

**DUTSE JOURNAL OF PURE AND APPLIED SCIENCES
(DUJOPAS)**

**A-bi-annual Publication of the Faculty of Science,
Federal University Dutse, Jigawa State - Nigeria**

Vol. 4 No. 1 June, 2018

ISSN: 2476-8316

Dutse Journal of Pure and Applied Sciences (DUJOPAS) is published by:

**The Faculty of Science,
Federal University Dutse.
Jigawa State - Nigeria.**

Printed by:

KABOD LIMITED

NL 7 Lokoja Road, Kaduna State, Nigeria.

+234(0)8030628933

kabodlimited@gmail.com

ISSN: 2476-8316

Copy rights:

All right of this publication are reserved. No part of this Journal may be reproduced, stored in a retrieval system or transmitted in any form by any means without prior permission of the publisher, except for academic purposes.

Note:

The articles published in this Journal do not in any way reflect the views nor position of DUJOPAS. Authors are individually responsible for all issues relating to their articles. Except for publication and copy rights, any issue arising from an article in this Journal should be addressed directly to the Author.

GUIDE TO AUTHORS

DUJOPAS is a publication of the Faculty of Science, Federal University Dutse, Jigawa State, Nigeria. It is an international peer-reviewed journal that publishes two issues in a year (June & December). The Journal publishes papers with original contributions to scientific knowledge in all fields of natural, life and applied sciences. Authors submitting papers for publication must adhere strictly to the following guidelines:

1. Research articles should be in the English language. Articles in other languages are NOT entertained. Correction of English language is not the responsibility of the Editorial Board of DUJOPAS. Author(s) not fluent in English are required to get their manuscripts checked by an English speaking colleague or professional editors
2. Submission(s) to DUJOPAS should be submitted electronically as MS word attachment to chifu.ndikilar@fud.edu.ng
3. Articles should be in 12 font size, Times New Roman and double-spaced with the normal A4 size margins.
4. The cover page should contain the title of the paper, author(s) name(s), and complete addresses including e-mail and mobile phone numbers. The corresponding author must also be specified clearly.
5. The article must contain an abstract of not more than 300 words and should be followed immediately by five keywords.
6. Articles submitted for publication must be original and should not be under consideration for publication elsewhere. The content should include (but not restricted to):
 - i. Introduction
 - ii. Background of the Research
 - iii. Methodology
 - iv. Results and Discussion
 - v. Conclusion
 - vi. References
7. Articles are accepted on the understanding that they have not been published elsewhere, and will not be, without the Editor-in-Chief's written consent.
8. The copyright of articles accepted for publication belongs to DUJOPAS.
9. All photos, drawings, diagrams, illustrations and other images in the manuscripts should also be submitted in digital format, preferably as JPEG or GIF files.
10. Captions should be submitted in a list separate from the diagrams or photographs.
11. The position of any photos, drawings, diagrams, illustrations and other images should be clearly marked in the text.
12. Raw graph data must also be provided separately in case it is necessary to reproduce the graph in another computer application program.
13. All references must adhere strictly to the Harvard referencing style. Citations must be given in Harvard style in the text e.g (Ndikilar *et al.*, 2017; Garku, 2008), or Mustapha *et*

al. (2016) or according to Abdulsalam (1988) and Bala & Idowu (2018)., If two or more works by different authors or authoring bodies are cited at one point in the text, use a semi-colon to separate them: (Okoro 2006; Olufemi 2009)

- The total number of references should not exceed 40 and references should not be numbered.
- An alphabetical list of all literature cited in the text should follow the text, headed by References, and double spaces in Times New Roman font size 12.
- Names of the periodicals should be given in full.
- Page numbers should be mentioned in the references.
- If the number of authors is five, include all author names in the references section. If the authors are more than five, then put names of the first five authors followed by *et.al.*

14. Authors submitting papers must send along ₦5000 or \$20 non-refundable processing fee.

15. Contributors whose articles are accepted for publication would be required to pay page charge of ₦15, 000 or \$100 payable to

Bank: ECOBANK

Name: DUTSE JOURNAL OF PURE AND APPLIED SCIENCES

Number: 3653080563

Each accepted article is entitled to a printed copy of the journal

16. A maximum of 12 pages are allowed, extra pages will attract ₦1, 000 (\$5) per page.

17. The deadline for the submission of articles for June issue is 30th April, while for the December issue is 31st October each year.

