Dr. Ghulam Abbas ****

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**Education**

* Ph.D. Soil science, 2010-2013. Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad, Pakistan. Thesis title: Physiological, biochemical and phytoremedial characterization of acacia species for salt affected soils.
* M.Sc. (Hons.) Soil Science, 2008-2010. Institute of Soil and Environmental Sciences, University of Agriculture, Faisalabad, Pakistan. Thesis title: Screening of different rice genotypes against iron deficiency under saline and non-saline conditions.
* B.Sc. (Hons.) Soil Science, 2004-2008. University of Agriculture, Faisalabad, Pakistan.

**Experience**

* February 16, 2023 to date as an Associate Professor in the Centre for Climate Research and Development, COMSATS University Islamabad.
* April 04, 2014 to April 11, 2022 as an Assistant Professor, and from April 12, 2022 to February 15, 2023 as an Associate Professor in the Department of Environmental Sciences, COMSATS University Islamabad, Vehari Campus
* March 22 to August 21, 2016:Endeavour Post-Doctoral Research Fellow**.** The UWAInstitute of Agriculture and School of Agriculture and Environment, The University of Western Australia, Perth, Australia
* September 22, 2010 to June 30, 2013: Research Fellow in The Institute of Soil & Environmental Sciences, University of Agriculture, Faisalabad

**Research Interests**

* Rehabilitation and management of salt affected soils
* Exploring abiotic stresses (salinity, heavy metals, drought, heat) tolerance mechanisms in plants
* Plant stress physiology
* Remediation of heavy metal contaminated soils
* Alternative cropping for food security under changing climate
* Treatment and use of wastewater in agriculture
* Sustainable management of crop residues for food security and environment quality

**Publications**

1. **Research Articles (Total IF 236)**
2. Abbas, G., Areej, F., Asad, S.A., Saqib, M., Anwar-ul-Haq, M., Afzal, S., Murtaza, B., Amjad, M., Naeem, M.A., Akram, M. and Akhtar, N., 2023. Differential effect of heat stress on drought and salt tolerance potential of quinoa genotypes: a physiological and biochemical investigation. Plants, 12(4), p.774. IF 4.658
3. Abdal, N., **Abbas, G.,** Asad, S.A., Ghfar, A.A, Shah, G.M., Rizwan, M., Ali, S. and Shahbaz, M. 2021. Salinity mitigates cadmium-induced phytotoxicity in quinoa (Chenopodium quinoa Willd.) by limiting the Cd uptake and improved responses to oxidative stress: implications for phytoremediation. Environ Geochem Health. 45:171–185. doi.org/10.1007/s10653-021-01082-y IF 4.898
4. Murtaza, B., Naseer, A., Imran, M., Shah, N.S., Al-Kahtani, A.A., ALOthman, Z.A., Shahid, M., Iqbal, J., **Abbas, G.**, Natasha, N. and Amjad, M. 2023. Chromium removal from aqueous solution using bimetallic Bi0/Cu0-based nanocomposite biochar. Environ. Geochem. Health, pp.1-14. doi.org/10.1007/s10653-023-01630-8 IF 4.898
5. Afzal, S., Bakhat, H.F., Shahid, M., Shah, G.M. and **Abbas, G.** 2023. Assessment of lithium bioaccumulation by quinoa (Chenopodium quinoa willd.) and its implication for human health. Environ. Geochem. Health. doi.org/10.1007/s10653-023-01659-9 IF 4.898
6. Rasool, S., Ahmad, I., Jamal, A., Saeed, M.F., Zakir, A., **Abbas, G.**, Seleiman, M.F. and Caballero-Calvo, A. 2023. Evaluation of phytoremediation potential of an aquatic macrophyte (Eichhornia crassipes) in wastewater treatment. Sustainability. 15(15):11533. https://doi.org/10.3390/su151511533 IF 3.9
7. Abrar, M.M., Sohail, M., Saqib, M., Akhtar, J., **Abbas, G.,** Wahab, H.A., Mumtaz, M.Z., Mehmood, K., Memon, M.S., Sun, N., Xu, M. 2022. Interactive salinity and water stress severely reduced the growth, stress tolerance, and physiological responses of guava (*Psidium Guajava* L.). Sci. Rep. 12:18952: doi.org/10.1038/s41598-022-22602-5 IF 4.996
8. Aslam, M., Sonia, M., **Abbas, G.,** Shahid, M., Murtaza, B., Khalid, M.S., Qaisrani, S.A., Alharby, H.F., Alghamdi, S.A., Alharbi, B.M., Chen, Y. 2022. Multivariate characterization of biochemical and physiological attributes of quinoa (*Chenopodium quinoa* Willd.) genotypes exposed to nickel stress: implications for phytoremediation. Environ. Sci. Pollut. Res. [https://doi.org/10.1007/s11356-022-23581-w 5.190 IF 5.190](https://doi.org/10.1007/s11356-022-23581-w%205.190%20IF%205.190)
9. Shah, G.M., Amin, M., Shahid, M., Ahmad, I., Khalid, S., **Abbas, G.,** Imran, M., Naeem, M.A. and Shahid, N., 2022. Toxicity of ZnO and Fe2O3 nano-agro-chemicals to soil microbial activities, nitrogen utilization, and associated human health risks. Environ. Sci. Eur. 34:106 doi.org/10.1186/s12302-022-00687-z IF 5.481
10. Alsamadany, H., Alharby, H.F., Al-Zahrani, H.S., Alzahrani, Y.M., Almaghamsi, A.A., **Abbas, G.** and Farooq, M.A. 2022. Silicon-nanoparticles doped biochar is more effective than biochar for mitigation of arsenic and salinity stress in Quinoa: Insight to human health risk assessment. Front. Plant Sci. 13:989504. doi: 10.3389/fpls.2022.989504 IF 6.627
11. Shah, A.H, Shahid, M., Tahir, M., Natasha, Bibi, I., Tariq, T.Z., Khalid, S., Nadeem, M., **Abbas, G.,** Saeed, M.F., Ansar, S., Duma, C. 2022. Risk assessment of trace element accumulation in soil and *Brassica oleracea* after wastewater irrigation. Environ Geochem Health. doi.org/10.1007/s10653-022-01351-4 IF 4.609
12. **Abbas, G.,** Rehman, S., Saqib, M., Amjad, M., Murtaza, B., Siddiqui, M.H. and Chen, Y. 2022. Resistance to NaCl salinity is positively correlated with iron and zinc uptake potential of wheat genotypes. Crop Pasture Sci. doi:10.1071/CP21478 IF 2.29
13. **Abbas, G**., Abrar, M.M., Naeem, M.A. *et al.* 2022. Biochar increases salt tolerance and grain yield of quinoa on saline-sodic soil: multivariate comparison of physiological and oxidative stress attributes. J Soils Sediments. [https://doi.org/10.1007/s11368-022-03159-2 IF 3.308](https://doi.org/10.1007/s11368-022-03159-2%20IF%203.308)
14. Alharby, H.F., Al-Zahrani, H.S., **Abbas, G**. Potassium and Silicon Synergistically Increase Cadmium

