

CURRICULUM VITAE

DR. FESTUS M. TOLO

Ph.D. (JKUAT), SLDP (KSG), ASI (Fellow), NGA (KEMRI)

Nationality: Kenyan by birth

ID No.: 0646975

Email: ftolo@kemri.go.ke; fntolo1@gmail.com

Office Tel: (254) (020) 2722541, Ext. 3321

Fax: (254) (020) 2720030

Mobile: +254 721 703 501

Contact address: Centre for Traditional Medicine and Drug Research,
Kenya Medical Research Institute,
P.O Box, 54840-00200, Nairobi, Kenya.

Home address: Ebukuti Primary School,
C/O Assistant Chief,
Ebukuti Sub-Location,
P.O. Box 72, Butere, Kenya

Profession: Medicinal Phyto- Biologist

ACADEMIC QUALIFICATIONS

3. **Doctor of Philosophy (Ph.D.) in Medicinal Phytochemistry.** Jomo Kenyatta University of Agriculture and Technology (JKUAT), Nairobi. Kenya, **2007**.
2. **Master of Science (MSc.) in Infection Diagnosis.** Kenyatta University (KU), Department of Biochemistry, Nairobi, Kenya. **2003**.
1. **Bachelor of Science (BSc.) (HND eq.) in Pharmacology and Toxicology, Medical Microbiology, Physiology and Laboratory Management.** Department of Applied Sciences. Technical University of Kenya, Nairobi, Kenya, **1987**.

PROFESSIONAL QUALIFICATIONS

7. **Certificate in Peer Review.** Commission for University Education (CUE). Nairobi, Kenya. November, 2014
6. **Certificate in Research and Good Clinical Practice in Tsetse and Trypanosomiasis.** Drugs for Neglected Diseases initiative (DNDi) and Yale University, Juba, South Sudan, 2012.
5. **Certificate in ISO 9001:2008 audits for organizations.** Kenya Afri-aviation, Mombasa, Kenya, 2011.
4. **Intellectual Property Rights (IPR) in Research.** MIHR African Programme for Health Innovation (APHI) Workshop, KEMRI HQ., Nairobi, Kenya, 2006.
3. **Good Laboratory Practice (GLP) Trainer (Trainer of Trainers in GLP).** UNDP/World Bank/WHO Special Program for Research and Training in Tropical Diseases (TDR) Nairobi, Kenya, 1999.

2. **Certificate in Research and Control of Infectious Diseases.** Counterpart Training Course on Research and Control of Infectious Diseases (HIV/AIDS) KEMRI/JICA Project. Toyama Medical and Pharmaceutical University, Toyama, Japan, 1999.
1. **Radio-Immuno Assays Technology.** Application of radio-isotopes in medicine and research. Sponsored by The International Atomic Energy Agency (IAEA). Institute of Izotopes Co. Ltd., Hungary, 1996.

MANAGEMENT/LEADERSHIP TRAINING

3. **Certificate in Project Cycle Management.** Kenya School of Government, Nairobi, Kenya. September, 2015.
2. **Certificate in Management Skills Development.** Kenya School of Government, Nairobi, Kenya. August, 2013.
1. **Certificate in Strategic Leadership Development Programme (SLDP).** Kenya School of Government, Nairobi, Kenya. May 2013.

CARRIER PROGRESSION/PROFESSIONAL APPOINTMENTS

2020 September: Acting Deputy Director, CTMDR, KEMRI

2020 June: Senior Principal Research Scientist, CTMDR, KEMRI

2017 June: Chief Research Officer, CTMDR, KEMRI.

2016 Oct.-Nov. Acting Assistant Director, Scientific Programmes and Partnerships

2014 July

2020 August: Head, Natural Products Research and Drug Development Programme, KEMRI

2013 July: Principal Research Officer, CTMDR, KEMRI.

2012 August: Acting Head, Traditional Medicine and Drug Development Programme, KEMRI, Nairobi, Kenya.

2011 November: Appointed committee member, Traditional Medicine and Drug Development Programme (TMDDP).

2010-2014 Unit head, Biological Sciences Unit, CTMDR-KEMRI.

2008-2013 Senior Research Officer, CTMDR, KEMRI

2003-2008 Research Officer, CTMDR, KEMRI

1986 March: Research assistant/Technologist. Center for Traditional Medicine and Drug Research (CTMDR), Kenya Medical Research Institute (KEMRI).

1985-1986: Technician in charge, Pharmaceutics and Pharmaceutical Microbiology Laboratories. Faculty of Pharmacy, University of Nairobi.

1981-1985: Trainee technician, Department of Pharmaceutics and Pharmaceutical Microbiology, Faculty of Pharmacy, University of Nairobi.

ACADEMIC APPOINTMENTS

2020 January

To date: Re-appointed **course coordinator** Chemistry/Phytochemistry course, **KEMRI Graduate School**

2019 January Appointed **course coordinator** Chemistry/Phytochemistry course, **KEMRI Graduate School**

2018 March

To date: Re-Appointed as an **External Quality Assurance Peer Reviewer** of University Curriculum for a period of 4 years by the Commission for University Education, Kenya.
Commission for University Education (CUE) Hq., Redhill Road, off Limuru, Road, Gigiri, P.O. Box 54999 – 00200, Nairobi, Kenya.

2012/13-2013/14: **University of Nairobi**
P.O. Box 30197, GPO, Nairobi, Kenya
Tel: (+254-20) 3318262/ (+254-020) 2429997
-Board of Postgraduate studies.
-External examiner for MSc. Thesis for 4 students.

2007-to Date: Faculty of Science, Department of Medical Microbiology-Karen campus, **Jomo Kenyatta University of Agriculture and Technology**
-Part Time Lecturer (Medical Virology, Medical Bacteriology, Bacterial Systematics).

2004-2006: Faculty of Science, Department of Biochemistry & Biotechnology (Unit of Medical Laboratory Science), **Kenyatta University**.
- Part time lecturer (Cell Biology, Medical Laboratory Management, Physiology).

ADMINISTRATIVE APPOINTMENTS

2019 July: Appointed Member of the Institute Budget Implementation Committee for three years

2019 Feb. Chair, KEMRI Housing Committee

2018 Nov. Chair, KEMRI Internal Research Grants (IRG) Committee

2017 to Date: Chair, Infrastructure committee of the KEMRI Scientific Steering Committee (SSC).

2016 To date: Appointed to the KEMRI's Strategic Plan Implementation Committee.

2015 March

To date: Appointed Chair, KEMRI Disposal Committee

2013 To date: Appointed as a member of the Technical Guiding Committee on product development from Traditional Medicine. Ministry of Health, Afya House, Nairobi.

- 2016-19:** Appointed as a member of the KEMRI Internal Research Grants (IRG) awarding and Management Committee for 3 years.
- 2013 To date:** Appointed as a member of the KEMRI Turning Research into Policy committee.
- 2012 To date:** Appointment as a member of the KEMRI Ethics and Scientific Review task force committee (ADILI).
- 2012 To date:** Appointed as a member of the KEMRI Vision 2030 committee.
- 2012 To date:** Member, KEMRI Scientific Steering Committee (SSC).
- 2012 September:** Member, KEMRI Publications committee.
- 2011-2012:** Appointed CTMDR-KEMRI ISO 9001:2008 Coordinator.
- 2010 October:** Appointment as a member of a taskforce for the implementation of the constitution review and repeal of laws governing the health sector.
- 2009 January:** A committee member of the Organizing committee (Ministry of Health) of the 3rd East African Health & Scientific Conference, Nairobi, Kenya, March 25-27, 2009.
- 2008 November:** Appointment as member of the KEMRI Procurement Committee, 2008/2009; 2009/2010 financial years.
- 2007 October:** Member of the KEMRI Staff Service Regulations review committee, October 2007 to September 2008. The committee successfully reviewed the service regulations which were presented to the Management of KEMRI on 29th Sep., 2008.

