

CURRICULUM VITAE

Dr. Orek O. Charles

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Education Background

- 2010 – 2014:-** PhD in Plant Sciences at the Institute of Agricultural Sciences (IAS), Swiss Federal Institute of Technology (ETH-Zürich), Switzerland.
- 2007 – 2010: -** Master of Science in Crop Protection at the Department of Plant Science and Crop Protection, University of Nairobi, Nairobi, Kenya.
- 2001 – 2005:-** Bachelor of Science in Agriculture, at the Department of Plant Science and Crop Protection, University of Nairobi, Nairobi, Kenya
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Professional Experience:

- 2023 – current:** **Senior Lecturer & Research Scientist** at the Department of Agriculture, Murang'a University of Technology, Murang'a, Kenya

Duties:

- Teach undergraduate and post-graduate students in crop sciences: Agronomy, Plant Pathology, Plant Breeding, Plant Physiology, General Genetics, Biotechnology, Research Methods and Special Projects among others
 - Supervise post-graduate students on their projects
 - Development of research proposals and application of grants for funding
 - Development of new curriculum and review of curriculum for the department of agriculture
 - Carry out research and training in the field of agriculture.
 - Carry out consultancy and community outreach programs
 - Research dissemination through conferences and workshops and publication of articles in peer reviewed journals
 - Perform any other duty as may be assigned by chairman of department or university management
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- 2015 - 2022:** **Lecturer & Research Scientist** at the Department of Agricultural Sciences, School of Agriculture, Environment, Water & Natural Resources, South Eastern Kenya University, Kitui Kenya

Duties:

- Teach undergraduate and post-graduate students in crop sciences: Biotechnology and Biodiversity, Molecular Genetics, Plant Pathology, Plant Breeding, Plant Physiology, Weed Science, Principles of Crop Production, Research Methods and Special Projects among others
 - Supervise post-graduate students on their projects
 - Carry out research and training in the field of Agriculture.
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- Development of research proposals and application of grants for funding of the projects
 - Carry out consultancy and community outreach programs
 - Research dissemination through conferences and workshops and publication of articles in peer reviewed journals
 - Perform any other duty as may be assigned by chairman of department or university management
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Aug. – Dec. 2014: **Part-time lecturer** at Department of Plant Sciences & Crop Protection, College of Agriculture & Veterinary Sciences, University of Nairobi.

Duties:

- Teach diploma students: Agricultural Entomology, Biotechnology, Plant Pathology and Seed Health.
 - Supervise and coordinate practicals for students
 - Set exams, examine, mark scripts and provide results to chairman of department
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Jan – Dec. 2014: **Project Manager** for the Seed Enterprise Management Institute (SEMIs), at the department of plant science and crop protection, University of Nairobi.

Duties:

- Support the finance officer to maintain an up to date budget analysis.
 - Ensure that proper contracts are developed for the different partners and consultants.
 - Authorize and facilitate travel arrangements and logistics (transport of project staff and partners, air ticket purchase, vehicle hire, airport pickups, hotel reservations).
 - For workshops, seminars and training this includes booking workshop venues for seminars / training, ensuring equipment of conference room with workshop facilitation materials.
 - Focal point for project monitoring, evaluation, and reporting. Ensure reports are prepared on time and submitted to according to the required formats.
 - Ensure data is organized by experts as required by the data manager and the M&E officer at Benefit Partnership Coordination Unit.
 - Serving as secretarial role in regular team meetings and planning sessions for the regional project unit.
 - Validating the meeting or planning session agenda with Scientific Coordinator.
 - Taking written notes of meetings of key discussion points, action points with times lines and responsible parties, and manage the regional drop box.
 - Manage other staff members of the institute including administrative staff, farm workers, drivers and casuals
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2013 – 2014: : **Research Scientist** at International Institute of Tropical Agriculture (IITA), c/o International Livestock Research Institute (ILRI), Nairobi, Kenya.