and Lead Tolerance and Phytostabilization by Quinoa through Modulation of Physiological and Biochemical Attributes. Toxics 2022, 10, 169. https://doi.org/10.3390/toxics10040169 IF 4.146

1. Bamagoos, A.A., Alharby, H.F., **Abbas, G**. 2022. Differential uptake and translocation of cadmium and lead by quinoa: a multivariate comparison of physiological and oxidative stress responses. Toxics, 10, 68. <https://doi.org/> 10.3390/toxics10020068 IF 4.146
2. **Abbas, G.,** Rehman, S., Siddiqui, M.H., Ali, H.M., Farooq, M.A., Chen, Y. 2022. Potassium and humic acid synergistically increase salt tolerance and nutrient uptake in contrasting wheat genotypes through ionic homeostasis and activation of antioxidant enzymes. Plants. 11(3):263. https://doi.org/10.3390/plants11030263 IF 3.935
3. Naheed, N., **Abbas, G**., Naeem, M.A., Hussain, M., Shabir, R., Alamri, S., Siddiqui, M.H. and Mumtaz, M.Z. 2022. Nickel tolerance and phytoremediation potential of quinoa are modulated under salinity: multivariate comparison of physiological and biochemical attributes. Environ Geochem Health. doi.org/10.1007/s10653-021-01165-w IF 4.609
4. Usman, M., Murtaza, B., Natasha, Imran, M., **Abbas, G**., Amjad, M., Shahid, M., Ibrahim, S.M., Owens G., Murtaza, G. 2022. Multivariate analysis of accumulation and critical risk analysis of potentially hazardous elements in forage crops. Environ Monit Assess 194, 139 https://doi.org/10.1007/s10661-022-09799-8 IF 2.513
5. Shamshir, F., **Abbas, G**., Amjad, M., Rizwan, M., Akram, M., Ahmad, S., Tahir, M., Ali, S., Farooq, A.B.U. 2022. Physiological and biochemical characterization of Kalongi (*Nigella sativa*) against arsenic stress: Implications for human health risk assessment. Environ. Pollut. doi.org/10.1016/j.envpol.2022.118829 IF 8.071
6. Naeem, M.A., Abdullah, M., Imran, M., Shahid, M., **Abbas, G**., Amjad, M., Shah, G.M., Alamri, S. and Al-Amri, A.A., 2022. Iron oxide nanoparticles doped biochar ameliorates trace elements induced phytotoxicity in tomato by modulation of physiological and biochemical responses: Implications for human health risk. Chemosphere, doi.org/10.1016/j.chemosphere.2021.133203 IF 7.086
7. Shabbir, A., Saqib, M., Murtaza, G., **Abbas, G.**, Imran, M., Rizwan, M., Naeem, M.A., Ali, S., Javeed, H.M.R. 2021. Biochar mitigates arsenic-induced human health risks and phytotoxicity in quinoa under saline conditions by modulating ionic and oxidative stress responses. Environ. Pollut. [doi.org/10.1016/j.envpol.2021.117348](https://doi.org/10.1016/j.envpol.2021.117348) IF 8.071
8. Shabbir, A., **Abbas, G**., Asad, S.A., Razzaq, H., Haq, M.A., Amjad, M. 2021. Effects of arsenite on physiological, biochemical and grain yield attributes of quinoa (*Chenopodium quinoa* Willd.): Implications for phytoremediation and health risk assessment. Inter. J. Phytoremediation. 23:9, 890-898. IF 3.212
9. Iftikhar, A., **Abbas, G**., Saqib, M., Shabbir, A., Amjad, A., Shahid, M., Ahmad, I. Iqbal, S., Qaisrani, S.A. 2022. Salinity modulates lead (Pb) tolerance and phytoremediation potential of quinoa: a multivariate comparison of physiological and biochemical attributes. Environ. Geochem. Health. 44:257–272. doi.org/10.1007/s10653-021-00937-8 IF 4.609
10. **Abbas, G**., Amjad, M., Saqib, M., Murtaza, B., Naeem, M.A., Shabbir, A., Murtaz, G. 2021. Soil sodicity is more detrimental than salinity for quinoa (*Chenopodium quinoa* Willd.): A multivariate comparison of physiological, biochemical and nutritional quality attributes. J. Agron. Crop Sci. 207 (1): 59-73 IF 3.473
11. Abbas, B., Bibi, S., **Abbas, G**., Saqib, M., Masood, N., Murtaza, B., Shabbir, A., Saifullah. 2021. Multivariate analysis of heavy metals contents and associated health hazards in commercially available vegetables in Faisalabad, Pakistan.Pak. J. Agri. Sci. 58(2): 477-484. IF 0.748
12. Anwar, H., Shahid M., Natasha, Niazi, N.K., Khalid, S., Tariq, T.Z., Ahmad, S., Nadeem, M., **Abbas, G**. 2021. Risk assessment of potentially toxic metal(loid)s in *Vigna radiata* L. under wastewater and freshwater irrigation. Chemosphere. doi.org/10.1016/j.chemosphere.2020.129124 IF 7.086
13. Natasha, Shahid, M., Khalid, S., Niazi, N.K., Murtaza, B., Ahmad, N., Farooq, A., Zakir, A., Imran, M., **Abbas, G**. 2021. Health risks of arsenic buildup in soil and food crops after wastewater irrigation. Sci. Total Environ.doi.org/10.1016/j.scitotenv.2021.145266. IF 7.963
14. Amjad, M., Iqbal, M.M., **Abbas, G**., Farooq, A.B.U., Naeem M. A., Imran, M., Murtaza, B., Nadeem, M., Jacobsen, S-E. 2021. Assessment of cadmium and lead tolerance potential of quinoa (*Chenopodium quinoa* Willd) and its implications for phytoremediation and human health. Environ. Geochem. Health. doi: 10.1007/s10653-021-00826-0 IF 4.609