STUDENT SUPERVISION

PhD

- 2013 to 2018** **Jomo Kenyatta University of Agriculture and Technology,
P.O. Box 62,000 – 00200 NAIROBI, KENYA**
-Supervising **1 Ph.D.** Student (GLENN ONSOMU ARAKA -TM-410-002/04)
- Defended successfully, passed and **Graduated**, December, 2018.
- 2012 to 2018:** **Jomo Kenyatta University of Agriculture and Technology,
P.O. Box 62,000 – 00200 NAIROBI, KENYA** -The **one Ph.D.** Student
(OMONDI ANTONY RADOL-TM PhD) defended successfully, passed and **Graduated**, December, 2018.
- 2016 To date** **Karatina University, Main Campus, Kagochi, Karatina, Nyeri,
P.O. BOX 1957—10101,Nyeri**
-Supervising **1 Ph.D.** Student (ALICE WAGURA GATHONI-
P300/2006/P/13)
- On going

MSc

- 2020 January** **Jomo Kenyatta University of Agriculture and Technology,
P.O. Box 62,000 – 00200 NAIROBI, KENYA**
-MSc. Student supervision
- OLUOCH PATRICIA J. ACHIENG-Department of Pharmacology (JKUAT)
-Work in progress, ongoing.
- 2019 October** **Technical University of Mombasa, Tom Mboya Street Tudor, Mombasa
Kenya, Telephone: (254) 733 955377; (+254) 020-8095365/ 020-8095368/
020-8095371**
-MSc. Student supervision
- EVALYN WANDII MUTUVA- MMPV/0003/2015
-Work in progress, ongoing.
- 2018-19** **Jomo Kenyatta University of Agriculture and Technology,
P.O. Box 62,000 – 00200 NAIROBI, KENYA**
-MSc. Student supervision
- NKIROTE NTHIORI JUDITH - TM306-5714/2015
-Submitted thesis, December 2019. Defended successfully -Passed.
- 2015 to 2016** **Jomo Kenyatta University of Agriculture and Technology,
P.O. Box 62,000 – 00200 NAIROBI, KENYA**
-Supervised 1 MSc. Student.
- Defended successfully and passed.
- SIMON ALEM OGBAMIKAEL-TM- 303-3930/2014 MSc. awarded July
2016
- 2014 to 2015** **Jomo Kenyatta University of Agriculture and Technology,
P.O. Box 62,000 – 00200 NAIROBI, KENYA**
-Supervised 1 MSc. Student.
- Defended successfully and passed.
- ODONGO GRACE AKINYI- TM 305-2816/2013 MSc. awarded 2015
- 2014 -2015:** **University of Nairobi,
P.O. Box 30197, GPO, Nairobi, Kenya
Tel: (+254-20) 3318262/ (+254-020) 2429997**
-Department of Botany and Zoology.
-Supervising 1 MSc. Student. (JOSEPH OKOTH OGOLLAH, BPHARM)
-Defended successfully and passed (October 2015). MSc. awarded 2015
- 2014-2018:** **Jomo Kenyatta University of Agriculture and Technology,
P.O. Box 62,000 – 00200 NAIROBI, KENYA**
-Supervising 1 MSc. Student. (DANIEL MWITI -TM 304-2137/2014)
-Defended successfully and passed, October, 2018. MSc. Awarded 2019
- 2013-2014:** **Kenyatta University, P.O. Box 43844-00100, Nairobi, Kenya**
- Supervised 1 MSc. student (ALLAN JUMA ODEGI -56/CE/12915/2009.)
-Defended successfully and passed (December 2013). MSc. awarded.
- 2012 to 2014:** **Jomo Kenyatta University of Agriculture and Technology,
P.O. Box 62,000 – 00200 NAIROBI, KENYA**

- Supervising 1MSc student
- The MSc. student (LUCY WANJA KARANI-TM MSc)
- Defended successfully and passed (June 2014). **MSc. awarded.**

STAFF MENTORSHIP

2010 to date: As Section Head, Biological Sciences Unit, CTMDR-KEMRI and Head NAPREDA-KEMRI: -
Successfully mentored/mentoring the following members of staff: -

- i) Mr. Jeremiah Waweru - P/No. 21539 - Ass. Research Officer – Now Principal Research Officer
- ii) Ms. Ruth Nyangacha - P/No. 21903 - Ass. Research Officer – Now Research Officer.
- iii) Ms. Lillian Ngenyi – P/No. 21756 - Ass. Research Officer - Now Research Officer.
- iv) Mr. Nicholas Mwikwabe – P/No. 21864 – Ass. Research Officer, Now KEMRI Biosafety Officer.
- v) Mr. Gabriel Amalemba – P/No. 21636 – Ass. Research Officer-On going.
- vi) Ms. Cecilia Kimani – P/No. 21490 – Technologist – Completed Ph.D. in Japan
- vii) Mr. Enoch Moindi – P/No. 21822 –Technologist – Now Accountant.
- viii) Mr. Joseph Mutunga – P/No. 20021 – Technician
- ix) Mr. Nicholas Adipo – P/No. 21754 – Technician

PROFESSIONAL AFFILIATIONS/ACHIEVEMENTS **FELLOWSHIPS/RECOGNITIONS/WARDS**

2017 December: **Awarded the Distinguished Scientist and Leadership Award** by the KEMRI management and the Board.

2016 June to date: Member of the **Bioethics Society of Kenya (Membership No. 0022)**

2015 September: **Awarded the Distinguished Scientist Award** in the area of Natural Products Research by the Inter-Academy Medical Panel (IAMP) organized by the China Academy of Chinese Medical Sciences (CACMS) and Chinese Academy of Engineering (CAE) in Beijing, China.

2015 August to date: Member of the **African Society for Laboratory Medicine (ASLM)**

2014 December: **Awarded “The Nelson Gold Award (NGA)”** in recognition of outstanding research in Natural Products by the KEMRI management and Board.

2013 September: Marquis WHO is WHO in the world of Science.
 (Recognition for Scientific Contributions in the area of Natural Products Research).
 -Marquis Who’s Who Biographee, Thirtieth Edition, 2013. **VIP NUMBER: 36639219.** ISBN: 978-0-8379-1150-2, New York, USA.
customerservice@marquiswhoswho.com

2012 December: **KEMRI Long Service award** – 26 years of continuous service to the Institute by KEMRI management and Board.

2012 To Date: Member of the Science, Technology and Innovation (STI) for Development in Africa.

2012 September: Lead exhibitor at the KEMRI stand, the Nairobi International Trade Fair. Main show stopper-the Traditional Medicine and Drug Development Programme (TMDDP). KEMRI won the best Health Stand.

2011 February: Best oral presentation award - Traditional Medicine category, 1st KASH Conference, 2011.

2011 January: The African Scientific Institute, P.O Box 12161, Oakland, CA 94604, USA.
(www.asi-org.net; asi@quixnet.net)
-Inducted to the African Scientific Institute (ASI), as a Fellow.

PATENTS

2. Patent for: - “A novel Anti-Viral Plant Extract”.
Main Inventor: Dr. Festus M. Tolo
Patent application number: KE/P/06/00492
Date of application: 11th July, 2006
Status: Application confirmed by KIPI.
Patent ownership: KEMRI
1. Patent application for: - “A Kenyan herbal extract with anti-tumour effects”.
Main inventors: Dr. G.M. Rukunga and **Dr. F.M Tolo** of KEMRI in addition to a Japanese counterpart (Prof. Y. Eizuru).
Patent application number: KEMRI/RES/7/22/VOL.VI/298
Status: Confirmation pending.
Patent ownership: KEMRI

RESEARCH PROPOSALS/GRANTS AWARDED –CLOSED AND ONGOING

RESEARCH

28. Pre-Clinical Evaluation of the Antiviral Herbal Product “Zedupex” in combination with Kenyan Green Tea for management of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Infection and its Resulting Disease (COVID-19)
(The ZEDUPEX-TEA COVID-19 Study)
P.I: Dr. Festus M. Tolo
Approval Date: 4.6.2020
SSC Number: KEMRI/SERU/CTMDR/088/4015
Status: Ongoing
Grants awarded: KSh.10 Million by the GoK (IRG)
27. Documentation, pre-clinical evaluation and prototype development of natural products or in combinations with hydroxychloroquine for prevention and management of COVID-19.
(Version 3.0 dated 03 July 2020)
P.I: Dr. Peter Mwitari
CO-Investigator: Dr. Festus M. Tolo
Approval Date: 23.7.2020
SSC Number: KEMRI/SERU/CTMDR/091/4026
Status: Ongoing
Grants awarded: KSh.14 Million by the GoK (IRG)

26. Evaluation of some Kenyan medicinal plants for anti-sickling activity in induced mammalian sickle cells *in vitro* and formulation of a herbal product as a management therapy: The herb for sickle cell anemia (THESCA) study.
P.I: Dr. Festus M. Tolo
Approval Date: 1.12.2019
SSC Number: 2423 REV
Status: Ongoing
Grants awarded: KSh.5 Million by the GoK (IRG)

