



Machocho, Alex King'ori (PhD)

PERSONAL INFORMATION

Date of Birth: 10th April, 1961
Nationality: Kenyan (ID No. 5170136)

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QUALIFICATIONS

- PhD (Chemistry) University of Barcelona, Natural Product Chemistry (1996-2000)
- MSc (Chemistry) Kenyatta University, Natural Product Chemistry (1990-1992)
- BEd (Science) University of Nairobi, Upper 2nd Class Honours (1981-1985)

CAREER

- Senior Lecturer: Kenyatta University, July 2003 – Present
- Lecturer: Kenyatta University, Jan. 1996 – July 2003
- Tutorial Fellow: Kenyatta University, July 1992 – Dec. 1995
- Graduate Assistant: Kenyatta University, Jan. 1990 - June 1992
- College Tutor: Laikipia Teachers College, Jan. 1989 - Jan. 1990
- Graduate Teacher: Nyeri High School, July 1985 – Dec. 1988

MERIT AWARD

- **Chancellor's Extraordinary Doctoral Prize, University of Barcelona (2001).** Natural Products Chemistry on PhD Programme on 'Alkaloids from Kenyan Amaryllidaceae' (Faculty of Pharmacy)
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EDUCATION/RESEARCH BACKGROUND

- June 2001 - Feb. 2002: **Post-Doctoral Studies [UNESCO/Israel Post-Doctoral Fellowship]**
Ben-Gurion University of the Negev, Beer-Sheva, Israel;
Research areas: (1) Secondary Metabolites from *Embelia schimperi*
(2) Studies of the reactions of Quinones and Jeffamines
- August 1996 – July 2000: **Doctoral Studies (PhD) [Spanish Government Scholarship]**
University of Barcelona, Spain
Thesis: Alkaloids from Kenyan Amaryllidaceae and Applications
- Jan. 1990 - July 1992: **Master of Science (MSc) Studies (Chemistry) (Coursework, Thesis and Examinations) [Kenyatta University Scholarship]**
Kenyatta University, Nairobi, Kenya.
Thesis: Flavonoids from *Tephrosia emoroides* and their Antifeeding Effects on the Spotted Stalk Borer *Chilo partellus* Swinhoe (Attached at ICIPE)
- Sept. 1981 – June 1985: **Bachelor of Education (BEd, Science) (Upper 2nd Class Honours) (Chemistry Major) [Kenya Government Scholarship]**
Kenyatta University College (By then under University of Nairobi)

AREAS OF RESEARCH

Natural Product Chemistry with particular reference to:

- Search for bio-pesticides for the control of crop and animal pests as a strategy of improving food security
- Search for antimalarial and antimicrobial agents from medicinal plants
- Structural elucidation of Natural Products by use of spectroscopic methods
- Synthesis of bioactive Natural Products

TEACHING RESPONSIBILITIES (Postgraduate and Undergraduate)

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|----------------------------|------------------------------|
| -Natural Product Chemistry | -Organic Chemistry |
| -Medicinal Chemistry | -Synthetic Organic Chemistry |
| -Stereochemistry | -Organic Spectroscopy |
| -Polymer Chemistry | -Applied Organic Chemistry |

ADMINISTRATIVE RESPONSIBILITIES AT KENYATTA UNIVERSITY/DEPARTMENT

- University Intellectual Property Board Member
- University Graduate School Board Member (Rep SPAS 2005 - 08)
- School of Pure and Applied Sciences (SPAS) - Board of Postgraduate Studies: Chairman
- Academic Advisor Year 1 Coordinator
- Departmental Social Welfare Committee Member
- Departmental Post-graduate Board Member (Chairman, 2003-2005)
- Linkages, student field trips and attachment committee Member (Coordinator, 2003-2004)
- Departmental Income Generating Committee Member
- Research and proposal writing committee Member
- Departmental Timetabler (1994-1996)

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS

- Kenya Chemical Society (KCS)
- Natural Products Research Network of East and Central Africa (NAPRECA) (Both Country and Regional)

RESEARCH GRANT AWARDS

- **Lake Victoria Research Initiative (VicRes) - SIDA/SAREC/IUCEA.** - Project title: Enhancing integrated pest and disease management strategies in the production of green gram in parts of Lake Victoria Basin. US\$ 150,000. (2008; on going)
- **Lake Victoria Research Initiative (VicRes) - SIDA/SAREC/IUCEA.** - Project title: Evaluation, biological and chemical studies of anti-malarial plants of Western Kenya. US \$ 150,000. (2003 to 2007).
- **African Institute for Capacity Development (AICAD).** Project title: Bioprospecting for phytochemicals in ASAL regions in Kenya to control *Sitophilus zeamais* as a strategy for increasing food security. US \$ 20,000. (2003 to 2005).
- **International Foundation of Science (IFS)** Project title: Active Principles from the Genus *Tephrosia* against various Insect Pests. US \$ 12,000 (1995-1996).