15. Parvez, S., **Abbas**, **G**.,M. Shahid, M. Amjad, M. Hussain, S. A. Asad, M. Imran, M. A. Naeem. 2020. Effect of salinity on physiological, biochemical and photostabilizing attributes of two genotypes of quinoa (*Chenopodium quinoa* Willd.) exposed to arsenic stress. Ecotoxicol. Environ. Safe. 187. doi.org/10.1016/j.ecoenv.2019.109814. IF 6.291
16. Siddique, M.A., Saqib, M., **Abbas, G**., Wahab, H.A., Ahmad, N., Khalid, M. and Akhtar, J. 2020. Foliar and soil-applied micronutrients improve yield and quality of kinnow (Citrus reticulata Blanco). Pak. J. Agri. Sci. 57(6):1539-1547. IF 0. 618
17. Abrar, M.M., Saqib, M., **Abbas, G**., Atiq-ur-Rahman, M., Mustafa, A., Shah, S.A.A., Mehmood, K., Maitlo, A.A., Sun, N. and Xu, M., 2020. Evaluating the contribution of growth, physiological, and ionic components towards salinity and drought stress tolerance in *Jatropha curcas*. Plants, 9(11), 1574. IF 2.632
18. Saqib, M., **Abbas G.** and J. Akhtar. Root mediated acidification and resistance to low calcium improve wheat (Triticum aestivum) performance in saline-sodic conditions. 2020. Plant Physiol. Biochem. 156: 201–208. IF 3.80
19. Shabbir, Z., Sardar, A., Shabbir, A., **Abbas, G**., Shamshad, S., Khalid, S., Natasha, N., Murtaza, G., Dumat, C. and Shahid, M., 2020. Copper uptake, essentiality, toxicity, detoxification and risk assessment in soil-plant environment. Chemosphere. doi.org/10.1016/j.chemosphere.2020.127436 IF 5.778
20. Hussain, M., M. Imran, **Abbas**, **G.,** M. Shahid, M. Iqbal, M. A. Naeem, B. Murtaza, M. Amjad, N.S. Shah, Z. H. Khan and A. Islam. 2020. A new biochar from cotton stalks for As (V) removal from aqueous solutions: its improvement with H3PO4 and KOH. Environ. Geochem. Health. 42:2519–2534. doi.org/10.1007/s10653-019-00431-2 IF 3.472
21. Mumtaz, M.Z., M. Saqib, **Abbas**, **G**.and J. Akhtar. 2020. Drought stress impairs grain yield and quality of different rice genotypes under field conditions by impaired photosynthetic attributes and K nutrition. Rice Sci. 27(1): 5-9. IF 3.162
22. Naeem, M.A., A. Shabbir, M. Amjad, **Abbas**, **G.,** M. Imran, B. Murtaza and M. Tahir. 2020. Acid treated biochar enhances cadmium tolerance via restricting its uptake and improving physico-chemical attributes in quinoa (*Chenopodium quinoa* Willd.). Ecotoxicol. Environ. Safe. doi.org/10.1016/j.ecoenv.2020.110218 IF 4.710
23. Riaz, F., **Abbas**, **G.,** M. Saqib, M. Amjad, A. Farooq, S. Ahmad, M.A. Naeem, M. Umer, M.S. Khalid, K. Ahmed and N. Ahmad. 2020. Comparative effect of salinity on growth, ionic and physiological attributes of two quinoa genotypes. Pak. J. Agri. Sci. 57(1), 115-122. IF 0. 618
24. Farooq, A., Nadeem, M., **Abbas, G**., Arslan et al. 2020. Cadmium partitioning, physiological and oxidative stress responses in marigold (*Calendula calypso*) grown on contaminated soil: implications for phytoremediation. Bull Environ Contam Toxicol. 105:270–276. doi.org/10.1007/s00128-020-02934-6 IF 1.657
25. Amjad, M., H. Raza, B. Murtaza, **Abbas**, **G.,** M. Imran, M. Shahid, M.A. Naeem, A. Zakir, and M.M. Iqbal, 2020. Nickel toxicity induced changes in nutrient dynamics and antioxidant profiling in two maize (*Zea mays* L.) Hybrids. Plants, 9(1), 5. doi:10.3390/plants9010005 IF 2.632
26. Kamran, M., H. Ali, M.F. Saeed, H. F. Bakhat, Z. Hassan, M. Tahir, **G. Abbas**, M.A. Naeem, M.I. Rashid, G.M. Shah. Unraveling the toxic effects of iron oxide nanoparticles on nitrogen cycling through manure-soil-plant continuum. 2020. Ecotoxicol. Environ. Safe. 205. doi.org/10.1016/j.ecoenv.2020.111099 IF 4.710
27. Amjad, M., Ameen, N., Murtaza, B., Imran, M., Shahid, M., **Abbas, G.**, Naeem, M.A. and Jacobsen, S.E., 2020. Comparative physiological and biochemical evaluation of salt and nickel tolerance mechanisms in two contrasting tomato genotypes. Physiol. Plant. 168: 27–37. doi: 10.1111/ppl.12930 IF 4.148
28. Murtaza, B., Natasha, M. Amjad, M. Shahid, M. Imran, N.S. Shah, **Abbas**, **G.,** M.A. Naeem and M. Amjad. 2020. Compositional and health risk assessment of drinking water from health facilities of District Vehari, Pakistan. Environ. Geochem. Health. 42: 2425–2437 IF 3.472
29. Naeem, M.A., M. Imran, M. Amjad, **Abbas**, **G.,** M. Tahir, B. Murtaza, A. Zakir, M. Shahid, L. Bulgariu and I. Ahmad. 2019. Batch and column scale removal of cadmium from water using raw and acid activated wheat straw biochar. Water. 11, 1438; doi:10.3390/w11071438. IF 2.544
30. Amjad, M., N. Ameen, B. Murtaza, **Abbas**, **G.,** M. Imran, M.A. Naeem, W.M. Bhutta, A. Zakir, N. Masood and S.E. Jacobsen. 2019. A comparative analysis of salinity and nickel tolerance of tomato (*Solanum lycopersicum* L.). Commun Soil Sci. Plant Anal. 50(18), 2294-2308. doi:10.1080/00103624.2019.1659298 IF 0.767
