

## REFERENCE

- Aamer, M., M. Shaaban, M.U. Hassan, H. Guoqin, L.Ying, T.H. Ying, F. Rasul., M. Qiaoying, L. Zhuanling, A. Rasheed, and Z. Peng., 2020. Biochar mitigates the N<sub>2</sub>O emissions from acidic soil by increasing the nosZ and nirK gene abundance and soil pH. *Journal of Environmental Management*, 255: 1-7.
- Ai., C., G. Liang, X. Wang, J. Sun, P. He, and W. Zhou. 2017. A distinctive root-inhabiting denitrifying community with high N<sub>2</sub>O/ (N<sub>2</sub>O+N<sub>2</sub>) product ratio. *Soil Biology and Biochemistry*, 109: 118-123.
- Alvarenga, P., M. Farto, C. Mourinha, P. Palma. 2016. Beneficial use of dewatered and composted sewage sludge as soil amendments: behaviour of metals in soils and their uptake by plants. *Waste Biomass Valor*, 7: 1189–1201.
- Akiyama, H., T., Sano, K. Nishina, S. Sudo, N. Oura, M. Fujimori, I. Uezono, S. Yano, S. Ohkosi, Y. Fujita, Y. Shiratori, M. Tsuji, H. Hasukawa, Y. Suzue, Y. Yamada, H. Mizukami, T. Matsumoto, and K. Yagi. 2023. N<sub>2</sub>O emission factors for organic amendments in Japan from measurement. *Science of the Total Environment*, 864: 1-9.
- Aneja, V.P., W.H. Sclesinger, Q. Li, A. Nahas, W.H. Battye. 2019. Characterization of atmospheric nitrous oxide emissions from global agricultural soils. *SN Applied Sciences*, 1(1662): 1-11.
- Bag, S., B. Saha, O. Mehta, D. Anbumani, N. Kumar, M. Daya, A. Pant, P. Kumar, S. Saxena, K.H. Allin, T., Hansen, M. Arumugam, H. Vestergaard, O. Pedersen, V. Pereira, P. Abraham, R. Tripathi, N. Wadhawa, S. Bhatnagar, V.G. Prakash, V. Radha, R.M. Anjana, V. Mohan, K. Takeda, T. Kurakawa, G.B. Nair, and B. Das. 2016. An improved method for high quality metagenomics dna extraction from human and environmental samples. *Scientific Reports*, 6 (26775): 1-9.
- Bahram, M., M. Espenberg, J. Pärn, L.L. Morley, S. Anslan, K. Kasak, U. Kõljalg, J. Liira, M. Maddison, M. Moora, U. Niinemets, M. Öpik, M. Pärtel, K. Soosaar, M. Zobel, F. Hildebrand, L. Tedersoo, and Ü. Mander. 2022. Structure and function of the soil microbiome underlying N<sub>2</sub>O emissions from global wetlands. *Nature Communications*, 13: 1430-1439.

- Binet, R., D.M. Deer, and S.J. Uhlfelder. 2014. Rapid detection of *Shigella* and enteroinvasive *Escherichia coli* in produce enrichments by a conventional multiplex PCR assay. *Food Microbiology*, 40: 48-54.
- Booth, D.J.L., C.E. Prescott, and S.J. Grayston. 2014. Microbial functional genes involved in nitrogen fixation, nitrification and denitrification in forest ecosystems. *Soil Biology & Biochemistry*, 75:11-25.
- Broeders, S., I. Huberb, L. Grohmannc, G. Berbend, I. Tavernierse, M. Mazzaraf, N. and D. Morisset. 2014. Guidelines for validation of qualitative real-time PCR methods. *Trends in Food Science & Technology*, 37: 115-126.
- Botchkova, E., A. Vishnyakova, N. Popova., M. Sukhacheva, T. Kolganova, Y. Litt, and A. Safonov. 2023. Characterization of enrichment cultures of anammox, nitrifying and denitrifying bacteria obtained from a cold, heavily nitrogen-polluted aquifer. *Biology*, 12: 221-246.
