

## **PROF. KIPLAGAT KOTUT**

**Name:** Professor Kiplagat Kotut

**Title/Qualification:** PhD

**Position:** Deputy Vice Chancellor (Academic, Research & Extension)

**Area of Specialization:** Plant Ecology, Phytoplankton Ecology

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### **Publications in Journals:**

1. Mbatha, A., Githaiga, M. N., **Kiplagat, K.**, Kairo, J., & Mungai, F. (2022). How Sustainable is Mangrove Harvesting in Lamu? An Analysis of Forest Structure. *Journal of Sustainable Forestry*, 1-20. <https://doi.org/10.1080/10549811.2022.2123357>
2. Koskei EC., **Kotut K.**, Nyaga J. & Oduor SO., (2019). Temporal variation in physico-chemical characteristics, phytoplankton composition and biomass in Lake Solai, Kenya. *International Journal of Aquatic Science*. Vol 10 issue 2, 101-111.
3. Kairu A., Upton C., Huxhamc M. ,**K. Kotut.**, Mbechee R., and Kairo J. (2017). From Shiny Shoes to Muddy Reality: Understanding How Meso-State Actors Negotiate the Implementation Gap in Participatory Forest Management. *Society & Natural Resources* Vol. 0 , Iss. 0,0. <https://doi.org/10.1080/08941920.2017.1382628>
4. Luo W., H. Li, **K. Kotut** and L. Krienitz (2017). Molecular diversity of plankton in a tropical crater lake switching from hyposaline to subsaline conditions: Lake Oloidien, Kenya. *Hydrobiologia* 788:205-229.
5. Mutiga M. I., P.K. Muoria, **K. Kotut** and H.W. Karuri (2016). Behavioural Patterns and Responses to Human Disturbances of Wild Somali Ostriches (*Struthio molybdophanes*) in Samburu, Kenya. *International Journal of Advanced Research* 4(8): 495-502.
6. Krienitz L., C. Bock, P.K. Pawan, K. Dadheech, **K. Kotut**, W.Luo and M. Schagerl (2016). An Underexplored Resource for Biotechnology: Selected Microphytes of East African in Soda Lakes and Adjacent Waters. In Soda Lakes of East Africa by M. Schagerl (Ed). pp 323-343 ISBN: 978-3-

319-28620-4 (Print) 978-3-319-28622-8 (Online) Springer International Publishing AG  
Switzerland.

7. Oduor S.O. and **K. Kotut (2016)**. Soda Lakes of the East African Rift System: The Past, the Present and the Future. In Soda Lakes of East Africa by M. Schagerl (Ed). pp 365-374 ISBN: 978-3-319-28620-4 (Print) 978-3-319-28622-8 (Online) Springer International Publishing AG Switzerland.
8. Krienitz L., D Krienitz, P.K. Dadheech, T. Hübener, **K. Kotut**, W. Luo, K. Teubner, and W. D. Versfeld(2016). Food algae for Lesser Flamingos: a stocktaking. *Hydrobiologia* 775: 21-50.
9. Dadheech, P.K., Mahmoud, H., **Kotut, K.**, Krienitz, L. (2014). *Desertifilum fontinale* sp. nov. (Oscillatoriales, Cyanobacteria) from a warm spring in East Africa, based on conventional and molecular studies. *Fottea*, Olomouc, 14(2): 129–140
10. Metcalf, J.S., Banack, S.A., **Kotut, K.**, Krienitz, L., Codd, G.A., 2013. Amino acid neurotoxins in feathers of the Lesser Flamingo, *Phoeniconaias minor*. *Chemosphere* 90: 835 – 839.
11. Krienitz, L., Dadheech, P.K.& **Kotut, K.**, 2013. Mass developments of a small sized ecotype of *Arthrospira fusiformis* in Lake Oloidien, Kenya, a new feeding ground for Lesser Flamingos in East Africa. *Fottea*, Olomouc, 13(2): 215–225.
12. Krienitz, L. Dadheech, P.K., Jutta Fastner, **Kotut, K.** 2013. The rise of potentially toxin producing cyanobacteria in Lake Naivasha, Great African Rift Valley, Kenya. *Harmful Algae* 27: 42 – 51.
13. Dadheech, P.K., Glockner, G., Casper, P., **Kotut, K.**, Mazzoni, C.J., Mbedi, S. & Krienitz, L. 2013. Cyanobacterial diversity in the hot spring, pelagic and benthic habitats of a tropical soda lake. *FEMS Microbiol Ecol* 85: 389 – 401.
14. Krienitz, L., Dadheech, P.K., and **Kotut, K.** 2012. Mass developments of the cyanobacterium *Anabaenopsis* and *Cyanospira*(Nostocales) in the soda lakes of Kenya: ecological and systematic implications. *Hydrobiologia*(DOI 10.1007/s10750-012-1346-z).
15. Luo, W. **Kotut, K.** and Krienitz, L. 2012. Hidden diversity of plankton in the soda lake Nakuru, Kenya, during a phase of low salinity revealed by SSU rRNA gene clone library. *Hydrobiologia*(DOI 10.1007/s10750-012-1310-y).
16. Krienitz, L., Bock, C., **Kotut, K.** and Proschold, T. 2012. Genotypic diversity of *Dictyosphaerium*-morphospecies (Chlorellaceae, Trebouxiophyceae) in African inland waters, including the description of four new genera. *Fottea*, Olomouc, 12(2): 231-253.