25. Evaluation of anti-cancer, anti-diabetic, phytochemical and safety properties of formulated herbal remedies being marketed in selected counties of Kenya.
P.I: Ms. Ruth Nyangacha
Co- Investigator: Dr. Festus M. Tolo
Approval Date: 2.01.2019
SSC Number: SSC
Status: Ongoing
Grants awarded: KSh.5 Million by the GoK (IRG)

24. Biomedical research on *Chrysanthemum cinerariaefolium* (pyrethrum) for management of tungiasis in Western Kenya, control of the *Leishmania major* vector *Phlebotomus duboscqi* and Nano-technology formulation of phytochemicals for use on bed nets.
P.I: Dr. Festus M. Tolo
Approval Date: 14.02.2018
SSC Number: Phase 11 (2669)
Status: Ongoing
Grants awarded: KSh.27 Million (proposed-waiting release) from the GoK

23. Pharm-Bio Technology and Traditional Medicine Centre (PHARMBIOTRAC). Africa Centers of Excellence Project (ACE):- ACE II MUST 44; 2016–2022. Mbarara University of Science & Technology, P. O. Box 1410, Mbarara, Uganda.
KEMRI P.I: Dr. Festus M. Tolo
Approval Date: 08th September 2016
Status: Ongoing
Grants awarded (KEMRI Activities): US\$188,000

22. Biomedical research on *Chrysanthemum cinerariaefolium* (pyrethrum) grown in Kenya for its safety and new insecticidal and antimicrobial applications
P.I: Dr. Festus M. Tolo
Approval Date: 8.02.2015
SSC Number: 2669
Status: Closed, June 2019.
Grants awarded: KSh.95 Million by the GoK.

21. The anti-asthmatic activity of extracts from two Kenyan medicinal plants *Synadenium grantii* Hook.f. and *Microglossa pyrifolia* (Lam.) Kuntze and their combined synergetic efficacy.
P.I: Dr. Festus M. Tolo
Approval Date: 7.10.2010
SSC Number: 1922
Status: Closed, 2015.

Grants awarded: KSh. 1,000,000.00 KEMRI IRG

20. Validating selected ethnomedicines used in Kenya with potential antimicrobial, analgesic and anti-inflammatory agents.
P.I: Dr. Festus M. Tolo
Approval Date: 11.12.2008
SSC Number: 1540
Status: Closed, 2011
Grants awarded: KSh.500,000.00 (Collaboration: KEMRI-UoN Kabete Campus).
19. A holistic assessment of malaria in Kirinyaga County: Evaluation of artemisinin based drug resistance, quality of the drugs, insecticide-treated nets and improvement of diagnosis
P.I: Dr. Jeremiah Gathirwa
Co-Investigator: Dr. Festus M. Tolo
Approval Date: October, 2016
SSC Number:
Status: Ongoing
Grants awarded: KSh. 5,000,000.00 by the GoK.
18. Synergistic effect of *Chrysanthemum cinerariaefolium* and *Solanum incanum* extracts and green synthesized nanoparticles against *tunga penetrans*.
P.I: Dr. Peter Mwitari
Co-Investigator: Dr. Festus M. Tolo
Approval Date: October, 2016
SSC Number:
Status: Ongoing
Grants awarded: KSh. 1,000,000.00 by the IRG (GoK).
17. The KEMRI/JICA Infectious Diseases Project. The Plant Drug Research Group for antiviral agents.
P.I: Dr. G.M. Rukunga (Deceased)
Group team leader: Dr. Festus M. Tolo
Approval Date: 1998
SSC Number: KEMRI/JICA IDP Project
Status: Closed, 2006.
Grants awarded: US \$ 500,000.00
16. The WHO/TDR-KEMRI Project ID A30707: An Investigation of Safety, Efficacy and Chemistry of Herbal Medicines used Traditionally for Treatment of Malaria.
P.I: Dr. G.M. Rukunga (Deceased)
Project Manager: Dr. Festus M. Tolo
Approval Date: 2004
SSC Number: 1205
WHO ID Number: TD A30707A
Status: Closed, 2014
Grants awarded: KSh. 14,286,931.05
15. Isolation and biological studies of anti-plasmodial compounds from selected plants used by Masasai community, Kenya.
P.I: Mr. Peter Kirira

- Co. Investigator: Dr. Festus M. Tolo**
Approval Date: 2006
SSC Number: 1101
Status: Closed, 2009
Grants awarded: \$10,000 Funded by International Foundation for Science (IFS).
14. A pre-clinical study on the safety, efficacy and chemistry of some Kenyan medicinal plants traditionally used for treatment of diabetes.
P.Is: Dr. Geoffrey M. Rukunga (Deceased)
Co. Investigator: Dr. Festus M. Tolo
Approval Date: 2008
SSC Number: 1145
Status: Closed, 2010.
Grants awarded: KSh. 2,500,000.00 Funded, NACOSTI,
13. Evaluation of Herbal Cough Formulations for Antitussive Activity
P.I: Dr. Jennifer Akinyi Orwa
Co. Investigator: Dr. Festus M. Tolo
Approval Date: SSC approved
SSC Number: Approved by CSC-CTMDR
Status: Closed, 2009
Grants awarded: KSh. 250,000.00 Funded by Universal Pharmaceuticals
12. Natural Products Innovation System: Establishing a National Nutraceuticals and Phytomedicines Development Pipeline
P.I: Dr. J. A. Orwa
Co. Investigator: Dr. Festus M. Tolo
Approval Date: June 2009
SSC Number: 1706
Status: Closed, 2011.
Grants awarded: KSh. 2,000,000.00 Funded by NACOSTI
11. Mitigation of toxicity linked to synthetic pesticides through alternative use of pyrethrins and other botanicals in managing insect-vectored tomato viral diseases. PhD. Study protocol nested in the main pyrethrum project SSC 2629.
Wagura Alice Gathoni (P300/2006/P/13)
Supervisors
Peter Githaiga Mwitari
Festus M. Tolo
10. *In vitro* and *in vivo* anti-viral activity of extracts from Kenya grown pyrethrum (*Chrysanthemum cinerariaefolium*). MSc. Study protocol nested in the main pyrethrum project SSC 2629.
Simon Alem Ogbamikael (TM 303-3930/2014)
Supervisors
Festus M. Tolo
A.O. Makokha
9. Evaluation of antibacterial and antifungal activity of *Chrysanthemum cinerariaefolium* (Pyrethrum). MSc. Study protocol nested in the main pyrethrum project SSC 2629.
Joseph Ouko (TM 302-2907/2014)

Supervisors

Christine Bii

Festus M. Tolo

8. Laboratory evaluation of anti-leishmanial activity of pyrethrin extracts of *Chrysanthemum cinerariaefolium* Trevir (Asterales: Asteraceae) plant. Study protocol nested in the main pyrethrum project SSC 2629.
Festus M. Tolo,
Peter Mwitari
Christopher Anjili
7. Evaluation of antiplasmodial activity of *Chrysanthemum cinerariaefolium* extracts, singly and in combination with chloroquine, lumefantrine and piperazine. Study protocol nested in the main pyrethrum project SSC 2629.
Principal investigators; Francis T. Kimani and Godfrey K. Wachira
Co-Investigators:
Festus Tolo, Jeremiah Waweru, Francis W. Muregi , Joseph Ng'ang'a, Joseph Mwatha2, Luna Kamau, Kimani Gachuhi, Beatrice Irungu, Charles Muthaura, Ruth Nyangacha and Elizabeth Kigundu.
6. Analysis of Levels of Pyrethrins in Soil and Drinking Water, in Pyrethrum Growing Areas in Kenya. Study protocol nested in the main pyrethrum project SSC 2629.
Elizabeth Mumbi
Festus M. Tolo
5. Evaluation of mosquito larvicidal and adulticidal efficacy of nanoformulated natural *Chrysanthemum cinerariaefolium* pyrethrin products. Study protocol nested in the main pyrethrum project SSC 2629
P.I: Dr. Jeremiah Gathirwa
Co-PI: Dr. Peter Mwitari; **Dr. Festus Tolo**
Co-Investigators
Dr. L. Kamau
Ms. Ruth Nyangacha
Dr. James Kuria
4. Laboratory evaluation on toxicological efficacy of essential oil leaf extracts from pyrethrum, eucalyptus and tobacco on *Anopheles gambiae* (giles) Mosquito larvae. PhD. Study protocol nested in the main pyrethrum project SSC 2629.
Glenn Onsomu Araka (TM-410-002/04)
Supervisors
John Ochora
Johnstone Wakhisi
Festus M. Tolo
3. The antimicrobial activity of *Chrysanthemum cinerariaefolium* (Pyrethrum) and its synergetic effects on diatomite and *Eucalyptus globulus*. MSc. Study protocol nested in the main pyrethrum project SSC 2629.
Supervisors
Andrew Nyerere
Festus M. Tolo
Tom Ouko