- Bourioug, M., L.A. Sehmer, X. Laffray, M. Benbrahim, L. Aleya, and B.A. Sossé. 2015. Sewage sludge fertilization in larch seedlings: Effects on trace metal accumulation and growth performance. *Ecological Engineering*, 77: 216-224.
- Caione, G., F.M. Fernandes, and A. Lange. 2013. Residual effect of phosphorus sources in soil chemical properties, nutrition and biomass productivity of sugarcane. *Revista Brasileira de Ciências Agrárias*, 8(2): 189-196.
- Canisares, L.P., C.A. Rosolem, L. Momesso, C.A.C. Crusciol, D.M. Villegas, J. Arango, K. Ritz, and H. Cantarella. 2021. Maize-brachiaria intercropping: A strategy to supply recycled N to maize and reduce soil N<sub>2</sub>O emissions. *Agriculture, Ecosystems and Environment*, 319: 1-11.
- Chaudhuri, R.R. and I.R. Henderson. 2012. The evolution of the *Escherichia coli* phylogeny. *Infection, Genetics, and Evolution*, 12: 214-226.
- Chen, X.P., Y.G. Zhu, Y. Xia, J.P. Shen, and J.Z. He. 2008. Ammonia oxidizing archaea: important players paddy rhizosphere soil. *Environmental Microbiology*, 10(8): 1978-1987.

- Chen Z., Q. Wang, J. Zhao, Y. Chen, H. Wang, J. Ma, P. Zou, L. Bao. 2020. Restricted nitrous oxide emissions by ammonia oxidizers in two agricultural soils following excessive urea fertilization. *Journal of Soils and Sediments*, 20: 1502-1512.
- Chern, E.C., S. Siefiring, J. Paar, M.Doolittle, and R.A. Haugland. 2012. Comparison of quantitative PCR assays for *Escherichia coli* targeting ribosomal RNA and single copy genes. *Lettes in Applied Microbiology*, 52: 298–306.
- Denisova, K.O., A.A. Ilyin, R.N. Rummyantsev, A.P. Ilyin, and A.V. Volkova. 2019. Nitrous oxide: Production, application, and protection of the environment. *Russian Jpurnal of General Chemistry*, 89(6): 46-54.
- Fukuda, K., M. Ogawa, H. Taniguchi, and M. Saito. 2016. Molecular approaches to studying microbial communities: targeting the 16S ribosomal RNA gene. *Journal of University of Occupational and Environmental Health*, 3: 223-232.
- Gaimster, H., M. Alston, D.J. Richardson, A.J. Gates, and G. Rowley. 2018. Transcriptional and environmental control of bacterial denitrification and N<sub>2</sub>O emissions. *Federation of European Microbiological Society Microbiology Letter*, 365:1-8.
- GIO and MOE (Greenhouse Gas Inventory Office of Japan and Ministry of the Environment), 2022. National Greenhouse Gas Inventory Report of Japan. Center for Global Environmental Research, Earth System Division, National Institute for Environmental Studies, Japan.
- Guardia, G., M.T. Cangani, A.S. Cobena, J.L. Junior, and A. Vallejo. 2017. Management of pig manure to mitigate NO and yield-scaled N<sub>2</sub>O emissions in an irrigated Mediterranean crop. *Agriculture, Ecosystems and Environment*, 238: 55-66.
- Gutiérrez, J.C.L., S. Henry, S. Hallte, F.M. Laurent, G. Catroux, and L. Philippot. 2004. Quantification of a novel group of nitrate-reducing bacteria in the environment by real-time PCR. *Journal of Microbiological Methods*, 57: 399–407.
- Hayatsu, M., C. Katsuyama, and K. Tago. 2021. Overview of recent researches on nitrifying microorganisms in soil. *Soil Science and Plant Nutrition*, 67: 619-632.
- Harter, J., H.M. Krause, S. Schuettler, R. Ruser, M. Fromme, T. Scholten, A. Kappler, and S. Behrens. 2014. Linking N<sub>2</sub>O emissions from biochar-amended soil to the structure

- and function of the N-cycling microbial community. *The International Society for Microbial Ecology Journal*, 8: 660–674.