18. All correspondence should be directed to The Editor-in-Chief, DUJOPAS, Faculty of Science, Federal University Dutse, P. M. B. 7156, Dutse, Jigawa State, Nigeria. E-mail: ebenechifu@yahoo.com, chifu.ndikilar@fud.edu.ng

Signed

Prof. Chifu E. Ndikilar

Editor-in-chief, DUJOPAS

Department of Physics

Faculty of Science

Federal University Dutse

(0806 955 3173)

EDITORIAL BOARD

Editor-in-chief

Prof. Chifu E. Ndikilar
Department of Physics
Federal University Dutse
Email: chifu.ndikilar@fud.edu.ng

Assistant Editor-in-chief

Prof. Ali A. Sani
Department of Chemistry
Federal University Dutse
Email: ali.audu@fud.edu.ng

Subject Editors

Biological Sciences

Prof. M. M. Abubakar
Department of Biological Sciences
Federal University Dutse
Email: mmabubakar2005@gmail.com

Chemistry

Prof. A. Mustapha
Department of Chemistry
Federal University Dutse
Email: abmustapha2004@yahoo.com

Computer Science/IT

Dr. Ahmed B. Garko
Department of Computer Science
Federal University Dutse
Email: abgarko@fud.edu.ng

Environmental Sciences

Dr. Abdulhamed A. Ibrahim
Environmental Sciences Department
Federal University Dutse
Email:

Mathematical Sciences

Prof. Uba Ahmad Ali
Department of Mathematics
Federal University Dutse
Email: ubahamad@yahoo.co.uk

Physics

Dr. R. L. Njinga
Department of Physics
Federal University Dutse
Email: njingaraymond@yahoo.co.uk

Advisory Team

Prof. S. C. Oukoumi Noutchie
Department of Mathematical Sciences
North-West University,
Mafikeng, South Africa
Email: 23238917@nwu.ac.za

Prof. Shafi'u Jibrin
Department of Mathematics
Federal University Dutse

Prof. Abdulahi Ndzi Njah
Department of Physics
University of Lagos
Email: anjah@unilag.edu

Prof. G.M. Wajiga
Department of Computer Science
MAUTECH Yola
Email: gwajiga@gmail.com

Prof. Bashiru Garba
Department of Chemistry

Dr. Gideon Mbiydzennyuy
Department of InfoTech

Usman Danfodiyo University
Sokoto

University of Boras, Sweden
Email: gideon4life@gmail.com

Prof. M. B. Yerima
Department of Microbiology/Biotechnology
Federal University Dutse
Email: yerimbel@yahoo.co.uk

Prof. M. S. Sule
Department of Biochemistry
Bayero University Kano

Prof. Auwal I. Magashi
Department of Plant Breeding
Kano University of Science & Technology
Email: magashi2@mail.ru

Prof. Ibrahim Garba
Department of Geology
Ahmadu Bello University Zaria

Prof. B. M. Auwalu
Department of Agronomy
Bayero University Kano, Nigeria
Email: monsurauwalu@gmail.com

Prof. S.U. Gulumbe
Department of Statistics
Usman Danfodiyo University, Sokoto
Email: ugulumbe@gmail.com

Prof. Aliyu B. Nabegu
Department of Environmental Sciences
Kano University of Science & Technology
Email: aliyunabegu@kustwudil.edu.ng

Prof. Babangida Sani
Operations Research
Ahmadu Bello University Zaria

PUBLICATION CHARGES

Article Charges

Authors submitting manuscripts must send along ₦5000 or \$20 non-refundable processing fee.

Contributors whose articles are accepted for publication are required to pay page charges of ₦15,000 or \$100 payable to DUJOPAS. Each accepted article is entitled to a printed copy of the journal. This fee excludes postal charges.

A maximum of 12 pages are allowed, extra pages will attract ₦1,000 (\$5) per page.

Offprints/Reprints

Interested authors will be charged the printing and postal charges.

