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Vita

Charlotte Jean Barker, Ph.D.

Academic Studies

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Education

B.S. Biology/Chemistry minor, 1978, East Texas Baptist University, Marshall, Texas
M.S. Cell Biology, 1982, University of Memphis, Memphis, Tennessee
Graduate hours, Microbiology, 1996 – 1997, Louisiana State University, Baton Rouge, La
Ph.D. Biology, 2018, University of Southern Mississippi, Hattiesburg, Mississippi

Honors and Awards

Awarded Tenure at Lamar State College of Orange, 2022
Promoted to Associate Professor at LSCO, 2023
University of Southern Mississippi Graduation Scholarship, Spring 2018

Association Memberships

American Daylily (Hemerocallis) Society

Professional Experience

Sr. Research Technician	University of Tennessee Health Health Science Center Memphis, Tennessee Neuropharmacology/Neurosurgery	1/1979 – 5/1980
Lab Instructor, Biology	Memphis State University now University of Memphis Memphis, Tennessee Zoology Labs, Botany Labs	8/1980 – 5/1982

Instructor, Biology/Chemistry Teaching Assignment	Cisco Junior College Cisco, Texas General Inorganic Chemistry, Organic Chemistry, General Biology	8/1982 – 5/1983
Research Assistant	Baylor College of Medicine Houston, Texas Cardiology/Molecular Biology	10/1983 – 7/1984
Research Assistant I/II	UT Health Science Center Houston, Texas Renal Transplantation	7/1984 – 9/1986
Transplant Technologist	Stanford University Hospital Stanford, California Renal Transplantation Immunology	10/1986 – 10/1988
Research Assistant	Stanford University Blood Bank Palo Alto, California Cellular Immunology	2/1989 – 8/1989
Senior Research Assistant	UT MD Anderson Cancer Center Houston, Texas Cellular Immunology	9/1989 – 1/1990
Research Associate I/II	University of Texas Medical Branch Galveston, Texas Cardiology/Molecular Biology	1/1991 – 5/1992
Instructor, Biology Teaching Assignment:	Nicholls State University Thibodaux, Louisiana Botany, Anatomy & Physiology Labs, Molecular Biology Labs	8/1994 – 5/1997
Instructor, Biology Teaching Assignment:	Angelina College Lufkin, Texas Zoology, Botany, General Biology, Microbiology, Anatomy & Physiology, Human Biology, Labs of listed courses	8/1997 – 7/2008
Instructor, Biology Teaching Assignment:	Mississippi Gulf Coast Community College Perkinston Mississippi campus General Biology lecture and lab	8/2008 – 5/2009

Adjunct Instructor, Biology Teaching Assignment:	Mississippi Gulf Coast Com College Gulfport & West Harrison campuses General Biology lecture and lab Microbiology lecture and lab	6/2009 – 12/2010
Lab Instructor, Biology Teaching assignment:	University of Southern Mississippi Hattiesburg, Mississippi 2101 Human Anatomy & Physiology I lab	8/2010 – 8/2014
Assistant Professor, Biology Teaching assignment:	East Texas Baptist University Marshall, Texas 1421 Fundamentals of Anatomy & Physiology & lab 1422 Fundamentals of Anatomy & Physiology & lab 2421 Fundamentals of Microbiology & lab 1410 Human Health and Diseases & lab 2401 Human A & P Lab	8/2014 – 7/2018
Adjunct Instructor	Panola College Carthage, Texas (Marshall Center) 2302 Human Anatomy and Physiology II 2102 Human Anatomy & Physiology II Lab	7/2018-8/2018
Assistant/Associate Professor Biology Teaching Assignment	Lamar State College Orange Orange, Texas Biol 1322 Nutrition Biol 1411 Botany 2401 Human Anatomy & Physiology I 2402 Human Anatomy & Physiology II	8/2018 – present

Research Interests

I have an interest in daylily genetics which I have pursued over a number of years with hybridization aimed at the development of rust resistant diploid daylilies suitable for general garden use in USDA zone 9. I am also hybridizing for diploid daylilies with edges, bitones, and fragrance and have seedlings with one or more of each of those traits.

