

## CV FORMAT – KEFRI SCIENTISTS

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### PICTURE



**RESEARCHER ID : Machua, Joseph**

**SCOPUS ID : 8419564200**

**ORCID:** [0000-0002-0442-5407](https://orcid.org/0000-0002-0442-5407)

**Position: Senior Research Scientist**

- **PERSONAL INFORMATION**

- .1. NAME : **Machua, Joseph Mwangi**
- .2. ADDRESS: PO BOX 20412 – 00200
- .3. PHONE : +254722831071
- .4. EMAIL ADDRESS: [machuaj@gmail.com](mailto:machuaj@gmail.com), [Machua@yahoo.com](mailto:Machua@yahoo.com), [jmachua@kefri.org](mailto:jmachua@kefri.org)
- .5. NATIONALITY : Kenyan
- .6. GENDER : Male

- **QUALIFICATIONS**

- .1. Academic Qualifications:

2014-: PhD Candidate in Microbiology, University of Pretoria, South Africa

2005: Master of Science in Botany Msc. (Agroforestry), Maseno University, Kenya

1990: Bachelor of Science in Forestry Bsc. (For.) Second-class honours. Moi University, Kenya

1986: Advanced certificate of secondary education, Nakuru High School

1984: Certificate of secondary education, Kabarak High School

- .2. Other Courses

2020: Certificate in Job evaluation in Public Service, Kenya School of Government

2015: Certificate in Advanced Molecular Phylogenetics, University of Pretoria, SA

2013: Training on analysis of molecular data in African timber species, Libreville, Gabon.

- 2012: Training on DNA analysis (Development and use of microsatellite markers of *Acacia tortilis*) at Forest and Tree Breeding Centre (FTBC), Takahagi, Japan
- 2011: Certificate in Environmental Management System (ISO 14001) Lead auditor (KEBS) Mombasa, Kenya
- 2010: Certificate in Environmental Management System (ISO 14001) auditing (Sheer Quality) Muguga, Kenya
- 2007: Certificate in Environmental Impact Assessment and Audit (KIA)
- 2007: Certificate in public procurement and disposal Act and Regulations. KISM Kenya
- 2007: Certificate in ISO 14001 Procedure writing and Environmental Management System (EMS) auditing (SGS K Ltd) Muguga, Kenya
- 2007: Certificate in scientific writing. Nairobi, Kenya.
- 2003: Certificate in Geographic Information (GIS) application in Biodiversity management. Department of Remote Sensing and Resource Survey (DRSRS). Nairobi, Kenya
- 2002: Certificate in designing of molecular probes. Edinburgh, UK
- 1999: Certificate in data analysis and database management (ICRAF). Nairobi, Kenya
- 1997: Certificate in Advanced Biotechnology. University of Hannover (DSE/ZEL), Germany.
- 1995: Certificates in water use, isotopes and soil nutrients. International atomic energy Agency (IAEA), Nairobi
- 1995: Certificate in isotopes and soil microbiology. Institute of Grassland and Environmental Research (IGER), Wales (UK).

## - **EMPLOYMENT HISTORY**

- **Sept 2008 – Date:** Senior Research Scientist, Biotechnology, Kenya Forestry Research Institute (KEFRI), P.O Box 20412 - 00200 Nairobi, Kenya.
- **2003 – 2007:** Research Scientist II, Biotechnology Maseno, KEFRI

- **1994- 2003:** Research Scientist I, Biotechnology KEFRI
- **July 1991 - 1994:** Assistant Research Officer, Biotechnology, KEFRI
- **ADMINISTRATIVE RESPONSIBILITY**
  - 2020 –Present: Head, Biosciences Department
  - 2019 – Present Project Coordinator, KEFRI-GATSBY Commercial Forestry Project
  - 2012 – 2015: Project Coordinator and Country Representative, ITTO - PROJECT
  - 2008 -2012: Assistant Project Coordinator EU–Gum Arabic project
  - 2002 – 2008: Assistant Project Coordinator, EU SAFSYS project
  - 2000 – 2005: Project coordinator (Western Kenya), EU-IMPALA
  - 1991-1998: Assistant Project Coordinator, EEC Nitrogen Fixation project
- **PUBLICATIONS**
  - .1. Journal papers**
    1. Nagel, J.H., Cruywagen, E.M., **Machua, J.**, Wingfield, M.J. and Slippers, B., 2020. Highly transferable microsatellite markers for the genera *Lasiodiplodia* and *Neofusicoccum*. *Fungal Ecology*, 44, p.100903.
    2. Omondi SF, **Machua J**, Muturi GM, Gicheru JM and Hanaoka S (2019). Evidence of high genetic diversity and significant population structuring in *Vachellia tortilis* (Forsk.) Galasso & Bonfi population in Kenya. *Annals of Forest Science* (DOI: 10.1007/s13595-019-0834-y)
    3. **Machua, J.**, Jimu, L., Njuguna, J., Wingfield, M.J., Mwenje, E. and Roux, J., 2016. First report of *Teratosphaeria gauchensis* causing stem canker of Eucalyptus in Kenya. *Forest Pathology*, 46(2), pp.168-170.
    4. Kimiti, J.M., **Machua, J.M.** and Odee, D.W., 2016. *Acacia senegal* (L.) Wild. Associates with a Diversity of Beneficial Micro-symbionts in the Arid and Semi-arid Lands of Kenya. *Microbiology Research Journal International*, pp.1-8.
    5. Omondi SF, **Machua J**, Gicheru JM, Hanaoka S (2015). Isolation and characterization of microsatellite markers for *Acacia tortilis* (Forsk.) Hayne. *Conservation Genet Resour.* 7 (2): 529-531.

