

# Barnabas H. Daru, PhD

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## SCHOLARLY PROFILE

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I am passionate about evolutionary biology as my focus has been on characterizing phylogenetic relationships and how this can be translated into phylogenetic diversity for understanding the origin and distribution of biodiversity; and how this understanding can guide conservation decisions. Key focal areas include ecology, distribution modelling, species introductions and extirpations, biodiversity and global climate change, and conservation.

## CURRENT APPOINTMENT

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2018- **Assistant Professor of Biology**, Department of Life Sciences, Texas A&M University Corpus Christi, Texas.

## EDUCATION

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2016-2018 **Postdoctoral Fellow, Harvard University**

Project: Analysis of extinction risk, biotic interactions and spatial trends of phenological diversity using herbarium records.

Faculty Mentor: Charles Davis, Professor of Organismic and Evolutionary Biology and Curator of Vascular Plants in the Harvard University Herbaria.

2012-2015 **Ph.D. in Biology, University of Johannesburg, South Africa**

Dissertation: An evaluation of the phylogenetic diversity of trees in southern Africa.

Faculty Advisor: Prof Michelle van der Bank and Prof T. Jonathan Davies.

2010-2012 **M. Sc. in Biology, University of Johannesburg, South Africa**

Project: Molecular phylogenetics of Alooideae (Asphodelaceae).

Faculty Advisors: Prof Michelle van der Bank and Dr Olivier Maurin

2003-2007 **B.Sc. Hons, University of Jos, Nigeria**

Project: Species diversity of fig wasps in *Ficus* species of Amurum Forest, Nigeria.

## PUBLICATIONS

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(Google Scholar [August 2018]: 33 papers; 14 first-author; Times cited = 500; H-index = 14)

### [2018]

33. **Daru, B.H.**, Park, D.S., Primack, R.B., Willis, C.G., Barrington, D.S., Whitfeld, T.J.S., Seidler, T.G., Sweeney, P.W., Foster, D.R., Ellison, A.M. & Davis, C.C. (2018) Widespread sampling biases in herbaria revealed from large-scale digitization. *New Phytologist* 217: 939-955.
32. **Daru, B.H.**, van der Bank, M. & Davies, T.J. (2018) Unravelling the evolutionary origins of biogeographic assemblages. *Diversity and Distributions* 24: 313-324.

### [2017]

31. **Daru, B.H.**, Elliott, T.L., Park, D.S. & Davies, T.J. (2017) Understanding the processes underpinning patterns of phylogenetic regionalization. *Trends in Ecology and Evolution* 32: 845-860.

30. **Daru, B.H.**, Holt, B.G., Lessard, J.P., Yessoufou, K. & Davies, T.J. (2017) Phylogenetic regionalization of marine plants reveals close evolutionary affinities among disjunct temperate assemblages. *Biological Conservation* 213: 351–356.
29. **Daru, B.H.**, van der Bank, M. & Yessoufou, K. (2017) Testing the reliability of the standard and complementary DNA barcodes for the monocot subfamily Alooideae from South Africa. *Genome* 60: 337–347.
28. Bezeng, B.S., Morales-Castilla, I., van der Bank, M., Yessoufou, K., **Daru, B.H.** & Davies, T.J. (2017) Climate change may reduce the spread of non-native species. *Ecosphere* 8: e01694.
27. Yessoufou, K., **Daru, B.H.**, Elansary, H.O., Rampedi, I. (2017) Integrating biogeography, threat, and evolutionary data to explore extinction on crisis in the taxonomic group of cycads. *Ecology and Evolution* 7: 2735–2746.
26. Bezeng, B.S., Davies, T.J., **Daru, B.H.**, Kabongo, R.M., Maurin, O., Orton, R.D., Yessoufou, K., van der Bank, H. & van der Bank, M. (2017) Ten years of barcoding at the African Centre for DNA barcoding. *Genome* 60: 629–638.

