions of Sub-Saharan Africa. Shea fruit pulp is characterized by a sweet pear-like taste rich in sugars, ascorbic acids and essential minerals. The fruit pulp is consumed as dessert or whole meal in the rainy season contributing to food security. However, fruit fly infestation affects the quality of fruits intended for human consumption and commercialization. This study assessed the composition and distribution of fruit flies associated with shea and compared infestation levels between shea parklands. A reconnaissance survey was conducted to identify shea parklands with mature trees. Two sites were selected for fruit sampling over a period of three months in the 2023 shea fruiting season. A total of 180 fruits were incubated every fortnight till fly emergence. Three fruit fly species (*Ceratitis cosyra*, *Dacus ciliatus* and *Trirhithrium*) emerged, of which *Ceriiatitis cosyra* was the most dominant (99.62%). Peak infestation occurred in the month of June 2023 and was followed by a progressive decline for the rest of the fruiting season. However, infestation levels did not differ significantly between shea parklands ($p = 0.126$). Future studies should examine infestation over multiple seasons to understand interannual variability in fruit fly infestation.

Keywords: Shea, Fruit flies, *Ceratitis cosyra*, Infestation, Farmland

80. GENETIC ANALYSIS AND CAROTENOID COMPOSITION OF PROVITAMIN A MAIZE INBREDS AND HYBRIDS UNDER DROUGHT AND LOW SOIL NITROGEN CONDITIONS

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Abstract
Maize varieties with enhanced carotenoid content will contribute to a reduction in vitamin A deficiency in vulnerable populations in sub-Saharan Africa. This study evaluated maize inbreds and hybrids for agronomic performance, stability, combining ability and provitamin A (PVA) contents under drought, low soil nitrogen (low-N) and optimal conditions. Ninety-six hybrids developed from 24 PVA lines using NC II, including four checks, were accessed in a 10 × 10 alpha lattice design under low soil nitrogen, drought and optimal conditions for two years. Significant differences were observed among the lines for β-cryptoxanthin (0.02 - 24.21 µg/g), α-carotene (0.06 - 16.88 µg/g) and β-carotene (0.03 -13.63 µg/g). Genotype and genotype × environment interaction effects were significant for grain yield and yield related traits under the conditions studied for both inbred and hybrid trials. Grain yield of the hybrids ranged from 2600.6 to 5760.7 kg ha -1 and 3923.4 to 7667.4 kg ha^{-1} under low-N and optimal nitrogen conditions, respectively. Under drought and rainfed conditions, the ranges in grain yield were 1594.40 to 4110.40 kg ha^{-1} and 3442.83 to 7364.44 kg ha^{-1}, respectively. Grain yield reduction due to low-N and drought stress were 40.90% and 50.30%, respectively. Significant general combining ability and specific combining ability effects were detected for grain yield under the different growing conditions, indicating the importance of both additive and non-additive genetic effects in the set of genotypes evaluated. The lines with high carotenoid content would serve as a valuable source of germplasm for the development of PVA hybrids.

Keywords: Additive gene effect, Carotenoid content, Combining ability, Drought tolerance, Low soil nitrogen

81. AIR-FRYING OF TRADITIONAL SNACKS (*KELEWELE, CHIN-CHIN*); A HEALTHIER ALTERNATIVE

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Abstract
The rising concern over the health implications of deep-fried foods has led to increased interest in alternative cooking methods. This study explored air frying as a healthier alternative to deep frying for producing traditional Ghanaian snacks; kelewele and chin-chin. Kelewele samples were air fried at 160 o C for 20 min and deep fried at 165+5 o C for 12 min, whereas the chin-chin was done at the same temperature with varying times of 15 and 5 respectively. All the samples were analyzed for moisture content, fat content, color profile, and sensory attributes. Air-fried samples exhibited significantly lower fat content compared to deep-fried versions (49.68% vs 60.34% for chin-chin; 8.16% vs 18.98% for *kelewele* < 0.05) while maintaining similar moisture levels. Color profiles (L*, a*, b* values) showed no significant differences ($p > 0.05$) between the methods. Triangle tests with 50 panelists revealed that most could not reliably distinguish between air-fried and deep-fried Samples (34% correct for kelewele, 44% for chin-chin, $p > 0.05$). Preference tests showed a slight trend favoring air-fried samples, though not statistically ($p > 0.05$) significant (56% for *kelewele* 54% for chin-chin). These findings suggest air frying can produce healthier versions of these snacks without significantly compromising sensory quality or consumer acceptability. The ability to maintain similar color and texture while reducing fat content addresses growing consumer health concerns. This study demonstrates the potential of air frying as a viable technique for producing traditional snacks with improved nutritional profiles. Future research should focus on optimizing air frying parameters, conducting larger-scale consumer acceptance studies, and investigating shelf-life.

Keywords: Local snacks, Frying methods, Quality characteristics, Consumer acceptability

82. USING TERMINAL-RESTRICTION FRAGMENT LENGTH POLYMORPHISM (T-RFLP) TO IDENTIFY MICROORGANISMS CONTAMINATING OIL PALM FRUITS AND PALM OIL FROM PROCESSING MILLS IN GHANA

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Abstract
Visual observations of the oil palm fruits used for oil production at the small-scale mills in Ghana show various levels of microbial contamination of the fruits. This study was therefore undertaken to develop a molecular technique based on variability of the bacterial 23S rDNA and fungal ITS2 gene sequences to monitor the total bacterial and fungal populations of oil palm samples. Oil palm fruits and processed oil samples were collected from processing mills in the Eastern Region of Ghana. The fruits were washed in Potassium phosphate buffer to contaminate culture microorganisms. Isolated bacterial and fungal species were identified using PCR analysis and Terminal Restriction Fragment Length Polymorphism (T-RFLP). T-RFLP analysis was performed on fruits stored over a 26-day period to analyse the build-up of microbial communities. The distribution of microbes on fruits and oils from eight selected locations was also determined. A total of 30 bacterial and 31 fungal species were identified and these included colonizers, lipolytic, pathogenic and toxin-producing species. Approximately 57.9 percent of samples from the eight locations amplified with ochratoxin biosynthetic gene primers at a product size of 480-520 bp.

Keywords: Oil palm fruits, oil, bacteria, fungi, T-RFLP

83. COCOA (*THEOBROMA CACAO*) PULP JUICE: AN EMERGING TROPICAL FRUIT JUICE FOR THE BEVERAGE INDUSTRY IN GHANA

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Abstract

Cocoa pulp juice (sweating) is one of the major by-products obtained during processing of the bean. It is normally allowed to go waste during the fermentation of fresh cocoa beans. It is also estimated that 1 tonne dry cocoa beans leave about 400-425kg of pulp and with an annual average production of 800,000 MT of dry beans in Ghana, there is a huge loss of the pulp annually. Cocoa sweating has an antioxidant activity of 1871 µmol TE/100g pulp due to its high polyphenol content and has been used in the production of non-alcoholic drinks and fruit preserves. The two main components of sweating are water and sugars, making it a very good substrate for microbial growth during fermentation. Spontaneously fermented sweating can be distilled into industrial alcohol, and it has been estimated that 110 L sweating would produce 6 L of 85% alcohol. Fermentation of sweating through the introduction of carefully selected microorganisms has also been used to develop different kinds of beverages with alcohol contents ranging from 0.36 to 12%. Utilization of sweating in the production of both alcoholic and non-alcoholic beverages has been found to be economically viable, generating over 100% profits. It is also beneficial in the creation of jobs and extra income for cocoa farmers. For this reason, its promotion in the beverage industry is timely. This paper, therefore, seeks to review the utilization of sweating and its economic benefits in Ghana.

Keywords: By-product, alcoholic beverages, economic benefits, juice drink, utilization

84. EXAMINING THE REPRODUCTIVE POTENTIALS OF AUCHENOGLANIS OCCIDENTALIS IN BONTANGA RESERVOIR, GHANA

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Abstract

This study investigated aspects of the reproductive biology of *Auchenoglanis occidentalis* from the Bontanga Reservoir in Northern Region of Ghana, focusing on gonadosomatic index (GSI), fecundity, and egg size, to provide baseline information for management. A total of 62 specimens (31 females and 31 males) were sampled monthly between April and August 2021 using gill nets and cast nets. Fish were measured for total length (TL) and body weight (BW), and gonads were dissected and weighed (GW). The GSI, fecundity, and egg diameter were determined following standard methods. Linear regression analysis was used to evaluate relationships between reproductive parameters (GSI, fecundity, egg size) and morphometric variables (TL, BW, GW). Six gonad maturation stages were identified. The mean GSI was 0.10 in females and 0.05 in males, varying with sex, size class, and maturation stage, and showing significant correlation with TL, and BW. Mean fecundity was 541 eggs, and it showed significant positive correlation with gonad weight (GW) and was directly proportional to total length (TL) and body weight (BW) but inversely related to egg diameter. The mean egg diameter was 0.74 mm, and it was significantly correlated with TL, BW, and GW. Egg size distribution was bimodal, indicating multiple spawning. These findings highlight fecundity, GSI, and egg size as key indicators of the reproductive potential of *A. occidentalis* and provide essential information for the species' management in Bontanga Reservoir.

Keywords: *Auchenoglanis occidentalis*, Fecundity, Gonadosomatic Index (GSI), Egg size, Gonad maturation

85. EXPLORING THE EFFICACY OF FOUR PLANT SPECIES ON DISEASE-CAUSING ORGANISMS OF COWPEA *IN VITRO*

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Abstract

Exploring bioactive compounds of plant origin may be a more environmentally friendly approach to controlling diseases in cowpea, as compared with synthetic pesticides. This study evaluated the antimicrobial effect of extracts from four plant species on cowpea pathogens in vitro. Fresh leaves of *Azadirachta indica* (neem), *Morinda citrifolia* (noni), *Cocos nucifera* (coconut), and *Melaleuca alternifolia* (tea) were harvested from the botanical garden of the School of Biological Sciences, University of Cape Coast (UCC) and the tea farm at Amedzofe, Volta Region, for extract preparation. Varying concentrations (100%, 50%, 25%, 10%, 0%) of the plant extracts were prepared and used for the efficacy test. Cultures of four bacterial and five fungal species isolated from infected cowpeas in the coastal and Sudan savannah agroecological zones were standardized with a spectrophotometer to 10^8 CFU/ml for bacteria and 10^4 CFU/ml for fungi. The antimicrobial effect of the extracts was tested against the bacterial and fungal isolates using the agar well diffusion method. Streptomycin sulphate and Itraconazole were used as positive controls for bacteria and fungi, respectively, while sterile distilled water served as a negative control. Neem, tea, and noni extracts had a significant effect on the inhibition zones of the plant pathogens ($p \leq 0.05$). The highest antibacterial inhibitions came from tea and neem, with *Pseudomonas* being the most susceptible (3.50 cm). The highest antifungal, noni and neem, effectively inhibited *Cercospora* (3.57 cm) and *Protomycopsis* (2.8 cm). Microscopy confirmed cell deformation at concentrations of ≥ 25% for neem, tea, and noni extracts.

Keywords: Cowpea, efficacy, antimicrobial, bioactive, biopesticides

86. NUTRITIONAL COMPOSITION OF TWO DISHES OF PEARL MILLET (Hausa koko and Zimkom) IN GHANA

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Abstract

Pearl millet (*Pennisetum glaucum*) is an indigenous, drought-tolerant cereal crop cultivated and consumed in Ghana, particularly in the northern regions. Despite its nutritional benefits and climate-resilient properties, its utilization remains marginalized due to socio-cultural perceptions. This study assessed the nutritional composition of two traditional millet-based dishes; Hausa Koko (fermented porridge) and "Zimkom" (a light beverage) prepared from five pearl millet genotypes: AKAD KOM, ICMV221Br, SALMA III, SARMIL085, and WAAPP-NAARA. Using AOAC, 1990 method, proximate analyses were conducted to determine moisture, protein, fat, ash, and carbohydrate contents of the different dishes. The analysis of variance (ANOVA) indicates significant differences among genotypes ($p < 0.05$), with ICMV221Br consistently exhibiting superior nutritional qualities in both dishes e.g Hausa koko: carbohydrate = 9.8% and protein = 1.4% while in Zimkom dish had 10.7% carbohydrate and 1.7% protein. Reduction of anti-nutritional factors like phytate observed at post-processing were attributed to enzymatic and microbial activities during fermentation. The study highlights the potential of pearl millet, particularly ICMV221Br, to improve food and nutrition security in arid and semi-arid regions where drought is so severe. Promoting millet-based meals could contribute to dietary diversity and resilience in the face of climate variability.

Keywords: dishes, genotype, food-security, Hausa-koko, "Zimkom"

87. MAPPING OF GENOMIC REGIONS ASSOCIATED WITH PHENOLOGICAL TRAITS IN SOYBEAN (*Glycine max* L. Merr.) USING GENOME-WIDE ASSOCIATION STUDY IN THE GUINEA SAVANNAH TROPICAL ZONE

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Abstract

Soybean (*Glycine max* L. Merril) is an oil and nutrient rich leguminous crop which exhibits strong sensitivity to photoperiod. Phenological traits such as days to flowering (DTF) and days to maturity (DTM) are crucial for soybean adaptability and yield. Despite this, information on the genetic basis of soybean phenology is scanty. This study aimed to uncover molecular markers associated with DTF and DTM and identify underlying candidate genes for the benefit of genomic assisted breeding strategies in Ghana. A diverse set of soybean accessions comprising 74 foreign lines (FL) and 4 local lines (LL) were evaluated for two seasons and then genotyped. These accessions were divided into four clusters, consistent with the Neighbor-joining tree. Statistical description reveals minimum DTF and maximum DTM values for FL and LL, respectively. FL had mean ± SD, minimum DTF, and maximum DTF values of 41.76 ± 5.44, 28, and 55, respectively. LL had DTF values of 51.12 ± 1.95, 49, and 55, and DTM values of 102 ± 6.95, 94, and 113. Broad-sense heritability (H^2) for DTF (51.72-86.45), and DTM were (86.95 - 88.76), suggesting that DTF is moderately controlled by genetic factors. Six common SNPs were extracted, in regions which were identified as stable in two environments. Moreover, the in-silico analysis predicted candidate genes for traits based on their genomic position. These genes are crucial for various biological processes and pathways, such as floral organ identity and photoperiodism. Results from the study provides information that is useful for improving soybean breeding programs and economic benefit in the Guinea Savannah zone of Ghana.

Keywords: Genome, Nucleotide, Flowering, Maturity, Soybean, Trait

88. EFECT OF DRYING TECHNIQUES ON THE COLOR AND NUTRITIONAL QUALITIES OF GHANAIAN BUTT CHEEK PEPPER

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Abstract

Cashew apple is a nutritious fruit yet highly underutilized in developing countries due to high perishability, and limited knowledge in its value-added products. Cashew apples are often considered by-product of cashew nut production while studies suggest their potential use as composite flour in bread production. This study evaluated the impact of incorporating cashew apple flour (CAF) into wheat flour for bread production, focusing on enhancing nutritional value and functional properties. Composite flours were formulated by substituting wheat flour with 10%, 15%, and 20% CAF, and proximate composition, functional and sensory properties of the resulting bread were determined using standard methods. Results showed an increase in dietary fibre and ash content with higher CAF levels, indicating a rise in mineral content. The addition of dietary fibre from CAF can offer health benefits, such as improved digestive health and potentially lower glycaemic responses. The increased fibre content enhances the bread's nutritional profile, making it a more attractive option for health-conscious consumers. Protein content decreased, likely due to the lower protein levels in CAF compared to wheat flour. Sensory evaluation highlighted that bread with 10% CAF substitution had the highest acceptability, balancing improved nutritional content with desirable organoleptic properties. The study concludes that CAF is a promising ingredient for composite flours, contributing to dietary fibre and mineral intake, though further research is needed to optimize protein levels in the final product. Utilization of cashew apples in bread production would contribute to growth of local bakeries and waste reduction thereby achieving the SDG 12.

Keywords: Cashew apple, Value-added products, Proximate composition, Functional properties, Sensory characteristics

89. APPLYING BIOFERTILIZERS WITH NPK ENHANCES GROWTH AND YIELD PERFORMANCE OF RICE UNDER GHANAIAN AGROECOLOGICAL CONDITIONS

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Abstract
In Ghana's rice-growing regions, integrating biofertilizers with chemical fertilizers presents a promising path toward sustainable agriculture, especially under climate stress. This study explored how two biofertilizers—Tokyo 8 and Humate-500, perform when applied alone or in combination with NPK fertilizer. Using a randomized complete block design with six treatments and six replications, we assessed rice growth, yield, and grain quality across developmental stages. The standout performer was the 50% Tokyo 8 + 50% NPK treatment, which consistently boosted vegetative growth. At the early stage, it produced the highest tiller count (3.6), surpassing both 50% Humate-500 + 50% NPK (2.7) and full NPK (2.5). This advantage held through the active growth phase, with Tokyo 8 + NPK yielding 7.3 tillers, compared to 5.4 in the control. At peak growth, the highest tiller counts were recorded in 100% NPK (13.7), Tokyo 8 + NPK (11.7), and Humate-500 + NPK (10.9), all of which outperformed sole biofertilizer treatments and the control. Plant height mirrored these trends. Tokyo 8 + NPK led early growth with 48.6 cm, and at maturity reached 66 cm slightly ahead of Humate-500 + NPK (65.1 cm) and full NPK (65.8 cm). Treatments using only biofertilizers or no input consistently lagged behind. These findings underscore the synergistic benefits of combining biofertilizers with chemical fertilizers. Such integration not only enhances rice growth and yield but also aligns with sustainable farming goals in Ghana's agroecological zones.