2. Evaluation of *Chrysanthemum cinerarifolium* (Trevir) (Asterales: Asteraceae) extracts for the control of phlebotomine sand flies in Marigat, Baringo County. Study protocol nested in the main pyrethrum project SSC 2629.
Principal Investigator: Milkah M. Mwangi
Co-Investigators
 Bernard O. Osero, Josyline Kaburi, Philip M. Ngumbi, Beatrice Irungu, Lucia Keter, Peter Mwitari, **Festus M. Tolo**
1. Laboratory evaluation of *Chrysanthemum cinerariaefolium* extracts for molluscicidal, cercericidal and miracidal activities. MSc. Study protocol nested in the main pyrethrum project SSC 2629.
Daniel Mwiti (TM 304-2137/2014)
Supervisors
 Joseph Mwatha
Festus M. Tolo

RESEARCH TEAMS ACTIVITY

| | Name of Research Team | Team Leader | Team members | Projects undertaken and output |
|---|---|--------------------|---|--|
| 1 | The Plant Drug Research Group of the KEMRI-JICA Project 1998-2006 | Dr. Festus M. Tolo | -Dr. G.M. Rukunga -Dr. Lucia Keter -Dr. Jeremiah Waweru -Mr. Charles Muthaura -Mr. Dalmus Odira -Ms. Margaret Muthoni -Ms. Gladys Nginya -Mr. Nashon Mwangi -Dr. Faith W. Muli, -Prof. Eliud N.M. Njagi, -Dr. Wilson Njue, -Dr. Kazuko Kumon, -Mr. Geoffrey M. Mungai, -Mr. Joseph M. Muli, -Dr. Esau Oishi, -Dr. M.W. Kofi-Tsekpo | The KEMRI/JICA Infectious Diseases Project. Medicinal plants for antiviral agents -2 publications -1 MSc. thesis |
| 2 | The Malaria | Dr. | -Dr. G.M. Rukunga | The WHO/TDR- |

| | | | | |
|---|--|--|---|---|
| | Research Group of the WHO-KEMRI project 2004-2014 | Geoffrey Rukunga Project Manager: Dr. Festus Tolo | -J W Gathirwa, -E N M Njagi, -S A Omar, -P G Mwitari, -A N Guantai, -C W Kimani, -C N Muthaura, -P G Kirira, -T N Ndunda, -F W Muregi, -C. Muthaura -G M Mungai, -W M Kofi-Tsekpo. | KEMRI Project ID A30707: An Investigation of Safety, Efficacy and Chemistry of Herbal Medicines used Traditionally for Treatment of Malaria Medicinal plants for management of malaria -6 publications |
| 3 | The pyrethrum research team under NAPREDA-KEMRI 2015-18 | Dr. Festus M. Tolo | -Dr. Peter G. Mwitari -Dr. Lucia Keter -Dr. Jeremiah Waweru, -Dr. James Kuria -Dr. Sabina Wachira -Dr. Luna Kamau -Dr. Kimani Gachuhi -Dr. Christine Bii -Dr. Joseph Mwatha Kuyu -Dr. Beatrice Irungu -Dr. Charles Muthaura -Ms. Ruth Nyangacha -Mr. Missiani Ochwato -Ms. Lillian Ngeny -Ms. Joyce Ondicho -Mr. Nicholas Mwikwabe -Dr. Elizabeth Kigundu -Mr. Tom Turbine Ouko -Mr. Richard Korir -Dr. Francis T. Kimani -Mr. Timothy K. Mutisya -Ms. Gladys Nginya -Ms. Loice Tonui -Mr. Nicholas Adipo, | Biomedical research on <i>Chrysanthemum cinerariaefolium</i> (pyrethrum) grown in Kenya for its safety and new insecticidal and antimicrobial applications -10 publications -7 MSc. Student thesis -1 Ph.D. Student thesis -An invention: Tungicide for management of tungiasis |
| 4 | The NAPREDA Research Team on Natural Products Research 2019 | Former Head of NAPREDA- Dr. Festus M. Tolo | Still recruiting | To develop joint proposals and seek funding |
| 5 | The ZEDUPEX-TEA COVID-19 Study) | Ag. DD-CTMDR Dr. Festus M. Tolo | Peter Mwitari, Ph.D. Beatrice Irungu, Ph.D., Lucia Keter, MPharm., Jeremiah Gathirwa, Ph.D., James Kuria, MVM., Ruth Nyangacha, MSc., Joyce Ondicho, MSc., Japheth Ng'etich, MSc., | Search for COVID-19 management therapy from natural products |

| | | | | |
|--|--|--|---|--|
| | | | Nicholas Adipo, Dip., MLT Nashon Mwangi, Dip., MLT Nahshon Muturi, Ph.D James Kimotho, Ph.D. Missiani Ochwoto, MSc. | |
|--|--|--|---|--|

RESEARCH PUBLICATIONS

2021

60. *Caroline J. Kosgei, Festus Tolo, Josphat C. Matasyoh, Meshack Obonyo, Peter Mwitari, Lucia Keter, Richard Korir and Beatrice Irungu.* Anti-bacterial activity of secondary metabolites from *Chrysanthemum cinerariaefolium*. **Journal of Medicinal Plants Research. Vol. 15(6), pp. 241-251, June, 2021. DOI: 10.5897/JMPR2019.6888. Article Number: 66054E866943**
59. *Caroline Jepchirchir Kosgei, Festus Tolo, Josphat Clement Matasyoh, Meshack Obonyo, Peter Mwitari, Lucia Keter, James Jorum Owuor, Moses Ollengo, Beatrice Irungu.* Synthesis of Silver Nanoparticles Using Dichloromethane-Methanol Flower Extract of *Chrysanthemum cinerariaefolium* and Its Antibacterial Activity. **American Journal of Nano Research and Applications. Vol. 9, No. 1, 2021, pp. 1-8. doi: 10.11648/j.nano.20210901.11**
58. *Sarah Atambo, Peter K. Njenga and Festus Tolo.* Anti-Malarial Activity and Toxicological Effect of Combined *Corymbia Citriodora*, *Maytenus Senegalensis* and *Warbugia Ugandensis* as Used in Traditional Medicine in Kenya. **Journal of Natural Sciences Research. ISSN 2224-3186 (Paper) ISSN 2225-0921 (Online) Vol.12, No.22, 2021. www.iiste.org**

2020

57. *Caroline J. Kosgei, Josphat C. Matasyoh, Meshack Obonyo, Festus Tolo, Peter Mwitari, Beatrice Irungu, Lucia Keter and Richard Korir* Anti-bacterial activity of secondary metabolites from *Chrysanthemum cinerariaefolium* **Journal of Medicinal Plants Research (ISSN: 1996-0875; DOI: 10.5897, Vol. XX (XX), 2020**

2019

56. *Elizabeth V. Mumbi Kigundu, Willie Njuguna, Phillip Ndemwa, Simon Mwangi, Peter G. Kirira, Lucia Keter, Peter G. Mwitari, Festus Tolo.* Pyrethrins In Soil and Water From Selected Pyrethrum Growing Areas In Nakuru County, Kenya. **African Journal of Health Sciences, Volume 32, Issue No. 2, 64 – 71, March - April 2019**
55. *Antony Omondi Radol, Michael Kiptoo, A. O. Makokha and Festus M. Tolo.* Determination of Antioxidant Value and Chemical Groups in Selected Medicinal Plants Used for Conditions Associated with Herpes Simplex and Herpes Zoster Infections in Kakamega County, Kenya. **Asian Journal of Biology 8(4): 1-10, 2019; Article no.AJOB.54049 ISSN: 2456-7124**
54. *Nkirote N. Judith, Francis K. Njonge, Gideon Mutie Kikuvu and Festus M. Tolo.* Determinants of *Moringa oleifera* utilization among HIV positive patients attending comprehensive care clinic at Migori County referral hospital, Kenya **Journal of Health, Medicine and Nursing. ISSN 2520-4025 (Online). Vol.4, Issue 6. No.1, pp 1- 16, 2019. www.iprjb.org**