17. Ngángá, V.G., Kariuki, F.W. and **Kotut, K.** 2012. A Comparison of the physico-chemical and bacteriological quality of greywater from water deficient households in Homabay Town and Githurai Estates in Kenya. *The Open Environmental Engineering Journal*, 5:110-118.
18. Kariuki, F.W., Ngángá, V.G. and **Kotut, K.** 2012. Hydrochemical characteristics, plant nutrients and metals in household greywater and soils in Homa Bay Town. *The Open Environmental Engineering Journal*, 5:103-109.
19. Dadheech, P.K., Mahmoud, H, **Kotut, K.** and Krienitz, L. 2012. *Haloleptolyngbyaalcalis* gen. et sp. nov., a new filamentous cyanobacterium from the soda lake Nakuru, Kenya. *Hydrobiologia*, 691: 269–283.
20. Krienitz, L., Bock, C, **Kotut, K.** & Luo, W. 2012. *Picocystissalinarum* (Chlorophyta) in saline lakes and hot springs of East Africa. *Phycologia*, 51: 22–32.
21. Kariuki, F.W., **Kotut, K.** and Ngángá, V.G., 2011. The potential of a low cost technology for greywater treatment. *The Open Environmental Engineering Journal*, 4: 32-39.
22. **Kotut, K.** & Krienitz, L., 2011. Does the potentially toxic cyanobacterium *Microcystis* exist in the soda lakes of East Africa? *Hydrobiologia*, 664: 219–225.
23. **Kotut, K.**, Nganga, G.G., Kariuki, F.W., 2011. Physico-chemical and microbial quality of greywater from various households in Homa Bay town. *The Open Environmental Engineering Journal*, 4:162-169.
24. Dadheech, P.K., Ballot, A., Casper, P., **Kotut, K.**, Novelo, E., Lemma, B, Proschold, T. & Krienitz, L. 2010. Phylogenetic relationship and divergence among planktonic strains of *Arthrospira* (Oscillatoriales, Cyanobacteria) of African, Asian and American origin deduced by 16S–23S ITS and phycocyanin operon sequences. *Phycologia*, 49 (4): 361–372.
25. Krienitz L. & **Kotut K.** 2010. Fluctuating algal food populations and the occurrence of Lesser Flamingos (*Phoeniconaias minor*) in three Kenyan Rift Valley lakes. *Journal of Phycology*, 46: 1088–1096.
26. Ballot, A., **Kotut, K.**, Novelo, E. & Krienitz, L., 2009. Changes of phytoplankton communities in Lakes Naivasha and Oloidien, examples of degradation and salinization of lakes in the Kenyan Rift Valley. *Hydrobiologia* 632:359–363 (Published online in June 2009).