Project duties:

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- Indexing of cassava brown streak viruses in cassava breeding lines from Chambezi, Tanzania.
 - Identification and selection of UCBSV resistant, tolerant and susceptible cassava breeding lines before release of resistant lines to farmers.
 - Data analysis, preparation of reports, results and publication from the project.
 - Supervision of PhD & MSc students and Lab technicians
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2010 – 2014:

Doctoral Student at IAS, ETH-Zürich, Switzerland - Plant Physiology & Biotechnology

Duties:

- Carry out field, greenhouse and laboratory experiments to generate data for award of PhD degree
 - Supervision of master students, Organizing laboratory practicals and greenhouse experiments for Bachelors or undergraduate students
 - Lab assistance or management i.e. ordering for consumables, cold room and storage facilities, surface sterilization, cleaning and lab waste disposal etc.
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Jan. – Aug. 2009:

Research Assistant at International Institute of Tropical Agriculture (IITA), and BeCA c/o ILRI, Nairobi, Kenya.

Duties:

- Establishment of crop field trials, field data collection and analysis
 - *In vitro* plant propagation, transplanting and hardening of plants under greenhouse conditions.
 - Application of Microarrays for gene expression profiling.
 - Learn laboratory techniques such as nucleic acids extraction and PCR, gene identification and primer design etc.
 - Learn plant tissue culture, designing lab and greenhouse experiments etc.
 - Assist lab technicians and post-graduate students with their projects such as data collection and analysis
 - Ordering and management of lab consumables and cleaning lab work spaces
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Leadership Roles at the University:

Jul. –Dec. 2022

Associate Dean of Students - at South Eastern Kenya University, Kitui, Kenya

Duties:

- Assist the dean of students in day-to-day management of student affairs
 - Provide overall coordination of student welfare needs for physical, spiritual and social development of students.
 - Create and implement departmental goals, policies, budgets and working procedures
 - Assess the needs of the student body and respond in a timely and effective manner
 - Provide support to students on issues related to the institution policies, department processes and student services
 - Oversight student counseling services, club activities and sports and games department
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- Participate in student disciplinary process
 - Oversee student elections and governance
 - Organize for orientation programs (especially freshmen)
 - Advisory role for student leaders for effective student communication
 - Perform other duties as define and assigned by the supervisor – dean of students.
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2018 - 2022

Coordinator - for the Alcohol, Drug and Substance Abuse (ADSA) prevention unit at South Eastern Kenya University.

Duties:

- Develop, implement, evaluate and review the university ADSA policy
 - Sensitize university staff and students on effects and prevention of ADSA
 - Implement a workplace policy on use of alcohol and drug abuse
 - Submit ADSA prevention unit work plans and quarterly reports to NACADA
 - Undertake follow up surveys to establish prevalence of ADSA
 - Establish & Operationalized an Employee Assistance Programme (EAPs)
 - Identify and refer staff & students with ADSA problems for guiding and counseling, rehabilitation and treatment
 - Train staff & student for Peer-to-Peer educators /champions
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2018 - 2019:

Examinations coordinator - for the School of Agriculture & Veterinary Sciences (SAVS) of South Eastern Kenya University.

Duties:

- In charge of examination processing in the school
 - Consolidate marks from various departments for the school board of examiners meeting
 - Attend university senate board of examiners
 - Prepare captions for results from the school for presentation in the University senate board of examiners meeting
 - Enforce strict adherence to security systems and procedures in the handling, processing and storage of marks and related issues
 - Attend to queries on examination results in liaison with university examination office
 - Prepare result slips for students
 - Coordinate teaching & examination timetables in the school
 - Coordinate and ensure harmony in teaching, ordinary and special examination timetables in the school
 - Keep an updated record of the units where students will be expected to sit for special examination
 - Process students for graduation
 - Any other timetable and examination related duties that may be assigned from time to time
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**2022
2018**

Acting Chairman - department of Agricultural Sciences, School of Agriculture, Environment, Water & Natural Resources at South Eastern Kenya University.