- He, H., Y. Zhen, T. Mi, L. Fu, and Z. Yu. 2018. Ammonia-oxidizing archaea and bacteria differentially contribute to ammonia oxidation in sediments from adjacent waters of Rushan Bay, China. *Frontier Microbiology*, 9(116): 1-14.
- Heil, J., Vereecken, H., and Brüggemann, N. 2016. A review of chemical reactions of nitrification intermediates and their role in nitrogen cycling and nitrogen trace gas formation in soil. *European Journal of Soil Science*. 67:23–39.
- Horta, L.A.D., M. Putz, A. Spor, D. Bru, MC. Breuil, S. Hallin, and L. Philippot. 2016. Non-denitrifying nitrous oxide-reducing bacteria – An effective N<sub>2</sub>O sink in soil. *Soil Biology & Biochemistry*, 103: 376-379.
- Huang, R., Y. Wang, J. Liu, J. Li, G. Xu, M. Luo, C. Xu, E. Ci, and M. Gao. 2018. Variation in N<sub>2</sub>O emission and N<sub>2</sub>O related microbial functional genes in straw- and biochar-amended and non-amended soils.
- Huang, X., Y., Zou, C. Qiao, Q. Liu, J. Liu, R. Kang, L. Ren, and W. Wu. 2023. Effects of biological nitrification inhibitor on nitrous oxide and nosZ, nirK, nirS denitrifying bacteria in paddy soils. *Sustainability* 15: 1-12.
- Jay, Z.J. and W.P. Inskeep. 2015. The distribution, diversity, and importance of 16S rRNA gene introns in the order Thermoproteales. *Biology Direct* 10(35): 1-10.
- Ji, G., K. Yang, L. Zhu, Y. Jiang, H. Wang, J. Zhou, and H. Zhang. 2015. Aerobic Denitrification: a review of important advances of the last 30 years. *Biotechnology and Bioprocess Engineering* 20: 643-651.
- Johnson, J.S., D.J. Spakowicz, B.Y., Hong, L.M. Petersen, P. Demkowicz, L. Chen, S.R. Leopold, B.M. Hanson, H.O. Agresta, M. Gerstein, E. Sodergren, and G.M. Weinstock. 2019. Evaluation of 16S Rrna gene sequencing for species and strain-level microbiome analysis. *Nature communications* 10(5029): 1-11.
- Junier, P., V. Molina, C. Dordor, O. Hadas, O.K. Kim, T. Junier, K.P. Witzel, and J.F. Imhoff. 2010. Phylogenetic and functional marker genes to study ammonia-oxidizing microorganisms (AOM) in the environment. *Applied Microbiology and Biotechnology*, 85: 25–440.

- Júnior, N.M., j.j. Comin, G.W. Ferreira, J.M.R. Tavares, R.D.R. Couta, and P.B. Filho. 2021. Nitrous oxide emissions in soils fertilized with pig manure: soil processes and strategies of control and mitigation. *Research, Society and Development*, 10(2): 1-16.
- Kahrl, F., Y. Li, Y. Su, T. Tennigkeit, A. Wilkes, and J. Xu. 2010. Greenhouse gas emissions from nitrogen fertilizer use in China. *Environmental Science and Policy*, 13: 688–694.
- Kajiura, M., K., Minamikawa, T. Tokida, Y. Shirto, and R. Wagai. 2018. Methane and nitrous oxide emissions from paddy fields in Japan: An assessment of controlling factor using an intensive regional data set. *Agriculture, Ecosystems and Environment*, 252: 51-60.
- Kearns, P.J., J.H. Angel, S.G. Feinman, and J.L. Bowen. 2015. Long-term nutrient addition differentially alters community composition and diversity of genes that control nitrous oxide flux from salt marsh sediments. *Estuarine, Coastal and Shelf Science*, 154: 39-47.
- Kim, P.J., M.I. Khan, and S.J. Lee. 2021. Effect of rice on nitrous oxide (N<sub>2</sub>O) Emission under different levels of nitrogen fertilization. *Agronomy*, 11(2): 217-228.