53. Daniel Mwiti, Joseph Mwatha, **Festus Tolo**, Rebecca Waihenya, Geoffrey Maina, David Muriu, Rael Musili, Linus M Lewa, Murima Ng'ang'a.
Molluscicidal Activity of *Chrysanthemum Cinerariaefolium* Extracts Against Biomphalaria Pfeifferi Snails.
IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS)
e-ISSN:2278-3008, p-ISSN:2319-7676. Volume 14, Issue 1 Ser. IV (Jan – Feb 2019), PP 88-98. www.iosrjournals.Org
 52. **Festus M Tolo** and Charles N Muthaura
Natural products research: A potential source of innovative new drug discovery and development. Global Experts Meeting on Infectious Diseases & Endocrinology 2019.
Journal of Infectious Diseases & Therapy, 2019,
Volume7. DOI: 10.4172/2332-0877-C2-062
 51. **Festus M. TOLO** and Lucy Wanja
Herbal Medicine in Management of Non-Communicable Diseases: a follow up study on two Kenyan Medicinal Plants; *Synadenium grantii* and *Microglossa pyrifolia* under Evaluation for Bronchial Asthma.
Journal of Traditional Medicine & Clinical Naturopathy, 2018, Volume 7. DOI: 10.4172/2573-4555-C3-00
- 2018**
50. Glenn Onsomu Araka (TM-410-002/04-2018), John M. Ochora, Johnstone Wakhisi and **Festus M. Tolo**, 2018. PhD. Thesis:- “Laboratory evaluation on toxicological efficacy of essential oil leaf extracts from pyrethrum, eucalyptus and tobacco on *Anopheles gambiae* (giles) Mosquito larvae”.
Jomo Kenyatta University of Agriculture and Technology,
P.O. Box 62,000 – 00200 NAIROBI, KENYA
 49. Omondi Antony Radol (TM PhD), Michael Kiptoo, Anselimo O. Makokha and **Festus M. Tolo**, 2018. PhD. Thesis:- “Antiviral and antioxidant value of selected medicinal plants collected from Western Kenya”.
Jomo Kenyatta University of Agriculture and Technology,
P.O. Box 62,000 – 00200 NAIROBI, KENYA
 48. J. Ouko, C. Bii, T. Ouko, P. Mwitari, A. Nyerere, **F. Tolo** (2018).
Antimicrobial Activity of Crude Extracts of *Chrysanthemum cinerariaefolium* (Pyrethrum) Flowers from Nakuru and Bomet Counties, Kenya.
East African Journal of Health Sciences (In press)
 47. Christopher Anjili and **Festus M. Tolo** (2018).
Laboratory evaluation of anti-leishmanial activity of pyrethrin extracts of *Chrysanthemum cinerariaefolium* Trevir (Asterales: Asteraceae).
9th KASH Conference Book of proceedings. 2019. Page 184
 46. Godfrey K. Wachira, Francis W. Muregi, Francis T. Kimani, Jeremiah W. Gathirwa, Joseph K. Ng'ang'a, Peter G. Mwitari, **Festus M. Tolo**, Lucia Keter and Beatrice Irungu (2018). Evaluation of Antiplasmodial Activity and Safety of Flower Extracts of *Chrysanthemum cinerariaefolium*, singly and in Combination with Chloroquine, Lumefantrine and Piperazine.

**European Journal of Medicinal Plants. 22(2): 1-14, 2018; Article no.EJMP.39246
ISSN: 2231-0894, NLM ID: 101583475**

45. *Reuben Ruttoh, Bernard Osero, Johnston Ingonga, Mourine Kangogo, Amos Mbugua, Festus Tolo, Peter Mwitari and Christopher Anjili (2018). Immunological Response against Leishmaniamajor Parasites with Pyrethrum Extracts. Journal of Zoological Research Volume 2, Issue 1, 2018, PP 1-6*

2017

44. *Ruth Monyenye Nyangacha, David Odongo, Florence Oyieke, Missiani Ochwoto, Richard Korir, Ronald Kiprotich Ngetich, Gladys Nginya, Olipher Makwaga, Christine Bii4, Peter Mwitari, Festus Tolo (2017). Secondary bacterial infections and antibiotic resistance among tungiasis patients in Western. Kenya. PLoS Negl Trop Dis 11(9): e0005901. <https://doi.org/10.1371/journal.pntd.0005901>.*
43. *Festus M. Tolo, Rukunga M. Geoffrey, Lucia K. Keter, Jennifer Orwa, Kazuko Kumon and Masahiko Kurokawa. Zedupex, an Anti-herpes Herbal Medicine for Management of Human Herpes (2017). Exploring Traditional Medicine; Report of a Symposium. In IAP for Health a component of the InterAcademy Partnership Editors: P.F. McGrath and P. Tout. Published by: IAP for Health – a component of the InterAcademy Partnership. Page 206-217, 2017, Trieste, Italy.*
42. *J.K Musyoki, N Wachira, P.G Mwitari, F.M Tolo, J.M Kuria, N Adipo, C.N. Mutuku, J.N Mutunga. Use of Maerua Decumbens as a Natural Coagulant for Water Purification in the Dry Lands of Kenya. International Journal of Sciences, Volume 6 – January 2017 (01), DOI: 10.18483/ijSci.919; Online ISSN: 2305-3925; Print ISSN: 2410-4477*

2016

41. *Simon Alem, Festus M. Tolo, Nicholas Adipo, Peter G. Mwitari, Ngetich K. Japheth and Anselimo O. Makokha (2016). In vitro Anti-Herpes Simplex Type-1 Virus Evaluation of Extracts from Kenya Grown Pyrethrum (Chrysanthemum cinerariaefolium). European Journal of Medicinal Plants 17(2): 1-8, 2016; Article no.EJMP.28967 ISSN: 2231-0894, NLM ID: 101583475*
40. *Antony Omondi Radol, Michael Kiptoo, A. O. Makokha and Festus M. Tolo (2016). Types of Herbal Medicine Used for HIV Conditions in Vihiga County, Kenya. European Journal of Medicinal Plants 13(2): 1-23, 2016, Article no.EJMP.23180 ISSN: 2231-0894, NLM ID: 101583475*
39. *Antony Omondi Radol, Michael Kiptoo, A. O. Makokha and Festus M. Tolo. Cytotoxicity and Anti - Herpes Activity of Selected Medicinal Plants Cited for Management of HIV Conditions in Kakamega County – Kenya. British Journal of Pharmaceutical Research 13(5): 1-13, 2016, Article no.BJPR.29317 ISSN: 2231-2919, NLM ID: 101631759*
38. *Glenn O. Araka, Prof. John Ochoraz, Prof. Johnstone Wakhisi, Dr. Festus Tolo, Prof. B.O. Khwa-Otsyula. Larvicidal and Synergistic Activities of Crude Leaf Extracts of Pyrethrum (Chrysanthemum), Eucalyptus camaldulensis Sm. (Myrtaceae) and Nicotiana tabaccum (Tobacco) against the Larvae of the Malaria Vector Anopheles gambiae s.s. Giles (Diptera: Culicidae). International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Volume 5 Issue 4, April 2016. Pages 48-56*

37. Glenn O. Araka (M. Sc, Lead Researcher), John Ochora (PhD), Johnstone Wakhisi (PhD) **Dr. Festus Tolo (Ph.D.)**. Larvicidal Efficacy of Crude Essential Oil (Leaf Extracts) of Pyrethrum (*Chrysanthemum*: Compositae), *Eucalyptus camaldulensis* Sm (Myrtaceae) and *Nicotiana tabaccum* (Tobacco L.) (Solanaceae) against Third Instar Larvae of the Malaria Vector *Anopheles gambiae* s.s. Giles (Diptera: Culicidae). **International Journal of Science and Research (IJSR)** ISSN (Online): 2319-7064 Volume 5 Issue 3, March 2016. Pages 370-375
36. Glenn O. Araka (Msc, Lead Researcher), John Ochora (PhD), Johnstone Wakhisi (PhD), **Dr. Festus Tolo (PhD)**, B.O. Khwa-Otsyula. Larvicidal and Antagonistic Activities of Crude Leaf Extracts of Pyrethrum (*Chrysanthemum*: Compositae), *Eucalyptus camaldulensis* Sm. Myrtaceae, and *Nicotiana tabaccum* (Tobacco L.) (Solanaceae) Against Third Instar Larvae of the Malaria Vector, *Anopheles gambiae* s.s. Giles (Diptera: Culicidae). **International Journal of Science and Research (IJSR)**. ISSN (Online): 2319-7064 Volume 5 Issue 4, April 2016. Pages 789-795.
35. Ogbamikael Simon, **Tolo Festus M**, Makokha Anselimo O. Pre-Clinical anti-HSV-1 activity of aqueous and methanol extracts of Kenyan grown pyrethrum (*Chrysanthemum cinerariaefolium*). **Journal of Medicinal Plants Research** (Accepted May, 2016) JMPR/19.02.16/6078

2015

34. Grace Odongo, **Festus Tolo**, Fred Wamunyokoli, Joseph Mwatha. Effects of methanol and aqueous extracts of *Acacia xanthophloea*, *Strychnos heninningsii* and *Microglossa pyrifolia* on Immunoglobulin E using asthma induced mice model. **The Journal of Natural Sciences Research**. ISSN 2222-1719 (Paper) ISSN 2222-2863 (Online) Vol X, No.X, 2015 Pages 1-16.