2017

Duties:

- Provide academic leadership & management roles at the department
- Lead the department in development, coordination and implementation of departmental goals and objectives
- Schedule & chair department meetings on academic and administrative objectives or agenda
- Prepare annual or semester workload allocation for departmental staff and other curricula activities.
- Encourage and assist the department staff to improve professionally through study, research, creative activity, service and participation in professional activities
- Ensure students are taught & respond to any other issues from students
- Manage staff performance through staff appraisal and consultation n
- Coordinate teaching & examinations at the department
- Coordinate review of academic programs and development of new programs offered by the department
- Ensure university academic policies, procedures and regulations are implemented at the department level among other functions
- Perform any other duties assigned by university management

Membership in University Committee and Boards:

- 2023 – current:** Member of *Ad Hoc* Committee on Curriculum Development, Department of Agriculture of Murang’a University of Technology (MUT)
- 2023 – current:** Member of curriculum development committee for BSc. Agri-Technology and Food Systems for the Open University of Kenya (OUK)
- 2021 – 2022:** University Marketing, South Eastern Kenya University (SEKU)
- 2021 – 2022:** Member of the University Board of Postgraduate Studies – SEKU
- 2019 – 2022:** Member of Performance Contracting and Quality Management Systems Board – SEKU
- 2018 – 2022:** Committee member of Alcohol, Drugs & Substance Abuse control unit – SEKU

Membership in Professional Bodies

- 2023 – current:** Member of Horticultural Association of Kenya
- 2023 – current:** Member of the Entomological Society of Kenya
- 2023 – current:** Member of Biochemistry and Biotechnology Professionals Society of Kenya
- 2022 – current:** Member of Nature Kenya
- 2020 – current:** Member of Africa Phytopathology Society

Examination of postgraduate theses / dissertations:

#	Year	Title / Description	Program
1.	2022	Assessing the effects of ZAI PIT combined with Integrated Soil Fertility Management on Sorghum Yields and Selected Soil Properties in Kitui County, Kenya	PhD
2.	2022	Documentation and validation of key indigenous knowledge practices on management of crop pests in Kenya. The case of Kitui west sub-county	MSc

3.	2022	Effects of Spacing and the Negarim Micro Catchment on the Growth of Two Provenances of <i>Moringa Oleifera</i> in Kitui County, South Eastern Kenya	MSc
4.	2021	Comparative Growth and Productivity Evaluation of Phoenix Oyster Mushroom (<i>Pleurotus Spp.</i>) on Residual Agro-Waste Substrates in Semi-Arid Lands of Kenya	MSc
5.	2019	Factors affecting small holder farmers' adoption of integrated soil fertility and water management practices in Machakos County	MSc
6.	2019	The effects of physical properties of common bean varieties in relation to soaking and cooking time	MSc
7.	2019	Comparative differences of whitefly-transmitted diseases between local and hybrid bean varieties in Kitui County	MSc
8.	2017	Factors Affecting Sisal Cultivation and Adoption in Kiomo Division, Kitui, County, Kenya	MSc.
9.	2016	Adaptability of pearl millet (<i>Pennisetum glaucum</i>) Varieties in the Semi-Arid Kitui County of Kenya	MSc.

Supervision of Postgraduate Students:

