

Youjun Deng

Associate Professor of Soil Clay Mineralogy
Dept. of Soil and Crop Sciences, Texas A&M University, College Station, Texas

Education/Training

2001 PhD Soil Science, Texas A&M University, College Station, TX, USA
1991 MS Soil Science, Institute of Soil Science, Chinese Academy of Sciences, Nanjing, China
1988 BS Soil Science and Agricultural Chemistry, Huazhong Agricultural University, Wuhan, China

Positions and Employment

2007- Assistant/Associate Professor, Soil and Crop Sciences, Texas A&M University
2002-2007 Postdoctoral Research Associate/Fellow, Texas A&M University, College Station, TX, USA; Washington State University, Pullman, WA; Desert Research Institute, Reno, NV.
1996-2001 Graduate assistant, Texas A&M University
1996 Honorary Research Fellow. The Queen's University of Belfast, Northern Ireland, UK
1991-1995 Research assistant/associate, Institute of Soil Science, Chinese Academy of Sciences.

Program Overview

The research focus of soil clay mineralogy group is to reveal molecular mechanisms of 1) reactions of soil/ clay minerals with natural and synthetic organic, inorganic, and biological compounds with environmental and industrial importance, e.g., mycotoxins, emerging organic contaminants, organoclays, modification of clay minerals; and 2) soil/clay mineral transformation under various natural and anthropogenic conditions, e.g., agriculture, forest, desert, wetland, polar region, and Mars soils, at nuclear waste storage sites and repositories, mine tailing and dump sites. We are also adapting and developing advanced spectroscopic and microscopic methods and molecular modeling for soil/clay mineralogy studies. I currently teach a graduate course in Soil Mineralogy each Fall semester.

Significant 5 Year Accomplishments

Research 1. Our research has significantly improved the understanding about the interactions between aflatoxin and smectite minerals: 1). established the criteria for a "good" natural bentonite as an aflatoxin binder; 2). revealed the aflatoxin-smectite reaction mechanisms, 3). revealed the key functions of smectite charge density and the type of exchange cations in the adsorption of the smectites for aflatoxin, and 4) expanded the work to ochratoxin, deoxynivalenol, and zearalenone. 2. We are actively involved in the study of mineralogical and geochemical constrains for unique soils and mine tailings. The uncommon minerals such serpentine, talc, chromite, oxides of heavy metals in soils derived from mafic/ultramafic rocks, arseno-pyrite in mine tailings. 3. We tackled the engineering problems caused by clay contamination of coarse and fine aggregates used in portland cement concrete, bituminous mixes and chip seals. We characterize the clay mineralogy of the troublesome aggregates to determine what clays are detrimental and how they affect the engineering properties. Teaching: Instructed five semesters of Soil Mineralogy (SCSC 626/685), two semesters of Graduate Seminar (SCSC 681). Supervised 1 postdoctoral research associate, 7 PhD students, and 4 MS students, 3 of whom are now assistant or full professors at various institutions. Supervised 3 undergraduate students.

Publications (Ten most recent peer-reviewed journal publications)

1. Barrientos Velázquez*, A. L., S. Arteaga, J. B. Dixon, and Y. Deng. The effects of pH, pepsin, exchange cation, and vitamins on aflatoxin adsorption on smectite in simulated gastric fluids. *Applied Clay Science*. 120, 17-23. doi:10.1016/j.clay.2015.11.014. 2016
2. Alam*, S., Y. Deng, and J. B. Dixon. Minimal interference of glucose and ethanol on aflatoxin B1 adsorption by smectites. *Applied Clay Science*. 104, 143-149. doi:10.1016/j.clay.2014. 11.022. 2015

3. Mehmood*, A., M. S. Akhtar, Y. Deng, J. B. Dixon, M. Imran, and S. Rukh. Iron oxides minerals in soils derived from different parent materials. *International Journal of Plant & Soil Science*. 5(2). DOI: 10.9734/IJPSS/2015/14384. 2015.
4. Lee, K.-M., J. Davis, T. J. Herrman, S. C. Murray, and Y. Deng. An empirical evaluation of three vibrational spectroscopic methods for detection of aflatoxins in maize *Food Chemistry*. 173, 629-639. 2015.
5. Fowler, J., M. Hashim, A. Barrientos-Velazquez, Y. Deng, and C. A. Bailey. Utilization of a spray-applied calcium bentonite clay to ameliorate the effects of low-levels of aflatoxin in starter broiler diets containing DDGS. *Natural Products and Chemistry Research*. 2:127. doi: 10.4172/2329-6836.1000127.
6. Valencia-Quintana, R., J. Sánchez-Alarcón, M. G. Tenorio-Arvide, Y. Deng, J. M. R. Montiel-González, S. Gómez-Arroyo, R. Villalobos-Pietrini, J. Cortés-Eslava, A. R. Flores-Márquez, and F. Arenas-Huertero. The microRNAs as potential biomarkers for predicting the onset of aflatoxin exposure in human beings: a review. *Frontiers in Microbiology*. 5. Article 102. 1-14. doi: 10.3389/fmicb.2014.00102. 2014.
7. Hu^f, H., Y. Deng, and J. Zou. Microfluidic smectite-polymer nanocomposite strip sensor for aflatoxin detection. *IEEE Sensors Journal*. 13(5), 1835-1839. 2013
8. Deng, Y., L., Liu*, A. L. Barrientos Velázquez*, and J. B. Dixon. Determinative role of exchange cation and layer charge density of smectite on aflatoxin adsorption. *Clays and Clay Minerals*, 374-386, 2012.
9. Hu^f, H., Y. Deng, and J. Zou. Optimized smectite-polymer nanocomposite films for rapid ppb-level quantification of aflatoxins. *Chemical Sensors*, 2:12. 1-6. 2012
10. Jiang, G, Y. Liu, L. Huang, Q. Fu, Y. Deng, and H. Hu. Mechanism of lead immobilization by oxalic acid-activated phosphate rocks. *Journal of Environmental Sciences (Beijing, China)* 24(5), 919-925. 2012

Awards and Honors

- *Honorable mention, 4th place of the Top Finishers of the (2012) 6th Reynolds Cup competition (a soil and clay mineral quantification contest), the Clay Minerals Society.*
- *Best Student Paper award and grant, the Clay Minerals Society (2000).*
- *Tom Slick Graduate Research Fellowship (\$15,000), Texas A&M University (1999).*
- *Graduate Student Research & Presentation grant, Texas A&M University (2000).*

Professional Experience

- Advised/co-advised 1 postdoctoral research associate, 7 PhD students, and 4 MS students.
- Authored/co-authored 48 peer-reviewed journal articles, 1 conference proceedings, 1 book, 4 book chapters, and 127 scientific abstracts/presentations including 12 invited international and national presentations.
- Courses instructed: Soil Mineralogy (SCSC 626, 5 credits), Forensic Soil Science (co-taught once), Environmental Soil Chemistry (once) Soil Science Lab (twice). Graduate Student Seminar
- Chaired the 51st Annual Meeting of the Clay Minerals Society. Organized technical session and symposia, field trip for the Soil Mineralogy Division of Soil Science Society of America (SSSA).
- Served on the Nomenclature committee and Electronic Communication committee of the Clay Minerals Society (CMS), bid committee of Society (CMS) for the 2017 international clay conference, Marion L. & Chrystie M. Jackson Soil Science Award Committee, SSSA.