6. Russell, J.R., Hedley, P.E., Cardle, L., Dancey, S., Morris, J., Booth, A., Odee, D., Mwaura, L., Omondi, W., Angaine, P. and **Machua, J.**, 2014. TropiTree: an NGS-based EST-SSR resource for 24 tropical tree species. *Plos one*, 9(7), p.e102502.
7. Kuria, M.W., Ngumi, V.W., **Machua, J.M.**, Odee, D.W. and Njenga, P.K., 2012. Regeneration of the East African greenheart, *Warburgia ugandensis* (Sprague) through tissue culture. *African Journal of Biotechnology*, 11(26), pp.6832-6838.
8. Gabriel M. Muturi , **Joseph M. Machua**, Godefridus M. J. Mohren, Lourens Poorter, John M. Gicheru and Lorna W. Maina (2012) Genetic diversity of Kenyan *Prosopis* populations based on random amplified polymorphic DNA markers. *African Journal of Biotechnology* Vol. 11(87), pp. 15291-15302
9. Johnstone Neondo, **Joseph Machua**, Anne Muigai, Aggrey B. Nyende, Moses Munjuga, Ramni Jamnadass and Alice Muchugi 2011. Micropropagation of *Allanblackia stuhlmannii*: Amenability to tissue culture technique. *International Journal for Biotechnology and Molecular Biology Research* Vol. 2(11), pp. 185-194.
10. **Machua J.**, Muturi G, Omondi S. F. and Gicheru J (2011) Genetic diversity of *Jatropha curcas* L. accessions in Kenya using RAPD molecular markers: Implication to plantation establishment. (In press). *African Journal of Biotechnology*: AJB-10-1990
11. Muchane, M.N., Jama, B., Othieno, C., Okalebo, R., Odee, D., **Machua, J.** and Jansa, J., 2010. Influence of improved fallow systems and phosphorus application on arbuscular mycorrhizal fungi symbiosis in maize grown in western Kenya. *Agroforestry systems*, 78(2), pp.139-150.
12. Machua, J., Muturi, Gicheru, J. (2007) Genetic diversity within *Brachylaena* (O. Hoffm) populations in Kenya; Implications for conservation of a woodcarving tree. *Discovery and innovations*. 19 (RPSUD Special edition No.1): 32-36
13. Desaegeer J., Odee D., **Machua J.**, Esitubi M. (2005) Interactions between *Meloidogyne javanica* (Treub) Chitwood and rhizobia on growth of *Sesbania sesban* (L.) Merr. *Applied Soil Ecology* 29: pp 252-258
14. Odee, D.W., Njoroge, J., **Machua, J.** and Dart, P., 1998. Selective preference for nodulation and symbiotic nitrogen fixing potential of indigenous rhizobia with African and Australian acacias. In *Biological nitrogen fixation for the 21st century* (pp. 673-674). Springer, Dordrecht.

## **.2. Books**

## **.3. Book Chapter**

Odee, D.W., Ingley, K., Lebonvallet, S., Sylvester-Bradely, R., **Machua, J.** and Lesueur, D. (2003) Selection of multi origin microsymbionts (rhizobia and arbuscular mycorrhiza) of *Calliandra calothyrsus* Meisn. for field inoculation trials. Pp 22-41 In (eds) A.J. Pottinger & D Lesueur), Evaluation and use of the microsymbiont of *Calliandra calothyrsus* to optimize fodder production within small scale farming systems in humid zone. H. Charlesworth & Co.Ltd, Huddersfield, United Kingdom.

## **.4. Technical Notes /Protocols/Guidelines**

Gitehi Giathi, **Joseph Machua** and Pauline Bala (2015). Propagation of East African Sandalwood (*Osiris lanceolata*) by air layering: Guideline for farmers and extension agents. ©KEFRI 2015.

Kamondo, B., Giathi, G., Osore, C., **Machua, J.**, Kagunyu, L., Wafula, A., Bala, P., Njuguna, J., Wakori, S., Maingi, F. and Nyingi, K., 2014. Growing of East African Sandalwood. *Guidelines for Tree Growers. KEFRI, Nairobi. KEFRI*, p.3.

Hanaoka S, **Omondi SF** and Machua J (2013). Basic Molecular Techniques for Tree breeding: Experimental Protocol. Sankeisha Co LTD, Nagoya Aichi, Japan. ISBN 978-4-86487-110-5 C3045.

