ESTHER EDITH ARUNGA

Name: Esther Edith Arunga

Title/Qualification: Dr.

Position: Senior Lecturer

Department: Agricultural Resource Management

School: Agriculture

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Short Biography

Esther Arunga has a Doctor of Philosophy in Plant Breeding and Biotechnology from Moi University Kenya.

Research Interests

Dr. Arunga's research interest is on marker-assisted breeding, genetics and genomics of major tropical food crops. Special interests to the following crops: Common beans (dry and snaps), groundnuts, cowpeas, lablab, cassava and Irish potato. Dr. Arunga has also equiped the research lab at Embu University College with the support of Kirkhouse Trust, UK. Currently, Dr. Arunga is involved in the following research Projects:

2013 – 2017: Kirkhouse Trust, Principal Investigator- Marker-assisted Breeding for Multiple Disease Resistance in Market-Class Kenyan French Beans.

2013-2015: National Commission for Science, technology and innovation, Women innovations: Principal Investigator-Groundnut innovations and groundnut rosette disease to improve livelihoods of Kenyan farmers.

Publications in Journals

1. Njau, S. N., Parker, T. A., Duitama, J., Gepts, P., & **Arunga, E. E**. (**2024**). QTL mapping for pod quality and yield traits in snap bean (Phaseolus vulgaris L.). *Frontiers in Plant Science*, *15*, 1422957.https://doi.org/10.3389/fpls.2024.1422957
2. Masheti, Y., Muthomi, J. W., Muiru, W. M., **Arunga, E. E.**, & Gepts, P. (**2024**). Inoculum sources and management of bean scab caused by *Elsinoë phaseoli*. *Journal of Phytopathology*, *172*(4), e13355.
3. Masheti, Y. O., Muthomi, J. W., Muiru, W. M., **Arunga, E. E**., & Gepts, P. (**2024**). Identification of Elsinoë phaseoli causing bean scab in Kenya and evaluation of sporulation using five adapted techniques. *Journal of Phytopathology*, *172*(3), e13343. https://onlinelibrary.wiley.com/doi/10.1111/jph.13343?af=R
4. Masheti, Y. O., Muthomi, J. W., Muiru, W. M., **Arunga, E. E.**, & Gepts, P. (**2024**). First report of *Elsinoë phaseoli* causing scab of common beans in Kenya. *New Disease Reports*, *49*(2), e12268.
5. Watare, G. W., Gichimu, B. M., & **Arunga, E. E. (2023)**. Host plant resistance to bean common mosaic necrosis virus among snap bean cultivars in Kenya. *Journal of Plant Protection Research*.
6. Wafula, B. W., **Arunga, E. E**., & Rotich, F. (**2023**). Prevalence and Host Resistance to Common Bean Rust Disease in Western and Central Kenya. *International Journal of Agronomy*, *2023*.
7. Misango, S., Otsyula, R., & **Arunga, E. E. (2022)**. Resistance to *Pythium* root rot and anthracnose among Kenyan common bean genotypes and marker-assisted introgression of resistance genes. *Journal of Crop Improvement*, 1-21.
8. Parker, T. A., Cetz, J., de Sousa, L. L., Kuzay, S., Lo, S., Floriani, T. O., Njau, S., **Arunga, E.**, Duitama, J., Jernstedt, J., Myers, J. R., Llaca, V., Herrera-Estrella, A. & Gepts, P. **(2022**). Loss of pod strings in common bean is associated with gene duplication, retrotransposon insertion, and overexpression of PvIND. *New Phytologist*, 235(6): 2454-2465.
9. Kamiri, A.K., **Arunga, E.E.**, Rotich, F. & Otsyula, R. (**2021**). Response of French bean genotypes to *Colletotrichum lindemuthianum* and evaluation of their resistance using SCAR markers. *African Journal of Biotechnology*, 20(2): 51-65.