Keywords: Biofertilizer, Tokyo 8, Humate-500, NPK, Sustainable agriculture

90. LOCATION AND PLANTING DATE INFLUENCE ON FALL ARMYWORM INFESTATION AND MAIZE YIELD IN THE GUINEA AND SUDAN AGROECOLOGICAL ZONES OF GHANA

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Abstract
Maize production in Ghana faces significant yield losses due to fall armyworm (FAW) infestations. This study evaluated the impact of planting dates and Location on FAW infestation and maize yields in the Guinea and Sudan savanna zones of Ghana. The experiment was laid out in a split-plot design with location at three levels and planting regime at two levels. Data was analyzed using ANOVA to test the main and interaction effects of Location and Planting date on Fall armyworm infestation and maize yield. There was significant interaction between Location and Planting date on Larvae count ($P < 0.001$), Leaf damage ($P < 0.001$), plant and ear height ($P < 0.001$), and grain yield ($P < 0.001$). Early planting in Nyankpala recorded the highest FAW infestation and damage, and the lowest was recorded by Damongo in the early planting regime. The low FAW infestation in Damongo supported vigorous plant growth, resulting in the highest grain yield (4,252 kg/ha), while heavy FAW infestation and damage in Nyankpala under early planting resulted in stunted growth and poor yields (2,235 kg/ha). It was observed that pest infestation and damage were reduced in Damongo and Manga under late planting, but infestation persisted in Nyankpala. Despite this, Nyankpala achieved the highest late-planting yield (3,372 kg/ha), while Damongo saw reduced yields (1,304 kg/ha). The significant yield and leaf damage variations observed across planting dates and locations demonstrate that agroecological conditions, including temperature, rainfall patterns, and pest dynamics, play a crucial role in determining maize performance. These results emphasize the need for location-specific planting schedules to mitigate fall armyworm damage and improve maize yields.

Keywords: Fall armyworm, Planting dates, Location, Crop yield, Ghana Agriculture

91. TOWARDS EFFICIENT COCOA SWOLLEN SHOOT VIRUS DISEASE (CSSVD) INTEGRATED MANAGEMENT IN WEST AFRICA: THE COMPLEMENTARY ROLE OF SENSITIVE AND RELIABLE MOLECULAR DIAGNOSTIC TOOLS

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Abstract

Cocoa swollen shoot virus disease (CSSVD) remains one of the major biotic limitations to cocoa (*Theobroma cacao*) production in Ghana and the other cocoa producing nations in West Africa. Over the years, the rogueing and replanting methods, commonly referred to as the cutting out system, have been the main control strategy to minimize spread and impact of the disease. Implementation of the cutting out system is, however, hampered by late detection and removal of latently infected and asymptomatic cocoa plants. This results in accumulation of virus inoculum in the field and continuous spread of the disease into new plantations. Availability of efficient and reliable molecular diagnostic tools such as the polymerase chain reaction (PCR) is considered one of the best complementary strategies for prompt management of the disease. Consequently, several CSSV primer sets have been developed for PCR detection of the virus in the laboratory, albeit with variable detection efficiencies. In this study, two distinct CSSV primer sets designed from the movement protein (MP) and reverse transcriptase (RT) positions of the third open reading frame (ORF3) of the full-length CSSV genome were evaluated to determine their detection efficiency on asymptomatic samples. A total of 1050 representative asymptomatic samples collected from infected but apparently healthy cocoa plants across the cocoa regions in Ghana were PCR assessed with the two primer sets. The results indicated low detection potential of the primers and ranged from 28% to 44% for the MP primers, and 24% to 36% for the RT primer sets. These outcomes highlight the need to further optimize the existing PCR protocols and also develop new primer sets for efficient detection of latent infections to complement management of the disease for sustainable cocoa production in Ghana.

Keywords: Cocoa, CSSVD, molecular, detection, PCR

92. CONSUMER PERCEPTION AND QUALITY CHARACTERIZATION OF WILD GRASSCUTTER (*THRYONOMYS SWINDERIANUS*) DIGESTA

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Abstract

Grasscutter (*Thryonomys swinderianus*) digesta is the undigested food component (grasses, tubers and legumes) found in the large intestines and usually consumed by many ethnic groups in Ghana. Although grasscutter digesta is eaten as a delicacy, information about its nutritive composition and microbial load is limited. This study determined consumers' knowledge and perception, proximate, minerals, phytochemicals and microbial load of grasscutter digesta using standard methods. Grasscutter samples were collected from Adukrom, a town in the Eastern Region of Ghana. Non-experimental design involving the use of a survey was adopted to gather information from consumers in three randomly selected towns in Atiwa municipality. Out of two hundred and nine (209) respondents, majority (85%) showed awareness of grasscutter digesta consumption through friends (48.02%) and parents (39.55%), and its occasional consumption at home, and chopbars are influenced by affordability, availability, nutritional benefits, taste and aroma. The study's findings indicated absence of *Escherichia coli*, *Enterobacteriaceae*, *Salmonella*, and total coliform in the grasscutter digesta. Mineral assessment revealed significant amounts of copper (58.96 mg/kg), Zinc (18.34 mg/kg), Iron (307.97 mg/kg), Potassium (2.91 mg/kg), Calcium (1.24 mg/kg), and Manganese (31.27 mg/kg). Also, the grasscutter intestinal digesta contained 7.43%, 25.06%, 4.21%, 1.99%, 74.94%, and 11.44% for carbohydrate, total solids, crude protein, crude fat, moisture content, and total ash respectively, and phytochemical profiling discovered alkaloids (2.2%), glycosides (14%), saponins (20.2%), Tannins (50%), flavonoids (11.6%) and coumarins (2.0%). Grasscutter digesta utilization in local foods preparation is potentially safe and offers nutritional benefits to consumers.

Keywords: Grasscutter digesta, Consumer perception, Microbial load, Minerals, Phytochemicals

93. VARIETAL RESPONSE OF SOYBEAN TO DIFFERENT RATES OF INOCULANT UNDER RAINFED AND IRRIGATION SYSTEMS IN NORTHERN GHANA

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Abstract

Soybean (*Glycine max* L.) is a crucial leguminous crop that forms symbiotic relationships with nitrogen-fixing bacteria, *Bradyrhizobium* spp, resulting in the greater development of root nodules. These nodules enable biological nitrogen fixation (BNF), decreasing reliance on synthetic fertilisers. The effectiveness of nodulation, nitrogen fixation and consequent increase in yield can be influenced by soybean variety and soil moisture conditions. In the study, the plant growth parameters, grain yield, ureide-N concentration, relative ureide-N abundance and shoot %Ndfa of three soybean varieties were assessed at four inoculant application rates (0ml/kg, 1ml/kg, 2ml/kg and 3ml/kg) using the ureide technique (Favour, at an inoculation rate of 3ml/kg, recorded the highest grain yield of 1356kg/ha under rainfed conditions. This represents a 54% increase in grain yield over the control. The percentage increase in ureide-N concentration under inoculation ranged from 17.1% to 39.6% under irrigation. The variety "Favour" recorded the highest ureide-N concentration under irrigation, while "Afayak" outperformed the other two varieties under rainfed conditions. Inoculation effect on relative ureide-N abundance and %Ndfa were significant ($p < 0.05$). Efforts should be made to improve soil nutrients by exploiting the advantages of BNF.

Keywords: inoculation, ureide-N concentration, relative ureide-N abundance and Ndfa

94. COMPARATIVE NUTRITIONAL PROFILING OF TRADITIONAL AND MODIFIED DAWADAWA (AFRICAN LOCUST BEAN) FORMULATIONS

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Abstract

African locust bean (*Parkia biglobosa*) is an important indigenous multipurpose fruit in many countries of Sub-Sahara Africa. Dawadawa is a traditional fermented food condiment derived from African locust bean and plays a key role in West African diets. Despite their extensive use, there is a significant gap in the comprehensive analysis of Dawadawa's nutrient composition, particularly in the context of their traditionally processed form and when supplemented with other legumes. This study aimed to conduct a comparative proximate and mineral analysis of Dawadawa formulations; thus, traditional and 1:1 ratio mixed-legume variants. The Proximate and mineral content were evaluated using standardized AOAC methods after the samples were processed. The results were subjected to ANOVA, and the means were compared using Fisher`s protected LSD at 5% significance. The proximate and minerals compositions of the various formulations showed highly significant differences (p<0.0001). Dawadawa recorded the highest Fat and the lowest fiber and Ash contents (35.22%, 8.18% and 1.8% respectively). With protein content, soybean Dawadawa had 57.01% while Groundnut Dawadawa had 37.29% as the lowest. Generally, the carbohydrate amounts were noted to range from 0.52% (soybean) to 12.15% (Locust Beans + soybean). The mixed-legume formulation of Dawadawa recorded higher levels of Iron (Fe) and Zinc (Zn), thus 124.78mg/kg and 38.3mg/kg respectively. Also, Locust Beans + Groundnut had the most amount of Calcium (1.04%) and soybeans had the highest potassium of 2.12g/100g. Generally, the formulation did not record higher levels than the individual products, but mixed legume formulation had higher mineral content and hence, should be advised on nutritional needs basis.

Keywords: Dawadawa, proximate analysis, minerals, soybean, groundnut

95. INNOVATIVE AND SUSTAINABLE PROCESSING OF SHEA (*VITELLARIA PARADOXA*) FRUIT BY-PRODUCTS INTO VALUE-ADDED LEATHER: EFFECTS OF GELATIN AND HOT-AIR DRYING

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Abstract
Shea (*Vitellaria paradoxa*) fruit by-products, which include peel and pulp, are generated during shea nut processing. These by-products are rich in bioactive compounds and have potential applications in the food industry. However, their use is currently limited by short shelf life and seasonal availability. This study provides a sustainable approach to their utilization by transforming them into fruit leather using gelatin as a binder and hot air drying as the preservation method. The impact of drying air temperature (50°C and 60°C) and gelatin concentrations (0 – 4%) on drying kinetics, color, bioactive compound retention, and sensory properties was analyzed. The results showed that drying of shea fruit by-product at 60°C reduced drying time and resulted in moisture content (18.29 - 21.11%) and water activity (0.1235 - 0.2565) levels that are unfavorable for microbial growth. The Midilli et al. model (R^2 = 0.9933 - 0.9998) best fits the drying kinetic data. The moisture diffusivity values (3.91×10^{-12} to 2.76×10^{-11} m²/s) increased as the drying temperature increased, while the activation energy ranged from 13.20 to 87.71 kJ/mol. Drying at 60°C best preserved total phenolics, flavonoids, and antioxidants, while 50°C was optimal for carotenoid retention. The color of the shea fruit leather was significantly impacted ($p < 0.001$) by temperature and gelatin concentration, with less visible color change at higher gelatin levels. Moderate levels of gelatin were preferred, with sensory scores ranging from 5.77 - 5.27. The study demonstrates a viable method for transforming shea fruit by-products into value-added products, reducing postharvest losses and creating income opportunities, especially in rural areas.

Keywords: Shea fruit by-product, Shea fruit leather, Hot air drying, Gelatin, Drying kinetics, Quality attributes

96. UNLOCKING THE FEED POTENTIAL OF PTEROCARPUS ERINACEUS, ANACARDIUM OCCIDENTALE, AND GMELINA ARBOREA FOR SUSTAINABLE LIVESTOCK PRODUCTION IN THE GAMBIA

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Abstract
The escalating cost of conventional livestock feed ingredients in The Gambia has created renewed interest in exploring alternative feed resources that are locally available, sustainable, and affordable. Feed typically accounts for the largest proportion of production expenses in livestock farming, and the country's heavy reliance on imported feedstuffs such as maize and soybean meals has made farmers vulnerable to global market fluctuations. As prices of these conventional feed ingredients continue to rise, both smallholder and commercial farmers are increasingly pressured to identify substitutes that can meet the nutritional needs of livestock while simultaneously reducing costs. Within this context, the use of agroforestry products and agro-industrial byproducts represents a viable strategy for strengthening local feed supply systems. This study was conducted to evaluate the proximate composition and metabolizable energy of six locally available, plant-derived materials. The feed resources investigated included rosewood (*Pterocarpus erinaceus*) dried leaves, cashew (*Anacardium occidentale*) fruit pulp residue, and four components of gmelina (*Gmelina arborea*), namely dried seeds, fresh leaves, flowers, and fallen leaves. Samples were analyzed on an as-fed basis. Rosewood leaves exhibited the highest crude protein content (17.51%) and crude fibre content (22.19%), indicating excellent potential as a ruminant roughage. Cashew pulp had a high nitrogen-free extract (56.68%) and metabolizable energy (2951 kcal/kg), indicating a strong energy value. Among the Gmelina components, fresh leaves had the highest crude protein (14.89%) and metabolizable energy (2917.97 kcal/kg), while flowers and fallen leaves provided balanced fat and fibre. The practical implications of these findings are highly relevant for improving feed security in The Gambia. Rosewood leaves, with their high protein and roughage content, can be strategically included in ruminant diets, either as supplementary forage or as part of total mixed rations. Cashew pulp residue, given its strong energy value, can be incorporated into monogastric diets to partially replace maize, thereby lowering dependence on costly imports. Meanwhile, the different gmelina components, particularly the fresh leaves, could be used to diversify ruminant rations and provide both protein and energy at minimal cost. In conclusion, incorporating these resources into feeding strategies may lower feed costs, reduce reliance on imported ingredients, and improve the resilience of the local feed industry. These results highlight the nutritional diversity and feed value of these materials and their potential contribution to more sustainable and Affordable livestock feeding systems in The Gambia.

Keywords: Agroforestry byproducts; Livestock feed; Rosewood (*Pterocarpus erinaceus*); Cashew (*Anacardium occidentale*); Gmelina (*Gmelina arborea*).

97. NUTRITIONAL COMPOSITION, ANTIOXIDANT ACTIVITY AND MICROBIOLOGICAL QUALITY OF NON-ALCOHOLIC CASHEW APPLE WINE

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Abstract
Expanding knowledge on cashew apple utilization has ensued in the development of non-alcoholic cashew wine using *S. ludwigii* and *Z. rouxii* yeast strains under cold fermentation (1-3^{o}C) in a completely randomized design, but its quality and safety characteristics have not been evaluated. This research determined the nutritional content, antioxidant activity and microbiological quality of non-alcoholic cashew apple wine. The two non-alcoholic cashew apple wine samples (*S. ludwigii* and *Z. rouxii*) were analysed for minerals, phytochemicals, antioxidant activity, *Enterobacteriaceae*, *Staphylococcus aureus*, total yeast, aerobic plate and coliform counts using standard analytical methods. All the wine samples contained equivalent compositions of sodium, total phenols and flavonoids, which were higher or comparable to commercial grape wines. *S. ludwigii* wine had higher concentrations of K, Zn, Ca, vitamin C and anthocyanin, except for Tannins, Mn and Mg, which were paramount in *Z. rouxii*. In furtherance, *Z. rouxii* recorded higher antioxidant activity at an IC-50 of 0.014 mg/mL than *S. ludwigii* (0.021mg/mL), and this may be attributed to the high tannin content. Copper and Iron were absent in all the samples, probably resulting from utilization by the yeast cells for their metabolic activities during fermentation. Except for aerobic plate count (within acceptable levels), all the wine samples were free from spoilage and pathogenic bacteria, which is indicative of shelf stability and microbiological safety. In conclusion, all the non-alcoholic cashew apple wines are nutritious, microbiologically safe and have high antioxidant activity to help in the management of cardiovascular diseases.

Keywords: Cashew wine, Minerals, Phytochemicals, Antioxidant activity, Microbiological quality

98. EXPLORING IMAGING TECHNIQUES FOR DETECTING TOMATO SPOTTED WILT VIRUS (TSWV) INFECTION IN PEPPER (*CAPSICUM SPP.*) GERMPLASM

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Abstract
Due to the vulnerability of pepper (*Capsicum spp*.) and the virulence of Tomato Spotted Wilt Virus (TSWV), seasonal shortages and price surges pose a significant challenge, thereby threatening household income. Traditional bioassays for detecting TSWV, such as symptom observation and reverse-transcription PCR, are time-consuming, labour-intensive, and sometimes lack precision, highlighting the need for a faster and more reliable approach to plant disease assessment. We, therefore, explored the use of imaging techniques to assess TSWV in different pepper accessions. Here, two imaging techniques - Red-Green-Blue (RGB) imaging, and hyperspectral (using NDVI and wavelength intensities) were compared with a bioassay method to study the incidence and severity of TSWV in different pepper accessions. The bioassay results gave TSWV incidence from 0 – 100% among the accessions, while severity ranged from 0 to 5.68% based on RGB analysis. Normalized difference vegetative index (NDVI) scored 0.21 to 0.23 for healthy spots on the leaf but 0.14 to 0.19 for disease spots, depending on the severity of the damage. A peak reflectance of the disease spots on the leaves was identified in the visible light spectrum (430 – 470 nm) when spectral bands were studied in the broad spectrum (400.93 – 1004.5 nm). For the selected wavelength in the visible light spectrum, a high reflectance intensity of 340 to 430 was identified for disease areas, but between 270 to 290 for healthy leaves. RGB and hyperspectral imaging techniques can be recommended for the precise and accurate detection and quantification of TSWV infection.