POSTGRADUATE SUPERVISION

1. **Mwangi, Erastus Stanley Kamau (MSc, JKUAT).** "Pesticidal principals from *Teclea trichocarpa*, and *Albizia anthelmintica* against control the maize weevil (*Sitophilus zeamais*) as a strategy of food security" (Graduated 2007).
2. **Musyoka, Stephen Makari (MSc)** "Phytochemical investigation of anti-larval activity of the genus *Vitex* against *Anopheles gambiae*." (Graduated 2008).
3. **Njoroge, Peter Waitthaka (MSc).** "Isolation and structure elucidation bioactive antimicrobial agents from selected medicinal plants of the genus the *Rhus* (Anacardiaceae). (Graduated 2008).
4. **Amboga Enok Bichang'a (MSc).** "Anti-mycobacterial effects of selected medicinal plants used by herbal doctors in Kisii to treat respiratory infections". (Graduated 2009).
5. **Onyancha, Evans Marvin (MSc).** "Phytochemical studies of some species of genus *Teclea* and used in traditional medicines in Kenya". (Awaiting Defence).
6. **Mohamed, Mbarak Awadh (MSc).** "Phytochemical and biological studies of selected plants from the Ochnaceae family used in tradition medicine in the coastal region of Kenya". (Awaiting Defence).
7. **Omole, Ruth (MSc).** "Anti-malarial activity of *Cissampelos mucronata* and *Stephania abyssinica*." (Awaiting Defence).
8. **Serem, Abraham Kipkemei (MSc).** "Antimicrobial activity and structural studies of secondary metabolites from *Tabernaemontana stapfiana* and *Garcinia buchananii*". (Thesis Writing).
9. **Okwemba, Ronald Ing'ahu (MSc).** "Isolation and screening of metabolites for antimicrobial activity of selected plants of the family, Rutaceae Antimicrobial activity and structural elucidation of secondary metabolites from *Rubus steudneri*, *Indigofera homblei* and *Chasmanthera dependens*". (Thesis Writing).
10. **Muithya, James (MSc).** "Isolation, structure elucidation and antimicrobial activity studies of secondary metabolites from genus *Uvariadendron anisatum*, *Erythrococca bongensis* and *Echinops hispidus*". (Awaiting Defence).
11. **Odhiambo Oduor Leonard (MSc).** "Isolation and identification of anti-Plasmodial compounds from anti-malarial plants from Western Kenya. (Continuing).

12. **Njogu, Stephen Mwaniki (PhD)**. Biological and phytochemical studies of selected medicinal plants from Eastern Kenya used in the management of diabetes mellitus (Continuing).
13. **Mwagiru (PhD)**. "Antimicrobial, antituberculosis and antimalarial activity of medicinal plants from Central Kenya. (Continuing).
14. **Irungu, Kenneth (MSc)**. "Antimicrobial activity and structural elucidation of secondary metabolites from *Rubus steudneri*, *Indigofera homblei* and *Chasmanthera dependens*". (Continuing).
15. **Mbithi Justus Muema (MSc)**. Phytochemical investigation of the antimicrobial activity of *Ochna thomasiana* Engl. & Gilg (Continuing)
16. **Mwangi Henry M. (MSc)**. Isolation and identification of antimicrobial metabolites from selected medical plants of the genus *Rhus* (Continuing).

THESIS EXAMINATION

- Been involved in evaluation and examining of over **twenty (20)** MSc thesis and **six (6)** PhD thesis to date as an examiner internally and externally (University of Nairobi, JKUAT, Egerton University and Moi University).