27. Dadheech, P.K., Krienitz, L., **Kotut, K.**, Ballot, A. & Casper, P. **2009**. Molecular detection of uncultured cyanobacteria and aminotransferase domains for cyanotoxin production in sediments of different Kenyan lakes. *FEMS Microbiology Ecology* 68: 340–350.
28. Metcalf, J.S., Morrison, L.F., Krienitz, L., Ballot, A., Krause, E., **Kotut, K.**, Pütz, S., Wiegand, C., Pflugmacher, S. & Codd, G.A. **2006**. Analysis of the cyanotoxins saxitoxin-a and microcystins in Lesser Flamingo feathers. *Toxicology and Environmental Chemistry* 88: 159-167.
29. **Kotut, K.**, Ballot, A., Krienitz, L. **2006**. Toxic cyanobacteria and its toxins in standing waters of Kenya: implications for water resource use. *Journal of Water & Health* 4: 233-245.
30. Krienitz, L., Ballot, A., Casper, P., **Kotut, K.**, Wiegand, C., Pflugmacher, S. **2005**. Cyanobacteria in hot springs of East Africa and their potential toxicity. *Algological Studies* 117: 297-306.
31. Krienitz, L., Ballot, A., Casper, P., Codd, G.A., **Kotut, K.**, Metcalf, J.S., Morrison, L.F., Pflugmacher, S., Wiegand, C. **2005**. Contribution of toxic cyanobacteria to the massive deaths of Lesser Flamingos at saline-alkaline lakes of Kenya. *Verhandlungen der Internationalen Vereinigung für Limnologie* 29: 783-786.
32. Ballot, A., Krienitz, L., **Kotut, K.**, Wiegand, C. & Pflugmacher, S. **2005**. Cyanobacteria and cyanobacterial toxins in the alkaline crater lakes Sonachi and Simbi, Kenya. *Harmful Algae* 4: 139-150.
33. Ballot, A., Krienitz, L., **Kotut, K.**, Wiegand, C., Metcalf, J.S., Codd, G.A. & Pflugmacher, S. **2004**. Cyanobacteria and cyanobacterial toxins in three alkaline Rift valley lakes of Kenya – Lakes Bogoria, Nakuru and Elmenteita. *Journal of Plankton Research* 26: 925-935.
34. Krienitz, L., Ballot, A., **Kotut, K.**, Wiegand, C., Pütz, S., Metcalf, J.S., Codd, G.A. & Pflugmacher, S. **2003**. Contribution of hot spring cyanobacteria to the mysterious deaths of Lesser Flamingos at Lake Bogoria, Kenya. *FEMS Microbiology Ecology* 43. 141-148.
35. Ballot, A., Pflugmacher, S., Wiegand, C., **Kotut, K.** & Krienitz, L. **2003**. Cyanobacterial toxins in Lake Baringo, Kenya. *Limnologica* 33, 2-9.
36. Codd, G.A., Metcalf, J.S., Morrison, L.F., Krienitz, L., Ballot, A., Pflugmacher, S., Wiegand, C. & **Kotut, K.** **2003**. A cyano-anomaly? Cyanobacterial toxins as contributors to Lesser Flamingo

- mass deaths. Harmful Algae News. The Intergovernmental Oceanographic Commission UNESCO 24:1-2.
37. Codd, G.A., Metcalf, J.S., Morrison, L.F., Krienitz, L., Ballot, A., Pflugmacher, S., Wiegand, C. & **Kotut, K. 2003**. Susceptibility of flamingos to cyanobacterial toxins via feeding. *Veterinary Record* 152: 722-723.
38. Krienitz, L., Ballot, A., Wiegand, C., **Kotut, K.**, Codd, G.A. & Pflugmacher, S. **2002**. Cyanotoxin producing bloom of *Anabaena flos-aquae*, *Anabaena discoidea* and *Microcystis aeruginosa* (Cyanobacteria) in Nyanza Gulf of Lake Victoria, Kenya. *Journal of Applied Botany* 76, 179-183.
39. **Kotut, K.**, Njuguna, S.G., Muthuri, F.M., & Krienitz, L. **1999**. The physico-chemical conditions of Turkwel Gorge Reservoir, a new man made lake in northern Kenya. *Limnologia* 29; 377 - 392.
40. **Kotut, K.**, Krienitz, L & Muthuri, F.M. **1998**. Temporal changes in phytoplankton structure and composition at the Turkwel Gorge Reservoir, Kenya. *Hydrobiologia* 368; 41 - 59.
41. **Kotut, K.**, Krienitz, L., Wolfram, S., Monika, E. & Grigorszky, I. **1998**. Some interesting cyanoprocaryotes and algae from Turkwel Gorge reservoir, Kenya. *Algological Studies* 91; 37 - 55.
42. Krienitz, L., **Kotut, K.**, & Hegewald, E. **1998**. Some interesting coccal green algae (Chlorellales) from Turkwel Gorge Reservoir, Kenya. *Algological Studies* 91; 57 - 69.
43. Patterson, G. & **Kiplagat, W.K. 1995**. The influence of diel climatic cycle on the depth time distribution of phytoplankton and photosynthesis in a shallow equatorial lake (Lake Baringo), Kenya. *Hydrobiologia* 1 - 8.