99. EFFECT OF TREATMENT METHODS ON OXALATE LEVELS IN TARO LEAVES (*COLOCASIA ESCULENTA* L.)

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Abstract
Despite the high amount of potassium, folate, vitamin A and C found in taro leaf, its utilization is limited due to high oxalate content. The study determined the influence of various pre-treatment methods on the levels of oxalates in taro leaves. Four distinct varieties of taro leaves (*Asempa*, *Huogbelor*, *Agyenkwa*, and *Yen Anya Woa*) were divided into two, and one part was cut into pieces, and another remained intact or whole. Subsequently, each component was subjected to a series of treatment processes, including 12 h oven drying, soaking in tap water at room temperature for 1 h, hot water blanching for 4 min, boiling for 5 min, and a combined soaking and boiling process. The oxalate contents of the samples were analysed using titrimetric method (Indirect $KMnO_4$ titration of extract). Drying led to an overall reduction in oxalate content by 9.5%, while soaked taro leaves exhibited a reduction of 33.1%. In contrast, blanching samples resulted in a mean reduction of 47.6% in the total oxalate content. The boiling treatment yielded an average oxalate reduction of 58.3%, while the soaking and boiling technique emerged as most effective with oxalate reduction of 73.8%. It is essential to highlight that the oxalate levels discovered during this study were found to be high, ranging from 157.6 to 310.1 mg/100g of taro leaves. Ultimately, the soaking and boiling technique significantly reduced the oxalate content, thereby underscoring its efficacy in mitigating oxalate concentrations in taro leaves.

Keywords: Oxalate concentration, Taro leaves, Drying, Soaking, Blanching, Boiling

100. ASSESSMENT OF FOOD SAFETY AND HYGIENE SITUATIONS OF TERTIARY INSTITUTIONS IN KOFORIDUA FROM THE CONSUMERS' PERSPECTIVES

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Abstract
Food safety and hygiene involve proper and coordinated efforts to ensure foods are properly handled, prepared and stored under suitable conditions. Institutional catering and street food vending contribute immensely to the food needs of many people due to busy schedules, affordability and convenience. The consumption of street foods among tertiary institution populace continues to grow, with limited evaluation of the safety and hygienic practices of food vendors from the consumers' standpoint. This study, therefore, aimed to determine consumers' perceptions about the safety and hygiene practices of food sold in various tertiary institutions in Koforidua. Semi-structured questionnaires were developed and administered to 850 respondents from three randomly selected institutions: Koforidua Technical University (KTU), SDA Teachers Training College (SDATTC), and All Nations University College (ANUC). The study recorded male (41.6%) and female (58.4%) respondents between 18-30 years (84.4%), of which 80.7% buy food on campus. The respondents of SDATTC (57.58%), KTU (55.80%) and ANUC (58.44%) preferred rice whilst the rest had diverse preferences for banku (29.78%), kenkey (29.56%) and kenkey (27.92%), respectively. Regarding food safety and hygiene issues, the study showed most vendors' foods were close to stagnant waters, exposed to flies, and their personnel handled food with uncovered hair, long nails and used dirty water for washing bowls indicating limited knowledge in food safety and hygiene practices among vendors in and around these tertiary institutions at Koforidua. Incorporation of these findings in the development of food safety guidelines or awareness campaigns for tertiary institutions would safeguard public health.

Keywords: Food safety, Food hygiene, Food vendors, Consumers' perceptions, Tertiary institutions

101. EVALUATION OF AGROECOLOGICAL PRACTICES ON FLORA DIVERSITY IN THE CENTRAL GONJA DISTRICT

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Abstract
Agroecology integrates ecological principles into agriculture and offers a promising alternative to conventional farming. However, in Ghana, there is limited empirical evidence on the extent to which it promotes floral diversity, a key measure of resilience in ecosystems. This study sought to evaluate the impact of agroecological practices on flora diversity in farms within the Central Gonja District of Ghana by comparing ten paired farms managed by the same farmers. Using a comparative cross-sectional design, floral composition was assessed over a four-month period. Floral species were identified in situ each month, and dominance, richness and evenness were quantified using Simpson's Index, Shannon–Wiener Index, and Pielou's Evenness. Importance Value Indices and rank–abundance curves were used to identify and characterize dominant species, while non-metric multidimensional scaling (NMDS) was used to compare and visualise differences in community structure. The study revealed that agroecological plots exhibited significantly higher total abundance and slightly higher richness of flora than conventional plots. Further there were marked differences in species between paired farms. Weeds under agroecological farms included *Tridax procumbens* and *Commelina benghalensis*, whereas conventional plots were dominated by *Scoparia dulcis* and *Dactyloctenium aegyptium*. Non-Metric Multidimensional Scaling (NMDS) showed greater dispersion in agroecological communities. Farmers cited improved soil health and product quality as benefits, but highlighted limited policy support, and low access to inputs as barriers. Overall, agroecological practices enhanced floral diversity and ecological resilience. It is therefore recommended that extension services be intensified to provide the needed information for farmers who are practicing agroecology.

Keywords: Agroecology, floral diversity, ecological resilience, Ghana, NMDS

102. INVESTIGATING OXALATE CONTENT OF SOME INDIGENOUS VEGETABLES IN THE EASTERN REGION OF GHANA

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Abstract
Calcium oxalate accounts for over 80% of kidney stones, with dietary oxalate being the primary source. This study assessed oxalate content in selected indigenous vegetables across highland (Block A) and lowland (Block B) areas of Eastern Region of Ghana using spectrophotometric and titrimetric methods under fresh and heat-treated conditions. A Randomized Complete Block Design (RCBD) was employed, with statistical analysis using ANOVA, Tukey's HSD, and Bland-Altman comparison. Spectrophotometric responses were generally higher than titrimetric readings, with cocoyam leaves and jute leaves recording the highest oxalate concentrations, particularly under heat treatment. In Block A, oxalate levels were significantly higher than in Block B ($p = 0.0301$). Heat treatment showed a marginal effect on oxalate content ($p = 0.0833$). RCBD results indicated that block effects were significant for titrimetric responses but not for spectrophotometric data. Bland-Altman analysis revealed a mean bias of 119.91 mg/100g between methods, with most observations within acceptable agreement limits. Dietary evaluation highlighted that most vegetables exceeded the recommended oxalate safety limit, especially after heat treatment, emphasizing the need for proper processing to reduce dietary oxalate intake. The findings underscore the influence of environmental conditions, analytical method, and thermal processing on oxalate levels in edible indigenous leafy vegetables and provide practical recommendations for safer consumption.

Keywords: Oxalate content; Indigenous vegetables; Spectrophotometric and titrimetric methods; Heat treatment; Randomized Complete Block Design

103. MORPHOLOGICAL AND PHENOLOGICAL VARIATION OF SHEA (*VITELLARIA PARADOXA*) FLOWERING IN NORTHERN GHANA

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Abstract
Vitellaria paradoxa is a multipurpose tree endemic to the Sudano-Sahelian zone of Africa. The edible fat extracted from shea seed is of cultural, nutritional and industrial significance. Floral phenology and morphology do not only influence pollinator attraction but also serve as indicators of genetic diversity in tree improvement programmes. Understanding shea floral phenology is essential to unveiling phenological responses to climate change. The study examined the relationship between floral phenology and climatic factors as well as the variation in floral traits in six study sites across three regions (Upper West, Upper East, and North East) of Ghana. Twenty focal trees were tagged for observation of phenological parameters and measurement of floral traits in each site. We found a variation in the date of flowering onset between regions. Flowering commenced in Upper West over a month earlier than in the Upper East and Northeast regions. The weekly number of trees commencing flowering was found to be significantly associated with soil moisture ($\beta = -58.558 \pm 18.463$, $p = 0.0015$), and soil temperature ($\beta = 0.262 \pm 0.098$, $p = 0.0073$). Shea floral traits (pedicel diameter, pedicel length, petal length, filament length and style length) also differed significantly between regions. The study attributed morphological variability in floral traits to management practices and genetic diversity of the species. This variability should be considered in germplasm collection for tree improvement and domestication programmes.

Keywords: Floral; Climate; Phenology; Morphology; Shea

104. EFFECT OF DRYING METHODS ON THE QUALITY CHARACTERISTICS OF GINGER (*ZINGIBER OFFICINALE*)

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Abstract
Ginger (*Zingiber officinale*) is rich in minerals, vitamins, and dietary fiber, offering various health benefits. Due to its short shelf-life, drying is a crucial method for enhancing storability. The research determined the effect of drying methods on the quality characteristics of ginger. Fresh ginger slices were dried using oven, dehydrator, microwave, sun, and tunnel techniques, and were assessed for antioxidant activity (DPPH assay), color (colorimetry), microbial load (aerobic bacteria, *E. coli*, yeast, and molds using plate count method), and moisture contents. From the results, the fresh ginger samples had a higher antioxidant activity of 80.18% and 68.64% for the unpeeled and peeled ginger samples, respectively. Also, sun drying had a higher antioxidant activity (75.28%), followed by dehydrator (73.27%) and least in oven (49.97%) for the dried ginger samples. In terms of color, the peeled samples had a lighter color compared to the unpeeled one due to the presence of the suberin (dark pigment) in the peels. The peeled samples had the lowest moisture content (13.9%) followed by the unpeeled (16.69 %) samples. The peeled samples generally had a higher microbial load compared to the unpeeled samples. In general, the samples subjected to sun and dehydrator drying gave the best outcomes for all the quality parameters assessed and are therefore recommended for large-scale industrial applications. The study can contribute to maximizing the retention of antioxidants in dried ginger products, thereby enhancing their nutritional value and health benefits.

Keywords: Microbial load, Antioxidant activity, Drying methods, Ginger, Moisture content

105. GROWTH AND YIELD RESPONSE OF COPPICED ROBUSTA COFFEE TO APPLICATION OF DIFFERENT COMBINATIONS OF NITROGEN AND POTASSIUM

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Abstract
Rejuvenation of coffee plants often requires coppicing of the trees, exposing the soil to the forces of erosion and leaving the farmer without income for up to two years. This juvenile period is prolonged when the soil is depleted of nutrients such as nitrogen. A trial was therefore conducted on a coppiced Robusta coffee farm to evaluate the benefits of applying combinations of potassium and nitrogen to the soil during the rejuvenation period. The treatments evaluated were T1 (no fertilizer), T2 (200 kg N + 200 kg K), T3 (200 kg N + 300 kg N), T4 (200 kg N + 400 kg K), T5 (300 kg N + 200 kg K), T6 (300 kg N + 300 kg K), T7 (300 kg N + 400 kg K), T8 (400 kg N + 200 kg K), T9 (400 kg N + 300 kg K) and T10 (400 kg N + 400 kg K). These treatments were laid out in a randomised complete block design with three replications. Data collected included weed growth and composition, growth of the coffee plants and berry production. The data was subjected to analysis of variance and differences between treatment means were determined by the least significant differences at 5 % probability. Results showed that the application of higher rates of N and K led to faster weed growth and accumulation of more weed dry matter. Higher rates (T9 & T10) led to the accumulation of higher levels of chlorophyll in coffee leaves. Application of T9 promoted stem diameter and height increase in the rejuvenated Robusta coffee, while a higher number of laterals was supported by the application of T7. The application of T4 and T9 promoted higher early yield in Robusta coffee. Cumulatively, except for T6, all the fertilizer treatments supported the production of higher clean coffee beans compared to the control and hence, higher gross income from the sale of coffee beans. Application of the T4 and T9 combinations supported a higher cumulative increase in clean coffee yield, while application of T6 reduced the cumulative clean coffee yield relative to the control. It was therefore concluded that combinations of N and K should be applied to coffee plants during rejuvenation, with the 400 kg N + 300 kg K ha^{-1} recommended for supporting faster regrowth, higher berry production and gross income.

Keywords: Coffee nutrition, Rejuvenation, fertilizers, coffee beans, Gross farm income

106. SCALING-UP SHELF-STABLE LOCAL DRINKS: INDUSTRY PERSPECTIVES AND CHALLENGES

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Abstract
The global beverage industry is undergoing a significant transformation, driven by increased demand for shelf-stable drinks. In Ghana, the food and beverage sector contribute about 20% of gross domestic product and employs over 1.5 million people. However, local manufacturers face challenges in scaling-up production of traditional beverages such as *sobolo*, *asana* and ginger drinks. This study examined the barriers, technical requirements and quality control strategies related to scaling-up local drink production in Ghana. A quantitative approach was used, with data collected from 462 participants via stratified random sample, yielding a 95% response rate (n = 439). The findings showed that larger companies faced greater resource constraints (28.51%), especially in skilled labour, and had more complex market (27.22%) and infrastructure challenges (25.62%). Quality control practices varied across management and operational levels. The study concludes that scaling-up production requires tailored interventions, including strategic investments in infrastructure, equipment, and quality systems to safeguard product consistency and safety. It is imperative for policy regulatory agencies to ensure compliance with infrastructure and personnel requirements for food processing companies since production of quality and safe food is dependent on these factors.

Keywords: Local drinks, Scaling-up production, Production challenges, Quality control

107. ASSESSMENT OF CONTAMINATION AND EXTRANEOUS MATERIALS IN PEELED AND UNPEELED READY-TO-EAT ROASTED PEANUT KERNELS

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Abstract
Food safety concerns regarding roasted ready-to-eat peanut kernels have escalated due to contamination risks from aflatoxins, microbial pathogens, and extraneous materials like sand and stone. This study evaluated contamination levels in peanut samples sold in Accra, Ghana, focusing on aflatoxin presence, microbial quality, and acid-insoluble ash content. The study sampled twelve (12) peanut samples categorised by peeling status and packaging type across the study areas, and aflatoxin content was determined using HPLC whereas acid-insoluble ash, aerobic bacteria, *S. aureus*, *E. coli*, *Salmonella spp*., and *Pseudomonas spp*., yeast and moulds were analysed using standardised laboratory techniques including plate count, and other microbiological tests. Results revealed detectable aflatoxins in 41.7% of samples, all exceeding the regulatory limit of 4.0 ng/g, with a mean total aflatoxin level of 5.14 ng/g and a peak contamination of 20.69 ng/g. Peeled samples exhibited significantly higher ($p < 0.05$) aflatoxin contamination (6.95 ng/g) compared to unpeeled samples (3.82 ng/g). Microbial analysis showed elevated levels of aerobic bacteria, *Staphylococcus aureus*, yeast and moulds in peeled peanuts, while *E. coli*, *Salmonella spp*., and *Pseudomonas spp*. were absent in all samples. Additionally, 25% of samples exceeded the Ghana Standards Authority's regulatory limit for acid-insoluble ash, indicating inadequate sorting and handling techniques. These findings underscore the need for enhanced food safety protocols, improved processing standards, and stricter regulatory enforcement to mitigate contamination risks in peanut products. Future studies may expand the research scope to cover a larger study area to ensure the quality and safety of roasted peanuts across the country.

Keywords: Aflatoxin, Extraneous materials, Pathogen, Roasted Peanut

108. QUALITY CHARACTERISTICS AND CONSUMER ACCEPTABILITY OF COMPOSITE WHEAT AND ORANGE-FLESHED SWEETPOTATO BREAD

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Abstract
Bread is a global staple food, but traditional wheat bread lacks significant amount of some essential nutrients such as beta-carotene which the body transforms into vitamin A to promote proper immune function and good visual health. This study aimed to evaluate the quality characteristics and consumer acceptability of composite bread developed from wheat and orange-fleshed sweet potato (OFSP) flour or puree. Three forms of OFSP roots were used: cooked and dried, freshly dried, and puree. Using a quantitative experimental design substitution level, the study analyzed physical properties, nutritional composition, and consumer acceptability using 70 consumers of bread (untrained panelists). Substitutions used were 40:60% (OFSP: wheat flour) for all breads across the different forms of OFSP roots. Results showed that OFSP incorporation significantly enhanced nutritional content, with beta-carotene increasing from 2.91 ppm in the control to 26.08 ppm in the composite wheat and cooked dried OFSP bread, while iron increased from 47.68 mg/kg in the control to 58.69 mg/kg in composite wheat and freshly dried OFSP bread. Potassium (6197 to 10636 mg/kg), and magnesium (972to 1248 mg/kg) contents increased insignificantly in all the breads incorporated with OFSP. Composite wheat and OFSP puree bread demonstrated optimal volume (1020 mL) and specific volume (3.15 mL/kg) compared to control (880 mL, 2.43 mL/kg) and scored highest in consumer acceptability tests for appearance (5.71 ± 1.42), texture (5.64±1.45), and overall acceptability (5.51±1.26). OFSP puree incorporation at 40% substitution level produced nutritionally enhanced bread with improved beta-carotene content while maintaining consumer acceptability comparable to traditional wheat bread.

Keywords: Orange-fleshed sweetpotato, Beta-carotene, Nutritional enhancement, Consumer acceptability, Composite Bread.