- Kralik, P. and M. Ricchi. 2017. A basic guide to real time PCR in microbial diagnostic: Definitions, parameters, and everything. *Frontiers in Microbiology*, 88(108): 1-9.
- Kumar, A., K. Medhi, R. Kishor, G. Subrahmanyam, R. Mondal, P. Raja, P. Raja, S. K. Gupta, and H. Pathak. 2020. Molecular and ecological perspectives of nitrous oxide producing microbial communities in agro-ecosystems. *Reviews in Environmental Science and Biotechnology*, 19: 717-750.
- Lahlali, R., D.S.S. Ibrahim, Z. Belabess, M.Z.K. Roni, n. Radouane, C.S.L. Vicente, E. Mendez, F. Mokrini, E.A. Barka, M.G.D.M. Mota, and G. Peng. 2021. High-throughput molecular technologies for unraveling the mystery of soil microbial community: challenges and future prospects. *Heliyon*, 7(10): 1-16.
- Lawrence, N.C., C.G. Tenesca, A.V. Loocke, and S.J. Hall. 2021. Nitrous oxide emissions from agricultural soils challenge climate sustainability in the US Corn Belt. *The Proceedings of the National Academy of Sciences*, 118(46): 1-8.

- Lazcano, C., X.Z. Barker, and C. Decock. 2021. Effects of Organic Fertilizers on the Soil Microorganisms Responsible for N<sub>2</sub>O Emissions: A Review. *Microorganisms*, 9(983): 1-18.
- Li, S., L. Song, Y. Jinm S. Liu, Q. Shen, and J. Zou. 2016. Linking N<sub>2</sub>O emission from biochar-amended composting process to the abundance of denitrify (nirK and nosZ) bacteria community. *AMB Express*, 6: 37-47.
- Li, L., Z. Zheng, W. Wang, J.A. Biederman, X. Xu, Q. Ran, R. Qian, C. Xu, B. Zhang, F. Wang, S. Zhou, L. Cui, R. Che, Y. Hao, X. Cui, Z. Xu, and Y. Wang. 2020. Terrestrial N<sub>2</sub>O emissions and related functional genes under climate change: A global meta-analysis. *Global Change Biology*, 26: 931-943.
- Liang, D. and P. Robertson. 2021. Nitrification is a minor source of nitrous oxide (N<sub>2</sub>O) in an agricultural landscape and declines with increasing management intensity. *Global Change Biology*, 27: 5599–5613.
- Lin, S., Y. Pi, D., Long, J. Duan, X. Zhu, X. Wang, J. He, and Y. Zhu. 2022. Impact of organic and chemical nitrogen fertilizers on the crop yield and fertilizer use efficiency of soybean–maize intercropping systems. *Agriculture* 12: 1-9.
- Liu, G. 2012. *Greenhouse Gases : Emission, Measurement and Management*. IntechOpen, Rijeka.
- Liu, S., M. Schlöter, R. Hu, H. Vereecken, and N. Brüggemann. 2019. Hydroxylamine contributes more to abiotic N<sub>2</sub>O production in soils than nitrite. *frontiers in environmental science*, 7(47): 1-10.
- Lobell, D.B., W. Schlenker, and J. Costa-Roberts. 2011. Climate trends and global crop production since 1980. *Science*, 333: 616–620.
- Lourenço, K.S., O.Y.D.A. Costa, H. Cantarella, and E.E. Kuramae. 2022. Ammonia-oxidizing bacteria and fungal denitrifier diversity are associated with N<sub>2</sub>O production in tropical soils. *Soil Biology and Biochemistry*, 166: 1-13.
- Lu, L and Z. Jia. 2013. Urease gene-containing Archaea dominate autotrophic ammonia oxidation in two acid soils. *Environmental Microbiology*. 15(6): 1795-1809.