#	Student Name	Program	Institution	Status	Year
1.	Irene Koima	PhD in Plant Pathology	University of Nairobi	Thesis writing	2024
2.	Diana Gitonga	PhD in Agricultural Resource Management	University of Nairobi	Thesis writing	2024
3.	Christine Wanyonyi	PhD in Biotechnology	Kenyatta University	Thesis writing	2023
4.	Jennifer Kago	MSc. in Food Science & Technology	Jomo Kenyatta University of Science & Technology	Data collection	2024
5.	Violet Barasa	MSc. Dryland Agriculture	Kenyatta University	Data collection	2024
6.	Roselyn Otieno	MSc. in Biotechnology	University of Nairobi	Data collection	2023
7.	Ken Robert Mulupi	MSc. in Agricultural Resource Management	South Eastern Kenya University	Thesis submitted	2023
8.	Abel Odhiambo	MSc. Plant Breeding & Biotechnology	University of Nairobi	Completed	2022
9.	Janet Koros	MSc. in Biotechnology	Kenyatta University	Completed	2021
10.	Agnes Ngela	MSc. in Agricultural Resource Management	South Eastern Kenya University	Completed	2021
11.	Martin Maluki	MSc. in Agricultural Resource Management	South Eastern Kenya University	Completed	2020
12.	Irene Koima	MSc. in Agricultural Resource Management	South Eastern Kenya University	Completed	2018

Research Funding / Projects:

Collaborating & Institution	Research Title of Project	Funding period	Role	Donor	Funding Amount (Kshs)
Murang'a University of Technology and Alliance Bioversity & CIAT	Up-Scaling Climate-Smart Agricultural Technologies and Practices for Increased Productivity, Enhanced Climate Resilience and	2023-2025	Co-Researcher	Alliance Bioversity & CIAT, AICCRA and the World Bank.	6,400,000

Promotion of Low Carbon Growth					
Murang'a University of Technology and Alliance Bioversity & CIAT	Climate Smart Agricultural Technologies and Practices for Climate Change Adaptation	2022-2023	Co-Researcher	Alliance Bioversity & CIAT, AICCRA and the World Bank.	2, 151, 300
University of Nairobi, South Eastern Kenya, University of KU Leuven – Belgium	PHEALING Project (Innovative management of Post-Harvest physiological deterioration of cassava storage roots in Kenya	2021-2024	Principal Investigator	FOSC ERA-NET Cofund on Food Systems & Climate Change by European Union and NRF	8, 000, 000
Finland (Aalto & HAMK Universities); Kenya (SEKU, Egerton & UoN); Zambia (UNZA & Mulungushi)	Problem-based learning in Africa / PBL-BioAfrica Project for Capacity building of Higher Education Institutions in Africa	2020-2024	Co-Researcher	Government of Finland	10, 000, 000
South Eastern Kenya and Biosciences Eastern Central Africa (BeCA/ILRI) Hub	Management of major pests and virus diseases of cassava in cassava genotypes in Kenya	2017-2018	Principal Investigator	African Biosciences Challenge Fund (ABCF) fellowship from BeCA-ILRI Hub	2, 500, 000

Selected Consultancies:

- May 2020** Promotion of adoption and cultivation of quality Rice Seeds & Varieties for improved rice production in Ahero Irrigation Scheme in Kisumu County, Kenya.
- Apr. 2018:** Development of farmer training manuals on Small Plot Horticulture (SPH). Using the SPH manual to train trainer of trainers (ToTs), youth groups and farmers in Mandera County, Kenya.
- Jul. 2018:** Development of farmer training manuals on kitchen gardening in Kilifi County. Using the kitchen garden manual to train youth groups, women and other smallholder farmers on kitchen gardening in Kilifi County
- Mar. 2017:** Reconnaissance Study in Embu, Isiolo, Kitui, Meru and Tharaka Counties. Carry out needs assessment to establish key needs of the communities to be targeted within the selected counties and the specific agriculture-based value chains the communities.