2013

33. Lucia K. Keter, Nicholas M. Mwikwabe, Mathiu P. Mbaabu, Harihara M. Sudheer, **Festus M. Tolo**, Palu Dhanani, and Jennifer A. Orwa. Validation of Safety and Efficacy of Antitussive Herbal Formulations. **African Journal of Pharmacology and Therapeutics** Vol. 2 No. 1 Pages 26-31, 2013.
32. L. W. Karani, **F. M. Tolo**, S. M. Karanja and C. W. Khayeka. Safety and Efficacy of *Prunus africana* and *Warburgia ugandensis* in asthma treatment. **South African Journal of Botany**. 88 (2013): 183-190.
31. **F. M. Tolo**, L Keter, G M Mungai. TMR5 (Zedupex™) as a Management Therapy for Herpes Infections: Results of Preclinical Evaluations. **Sexually Transmitted Infections**. July 2013 Vol 89 (Suppl 1):A1–A428.
30. L. W. Karani, **F. M. Tolo**, S. M. Karanja and C. W. Khayeka. Safety and Efficacy of *Prunus africana* and *Warburgia ugandensis* Against Induced Asthma in BALB/c Mice. **European Journal of Medicinal Plants**. 3(3): 345-368, 2013.
29. **Tolo, F.M. (Article contribution)**
The Role of Traditional Medicine in Public Health
The KEMRI Bioethics Review. ADILI - The KEMRI Bioethics Center, P.O. Box 54840-00200, Nairobi, Kenya. Volume 3, Issue 2, 2013.

28. Lucia K. Keter, Ingrid Wekesa, **Festus Tolo** , Zacharia Mwaghadi , Peter Mwitari, Sylvia Murunga, Robert Karanja, Benjamin Gituku , Wesley Ronoh , Phyllis Ngunjiri , and Jennifer A. Orwa. Development of a nutraceutical from natural products: A case study of a herbal-based low sodium table salt.

African Journal of Pharmacology and Therapeutics. Vol. 2 No. 1 Pages 9-16, 2013.

2012

27. **Tolo, F.M. (Article contribution)**

Traditional Medicine in Healthcare: The concerns of Safety, Efficacy and Regulation.

The KEMRI Bioethics Review.

ADILI - The KEMRI Bioethics Center, P.O. Box 54840-00200, Nairobi, Kenya. Volume 2 Issue 4, October-December, 2012: pp 6-10

26. **Tolo, F.M., Rukunga, G.M., Ochora, J., Muthaura, C. N, Kimani, C.W., Orwa, J. and Mungai, G.M.**

The efficacy of a herbal cream (TMR5) for primary and latent HSV infection in guinea pigs.

National Council for Science and Technology. Book of conference proceedings, 2012.

2011

25. **Tolo, F.M. (Article contribution)**

Ethnomedicine: The role of medicinal plants in health care.

The Workplace, A Public Sector HIV and AIDS Newsletter.

Ministry of State for Public Service, Harambee House, Harambee Avenue, P.O. Box 30050-00100, Nairobi, Kenya. July 2011: pp 6-8.

2010

24. **F. M. Tolo, G. M. Rukunga, F. W. Muli, J. M. Ochora, B. N. Irungu, C. N. Muthaura, C. K. Wanjiku, G. M. Mungai, Quang Ngoc, K. Hashimoto and Y. Asakawa.**

The antiviral activity of compounds isolated from Kenyan *Carissa edulis* (Forssk.) Vahl

Journal of Medicinal Plants Research Vol. 4(15), pp. 1517-1522, 4 August, 2010

2009

23. **Tolo, F. M., Rukunga, G.M, Muli, F.W., Ochora, J.M., Irungu, B.N., Muthaura, C.N., Wanjiku, C.K., Mungai, G.M., Quang, Ngoc., Hashimoto, K. and Asakawa, Y.**

The antiviral activity of compounds isolated from Kenyan *Carissa edulis* (Forssk.) Vahl., preliminary results.

The Internet Journal of Alternative Medicine. 2009 Volume 8 Number 1

2008

22. **Tolo, F.M., Rukunga, G.M., Ochora, J., Muli, F.W., Eizuru, Y., Muthaura, C. N, Kimani, C.W. and Mungai, G.M.**

In vitro anti-viral effect of Kenyan *Acacia mellifera* (Vahl) Benth against human Cytomegalovirus.

The East African Journal of Botany. 1(2): 115-124 (2008)

21. **J W Gathirwa, G M Rukunga, E N M Njagi, S A Omar, P G Mwitari, A N Guantai, F M Tolo, C W Kimani, C N Muthaura, P G Kirira, T N Ndunda, G**

The in vitro anti-plasmodial and in vivo anti-malarial efficacy of combinations of some medicinal plants used traditionally for treatment of malaria by the Meru community in Kenya.

Journal of Ethnopharmacology (Impact Factor: 2.76). 01/2008; 115(2):223-31

20. *G M Rukunga, F W Muregi, F M Tolo, S A Omar, P Mwitari, C N Muthaura, F Omlin, W Lwande, A Hassanali, J Githure, F W Iraqi, G M Mungai, W Kraus, W M Kofi-Tsekpo.* The antiplasmodial activity of spermine alkaloids isolated from *Albizia gummifera*. **Fitoterapia (Impact Factor: 2.23). 01/2008; 78(7-8):455-9.**

2007

19. **Tolo, F.M.** The antiviral activities of some Kenyan Medicinal Plants against *Herpes simplex viruses* and *Human cytomegalovirus*. **A thesis submitted in partial fulfillment for the award of Doctor of Philosophy in Medicinal Phytochemistry (Virology option) of Jomo Kenyatta University of Agriculture and Technology, July, 2007.**
18. *C N Muthaura , G M Rukunga , S C Chhabra , S A Omar , A N Guantai , J W Gathirwa , F M Tolo , P G Mwitari , L K Keter , P G Kirira , C W Kimani , G M Mungai , E N M Njagi.* Antimalarial activity of some plants traditionally used in Meru district of Kenya. **Phytotherapy Research. 2007. 21(9):860-7.**
17. *C.N. Muthaura, G.M. Rukunga, S.C. Chhabra, S.A. Omar, A.N. Guantai, J.W. Gathirwa, F.M. Tolo, P.G. Mwitari, L. K. Keter, P.G. Kirira, C.W. Kimani, G.M. Mungai, E.N.M. Njagi.* Antimalarial activity of some plants traditionally used in treatment of malaria in Kwale district of Kenya. **Journal of Ethnopharmacology. doi:10.1016/j.jep.2007.05.002**
16. *James W. Gathirwa, Geoffrey M. Rukunga, Eliud N. M. Njagi, Sabah A. Omar, Anastasia N. Guantai, Charles N. Muthaura, Peter G. Mwitari. Cecilia W. Kimani, Peter G. Kirira, Festus M. Tolo, Teresia N. Ndunda, Isaiah O. Ndiege.* In vitro anti-plasmodial and in vivo anti-malarial activity of some plants traditionally used for the treatment of malaria by the Meru community in Kenya. **Journal of Natural Products. DOI 10.1007/s11418-007-0140-0**
15. **Tolo, F.M., Rukunga, G.M., Muli, F.W., Ochora, J., Eizuru, Y., Ukon, T., Muthaura, C. N, Cicilia, K., and Mungai, G.M.** The anti-viral activities of Kenyan *Carissa edulis*, *Prunus africana* and *Melia azedarach* total aqueous extracts against Human Cytomegalovirus infection *in vitro*. **Africa Journal of Health Sciences. 2007: 14(3-4):143-148**
14. *Tsugiya Murayama, Yoshito Eizuru, Rie Yamada, Hidetaka Sadanri, Keiko Matsubara, Geoffrey Rukunga, Festus M. Tolo. Geoffrey M. Mungai and Mawuli Kofi-Tsekpo, (2007).* Anticytomegalovirus activity of pristimerin, a triterpenoid quinine methide isolated from *Maytenus heterophylla* (Eckl. & Zeyh.). **Antiviral Chemistry & Chemotherapy. 18: 133-139.**
13. **Tolo, F.M., Rukunga, G.M., Muli, F.W, Ochora, J., Kurokawa, M., Orwa, J., Mungai, G.M., Muthaura, C.N., Wanjiku, C.K. and Kofi-Tsekpo, M.W.** Antiviral formulations from Kenyan medicinal plants with activity against herpes simplex virus infection in mice. **East African Journal of Botany. 2007. 1(1): 33-45.**

