



Ratna Sharma-Shivappa (1965-Present)

Associate Professor Bioprocessing

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“Everyone has something they like and can do in this field—that’s the beauty of it.” Ratna Sharma-Shivappa, 2006.

Overview

Dr. Ratna Shivappa is a professor of bioprocessing at North Carolina State University. Her lab is currently engaged in Conversion of energy crops to bioethanol and other bioprocessing projects. She teaches courses on Industrial Microbiology and Manufacturing as well as other courses to graduate and undergraduate students. Some of her selected publications are below:

- J. Shi, R. Sharma-Shivappa, M.S. Chinn, N. Howell. 2009. Effect of microbial pretreatment on enzymatic hydrolysis and fermentation of cotton stalk for ethanol production. *Biomass and Bioenergy*. 33: 88-96.
- R. Sharma-Shivappa, Y. Chen. 2008. Conversion of cotton wastes to bioenergy and value-added products. *Transactions of ASABE*. 51(6): 2239 – 2246.
- J. Shi, M.S. Chinn, R. Sharma-Shivappa. 2008. Microbial pretreatment of cotton stalks by solid state cultivation of *Phanerochaete chrysosporium* for bioethanol production. *Bioresource Technology*. 99: 6556 – 6564.
- J. Shi, R. Sharma-Shivappa, M.S. Chinn. 2008. Microbial pretreatment of cotton stalks by submerged cultivation of *Phanerochaete chrysosporium* for bioethanol production. *Bioresource Technology*.
- J. Shi, R. Sharma-Shivappa, M.S. Chinn. 2007. Challenges in quantification of ligninolytic enzymes from *phanerochaete chrysosporium* cultivation for pretreatment of cotton stalks. *Transactions of ASABE*. 50(6): 2347 – 2354.

This interview was conducted in 2015.

Early Life and Education

Ratna Sharma-Shivappa was raised on an agricultural university campus in India. “Everyone around me was an academician, a student or a faculty member,” she remembers. “It was always about being in the university.”

Both of Sharma-Shivappa's parents were professors, and the family lived in on-campus housing. There was no question in her mind growing up that she too would go to college, earn her doctorate, and eventually end up teaching at a university.

As a young adult on an agricultural university campus, Sharma-Shivappa was surrounded by questions about agricultural issues, such as crop production, farm use, and use of resources and equipment. "I knew I wanted to look at aspects related to both the environment and agriculture," she recalls. "I ended up in bioprocess engineering."

Sharma-Shivappa attended college at Punjab Agricultural University, where she received her bachelor of technology degree in Agricultural Engineering. She then went on to get her master's degree in engineering at the Asian Institute of Technology in Bangkok, Thailand, and received her doctorate at Penn State University in agricultural and biological engineering. Sharma-Shivappa got her current job as an assistant professor at North Carolina State University within six months of finishing her doctorate; in fact, she had already secured the job before she submitted her dissertation. "It was quite a jump from being in graduate school to being a faculty member," she says. "I thought, 'Okay, now I have a lot of responsibility. I'm guiding grad students.' Besides, I have a lot of things to deal with in addition to grant writing and teaching."

Highlights

Sharma-Shivappa feels that getting her current position has been a real highlight in her still developing career. "It's really made me learn a lot over the past three years," she says. "I've grown a lot both personally and professionally." She also enjoys the interactions and collaborations with other people in the field. Her current job has also increased her awareness of the need for more research in biofuels development.

Importance of Mentoring to Career

Sharma-Shivappa credits her husband, Dr. Raghunath Shivappa, for helping her get to where she is today; without his support, she says, she would not have been able to get her job and finish her doctorate. She is also mentored by her Ph.D. advisor, Dr. Ali Demirci, who has inspired her, given her confidence and put her in a position where she can now guide others. And perhaps most importantly, "I was inspired by my parents in the first place," Sharma-Shivappa notes. "Both were faculty members, and I grew up seeing their work and watching them guide their students."

Challenges

Though Sharma-Shivappa has found much success in her chosen field, she did have to overcome some obstacles to get to where she is today. "When I finished high school, my parents wanted me to become a doctor," she explains. "I couldn't go to medical school because I really wanted to be an engineer. Not many women in India pursue unconventional engineering fields. I had always wanted to do something different. I had to pull against my parents wishes."

While it requires (really) good time management skills to balance work and family life with 2 young kids, Sharma-Shivappa's is proud of her accomplishments including being a part of a discussion panel with President George W. Bush but feels that she still has a lot to achieve professionally. She believes that coming to the United States and leaving her family and home behind were very significant achievements for her. As an only child, it was

especially hard (and still is) to break the tie with her aging parents and move so far away to pursue her career.

Sharma-Shivappa is excited to continue teaching and researching in the environmental/bioprocessing field. She sticks with it primarily because she enjoys interacting with students, and the opportunities it provides for innovation. “I have to be creative—it keeps me active, looking for new things to do,” she says. “There is no way to get bored. I keep getting into new research and new ideas. Students keep you active too.”

Advice to Young Professionals

Sharma-Shivappa has this advice for minorities who are considering a career in the environmental field: “The most important thing is that this is a very exciting field; it’s very applied, so you can apply what you learn in the field to a variety of things. Being a minority shouldn’t stop you from getting into this up-and-coming field. We all have something to give. Everyone has something they like and can do in this field—that’s the beauty of it.”

For More Information

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