#### [2016]

25. Charles-Dominique, T., Davies, T.J., Hempson, G.P., Bezeng, B.S., **Daru, B.H.**, Kabongo, R.M., Maurin, O., Muasya, A.M., van der Bank, M. & Bond, W.J. (2016) Spiny plants, mammal browsers and the origin of African savannas. *Proceedings of the National Academy of Sciences USA* 113: E5572–E5579.
24. **Daru, B.H.** & le Roux, P.C. (2016) Marine protected areas are insufficient to conserve global marine plant diversity. *Global Ecology and Biogeography* 25: 324–334.
23. **Daru, B.H.**, van der Bank, M., Maurin, O., Yessoufou, K., Schaefer, H., Slingsby, J.A. & Davies, T.J. (2016) A novel phylogenetic regionalization of the phytogeographic zones of southern Africa reveals their hidden evolutionary affinities. *Journal of Biogeography* 43: 155–166.
22. **Daru, B.H.**, Berger, D.K. & van Wyk, A.E. (2016) Opportunities for unlocking the potential of genomics for African trees. *New Phytologist* 210: 772–778.
21. Davies, T.J., **Daru, B.H.**, van der Bank, M., Maurin, O. & Bond, W.J. (2016) Multiple routes underground? Frost alone cannot explain the evolution of underground trees. *New Phytologist* 209: 910–912.

#### [2015]

20. **Daru, B.H.**, van der Bank, M. & Davies, T.J. (2015) Spatial incongruence among hotspots and complementary areas of tree diversity in southern Africa. *Diversity and Distributions* 21: 769–780.
19. Yessoufou, K., **Daru, B.H.** & Muasya, A.M. (2015) Phylogenetic exploration of commonly used medicinal plants in South Africa. *Molecular Ecology Resources* 15: 405–413.
18. Bello, A., **Daru, B.H.**, Stirton, C.H., Chimphango, S.B.M., van der Bank, M., Maurin, O. & Muasya, A.M. (2015) DNA barcoding reveals microevolutionary signals in fire survival and regeneration strategies in southern African Psoraleoid legumes. *AoB PLANTS* 7: plv124.
17. **Daru, B.H.**, Yessoufou, K., Nuttman, C. & Abalaka, J. (2015) A preliminary study of bird use of fig *Ficus* species in Amurum Forest Reserve, Nigeria. *Malimbus* 37: 1–15.

#### [2014]

16. Maurin, O., Davies, T.J., Burrows, J.E., **Daru, B.H.**, Yessoufou, K., Muasya, A.M., Van der Bank, M. & Bond, W.J. (2014) Savanna fire and the origins of the "underground forests" of Africa. *New Phytologist* 204: 201–214.
15. **Daru, B.H.**, Yessoufou, K. & Davies, T.J. (2014) Speculation versus data-driven conclusions: A response to Gereau et al.'s "Phylogenetic patterns of extinction risk: the need for critical application of appropriate datasets". *PeerJ PrePrints* 2: e323v1.

14. Manning, J.C., Boatwright, J.S., **Daru, B.H.**, Maurin, O. & Van der Bank, M. (2014) A molecular phylogeny and classification of Asphodelaceae subfamily Alooideae: towards a resolution of the prickly issue of polyphyly in the Aloooids. *Systematic Botany* 39: 55–74.
13. Yessoufou, K., Bamigboye, S.O., **Daru, B.H.** & Van der Bank, M. (2014) Evidence of constant diversification punctuated by a mass extinction in the African cycad. *Ecology and Evolution* 4: 50–58.
12. Iheanacho, H.E., Njobeh, P.B., Dutton, F.M., Steenkamp, P.A., Steenkamp, L., Mthombeni, J.Q., **Daru, B.H.** & Makun, A.H. (2014) Morphological and molecular identification of filamentous *Aspergillus flavus* and *A. parasiticus* isolated from compound feeds in South Africa. *Food Microbiology* 44: 180–184.
11. Yessoufou, K., Gere, J., **Daru, B.H.** & Van der Bank, M. (2014) Differences in evolutionary history translate into differences in invasion success of alien mammals in South Africa. *Ecology and Evolution* 4: 2115–2123.
10. Manning, J.C., Boatwright, J.S. & **Daru, B.H.** (2014) *Aloe* and goodbye: a new evolutionary classification of the Aloooids. *Alsterworthia International* 14: 7–15.

### [2013]

09. **Daru, B.H.**, Yessoufou, K., Mankga, L.T. & Davies, T.J. (2013) A global trend towards the loss of evolutionarily unique species in mangrove ecosystems. *PLoS ONE* 8: e66686.
08. **Daru, B.H.**, Manning, J.C., Boatwright, J.S., Maurin, O., Maclean, N., Schaefer, H., Kuzmina, M. & Van der Bank, M. (2013) Molecular and morphological analysis of subfamily Alooideae (Asphodelaceae) and the inclusion of *Chortolirion* in *Aloe*. *Taxon* 62: 62–76.
07. Kyalangalilwa, B., Boatwright, J.S., **Daru, B.H.**, Maurin, O. & Van der Bank, M. (2013) Phylogenetic position and revised classification of *Acacia s.l.* (Fabaceae: Mimosoideae) in Africa, including new combinations in *Vachellia* and *Senegalia*. *Botanical Journal of the Linnean Society* 172: 500–523.