109. UTILISATION OF CASHEW APPLE POWDER IN BREAD PRODUCTION

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Abstract
Cashew apple is a nutritious fruit yet highly underutilized in developing countries due to high perishability, and limited knowledge in its value-added products. Cashew apples are often considered by-product of cashew nut production while studies suggest their potential use as composite flour in bread production. This study evaluated the impact of incorporating cashew apple flour (CAF) into wheat flour for bread production, focusing on enhancing nutritional value and functional properties. Composite flours were formulated by substituting wheat flour with 10%, 15%, and 20% CAF, and proximate composition, functional and sensory properties of the resulting bread were determined using standard methods. Results showed an increase in dietary fibre and ash content with higher CAF levels, indicating a rise in mineral content. The addition of dietary fibre from CAF can offer health benefits, such as improved digestive health and potentially lower glycaemic responses. The increased fibre content enhances the bread's nutritional profile, making it a more attractive option for health-conscious consumers. Protein content decreased, likely due to the lower protein levels in CAF compared to wheat flour. Sensory evaluation highlighted that bread with 10% CAF substitution had the highest acceptability, balancing improved nutritional content with desirable organoleptic properties. The study concludes that CAF is a promising ingredient for composite flours, contributing to dietary fibre and mineral intake, though further research is needed to optimize protein levels in the final product. Utilization of cashew apples in bread production would contribute to growth of local bakeries and waste reduction thereby achieving the SDG 12.

Keywords: Cashew apple, Value-added products, Proximate composition, Functional properties, Sensory characteristics

110. GC-MS COMPOSITION OF *MORINDA LUCIDA* BENTH. AND PHYTOTOXICITY ACTIVITY OF ETHYL ACETATE EXTRACTS OF THE BARK

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Abstract
Morinda lucida Benth. is a well-known medicinal plant used for the treatment of various ailments across Africa and other parts of the world. Herein, we examined the phytochemical components of the ethyl acetate extract by GC-MS and also established the phytotoxic activity of the extract by using lettuce seed (*Lactuca sativa*). In the phytotoxicity experiment using Petri-dish lined with Whatman™ No 41 filter papers, three treatments (TR) were prepared in triplicates; TR1, TR2 and TR3, with concentrations 19.61µg/µL, 39.22µg/µL and 78.44µg/µL respectively. Data visualization was done using a bar chart by plotting the treatments against the Shoot and root lengths. After 7 days, TR3 showed the strongest phytotoxic effect on seed growth, causing an 80% reduction in shoot length and an 85% reduction in root length. The GC-MS data revealed 24 compounds with the major components being Ergosta-4,22-dien-3-one and Cholest-4-en-3-one constituting 14.2% and 12.9% respectively. Other compounds reported to possess phytotoxic activity identified in the extract are 4(1H)-Quinazolinone, 5-(p-hydroxyphenyl)-5-phenyl- and 9-octadecenoic acid.

Keywords: Phytotoxicity, Medicinal plant, Extract, visualization

111. EFFECT OF DIFFERENT RIPENING STAGES AND STORAGE CONDITIONS ON THE PHYSICO-CHEMICAL CHARACTERISTICS OF SHEA (*VITELLARIA PARADOXA*) FRUITS

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Abstract
Indigenous fruit trees are crucial for meeting the nutritional needs and sustaining the livelihoods of rural populations, and among these, the shea tree (Vitellaria paradoxa) is a valuable deciduous species native to the Savannah and Sub-Saharan Africa. Despite its economic potential, the shea fruit pulp remains underutilized. While previous research has explored its processing into jam and wine, studies on its storage behavior and shelf life remain limited. Moreover, the influence of ripening stages and storage characteristics is largely undocumented. This study investigated the combined effects of different ripening stages and storage conditions on the physicochemical properties of shea fruits using a 3 × 2 factorial experiment in a completely randomized design. Fruits were sourced from Savelugu and analyzed at the Department of Horticulture, KNUST, Kumasi. The results obtained were subjected to analysis of variance (ANOVA) at a significance level of P = 0.01. Findings showed steady weight loss of fruits under all storage conditions. Additionally, fruits stored under ambient conditions at the overripe stage exhibited significantly higher moisture (75.6%), total soluble solids (25.27°Brix), crude protein (5.91%), and crude fat (2.92%). Conversely, refrigerated fruits at the ripe stage recorded higher firmness (68.13 N), carbohydrate (72.46%), and ash content (2.99%). Mineral analysis further revealed that ambient-stored fruits contained more magnesium (0.90%), potassium (3.03%), sodium (0.23%), and iron (469.93 mg/kg), whereas refrigerated fruits had more calcium (1.71%), phosphorus (0.59%), and zinc (121.93 mg/kg). The shelf life was determined to be 5 days under ambient storage and 13 days under refrigeration. Overall, the study highlights the potential for commercial utilization of shea fruit pulp, using its established shelf life and desirable physicochemical attributes as a guide for optimal storage and utilization.

Keywords: Shea fruit, storage conditions, ripening stages, shelf life, post-harvest quality

112. SUSTAINABLE PROCESSING AND DEVELOPMENT OF FUNCTIONAL AERIAL YAM (*Dioscorea Bulbifera*) FLOUR FOR GLUTEN-FREE SHORTBREAD COOKIES

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Abstract
Aerial yam (Dioscorea bulbifera) is a high-yielding, climate-resilient food security crop in tropical regions that has great nutritional and medicinal benefits. Nevertheless, the short storability, high enzymatic browning, and antinutrients in aerial yam create a challenge in industrial processing and application. This study presents an innovative agro-industrial processing technique for aerial yams into high-value-added food products. The influence of soaking aerial yam slices in distilled water, sodium metabisulfite or a combination and convective drying temperatures (45°C to 65 °C) on the drying rate and nutritional, bioactive compounds, antinutrients, and techno-functional properties of the aerial yam flour were assessed. Additionally, the potential application of aerial yam flour for gluten-free shortbread cookies formulations was investigated. The effective moisture diffusivity increased while drying time decreased significantly ($p < 0.0001$) as drying temperature increased. The aerial yam flour has considerably high nutrients contents, total carotenoids (1.76 - 2.89 mg/100g dry basis (d.b.)), total phenolics (63.02-196.51mg GAE/100g d.b.) and DPPH scavenging activity (79.2% - 86.50%). The combined pretreatment (sodium metabisulfite and 12-h soaking in water) and drying at 55°C resulted in increased colour and bioactive compounds retention, high viscoelastic properties and reduced enzymatic browning and antinutrients (phytate, oxalate, tannins and saponins) in flour. Gluten-free shortbread cookies from aerial yam and corn starch (0%-40%) had statistically ($p<0.0001$) higher nutrient contents, bioactive compounds, hardness and fracturability values and relatively similar acceptability compared with wheat shortbread cookies. The processing of aerial yams into high-quality flour offers a sustainable ingredient for the bakery industry and reduces postharvest spoilage, improves food security, and creates job opportunities

Keywords: Aerial yam, bioactive compounds, convective air drying, predrying treatment, gluten-free shortbread cookies

113. DEVELOPMENT OF HERBAL TEA FROM MANGO PEELS AND OTHER NATURAL SPICES

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Abstract
The increasing demand for natural health-promoting beverages has led to the exploration of an unconventional ingredient, mango peel, which is typically discarded as waste in the food industry. This study investigated the development and evaluation of herbal tea formulated from mango peels and natural spices (cinnamon, ginger and eucalyptus) aiming to address environmental issues related to mango peel waste. The study involved the formulation of ten herbal tea samples using varying proportions of dried mango peels (59-70%), ginger (20-31%), cinnamon (10-20%) and eucalyptus (1-10%). Each formulation was prepared, brewed and subjected to sensory evaluation by 50 panelists. The antioxidant capacity, flavonoid and total phenolic contents were determined using standard methods. Sensory analysis revealed that the Control (100% Mango peels) was highly rated in terms of overall acceptability while specific blends such as sample 372 (59% Mango Peels, 20% Ginger, 11% Cinnamon and 10% Eucalyptus) and sample 240 (59% Mango Peels, 21% Ginger, 10% Cinnamon and 10% Eucalyptus) showed strong preferences for aroma and flavour. The antioxidant capacity (59.32-68.85%), total phenolic (30.23-51.06 mg/L) and flavonoid content (3050.76 - 4301.86 mg/L) of the formulations were high, highlighting the impact of spice additions on these properties. Though sample 141 (60 Mango peels, 20% Ginger and 20% Cinnamon) had the highest antioxidant capacity, sample 372 and 240 were the best preferred. The results indicate the potential of utilizing mango peels to create a healthful tea product contributing to waste reduction, increased awareness of the benefits of mango peels and supporting sustainable practices in the food industry.

Keywords: Mango peels, Herbal tea, Antioxidant activity, Phytochemical, Sensory properties

114. CLIMATE VARIABILITY AND ITS EFFECT ON THE SUSTAINABILITY OF MAIZE PRODUCTION IN NORTHERN GHANA

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Abstract
This research evaluates the effect of climate variability on the viability of maize production in Tolon District of Ghana during the 25 years (2000 to 2024). Trends in main climatic elements and data on production of maize were determined using the non-parametric Mann-Kendall test and Sen slope estimator. Findings show that the pattern appears to be statistically insignificant but increasing with regard to annual rainfall ($p = 0.0798$, Sen slope = +6.65 mm/year) though no significant change was evident in terms of maximum temperature ($p = 0.7436$). But the mean lowest temperature rose significantly ($p = 0.0008$, +0.0591 o C/year), which is an indication of a warming period especially at night. The humidity during the daytime was reduced considerably ($p = 0.0106$), but the humidity at night was not affected. It exhibited a positive and not-significant trend of maize yield ($p = 0.0679$, +0.0392 ton/ha/year). Pearson correlation established two significant correlations; significant positive relationship between rainfall and the maize yield ($r = 0.425$, $p = 0.034$), and the crop relies on availability of water. Nonetheless, there was no significant relationship between temperature and humidity with yield. The results indicate that there is a resilience to climate variability (rainfall uncertainty and increasing nights low temperatures) despite the resilience enjoyed by maize production in Tolon; the system is not insulated to climate variability. In the light of current climate changes, the paper suggests carrying out additional research to promote and optimize the requirements of Climate-Smart Agricultural practices, water management, and farmer training that will build resilience and guarantee sustainable maize production.

115. VALORIZATION OF OKRA

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Abstract

Okra (*Abelmoschus esculentus*) is a multipurpose and climate-resilient crop native to Africa, which has the potential to support sustainable food systems through full valorization. Valorization of okra means adding value to okra or finding innovative, higher value uses for okra and its by-products beyond traditional consumption as a fresh vegetable. Instead of viewing surplus okra, processing residues, or less marketable grades as waste, valorization transforms them into valuable products for food, health, and industry. The composition and potential applications across the various okra parts were reviewed. Despite its high nutritional and functional properties, large portions of okra biomass (seeds, stems, and roots) are discarded during processing and peak harvesting season. Valorization of okra exemplifies Sustainable Development Goal 12 (Responsible Consumption and Production) by turning local crops into multi-purpose, resource-efficient, low-waste value chains that strengthen local industries, reduce imports, foster responsible production, and promote healthier, sustainable consumption patterns. Okra valorization can reduce agro-waste, enhance economic resilience and promote food and nutrition security. Valorization strategies include using okra seed oil, pectin/mucilage, pods, stems and biomass in food, pharmaceuticals, animal feed, packaging and bioenergy production. Ongoing works show that Okra genotypes provide pectin (11-20%) that can be used as emulsifier for chocolate making and as disintegrants in immediate release tablet formulations. Gaps identified ranged from processing, extraction technologies, and scalability, which require multidisciplinary efforts to maximize utility and sustainability potential.

Keywords: okra pectin, extraction, processing, applications

116. HYDROPONIC FARMING: A MODERN WAY OF ADDRESSING PRODUCTION CONSTRAINTS OF TOMATO FARMING

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Abstract

Tomato (*Solanum lycopersicum*) is one of the highly patronized vegetable crops of choice in Ghana. It is used for cooking in various recipes. Given the year-round demand for tomatoes, growing them may be a profitable venture that creates jobs. Over the years, the primary factors limiting tomato production have been variable rainfall, elevated temperatures, infestation of pests and diseases, low soil fertility, labor scarcity, and supply seasonality. This research innovation is aimed at developing ebb and flow hydroponic system that can overcome production constraints that limit the potential profit margins associated with tomato farming. Hydroponic farming is the industry term of growing plants without soil in nutrient solutions. Vermiculite, sawdust, coconut coir, perlite, and rockwool are among the artificial media that are frequently used for plant support. Tomatoes are first cultivated in nursery trays before they are moved into the selected hydroponic system (ebb and flow). In milligrams per liter (mg/L) or parts per million (ppm), the concentration of nutrients is changed at different stages of growth. The statistical model employed to comprehend the link between the two assessment variables the response variable x (EC/pH) and the predictor y (days after transplanting), was linear regression. There is a 95% confidence level that there is a linear relationship between the EC/pH of the nutrient solution and the number of days after tomato transplanting because the significance F and p values are less than 0.05. For electrical conductivity (EC), the model equation from the assessment study is $y = 0.025 x + 2.0 \pm 0.795$, and for the pH of the nutrient solution, it is $y = 0.019 x + 5.17 \pm 0.175$. The machine was developed at a reasonable cost of ₦ 212,200, or $141.47. Tomatoes grown in hydroponic systems have an average yield potential of 4.5 kg to 18 kg per stand, which is four times higher than that of conventional farming. Promoting hydroponic tomato farming technology nationwide will boost farmers' income potential, create job opportunities, and boost the local economy in the areas where it is used.

Keywords: inoculation, ureide-N concentration, relative ureide-N abundance and Ndfa

117. FERMENTATION KINETICS AND PHYSICOCHEMICAL CHARACTERIZATION OF NON-ALCOHOLIC WINE PRODUCED FROM CASHEW APPLE JUICE

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Abstract
There is an increasing demand for non-alcoholic wines owing to religious beliefs, responsible driving, harmful effects of alcohol and strict alcohol regulatory measures. Alcohol removal methods, used for non-alcoholic wine production, have negative impact on flavour characteristics and consumer acceptance. This study seeks to determine the fermentation kinetics and physicochemical properties of non-alcoholic wine developed from cashew apple juice using cold fermentation in combination with special yeast. The extracted cashew apple must be inoculated with *S. ludwigii* and *Z. rouxii* yeast culture separately and allowed to ferment at 0 - 4°C for 7 days in a completely randomized design. The pH, total soluble solids (TSS), temperature, specific gravity, titratable, volatile and non-volatile acidities of the fermenting must, and wine were determined using standard methods. All the yeast strains maintained comparable fermentation trends with respect to pH, TSS, specific gravity, volatile acidity, titratable acidity and fixed acid, but with different alcohol yields of 0.89 and 0.68% for *S. ludwigii* and *Z. rouxii* respectively. The wine produced using *S. ludwigii* had a lower reduced sugar (3.58 mg/L) and TSS (6.65° Brix) compared to *Z. rouxii* (6.23 mg/L and 7.65° Brix) respectively. However, no significant differences ($p > 0.05$) existed in pH, titratable acidity, specific gravity, alcohol content and colour characteristics: brightness (L*). The mature wine products recorded 0% alcohol content, and distinct appealing colours. The application of cold fermentation combined with special yeast in non-alcoholic wine production is promising and deserves more research to explore its full potential in meeting the increasing demand for non-alcoholic wines.

Keywords: Cashew wine, Minerals, Phytochemicals, Antioxidant activity, Microbiological quality

118. THE NUTRITIVE POTENTIAL OF FERMENTED PINEAPPLE PULP RESIDUE (PPR) AS A FEED RESOURCE IN LIVESTOCK PRODUCTION

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Abstract
Maize is a primary energy source in monogastric diets but has become increasingly expensive and is often scarce during certain parts of the year. This study evaluated the potential of pineapple pulp residue (PPR) as a maize substitute through solid-state fermentation (SSF) and sun-drying (SD). The experiment assessed the effects of these two processing methods on the nutritional composition and microbiological characteristics of PPR. A total of 200 kg of freshly combined PPR from Sugarloaf, MD2, and Smooth Cayenne pineapple varieties was divided into five treatments (40 kg each): one sun-dried (T0) and four fermentation treatments of varying durations - 7 (T1), 14 (T2), 21 (T3), and 28 (T4) days. Samples from each treatment were analyzed for nutrient composition (as-fed basis) and microbiological properties. Data were analyzed using ANOVA in Minitab version 18.0. Microbiological analysis showed no significant differences ($p > 0.05$) across treatments for total viable count, yeast and mold count, or lactic acid bacteria count. However, PPR supported the growth of beneficial microorganisms such as Bacillus, Lactobacillus, and Aspergillus species, which are known for their enzymatic fibre degradation. The 21-day (T3) and 28-day (T4) fermented PPR recorded higher crude protein levels (6.61% and 5.9%, respectively) compared ($p < 0.05$) to the shorter fermentation treatments (T1 and T2) but were similar to sun-dried PPR (6.35%). Crude fiber, crude fat, and nitrogen-free extract values did not differ significantly ($p > 0.05$) across treatments. The calculated metabolizable energy (ME) of PPR samples ranged from 2097.66 to 2395.79 kcal/kg. Based on nutrient composition, PPR (processed via SSF or SD) could partially replace maize in monogastric animal diets. Further feeding trials are recommended to determine optimal replacement levels.