PEER REVIEWED PUBLICATIONS

- 1) **Orek C. (2023):** A review of the functions of transcription factors and related genes involved in cassava (*Manihot Esculenta* Crantz) response to drought stress. *Tropical Plants* 2:14 <https://doi.org/10.48130/TP-2023-0014>
- 2) **Orek C, Mulupi K, Koima I (2023):** A Review of the Roles of Non- Coding RNAs Associated with Drought Stress Response in Cassava (*Manihot esculenta* Crantz). *Journal of Advances in Biology & Biotechnology*, 26(7): 1–10. <https://doi.org/10.9734/jabb/2023/v26i7642>

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- 3) **Orek C**, Kyallo M, Yao N (2023): Analysis of local cassava landraces and improved genotypes in response to infections by cassava mosaic begomoviruses under field conditions in Kenya. *Tropical Plant pathology*, 48: 182–198. <https://doi.org/10.1007/s40858-023-00558-9>
 - 4) Koima IN, Kilalo DC, **Orek CO**, Wagacha JM, Nyaboga EN (2023): Identification and Characterization of *Colletotrichum* Species Causing Sorghum Anthracnose in Kenya and Screening of Sorghum Germplasm for Resistance to Anthracnose. *Journal of Fungi*, 9(1):100. <https://doi.org/10.3390/jof9010100>
 - 5) Koima IN, Kilalo DC, **Orek CO**, Wagacha JM, Nyaboga EN (2022). Survey of Fungal Foliar and Panicle Diseases in Smallholder Sorghum Cropping Systems in Different Agro-Ecologies of Lower Eastern Kenya. *Microbiology Research*, 13(4): 765-787 <https://doi.org/10.3390/microbiolres13040055>
 - 6) **Orek C** (2022): Farmer-Cultivated Landraces and Improved Cassava Genotypes Exhibit Varied Response to Cassava Brown Streak Disease under Natural Infections in Kenya. *Journal of Plant Pathology Research* 4(1):30-44 <https://doi.org/10.36959/394/624>
 - 7) Ngela AM, Muli B, **Orek C** (2021): Evaluation of bean common mosaic disease and associated aphid vector, *Aphis fabae* L., on common bean (*Phaseolus vulgaris* L.) production in lower Eastern Kenya. *International Journal of Pathogen Research* 8 (3): 1-18 <https://doi.org/10.9734/ijpr/2021/v8i330203>
 - 8) **Orek C**, Gruissem W, Ferguson M, Vanderschuren H (2020): Morpho-Physiological and Molecular Evaluation of drought tolerance in cassava (*Manihot esculenta* Crantz). *Field Crops Research*, 255 (2020) 107861 <https://doi.org/10.1016/j.fcr.2020.107861>
 - 9) Maluki M, **Orek CO**, Akuja, T (2019): Evaluation and selection of different legumes species based on morphological and nodulation differences under water deficient conditions of lower eastern Kenya. *International Journal of Current Research*, 11(4): 3206-3214.
 - 10) **Orek CO** (2018): An Optimized Cetyltrimethylammonium Bromide (CTAB)-Based Protocol for Extracting RNA from Young and Old Cassava Leaves. *Journal of Advances in Biology & Biotechnology*, 19(4): 1-7 <https://doi.org/10.9734/JABB/2018/45370>
 - 11) Koros JC, Runo SM, Yusuf M, **Orek CO** (2018): Screening selected cassava cultivars for resistance against cassava viruses and cassava green mites under advanced yield trials in Kenya. *Journal of Biotechnology and Biochemistry*, 4(5): 37-52.
 - 12) Koima IN, **Orek CO** (2018): Response to Cassava Brown Streak Disease Infections in Local and Improved Cassava Genotypes under Field and Greenhouse Assays in Lower Eastern Kenya. *International Journal of Pathogen Research*, 1(3): 1-14

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- 13) Koima IN, **Orek CO**, Nguluu S (2018): Distribution of Cassava Mosaic and Cassava Brown Streak Diseases in Agro-Ecological Zones of Lower Eastern Kenya. *International Journal of Innovative Science and Research Technology*, 3 (1): 391 – 399
- 14) Ngugi K, **Orek C**, Mwang'ombe A (2013): Morphological and Physiological Measurement of the Stay-Green Trait in Transgenic and Non-Transgenic Cassava under Greenhouse Water Stress Conditions. *Journal of Renewable Agriculture*, 1(5): 77 – 83.
<https://doi.org/10.12966/jra.08.02.2013>