31. Natash, M. Shahid, C. Dumat, S. Khalid, F. Rabbani, A.B.U. Farooq, M. Amjad, **Abbas**, **G.,** N.K. Niazi. 2019. Foliar uptake of arsenic nanoparticles by spinach: an assessment of physiological and human health risk implications. Environ. Sci. Pollut. Res. 26 (20), 20121–20131. IF 3.056
32. Rehman, S., **Abbas**, **G.,** M. Shahid, M. Saqib, A.B.U. Farooq, M. Hussain, B. Murtaza, M. Amjad, M.A. Naeem, A. Farooq. 2019. Effect of salinity on cadmium tolerance, ionic homeostasis and oxidative stress responses in conocarpus exposed to cadmium stress: Implications for phytoremediation. Ecotoxicol. Environ. Saf. 171, 146-153. IF 4.710
33. Murtaza, B., F. Naeem, M. Shahid, **Abbas**, **G.,** N.S. Shah, M. Amjad, H.F. Bakhat, M. Imran, N.K. Niazi, G. Murtaza. 2019. A multivariate analysis of physiological and antioxidant responses and health hazards of wheat under cadmium and lead stress. Environ. Sci. Pollut. Res. 26: 362–370.
	1. IF 3.056
34. Ameen, N., Amjad, M., Murtaza, B., Abbas, G., Shahid, M., Imran, M., Naeem, M. A., Niazi. N. K. 2019. Biogeochemical behavior of nickel under different abiotic stresses: toxicity and detoxification mechanisms in plants. Environ. Sci. Pollut. Res. 26 (11); 10496–10514. doi.org/10.1007/s11356-019-04540-4. IF 3.056
35. Naeem, M.A., M. Imran, M. Tahir, M. Amjad, B. Murtaza, **Abbas**, **G.,** S. Ahmad and N. Ahmad. 2019. Temporal variations in soil chemical properties and nutrient availability in response to maize biochar produced at different temperatures. Pak. J. Agri. Sci. 56(2): 291-300 IF 0. 618
36. Ahmad, A., Shahid, M., Khalid, S., Zaffar, H., Naqvi, T., Pervez, A., Bilal, M., Ali, M.A., **Abbas, G.** and Nasim, W. 2019. Residues of endosulfan in cotton growing area of Vehari, Pakistan: an assessment of knowledge and awareness of pesticide use and health risks. Environ. Sci. Pollut. Res. 2019. 26 (20): 20079–20091. doi.org/10.1007/s11356-018-3169-6 IF 3.056
37. Shabir, R., **Abbas**, **G.,** M. Saqib, M. Shahid, G. M. Shah, M. Akram, N. K. Niazi, M. A. Naeem, M. Hussain and F. Ashraf. 2018. Cadmium tolerance and phytoremediation potential of acacia (*Acacia nilotica* L.) under salinity stress. Int. J. Phytoremediation. 20(7): 739-746. doi: 10.1080/15226514.2017.1413339 IF 2.570
38. **Abbas, G**., Y. Chen, F. Khan, Y. Feng, J. Palta and K.H.M. Siddique. 2018. Salinity and low phosphorus differentially affect shoot and root traits in two wheat cultivars with contrasting tolerance to salt. 2018. Agronomy. 8 (8): 155. doi:10.3390/agronomy8080155 IF 1.683
39. Ashraf, F., **Abbas**, **G.,** B. Murtaza, M. Amjad, M. Imran, M.A. Naeem, M. Saqib, N.K. Niazi, A. Zakir, M. Hussain and R. Shabir. 2018. Comparative tolerance and phytoremediation potential of *Conocarpus erectus* and *Eucalyptus camaldulensis* grown in Cd contaminated soil. Pak. J. Agri. Sci. 55(3): 521-529. IF 0. 618
40. Rafiq, M., Shahid, M., Shamshad, S., Khalid, S., Niazi, N.K., **Abbas, G**., Saeed, M.F., Ali, M. and Murtaza, B. 2018. A comparative study to evaluate efficiency of EDTA and calcium in alleviating arsenic toxicity to germinating and young *Vicia faba* L. seedlings. J. Soils Sediments. 18 (6): 2271–2281. doi.org/10.1007/s11368-017-1693-5 IF 2.763
41. Fatima, N., M. Akram, M. Shahid, **Abbas**, **G.,** M. Hussain, M. Nafees, A. Wasaya, M. Tahir and M. Amjad. 2018. Germination, growth and ions uptake of moringa (*Moringa oleifera* L.) grown under saline condition. J. Plant Nutr. 41(12): 1555-1565. doi: 10.1080/01904167.2018.1459690 IF 1.132
42. **Abbas, G**., Murtaza, B., Bibi, I., Shahid, M., Niazi, N.K., Khan, M.I., Amjad, M. and Hussain, M., 2018. Arsenic uptake, toxicity, detoxification, and speciation in plants: physiological, biochemical, and molecular aspects. Int. J. Environ. Res. Public Health. 15 (1): 59. doi:10.3390/ijerph15010059 IF 2.849
43. Naeem, M.A., M. Khalid, M. Aon, **Abbas**, **G.,** M. Amjad, B. Murtaza, W.U.D. Khan, N. Ahmad. 2018. Combined application of biochar with compost and fertilizer improves soil properties and grain yield of maize. J. Plant Nutr. 41 (1): 112-122. doi.org/10.1080/01904167.2017.1381734 IF 1.132
44. Mumtaz, M.Z., M. Saqib, **Abbas**, **G.,** J. Akhtar and Z. Qamar. 2018. Genotypic variations in rice for grain yield and quality as affected by salt affected field conditions. J. Plant Nutr. 41(2): 233-242. doi.org/10.1080/01904167.2017.1385796 IF 1.132
45. Murtaza, B., G. Murtaza, M. Sabir, G. Owens, **Abbas**, **G.,** M. Imran and G.M. Shah. 2017. Amelioration of saline–sodic soil with gypsum can increase yield and nitrogen use efficiency in rice–wheat cropping system. Arch. Agron. Soil Sci. 63(9): 1267-1280. doi.org/10.1080/03650340.2016.1276285 IF 2.135
46. **Abbas, G**., M. Saqib, J. Akhtarand G. Murtaza. 2017. Physiological and biochemical characterization of *Acacia stenophylla* and *Acacia albida* exposed to salinity under hydroponic conditions. Can J. Forest Res. 47: 1293–1301. doi.org/10.1139/cjfr-2016-0499 IF 1.689