Keywords: Agro-industrial by-products, maize, pineapple pulp residue, solid-state fermentation

119. ASSESSING THE WATER QUALITY OF SMALL RESERVOIRS IN NORTH-EAST REGION OF GHANA: IMPLICATIONS FOR CAGE AQUACULTURE

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Abstract

Aquatic foods are an important component of the global food system and provide benefits for the growing population globally. Small reservoirs are prominent features in northern Ghana and most of them are underutilized. The objective of the study was to assess the suitability of these reservoirs for cage fish farming for enhanced fish production for food security. The study was carried out in the Langbinsi, Nalerigu, Nansoni, and Tombu reservoirs in the North-East Region of Ghana. Temperature, dissolved oxygen, pH, water depth, and conductivity of the reservoirs were measured *in situ*. Water samples were collected from each reservoir for analyses of nutrients, major ions and plankton occurrence and composition. Data was analyzed using multivariate techniques. The results of the study showed that turbidity, total suspended solids (TSS), colour, and nitrate significantly contributed to water quality at the reservoir surface. Turbidity and nitrate were significant in determining water quality at the reservoir bottom. Blue-green algae dominated all the reservoirs except Nansoni reservoir where green algae dominated. Based on results, Nansoni and Tombu reservoirs could better support cage aquaculture. It was recommended that cages need to be relocated after each production circle to reduce the effect of high nitrate concentration on the cultured fish.

Keywords: Cage fish farming, physicochemical parameters, plankton species, fish production

120. CHALLENGES OF TEACHING AND LEARNING BIOLOGY IN SELECTED SENIOR HIGH SCHOOLS IN THE EASTERN REGION, GHANA

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Abstract

This paper examined the challenges associated with teaching and learning biology across selected schools in the Eastern Region, Ghana. Data was obtained from 26 biology teachers and 450 students across the selected schools. A questionnaire, interview guide and checklist for observations served as instruments for the study. The ninety (90) public senior high schools in the Eastern Region constituted the target population. Using stratified random sampling methods, sixteen (16) senior high schools from the accessible population were selected for the study. These schools were in six (6) districts namely New Juaben North, New Juaben South, Upper Manya Krobo, Lower Manya Krobo, Akwapim North and Akwapim South Districts. Thematic analysis was employed for qualitative data while SPSS was used for quantitative data analysis. The thematic analysis revealed challenges with the availability of resources, theoretically based instruction, engagement and interest of students in the subject among teacher related issues surfaced. Suggestions for addressing these challenges included the provision of resources, orientation, seminars and workshops regarding instructional methods, teacher motivation among others. Insights from this paper represent an overview for stakeholders regarding the nature of the challenge's biology education in senior high schools' face and how they can be resolved.

Keywords: biology, biology challenges, teaching and learning, teaching and learning resources, senior high schools, workshops

121. INTEGRATING EDUCATION FOR SUSTAINABLE DEVELOPMENT ACROSS GHANAIAN SCHOOLS' CURRICULA

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Abstract

Education for Sustainable Development (ESD) functions as a transformative framework that integrates environmental, social, and economic sustainability into educational systems. In Ghana, the growing demand for sustainable development necessitates a comprehensive strategy to incorporate ESD into the national school curriculum. The objective of this concept paper was to examine the rationale, strategies, and potential impact of integrating ESD across Ghanaian educational institutions, with a focus on curriculum reform, pedagogical innovations, and stakeholder engagement. A desk review of Ghana's educational framework was conducted to identify existing gaps such as the limited emphasis on sustainability principles, the absence of structured ESD programs, and inadequate teacher training. Further analysis of international best practices in interdisciplinary ESD integration also led to the proposal of multi-tiered approach that includes embedding sustainability themes into core subjects, creating standalone ESD modules, implementing project-based learning, and fostering interdisciplinary connections between science, social studies, and indigenous knowledge systems. The findings also indicate that innovative teaching methodologies such as inquiry-based learning, experiential education, and digital technology integration are crucial strategies for effective ESD delivery. Other findings include challenges like constraints in resources and limited educator expertise which require government policy support, strategic partnerships, and adaptive curriculum design to overcome. ESD integration cannot be ignored seeing the myriad environmental issues Ghana is battling. ESD leads to heightened environmental awareness, enhanced decision-making skills, increased employment opportunities in sustainability sectors, and a reinforced cultural identity through the preservation of indigenous sustainability practices.

Keywords: Sustainable development, stewardship, integration models, adaptive curriculum

122. INTEGRATED SCIENCE TEACHERS' WILLINGNESS AND ATTITUDES TOWARD IMPLEMENTATION OF THE ACTIVITY METHODS

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Abstract

Activity method of science instruction is a teaching instruction in science that focuses more on the students and allows the student to learn by doing things on their own. The JHS science syllabus recommends the use of activity method for the teaching and learning of science, but this depends on the willingness and the attitude of the science teacher. The study investigated Junior High School science teachers' willingness and attitudes toward implementation of the activity method in the Central Region of Ghana. The design adopted for the study was descriptive research design and the method used to collect data was mixed method. The sample used were 1365 and 12 science teachers for quantitative and qualitative methods respectively. Questionnaire, observation and interview were used to collect the data. Some of the key findings that emerged from the study were: 59.2% of the science teachers had a negative attitude towards activity method of teaching science and it affected their willingness to use activity method to teach integrated science; 75% of science teachers were not willing to use the activity method to teach science. It was recommended to stake holders to consider improving willingness and attitude of the science teachers by exposing them to methods of teaching that would improve their attitude towards implementation of the activity method and also providing them with enough resources to use during the teaching and learning of science.

123. CREATING A PIPELINE OF TALENT TO FEED THE GROWTH OF NEUROSCIENCE: LESSONS FROM GHANA

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Abstract

The fields of Science, Technology, Engineering, and Mathematics (STEM) are crucial for innovation and societal advancement1. However, gender disparities persist, particularly in neuroscience. In this paper, we share insights and lessons gleaned from our model of neuroscience experiential days targeted at teenage girls. By sharing our experiences, we hope to contribute to the broader effort of increasing gender diversity in STEM and its sub-specialties by inspiring similar initiatives globally. Since 2017, these experience days have combined hands-on activities with career talks, reaching hundreds of participants and fostering a community of young women interested in neuroscience. We discuss the structure and content of our neuroscience experience days, highlight the opportunities they create for participants, and address the challenges we have encountered along the way. Over the span of 6 years, we have engaged 1800 + pretertiary students, across 8 events with support from 22 different STEM related professions. The NeuroGirl Camp initiative has demonstrated significant potential in empowering a new generation of female students with an interest in neuroscience and by so doing bridging the gender gap. By providing teenage girls with hands-on experiences and exposure to career opportunities in neuroscience, the camps have not only sparked interest but also built a supportive community of young women aspiring to enter STEM fields.

Keywords: Neuroscience, STEM Education, Public engagement, Gender disparity, Capacity building

124. INTEGRATED ONE HEALTH APPROACHES TO LIVESTOCK DISEASE SURVEILLANCE AND CONTROL: FOSTERING INNOVATION THROUGH PUBLIC-PRIVATE PARTNERSHIPS FOR ENHANCED FOOD SECURITY IN GHANA

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Abstract

Livestock sector in Ghana faces significant challenges from emerging infectious diseases, antimicrobial resistance, and inadequate surveillance systems that threaten food security and public health. This study explores the implementation of integrated One Health approaches to livestock disease surveillance and control through strategic public-private partnerships (PPPs) to address these multifaceted challenges. The research employed a mixed-methods approach combining quantitative analysis of disease surveillance data from 2019-2024, qualitative stakeholder interviews with 120 participants across government, private sector, and civil society, and participatory action research in five regions of Ghana. Results indicate that current livestock disease surveillance covers only 35% of the national herd, with significant gaps in zoonotic disease monitoring and antimicrobial resistance tracking. The study identified successful PPP models in Kenya, Nigeria, and Senegal that achieved 78% improvement in disease detection rates and 45% reduction in livestock mortality through integrated surveillance systems. Key findings reveal that technology-enabled surveillance platforms, when supported by collaborative governance frameworks, can reduce disease outbreak response time from 14 days to 3 days while improving cost-effectiveness by 60%. The research proposes a comprehensive One Health framework incorporating digital disease surveillance, community-based monitoring, laboratory networking, and cross-sectoral coordination mechanisms. Economic analysis demonstrates that investing $2.3 million annually in integrated surveillance systems could prevent economic losses of $45 million from livestock disease outbreaks while enhancing food security for 2.8 million Ghanaians. The study recommends establishing a National One Health Platform, developing regulatory frameworks for digital health technologies, and implementing incentive mechanisms for private sector participation in disease surveillance. This research contributes to the growing body of evidence supporting One Health approaches as transformative strategies for sustainable livestock development in Sub-Saharan Africa.

Keywords: One Health, livestock disease surveillance, public-private collaboration, food security, antimicrobial resistance, Ghana, zoonotic diseases, digital health technologies

125. INVESTIGATING THE INFLUENCE OF TEACHING PEDAGOGIES ON THE SPATIAL REASONING ABILITIES OF JUNIOR HIGH SCHOOL PUPILS IN KRACHI EAST, WEST AND NKWANTA SOUTH

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Abstract

This study examined the impact of teaching pedagogies on the spatial reasoning skills of junior high school students in Krachi East, Krachi West, and Nkwanta South. Utilizing a descriptive research approach, the study sampled 103 students from a total population of 140, employing Krejcie and Morgan's (1970) sample size determination formula. We used multiple linear regression to look at how teacher-related factors affected students' spatial reasoning, both individually and as a group. The regression model yielded a substantial R^2 value of 0.760, signifying that 76% of the variance in students' spatial reasoning abilities is due to the collective influence of teachers' pedagogical approaches, qualifications, and experience. The results indicated that among the three predictors, teachers' experience exerted the most substantial influence ($\beta = 0.693$, $t = 3.585$, $p < 0.05$), followed by qualifications and expertise ($\beta = 0.607$), despite the absence of its t-value. Teachers' pedagogies, on the other hand, had a very little and statistically insignificant influence ($\beta = -0.006$, $t = 0.038$). The ANOVA findings revealed that the entire model was statistically significant ($F = 104.711$, $p = 0.000$), and the multicollinearity diagnostics showed that there were no risks to the model's validity because all of the VIF values were below 5. The regression equation highlighted instructor experience as the predominant factor in improving students' spatial thinking abilities, but pedagogical style and qualifications exhibited somewhat diminished predictive significance. These results show how important it is for teachers to have real-world experience and use good teaching methods to help students improve their cognitive skills, especially in spatial reasoning, which is very important in STEM fields. The study suggests that professional development programs, mentorship for less experienced teachers, and a reevaluation of the importance of teacher qualifications in policy and practice should all be given more attention. Subsequent research ought to investigate supplementary student-related factors, including motivation, familial support, and educational resources, to elucidate the unexplained variance in spatial reasoning competence.

Keywords: Teaching pedagogies, spatial reasoning, junior high school pupils, teacher experiences and educational outcomes

126. ENGINEERING POLICY AND MANAGEMENT IN PLASTIC WASTE MANAGEMENT: BRIDGING INNOVATION, GOVERNANCE, AND STRATEGIC IMPACT

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Abstract

In recent years, there has been that long-standing societal demands related to plastic waste management sustainability, wellbeing, and quality of management services, have reached the top of public agendas worldwide. Described as 'grand challenges' or 'sustainable development goals' in current policy debates, these demands are now driving policies on multiple governmental levels and in many policy domains, however there is a neglect of engineering policy and management aspect in plastic waste management. The main aim of the study was to assess the engineering policy and management; bridging innovation, governance, and strategic impact. Narrative review method was employed in this study to retrieve and synthesize diverse documents. Themes were developed. It explores the integration of engineering management and principles with policy formulation and management practices. The review highlights the regulatory framework for several sustainable plastic waste management options, including recycling, composting and other emerging technologies. It emphasizes the need for engineers to understand policy dynamics, regulatory frameworks, sustainability challenges, and project management strategies. By equipping engineers with policy literacy and managerial competencies, institutions and industries can foster innovation, ensure compliance, and contribute to national development agendas.

127. THE BURDEN OF COMORBIDITIES OF HIV, TUBERCULOSIS AND CHRONIC KIDNEY DISEASE AMONG PATIENTS IN THE SEKYERE SOUTH MUNICIPAL, GHANA

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Abstract
The comorbidity of HIV, tuberculosis (TB), and chronic kidney disease (CKD) significantly worsens health outcomes and complicates care in low-resource settings. This study assessed the burden of co-morbidity of HIV, TB, and CKD among patients in the Sekyere South Municipal. A cross-sectional study was conducted from July to December 2024 at the Seventh-Day Adventist Hospital, Agona-Asamang. A total of 183 HIV and/or TB patients aged 18–80 was purposively recruited along with 81 healthy controls. Data collection included questionnaires, medical record reviews, and laboratory tests. HIV was diagnosed using rapid tests, TB via GeneXpert, and CKD using serum urea/creatinine and eGFR (CKD-EPI). Data was analysed using SPSS v23.0. HIV-TB coinfection prevalence was 19.13% (35/183); 68.6% were female (24/35). Among them, 88.57% (31/35) had CKD - 67.7% of whom were female (21/31). Age (OR = 1.038; p = 0.045), alcohol use (OR = 19.075; p = 0.011), and hypertension (OR = 16.520; p = 0.037) were significant CKD risk factors. HIV-TB-CKD patients had significantly higher creatinine (p = 0.020), lower eGFR (p = 0.044), reduced haemoglobin and haematocrit (p < 0.001), and elevated monocytes (p < 0.001), indicating inflammation. Mortality among the HIV-TB-CKD group was 16.1%, with hospitalizations common but not significantly improving outcomes (χ^2 = 11.454). HIV, TB, and CKD comorbidity is common and disproportionately affects women. Integrated screening, early diagnosis, and management of risk factors are essential. Findings support multisectoral strategies to strengthen HIV care systems in line with SDG 3 and WHO sector goals.

Keywords: Comorbidity, HIV, Tuberculosis (TB), Chronic Kidney Disease (CKD)

128. EFFECTS OF NON-USE OF WEIGHING SCALES ON THE RETAIL OF AGRI-FOODS IN SOME LOCAL MARKETS IN THE CAPE COAST MUNICIPALITY OF GHANA

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Abstract
In Ghana, the adoption of standard weighing scales in the local markets is neglected. The study identified retailed agri-foods that are most affected by the non-use of weighing scales. Agri-foods were purchased from Kotokuraba (61 sellers), Abura (48 sellers) and Science markets (18 sellers), counted and weighed in the laboratory, and the data was analysed to assess the level of variations in the quantity and pricing. Most agri-food commodities were priced marginally higher on the Science market than elsewhere. The range of pricing (GH¢/kg) of smoked salmon (47.89 - 93.56) and bonnet pepper (19.65 – 37.33) in the Science market showed the highest variance (σ^2) of 1,043 and 156, respectively. At the Kotokuraba market, smoked salmon had the highest price variance of 157, while ginger had the highest (41.73) among the vegetables. Whilst ginger had the highest price variation at Kotokuraba (σ^2 = 41.73), bell pepper (σ^2 = 59.24) recorded the highest price variation at the Abura market. Across the three markets, the variance in the number of units of agri-food items bought for a given price was highest for bonnet pepper. Inconsistencies in pricing were mainly caused by variations in the number of units and weights per price of agri-food commodities. The use and enforcement of weighing systems for the retail of agri-foods could be innovative for improving fairness and transparency in the local markets, thereby, contribute to strengthen public-private partnerships in the food sector for sustainable development in Ghana.

Keywords: Weighing scale, agri-food, pricing, local market

129. QUANTITATIVE ETHNOBOTANY AND ECOSYSTEM SERVICES VALUATION OF WOODY CLIMBING PLANT

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Abstract
Woody climbers, or lianas, play a vital role in both traditional knowledge systems and the delivery of ecosystem services, offering potential for the sustainable management of forest resources. This study aimed to assess the species diversity, ethnobotanical significance, and perceived importance of lianas in Ghana's dry and moist semi-deciduous forests. It also explored how ecological setting, and respondent demographics influence ethnobotanical knowledge. Data was collected from residents of ten forest-edge communities, equally divided between the two forest types. Ethnobotanical metrics were calculated using informant consensus methods and statistically compared between sites using the Welch t-test. To identify demographic predictors of knowledge and use, a generalized linear model (Poisson distribution with a log link) was applied. Findings revealed that both age and gender significantly shaped respondents' familiarity and interaction with liana species. Among the documented plants, Dalbergia saxatilis and Paullinia pinnata emerged as the most culturally and practically significant species across both forest zones. Provisioning services—including medicinal applications, construction uses, and food—were the most frequently cited benefits. Despite these uses, many participants still prioritized trees over lianas for ecosystem services, indicating a need for increased awareness and education on the value of climbing species. The findings suggest a shift in forest management is warranted—from indiscriminate removal of lianas to intentional, sustainable harvesting strategies that align with their ethnobotanical value.