Seminars, Workshop & Conferences Attended

- 1) **Aug. 2023:** Capacity-building workshop on Genetic Engineering and Biotechnology Research for African Universities and Research Institutions. Organized by International Centre for Genetic Engineering and Biotechnology (ICGEB), NACOSTI, Alliance for African Partnership – Michigan State University and Egerton University – Nakuru, Kenya
- 2) **Jul. 2023:** Seminar on BRIO Methods and Tools to fasten crop breeding procedures for an efficient Demand-Led Breeding Operations and Programs. Organized by Prof. Wallace Cowling from the University of Western Australia
- 3) **Apr. 2023:** Biotech Stakeholders' Meeting: 'The Role of Agri-innovations in Strengthening Resilience of Farming Systems'. Organized by International Service for the Acquisition of Agri-biotech Applications (ISAAA AfriCenter) and Open Forum on Agricultural Biotechnology (OFAB) at Norkas Hotel, Murang'a Kenya.
- 4) **Nov. 2022:** Short course on Current and Emerging Threats to Crops Innovation – Lab Practical Course by Michigan State University
- 5) **Aug. 2021:** Science Communication Training for Universities Biotechnology Experts, at University of Embu. Organized by OFAB and ISAAA.
- 6) **Jun. 2021:** Setting up agribusiness incubation hubs based on the Korea model. Virtual / Online
- 7) **Sept. 2020:** Association of African Universities (AAU): Quality Assurance Workshop in Research and Project Grants Proposals Writing. Virtual / Online
- 8) **Apr. 2020:** Short Course Training on Strengthening Postgraduate Supervision organized by Rhodes University in South Africa
- 9) **Nov. 2018:** International Conference on Science, Technology and Innovation for Sustainable Development in Dryland Environments, South Eastern Kenya University, Kitui, Kenya
- 10) **Mar. 2017:** Agri-Biotech Forum: Demystifying Agricultural Biotechnology through Active Engagement of Academia. University of Embu, Kenya.

11) **Sept. 2016:** Workshop: Viral Induced Gene Silencing (VIGS); a Technology based on RNAi. International Institute of Tropical Agriculture (IITA) c/o International Livestock Research Institute (ILRI), Nairobi, Kenya.

Selected Presentations in Seminars / Conferences:

- 1) **Nov. 2022:** 1st Research & Innovation Week of South Eastern Kenya University, Kitui, Kenya: Presentation on Screening for major fungal diseases and tolerance among sorghum varieties under field trials in Lower Eastern Kenya (by Mulupi K, Koima IN, Nyaboga EN, Muli BK and **Orek CO**).
- 2) **Sept. 2021:** 3rd Phytosanitary Conference – KEPHIS Nairobi, Kenya: Presentation on Adaptability of different potato varieties to different moisture and temperature conditions in the Semi-Arid Areas of Kenya (by Gitonga D, Maina M, Kimenju JW, **Orek CO** and Solveig H)
- 3) **Feb. 2021:** Public lecture by **Orek CO** on Potential role of cassava (*Manihot esculenta* Crantz) in drought stress mitigation and climate change, South Eastern Kenya University, Kitui, Kenya
- 4) **Jun. 2018:** Presentation on Drought tolerance in cassava during BIOCAS Annual Project Meeting & Workshop – Department of Horticulture, JKUAT (by **Orek CO**)
- 5) **Jan. 2018:** African Combined Congress - Cape Town, South Africa: Presentation on Rhizobial specificity and nodulation in legumes under drought conditions in the semi-arid county of Kitui in lower Eastern Kenya (by **Orek CO**, Maluki, J.M., and Akuja, T)
- 6) **Mar. 2016:** Poster on Gene expression associated with ‘Staygreen’ trait for drought tolerance in cassava (*Manihot esculenta* Crantz) by **Orek CO**, Zhang, P., Gruissem, W., Ferguson, M., & Vanderschuren, H

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