### [2012]

06. Yessoufou, K., **Daru, B.H.** & Davies, T.J. (2012) Phylogenetic patterns of extinction risk in the Eastern Arc ecosystems, an African biodiversity hotspot. *PLoS ONE* 7: e47082.
05. Van der Bank, H.F., Greenfield, R., **Daru, B.H.** & Yessoufou, K. (2012) DNA barcoding reveals micro-evolutionary changes and river system-level phylogeographic resolution of seven populations of African silver catfish, *Schilbe intermedius* (Siluriformes, Schilbeidae). *Acta Ichthyologica et Piscatoria* 42: 307–320.
04. Yessoufou, K., Abalaka, J., Van der Bank, M. & **Daru, B.H.** (2012) Fig-frugivore interactions follow a constrained Brownian motion model of evolution in an Important Bird Area, West Africa. *Israel Journal of Ecology and Evolution* 58: 39–51.

### Publications in Peer-Reviewed Book Chapters

03. **Daru, B.H.** & Yessoufou, K. (2016) A search for a single DNA barcode for seagrasses of the world. In: *DNA barcoding in marine perspectives: assessment and conservation of biodiversity* (eds. by S. Trivedi, A.A. Ansari, K.S. Ghosh, H. Rehman), pp. 313–330. Springer International Publishing Switzerland. doi: 10.1007/978-3-319-41840-7\_19
02. Gere, J., Yessoufou, K., **Daru, B.H.**, Mankga, L.T., Maurin, O. & Van der Bank, M. (2013) Incorporating *trnH-psbA* to the core DNA barcodes improves significantly species discrimination within southern African Combretaceae. In: *DNA barcoding: a practical tool for fundamental and applied biodiversity research* (eds. by Z.T. Nagy, T. Backeljau, M. De Meyer, K. Jordaens), ZooKeys 365, pp. 127–147. doi: 10.3897/zookeys.365.5728.
01. Mankga, L.T., Yessoufou, K., Moteetee, A.M., **Daru, B.H.** & Van der Bank, M. (2013) Efficacy of the core DNA barcodes in identifying processed and poorly conserved plant materials commonly used in South African traditional medicine. In: *DNA barcoding: a practical tool for fundamental and applied biodiversity research* (eds. by Z.T. Nagy, T. Backeljau, M. De Meyer, K. Jordaens), ZooKeys 365, pp. 215–233. doi: 10.3897/zookeys.365.5730.

### Manuscripts Under Review

04. Daru, B.H., Bowman, E.A., Pfister, D.H. & Arnold, A.E. Capturing the diversity of endophytic fungi preserved in herbarium specimens. *Philosophical Transactions of the Royal Society B* (under review).
03. Davies, T.J., Daru, B.H., Bezeng, B.S., Charles-Dominique, T., Hempson, G.P., Kabongo, R.M., Maurin, O., Muasya, A.M., van der Bank, M. & Bond, W.J. Savanna tree origins and the paleoenvironment of our hominin ancestors. *Nature Plants* (under review).
02. Daru, B.H., le Roux, P.C., Gopalraj, J., Park, D.S., Holt, B.G. & Greve, M. Addressing the shortfalls in the global protected areas network for safeguarding terrestrial hotspots of evolutionary diversity. *Global Ecology and Biogeography* (under review).
01. Daru, B.H. & Yessoufou, K. Phylogenetically informed delineation of phytogeographic realms of the world. *Botany Letters* (under review).

### Manuscripts in Preparation

03. Daru, B.H. Willis, C.G. & Davis C.C. Widespread homogenization of plant communities in the Anthropocene. Target journal: *Proceedings of the National Academy of Sciences USA* (90% complete in preparation).
02. Daru, B.H., Kling, M., Meineke, E.K. & van Wyk, A.E. The use of herbarium specimens for establishing long-term trends in the flowering phenology of Protea (Proteaceae). Target journal: *Applications in Plant Sciences* (80% complete in preparation).
01. Daru, B.H. & Yessoufou, K. Impact of climate change on the phylogenetic diversity of marine plants. Target journal: *Nature Climate Change* (50% complete in preparation).

