

Curriculum Vitae

Phetole Mangena

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African Scientists Directorate: <https://africanscientists.africa/business-directory/mangena/>

INTERESTS

Genetic manipulation of legume crops via modern biotechnology tools such as mutagenesis, polyploidisation and recombinant DNA technology. Plant responses to abiotic stresses, namely: salinity and drought stress. *In vitro* regeneration of plants via plant tissue culture. Metabolic and proteomic analyses in plants.

QUALIFICATIONS

- [1] Doctor of Philosophy (Botany)
- [2] Master of Science (Botany)
- [3] Bachelor of Science Honours (Botany)
- [4] Bachelor of Science (Major courses: Botany, Biochemistry, Biotechnology and Microbiology)
- [5] Postgraduate Diploma in Higher Education (**Durban University of Technology- Ongoing**)

Institution: University of Limpopo, Republic of South Africa

Field of Specialization: Plant Physiology and Biotechnology

SPECIALISED COURSES

- [1] Assessor course. Accredited by Education, Training and Development Practices Sector Education and Training Authority. US Code: 115753. Endorsement no: US18128.
- [2] Moderator course. Accredited by Education, Training and Development Practices Sector Education and Training Authority. US Code: 115759. Endorsement no: US143407.
- [3] Strengthening Postgraduate Supervision Course. Rhodes University 2019.
- [4] Appointed and trained as a First Aider (FIRST AID LEVEL 2). Effective from 2017 until April 2020.
- [5] Training in Handling and Safety of Hazardous Materials in the Laboratory (2015). Skills on handling and safety management, including disposal of safe and hazardous chemicals.
- [6] Information and Communication Technology Academic Computing Support (August- September 2010). Successfully completed a short course in Microsoft programs entailing Word, Excel and Power Point. Research Development and Administration Postgraduate Course (2011).
- [7] Postgraduate course presented by the Research Office, focussing on Soft Skills Management, Research Methodologies, Proposal and Theses Writing, and Induction to Research at UL.

HONORS AND AWARDS

- 2019- National Research Foundation (RSA) **Research Excellence Award for Next Generation Researchers.**
2019- University of Limpopo, Faculty of Science and Agriculture **Ambassador Award.**
2018- National Competitions in Science- **1st Prize Winner: The Innovation Hub GAP Bioscience Competition.**
2017- New Generation of Academics Programme (nGAP)- National Research and Innovation, Department of Higher Education and Training Staff Development Grant.

2015- Awarded the National Research Foundation-Department of Science and Technology (RSA) **Innovation Doctoral Scholarship.**

2009-2011- Awarded as the Best Student for Undergraduate and Postgraduate Honours in Botany from 2009-2011 by the department of Biodiversity, School of Molecular and Life Sciences, Faculty of Science and Agriculture, University of Limpopo.

RESEARCH FUNDING/GRANT AWARDS

2021- Thuthuka National Research Foundation Grant. Amount: **300.000 ZAR**

2018- Awarded the University of Limpopo Niche Grant for Upcoming Researchers. Amount: **50.000 ZAR**

TEACHING AND RESEARCH EXPERIENCE

Undergraduate and Postgraduate Senior Lecturer/Instructor- *University of Limpopo* **January 2017 - Present**

- Lecture planning and designing of module outlines.
- Preparation and facilitation of lectures and practical sessions.
- Research and supervision of students.
- Invigilating tests and examinations.
- Conducting general administrative work.
- Organising field work and excursion for students.

Senior Laboratory Assistant- *University of Limpopo* **April 2015 – December 2016**

- Good maintenance of the laboratory, purchase of consumables and equipment.
- Preparing and conducting laboratory practical for undergraduate botany modules (extended curriculum programme and mainstream- 1st, 2nd and 3rd level).
- Invigilating tests and examinations.
- General administrative work.

Graduate Research Assistant- *University of Limpopo* **February 2014 – February 2016**

- Contribute to multi-disciplinary projects conducted by various researchers in the department.
 - Help design and execute small-scale testing to validate chosen research designs for anticipated projects.
 - Collaborate and coordinate research information with departmental staff and fellow graduate students across the department.
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MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

[1] The South African Association of Botanists, Member: 2015 – present.

[2] International Society for Horticultural Sciences, Member (109614): 2019 – present.

[3] Former Member of the Southern African Environmental Observation Network- Graduate Student Network (SAEON-GSN).

[4] Former Workshop Facilitator for the African Religion Culture and Health Forum (ARCH Forum) (2016-2018).