47. Hussain, S., Akram, M., **Abbas, G**., Murtaza, B., Shahid, M., Shah, N.S., Bibi, I. and Niazi, N.K., 2017. Arsenic tolerance and phytoremediation potential of *Conocarpus erectus* L. and *Populus deltoides* L. Int. J. Phytoremediation. 19 (11): 985-991. doi.org/10.1080/15226514.2017.1303815 IF 2.570
48. Naeem, M.A., M. Khalid, M. Aon, M. Tahir, M. Amjad, **Abbas**, **G.,** B. Murtaza. 2017. Effect of wheat and rice straw biochar produced at different temperatures on maize growth and nutrient dynamics of a calcareous soil. Arch. Agron. Soil Sci. 63(14): 2048-2061 doi.org/10.1080/03650340.2017.1325468 IF 2.135
49. Rafiq, M., M. Shahid, S. Khalid, S. Shamshad, **Abbas**, **G.,** N.K. Niazi, C. Dumat. Comparative effect of calcium and EDTA on arsenic uptake and toxicity to *Pisum sativum.* 2017.Int. J. Phytoremediation. 19(7): 662-669 doi.org/10.1080/15226514.2016.1278426 IF 2.570
50. Khalid, S., Shahid, M., Dumat, C., Niazi, N.K., Bibi, I., Gul Bakhat, H.F.S., **Abbas, G**., Murtaza, B. and Javeed, H.M.R., 2017. Influence of groundwater and wastewater irrigation on lead accumulation in soil and vegetables: Implications for health risk assessment and phytoremediation. Int. J. Phytoremediation. 19(11): 1037-1046.doi.org/10.1080/15226514.2017.1319330. IF 2.570
51. **Abbas, G**., M. Saqib, J. Akhtar, G. Murtaza, M. Shahid and A. Hussain. 2016. Relationship between rhizosphere acidification and phytoremediation in two acacia species. J. Soils Sediments. 16 (4):1392–1399. IF 2.763
52. **Abbas, G**., M. Saqib and J. Akhtar. 2016**.** Differential response of two acacia species to salinity and water stress. Pak. J. Agri. Sci. 53(1): 51-57. IF 0. 618
53. Amjad M., J. Akhtar, B. Murtaza, **Abbas** **G.,** and H. Jawad. 2016. Differential accumulation of potassium results in varied salt-tolerance response in tomato (*Solanum lycopersicum* L.) cultivars. Hortic. Environ. Biotechnol. 57(3): 248-258. IF 1.585
54. Shahid, M., C. Dumat, B. Pourrut, **Abbas, G.,** N. Shahid and E. Pinelli. 2015. Role of metal speciation in lead-induced oxidative stress to *Vicia faba* roots. Russian J. Plant Physiol. 62(4): 448-454. IF 1.198
55. **Abbas, G**., M. Saqib, J. Akhtar, G. Murtaza and M. Shahid. 2015.Effect of salinity on rhizosphere acidification and antioxidant activity of two acacia species. Can. J. Forest Res. 45(1): 124-129. IF 1.689
56. **Abbas, G**., M. Saqib, J. Akhtar and M.A. Haq. 2015. Interactive effects of salinity and iron deficiency on different rice genotypes. J. Plant Nutr. Soil Sci.178 (2): 306–311. IF 2.083
57. **Abbas, G**., M. Saqib, Q. Rafique, M. A. Rahman, J. Akhtar, M.A. Haq and M. Nasim. 2013. Effect of salinity on grain yield and grain quality of wheat (*Triticum aestivum*L.). Pak. J. Agri. Sci. 50(2):185-189. IF 0. 618
58. **Abbas, G**., M. Saqib, J. Akhtar and S.M.A. Basra. 2013. Salinity tolerance potential of two acacia species at early seedling stage. Pak. J. Agri. Sci. 50(4): 683-688. IF 0. 618
59. Saqib, M., J. Akhtar, **Abbas** **G.,** and M. Nasim. 2013.Salinity and drought interaction in wheat (*Triticum aestivum* L.) is affected by the genotype and plant growth stage. Acta Physiol. Plant. 35(9): 2761-2768. IF 1.760
60. **Book Chapters**
61. Shahid, M., Natasha, S. Khalid, **Abbas, G**., N. K. Niazi, B. Murtaza, M. I. Rashid, I. Bibi. 2019. Redox mechanisms and plant tolerance under heavy metal stress: genes and regulatory networks. In: Sablok G. (Eds) Plant Metallomics and Functional Omics. pp. 71-105. doi:10.1007/978-3-030-19103-0\_5Springer, Cham
62. Saqib, M., Akhtar, J., **Abbas, G.** and Wahab, H.A. 2019. Saline agriculture: a climate smart integrated approach for climate change resilience in degraded land areas. In: Walter. L.F. (Ed.). Handbook of Climate Change Resilience, pp.1-19. Springer publisher, Dordrecht, The Netherlands.
63. Saqib, M., Akhtar, J., **Abbas, G.** and Murtaza, G. 2019. Enhancing food security and climate change resilience in degraded land areas by resilient crops and agroforestry. In: Castro P., Azul A., Leal Filho W., Azeiteiro U. (Eds) Climate Change-Resilient Agriculture and Agroforestry. pp. 283-297. Springer, Cham.
64. Shahid, M., Khalid, S., **Abbas, G.,** Shahid, N., Nadeem, M., Sabir, M., Aslam, M. and Dumat, C. 2015. Heavy metal stress and crop productivity. In: Hakeem K.R. (Ed.). Crop production and global environmental issues. Pp. 1-25, Springer International Publishing., ISBN: 978-3-319-23162-4
65. Murtaza, G., M. Saqib, A. Ghafoor, W. Javed, B. Murtaza, M. K. Ali and **Abbas, G**. 2015. Climate change and water security in dry areas. In: Walter L.F (Ed.). Handbook of Climate Change Adaptation. ISBN 978-3-642-38671-8. Pp. 1701-1730. Springer publisher, Dordrecht, The Netherlands.