### Features on TV, News and Popular Media Sources

05. Reuell, P. "Study uncovers botanical bias", *Harvard Gazette*, December 22, 2017. Available at: <http://tiny.cc/7rfupy>
04. TV interview, "The vital role of seagrasses in marine ecosystems", *WGBH Forum Network Boston*, January 10 (2017). Available at: <http://tiny.cc/cksxiy>
03. Powell, A. "Strong case for seagrass", *Harvard Gazette*, September 15 (2016). Available at: <http://tiny.cc/clxxfy>
02. Chabalala, J. "The thorny side of antelope evolution in Africa", *News24*, September 7 (2016). Available at: <http://tiny.cc/4mxxfy>
01. Barras, C. "Why some trees evolved to live underground", *BBC*, November 3 (2014). Available at: <http://tiny.cc/73y8fy>

## PRESENTATIONS

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### Honorary Lecture at International Conference

**Invited Plenary Speaker**, "Putting phylogenetic biogeography on the map", 21<sup>st</sup> congress of the Association for the Taxonomic Study of the Flora of Tropical Africa (AETFAT), Nairobi Kenya, May 2017 (~300 participants).

### Conference Presentations

- Daru BH et al.** (2018) Sampling biases in herbarium specimens, *Ecological Society of America meeting, New Orleans, USA*.
- Daru BH** (2017) Widespread phylogenetic homogenization in plant communities from anthropogenic change, *Congress of the Southern African Society for Systematic Biologists, Pretoria, South Africa*.
- Daru BH, le Roux PC** (2016) Marine plant diversity hotspots, *International Biogeography Association: The Biogeography of Ecology Special Meeting, Beijing, China*.
- Daru BH, Elliott TL** (2016) Are phylogenies always better at biogeographic regionalization? *The 42<sup>nd</sup> SAAB conference, Bloemfontein, South Africa*.

- Daru BH** (2015) Analysis of climate change on flowering phenology of South African *Protea* (Proteaceae), *The 41<sup>st</sup> SAAB conference, Venda, South Africa.*
- Daru BH**, Holt BG, Lessard JP, Yessoufou K, Davies TJ (2015) Phylogenetic regionalization of seagrasses, *The 41<sup>st</sup> SAAB conference, Venda, South Africa.*
- Daru BH**, van der Bank M, Maurin O, Yessoufou K, Schaefer H, Slingsby J, Davies TJ (2014) A phylogenetic regionalization of the phytogeographic zones of southern Africa, *17<sup>th</sup> Congress of the Society for Conservation GIS, Pacific Grove, California, USA.*
- Daru BH**, van der Bank M, Davies TJ (2014) Tree diversity hotspots in southern Africa, *10<sup>th</sup> Postgraduate Symposium Department of Botany, University of Johannesburg, South Africa.*
- Daru BH**, van der Bank M, Maurin O, Yessoufou K, Schaefer H, Slingsby J, Davies TJ (2014) A phylogenetic reclassification of the phytogeographic zones of southern Africa, *20<sup>th</sup> Congress of the Association for the Taxonomical Study of the Flora of tropical Africa (AETFAT), Stellenbosch, South Africa.*
- Daru BH**, van der Bank M, Maurin O, Yessoufou K, Schaefer H, Davies TJ (2013) A phylogenetic reclassification of the phytogeographic zones of southern Africa, *International Biogeography Association: The Geography of Species Association Special Meeting, Montreal, Canada.*
- Daru BH**, van der Bank M, Maurin O, Yessoufou K, Schaefer H, Davies TJ (2013) A phylogenetic reclassification of the phytogeographic zones of southern Africa, *Ninth Postgraduate Symposium Department of Botany, University of Johannesburg, South Africa.*
- Daru BH**, Yessoufou K, van der Bank M, Davies TJ (2013) Extinction risk in the Eastern Arc flora, *39<sup>th</sup> SAAB conference, Drakensberg, South Africa.*
- Daru BH**, Manning JC, Boatwright JS, Maurin O, van der Bank M (2012). Phylogeny of the subfamily Alooideae (Asphodelaceae), *Congress of Southern African Society for Systematic Biology (SASSB), Arniston, Cape Town, South Africa.*
- Moderator:** DNA barcoding Webinar (2011): All-taxon biodiversity inventory projects at the African Centre for DNA Barcoding. Presented by Prof Michelle van der Bank.
- Daru BH**, Maurin O, Maclean N, Bayer MB, van der Bank M (2011). Molecular phylogeny of *Haworthia* (Asphodelaceae): evidence from plastid and nuclear DNA sequences, *Congress of Southern African Society for Systematic Biology (SASSB), Rhodes University, South Africa.*
- Daru BH**, Tilahun D, Osei-Bonsu I, Tambal R (2009). Does isolation influence herbivory, seed set and flower visits in the spread of *Lantana camara*? A test in Kibale, Uganda, *Conference of Nigerian Tropical Biology Association (NTBA), University of Ibadan, Nigeria.*
- Daru BH** (2007). Species diversity and abundance of fig wasps in *Ficus umbellata* and *F. exasperata*, *Conference of the Ecological Society of Nigeria (EcSN) Jos, Nigeria.*