LIST OF PUBLICATIONS

PEER-REVIEWED JOURNAL ARTICLES

[1] **Phetole Mangena.** Analysis of correlation between seed vigour, germination and multiple shoot induction in soybean (*Glycine max* L. Merr.). *Heliyon* **2021.** 7(9), e07913, 1-8. <https://doi.org/10.1016/j.heliyon.2021.e07913>

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- [2] **Phetole Mangena.** Germination, morphological and physiological evaluation of seedlings pretreated with colchicine in soybean (*Glycine max* L). *Walailak Journal of Science and Technology* **2021**. 18(18), 9489, 1–12. <https://doi.org/10.48048/wjst.2021.9489>
- [3] **Phetole Mangena.** Effect of Agrobacterium co-cultivation stage on explant response for subsequent genetic transformation in soybean (*Glycine max* L. Merr. *Plant Science Today* **2021**. 8(4): 905–911. <https://doi.org/10.14719/pst.2021.8.4.1363>
- [4] **Phetole Mangena.** Effect of water stress on growth responses of soybean plants pretreated with colchicine. *Acta Horticulturae* **2021**. 1327, 121–128.
- [5] **Phetole Mangena.** Synthetic seeds and their role in agriculture: status and progress in sub-Saharan Africa. *Plant Science Today* **2021**. 8(2): 1–8. <http://dx.doi.org/10.14719/pst.2021.8.2.1116>
- [6] Phumzile Mkhize, **Phetole Mangena.** Enzyme-linked immunosorbent assay (ELISA) based detection of *Fusarium circinatum* for alleviation of pine seedlings wilt. *Journal of Biotech Research* **2021**. 12: 83–92. <http://www.btsjournals.com/assets/2021v12p83-92.pdf>
- [7] **Phetole Mangena.** Potential role of somatic embryo-generated synthetic seed production on mass propagation of recalcitrant grain legume crops in Sub-Saharan Africa – A review article. *International Journal of Agricultural Technology* **2021**. 17(3), 959–976.
- [8] **Phetole Mangena.** Influence of Hormonal Seed Priming on Growth, Physiological and Biochemical Parameters of Soybeans [*Glycine max* (L.) Merr.] Grown Under High Salinity Stress Condition. *International Journal of Agronomy* **2020**. Article ID 8847098, 1–5. <https://doi.org/10.1155/2020/8847098>
- [9] **Phetole Mangena.** Effect of hormonal seed priming on germination, growth, yield and biomass allocation in soybean grown under induced drought stress [*Glycine max* (L.) Merr.]. *Indian Journal of Agricultural Research* **2020**. 54(5): 592–598. <https://doi.org/10.18805/IJArE.A-441>
- [10] **Phetole Mangena.** Germination and Morpho-Physiological Analysis of Seedlings Pre-Treated with Different Concentrations of Colchicine in Soybean [*Glycine max* (L.) Merr.]. *Journal of Biotech Research* **2020**. 11: 111–121. <http://www.btsjournals.com/current-issue.html>
- [11] **Phetole Mangena.** *In vivo* and *in vitro* application of colchicine on germination and shoot proliferation in soybean [*Glycine max* (L.) Merr.]. *Asian Journal of Crop Science* **2020**, 12: 34- 42. <https://doi.org/10.3923/ajcs.2020.34.42>
- [12] **Phetole Mangena.** Benzyl adenine in plant tissue culture- succinct analysis of the overall influence in soybean [*Glycine max* (L.) Merrill.] seed and shoot culture establishment. *Journal of Biotech Research* **2020**, 11: 23-34. <http://www.btsjournals.com/current-issue.html>
- [13] **Phetole Mangena.** Phytocystatins and their Potential Application in the Development of Drought Tolerance Plants in Soybeans (*Glycine max* L.). *Protein & Peptide Letters* **2020**, 27(2): 135-144. <https://doi.org/10.2174/0929866526666191014125453>
- [14] Phumzile Mkhize & **Phetole Mangena.** ELISA-based development of functional antibodies for the efficient detection of mycotoxigenic *Fusarium* (*F. oxysporum* and *F. circinatum*) and *Diplodia* (*D. pinea*) species. *American J Biochemistry and Biotechnology* **2020**, 16(4): 529–537. <http://doi.org/10.3844/ajbbsp.2020.529.537>
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- [15] **Phetole Mangena**. A simplified in-planta genetic transformation in soybean. *Research Journal of Biotechnology* **2019**, 14(9): 117–125. Available at www.worldresearcherassociations.com/biotech/16.pdf
- [16] **Phetole Mangena** & Phatlane W Mokwala. The influence of seed viability on the germination and *in vitro* multiple shoot regeneration of soybean (*Glycine max* L.). *Agriculture* **2019**, 9 (35): 1-12. <https://doi.org/10.3390/agriculture9020035>
- [17] **Phetole Mangena**, Phatlane W Mokwala. Evaluation of Total Protein Profiles Using 1-D and 2-D Gel Electrophoresis on Soybean Cotyledonary Node Explants Infected with *Agrobacterium tumefaciens* in Soybean [*Glycine max* (L.) Merr.]. *Journal of Applied Biological Sciences* **2019**, 13 (2): 103-107. <http://www.jabsonline.org/index.php/jabs/article/view/611>
- [18] Mogotlane Emmanuel Alpheus, Phatlane William Mokwala & **Phetole Mangena**. Comparative analysis of the chemical compositions of indigenous watermelon (*Citrullus lanatus*) seeds from two districts in Limpopo province, South Africa. *African Journal of Biotechnology* **2018**, 17(32): 1001-1006. <https://doi.org/10.5897/AJB2018.16552>
- [19] **Phetole Mangena**, Phatlane W Mokwala & Roumiana V Nikolova. *In vitro* multiple shoot induction soybean. *International Journal of Agriculture and Biology* **2015**, 17: 838-842. <https://doi.org/10.17957/IJAB/14.0006>

