



Dr. Richard M. Musau
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B.Ed. (Sc) University of Nairobi
M.Sc. University of Nairobi
Ph.D University of Manchester Institute of Science and Technology (UK)

Areas of Research/Interests:

- Synthesis of Furan-Based Bifunctional and Macrocyclic Molecules
- Calixarenes
- Identification of Biologically active principles of East African Medicinal Plants
- Biofuels.

Teaching Organic Chemistry to Undergraduate and Postgraduate students

Conferences, Workshops and Seminars:

- Teaching: Symposia and Seminars organized by ICI and the Royal Society of Chemistry in U.K. (1991-1994)
- NAPRECA – Kenya, 2001
- Kenya Chemical Society Conference, 2005
- The Kenya DAAD Scholars Association Conference, 2005
- Kenya Chemical Society Workshop, 2008
- Management of University Departments/Schools/Directorates course, 2009
- Kenya Chemical Society Workshop, 2009
- Omolo M.O., Njiru B., Musau R.M., Ndiege I.O., Njagi P., Hassanali A.(2005). What in Smelly Feet Turns on Mosquitoes? In: **Proceedings of Gordon Research Conference on Malaria**, Gordon Research Centre, August 22nd-26th.
- Pan African Chemistry Network Sustainable Water Conference, University of Nairobi, 2009.

Membership:

- University of Nairobi Alumni Association
- Manchester University Alumni
- Kenyatta University Alumni
- Kenya Chemical Society

Awards:

- (i) 1983: Awarded Kenyatta University College Postgraduate Scholarship to study for M.Sc. at the University of Nairobi.
- (ii) 1985: Awarded a DAAD scholarship during M.Sc. studies at the University of Nairobi.
- (iii) 1991: Awarded a British Council Scholarship to Study Ph.D in Chemistry at the University of Manchester Institute of Science and Technology, U.K.
- (iv) 2008: Vice-Chancellor's Research Award (together with 2 other members of staff).

Publications:

- (i) R.M. Musau and R.M. Munavu, "The Preparation of 5-Hydroxymethyl-2-Furaldehyde (HMF) from D-Fructose in the Presence of DMSO". *Biomass*, 13 (1987) 67-74.
- (ii) R.M. Musau and R.M. Munavu, "The Conversion of 2-Furaldehyde into Some Potentially Useful Bifunctional Derivatives". *Biomass*, 23 (1990) 275-287.
- (iii) R.M. Musau and A. Whiting, "Synthesis of Calixfuran macrocycles and Evidence for Gas-Phase Ammonium Ion complexation". *J. Chem. SOC. Perkin Trans. 1* (1994) 2881-2888.
- (iv) R.M. Musau and A. Whiting, "The Synthesis of Furan-derived Calixarenes" *J. Chem. Soc. Chemical Communications* (1993) 1029-1031.
- (v) W. Njue, M.M. Njuguna and R.M. Musau, "Determination of

Aflatoxins in Alcohol Beverages and their Raw Materials using Thin Layer Chromatography" Int. J. BioChemPhys. 8 (1 & 2) (1999) 39-43.

- (vi) W. Njue, M.M. Njuguna and R.M. Musau, "Determination of Volatile Impurities in Alcohol Beverages Using Gas-Liquid Chromatography", Int. J. BioChemPhys. 8 (1 & 2) (1999) 44-47.
- (vii) F. Billo, R.M. Musau and A. Whiting, "Approaches to Polymetallated Calixarene Derivatives", ARKIVOC (2006), 199-210.
- (viii) R.M. Musau, "Preparation of Bifunctional Derivatives of 2 – Furaldehyde and 5 – Hydroxymethyl – 2 – Furaldehyde (HMF)", 1988 (M.Sc. Thesis).
- (ix) R.M. Musau, "The Synthesis of Furan – Based Macrocycles", 1994 (Ph.D Thesis).

Modules

- **SCH 102: Organic Chemistry I**

S.C. Chhabra and R.M. Musau
Institute of Open Learning, 2004, Kenyatta University, Nairobi, Kenya

- **SCH 303: Stereochemistry, Conformational Studies and Reaction Mechanisms**

R.M. Musau and S. Swaleh
Institute of Open Learning, 2007, Kenyatta University, Nairobi, Kenya

- **SCH 311: Organic Spectroscopy**

S.C. Chhabra and R.M. Musau
Institute of Open Learning, 2005, Kenyatta University, Nairobi, Kenya

Internal Examiner for the following:

- (a) Mr. L.M. Gitu, M.Sc. thesis title, "Analysis of Mycotoxins in Food in Nairobi and It's Surroundings" (1996).

- (b) Mr. G.N. Wanyoike, M.Sc. thesis title, “Antimalarial Screening and Chemical Studies of Some Plants Used in Traditional Medicine in Kenya” (2000).
- (c) Mr. S.S. Barasa, M.Sc. thesis title, “Stereoselective Synthesis and Stereostructure – Activity Studies of *p* – Menthane – 3, 8 – diols Against *Anopheles* sp” (2000).
- (d) Mr. E.K. Korir, M.Sc. thesis title, “Phytochemical Investigation of Larvicidal Activity of *Toddalia Asiatica* and *Ekebergia Capensis* Against *Anopheles Gambie*” (2002).
- (e) Ms. A.W. Wagutu, M.Sc. thesis title, “Oil Plants as Sources for Production of Fatty Acid Methyl Esters (Biodiesel) in Kenya”. (2010).
- (f) Mr. J.W. Mwenda, M.Sc. thesis title, “Selective Monobenzoylation of 1,2-Diols in Water”. (2011).

External Examiner for Mr. G.M. Mahanga, M.Sc. title, “Synthesis and Structural Activity Relationship of 2 – Hydroxy – 5 – Methoxybenzaldehydes as Mosquito Larvicides” (2003).

External Examiner, Mombasa Polytechnic University College, 2009 to date.

- (xi) Supervisor of the following:
 - (a) M.M. Njuguna, M.Sc. title, “Determination of Aflatoxins and Volatile Impurities in Alcohol Beverages and Their Raw Materials” (1999) – Graduated.
 - (b) M.Rono, M.Sc. title, “Bio-Prospecting for Anti-Leishmanial Compounds from Medicinal Plants Used in Baringo District of Kenya”, 2005).
 - (c) M.P. Wafula, M.Sc. title, “Variations in Chemical Composition and Mosquito Repellent Efficacy of Essential Oil of *Conyza Newii* from Different Regions of Kenya” (2006).
 - (d) F.W. Sawenja, M.Sc. (2006) – not yet graduated.
 - (e) M.O. Omolo, Ph.D title, “Isolation, Identification and Synthesis of Behaviourially Active Semiochemicals form Human Foot Odour for African Malaria Vectors” (2005).

- (f) T.S. Kippsy, M.Sc. title “Isolation, Screening and Structure Elucidation of Metabolites for Antimicrobial and Antifungal Activities of the Plants, *Crotalaria Quartiniana* and *Erythrina Melanacantha*”, (2008). On-going.

- (g) J.M. Kaindo, Ph.D. title, “ Synthesis of Multifunctional Additives from (R)-1-Methyl-4-(1-Methylethenyl)cyclohexene and Their Effects on Biofuel Properties of *Jatropha Curcas* and Algae Ethyl Ester Blends” , (2011). On-going.