Advertisement

Full page: ₦30,000 (\$200)

Half page: ₦15,000 (\$100)

Quarter page: ₦10,000 (\$70)

Subscription per annum

Institutions: ₦15,000 (\$100)

Individuals: ₦7,500 (\$50)

CONTENTS

Title and Author(s)	Page No.
Determination of Chromium and Nickel Concentrations In Chalawa Tannery Effluent <i>I.R. Yalwa</i>	1
Chromium, Iron and Lead Concentrations in Fresh and Contaminated Water Carrots (Daucascarota) <i>I.R. Yalwa</i>	10
Students Satisfaction of Indoor Learning Environment of Ahmadu Bello University, Zaria: A Case Study of Department of Architecture <i>Yahaya Mahmud Maikano, Abdullahi Abubakar</i>	17
Economic and Environmental Implications of Fodder Production In Kano Metropolis <i>A. M. Ibrahim, H. A. Idris, A. I. Kiyawa</i>	29
Management of Domestic Water by Women in Parts of Kano State, Nigeria <i>Nuratu Mohammed</i>	42
Effect of Aqueous Root Extract of Cochlospermum tinctorium on Liver Function Markers of Albino Rats <i>Adam, A. Adam, Murtala, Y., Ibrahim K. Adam, Bello, A. Bello, Musbahu M. Sani</i>	59
Wide Area Power System Load Protection Model using TCP/IP: A Review and a Conceptual Model <i>S. M. Lawan, A. Y. Abdullahi, B. D. Bala, A. Aminu</i>	68
An Assesment of Socio -Economic Implications and Coping Strategies of Water Supply Scarcity in Tudun Wada Area, Kaduna State <i>Nura Isyaku Bello, Ibrahim Kabir Abdullahi, Nurudden Shehu, Hamza Idris</i>	83
Some Cultural Dilemmas to Family Planning Decisions in Kano Metropolis, Kano State, Nigeria <i>Ibrahim Badamasi Lambo, Bilkisu Yayaji Ahmed</i>	91
Determination of Thermodynamic Parameters for the Neutralization Reaction between Hydrochloric Acid and Sodium Hydroxide Using Titration Method <i>Abdu, M.S., Aska, A.S., Faruq, U. Z., Dabai, M. U., Ali, U. A</i>	102

Spatio-Temporal Analysis of Drought Occurrence and Intensity in Northwest Zone of Nigeria <i>M. Murtala, E.O.Iguisi, A.A. Ibrahim, Y.O. Yusuf</i>	111
Spatio-Temporal Dynamics of Urban Growth and its Impact to the Environment of the Federal Capital City of Nigeria (Abuja) <i>Sulaiman Yunus, Fatima Adamu</i>	130
Effects of Landuse/Landcover Changes on Kusalla Reservoir in Kano State, Nigeria <i>E. B. Gimba, D. M. Musa, Y. I. Garba, A. Mu'azu</i>	143
Housing Among The Low Income Groups In Some Parts Of Kano Metropolis <i>Ahmed Maigari Ibrahim</i>	153
Prevalence of Hepatitis B Virus Surface Antigen and Hepatitis C Virus Antibody among Prospective Blood Donors at Murtala Muhammad Specialist Hospital, Kano, Nigeria <i>Mukhtar, Isyaku Gwarzo, Yakasai, Bashir Wada, Muhammad, Sagir Mukhtar, Salisu, Ahmad Ibrahim</i>	170
Factors Determining Choice of Domestic Energy Source and Consumption in Tofa L.G.A. Kano State <i>Nuratu Mohammed</i>	177
Vegetation Density and Diversity in the Dryland of Northwestern Nigeria <i>Mustapha Zakariya Karkana, Salisu Mohammed</i>	195
Analysis of Backward Bifurcation in Some Epidemiological Models <i>James Andrawus, Ali Maianguwa Shuaibu, Muhammad Abdullahi, Sale Ali</i>	209
Investigation of Causes of Backward Bifurcation in Some Epidemiological Models <i>James Andrawus, Ali Maianguwa Shuaibu, Muhammad Abdullahi, Sale Ali</i>	223
Geoelectrical Evaluation of Subterrenean Condition of Sule Lamido Unversity Kafin- Hausa, Jigawa State, Nigeria <i>I. G. Shitu, M. Salehmadobi, M. Ahmad</i>	238
Fungal Infection of Banana (Musa Sapientum) Sold at Wudil and Yanlemo Markets of Kano State <i>Yahaya, S. M. Abubakar, Y. Ali, M. U. Lawan, M. Ajingi, Y. S. Haruna, M. Hayatu, L.W. Abba, H. Safiyanu, I. Abdullahi, J. Mardiyya, A. Y. Sakina S. B. Hassan, M. I. Sale, A. I. Umma, M. Aisha, T. Bilkisu, A</i>	254