**Research projects**

1. Principal investigator: Adapting to climate change through climate smart agricultural practices in water-limited landscapes in South Asia. Amount: USD 80,475. 2023-2024. Funding agency: APN-Japan.
2. Principal investigator: Assessing the potential of quinoa as a climate proof crop; implications for food security in changing climate. Amount: Rs. 7.9 Million. 2022- 2025. Funding agency: HEC-Pakistan.
3. Principal investigator: Growth potential of quinoa as alternative food crop for salt-affected soils in various agro-ecological zones of Punjab, Pakistan. Amount: Rs. 2.77 Million. 2017- 2020. Funding agency: HEC-Pakistan.
4. Principal investigator: Phytoremediation of Cd by salt tolerant tree species: metal uptake in relation to salinity. 2015-2016. Amount: Rs. 0.47 Million. Funding agency: HEC-Pakistan.
5. Principal investigator: Enhancing salt tolerance and nutrient uptake in wheat by the application of K and humic acid. 2015-2017. Rs. 0.14 Million. Funding agency: COMSATS Institute of Information Technology
6. Co-principal investigator: Remediation of cadmium contaminated soils with activated and in-activated biochar. 2016. Amount: Rs. 0.5 million. Funding agency: HEC-Pakistan.
7. Co-principal investigator: Arsenic tolerance and phytoremediation potential of *Conocarpus erectus* and *Populusdeltoids*. 2016.Rs. 0.14 Million. Funding agency: COMSATS Institute of Information Technology