10. Wasonga, M. A., **Arunga, E. E.**, Neondo, J. O., Muli, J. K., Kamau, P. K., & Budambula, N. L. (**2020**). A hybridization technique for orphan legumes: development of an artificial interspecific pollination protocol for Crotalaria Spp. *Journal of Crop Improvement*, 35(2), 264-275.
11. Nderitu, P.W., Jonsson, M., **Arunga, E.**, Otieno, M., Jamleck Muturi, J., & Wafula, G. O. **(2020)**. Combining Host Plant Resistance, Selective Insecticides, and Biological Control Agents for Integrated Management of *Tuta absoluta*. *Advances in Agriculture*, https://doi.org/10.1155/2020/6239491.
12. **Arunga, E. E.**, & Odikara, O. S. (**2020**). Characterization of Kenyan French Bean genotypes into gene pool affiliations using allele specific markers. *African Journal of Biotechnology*, 19(9), 653-660.
13. Ndwiga, B. W., **Arunga, E.E.** & Ng'etich, F.K. (**2019**). Economic Assessment of Napier Grass Production Using Different Fertilizer Combinations under Smallholder Farming Conditions in the Central Highlands of Kenya. *International Journal of Plant & Soil Science*, 29(5), 1-6.
14. Kiptoo, G. J., **Arunga, E. E.**, & Kimno, S. K. (**2018**). Evaluation of French Bean (Phaseolus vulgaris L.) Varieties for Resistance to Anthracnose. *Journal of Experimental Agriculture International*, 27(4), 1-7.
15. Nderitu, W. P., J.J. Muturi, Otieno, M., **Arunga, E.E.**, Johnsson, M. **(2018)**. Tomato Leaf miner (*Tuta absoluta*) (Meyrick 1917) (Lepidoptera: Gelechiidae) prevalence and farmer management practices in Kirinyanga County, Kenya. *Journal of Entomology and Nematology*, Vol. 10(6),pp.43-49.
16. Miller, T., Gepts, P., Kimno, S., **Arunga, E.E**, Chilagane, A.L., Nchimbi-Msolla, S., Namusoke, A., Namayanja, A., Rezene, T.Y. **(2018**). Alternative markers linked to the Phg-2 angular leaf spot resistance locus in common bean using the Phaseolus genes marker database. *African Journal of Biotechnology* 17(26):818-828.
17. Rezene Y., Tesfaye, K., Mukankusi, C. **Arunga, E.E** & Gepts, P. (**2018**). Simple and rapid detached leaf technique for screening common beans (*Phaseolus vulgaris L.*) in vitro against angular leaf spot (*Pseudocercospora griseola*) disease. *African Journal of Biotechnology* 17(35):1076-1081.

18. Mogita, G.W., Ochuodho, J.O., Gohole, L.S., **Arunga, E.E.** & Makumba, B. (2017). Incidence of bean anthracnose in Western Kenya and its management using aqueous extract of Aloe vera. *African Journal of Education, Science and Technology* 3: 6-12.
19. Kimno, S.K., Kiplagat, O.K., Arunga, E.E., and Chepkoech, E. (**2016**). Evaluation of Selected French Bean (*Phaseolus vulgaris L.*) Genotypes for Resistance to Angular Leaf Spot (*Pseudocercospora griseola*) in Western Kenya. *American Journal of Experimental Agriculture* 13(4): 1-6.
20. **Arunga, E. E.** , Ochuodho, J.O., Kinyua, M.G., Owuoche, J.O. and Chepkoech, E. (**2015**). Genetic diversity of determinate French beans grown in Kenya based on morpho-agronomic and simple sequence repeat variation. *Journal of Plant Breeding and Crop Science*. 7(8):240-250.
21. Chepkoech E., Kinyua M., Kiplagat O., **Arunga E.E** and Kimno S. (**2015**). Genetic Diversity of Cassava Mutants, Hybrids and Landraces using Simple Sequence Repeat Markers. *American Journal of Experimental Agriculture* 5(4): 287-294.
22. **Arunga, E.E.**, Ochuodho, J.O., Kinyua, M.G. and Owuoche, J.O. (**2012**). Characterization of Uromyces appendiculatus isolates collected from snap bean growing areas in Kenya. *African Journal of Agricultural Research* 7: 5685-5691.
23. **Arunga, E.E.**, Van Rheenen H.A and Owuoche J. O. (**2010**). Diallel analysis of snap bean (Phaseolus vulgaris L.) varieties for important traits. *African Journal of Agricultural Research* 5(15):1951-1957.