PUBLICATIONS/JOURNAL ARTICLES

1. Mwangi, E.S.K., Keriko, J.M., **Machocho, A.K.**, Wanyonyi, A.W., Malebo, H.M., Chhabra, S.C. and Tarus, P.K. (2010). Antiprotozoal Activity and Cytotoxicity of metabolites from leaves of *Teclea trichocarpa*. *Journal of Medicinal Plants Research* 4 (9): 726-731.
2. Ruttoh, E.K., Bii, C.C., Tarus, P.K., **Machocho, A.K.**, Karimi, L.K. and Okemo, P.O. (2009) Antifungal Activity of *Tabernaemontana stapfiana* Britten (Apocynaceae) Organic Extracts. *Pharmacognosy Research* 1 (6): 387-391.
3. Ruttoh, E.K., Tarus, P.K., Bii, C.C., **Machocho, A.K.**, Karimi, L.K. and Okemo, P.O. (2009) Antibacterial Activity of *Tabernaemontana stapfiana* Britten (Apocynaceae) Extracts. *Afr. J. Trad. CAM* 6 (2): 186-194.
4. Kirira, P.G., Rukunga, G.M., Wanyonyi, A.W., Muthaura, C.N., Geoffrey M. Mungai, G.M., **Machocho, A.K.** and Isaiah O. Ndiege, I.O. (2007) Tigliane Diterpenoids from the Stem Bark of *Neoboutonia macrocalyx*, *Journal of Natural Products* 70 (5), 842-845.
5. **Machocho, A.K.**, Chhabra, S.C., Codina, C., Viladomat, F., Bastida, J. (2005) Amaryllidaceae Alkaloids from *Crinum kirkii* Baker. Proceedings, Kenya Chemical Society International Conference; Kenyatta University, August, 2005).
6. Mwangi, E.K., **Machocho, A.K.**, Tarus, P.K., Keriko, J.M., Chhabra, S.C., Wanyonyi, A.W. and Malebo, H.M. Phytochemical and Biological Studies of *Teclea trichocarpa* and *Albizia anthelmintica*. Proceedings, Kenya Chemical Society International Conference; Kenyatta University, August 2005)
7. **Machocho, A.K.**, Bastida, J., Codina, C., Viladomat, F., Brun, R. and Chhabra, S.C. (2004) Augustamine type alkaloids from *Crinum kirkii*, *Phytochemistry* 65 (23), 3143-3149.
8. **Machocho, A.K.**, Win, T., Grinberg, S. and Bittner, S. (2003) Reactions of benzoquinones and naphthaquinones with 1,8-diamino-3,6-dioxanonane and with 1,11-diamino-3,6,9-trioxaundecane. *Tetrahedron Letters* 44 (29), 5531-5534.
9. **Machocho, A.K.**, Kiprono, P.C., Grinberg, S. and Bittner, S. (2003) Pentacyclic triterpenoids from *Embelia schimperi*. *Phytochemistry* 62 (4), 573-577.
10. Tarus, P.K., **Machocho, A.K.**, Lang'at, C.C. and Chhabra, S.C. (2002) Flavonoids from *Tephrosia aequilata*, *Phytochemistry*, 60, 375-379.
11. Labranya, J., **Machocho, A.K.**, Kricsfalusy, V., Brun, R., Codina, C., Viladomat, F., Bastida, J. (2002) Alkaloids from *Narcissus angustifolius* subsp. *transcarpathicus* (Amaryllidaceae). *Phytochemistry* 60, 847-852.
12. Herrera, M.R., **Machocho, A.K.**, Nair, J.J., Campbell, W.E., Brun, R., Viladomat, F., Codina, C. and

- Bastida, J. (2001) Alkaloids from *Cyrtanthus elatus*, *Fitoterapia* **72**, 444-448.
13. Herrera, M.R., Machocho, A.K., Brun, R., Viladomat, F., Codina, C. and Bastida, J. (2001) Alkaloids from *Zephyranthes citrina* Baker, *Planta Medica* **67**, 191-193.
 14. Nair, J.J., Machocho, A.K., Campbell, W.E., Brun, R., Viladomat, F., Codina, C. and Bastida, J. (2000) Alkaloids from *Crinum macowanii*, *Phytochemistry* **54**, 945-950.
 15. Machocho, A., Chhabra, S.C., Viladomat, F., Codina, C. and Bastida, J. (1999) Alkaloids from *Ammocharis tinneana*, *Phytochemistry*, **51** 1185-1191.
 16. Machocho, A., Chhabra, S.C., Viladomat, F., Codina, C. and Bastida, J. (1998) Alkaloids from *Crinum stuhlmannii*, *Planta Medica*, **64** 679-680.
 17. Machocho, A.K., Lwande, W., Jondiko, J.O., Moreka, L.V.C. and Hassanali, A. (1995) Three new flavonoids from the roots of *Tephrosia emoroides* and their antifeeding activity against the Larvae of the Spotted Stalk Borer *Chilo partellus* Swinhoe; *International Journal of Pharmacognosy* **33** (3), 222-227.