## Posters

- Daru BH**, Park DS, Willis CG, Kennedy J, Davis CC (2016) Assessing fine-scale sampling bias in herbarium specimens, *Botanical Society of America, Savannah Georgia, USA.*
- Daru BH**, van der Bank M, Davies TJ (2015) A molecular phylogenetic analysis of tree diversity hotspots in southern Africa, *35<sup>th</sup> New Phytologist Symposium. The genomes of forest trees: new frontiers of forest biology Harvard University, USA.*
- Daru BH**, Yessoufou K, Boatwright JS, van der Bank M (2012). Ecological factors shaping distribution of *Lachnaea* spp. (Thymelaeaceae), *Spring Science Poster Competition by the Royal Society of South Africa, Johannesburg, South Africa.*
- Daru BH**, Mwansat GS, Abalaka J, Imandeh GN (2008). Species diversity and abundance of fig wasps in *Ficus* species of Amurum Forest Reserve, Nigeria (Poster Presentation), *Students Conference on Conservation Science (SCCS), University of Cambridge, UK.*

## TEACHING AND ADVISING EXPERIENCE

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### TEACHING

**Assistant Professor**, Department of Plant Science, University of Pretoria, South Africa (2014-16)

- **MLB 133**, Student evaluations 4.5 (out of 5.0). Molecular and Cell Biology (400 students)
- **MLB 143**, Student evaluations 4.3 (out of 5.0). Molecular and Cell Biology (400 students)

**Instructor**, R for Phylogenetics and Spatial Ecology, African Centre for DNA Barcoding, University of Johannesburg. 2011. 10 students

**Tutor**, Plant Diversity (BOT 1B), University of Johannesburg, South Africa. 200 students. I teaching assistant for practical on herbarium specimens. 2010-14.

**General Biology Instructor**: Comprehensive Grammar Secondary School Ogbooro, Oyo State, Nigeria (as part of National Youth Service Corp; NYSC). 2008/9

#### Invited Seminar

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| 2018 | Yale University, Department of Ecology and Evolutionary Biology.      |
| 2018 | Texas A&M University Corpus-Christi, Department of Life Sciences.     |
| 2018 | University of Central Oklahoma, Biology Department.                   |
| 2017 | Harvard University Herbaria Seminar Series.                           |
| 2017 | Arnold Arboretum of Harvard University Seminar Series.                |
| 2017 | Postdoctoral Science Café of Harvard University Seminar Series.       |
| 2017 | University of Pennsylvania, Department of Biology.                    |
| 2017 | Harvard University Herbaria Seminar Series.                           |
| 2016 | Harvard University, Conservation Biology.                             |
| 2014 | Harvard University, Department of Organismic and Evolutionary Biology |
| 2014 | University of California, Berkeley, Department of Integrative Biology |
| 2014 | University of Pretoria, South Africa, Department of Plant Science     |
| 2014 | A. P. Leventis Ornithological Research Institute Jos, Nigeria         |
| 2013 | University of Pretoria, South Africa, Department of Plant Science     |

#### ADVISING

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| 2015-present | Samantha-Leigh Jamison, MSc in Plant Science, University of Pretoria. |
| 2015-present | Sydney Ramulifho, MSc in Botany, University of Johannesburg.          |
| 2015-15      | David Bower, BSc Hons, University of Pretoria.                        |
| 2013-14      | Lesiba Papo, BSc Hons, University of Johannesburg.                    |
| 2013-14      | Babatunde S. Ojelade, BSc Hons, University of Johannesburg.           |

## FELLOWSHIPS, GRANTS, AND AWARDS

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### Fellowships

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| 2016 | <b>Harvard University Herbaria Postdoctoral Fellowship \$135,000.</b>  |
| 2014 | <b>South African NRF-DST Innovation Doctoral Fellowship \$8200:</b> National Research Foundation (NRF) and Department of Science and Technology (DST)'s doctoral fellowship merit award. |