- Luo G., V.P. Friman, H. Chen, M. Liu, M. Wang, S. Guo, N. Ling, Q. Shena. 2018. Long-term fertilization regimes drive the abundance and composition of N cycling-related

- prokaryotic groups via soil particle-size differentiation. *Soil Biology and Biochemistry*. 116: 213-223.
- Ma, Y., J.L. Zilles, and A.D. Kent. 2019. An evaluation of promoters for detecting denitrifiers via their functional genes. *Environmental Microbiology*, 21(4): 1196-1210.
- Madhu, G. 2022. Utilisation of corn and its applications. *The Pharma Innovation Journal*, 11(7): 1337-1342.
- Malhi, G.S., M. Kaur, and P. Kaushik. 2021. Impact of climate change on agriculture and its mitigation strategies: a review. *Sustainability*, 13: 1318-1338.
- Mardis, E. and W.R. McCombie. 2017. Library quantification: fluorometric quantitation of double-stranded or single-stranded dna samples using the qubit system. Cold Spring Harbor Laboratory Press, New York.
- Marotz, C., A. Amir, G. Humphrey, J. Gaffney, G. Gogul, and R. Knight. 2017. DNA extraction for streamlined metagenomics of diverse environmental samples. *BioTechniques*, 62: 290-293.
- Mongad, D.S., N.S. Chavan, N.P. Narwade, K. Dixit, Y.S. Shouche, and D.P. Dhotre. 2021. MicFunPred: A conserved approach to predict functional profiles from 16S rRNA gene sequence data. *Genomics*, 113(6): 3635-3643.
- Morphet, S.C., J.F., Huggett, D.R. Murdoch, and J.A.G. Scott. 2014. Making standards for quantitative real-time pneumococcal PCR. *Biomolecular Detection and Quantification*, 2: 1-3.
- Möller, K. 2015. Assessment of alternative phosphorus fertilizers for organic farming: meat and bone meal. Fact Sheet. Universität Hohenheim, ETH Zürich, FiBL, Bioforsk, Universität für Bodenkultur Wien, Newcastle University, University of Copenhagen.
- Nakazawa, T. 2020. Current understanding of the global cycling of carbon dioxide, methane, and nitrous oxide. *Proceedings of the Japan Academy*, 96(9): 394-419.
- Nisbet, E.G., E.J. Dlugokencky, R.E. Fisher, J.L. France, D. Lowry, M.R. Manning, S.E. Michel, and N.J. Warwick. 2021. Atmospheric methane and nitrous oxide: challenges along the path to Net Zero. *Philosophical Transactions A*, 379: 1-24.



- Nogalska, A., S.J. Krzebietke, M. Zalewska, and Z. Nogalski. 2017. The effect of meat and bone meal (MBM) on the nitrogen and phosphorus content and pH of soil. *Agricultural and Food Science*, 26: 181-187.
- Orschler, L., S. Agrawal, and S. Lackner. 2019. On resolving ambiguities in microbial community analysis of partial nitrification anammox reactors. *Scientific Reports*, 9: 1-10.
- Pan, B., L. Xia, S.K. Lam, E. Wang, Y. Zhang, A. Mosier, and D. Chen. 2022. A global synthesis of soil denitrification: driving factors and mitigation strategies. *Agriculture, Ecosystems and Environment*, 327: 1-11.
- Pauleta, S.R., M.S.P. Carepo, and I. Moura. 2019. Source and reduction of nitrous oxide. *Coordination Chemistry Reviews*, 367: 436-449.
- Phung, L.D., M. Miyazawa, D.V. Pham, M. Nishiyama, S. Masuda, F. Takakai, and T. Watanabe. 2021. Methane mitigation is associated with reduced abundance of methanogenic and methanotrophic communities in paddy soils continuously sub-irrigated with treated wastewater. *Scientific Reports*, 11: 7426-7436.
- Pichler, M., Ö.K. Coskun, A.S.O. Arbulú, N. Conci, G. Wörheide, S. Vargas, W.D. Orsi. 2018. A 16S rRNA gene sequencing and analysis protocol for the Illumina MiniSeq platform. *Microbiology Open*, 7: 1-9.