Presentation of Papers at Academic and Professional Conferences

1. Nderitu W. P., Wafula, G.O., Otieno, M., Muturi, J.J. & **Arunga E. (2019)**. Tomato Leaf Miner (*Tuta Absoluta*) Incidence and Severity in Kirinyaga County, Kenya. In: Muange, E., Wekesa, D. and Mbithe, D.S. *Proceedings of the 2nd Annual International Conference on Supporting Green Growth and Knowledge Economy through Research, Innovation and Technology for Sustainable Development* (pp 73–82). Machakos University, Machakos, Kenya.
2. Odikara, S. and **Arunga, E.E. (2019)**. Characterization of French Beans Based on Phaseolin Protein and Indel Spanning Molecular Markers. Paper presentation in the 13th Multidisciplinary International Conference held on 19th–21st June 2019, Masinde Muliro University of Science and Technology,

Kenya. Conference Theme: "Transformational Leadership, Innovation and Technology Transfer for Sustainable Development in Developing Countries".

3. **Arunga E.E.**, Ochuodho, J., Woyengo, V.W. & Owuoche, J. (**2018**). Incidence and Prevalence of Groundnut Diseases in Western Kenya. Paper presented at the 3rd Kibabii University International Conference, 12th – 14th June.
4. **Arunga, E.E** and Stephen, K.K. (**2015**). Introgression of angular leaf spot resistance to French beans adapted to Kenyan environment using molecular markers. Poster presentation at the Common Bean Disease Workshop on Angular Leafspot and Root Rot, Skukuza, South Africa, 20th -23rd July.
5. **Arunga, E.E**., Eleba, W., Danso, K. and Obare, J.I. (2014). Sensitivity of Lablab (Lablab purpureus L.) to Gamma Irradiation and Ethyl Methane Sulphonate. Paper presented at the 2nd Technical University of Kenya- Science Technology Innovation Research Conference: Nairobi, 24th to 27th June.
6. **Arunga, E.E.**, Ochuodho, J.O., Kinyua, M.G, Chepkoech and Karanja, D.K. (2013). Screening for bean rust resistance in French bean grown in Kenya. International Journal of Agribusiness, Innovations and Rural development 1:15-26. Paper presented at the Mount Kenya University First Annual Academic Conference and Agricultural Field Day, Kitale Kenya. 26th – 28th September.
7. Chepkoech, E., Kiplagat, O., Kinyua, G., **Arunga, E.E.**, and Kimno, S. (2013). Potato breeding potential to resistance to bacterial wilt (Ralstonia solanacearum) in Kenya. Paper presented at the 11th African Crop Science Society Conference, Entebbe, Uganda, 13th -17th October.
8. Chepkoech, E., Kiplagat, O., Kinyua, G., **Arunga, E.E.**, and Kimno, S. (2013). Genetic diversity of cassava mutants, hybrids and landraces based on morphological and microsatellite markers. Paper presented at the 1st international and interdisplinary conference held at University of Eldoret, Kenya, 3rd – 5th September
9. **Arunga, E.E.**, Ochuodho, J.O., Kinyua, M.G. and Owuoche, J.O. (2012). Characterization of Uromyces appendiculatus isolates collected from snap bean growing areas in Kenya. Poster presentation at IV international Conference on Legume Genetics and Genomics Conference, Hyderabad, India. 2nd – 7th October.

10. **Arunga, E.E.**, Kinyua, G. M. and Ochuodho, O. J. (2010). Application of Scar Markers for Breeding against Bean Rust in French bean. Paper presented at the Moi University 6th Annual International Conference, Eldoret, Kenya. 7th – 11th September.
11. **Arunga, E.E.**, Rao, B.S., Omega, B. and Rheenen, H.A. van (2008). Multilocational Trials of Advanced French bean (Phaseolus vulgaris) Breeding Material. Proceedings of 4th Annual International Conference, Moi University pp 21-27.
12. **Arunga, E.E.**, Angima, R. and Rheenen, H.A. van (2008). The Effect of Location on Seed Quality of French bean (Phaseolus vulgaris). Paper presented at the Moi University 4th Annual International Conference, Eldoret, Kenya. 29th – 1st July.