CONFERENCES/SEMINARS/WORKSHOPS (PRESENTATIONS)

1. Regional Consultative Workshop on "Enhancing the Conservation and Use of Neglected and Underutilized Species of Crops in Eastern & Southern Africa". Kenyatta University Conference Centre. 26th -28th July 2010.
2. Bioprospecting Experts Workshop for KWS. Voi Safari Lodge Tsavo Park 20th -25th June 2010.
3. Intellectual Property Workshop for Researchers in Nairobi Region by KIPI. Lukenya Getaway Hotel: 24th -27th February 2010.
4. Pan-African Green Chemistry Workshop. Cape Town, South Africa on 24th -26th Jan 2007.
5. Lake Victoria Research Initiative (VICRES) - SIDA/SAREC/IUCEA. Various workshops and seminars within the regions since 2004 to present and on going.
6. Amaryllidaceae alkaloids from *Crinum kirkii* Kenya Chemical Society Conference, August 2005, Kenyatta University, Nairobi.
7. Phytochemical and Biological Studies of *Teclea trichocarpa* and *Albizia anthelmintica*. Proceedings, Kenya Chemical Society International Conference; Kenyatta University, August 2005)
8. New pentacyclic triterpenoids from *Embelia schimperi*. Israel Chemical Society Meeting 29-30 January, 2002, Jerusalem.
9. Natural quinones and pentacyclic triterpenoids from Myrsinaceae. Faculty of Pharmacy, University of Barcelona as a visiting researcher in Natural Products Chemistry. 9-14 January, 2002, Barcelona.
10. A Pterocarpan and Chalcones from *Tephrosia aequilata* The 9th Symposium of The Natural Product Research Network for Eastern and Central Africa (NAPRECA), OP-30 (p.29), 27-31 August, 2001, Nairobi.
11. The 9th Symposium of The Natural Product Research Network for Eastern and Central Africa (NAPRECA), OP-55 (p 56), 27-31 August, 2001, Nairobi.
12. Isolation and characterization of bioactive flavonoids from *Tephrosia aequilata* presented to the NAPRECA conference in Kenyatta International Conference Centre, Nairobi, Kenya. 27th - 31st August 2001.
13. Natural Products Research of Eastern and Southern Africa (NAPRECA) Kenya Chapter symposium on 26th January, 2001 at Kenyatta University.
14. Alkaloids from *Narcissus angustifolius* subsp. *transcarpathicus* (Amaryllidaceae), 48th Annual Meeting of the Society for Medicinal Plant Research (GA), Natural Products Research in the New Millenium. 3-7 Sept 2000, Zurich.
15. An acetylcholinesterase inhibiting alkaloid from the South African *Cyrtanthus sanguineus* 48th Annual Meeting of the Society for Medicinal Plant Research (GA), Natural Products Research in the New Millenium. 3-7 Sept 2000, Zurich.
16. Alkaloids from Kenyan Amaryllidaceae. Medicinal Plants, Traditional Medicines and Local

- Communities in Africa: Challenges and Opportunities of the next Millenium, 16-19 May 2000, Nairobi, Kenya.
17. Biological Assays in Natural Products Research. University of Barcelona, Spain, 25–29 Jan. 1999.
 18. Alkaloids from *Zephyranthes citrina* Baker, 16 Conferencia de Quimica, 1999, Santiago de Cuba, QO-P 75.
 19. Alkaloids from *Ammocharis tinneana*, 46th Annual Congress of the Society for Medicinal Plant, Research, 1998, Vienna, Austria, G-04.
 20. Biological Assays in Natural Products Research. University of Barcelona, Spain; 26th–30th Jan. 1998.

OTHERS RESPOSIBILITIES

- Examiner Examiner: Organic Chemistry: Egerton University 2010 -
- External Examiner – Chemistry: Kimathi University College of Technology 2000 -
- Chairman; Board of Governors– Ngumo Sec. School, Laipikia West 2010 -
- Patron: Laikipia District Kenyatta University Students Association (LAKUSA) 1999 -

Revised: August, 2010