- Qiao, Z., R. Sun, Y. Wu, S. Hu, X. Liu, J. Chan, and X. Mi. 2020. Characteristics and metabolic pathway of the bacteria for heterotrophic nitrification and aerobic denitrification in aquatic ecosystems. *Environmental Research*, 191: 1-12.
- Qin, H., X. Xing, Y. Tang, H. Hou, J. Yang, R. Shen, W. Zhang, Y. Liu, and W. Wei. 2019. Linking soil N<sub>2</sub>O emissions with soil microbial community abundance and structure related to nitrogen cycle in two acid forest soils. *Plant soil*, 435: 95-109.
- Ribbons, R.R., D.J.L. Booth, J. Masse, S.J. Graystone, M.A. McDonald, L. Vesterdal, and C.E. Prescott. 2016. Linking microbial communities, functional genes and nitrogen-cycling processes in forest floors under four tree species. *Soil Biology & Biochemistry*, 103: 181-191.
- Rigby, H., B.O. Clarke, D.L. Pritchard, B. Meehan, F. Beshah, S.R. Smith, and N.A. Porter. 2016. A critical review of nitrogen mineralization in biosolids-amended soil, the



- associated fertilizer value for crop production and potential for emissions to the environment. *Science of the Total Environment*, 541: 1310–1338.
- Sánchez, E.P., C.C. Martínez, J.Á. Fuentes, and, D.P. Bonillaa. 2020. Impact of tillage and N fertilization rate on soil N<sub>2</sub>O emissions in irrigated maize in a Mediterranean agroecosystem. *Agriculture, Ecosystems and Environment*, 287: 1-10.
- Shakoor, A., S.M. Shahzad, N. Chatterjee, M. Saleem, T.H. Farooq, M.M. Altaf, M.A. Tufail, A.A. Dar, and T. Mehmood. 2021. Nitrous oxide emission from agricultural soils: Application of animal manure or biochar? A global meta-analysis. *Journal of Environmental Management*, 285: 1-11.
- Sharma, L.K. and S.K. Bali. 2018. A review of methods to improve nitrogen use efficiency in agriculture. *Sustainability*, 10(51): 1-23.
- Shi, Z., Q. Kong, X. Li, W. Xu, C. Mao, Y. Wang, W. Song, and J. Huang. 2022. The effects of dna extraction kits and primers on prokaryotic and eukaryotic microbial community in freshwater sediments. *Microorganisms*, 10: 1-12.
- Shun, J., R.A. Sanford, J.C. Sanford, S.K. Ooi, Y.F.E. Löffler, K.T. Konstantinidis, and W.H., Yang. 2020. Beyond denitrification: The role of microbial diversity in controlling nitrous oxide reduction and soil nitrous oxide emissions.
- Sun, R., D.D. Myrold, D. Wang, X. Guo, and H. Chu. 2019. AOA and AOB communities respond differently to changes of soil pH under long-term fertilization. *Soil Ecology Letters*, 1(4): 126–135.
- Suzuki, M.T., L.T. Taylor, and E.F. DeLong. 2000. Quantitative analysis of small-subunit rna genes in mixed microbial populations via 59-nuclease assays. *Applied and Environmental Microbiology*, 66(11): 4605–4614.
- Takeda, N., J. Friedl, D. Rowlings, Daniele De Rosa, C. Scheer, and P. Grace. 2021. Exponential response of nitrous oxide (N<sub>2</sub>O) emissions to increasing nitrogen fertiliser rates in a tropical sugarcane cropping system. *Agriculture, Ecosystem and Environment* 313: 1-8.
- Tao, R., S.A. Wakein, Y. Liang, and G., Chu. 2017. Response of ammonia-oxidizing archaea and bacteria in calcareous soil to mineral and organic fertilizer application and their relative contribution to nitrification. *Soil Biology & Biochemistry*, 114: 20-30.

- Taylor, S.C., K., Nadeau, M. Abbasi, C. Lachance, M. Nguyen, and J. Fenrich. 2019. The ultimate qpcr experiment: Producing publication quality, reproducible data the first time. *Trends in Biotechnology*, 37(7): 761-774.