Adsorption Study Of Methylene Blue On Mesoporous Silica Synthesized From Rice Husk <i>A. S. Kovo, A.F. Ali, Amah J. I., Anthony S. O.</i>	263
The Need for Implementation of Environmental Education in Nigeria - A Review <i>Shehu Nurudeen Muhammed, Ibrahim Kabir Abdullahi, Nura Isyaku Bello Abubakar Sadik Abdullahi</i>	280
Comparative Effects of Urbanization on Anthropometric Measures of Central and Generalized Body Adiposity among Hausa Ethnic Group in Kano State <i>Asuku, A. Y, Danborno, B., Akuyam, A. S, Timbuak, J. A, Adamu, L. H</i>	289
Fatty Acid Profile, Thrombogenic and Athrogenic Indices in the Raw Milk of Cow and Sheep Breeds <i>Yusha'u, A.Z</i>	299
Mineral Composition of the Raw Milk of Cow and Sheep Breeds from Kano and Jigawa States, Nigeria <i>Yusha'u, A. Z.</i>	308
Pattern of Growth of School Children Aged 5-12 Years from Kazaure Emirate of Northern Nigeria <i>Gudaji, A., Danborno, B., Hamman, W. O.</i>	317
Application of Transformation-Permutation to Lossless Data Encryption and Compression <i>Zirra P. B., Babayo A.M.</i>	322
Evaluation of Silymarin on Posterior Pituitary Cells in Experimental Liver Fibrosis Induced By CCl4 in Male Wistar Rats <i>D.U Jamil, H.O. Umar, I. B. Mai-Siyama, Labaran Ibrahim</i>	330
Pearl Millet Characteristics in Futchimiram, Northeastern Yobe State, Nigeria <i>Salisu Mohammed</i>	340
Relationship between Body Mass Index and Academic Performance among Students of Basic Medical Sciences, Bayero University Kano, Nigeria <i>Mukhtar Muhammad, Azizah Abdullahi Umar, Ibrahim Ahmad Atiku</i>	349
Effect Of Bi³⁺ On Metallization And Polarizability Properties On Willemite Glass Ceramics From Waste Material <i>I.A. Auwalu, U.H. Jamo, D.G. Diso, A.F. Inuwa, A. Aminu, M. Alhassan, S. A. Umar</i>	360

Momentum Distribution Calculations of ^{28}Si Core Fragment From $^{29}\text{P} + ^{12}\text{C}$ and ^{12}C Core Fragment From $^{13}\text{C} + ^9\text{Be}$ Reactions Using Glauber Theory <i>I.S. Salisu, I. Sa'adu, I. Z. Ali</i>	370
Geospatial Analysis of Land Use and Land Cover Dynamics in Akure, Nigeria <i>Olujide, H.M., Amoo, N.B., Oguntayo, S.M., Aroge, S.K., Amoo, A.O.</i>	379
Bacteriological Quality of Some Herbal Medicines Commonly Sold in Dutse Metropolis, Jigawa State <i>Shiaka, G.P., Orji, I.V., Idris, A., Yakubu, B.M.</i>	394
Cephalic Index In Relation To Academic Performance among Students of Basic Medical Sciences, Bayero University Kano, Nigeria <i>Mukhtar Muhammad, Musa Salisu Sani, Dauda Usman Jamil, Ibrahim Ahmad Atiku</i>	404
The Use of Moringa Oleifera Leaves as a Protein Source in the Diet of African Cat Fish <i>Clarias Gariepinus</i> <i>Samirah Idris Umar</i>	416
Synthesis, Characterization And Antimicrobial Activities Of Schiff Base Derived From Sulfamethoxazole And Isatin And Its Co(Ii), Cu(Ii) And Zn(Ii) Complexes <i>I. T. Siraj, H. B. Ado</i>	426
Development And Validation Of Training Manual For Health Masters/Mistresses As Preventive Strategy On Spread Of Tuberculosis In Boarding Secondary Schools In Kano Metropolis, Kano State <i>Gadanya M.A. , Bichi A.A., Gadanya H.S., Sani I., Sani M.</i>	436
2nd To 4th Digit Ratio (2d:4d) and Mathematics Performance among Secondary School Students in Kaduna, Nigeria <i>Muhammad Kabir Rayyan, Ramatu Salisu, Ibrahim Ahmad Atiku, Barnabas Danborn</i>	446
An Assessment on Some Selected Heavy Metals in Soils Around Maiganga Coal Mine and its Environs, Gombe State, Nigeria <i>Babayo, A. U, Santuraki, A.H, Adebayo Kabir</i>	456
Analysis of Spatial Variation in Agricultural Development Programmes in Kano State, Nigeria <i>Abdulkadir, H, Adefila, J. O, Yusuf, R. O</i>	466

