

Obituary: Professor Cheila Gonçalves Mothé

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Prof. Cheila G. Mothé was a Titular Professor of School of Chemistry at the Federal University of Rio de Janeiro, Rio de Janeiro, Brazil; Regional Editor of Journal of Thermal Analysis and Calorimetry; CNPq Ad Hoc Consulter; Fellow of the African Scientific Institute; President of the Brazilian Association of Rheology; President of Brazilian Association of Thermal Analysis and Calorimetry. Prof. Cheila was a leading scientist and educator in technological characterization by thermal analysis and rheology. The scope of Dr Mothé's research during her years as professor included technological characterization by thermal analysis; polymer composites with Brazilian vegetal fibers; study and characterization of natural products; kinetic study by thermal analysis; rheological behavior of polysaccharides; energetic potential associated with residues from biomass; thermal characterization and application of asphalt binders, biodiesel and heavy oil.

She started her academic journey back in the early 1970s in R. Federal University of Rio de Janeiro, graduating in chemical engineering. In 1976, she was invited by the

reputed Titular Professor Paulo Costa Pereira to be an Assistant Professor at the Department of Technological Chemistry. Due to her outstanding ability at experimental work both in laboratory and in pilot scale in the area of Organic Processes at UFRRJ, in 1983 Prof. Cheila was offered a position as a Full Professor in the School of Chemistry in UFRJ, Rio de Janeiro. She dedicated most of her research to studying polymers, polysaccharides and development of sustainable materials. One of her major accomplishments can be attributed to the *Anacardium occidentale* L., mostly known as cashew, in which she performed an extensive study about its different parts including cashew nut shell liquid (CNSL), pseudofruit, exudate and cashew gum.

She obtained her master's degree in Science, from IMA/UFRJ, in 1981, under the mentorship of Prof. Chaki Azuma, conducting her work about the synthesis of photosensitive polymers, an innovative subject at the time.

She worked actively during her whole life at university, dedicating herself to teaching, with more than 10,000 h of class time, and to encouraging her students to believe in the importance of a good and ethical scientific research to promote the technical scientific development of the country.

In the year of 1992, she obtained a DSc. from the University of São Paulo, Brazil/University of the Air, Japan, having her thesis entitled "*Synthesis, characterization and thermo-analytical study of phenolic resins isolated from cashew nut shell liquid.*" She had the mentorship of the prestigious Prof. Ivo Giolito, who was one of the pioneers of the introduction and dissemination of thermal analysis in Brazil.

In the early 1990s, besides all responsibilities as a university professor and researcher, Dr. Mothé assumed some diverse administrative roles, such as Substitute Member of the Deputy Professors' Representative to the School of Chemistry Congregation, Chair of the Organic Process Department at UFRJ, and Coordinator of the XIV UFRJ Scientific Initiation Meeting for undergraduate courses of the Federal University of Rio de Janeiro. Prof. Cheila also was one of the main responsible persons for revitalizing the research and experimental classes laboratories of the Organic Processes Department in School of Chemistry.

After her efforts for fund-raising through scientific projects, these laboratories now have high precision equipments with thermogravimetric analyzers, polymerization reactors, viscometers, among others.

She did her first postdoctoral training at Cornell University, New York, USA, in 1998, at the Food Science Department headed by awarded Emeritus Professor M. Andy Rao. She wanted to investigate and understand better how rheological properties influenced the behavior of polysaccharides, especially that of cashew gum. One of her publications that was produced from that period had a very positive repercussion on the rheology field entitled “*Rheological behavior of aqueous dispersions of cashew gum and gum arabic: effect of concentration and blending*” (1999).

In the 2000s, Prof. Mothé played a key role in mentoring some projects, which led to some of her most significant findings related to proving the effect of cashew gum as a promoter in the reduction of arterial hypertension in spontaneously hypertensive rats. Another significant development of this research was the intraperitoneal application of cashew gum in sarcoma-180, implanted into young Swiss albino mice. The dose of cashew gum exhibited high tumor inhibition, with result published in the article “*Antitumor activity of cashew gum from Anacardium occidentale L.*” It was certainly a extraordinary result.

The publication of the textbook “*Thermal Analysis of Materials*” in 2002, having the 2nd edition published in 2009, certainly solidifies Prof. Cheila’s contribution about some of her most relevant experimental research regarding thermal analysis to the Brazilian scientific community.

At Cleveland State University (Ohio, USA) in the year of 2003, she went on to do her second postdoctoral training under the guidance of Professor Alan Riga, to study thermal analysis of polymeric bio-membranes.

Prof. Cheila has always been aware of her role in society, and for this reason, she has been effective in social projects in outreach activities. She participated in the installation of workshops in communities to obtain soap (1986), gave lectures to detained juvenile offenders (1996 and 2005), participated in a project to implement small brick yard for the construction of popular houses (2002), and conducted training for the community of low income in the production of cleaning products (2004).

The year 2005 was a very unique year in Prof. Cheila’s professional career. She became the first black titular female professor at UFRJ approved by public concourse. Her accomplishment will be registered in the history of the university as an example of hard work, dedication, resilience and courage. It was a productive period from 2009 to 2011 as she authored 24 scientific journal publications based on those 3 years of work.

Her professional activities, besides a Full Professor at university, included Regional Editor of *J. Therm. Anal. Cal*

(2012–2020); NATAS Member and Volunteer (2001–2017); Honorary Member of the Group of the Hungarian Chemical Thermoanalytical Society, Budapest, Hungary (2010); CNPq Ad-Hoc Consulter for more than 10 years; Fellow of the African Scientific Institute (2011–2020); President and Vice-President of the Brazilian Society of Science and Technology RJ Food Regional (2007–2017); Founder and President of the Brazilian Association of Rheology (2010–2020); Vice President of Brazilian Association of Thermal Analysis and Calorimetry (2008–2016); President of Brazilian Association of Thermal Analysis and Calorimetry (2016–2020); Coordinator of three laboratories: Natural and Synthetic Polymers Technology, Rheology Laboratory and Thermal Analysis Laboratory at UFRJ, Brazil.

She received many awards during her whole life, confirming her excellence in research: Metanor/Copenor de Química Award (1986); Honorable Mention (1986, 1989, 1994, 1996, 1997, 2000, 2002, 2005, 2011, 2013 and 2017); Chemical Award of the Year and Medal (2006) by CRQ-Brazil; 1st place XI Award Abrafati-Petrobras Science in Paint (2008); Leopoldo Hartmann Award (2010); Oscar Niemeyer Award de Trabalhos Científicos e Tecnológicos—CREA-RJ (2013); Inovação ValorPneu Award (2nd place, 2015), Lisbon, Portugal; 16th ICTAC Award, FL/USA (2nd place, 2016).

During her life, she had more than 400 works published in national and international journals and congresses; supervised more than 50 MSc. and PhD. dissertations and more than 120 undergraduate students; she was the author of 10 books and deposited over 10 patents.

Dr. Mothé was very much admired by her colleagues, students and acknowledged by her many accomplishments. Prof. Cheila had a brilliant mind, like a true alchemist. And at the same time, she was a humble person, kind with a generous heart, to assist anyone who asked for her guidance. She is survived by her two daughters Michelle and Danielle and her husband Heitor. She always will be remembered as a person full of life.

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