- Thakur, S. and K. Medhi. 2019. Nitrification and denitrification processes for mitigation of nitrous oxide from waste water treatment plants for biovalorization: challenges and opportunities. *Bioresource Technology*, 282: 502-513.
- Thion, C.E., J.D. Poirel, T. Cornulier, F.T.D. Vries, R.D. Bardgett, and J.I. Prosser. 2016. Plant nitrogen-use strategy as a driver of rhizosphere archaeal and bacterial ammonia oxidiser abundance. *FEMS Microbiology Ecology*, 96: 1-11.
- Timilsina, A., F. Bizimana, B. Pandey, R.K.P. Yadav, W. Dong, and C. Hu. 2020. Nitrous oxide emission paddies: Understanding the role of rice plants. *Plants*, 9(20): 180.
- Wang, C., H. Lu, D. Dong, H. Deng, P.J. Strong, H. Wang, and W. Wu. 2013. Insight into the Effects of Biochar on Manure Composting: Evidence Supporting the Relationship between N<sub>2</sub>O Emission and Denitrifying Community. *Environmental Science & Technology*, 47(13): 7341–7349.
- Wang, J., D.R. Chadwick, Y. Cheng, and X. Yan. 2017. Global analysis of agricultural soil denitrification in response to fertilizer nitrogen. *Science of the Total Environment*, 616: 908-917.
- Wang, W., M. Yang, P. Shen, R. Zhang, X. Qin, J. Han, Y. Li, and X. Wen. 2019. Conservation tillage reduces nitrous oxide emissions by regulating functional genes for ammonia oxidation and denitrification in a winter wheat ecosystem. *Soil & Tillage Research*, 194: 104347-104355.
- Wang, Z., X.X. Zhang, X. Lu, B. Liu, Y. Li, C. Long, and A. Li. 2014. Abundance and diversity of bacterial nitrifiers and denitrifiers and their functional genes in tannery wastewater treatment plants revealed by high-throughput sequencing. *PLoS ONE*, 9(11): 1-19.
- Wenderborn, S. 2020. The chemistry, biology, and modulation of ammonium nitrification in soil. *Angewandte Chemie*, 132(6): 2202-2223.

- Wijesekara H, N.S. Bolan, P. Kumarathilaka, N. Geekiyanage, A. Kunhikrishnan, B. Seshadri, C. Saint, A. Surapaneni, M. Vithanage. 2016. Biosolids enhance mine site rehabilitation and revegetation. *Environmental Materials and Waste*, 3: 45-71.
- Wu, K., P. Gong, L. Zhang, Z. Wu, X. Xie, H. Yang, W. Li, Y. Song, and D. Li. 2019. Yield-scaled N<sub>2</sub>O and CH<sub>4</sub> emissions as affected by combined application of stabilized nitrogen fertilizer and pig manure in rice fields. *Plant, Soil and Environment*, 65(10): 497–502.
- Wu, J.W., L.M. Whang, T. Fukushima, and S.H. Chang. 2013. Response of ammonia-oxidizing archaeal and betaproteobacterial populations to wastewater salinity in a full scale municipal wastewater treatment plant. *Journal of Bioscience and Bioengineering*. 115(4): 424-432.
- Wu, Q., M. Ji, S. Yu., J. Li, X. Wu., X., Ju, X. Ju, B. Liu, and X. Zhang. 2023. Distinct denitrifying phenotypes of predominant bacteria modulate nitrous oxide metabolism in two typical cropland soils. *Microbial Ecology*, 86:509–520.
- Xu., Shanshan, P. Hou, L. Xue, S. Wang, and L. Yang. 2017. Treated domestic sewage irrigation significantly decreased the CH<sub>4</sub>, N<sub>2</sub>O and NH<sub>3</sub> emissions from paddy fields with straw incorporation. *Atmospheric Environment*, 169: 1-10.
- Xu, F. and H. Chang. 2022. Soil Greenhouse Gas Emissions and Nitrogen Change for Wheat Field Application of Composted Sewage Sludge. *Agronomy*, 12(8): 1-13.