**Papers in Conferences Proceedings (National & International)**

1. Aslam, M., Abbas, G., Murtaza, B., Naeem, M.A. Effect of nickel on growth and physiological attributes of quinoa (Chenopodium quinoa Willd.). International Conference on Recent Trends in Environmental Sustainability. Feb, 22-23, 2022. Vehari, Pakistan.
2. Fatima, R., Murtaza, B., Imran, M., Amjad, M., Abbas, G., Ahmad, S., Naeem, M.A. Health risk assessment of potentially hazardous elements in soil, plants and groundwater in peri-urban areas of Faisalabad, Pakistan. International Conference on Recent Trends in Environmental Sustainability. Feb, 22-23, 2022. Vehari, Pakistan
3. Muqaddas, S., Ahmad, S., Farooq, A.B.U., Abbas, G., Imran, M., Nawaz, R., Arshad, M. Investigating the effect of almond biochar and sewage water on the seed germination of spinach (*Spinacia oleracea*). International Conference on Recent Trends in Environmental Sustainability. Feb, 22-23, 2022. Vehari, Pakistan.
4. Anwar, H., Shahid, M., Natasha, Khalid, S., Nadeem, M., Abbas, G., Ahmad, M.S. Effect of wastewater irrigation on metal(loid) partitioning, physiological and biochemical attributes of Zea mays and Vigna radiate. International Conference on Recent Trends in Environmental Sustainability. Feb, 22-23, 2022. Vehari, Pakistan.
5. Abbas, G., Shabbir, A., Rehman, S. and Saqib, M. 2021. Reclamation of sodic soil using biochar and growing halophyte quinoa. First IUSS Conference on Sodic Soil Reclamation. July 30-Aug. 1, 2021. Changchun, China.
6. Virtual Conference on Ecosystem Restoration in the Global South. June 7, 2021. COMSATS Centre for Climate and Sustainability, Islamabad, Pakistan.
7. Abbas, G., Shabir, A., Amjad, M., Saqib, M., Murtaza, B. 2020. Salt tolerance and yield potential of exotic quinoa genotypes grown on saline-sodic soils under arid climatic conditions of Vehari, Pakistan. 1st International Conference on Innovations in Agriculture to Ensure Food Security in Changing Climate. April 02-03, 2020. Bahawalpur- Pakistan.
8. Shabir, A., Abbas, G., Imran, M. and Naeem, M.A. 2020. Role of biochar in mitigating arsenic toxicity in quinoa grown on as-contaminated saline soil. 1st International Conference on Innovations in Agriculture to Ensure Food Security in Changing Climate. April 02-03, 2020. Bahawalpur- Pakistan.
9. Murtaza, B., Natasha, Amjad, M., Shahid, M., Imran, M., Shah, N.S., Abbas, G., Naeem, M.A. and Amjad, M. 2019. Arsenic health risk assessment and multivariate comparison of physicochemical properties of drinking water from health facilities of district Vehari, Pakistan. 1st International Conference on Surface Science: Innovations and Applications for Geoenvironmental Challenges. April 25-26, 2019. Faisalabad, Pakistan.
10. Natasha, Shahid, M., Niazi, N.K., Khalid, S. and Abbas, G. 2019. Foliar uptake of lead oxide nanoparticles; accumulation, toxicity, with an inference of human health. 1st International Conference on Surface Science: Innovations and Applications for Geoenvironmental Challenges. April 25-26, 2019. Faisalabad, Pakistan.
11. Khalid, S., Shahid, M., Dumat, C., Niazi, N.K., Bibi, I., Abbas, G. and Murtaza, B. 2019. Wastewater irrigation effect on zinc and cadmium accumulation in vegetable environmental consequences and health risk assessment. 1st International Conference on Surface Science: Innovations and Applications for Geoenvironmental Challenges. April 25-26, 2019. Faisalabad, Pakistan.
12. Pervez, S., Abbas, G., M. Shahid, M. Amjad, B. Murtaza, M. Hussain and M. A. Naeem. 2019. Combined effect of salinity and arsenic on physiological and biochemical attributes of quinoa genotypes. ESCON, 2019: International Conference on Environmental Toxicology and Health, February, 25-27, 2019, Vehari Pakistan.
13. Natasha, M. Shahid, N. K. Niazi, F. Rabbani, A. B. U. Farooq, S. Khalid, G. Abbas, M. Amjad. 2019. Foliar application of lead oxide nanoparticles to assess the accumulation, toxicity, and risks associated with the foliar uptake of atmospheric ultrafine lead particles by spinach with an inference of human health. ESCON, 2019: International Conference on Environmental Toxicology and Health, February, 25-27, 2019, Vehari Pakistan.
14. Batool, M., G. Abbas, S. Pervez, M. Amjad, M. A. Naeem, A. Shabbir. 2019. Comparative salt tolerance and grain yield potential of quinoa genotypes grown on saline sodic soils. ESCON, 2019: International Conference on Environmental Toxicology and Health, February, 25-27, 2019, Vehari Pakistan
15. Murtaza, B., A. Ali, N. S. Shah, M. Imran, M. Shahid, M. A. Naeem, G. Abbas. 2019. Comparative study of various aqueous electron mediated reductive pathways for effective remediation of as from contaminated water. ESCON, 2019: International Conference on Environmental Toxicology and Health, February, 25-27, 2019, Vehari Pakistan
16. Naeem, M.A., M. Imran, M. Amjad, G. Abbas, M. Tahir, B. Murtaza, M. Shahid, A. Shabbir. 2019. Removal of cadmium from aqueous solutions using raw and acid activated wheat straw biochar: characterization, kinetics and equilibrium modeling. ESCON, 2019: International Conference on Environmental Toxicology and Health, February, 25-27, 2019, Vehari Pakistan
17. Tariq, K., Bashir, H., Saqib, M., Asghar, M.N., Abbas, G., and Akhtar, J. 2019. Performance of buttonwood (Conocarpus erectus L.) against soil salinity and lead Pollution. ESCON, 2019: International Conference on Environmental Toxicology and Health, February, 25-27, 2019, Vehari- Pakistan
18. Rehman, S., G. Abbas, M. Shahid, M. Saqib, B. Murtaza, M. Amjad, M. A. Naeem, M. Hussain, A. Farooq. Effect of salinity on cadmium tolerance and phytoremediation potential of *Conocarpus erectus* L. 2019. ESCON, 2019: International Conference on Environmental Toxicology and Health, February, 25-27, 2019, Vehari Pakistan
19. Tariq, M.N., Nadeem, M., Abbas, G., Amjad, M. and Murtaza, B. 2019. Salinity-Induced changes in the nutritional quality of wheat (*Triticum aestivum* L.) genotypes. ESCON, 2019: International Conference on Environmental Toxicology and Health, February, 25-27, 2019, Vehari- Pakistan
20. Ahmed, K., G. Abbas, M.A. Riaz, J. Akhtar and M. Saqib. 2018. Effect of salinity and boron on growth and physiology of different maize genotypes. 17th Int. Congress of Soil Science, March 13-15, 2018, Faisalabad-Pakistan
21. Mumtaz, M.Z., G. Abbas, J. Akhtar and M. Saqib. 2018. Effect of drought on grain yield and quality of different rice genotypes. 17th Int. Congress of Soil Science, March 13-15, 2018, Faisalabad-Pakistan
22. Pervaiz, A.A., G. Abbas, J. Akhtar and M. Saqib. 2018. Response of different wheat genotypes to water stress under field conditions. 17th Int. Congress of Soil Science, March 13-15, 2018, Faisalabad-Pakistan
23. M. Saqib, J. Akhtar, G. Abbas, H.A. Wahab. 2017. Root-mediated acidification and better nodal root growth contributes to phytoremediation potential and salt-resistance of wheat. Plant Nutrition, Growth & Environment Interactions III. Federal Office building Radetzkystraße, Hintere Zollamtsstraße 1, 1031, Vienna, Austria February 20-21, 2017
24. Tariq, M.N., Nadeem, M., Abbas, G., Amjad, M., Murtaza, B. 2017. Salinity-Induced Changes in the Nutritional Quality of Wheat (*Triticum aestivum* L.) Genotypes. 5th International Conference on “Food & Nutritional Security – Impact of climate change (FNSC-2017) & Food and Nutrition Expo. Institute of Home & Food Science, Government College University, Faisalabad-Pakistan. March 07-08, 2017
25. Saqib, M., G. Abbas, J. Akhtar, M. Arshad and R. H. Qureshi. 2015. Comparative salt resistance of wheat genotypes differs with calcium supply under saline conditions. German Plant Nutrition Conference. September 17-18, 2015. Georg-August University, Göttingen, Germany.
26. Saqib, M., M. Sanaullah, G. Abbas, J. Akhtar, R. H. Qureshi and G. Murtaza. 2015. Differential potential of different tree species to improve soil organic matter and chemical properties. 5th international symposium on soil organic matter. September 20-24. Georg-August University, Göttingen, Germany.
27. Saqib, M., J. Akhtar, G. Abbas, H.A. Wahab and G. Murtaza. 2015. Enhancing land rehabilitation, ecosystem restoration and climate change resilience in the degraded land areas through saline agriculture. Combating drought, land degradation and desertification for poverty reduction and sustainable development. 3rd UNCCD Scientific Conference. March 9-12, 2015, Cancun, Mexico.
28. Wahab, H.A., M. Saqib, J. Akhtar and G. Abbas. Response of *Conocarpus erectus*L. to salt-affected field conditions.15th International Congress of Soil Science: Soil Management in Changing Climate 18-20 March, 2014, Islamabad, Pakistan.
29. Abrar, M.M., M. Saqib, J. Akhtar, G. Abbas, A. Wahab and M. Asif. Interactive impact of salinity and water stress on the growth and ionic composition of *Jatrophacurcas*. 15th International Congress of Soil Science: Soil Management in Changing Climate 18-20 March, 2014, Islamabad, Pakistan.
30. Saqib, M., G. Abbas, J. Akhtar, G. Murtaza and M.A. Haq. 2013. Management and utilization of saline water and salt-affected arid land resources by raising salt tolerant grasses and trees. 11th Int. Conf. on Dry land Devel. March 18-23, 2013, Beijing, China.
31. Abbas, G., M. Saqib, J. Akhter and S.M.A. Basra. Interactive effect of salinity and water stress on the physiology of *Jatrophacurcas*. 14th Congress of Soil Science, March 12-15, 2012, Lahore-Pakistan.
32. Gill, M.B., M. Saqib, G. Abbas, M.A. Haq, M.S.A. Ahmed and M.Z. Mumtaz. Response of different maize (*Zea maize* L.) genotypes to salinity. 14th Congress of Soil Science, March 12-15, 2012, Lahore-Pakistan.
33. Ahmed, S., M. Saqib, G. Abbas, M.A. Haq, M. Maqsood and T. Ali. Response of different rice (*Oryza sativa* L.) genotypes to Boron and Salinity. 14th Congress of Soil Science, March 12-15, 2012, Lahore-Pakistan.
34. Abbas, G., Z. Hussain, M. Saqib, M.A. Rehman, M. Arshad, K. Ahmed and M.A. Riaz. Effect of salinity on growth and ionic composition of *Acacia nilotica.*12th International Conference of Botany (ICB) 1-3 September, 2012. Islamabad, Pakistan.
35. Rahman, M.A., M. Saqib, K. Saleem, G. Abbas, M. Arshad, K. Ahmed and M.A. Riaz. Effect of salinity on growth and macro and micro nutrient uptake of different wheat (*Triticumaestivum*L.) genotypes. 12th International Conference of Botany (ICB) 1-3 September, 2012. Islamabad, Pakistan.