As a continuation of my days in biomedical research, I follow current developments in cellular immunology, transplantation, and auto-immune disease.

I have an interest in the ecology of the southeastern United States and have completed a dissertation in a relevant area of agricultural ecology as discussed below

Current Research

My dissertation touched upon both the effects of increased atmospheric carbon dioxide levels upon plant root growth and the root growth effects of the now widely used no-tillage agricultural system. It involved quantifying and analyzing root growth dynamics of two major agricultural plants, *Sorghum bicolor* (sorghum), and *Glycine max* (soybean) which had been grown under four different conditions each of which had one of two tillage systems (conventional and no-tillage) and one of the two levels of carbon dioxide (ambient and twice-ambient). These plants, along with three rotating cover crops, had been grown in open top chambers at the USDA-ARS National Soil Dynamics Laboratory at Auburn, Alabama. The cover crops included *Crotalaria juncea* (sunn hemp), *Trifolium incarnatum* (scarlet clover), and *Triticum aestivum* (wheat). Root growth dynamics were also quantified for the conditions under which the cover crops were grown which included no-till ambient CO₂ and no-till elevated CO₂. Average root diameter, average root length, and standing root crop were quantified at shallow soil level (0-17 cm) and deep soil level (17-34 cm) for all five plants.

Of the two major agricultural plants, for sorghum there was a significantly greater average root length in deeper soil and a trend toward increased average root length in elevated CO₂. For soybean, increased average root diameter was associated with the no-till agricultural system. For the three legumes in the study there was a species difference in response to elevated CO₂ with sunn hemp having a significant root growth response while there was less increased root growth from the soybean and scarlet clover. For the members of family Poaceae, both the C₃ grass (wheat) and the C₄ grass (sorghum) had root growth response to elevated CO₂ conditions, which although not identical, did not support earlier indications of C₃ plants having an advantage in elevated CO₂ conditions.

Publications and Papers

Dissertation May, 2018. Root Dynamics of Crop Plants in a High Carbon Dioxide world: Effects of Elevated Versus Ambient Carbon Dioxide Levels and No-till Versus Conventional Agricultural Management. Available online at Aquila (University of Southern Mississippi).

Flechner SM, Kerman RH, Van Buren CT, Lorber MI, Barker CJ, Kahan BD. 1987. Does Cyclosporine Improve The Results of HLA Identical Renal Transplantation? Transplantation Proceedings 19(1 Pt 2):1485-1488.

Flechner SM, et al. (including Barker CJ). 1986. MLC Hyporesponsiveness is Associated with Decreased In-Vitro Cytotoxicity in CSA Treated Renal Recipients. Transplantation Proceedings 18(4):750-753, 1986.

Beck ML, Biggers CJ, Barker CJ. 1984. Chromosomal and Electrophoretic Analyses of Hybrids between Brass Carp and Bighead Carp (Pisces: Cyprinidae). Copeia, 1984(2), pp. 337-342.

Barker CJ, Beck ML, Biggers CJ. 1983. Hematologic and Enzymatic Analysis of *Ctenopharyngodon idella* X *Hypophthalmichthys nobilis* F₁ Hybrids. Comparative Biochemistry and Physiology Part A: Physiology Volume 74, Issue 4, 1983, pages 915 – 918.

Professional Presentations

Presentation of Botany Module for Texas Master Naturalists Training, at Shangri La Botanical Gardens and Nature Center, Orange, Texas, May 6, 2023

Dissertation defense, March 16, 2018. University of Southern Mississippi, Hattiesburg, Mississippi. Root Dynamics of Crop Plants in a High Carbon Dioxide World: Effects of Elevated versus Ambient Carbon Dioxide Levels and No-till Versus Conventional Agricultural Management.

AQUILA Digital Commons: Dissertation available online as of May 16, 2018. As of the September 2nd 2023 readership report, there were 265 downloads.

<https://aquila.usm.edu/dissertations/1488>.

References

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