BOOKS

- [1] Phetole Mangena. *Plant Transformation via Agrobacterium Tumefaciens: Culture Conditions, Recalcitrance and Advances in Soybean*. CRC Press/ Taylor & Francis ISBN: 978-1032-250-372 **Forthcoming 2022**.
- [2] **Phetole Mangena**. *Advances in Legume Research: Physiological Responses and Genetic Improvement for Stress Resistance*. Bentham Sciences ISBN: 978-981-14-7960-1/ eISBN: 978-981-14-7962-5. <https://benthambooks.com/book/9789811479625/>

PEER-REVIEWED CHAPTERS IN BOOKS

- [1] **Phetole Mangena**, Phumzile Mkhize. Analysis of cross-reactivity, specificity and the use of optimised ELISA for rapid detection of *Fusarium* spp. In Khan MS (Eds), *Frontiers in Molecular Pharming, Frontiers in Protein and Peptide Letters* (Vol 2). Bentham Books, Singapore. **2021**. <http://dx.doi.org/10.2174/9789815036663121020010>
- [2] **Phetole Mangena**. Genetic Transformation to Confer Drought Stress Tolerance in Soybean (*Glycine max* L.). In book: *Sustainable Agriculture Reviews 45*, Book edited by Guleria P., Kumar V., Lichtfouse E. Springer Nature, Cham **2020**. https://doi.org/10.1007/978-3-030-53017-4_10
- [3] **Phetole Mangena**. The Role of Plant Genotype, Culture Medium and *Agrobacterium* on Soybean Plantlets Regeneration during Genetic Transformation. In book: *Transgenic Crops*, Book edited by Muhammad Sarwar Khan. Intech open, London, UK **2018**. <https://doi.org/10.5772/intechopen.78773>
- [4] **Phetole Mangena**, Phatlane W Mokwala. Introductory Chapter. In book: *Pollination in Plants*, Book edited by Phatlane William Mokwala. Intech open, London, UK **2018**. <https://doi.org/10.5772/intechopen.71901>
- [5] **Phetole Mangena**. Water Stress: Morphological and Anatomical Changes in Soybean (*Glycine max* L.) Plants. In book: *Plant, Abiotic Stress and Responses to Climate Change*, Book edited by Violeta Andjelkovic. Intech open, London, UK **2018**. <https://doi.org/10.5772/intechopen.72899>
- [6] **Phetole Mangena**, Phatlane W Mokwala, Roumiana V Nikolova. Challenges of *In Vitro* and *In Vivo* *Agrobacterium*-Mediated Genetic Transformation in Soybean. In book: *Soybean - The Basis of Yield, Biomass and Productivity*, Book edited by Minobu Kasai. Intech open, London, UK **2017**. <https://doi.org/10.5772/66708>

CONFERENCE PRESENTATIONS (ORAL OR POSTER)

- [1] **Oral Talk:** 4th International Symposium on Horticulture in Europe, 8–11 March 2021. Annual Convention of the German Society for Horticultural Science. International Society of Horticultural Sciences (ISHS).
- [2] **Oral Talk:** South African Association of Botanists, January 2020. Department of Botany, University of Free State, Qwaqwa campus. Free State Province.
- [3] **Oral Talk:** South African Association of Botanists, January 2017, The Department of Biodiversity and Conservation Biology of the University of the Western Cape (UWC) and The Department of Conservation and Marine Sciences of the Cape Peninsula University of Technology (CPUT), Western Cape Province, Cape Town.
- [4] **Oral Talk:** South African Association of Botanists, January 2016, University of Free State, Bloemfontein. South Africa. 42nd Annual Conference, Biodiversity: Past, Present, Future.
- [5] **Oral Talk:** XXth AETFAT Congress, University of Stellenbosch, South Africa. Biodiversity of African Plants: Challenges in a Changing World.
- [6] **Oral Talk:** South African Association of Botanists, January 2013, University of KwaZulu-Natal. South Africa. “Green is Gold”, celebrating the economic and scientific value of plant diversity to South Africa.
- [7] **Oral Talk:** University of Limpopo: Faculty of Science and Agriculture Research Day, 2012.