**Trainings and workshops**

* Proposal Development Training Workshop held in Colombo, Sri Lanka on November 29- December 1, 2022, co-hosted by the Asia-Pacific Network for Global Change Research (APN) and Ministry of Environment of Sri Lanka.
* Workshop on Skill Enhancement & Employee Development Program (SEED) on July 26-28, 2022. Organized by COMSATS University Islamabad, Vehari Campus.
* Internationalon-line Training on Quinoa and Salicornia production on March 3, 2021. Organized by International Center for Biosaline Agriculture (ICBA), Dubai, United Arab Emirates.

**Awards & Honors**

* Letter of appreciation for commendable performance during 2017-2020. COMSATS University Islamabad, Vehari Campus
* Endeavour post-doc Fellowship-2016. The UWA Institute of Agriculture Sciences, The University of Western Australia, Perth, Australia
* Research Productivity Award 2015-2017. COMSATS University Islamabad, Vehari Campus
* Letter of appreciation (2013) from The Worthy Vice Chancellor, University of Agriculture, Faisalabad for completing the Ph.D. degree in six semesters
* Academic Excellence Scholarship (2005-2010), University of Agriculture, Faisalabad

**Membership**

* Soil Science Society of Pakistan
* FAO Global Soil Partnership; International Network of Salt-affected Soils since April, 2021

**Reviewer of Journals**

1. International journal of phytoremediation
2. Plant physiology and biochemistry
3. Acta physiologiae plantarum
4. Environmental geochemistry and health
5. Science of the total environment
6. Journal of hazardous materials
7. Ecotoxicology and environmental safety
8. Chemosphere
9. Environmental and experimental botany
10. Chemistry and ecology
11. Plos one
12. Applied geochemistry
13. Groundwater for sustainable development
14. Journal of soil science and plant nutrition
15. Pakistan journal of agricultural sciences
16. International journal of agriculture and biology
17. Research Journal of biotechnology

**Professional references**

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