#### **Presentation of papers at Academic Profession Conferences:**

1. Kotut, K. & Krienitz, L. 2013. Cyanobacteria and their toxins in the alkaline-saline lakes of Kenya – contribution to flamingo mortality. Proceedings of the Kenya’s Soda Lakes workshop held in the Kenya Wildlife Service Training Institute (KWSTI), Naivasha, Kenya from 4-6<sup>th</sup> December, 2013.
2. Kotut, K. & Krienitz, L. & Ballot, A. 2006. Toxic Cyanobacteria and its toxins in standing waters of Kenya: implications for water resource use. Proceedings of the 11<sup>th</sup> World Lake Conference Held in Nairobi, Kenya from 31<sup>st</sup> October to 4<sup>th</sup> November 2005, Vol. 2. pp 522 to 528.
3. Ballot, A., Pflugmacher, S., Wiegand, C., Kotut, K., Krause, E., Metcalf, J.S., Morrison, L.F., Codd, G.A. & Krienitz, L. 2002. Cyanobacterial toxins, a further contributory cause of mass

deaths of flamingos at Kenyan Rift Valley lakes. Proceedings of the Xth International Conference on Harmful Algae, St. Pete Beach, Florida, 21-25.October 2002, p. 20.

4. Krienitz, L., Ballot, A., Kotut, K. 2002. Research fields of the algal strain collection at the IGB in the frame of the algal biodiversity-BIOLOG-project in Kenya. Abstr. Int. Meeting, Culture Collections of Algae: increasing accessibility and exploring Algal Biodiversity', SAG Göttingen 2-6 September 2002.
5. Codd, G.A., Metcalf, J.S., Morrison, L.F., Krienitz, L., Ballot, A., Krause, E., Kotut, K., Putz, S., Wiegand, C. & Pflugmacher, S. 2003. Cyanobacterial toxins in the mass mortalities of flamingos at Kenyan lakes. Phycologist; Abstracts of presentation from the annual winter meeting, Galway, 2-5 January 2003.

### **Article Contributions**

1. Krienitz, L., Ballot, A., Kotut, K., Wiegand, C., Codd, G.A., Pflugmacher, S. 2003. Naturwunder in Gefahr: Rift-Valley-Seen Kenias. *Biologie in unserer Zeit* 33, 123-129.

## Postgraduate Student Supervision

### Present supervisions

Student's name	Degree	From	Research title
Sammy Musyoka	MSc	2014	Exploring Freshwater Microalgae for Production of Oil
Ann Kairu	PhD	2014	Impact of Land Use Type on Soil Quality in High Potential Agro-Ecological Zones in Embu, Kenya
Mutiga Mariciano Iguna	PhD	2014	Distribution, Abundance and Genetic Diversity of the Somali Ostrich in Samburu, Kenya
Karanja B. Mwangi	MSc	2013	Impact of African Azolla ( <i>Azolla Nilotica</i> ) as a Biofertilizer on Growth and Yield Properties in Basmati 370 Rice Variety in Mwea Irrigation Scheme
Jeophita June Mwajuma	PhD	2012	Microbial Ecology of Drinking Water Distribution Systems - Mombasa Municipality
Lucy B. Anaswa	MSc	2010	Impact of the Water Quality of Rivers Kisat and Kisiani on Phytoplankton and Physico-chemical Properties of Kisumu and Usoma Bays, Lake Victoria, Kenya