## **.5. Policy Briefs**

# **• RESEARCH**

## **.1. Completed**

KEFRI-GATSBY Commercial Forestry Project (Baseline studies) – **Completed 2021**

ITTO – PROJECT (Development and implementation of a species identification and Timber Tracking System with DNA fingerprints and stable isotopes in Africa – **Completed 2015**

EU–Gum Arabic Project - **Completed 2013**

EU SAFSYS Project – **Completed 2009**

EU-IMPALA Project- **Completed 2005**

EEC (EU) Nitrogen Fixation project – **Completed 1998**

## **.2. Ongoing research**

Tissue culture of *Melia volkensii* and exotic Bamboo species

## **.3. Mentorship and supervision**

**Priscuilla Kimani** – Assistant Research Officer

**Susan Karani** – Assistant Research officer on contract

**Mwaniki Muusya** - Technologist

## **• INNOVATIONS AND PATENTS (Intellectual Property)**

## **• CONFERENCES/SEMINARS/WORKSHOPS**

### **.1. Presentation of Papers at Academic and Professional Conferences**

**Machua, J.**, B. Kamondo, L. Mwangi, G. Gitehi, and O. Chahilu (2008). "Propagation of *Osyris lanceolata* (East African Sandalwood)." In *Recent advances in forestry research for environmental conservation, improved livelihood and economic development. Proceedings of the 4th KEFRI Scientific Conference, KEFRI Headquarters, Muguga, Kenya, 6 to 9 October 2008.*, pp. 207-218. Kenya Forestry Research Institute, 2009.

**Machua, J.**, Harrier, L.A., Macdonald, A., Ingleby, K., & Wilson, J. (2002) Using molecular approaches to monitor persistence and spread of *Calliandra calothyrsus* Meissn. arbuscular mycorrhizal inoculants in tropical agroforestry. Poster abstract at the 14th Symposium of the Scottish Microbiology Society and British Society for Plant Pathology joint meeting "Plant microbe interactions" University of Paisley, Glasgow, September 4Th 2002.

**Machua, J.** (2002) Growing ambition (Interviews), Europa Journal. November 2002.

Omondi SF, **Machua J**, Muturi G, Gicheru J, Matsushita M and Hanaoka S (2018) Genetic diversity and structure of *Acacia tortilis* population in Kenya. In: Ochieng D, Kamondo B and Muturi G (eds) Proceedings of international conference on 'Project on development of drought tolerant trees for adaptation to climate change in drylands of Kenya' held at KEFRI headquarters Muguga from 13<sup>th</sup>-16<sup>th</sup> February 2017. KEFRI, Kenya.

Omondi SF, **Machua J**, Gicheru J, Matsushita M and Hanaoka S (2018) Identification of *Melia volkensii* elite trees through microsatellite markers fingerprinting. In: Ochieng D, Kamondo B and Muturi G (eds) Proceedings of international conference on 'Project on development of drought tolerant trees for adaptation to climate change in drylands of Kenya' held at KEFRI headquarters Muguga from 13<sup>th</sup>-16<sup>th</sup> February 2017. KEFRI, Kenya.

Omondi SF, **Machua J**, Gicheru J, Matsushita M and Hanaoka S (2018) Genetic diversity of remnant populations of *Melia volkensii* in Kenya: Implication for conservation and tree improvement. In: Ochieng D, Kamondo B and Muturi G (eds) Proceedings of international conference on 'Project on development of drought tolerant trees for adaptation to climate change

in drylands of Kenya' held at KEFRI headquarters Muguga from 13<sup>th</sup>-16<sup>th</sup> February 2017. KEFRI, Kenya.

**.2. Participation in Workshops/Conferences**

**.3. Convening/Coordinating Conferences**

**2013:** Organized a regional Training workshop on the application of molecular genetic markers for timber tracking in Africa through the International Tropical Timber Organization (ITTO) at KEFRI, Muguga.

([http://www.itto.int/files/user/pdf/Meeting%20related%20documents/Kenya\\_Workshop\\_Flyer\\_Web\\_English\\_Final-3.pdf](http://www.itto.int/files/user/pdf/Meeting%20related%20documents/Kenya_Workshop_Flyer_Web_English_Final-3.pdf))

• **PROFESSIONAL ENGAGEMENT**

**.1. Training**

**.2. Consultancies**

**.3. Collaboration with external organizations**

• **EXTERNAL AND INTERNAL RESEARCH GRANTS**

Include research grants won

• **LOCAL, REGIONAL & INTERNATIONAL APPOINTMENTS**

**.1. Local**

**.2. Regional**

**.3. International**

• **AWARDS AND RECOGNITION**

• **CONTRIBUTION TO KEFRI'S ADVANCEMENT**

Member of KEFRI Management Training Committee

Core member and initiator of KEFRI ISO 14001

Participated as a member of KEFRI procurement committee

• **MEMBERSHIP TO PROFESSIONAL BODIES**

Forestry Society of Kenya (**FSK**) – Member

Environmental Institute of Kenya (**EIK**) - Member

- **REFEREES**

**Prof. Geoffrey M. Muluvi**

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