2006

12. **Festus M. Tolo, Geoffrey M. Rukunga, Faith W. Muli, Eliud N.M. Njagi, Wilson Njue, Kazuko Kumon, Geoffrey M. Mungai, Charles N. Muthaura,**

Joseph M. Muli, Lucia K. Keter, Esau Oishi, Mawuli W. Kofi-Tsekpo.
Anti-viral activity of the extracts of a Kenyan medicinal plant *Carissa edulis* against herpes simplex virus.
Journal of Ethnopharmacology. 2006: 104: 92-99

11. **Tolo, F.M., Rukunga, G.M., Muli, F. W., Ochora, J., Muthaura, C.N., Mungai, G.M. and Kofi-Tsekpo, M.W.**
The anti-viral effect of three Kenyan medicinal plant extracts; *Acacia mellifera*, *Melia azedarach* and *Prunus africana*, against herpes simplex virus type 1 infection in mice.
Journal of Tropical Microbiology 2006: 2 (1):3-9

10. **P.G. Kirira, G.M. Rukunga, A.W. Wanyonyi, F.M. Muregi, J.W. Gathirwa, C.N. Muthaura, S.A. Omar, F. Tolo, G.M. Mungai and I.O. Ndiege.**
Anti-plasmodial activity and toxicity of extracts of plants used in traditional malaria therapy in Meru and Kilifi Districts of Kenya
Journal of Ethnopharmacology. 106 (2006) 403–407

2003

9. **Fotie, J., Nkengfack, A.E., Rukunga, G., Tolo, F.M., Peter, G., Heydenreich, M., Fomum, Z.T. (2003).**
In vivo antimalarial activity of some oxygenated xanthenes.
Annals Tropical Medicine and Parasitology. 2003: 97(7):683-8.

2002

8. **Festus M. Tolo, Geoffrey M Rukunga, Faith W. Muli, Eliud N.M. Njagi, Wilson Njue, W.M. Kofi-Tsekpo, Masahiko Kurokawa, Geoffrey M Mungai, Peter M Tukey and Kimiyasu Shiraki, (2002).**
Efficacy of some medicinal plants against herpes simplex virus type 1 (HSV-1) in a murine HSV infection model.
Proceedings of the 23rd African Health sciences Congress, 22nd – 26th April, 2002, Makerere University Medical School, Kampala, Uganda. Paper 81:44.
7. **Festus M. Tolo, Geoffrey M Rukunga, Faith W. Muli, Eliud N.M. Njagi, Wilson Njue, W.M. Kofi-Tsekpo, Masahiko Kurokawa, Geoffrey M Mungai, Joseph M. Muli, Lucia K. Keter and Kimiyasu Shiraki, (2002).**
An extract from a Kenyan Medicinal plant with activity against acyclovir-resistant herpes simplex virus type 1.
Proceedings of the 23rd African Health sciences Congress, 22nd – 26th April, 2002, Makerere University Medical School, Kampala, Uganda. Paper 82:44.
6. **Mururi, Festus Tolo, (2002).**
A herbal remedy for herpes simplex virus infection.
A thesis submitted in partial fulfillment for the award of Master of Science in Infection Diagnosis of Kenyatta University.
5. **Geoffrey M Rukunga, Mawuli W Kofi-Tsekpo, Masahiko Kurokawa, Seiji Kageyama, Geoffrey M Mungai, Joseph M Muli, Festus M Tolo, Rukia M Kibaya James N Kanyara, Peter M Tukey and Kimiyasu Shiraki (2002).**
Evaluation of HIV-1 reverse transcriptase inhibitory properties of extracts from some medicinal plants in Kenya.
African Journal of Health Sciences, 2002. ISSN 1022-9272 Volume 9 No. 1-2 (Issue No. 20). Pages 81 to 90.

2001

4. Mawuli W Kofi-Tsekpo, Geoffrey M Rukunga, Masahiko Kurokawa, Seiji Kageyama, Geoffrey M Mungai, Joseph M Muli, **Festus M Tolo**, Rukia M Kibaya, Geoffrey M Mungai, James N Kanyara, Peter M Tukey and Kimiyasu Shiraki (2001).

An in vitro evaluation of extracts from some medicinal plants in Kenya against herpes simplex virus.

African Journal of Health Sciences, 2001. ISSN 1022-9272 Volume 8 No. 1-2 (Issue No. 19). Pages 61 to 69.

1999

3. A.M Kiyua, W.M. Kofi-Tsekpo, **F.M. Tolo**, G.N. Kamau, I.O. Jamba and A.H.S. El-Busaidy (1999).

Essential trace element analysis of traditional medicines used in anticonvulsant therapy.

New Aspects of Trace Element Research. 1999. 55: 235-240.

1989

2. W.M Kofi-Tsekpo, G.M Rukunga, J.A Aluoch, B. Khan, P.G Waiyaki, **F.M Tolo** and Ngugi Muthotho (1989).

A preliminary investigation of a Traditional Medicine KRM913 as a potential antimalarial and antiparasitic agent.

Proceedings of the 10th. Annual Scientific Conference, Nairobi, Kenya.

Paper 03/89 pages 25 to 28.

1986

1. **F.M Tolo, (1986).** Level and type of microbial contamination of some Traditional Medicines and their potential anti-microbial activity.

A project submitted in partial fulfillment for the award of the Higher National Diploma (BSc. Eq.) in Applied Science of the Technical University of Kenya, Nairobi, Kenya.

BOOKS/BOOKCHAPTERS AND ARTICLE CONTRIBUTIONS IN NEWSLETTERS FOR THE LAST 7 YEARS

| | Author | Year | Title | ISBN/ISSN Reference No. |
|---|--------------------|------|---|--|
| 1 | Festus M. Tolo | 2019 | Sodium metabisulphite: The facts you need to know | KEMRI Newsletter (<i>In press</i>) |
| 2 | Festus M. Tolo | 2016 | Intellectual Property Rights in Traditional Medicine | KEMRI Bioethics Review/ Vol VI Issue II 2016. Page 5-9. The KEMRI Bioethics Center, P.O. Box 54840-00200, Nairobi, |
| 3 | Tolo, F.M. | 2013 | The Role of Traditional Medicine in Public Health The KEMRI Bioethics Review. | KEMRI Bioethics Review/ Volume 3, Issue 2, 2013. Page 7-8. The KEMRI Bioethics Center, P.O. Box 54840-00200, Nairobi, |
| 4 | Dr. Festus M. Tolo | 2012 | Traditional Medicine in Healthcare: The concerns of Safety, Efficacy and Regulation | KEMRI Bioethics Review/ Volume 2 Issue 4. Page 6-10. The KEMRI Bioethics Center, P.O. Box 54840-00200, Nairobi, |