Keywords: Food safety, MRSA, Antibiotics, Grilled fish

130. THE USE OF INNOVATIVE REPRODUCTIVE TECHNOLOGIES AND DISEASE MANAGEMENT SYSTEMS THROUGH STRATEGIC PUBLIC-PRIVATE PARTNERSHIPS: A TRANSFORMATIVE APPROACH TO SUSTAINABLE LIVESTOCK DEVELOPMENT IN GHANA

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Abstract
Ghana's livestock sector faces significant challenges in reproductive efficiency and disease management, constraining it contribution to national food security and economic development. This study examines the potential of innovative reproductive technologies and integrated disease management systems implemented through strategic public-private partnerships (PPPs) to transform livestock productivity and sustainability. A mixed-methods approach combining field surveys of 450 livestock farmers, stakeholder interviews with 25 industry leaders, and analysis of reproductive and health data from 15 demonstration farms were employed. Results indicate that artificial insemination programs integrated with oestrus synchronization protocols increased conception rates by 34% ($p < 0.001$), while comprehensive disease management systems reduced mortality rates by 28% ($p < 0.05$). Economic analysis revealed that PPP models generated 2.3 times higher returns on investment compared to traditional approaches. Key success factors included technology transfer mechanisms, capacity building programmes, and sustainable financing models. The study demonstrates that strategic partnerships between public research institutions, private sector entities, and farmer cooperatives can effectively scale innovative reproductive and health technologies. These findings provide a framework for policy makers and stakeholders to leverage scientific innovation for sustainable livestock development in Ghana and similar sub-Saharan African contexts.

Keywords: Reproductive physiology, disease control, public-private partnerships, livestock productivity, sustainable development, Ghana

131. INNOVATING FORENSIC DNA EDUCATION IN LOW-RESOURCE SETTINGS THROUGH A CONTEXTUAL TOOLKIT

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Abstract
This intervention aimed to enhance student comprehension of Short Tandem Repeats (STRs) and Single Nucleotide Polymorphisms (SNPs) core concepts in forensic DNA science, which remain challenging to teach in many African universities due to limited infrastructure and a lack of access to real genomic data. A low-cost, hands-on teaching toolkit was piloted in the Department of Biotechnology and Molecular Biology at the University for Development Studies, Ghana. The toolkit used biologically realistic but hypothetical DNA sequences to simulate population-level genetic variation among Ghanaian ethnic groups (Akan, Ewe, Dagomba) and one Malian student from the Bambara tribe. It incorporated culturally relevant visual cards to make complex forensic genetic concepts more relatable. The toolkit was used with 36 undergraduate students. STRs and SNPs featured prominently in the final exam, and 94% of students passed; the two who did not were absent during the toolkit sessions. Additionally, the toolkit was demonstrated at a public science outreach event, where post-event surveys showed over 85% of attendees gained improved understanding and trust in forensic DNA science. This intervention demonstrates that forensic DNA education can be effectively delivered in low-resource settings. It offers a scalable, Africa-centred model for closing education and trust gaps in forensic genomics, advancing SDG 4 (Education) and SDG 16 (Justice).

Keywords: Forensic DNA, STR analysis, SNP analysis, Teaching toolkit, African populations

132. ADSORPTION OF TETRACYCLINE AND METRONIDAZOLE RESIDUES FROM LANDFILL LEACHATE USING SHEA NUTSHELL BIOCHAR

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Abstract
The improper disposal of unwanted or expired pharmaceuticals has increased the presence of pharmaceutical pollutants in landfill leachate, posing significant threats to the environment and human health. This study assessed the influence of dosage, temperature, and resident time on the adsorption efficiency of shea nutshell biochar for tetracycline and metronidazole. Characterisation of the biochar using Fourier Transform Infrared Spectroscopy (FTIR) confirmed surface functional groups, whilst X-ray Diffraction (XRD) revealed its amorphous and crystalline structure. Scanning electron microscopy (SEM) showed the porous nature of the biochar, and Energy Dispersive Xray (EDX) analysis revealed a carbon composition of 84.54%. The highest removal efficiencies of 95.96% for tetracycline and 98.97% for metronidazole were achieved at temperatures of 45 ℃ and 35 ℃, respectively. Increasing the biochar dose from 0.50 g to 1.50 g significantly improved the removal efficiency from 78.96% to 94.97% for tetracycline, and 88.27% to 98.97% for metronidazole, both at 60 min and 35 ℃. Temperature adjustments from 35 ℃ to 45 ℃ improved the removal efficiency of tetracycline from 80.79% to 88.97% at 60 min, and metronidazole from 87.55% to 91.32% at 15 min. Adsorption data fitted well with the Langmuir isotherm and pseudo second order models, indicating chemisorption on a homogeneous surface. The shea nutshell biochar demonstrated strong adsorption capability due to its structural and chemical properties, enhanced by favorable environmental conditions. Future research should focus on adsorption factors such as higher initial concentration, pH, and varied particle size to ascertain the removal efficiency in wastewater.

Keywords: Adsorption efficiency, Biochar, Pharmaceutical Pollutants, Crystalline structures, Pseudo second order model, Langmuir isotherm

133. MOSS AS A BIOINDICATOR OF TOXIC METALS IN FOREST ECOSYSTEMS IN TAMALE METROPOLIS

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Abstract

Mosses are used as indicators for monitoring environmental pollution due to their simple structure, genetic variety, totipotency, rapid cell division, and resistance to metals. This study explored the potential for using moss as a bioindicator for detecting heavy metals contamination in forest ecosystems in the Tamale Metropolis. Identified moss species were Sphagnum fleuxuosum, Andreaea alpine, and Grummia alpestris feucht. Analysis of the moss samples revealed average mercury of 0.45 mg/kg, 0.47 mg/kg for cadmium, 0.54 mg/kg for chromium, 3.16 mg/kg for arsenic, 3.93 mg/kg for lead, and 7.22 mg/kg for nickel. Mercury, cadmium, arsenic, and lead exceeded the World Health Organisation (WHO) and Food and Agriculture Organisation (FAO) permissible limit of heavy metals. The study attributed the presence of toxic metals in the forest ecosystems primarily to anthropogenic sources such as atmospheric deposition, agricultural activities, waterways, and waste disposal. Contamination factor and pollution load index values showed low level of pollution, indicating the site as unpolluted, whilst geo-accumulation values showed high level of pollution. The study recommends regular environmental monitoring and public sensitization to enhance awareness of environmental pollutants.

Keywords: *Andreaea alpine*, bioindicator, contamination factor, forest ecosystem, nickel

134. SPATIAL EXPLICIT MODELING OF THE INFLUENCE OF *Broussonetia Papyrifera* ON SOIL PROPERTIES WITHIN THE TINTE BEPO FOREST RESERVE, ASHANTI REGION, GHANA

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Abstract

This study investigates the influence of Broussonetia papyrifera on the spatial variability of soil physical and chemical properties within the Tinte Bepo Forest Reserve. Fifty soil samples were collected from an area of 225 Km^2; 25 from invaded areas and 25 from uninvaded (control) areas at a depth of 15cm using stratified sampling approach. Soil properties assessed include pH, sand, silt, clay, nitrogen, potassium, phosphorus, organic matter, organic carbon, calcium, magnesium, and sodium. The Inverse Distance Weighting and autocorrelation spatial explicit models were used to analyze the spatial distribution pattern of the soil properties after statistical analysis. Results showed that B. papyrifera invaded areas have a notable high level of sand (80.763 ± 0.71) and low clay content (6.68 ± 0.426), which influences soil water retention and nutrient availability. These invaded areas also recorded high soil pH level (pH = 6.411) alongside a significant low in critical exchangeable bases, including calcium (6.596 ± 0.473) and magnesium (2.78 ± 0.148). Interestingly, sodium, available phosphorus, nitrogen, and organic carbon, did not show significant differences between the two areas. Spatial explicit maps generated for the soil chemical analysis showed a clustered pattern of distribution with low values clustered mainly at the invaded areas. The findings implied that the invasion of B. papyrifera in the Tinte Bepo Forest Reserve contributes to the low level of the measured soil chemical properties as well as the sandy nature of the soil. The study recommends regular monitoring of B. papyrifera populations in the reserve and restoration of native plant species in invaded areas.

Keywords: Geostatistical Analysis, spatial autocorrelation, invaded plant species, Broussonetia Papyrifera, soil properties

135. HOME GARDENING ON A UNIVERSITY CAMPUS: IMPLICATION FOR PLANT DIVERSITY CONSERVATION AND ENVIRONMENTAL SUSTAINABILITY

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Abstract
Home gardens contribute to environmental sustainability by promoting biodiversity, reducing carbon emissions, and minimising waste. This study aimed to assess both the crop diversity and gardening practices of home gardens in lecturers' bungalows at the University of Cape Coast. Sixty home gardens were selected using purposive and convenient sampling methods. A questionnaire was administered to the home gardeners to obtain information on their gardening practices and the challenges they faced. Also, the entire home gardens were considered, and all the crops present were identified, classified into their taxonomic and their distribution patterns determined. The respondents comprised 42 males and 18 females, and aged 41 – 60 years. The home gardens were principally maintained by the occupants (37%) and their family members (47%). About 90 % of the respondents managed the soil through organic amendment, specifically composting and mulching, whereas both inorganic (42%) and organic (34%) pesticides were used to control pests and diseases. The main challenges cited by home gardeners included pest infestation, poor soil fertility and lack of time. A total of 40 crop species belonging to 37 genera and 24 families were identified from the gardens. Plantain (34%), cassava (23%), and maize (16 %) were the most abundant crops. The dominant families were Solanaceae and Cucurbitaceae. It can be concluded that diverse crops were cultivated in the bungalows using environmentally friendly gardening practices, which enhanced environmental sustainability. It is recommended that home gardening should be embraced by all residents on university campuses in Ghana.

Keywords: Home gardening, plant diversity, environmental sustainability, University of Cape Coast, Solanaceae, plantains.

136. ASSESSMENT OF HUMAN HEALTH RISKS FROM FLUORIDE, NITRATE AND TRACE METALS IN SHALLOW GROUNDWATER IN KOTEI AND MOSHIE ZONGO, KUMASI, GHANA

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Abstract
Access to safe drinking water is essential in many peri-urban communities in developing countries where groundwater serves as the main source for domestic use. This study assessed the concentrations of fluoride, nitrate, and selected trace metals; iron (Fe), zinc (Zn), manganese (Mn), cobalt (Co), cadmium (Cd), lead (Pb) and copper (Cu) in groundwater sources from Kotei and Moshie Zongo in Kumasi Metropolis, Ghana. It also assessed the non-carcinogenic health risks to adults and children via ingestion and dermal exposure. Results showed that fluoride and nitrate concentrations were within the World Health Organisation (WHO) and the Ghana Standard Authority (GSA) guideline values. However, in Moshie Zongo nitrate levels were significantly higher than in Kotei. Majority of the trace metals, including Fe, Zn, and Cu were below acceptable limits, with Cd and Pb undetected. Despite these low levels, non-carcinogenic risk assessment revealed potential health concerns, particularly among children. Fluoride posed a risk in 32% of samples for children, (HQ > 1). Cobalt was the most concerning element as HQ > 1 in 53% and 78% of samples for adults and children, respectively. In Moshie Zongo, Mn and Co were the only metals that posed ingestion risks. Dermal exposure risks were minimal for adults, but 68% of samples exceeded safe limits for children. The findings highlight the vulnerability of children to groundwater contaminants, especially cobalt and manganese. To safeguard public health in rapid urbanizing areas, continuous monitoring public education, and targeted mitigation strategies are recommended.

Keywords: Carcinogenic, drinking water, dermal exposure, public health, vulnerability

137. INSIGHTS FROM TAMALE METROPOLIS ON GENDER ROLES AND DYNAMICS IN SOLID WASTE MANAGEMENT TOWARD CIRCULAR ECONOMY PRACTICES

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Abstract

Solid waste management (SWM) plays a critical role in urban sustainability, yet gender dynamics within SWM systems remain underexplored, particularly in emerging cities like Tamale Metropolis, Ghana. This study aims to analyze gender roles and dynamics in the SWM system of Tamale, highlighting how gender influences participation, decision-making, and access to opportunities within the sector. A mixed-methods approach was employed using surveys (n = 400), focus group discussions, key informant interviews, and field observations. Descriptive statistics for gender roles, leadership, jobs, and support systems, chi-square and logistic regression for gender differences in SWM roles, cross-tabulations for comparing male and female access and opportunities and thematic analysis of FGDs for gender perceptions, barriers, and norms. The research examines the division of labour, the representation of men and women across formal and informal waste management activities, and the socio-cultural factors shaping these roles. Preliminary findings reveal that women are predominantly engaged in lower-tier and labour-intensive tasks such as waste collection and sorting, while men are more likely to occupy supervisory and technical positions. Additionally, traditional gender norms and limited access to training and resources contribute to reinforcing gender inequalities in the sector. Understanding these dynamics is essential for designing inclusive policies that promote gender equity and strengthen the circular economy (CE) practices within the SWM framework in Tamale Metropolis.

Keywords: Solid Waste Management, Gender Roles and Dynamics, Circular Economy (CE), Tamale Metropolis

138. GROUNDWATER PROSPECTIVITY MODELING USING BIVARIATE DATA DRIVEN APPROACHES OVER GHANA'S NORTHEASTERN VOLTAIAN BASIN

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Abstract

Overexploitation of groundwater resources is on the rise owing to its importance for domestic, agricultural, and industrial use, and to ensure long-term sustainability, effective planning and management are essential. This study delineates prospective zones of groundwater occurrence in the northeastern part of Ghana's Voltaian Basin by integrating eight conditioning factors sourced from geological, geophysical, remote sensing, and geomorphological datasets using Frequency Ratio (FR) and Shannon Entropy (SE) modeling approaches. The performance of the groundwater prospectivity models (GPMs) generated using the FR and SE approaches was evaluated using the receiver operating characteristic (ROC) curve and mean average precision (mAP) metrics, based on 161 known locations of groundwater occurrence derived from field surveys and historical groundwater records. Evaluation results indicate strong predictive capabilities for both models, with the model generated based on the SE approach outperforming the model produced using the FR approach. The area under the ROC curve (AUC) scores obtained for the SE and FR models were 0.94 and 0.87, respectively, whereas mAP scores of 0.94 and 0.86 were achieved, respectively, for the SE and FR models. This study highlights the robustness of both modeling approaches in delineating groundwater prospective zones, with the SE-based model showing superior accuracy. It is envisaged that the output of the GPMs produced in this study will be essential in guiding groundwater exploration, sustainable management, and the development of strategies that are viable for groundwater resources in the study area and similar terrains.

139. RECEPTOR MODELLING, ECOLOGICAL RISKS, AND HUMAN HEALTH IMPACTS OF MERCURY IN SOME GHANAIAN TOPSOILS DUE TO MINING AND COMMERCIAL ACTIVITIES

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Abstract

Globally, elevated environmental mercury levels have been linked to artisanal and small-scale gold mining; however, investigations into mining communities often overlook other potential sources and their contributions to soil mercury accumulation. This study explored the positive matrix factorization receptor model to identify other possible sources of mercury contamination in two major mining communities (Kenyasi and Obuasi) and a commercial city (Sunyani) in Ghana. The mercury concentrations across the three study areas showed no significant differences ($p = 0.257$ at the 95% confidence level). The positive matrix factorization model identified mining as the major contributor to mercury accumulation in Obuasi and Kenyasi, with other activities, such as farming, also contributing substantially. The generation and burning of hazardous waste in the Sunyani municipality due to increased commercial activities have contributed significantly to mercury contamination. Although the hazard quotient indicated no adverse health effects in the study areas ($HQ < 1$), the pollution and ecological risk indices showed that Obuasi was significantly enriched with mercury, with considerable levels found in Kenyasi and Sunyani. The results from this study will serve as a valuable database for environmental studies on mercury, particularly in Kenyasi and Sunyani, where extensive research on mercury contamination has been lacking.

Keywords: Factorization model; pollution factor; human health effects; enrichment factor; hazard quotient.

140. TREATMENT OF AQUACULTURE WASTEWATER USING HYBRID VERTICAL FLOW CONSTRUCTED WETLANDS FOR AGRICULTURAL REUSE

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Abstract

Aquaculture wastewater contains various pollutants, including uneaten feed, faecal matter, organic waste, nutrients (such as nitrogen and phosphorus), antibiotics, and other chemicals. Globally, more than 380 billion m^3 of aquaculture wastewater is discharged annually, with projections indicating a 24 % increase by 2030 and a 50 % rise by 2050. However, over 80 % of this volume is released untreated, posing serious risks to both the environment and public health. Consequently, the proper treatment and management of aquaculture wastewater are essential for safeguarding environmental quality and human well-being. This study thus evaluated the performance of vertical flow constructed wetlands (VFCWs) planted with elephant grass (*Pennisetum purpureum*) and vetiver grass (*Vetiveria zizanoides*) in treating aquaculture wastewater. A typical pilot-scale experiment evaluated the effectiveness of single and combined plant systems in improving wastewater quality. The results revealed that the combined use of elephant and vetiver grasses in VFCWs provided superior treatment performance compared to single-species setups. The system achieved removal efficiencies of 85 – 90 % for NH_4^+, 75 – 80 % for NO_3^-, 80 – 85 % for PO_4^{3-} , and 90 – 95 % for TSS. Both macrophyte species exhibited significant growth, with elephant grass increasing from an initial of 20 cm to 100 – 110 cm and vetiver grass increasing from 20 cm to 75 – 94 cm. The findings demonstrate the potential of hybrid VFCWs with elephants and vetiver grasses as a sustainable and environmentally friendly solution for aquaculture wastewater treatment, offering a promising approach to reducing environmental pollution, supporting sustainable aquaculture practices, and potential for agricultural reuse.