PROFESSIONAL SERVICE AND EXTERNAL REVIEW

Editorship Positions

- [1] **Editor and Fellow-** Research Journal of BioTechnology (World Researchers Association)
- [2] **Editorial Board Member-** Plant Biotechnology Persa Journal

Assistant Editor

- [1] **Book:** Pollination in Plants. Edited by Dr. Phatlane William Mokwala. Copyright 2018. Print ISBN 978-1-78923-236-3. Online ISBN 978-1-78923-237-0. Co-edited manuscripts submitted for consideration and publication in the book.

Major Grant Proposal Review

- [1] **Dimensions US-South Africa:** Elucidating mechanisms underlying a hyperdiverse radiation of legumes and their symbionts in the Cape Floristic Region Biodiversity Hotspot. Date: May 10, 2019. **NATIONAL SCIENCE FOUNDATION-** Division of Environmental Biology, 2415 Eisenhower Ave., Alexandria, VA 22314

International Journals Reviewer (some of 2020-2021)

- [1] **Journal of Agronomy and Crop Science** (ISSN: 1439-037X). Publisher: Wiley–VCH GmbH.
- [2] **Biologia Plantarum** (ISSN: 0006-3134 (Print) 1573-8264 (Online)). Publisher: Institute of Experimental Botany Academy of Sciences of the Czech Republic, Prague, Czech Republic.
- [3] **Journal of Food and Nutrition Research** (ISSN 1336-8672). National Agriculture and Food Centre, Slovakia.
- [4] **Walailak Journal** (E-ISSN: 2228-835X). Institute of Research and Innovation of Walailak University, Thailand.
- [5] **American Journal of Biochemistry and Biotechnology** (ISSN: 1558-6332 (Online) 1553-3468 (Print)). Publisher: Science Publishers, Dubai, United Arab Emirates.

INSTITUTIONAL SERVICE

Student Supervision

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- [1] **Mukatuni A.** Project title: An investigation on the cause of oxidative stress damage and tissue senescence during explant-agrobacterium interaction in soybean. 2019. Supervisor: **P Mangena**, Co-supervisor: PW Mokwala.
- [2] **Sepale C.S.** Project title: In vitro shoot development and regeneration in soybean cotyledonary node explants treated with colchicine. 2019. Supervisor: **P Mangena**.
- [3] **Mohlasedi R.T.** Project title: physiological and morphological analysis of soybeans polyploidised with colchicine for drought tolerance. Completed 2018. Supervisor: **P Mangena**, Co-supervisor: PW Mokwala.
- [4] **Lutombo L.** Project title: The effects of foliar application of salicylic acid on the response of *Capsicum frutescens* plants under water deficit stress. Completed 2018. Supervisor: Mabulwana TP, Co-supervisor: **P Mangena** and PW Mokwala.
- [5] **Modimola KS.** Project title: Analysis of growth and stability of in vivo developed soybean plants pre-treated with different concentrations of benzyladenine. Completed 2018. Supervisor: PW Mokwala, Co-supervisor: **P Mangena**.
- [6] **Derks S.JS.** Project title: A study of the effects that polyploidisation has on *Citrullus lanatas* (Thunb) Matsum and Nakai. Completed 2017. Supervisor: **P Mangena**, Co-supervisor: PW Mokwala.
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REFERENCES

- [1] Dr Phatlane William Mokwala (Senior Lecturer: University of Limpopo). Email: Phatlane.Mokwala@ul.ac.za
Tel: 015 268-2360.
- [2] Prof Roumiana Vassileva Nikolova (Professor: University of Limpopo). Email: Roumiana.Nikolova@ul.ac.za
Tel: 015 268-2889.
- [3] Mr Frank Nukeri (Lecturer: University of Limpopo). Email: Frankf.Nukeri@ul.ac.za Tel: 015 – 268 – 2871.
- [4] Ms Paseka Tritieth Mabulwana (Lecturer: University of Limpopo). Email: Paseka.Mabulwana@ul.ac.za Tel: 015 268-2871.
- [5] Mrs Helena DuPlessis (Lecturer: University of Limpopo). Email: Helena.duplessis@ul.ac.za Tel: 015 268-2361.
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