MAJOR CONFERENCES/WORKSHOP ATTENDANCE LAST 10 YEARS

| | Author | Year | Title of presentation | Conference Proceedings (ISBN) |
|----|-----------------------|------|--|--|
| 21 | Festus M. TOLO | 2022 | Guest Speaker, TICAD8 side event: Presentation:-Traditional Medicine in Africa & Medical issues on Infectious disease: The Kenyan case and the Eastern Africa Region in General | 8 th Tokyo International Conference for African Development (TICAD8) official Side Event. Health-Related Quality of Life and Well-being by Drug Development and African Traditional Medicines September 20 th , 2022, From 16:00 - 18:00 (Japanese time), Tokyo, JAPAN |
| 20 | Festus M. TOLO | 2022 | Guest Speaker, ABS High-Level Forum: Presentation:-Role of research and development in commercialization of intellectual property from indigenous knowledge and genetic resources: Case studies including COVID-19 initiatives | Kenya's journey towards unlocking a new subsector of the economy: High-level forum on Access and Benefit Sharing (ABS) arising from sustainable utilization of indigenous knowledge and genetic resources. 30 th January – 4 th February 2022, Mombasa, Kenya. |
| 19 | Festus M. TOLO | 2021 | Guest Speaker for the African Union: Presentation:- Regulations and integration of Traditional Medicine in the Public Health Care system in the 21st; its uses in the era of COVID-19 in Africa | Webinar on Traditional Medicine 27 th May 2021- The Commission for Education, Science, Technology and Innovation, ESTI-AUC, Africa Union (AU) |
| 18 | Festus M. TOLO | 2019 | Invited as a keynote speaker. Presentation:- "Traditional Medicine in Healthcare: The concerns of Safety, Efficacy and Regulation in Kenya" | International Conference on Traditional Medicine and Ethnomedical Research held in October 24-25, 2019 in Tokyo, Japan |
| 17 | Festus M. TOLO | 2019 | Invited as a keynote speaker. Presentation:-"Natural Products Research: A potential source of innovative new drug discovery and development" | 2nd Global Experts Meeting on Infectious Diseases held in February 27th -28th in Tokyo, Japan |
| 16 | Festus M. TOLO | 2019 | NAPREDA Symposium at KASH conference: Leveraging and strengthening Natural Products/Traditional Medicine research for Universal Health | The 9th KASH Conference, 13th to 15th Feb., 2019. Safari Park Hotel, Nairobi, Kenya. |

| | | | | |
|----|--|------|--|--|
| | | | Coverage in Kenya | |
| 15 | Festus M. TOLO | 2018 | Invited as Keynote speaker: Herbal and Traditional Medicine in Universal Health Coverage | First PAN African International Research Congress organized by Masinde Muliro University of Science and technology. 17 th to 21 st June, 2019. Grand Royal Swiss Hotel, Kisumu, Kenya. |
| 14 | Festus M. TOLO | 2018 | Herbal medicines in management of asthma: Results of preclinical evaluations of preparations from Kenyan medicinal plants | International workshop On Drugs Development from Herbs and Marine Medicinal Materials. From 10-12 December 2018 Hai phong, Vietnam |
| 13 | Festus M. TOLO | 2018 | The anti-plasmodial activity of <i>Carissa edulis</i> and its constituent phytochemicals. Festus M. TOLO B147 | 7th MIM Pan African Malaria Conference 2018, 15th April to 20th April 2018, Dakar, SENEGAL. |
| 12 | Festus M. TOLO | 2018 | Natural products research in drug development: The role of herbal/traditional medicine in management of NTDs and NCDs | NAPREDA Symposium at the 8 th KEMRI Annual Scientific and Health Conference, February, 2018, Nairobi, Kenya. |
| 11 | Festus M. TOLO, Jennifer Orwa and Charles N. Muthaura | 2017 | The antiviral activity of extracts of <i>Chrysanthemum cinerariaefolium</i> (Pyrethrum) grown in Kenya against Herpes simplex virus | 3 rd Global Conference on Virology. August 21 st to 23 rd , 2017, Barcelona, Spain. |
| 10 | Festus M. TOLO | 2017 | Biomedical research on pyrethrum grown in Kenya for its safety and new insecticidal and antimicrobial applications | NAPREDA Symposium at the 6 th Annual East African Health & Scientific Conference & International Health Exhibition & Trade Fair. Bujumbura, Burundi |
| 9 | Festus M. TOLO Simon Alem, Mwitari, P., Anselimo O. Makokha | 2016 | The antiviral activity of extracts of <i>Chrysanthemum cinerariaefolium</i> (Pyrethrum) grown in Kenya | 2 nd Global Conference on Virology & Vaccines. November 14-16, 2016 at Kuala Lumpur, Malaysia |
| 8 | Festus M. TOLO | 2016 | Invited as Keynote speaker: Complementary and alternative medicine (CAM): Traditional/Herbal Medicine Research and the KEMRI experience | The Masinde Muliro University of Science and Technology (MMUST) International Conference Presentation, Kakamega, May, 2016 |

| | | | | |
|---|---|------|--|--|
| 7 | Festus M. TOLO, Lucy Wanja | 2015 | Herbal Medicines in Management of Asthma: Results of Preclinical Evaluations of Preparations from Kenyan Medicinal Plants Oral B043: | 5 th Annual East African Health & Scientific Conference & International Health Exhibition & Trade Fair. 25TH - 27TH MARCH, 2015 Commonwealth Speke Resort Hotel & Conference Centre, Munyonyo, Kampala, UGANDA. |
| 6 | Festus M. TOLO | 2015 | Zedupex, an anti-herpes herbal medicine for management of human herpes: A KEMRI researched product registered as CAM035/CAM036 by the Pharmacy and Poisons Board of Kenya. | Inter Academy Medical Panel (IAMP) Symposium "Exploring Traditional Medicine" on 23 – 24 September 2015 in Beijing, China. |
| 5 | Festus M. TOLO | 2014 | Contribution of Traditional Medicine in health care towards vision 2030: Its role in the management of Non-Communicable and Neglected Diseases | The 4 th KASH Conference and Traditional Medicine Symposium, 5th to 7th Feb., 2014. KEMRI headquarters, Nairobi, Kenya. |
| 4 | Festus M. TOLO and Jeremiah WAWERU | 2013 | The anti-plasmodial activity of a Kenyan medicinal plant, <i>Carissa edulis</i> and its constituent phytochemicals | The 6th MIM Pan-African Malaria Conference. "Moving towards malaria elimination: Investing in research and control", 6th - 11th October 2013. The International Convention Centre, Durban, South Africa. |
| 3 | F. M Tolo, L Keter, G M Mungai. | 2013 | TMR5 (Zedupex™) as a Management Therapy for Herpes Infections: Results of Preclinical Evaluations. | The STI & AIDS World Congress Vienna 2013(Joint Meeting of the 20th ISSTD and 14th IUSTI Meeting), July 14 to 17, 2013, in Vienna, Austria. Abstract P2.180 |
| 2 | Festus M. TOLO, Jennifer Orwa, Charles N. Muthaura, Lucia Keter and Geoffrey M. Mungai | 2013 | "TMR5 (Zedupex™) as a management therapy for herpes infections: Results of preclinical evaluations" | 4 th East African Health & Scientific Conference, Kigali, Rwanda, March 27-29, 2013 |
| 1 | Karani L.W., Tolo F. M, Karanja S.M and Khayeka C.W | 2013 | The <i>in vitro</i> and <i>in vivo</i> toxicity profiles of extracts from Kenyan <i>Prunus africana</i> and <i>Warburgia ugandensis</i> in mammalian cell | The KEMRI Annual Scientific and Health Conference book of abstracts, February, 2013. Abstract 66, pp61 |

| | | | | |
|--|--|--|------------------------|--|
| | | | lines and mouse model. | |
|--|--|--|------------------------|--|

EXTRACURRICULAR ACTIVITIES

1. Member of Board, Ebukuti Primary School, Butere from 2017 to date.
2. Treasurer, KEMRI staff welfare association from 2004 to 2015.
3. St. Mark, Matora Church, Ebukiti. Church elder to date.


CURRENT RESEARCH INTERESTS

1. Evaluation of biological activity/efficacy of plant extracts/compounds for different microorganisms (antiviral and antibacterial/fungal activity).
2. Safety studies of plant extracts/compounds in both *in vitro* and *in vivo* environments (cytotoxicity and acute toxicity).
3. Evaluation of herbal medicines for management of Non-Communicable Diseases (NCDs) and Neglected Tropical Diseases (NTDs).
3. Conservation of medicinal plants.
4. Development of a medicinal plants database.
5. Identification of management therapies for COVID-19 disease from natural products.

REFEREE

1. PROF. JOHN MEMBA OCHORA: Professor of Botany,
Jomo Kenyatta University of Agriculture and Technology,
P. O. Box 62000-00200; Nairobi, Kenya.
E-mail: jmemba@yahoo.com
Cell number: +254-0722-860-934/+254-0729560299
Landline TEL. 067-52181-4, 52711; FAX: 067-52197
2. PROF. MWANGI JULIUS W: Professor of Pharmacology and Pharmacognosy,
University of Nairobi, School of Pharmacy, College of Health Sciences,
P.O. Box 19676 00202, Nairobi, Kenya.
Email: julius.mwangi@uonbi.ac.ke
juliusmupal@gmail.com
Cell Number: +254722825966

Sign:



Festus M. Tolo

Date: 1st October 2022