### Completed supervisions

Student's name	Degree	Year	Research title
Victor G. Nga'ng'a	MSc	2013	A Comparative Study of the Bacterial Load and Physico-chemical Properties of Greywater in Homabay Town and Githurai Estate
Michael N. Githaiga	MSc	2013	Productivity and Biomass Accumulation of Natural Mangrove Forests Along the Intertidal Complex of Gazi Bay, Kenya
Mutiga Mariciano Iguna	MSc	2012	Diet Overlap Between Grevy's Zebra and Selected Livestock in Samburu Ecoregion, Kenya
Sila Onesmus Nzunga	MSc	2011	Physico-chemical and Microbial Quality of Common Water Sources in Kithimani Area, Yatta District and Efficacy of Selected Treatment Procedures



Cheluget, Kipkemboi	MSc	2011	Microbial and physico-chemical quality of selected water sources in Samburu District and Efficacy of selected plant products in water purification
Charles P. Mwangi	MSc	2010	Growth responses of selected indigenous species in Kakamega Forest to nutrient enrichment and competition
Julius Kibii Kirui	MSc	2010	Efficacy of medicinal plants commonly used by Samburu people to treat waterborne diseases
Jeophita June Mwajuma	MSc	2010	Bacteriological Quality of Water and Antimicrobial Susceptibility of Pathogenic Isolates from Selected Water Sources in Samburu South
Esther L. Kitur	PhD	2009	Phytoplankton biodiversity changes in selected reservoirs in Central Kenya
Josephine Ngari	MSc	2007	Study of the efficiency of Nakuru Town Sewage Treatment Plant
Njeru Jamlick Mutegi	MSc	2007	Influence of Mode of Fertilization of Fish Ponds on Microbiota at Sagana Fish Farm
Karanja, A. Waruguru	MSc	2007	Impact of point and non-point sources on microbial and physico-chemical properties of River Thome
Lara L.G.	MSc	2006	Impacts of Natural Management Programmes on savannah biodiversity: a case study of three group ranches in Laikipia District, Kenya

## Research Contributions And Collaboration

### Ongoing Research Work

SPONSOR	COLLABORATORS	TITLE
NCST	Dr J.O. Odalo, L.K. Wangai, Dr C. Matoka & Dr. V.W. Wekesa	Exploration of inland and marine microalgae for biofuel production
KAPAP	Dr. F. Karuiki, Dr. S. Wambugu, Dr. M. P.H. Gathaara, Dr. Anthony O. Esilaba, Mr. Isaja Sijali, Dr. P. Kamoni Dr. C. Kibunja, Prof. J.R. Okalebo, Mrs. M. Njeri, K. Koech, Mrs K. W. Magorio, Mr. S. Nau, Dr. B. Vanlauwe & Mr. B. Vadera	Enhancing crop productivity and income generation through Integrated water and soil fertility management in different Agro-ecological zones of Kenya
UNESCO	Drs L. Krienitz and P. Casper, IGB, Germany: Dr. B. Lemma, Alemaya Univ., Ethiopia: Prof. E. Novelo, Univ. México, México: Dr. P. Dadheech, Gov. College Ajmer, Rajasthan, India	Potential and risk of mass development of the Cyanobacterium <i>Athrospira</i> , an important food resource in tropical inland waters
Ministry of Sci. and Tech. Germany	Dr. Lothar Krienitz, Institute of Freshwater Ecology and Inland Fisheries (IGB), Germany.	Biodiversity of selected model groups of phytoplankton in standing inland waters of Kenya

**Past research work**

<b>PERIOD</b>	<b>SPONSOR</b>	<b>COLLABORATORS</b>	<b>TITLE</b>
2005 - 2008	International Foundation for Science (IFS)	None	Influence of macrophyte community on the physico-chemical conditions and microalgae structure of a polluted river in Kenya
2007 – 2009	VICRES	Dr. E.O. Chaggu, Dr. M.S. Nabacwa & Dr. F.W. Kariuki	Greywater treatment and reuse for agricultural production and environmental protection in the Lake Victoria Basin
1993 - 1995	DAAD, East African Wildlife Society & KVDA	None	Phytoplankton and nutrient dynamics at Turkwel Gorge Reservoir, a new man made lake in northern Kenya. Ph.D. Thesis research project
1988 - 1989	Kenyatta Univ. & Operation Raleigh Int.	None	Phytoplankton and physico-chemical dynamics of Lake Baringo, Kenya. M.Sc. research project
1987	Kenyatta Univ.	None	The influence of different effluent types on the general limnological conditions of River Gatharaini, Nairobi, Kenya. Third year undergraduate research project