### Grants

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| 2016 | <b>South African National Research Foundation Thuthuka grant \$9300</b> to sequence the transcriptomes for Mangrove Plant <i>Lumnitzera racemosa</i> .   |
| 2015 | <b>Genome Research Grant \$4500</b> from Genome Research Institute, University of Pretoria, South Africa for project to sequence transcriptomes of Mangrove Plant <i>Lumnitzera racemosa</i> . |

## Academic Recognition

- 2015 **Winner – New Phytologist Poster Prize \$150** at the 35<sup>th</sup> New Phytologist Symposium: The genomes of forest trees: new frontiers of forest biology, Harvard University, USA.
- 2014 **Best PhD Oral Presentation** (gold medal) at the 10<sup>th</sup> Annual Symposium, Department of Botany and Plant Biotechnology, University of Johannesburg, South Africa.
- 2013 **Best PhD Oral Presentation** (gold medal) at the 9<sup>th</sup> Annual Symposium, Department of Botany and Plant Biotechnology, University of Johannesburg, South Africa.
- 2012 **Third Best Poster \$41** at the Royal Society of South Africa Spring Science Poster Competition, Delta Environmental Centre, Johannesburg, South Africa.
- 2011 **Best Oral presentation by a MSc student \$164** at the congress of Southern African Society for Systematic Biology (SASSB) 2011, Rhodes University, South Africa.

## Travel Grants

- 2014 **South African National Research Foundation Travel Grant to California, USA (\$3000):** To attend the 17<sup>th</sup> Conference of the Society for Conservation GIS in Pacific Grove, California, USA.

## Additional Support

- 2010 **Royal Society of London/National Research Foundation Bursary:** Merit postgraduate scholarship for Masters in Botany and Plant Biotechnology, University of Johannesburg, South Africa.
- 2008 **Tropical Biology Association (TBA) Scholarship:** Full scholarship with which I participated on the 2008 TBA field course in Kibale Forest, Uganda.
- 2003 **Nigerian National Petroleum Corporation (NNPC)/TOTAL ELF Petroleum Undergraduate scholarship (\$1912):** Full merit undergraduate scholarship by NNPC/TOTAL Petroleum. University of Jos Nigeria.

## PROFESSIONAL SERVICE

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### Guest Editor for Scientific Journal

Guest Editor for: *Philosophical Transactions of the Royal Society B* for a theme issue: "Museum Specimens as a Roadmap for Understanding Biodiversity in the Anthropocene" (2017-date).

### Peer-Review Services for Scientific Journals

Reviewer for: *Diversity and Distributions*, *Molecular Ecology*, *Molecular Ecology Resources*, *South African Journal of Botany*, *Journal of Biogeography*, *Tropical Ecology*, *Phytotaxa*, and *Botany Letters*.

### Professional Affiliation

- 2016- Botanical Society of America
- 2014- Society for Conservation GIS (geographic information systems)
- 2014- International Biogeography Society
- 2013- Southern African Association of Botanists
- 2010- Southern African Society for Systematic Biologists
- 2008- Tropical Biology Association, Cambridge UK
- 2007- Nigerian Conservation Foundation
- 2007- Ecological Society of Nigeria.

## Service

2013-16 Website Manager, South African Association of Botanists ([www.sabotany.co.za](http://www.sabotany.co.za))

## PROFESSIONAL DEVELOPMENT

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- 2016 Royal Society Discussion Meeting: *New trends in evolutionary biology: biological, philosophical and social science perspectives*. The Royal Society House, London, UK.
- 2015 Certificate of participation in African Forest Forum training workshop on *African Forestry Experts on Forest Related International Agreements*, Mombasa, Kenya.
- 2014 Certificate in *Working with Geodatabase Topology*, advanced GIS course at Asilomar Conference Grounds, California, USA.
- 2012 Advanced GIS analytic course at the University of Johannesburg, South Africa.
- 2012 Toyota Enviro Outreach plant samples collection, Cape Floristic Region, South Africa.
- 2012 Advanced R statistics course in Ecology, University of Sheffield, UK.
- 2011 Toyota Enviro Outreach plant samples collection, Maputaland biodiversity hotspot.
- 2011 R workshop in Phylogenetics and Spatial Ecology, University of Cape Town, South Africa.
- 2009 Introduction to R in Ecology, A. P. Leventis Ornithological Research Institute, Nigeria.
- 2008 Introductory Course on Molecular Ecology/DNA Barcoding at Imperial College London, UK.
- 2008 Tropical Biology Association (TBA) Field course (08/2) in Kibale Forest, Uganda.