- Yang, Y. H. Liu, and J. Lv. 2022. Response of N<sub>2</sub>O emission and denitrification genes to different inorganic and organic amendments. *Scientific Reports*, 12: 3940- 3949.
- Yang, Y.D, Y.G. Hu, Z.M. Wang, and Z.H. Zeng. 2018. Variations of the nirS-, nirK-, and nosZ-denitrifying bacterial communities in a northern Chinese soil as affected by different long-term irrigation regimes. *Environmental Science and Pollution Research*, 25: 14057–14067.
- X., Yuanjian, Y. Xiaoli, L. Haihua, and Z. Bo. 2023. Optimization of nitrogen removal performance and metabolic pathway of a heterotrophic nitrifying-aerobic denitrifying bacterial strain *Acinetobacter johnsonii* sp. N26. *Microbiology Bulletin*, 50(4): 1374-1395.

- Yue, H., S. Banerjee, C. Liu, Q. Ren, W. Zhang, B. Zhang, X. Tian, G. Wei, and D. Shu. 2022. Fertilizing-induced changes in the nitrifying microbiota associated with soil nitrification and crop yield. *Science of the Total Environment*, 841: 1-14.
- Zeglin, L.H., A.E. Taylor, D.D. Myrold, and P.J. Bottomley. 2011. Bacterial and archaeal amoA gene distribution covaries with soil nitrification properties across a range of land uses. *Environmental Microbiology Reports*, 3(6): 717–726.
- Zhang, H., M. Gañ ova, Z.Q. Yan, H. Chang, and P. Neuzil. 2020. PCR Multiplexing Based on a Single Fluorescent Channel Using Dynamic Melting Curve Analysis. *American Chemical Society Omega*, 5: 30267-30273.
- Zhang, H., Y. Fang, Y. Chen, Y. Li, Y. Lin, J. Wu, Y. Cai, and S.X., Chang. 2022. Enhanced soil potential N<sub>2</sub>O Emissions by land-use change are linked to AOB-amoA and nirK gene abundances and denitrifying enzyme activity in subtropics. *Science of the Total Environment*, 850: 1-10.
- Zhang, P., J., Zhang, and M. Chen. 2017. Economic impacts of climate change on agriculture: The importance of additional climatic variables other than temperature and precipitation. *Journal of Environmental Economics and Management*, 83: 8–31.
- Zhang, J., M. Zhuang, N. Shan, Q. Zhao, H. Li, and L. Wang. 2019. Substituting organic manure for compound fertilizer increases yield decreases NH<sub>3</sub> and N<sub>2</sub>O emissions in an intensive vegetable production systems. *Science of the Total Environment*, 670: 1184-1189.
- Zhang, X., Q. Liang, G. Wang, H. Zhang, A. Zhang, Y. Tan, and R. Bol. 2023. Incorporating straw into intensively farmed cropland soil can reduce N<sub>2</sub>O emission via inhibition of nitrification and denitrification pathways. *Journal of Environmental Management*, 342: 1-11.
- Zhaoxiang, W., L. Huihu, L. Qiaoli, Y. Changyan, and Y. Faxin. 2020. Application of bio-organic fertilizer, not biochar, in degraded red soil improves soil nutrients and plant growth. *Rhizosphere*, 16: 1-11.
- Zhi W. and G. Ji. 2014. Quantitative response relationships between nitrogen transformation rates and nitrogen functional genes in a tidal flow constructed wet land under C//N ratio constraints. *Water Research*, 64: 32-41.

- Zhou, J., Y. Dong, F. Luo, Z. He, Q. Tu, and X. Zhi. 2010. Functional molecular ecological networks. *American Society for Microbiology*, 1(4): 1-10.
- Zielińska, S., P. Radkowski, A. Blendowska, A.L. Galezowska, J.M. Łoś, and M. Łoś. 2017. The choice of the DNA extraction method may influence the outcome of the soil microbial community structure analysis. *Microbiology Open*, 6: 1-11.