Spatio-Temporal Trend Of Vegetation Density In Northern Guinea Savannah Zone Of Nigeria <i>Mu'azu, H, Usman A.K, Abdullahi, A.H</i>	477
Passive Architectural Design Strategies for Reducing Cooling Load within ICT Facilities In Tropical Hot And Dry Climate <i>Ngutor Elijah, Akaainjo, Abubakar, Abdullahi</i>	486
Effect Of Administration Of Sodium Selenite On Biochemical And Histomorphology of the Liver in Wistar Rats (Rattus Norvegicus) <i>A.S. Muhammad, D.U. Jamil, M.I. Umar, Ibrahim Ahmad Atiku Ibrahim Bukar Mai Siyama, H.O Umar, T.W. Jacks</i>	499
Trends and Diffusion Pattern of Meningitis in Kano State, Nigeria Using Inverse Distance Weight (Idw) and Linear Trend Surface Nafiu Zakari, Yusuf M. Adamu, Murtala U. Muhammed, <i>Nura Sabiu, Sabitu Saad Da'u</i>	510
Investigating the Levels of Attitude and Intention to Participate in Recycling Among Households in Kano Metropolis, Nigeria <i>Muhammad Salisu Khalil, Ibrahim Kabir Abdullahi , Nafiu Zakari Nura Sabiu, Shehu Nuruddeen Muhammed, Hamisu Alhaji Basiru</i>	521
Palm Oil Fuel Ash (POFA) Recycling In Porcelain Manufacture: Effects on Physical and Microstructural Properties at Different Temperatures <i>H. U. Jamo, I. A. Auwalu, M. A. Y. Hotoro, A. Aliyu, A M. Liman Y. Shehu, Y.U. Tarauni, M. U. Ali</i>	531
Study on Seroprevalence of Mycobacterium Bovis in Diary Milk from Cow and Herdsmen's Sputum in Kano, Nigeria <i>Abdul-Qadir, Z. A, Mohammed, Y, Rogo, L. D., Sani, M.N.</i>	542
Prelude To Singularity: Curating Bytes - The Challenge of Preserving Digital Material For Future Archaeology <i>Aminu Aliyu Abdullahi, Aminu Lawal Hussein, Farouk Lawan Gambo Umar Suleiman Jahun</i>	553
A Distributed Model to Compare the QoS Performance for LTE and Wimax Network Delay <i>Ibrahim Alhaji Lawal, Abubakar Aminu Mu'azu</i>	564
Qos Parameters For Real-Time Traffic In Vehicular Communication <i>Abubakar Aminu Mu'azu, Ibrahim A. Lawal</i>	575

Analytical Comparison of Arnoldi Methods for the Solution of Quadratic Eigenvalue Problems <i>Usman Sanusi, Hamisu Musa</i>	586
Influence Of Temperature On The Properties Of Torrefied Oil Palm Empty Fruit Bunches <i>Safana, A.A, Sabiu S.A., Adamu, B.I., Mohammad S. I., Hussaini Yusuf</i>	604
An E-Complaint System for the Nigerian Police Using Android Application <i>Suhail Muhammad Kamal, Adamu Sani Yahaya, Farouk Lawan Gambo Khadijah A. Abdussalam, Aminu Lawal Hussein</i>	613
Phishing Awareness Strategies: A Clear Case Of User And Industries Responsibilities <i>I.R. Saidu, Saadu Zakariya, Bello Aliyu Anka, Muazu Ibrahim Muhammad</i>	624
Determination of Gross Activity of the Alpha and Beta Radionuclides Present In Different Brands of Sachet Water within Kaduna Metropolis <i>Abdulkarim M.S., Abdullahi M.S, Sadiq Umar, Ahmed Mohammed</i>	634
Determination of Gross Alpha Gross Beta Radioactivity In Groundwater From Kaduna Metropolis <i>Abdulkarim M.S., Abdullahi M.S, Sadiq Umar, Ahmed Mohammed</i>	644
Phytochemical Assay of Some Members of the Family Loranthaceae From Local Area of Gwale, Kano Nigeria <i>Haruna, H., Bako ,S.P., Mustapha, Y., Umar, K.M.</i>	653
Antibacterial Effect of Neem Azadirachta Indica Stem Bark Extract on Some Dental Pathogens <i>Rabi, R.A, Haruna, H, Jalingo, A.A</i>	666