Keywords: Aquaculture wastewater, Constructed wetlands, *Pennisetum purpureum*, *Vetiveria zizanoides*, Nutrient removal

141. SUSTAINABLE INTENSIFICATION AND BIODIVERSITY: ISFM OUTPERFORMS CONVENTIONAL AGRICULTURE FOR UNDERGROUND ARTHROPOD DIVERSITY IN NORTHERN GHANA

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Abstract
Integrated Soil Fertility Management (ISFM) is increasingly promoted as a sustainable intensification practice in West Africa. However, its impact on biodiversity conservation remains poorly understood. This study examines arthropods response to land management across a gradient of land use intensity including pristine areas, ISFM, and conventional farms in northern Ghana. We sampled 5,097 above- and below-ground arthropods and earthworms during the fallow period of 2024 using Combi and pitfall traps as well as soil excavation in three sites per land use type. Samples of all species were pinned, sorted into morphospecies and counted. Results from the analysis of Hill diversity profiles reveal contrasting biodiversity patterns between the land use types. The pristine area recorded the highest diversity (> 115 morphospecies) of arthropods while ISFM and conventional systems recorded almost similar but reduced diversity patterns (93 and 95 morphospecies respectively). However, the land uses unexpected patterns in below-ground arthropods and earthworms. Indeed, ISFM sites yielded 3 times higher pedofauna diversity than pristine areas. Conversely, as expected conventional agriculture yielded no pedofauna. These findings suggest that ISFM practices may enhance soil habitat quality and microbiology activities through enhanced organic matter inputs and reduced chemical intensity. Moreover, the results demonstrate considerable potential of ISFM as a biodiversity-friendly intensification strategy, particularly for soil ecosystem services. Specimens from additional sampling periods are being analyzed to confirm these findings and to assess seasonal variability in arthropod diversity responses to land use intensity.

Keywords: Biodiversity Monitoring, ISFM, Arthropod, Hill Number, Smallholder Farming

142. LAND COVER PATTERNS AND DYNAMICS OF NYANKPALA CAMPUS OF THE UNIVERSITY FOR DEVELOPMENT STUDIES

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Abstract
Physical infrastructure is an essential component of educational institutions, especially universities. Although universities often prioritise built environment to the detriment of green spaces, scenic beauty is achieved through a blend of green spaces and built-up areas. Since the establishment of the Nyankpala campus in 1992, the demand for infrastructure has led to changes in landcover of the campus. This study was conducted to examine land cover changes of the area using remote sensing and GIS techniques. Land cover patterns and dynamics of the area over a period of four decades (1984, 1994 and 2024) were classified into three categories (cropland, savanna woodland and built-up). The study showed an increase in cropland at the expense of savannah woodland between 1984 and 1994. Built-up areas increased significantly from 1994 – 2024 while cropland decreased within same time. From 1994-2024, savanna woodland area increased. The expansion in woodland area would enhance environmental protection and contribute to microclimate amelioration on the campus. However, the interpretation of our findings is limited by the number of satellite images analysed, future studies should consider satellite images over 5-year durations to provide a fine scale resolution in detecting landcover transformation.

Keywords: Landuse; Landcover; Built-up; Cropland; Change

143. GALAMSEY AND LIVELIHOOD DISRUPTION: A CASE STUDY OF FISHING HOUSEHOLDS IN BANDA DISTRICT, GHANA

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Abstract
Water resources are essential to the livelihoods of communities, serving domestic, agricultural, and economic purposes. In Ghana's Banda District, these resources face increasing threats from contamination due to small-scale mining activities (galamsey). This study investigates the environmental and socioeconomic impacts of such mining operations on local fishing communities. Data were collected through structured questionnaires, surveys, and focus group discussions. Findings indicate, fishing in the area is male dominated, with 87% of respondents being men, 51.7% of respondents being 50-59 years old, and 58.3% had over two decades of fishing experience. Environmental degradation was evident: 98.3% of participants reported a significant decline in fish populations, and 33.3% observed reduced fish catches. These changes had direct impact on household incomes. Before the onset of small-scale mining, 80% of respondents earned above GH₵2,000 monthly. Post-mining, income levels dropped significantly, with 56.7% earning between GH₵1,000–2,000. The study also revealed that 91.7% of respondents believed mining had severely disrupted their fishing operations. In terms of community response, 50% stated that there were no traditional methods to counteract galamsey activities, while 25% expressed helplessness and fear towards the miners. These findings underscore the urgent need for policy interventions and community-based strategies to mitigate the adverse effects of galamsey. In conclusion, small-scale mining (galamsey) in the Banda District has led to significant environmental degradation and socioeconomic decline, particularly among fishing households. Addressing these challenges requires multi-stakeholder approach involving government regulation, community empowerment, and sustainable resource management to restore ecological balance and improve the well-being of affected populations.

Keywords: Galamsey, Governance, Environment, Livelihoods, Fishing

144. EFFECTS OF LAND COVER CHANGES ON ECOSYSTEM SERVICES AND FUNCTIONS IN THE KULPAWN RIVER BASIN OF GHANA

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Abstract
The Kulpawn River Basin (KRB) has experienced a significant decline in vegetation cover due to land-use and land-cover changes between 1995 and 2023, affecting hydrological flows and ecosystem services. This study evaluated the ecosystem service values (ESV) associated with these changes. The Random Forest (RF) algorithm was applied to extract LULC information from Landsat images from 1995-2023. The Benefit-Transfer Model (BTM) was employed to estimate the ESV over the study period. Results showed that 15.17% of dense savannah vegetation and water bodies, 14.14% of agricultural land, and 8.73% of light savannah vegetation had been converted into built-up areas, leading to a reduction in the area's dense savannah vegetation and water bodies by 25.71% and 20.10%. The total estimated values of ecosystem services were: 410,09 $\times 10^8$ USD, 362.92 $\times 10^8$ USD, 335$\times 10^8$ USD, and 319.28 $\times 10^8$ USD for 1995, 2005, 2015, and 2023, respectively. The total ESV declined from 410.09 $\times$ 10^8 USD (20.51%) in 1995 to 319.28 $\times$ 10^8 USD (15.96%) in 2023, signifying the effect of LULC changes on the river basin ecosystem services. The study also identified agricultural activities, expansion of built-up areas, population sprawl, and artisanal mining activities as key drivers of ecosystem service changes in the basin. The findings highlight the vulnerability of ecosystem services to LULC changes and the urgent need to develop programs and strategies to mitigate and curtail the degradation of LULC and ESV in the basin.

Keywords: Galamsey, Governance, Environment, Livelihoods, Fishing

145. MISTLETOE PREVALENCE AND INFESTATION SEVERITY ARE INFLUENCED BY LAND USE AND STAND STRUCTURE IN SHEA PARKLANDS

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Abstract
Vitellaria paradoxa (Shea) is an economic tree that contributes significantly to livelihoods and several sustainable development goals in Sub Saharan Africa. However, parasitic plant infestation poses a threat to growth and productivity. Shea parklands occur in diverse land use types, and understanding the ecology of parasitic plants in these land use systems is critical for effective management. The present study examined the influence of land use and dendrometry on mistletoe interaction with Vitellaria paradoxa in shea parklands of Northern Ghana. Three quadrates were laid in the three land use types (farmland, short fallow land and long fallow land) and replicated on three sites for the assessment of mistletoe prevalence, infestation levels and dendrometry parameters. A total of 51.45% of the 276 shea trees sampled were infested with mistletoe. Prevalence and severity of infestation was significantly higher among trees on farmlands compared to other land use types. The severity of mistletoe infestation was significantly associated with tree crown diameter and crown layer but not stem diameter. The study concludes that shea trees in cultivated areas are more vulnerable to mistletoe infestation, therefore control efforts should be intensified on farmlands to protect tree stands.

Keywords: *Vitellaria paradoxa*; infestation; land use; shea parkland; parasitic plant

146. EVALUATING THE INTEGRITY OF TREATED WATER FROM THE DABOASE PLANT TO NEARBY SETTLEMENTS

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Abstract
In response to public pressure, the Ghanaian government launched Operation Vanguard in April 2017, banning small-scale mining on water bodies due to environmental concerns. This study assessed water quality at the Daboase Treatment Plant, which processes water from the Pra River, a site heavily impacted by illegal mining (galamsey). A total of 120 water samples were collected from the main river (intake), treatment facility, and standpipes in Daboase during wet and dry seasons in 2017.The analysis focused on seasonal variations and compliance with WHO drinking water standards. Conductivity levels remained within acceptable limits, averaging 201 µS/cm across seasons, though they decreased from 129 µS/cm in May to 97.9 µS/cm in November. The water's pH ranged from neutral to slightly basic, increasing from 7.36 in raw water to 8.56 post-treatment due to lime addition. However, 46% of pH samples exceeded WHO guidelines. Turbidity presented a major issue: readings ranged from undetectable to 382 NTU, with only 26% of samples, including treated water, meeting the WHO limit of 5 NTU. While major ions like calcium and magnesium, and nutrient levels remained within safe ranges, metal contamination posed significant concerns. Iron (Fe) concentrations exceeded WHO limits (0.30 mg/L) at 12 treated water sites, and mercury (Hg) levels surpassed the 0.001 mg/L threshold at over 20 taps, posing risks such as kidney failure and gastrointestinal distress. Additionally, 67% of samples exceeded aluminum (Al) guidelines, likely due to excessive use of alum in treatment, although average levels remained low. Findings highlight that illegal mining continues to degrade water quality, especially through elevated turbidity and mercury levels, compromising public health.

Keywords: Aluminum, Galamsey, Mercury, Turbidity Levels, Water Quality

147. ISOLATION AND CHARACTERIZATION OF PLASTIC, HEAVY METALS, AND CRUDE OIL DEGRADING FUNGI

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Abstract
Environmental pollution with plastics, heavy metals, and crude oil has become a serious threat due to their high non-degradability, posing a substantial environmental and health risk. In this study, plastic, heavy metals, and crude oil-degrading fungal strains were isolated, characterized, and assessed for their pollutant degradability in vitro. Fungal strains were isolated from plastic dumpsites, mining sites, and crude oil-contaminated sites. Morphological and microscopic analyses identified Aspergillus sp., Penicillium sp., Trametes polyzona, and Basidiomycota fungus. Their pollutant degradation abilities were tested on Remazol brilliant blue agar and Bushnell-Haas media supplemented with polyethylene terephthalate (PET), high-density polyethylene (HDPE), heavy metals (Cr, Pb, As, and Hg), and crude oil. Isolates with strong degradation capabilities, evidenced by an enzymatic index of 1.00 cm for cellulolytic activity, were further assessed for degradability in solid-state and submerged phases at various pollutant concentrations, thus, 0%, 0.1%, 1%, and 10% for plastic and 0.1 ppm, 1 ppm, 10 ppm and 100 ppm for heavy metals and crude oil, and then incubated for 7 days at 28 °C. Plastic degradation was most effective at 10% in solid-state assessments and at both 0.1% and 10% in submerged treatments. Mercury, arsenic, and chromium were the most toxic heavy metals for the fungal strains at 100 ppm. Trametes Polyzona emerged as the best candidate for degrading all pollutants, offering a sustainable method for managing environmental pollution.

Keywords: Crude Oil, Enzymatic Index, Heavy Metals, High-Density Polyethylene, Polyethylene Terephthalate.

148. IMPACT OF AGROECOLOGICAL PRACTICES ON SOIL HEALTH IN NABDAM, GHANA

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Abstract
Soil health plays a vital role in sustainable agriculture by supporting plant growth, biodiversity, and ecosystem functions. Agroecology is an integrated approach to sustainable food systems, combining ecological and social principles. It relies on natural systems of production with minimal assistance from outside sources. There is, however, limited understanding of how agroecological methods influence soil macro-organisms and their contributions to nutrient retention and moisture conservation in rocky landscapes. In Ghana's Nabdam District, where rocky terrain and shallow soils pose challenges and limits productivity, agroecological practices may offer practical solutions. By addressing this gap, the study aims to provide practical insights for smallholder farmers to improve soil management and build resilience to climate change. This study evaluates the effects of mulching, composting, manual weeding, and organic control of pests and diseases on key soil health indicators, including organic carbon sequestration, pH balance, macro-organism diversity and abundance, and water holding capacity. A randomized control trial approach was used to assess how these practices enhance soil biological activity. The Shannon-Wiener diversity index was calculated for macro-organisms collected using pitfall traps across five agroecological farms and one conventional farm. The results showed that agroecological farms generally exhibited higher diversity values compared to the conventional farm, indicating a healthier and more stable soil ecosystem. The results highlight the potential of agroecology to restore soil fertility, enhance food security, and strengthen climate adaptation strategies, supporting the transition to more sustainable and climate-resilient agricultural systems in vulnerable regions.

Keywords: Agroecology, Soil Health, Nabdam, Sustainable Food systems, Climate change

149. UNCOVERING NONLINEAR PATTERNS IN GROUNDWATER POLLUTION USING VARIATIONAL AUTOENCODERS AND SELF-ORGANISING MAPS: A CASE STUDY FROM GHANA

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Abstract

The study examines intricate relationships and patterns among various pollutants to provide a comprehensive evaluation of groundwater quality in Atonsu, Ghana. Groundwater samples were collected from fifty-six locations and physicochemical parameters were measured and water quality indices were calculated. Advanced non-linear machine learning techniques, specifically Variational Autoencoders (VAEs) and Self-Organising Maps (SOMs), were used to analyse groundwater contaminants and identify relationships between parameters. All the physicochemical parameters evaluated fell within the WHO guideline values. The VAE and SOMs analyses confirm dual-source controls on groundwater chemistry in the Birimian terrains; natural geogenic inputs from silicate and mafic lithologies and anthropogenic impacts from settlements. Inverse loadings across latent dimensions captured spatial heterogeneity, separating lithology-driven variables (e.g., Na^+, Ca^{2+}, EC) from pollution markers (e.g., NO_3^-, Cl^-). SOM clustering further distinguished zones of minimal human influence from areas with localised contamination, such as Pb hotspots and elevated EC and salinity linked to mineralisation or saline intrusion. Scattered peaks in F^- and Cl^- suggested episodic anthropogenic inputs. The results reveal notable disparities in machine learning model performance based on target variable features; the Nitrate Pollution Index (NPI) yielded a Test R^2 of 0.983, indicating superior predictive accuracy. Conversely, challenges with the Fluoride Pollution Index (FPI) and Pollution Index of Groundwater (PIG) exposed limitations due to unmeasured geological factors and low variability. Our study proposes a data-driven, scalable diagnostic tool that could be integrated into national frameworks for monitoring water quality, with implications for Sub-Saharan Africa and other similarly affected regions.

Keywords: groundwater, VAE, SOM, water indices

150. WATER STORAGE POLYTANK URBAN METABOLISM: A HOLISTIC APPROACH TO UNDERSTANDING THE NEXUS BETWEEN MICROBES, INSECTS, PLANTS, AND POLYTANKS

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Abstract

Large scale plastic water tanks are a ubiquitous feature of the Tamale urban and peri urban environments for domestic and institutional water storage. Focused on water storage polytanks, a pervasive but little researched element of urban landscapes, this paper adopted a holistic approach to understand the intricate polytank ecology. Soil, plants, tank surface wipes and fungal samples were collected from on the surface and around the polytank and insect collections from mounted insect traps were analysed for microbial, plant and insect diversity. Bacterial and fungal isolates identified were *E. coli*, *Staphylococcus aureus*, *Baccilli*, *Pseudomonas aeruginosa*, *Aspergillus niger*, *Trichoderma* spp., *Penicillium spp*., and *Fusarium spp*. Plants which were common in the poly tank environment were *Amaranthus spinosus*, *Tridax procumbens*, *Herissantia crispa*, *Chamaecrista mimosoides*, *Senna tora*, *Acalypha paniculata Miq*., *Sida cordifolia*, and *Cynanchum Wilfordii*. The trapped insects were identified as spiders, ants, mosquitoes, bees, cockroaches and termites. Research findings show a preponderance of urban green zones, cool zones, and insect nesting and breeding grounds associated with poly tanks in Tamale. Similar to merging of living marine life and non-living plastic bodies into hybrid organisms in the case of ocean plastics, Tamale's tanks indicate that polytanks, though deemed an intrusive and foreign matter, can nevertheless be 'supportive' of life, subtly reprogramming urban metabolisms and the character and distribution of urban nature.

Keywords: Polytank, Ecology, Fungi, Water, Insect, Plant

151. VARIABILITY OF CLIMATIC FACTORS ON SUSTAINABLE RICE PRODUCTION IN THE TOLON AND KUMBUNGU DISTRICTS OF NORTHERN GHANA

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Abstract
Climate variability is significantly impacting the productivity of rice systems in Northern Ghana, where farmers rely heavily on rainfall and face limited irrigation options. This study examines the influence of rainfall and temperature trends on sustainable rice production in the Tolon and Kumbungu Districts using climate data (1991 – 2022). The Mann-Kendall trend test and Pettitt change-point analysis were applied to rainfall and temperature series, complemented by Innovative Trend Analysis to assess fluctuations across different periods. The results reveal evidence of changing climatic conditions. Rainfall exhibited seasonal deficits and occasional heavy precipitation events, with significant variability around a structural change detected in 2007. The study observed moderate increases in rainfall ($p = 0.0252$), but the uneven distribution frequently led to prolonged dry spells followed by short episodes of flooding. Minimum and maximum temperatures showed significant upward trends ($p = 0.0050$ and $p = 0.0322$, respectively), with notable shifts beginning in 1997. Average maximum temperature reached 34.07°C, intensifying crop water stress. Farmers reported declining rice output, shortened growing seasons, and pest incidence as direct outcomes of these changes. Despite these challenges, adaptive behaviors were evident, with farmers employing practices such as adjusting planting dates, diversifying crop choices, and adopting drought-tolerant varieties. The policy implications are significant, including strengthening sustainable water management through small-scale irrigation and rainwater harvesting, integrating climate projections into agricultural calendars, extension services, and farmer training programs, promoting access to weather information, and investing in climate-resilient seed varieties. Coordinated support from local and national authorities is essential for building long-term resilience in rice production systems.

Keywords: Climate variability, trends, water management, rice production, Northern Ghana

152. SHALLOW GROUNDWATER CHEMISTRY AND ITS IMPLICATIONS FOR DOMESTIC USAGE: A CASE STUDY OF KOTEI AND MOSHIE ZONGO COMMUNITIES IN KUMASI, GHANA

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Abstract
Groundwater is a critical natural water source for domestic, industrial and agricultural applications worldwide. This study assessed the quality of self-supplied shallow groundwater in two peri-urban communities in Kumasi, Kotei and Moshie Zongo, where residents rely heavily on groundwater for domestic purposes. A total of 44 water samples were collected, with 19 from Kotei and 25 from Moshie Zongo, and analysed following standard laboratory procedures. Results revealed that majority of pH values were below the World Health Organisation (WHO) and Ghana Standard Authority (GSA) recommended range of (6.5 – 8.5), suggesting acidic and potentially corrosive water. Major anions followed the order $HCO_3^- > Cl^- > NO_3^- > SO_4^{2-} >$ F- in Kotei and Cl- > $HCO_3^- > SO_4^{2-} > NO_3^- >$ F in Moshie Zongo, suggesting both natural geochemical processes and anthropogenic influences. Cationic concentrations followed the order Na > K > Mg > Ca in Kotei and Na > Ca > K > Mg in Moshie Zongo, ssuggesting differences in aquifer composition and human impacts. All samples had negative saturation index (SI) values for carbonate minerals such as calcite, aragonite, dolomite, implying mineral undersaturation. Hydrochemical facies included Nacl, $NaHCO_3$, and $CaMgSO_4$, and mixed types, with cation exchange dominating particularly in Kotei. Overall, the groundwater quality in both communities raises concern due to acidity. Regular monitoring, household water treatment, and further studies on seasonal variability are recommended to inform sustainable water management strategies.

Keywords: Aquifer, cation exchange, corrosive water, facies, saturated Index, water quality

153. INVESTIGATING THE USE OF PLASTICS BY FOOD SERVICE PROVIDERS AND CONSUMERS ON THE KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY (KNUST) CAMPUS

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Abstract

Single-Use Plastics (SUPs) in food services contribute to environmental pollution and pose health risks. This study investigates Single-Use Plastic (SUP) usage among food vendors and consumers at KNUST campus, highlighting its significant risks. Surveys of 80 food vendors and 130 consumers assessed usage patterns, awareness, and attitudes toward sustainable policies. Simple random sampling was utilized, and questionnaires were distributed both online and in-person and descriptive analysis and factor analysis were performed on the responses. The research revealed that 99.8% of vendors were females while 53.8% of consumers were males. Most vendors were between 31-40 years old and had basic education and most vendors (97.5%) used polyethylene bags, 85% used plastic containers, and 61.3% used plastic cutlery. While vendor awareness of SUP's environmental impact was high, knowledge of associated health risks was low (46.3%). Both groups showed strong support for reducing plastic use, with 58.8% of vendors and 69.2% of consumers in favour. Education campaigns and promoting reusable alternatives were the most preferred sustainability initiatives. However, a significant gap existed between awareness and action. Although 80% of consumers expressed a willingness to choose sustainable options, only 62.5% of vendors were willing to adopt them. This indicates a discrepancy between awareness and practical implementation, particularly among vendors. The study concludes that high SUPs use on campus presents a major environmental challenge. Effective policies must therefore be multi-faceted, addressing vendors' practical concerns while leveraging consumer demand. Recommendations include combining educational campaigns, promoting alternatives, and implementing gradual regulations to bridge the awareness-action gap.

Keywords: Single-use plastics, Food service providers, Sustainability, KNUST

154. LAND USE AND LAND COVER TRENDS IN SAKUMO WETLAND, ACCRA-GHANA OVER THE PAST 40 YEARS (1984-2024)

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Abstract

Changes in Land Use and Land Cover (LULC) can cause environmental challenges. However, few studies have investigated the impact of LULC changes on the Sakumo Wetland over a 40-year period. Tracking LC changes at such a scale over time is relevant for devising solutions to emerging land use issues in the area. This study examined LULC changes in the Sakumo Wetland for the past four decades (1984–2024) to highlight significant transformations and opportunities for sustainable development. Land cover data for five selected years (1984, 1994, 2004, 2014, and 2024) were obtained from Landsat 5, Landsat 8 and Landsat 9 and analyzed in ArcGIS Pro environment. Both supervised and unsupervised techniques were employed to classify satellite images into five classes: water bodies, built-up/urban areas, bare land, agriculture, and vegetation. On average, the results revealed increases in spatial coverage of 0.78%, 4.45%, 17.47%, and 0.35% for bare land, built-up, agriculture, and water body, respectively, across the designated wetland area, while dense vegetation declined significantly (-100.00%). Notably, bare land increased from 1984 to 2004 but declined afterward which raises water quality concerns in the area. To support future planning, a CA–Markov model was used to project LULC conditions for 2034. The projections indicate that built-up areas will expand from 60.66 km² (4.45%) in 2024 to 130.10 km² (9.65%) in 2034, with water bodies increasing from 4.77 km² to 15.20 km² likely due to flood-related impacts. Conversely, agriculture is expected to decline to 152.40 km², and bare land will continue decreasing by 24.2%. These findings highlight the urgency of continuous LULC monitoring and integrated policy interventions to mitigate urban encroachment and wetland degradation.

Keywords: Sakumo, wetlands, land use and land over, urbanization, sustainability

155. NANOMATERIALS FOR SUSTAINABLE REMEDIATION OF PHARMACEUTICAL CONTAMINANTS IN WATER: A SYSTEMATIC REVIEW

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Abstract

Pharmaceutical pollutants, such as antibiotics and hormones, are increasingly becoming widespread micropollutants in the world's water supply, with traditional wastewater treatment processes often failing to remove these micropollutants. In Ghana, as concern grows over healthcare and agricultural runoff pollution of water, immediate adoption of new measures is essential to safeguard public health and the environment. This review explores the potential of nanomaterials (NMs) in removing pharmaceutical pollutants through adsorption, catalytic degradation, and hybrid nanocomposites. A systematic review of peer-reviewed articles (2015–2024) published in Web of Science and Google Scholar was conducted using specific keywords. The inclusion criteria focused on studies reporting removal efficiency, mechanistic insights, and green synthesis. Adsorption mechanisms involve carbon-based nanomaterials (such as graphene oxide and biochar) and polymer-coated nanoparticles. Catalytic degradation employs metal oxides (TiO_2, ZnO) and Fenton-like nano-catalysts (nZVI). Hybrid materials include metal-organic frameworks (MOFs). Key findings show effective removal, with graphene oxide removing over 90 % of antibiotics like ciprofloxacin, and TiO_2 photocatalysts degrading sulfamethoxazole under UV light. Ghana's notable potential lies in producing biochar-based nanomaterials from low-cost, abundant agro-residues such as groundnut shells, rice husks, and cocoa pod husks. The country's favourable solar insolation positions it as a significant resource. Instead of relying on energy-intensive UV light for photocatalysis, the focus should shift to designing and testing sun-driven photocatalysts. In conclusion, nanomaterials present a revolutionary approach to pharmaceutical remediation, though their application in Ghana depends on eco-design and local material innovation.

Keywords: Nanomaterials, Pharmaceutical pollution, Water remediation, Sustainable technology

156. PROFILE AND CHARACTERISATION OF CULTURABLE MICROORGANISMS FROM ABATTOIR WASTEWATER FOR BIOREMEDIATION PURPOSES

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Abstract

Industrial activities and environmental pollution with toxic metals are a major problem worldwide and often occur alongside the establishment of facilities such as abattoirs. This study used culture-dependent and molecular techniques to isolate and characterize toxic metal-tolerant microbes from abattoir wastewater in Tamale, targeting the 16S rRNA gene for bacteria and the ITS1-5.8S-ITS2 region for fungi. The metal tolerance profiles of the identified microorganisms, including Bacillus spp., Enterobacter spp., and Aspergillus spp., were determined by subjecting isolates to 100, 500, and 1000 ppm concentrations of lead (Pb) and mercury (Hg) over 7 days. The Minimum Inhibitory Concentration (MIC) of each isolate against Pb and Hg was assessed on solid media. The isolates demonstrated the ability to reduce metal concentrations following exposure to both media supplemented with known concentrations of toxic metals for 14 days. *Bacillus* sp. and *Aspergillus* sp. reduced Pb by ~90% (from an initial 10 ppm) and Hg by ~80% (from an initial 20 ppm). The recovery of toxic metal-resistant microbes from abattoir wastewater indicates that the effluent contains measurable concentrations of heavy metals, which contribute to environmental pollution while simultaneously selecting adaptive traits in resident microorganisms. Consequently, these beneficial microbes could aid in the removal of such contaminants from the environment or be introduced into wastewater treatment systems.

Keywords: Microbial Remediation, Abattoir Wastewater, Lead, Mercury, Toxic Metal Tolerance

157. SOIL AND WATER MANAGEMENT IN ARID REGIONS OF AFRICA – A REVIEW

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Abstract
This review aimed to explore the complexities of soil and water management in Africa's arid regions, characterized by limited rainfall, high temperatures, and sparse vegetation. It examined how aridity impacts ecosystems, agriculture, human livelihoods, and the environment, while identifying effective strategies for sustainable resource management. Articles were sourced from reputable journals, focusing on studies that explored Soil and Water Management in Arid Regions of Africa. Data was gathered from different databases and search engines, Base-search.net, Google Scholar, Microsoft Academic, and Science Direct, and other Institutional Repositories, the World Health Organization, and the United Nations to ensure a comprehensive perspective on the topic, using specific terms like sustainable practices, soil fertility, adaptive technologies, climate change, water resources. Employing inclusion and exclusion criteria to filter relevant articles, suitable articles from the databases were assessed and duplicates that did not align with our criteria were excluded. The review identified major challenges including soil erosion, declining fertility, poor moisture retention, and water scarcity, all exacerbated by climate variability and human activities. Effective strategies highlighted include erosion control measures, soil fertility enhancement techniques, improved water harvesting and irrigation practices, adoption of appropriate technologies, and active community participation. The importance of integrating scientific research, policy support, and stakeholder collaboration emerged as central to the success of these interventions. Sustainable soil and water management in Africa's arid regions requires a holistic, multi-stakeholder approach. Coordinated efforts involving governments, NGOs, researchers, and local communities are critical to mitigating the effects of aridity, conserving natural resources, enhancing agricultural resilience, and supporting sustainable development. Such integrated and inclusive strategies are essential for meeting present needs while safeguarding resources for future generations.

Keywords: adaptive technologies, climate change, soil fertility, sustainable practices, water resources

158. MANAGING MUNICIPAL WASTE (LITTER/REFUSE/TRASH) FOR RECYCLING INSTEAD OF IMPROPER BURNING AND INDISCRIMINATE DISPOSAL - A CASE FOR SORTING IN SMALL VOLUMES

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Abstract
Pollution of our environment is of great concern worldwide. Part of the problem comes from improper disposal of municipal waste (litter/refuse/trash). This work reports very effective ways of managing municipal waste (from homes/ house, etcetera) by sorting different components (plastics, decomposable plant/ animal matter, metallic material, and glass) into small size/ volume containers, typically transparent plastic bags of size (37cm length, 24.5 cm width). Sorting into small volumes disposable containers and bulking into larger containers to meet waste collection schedule, allows effective managing of waste at the individual and home levels without having to hold waste for long periods to accumulate large volumes for collection for recycling. The procedure used allows effective management of about 1kg of litter per day per person in household translating to about 7kg litter per week per person in household. Sorting as done in this case enhances easy collection, handling for recycling, reduced handling cost (for example, from sorting) prior to recycling. Recycling will reduce indiscriminate disposal of waste into the environment, importer burning and other practices that cause serious pollution and health problems. Researchers and other stakeholders are encouraged to take up the issue boldly and help evolve effective ways of handling municipal waste like that indicated here, encourage and promote the use of such procedures to control inappropriate waste disposal with its harmful effect and reap great benefits for society.

159. EFFECTS OF CRIMES ON RESEARCH - LESSONS FROM PERSONAL EXPERIENCES AND OTHERS

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Abstract

Crimes here, considered as acts against law or unlawful acts, can have serious negative influence on research. Personal experiences and experiences by other people which have confirmed this unpleasant fact are mentioned here. Criminal acts experienced include a deliberate act by one causing the crime to disrupt critical collection of samples of high value, low volume product in a well-controlled and timed experimental procedure under very strict environmental control. A second is a deliberate holding in place of a component of equipment that has to be replaced with a new one periodically for accurate measurements. Another aspect of criminal exposure has to do with attack on the person of the researcher. This includes repeated abductions- forcing relocation to place away from usual needful working environment where normal functioning is not possible. A fourth experience of exposure to crime has to do with forceful unauthorized entry into one's residence by unauthorized person(s) accompanied by access to all lifetime acquired belongings including identity documents like passports, academic transcript, certificates, confidential examination materials, research results, publications etc. The negative consequences of the criminal attacks on the researcher and research are overwhelming. A caution is sounded here to fellow researchers and all concerned to take appropriate measures from all angles to ensure safety in laboratories, institutions and other research environments to control criminal acts and the negative consequences.

160. DIVERSITY OF GASTROINTESTINAL HELMINTH PARASITES PRESENT IN SOILS FROM THE MOLE NATIONAL PARK OF GHANA

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Abstract

Soil, an essential part of the earth's ecosystem, can harbor helminth parasites that pose serious public health risks in tropical communities with poor sanitation. This research aims to identify the different parasites that inhabit soils from Mole National Park that can cause infection and re-infection of humans. Investigating the presence of parasites in the soils of Mole National Park addresses a pressing public health issue, advances scientific understanding, builds community awareness, supports child safety and hygiene, and informs policy and preventive measures. Randomly collected soil samples from residential area, visitor's area, and school park were processed by sucrose flotation to isolate helminth eggs, which were identified and enumerated by microscopy. Parasite prevalence was highest in the residential area (43%), followed by the school park (32%) and the visitors' area (25%). Parasites observed were *Ascaris lumbricoides* (87.78%), *Strongyloides stercoralis* (6.79%), *Trichuris trichiura* (3.62%), *Dipylidium caninum* (0.90%), hookworm (0.045%), and pinworm (0.045%). The research indicates that diverse soil helminth parasite species are present and distributed throughout the Mole National Park. This study recommends that the physicochemical properties of the soil should be investigated as an attempt to manage the prevalence and transmission of soil parasites.

Keywords: Soil helminth, parasites, Mole National Park, sanitation, hygiene

161. BIRD SPECIES ABUNDANCE AND RICHNESS WITHIN THREE COMMUNITY RESOURCE MANAGEMENT AREAS IN THE WESTERN WILDLIFE CORRIDOR

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Abstract

The Community Resource Management Areas (CREMA) system is the main approach by which the Western Wildlife Corridor is protected. The corridor is a key migration path for animals moving from the Ranch de Nazinga wildlife reserve in Burkina Faso to Ghana's Mole National Park. This study investigated the effectiveness of the CREMAs using birds as indicators. Fixed-radius point-transect survey technique was used to record and compare between seasons and across three CREMAs. A total of 182 bird species comprising 19 Afro-Palearctic migrants, 28 intra-African migrants, and 135 resident bird species belonging to 64 families were recorded. Builsa Yenning (BY) recorded a significantly higher species abundance and richness followed by Moagduri Wuntaluri Kuwomsasi (MWK) with Sanyiga Kasena Gavara Kara (SKGK) CREMA being the lowest. The significant variation in bird species abundance and richness across the three CREMAs was attributed to local conditions and management strategies. Among the species recorded, 79 species were found to be shared across all three CREMAs, 23, 21, and 15 species were found to be unique to SKGK, MWK and BY CREMAs respectively. The study also attributed the similarities in species composition between BY and MWK CREMAs to proximity to each other and connectivity which facilitates species movement between these areas with ease. The study recommends adaptive and context-specific conservation strategies.

Keywords: Abundance; Bird; Biodiversity; Resource Management; Richness

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