

James Francis White, Jr.--deleted

Subjects: Agriculture, Dairy & Animal Science

Contributor: James White

Dr. James F. White, Jr. is Professor of Plant Biology at Rutgers University where he, students and collaborators conduct research on beneficial microbes that inhabit plant tissues. Dr. White obtained the Ph.D. in Botany/Mycology from the University of Texas, Austin. Dr. White is the author of more than 240 articles, and author and editor of reference books on the biology of endophytes, including *Biotechnology of Acremonium Endophytes of Grasses* (1994), *Microbial Endophytes* (2000), *The Clavicipitalean Fungi* (2004), *The Fungal Community: Its Organization and Role in the Ecosystem* (2005, 2017), *Defensive Mutualism in Microbial Symbiosis* (2009), and *Seed Endophytes: Biology and Biotechnology* (2019). Dr. White is a fellow of the AAAS, and Associate Editor for journals *Fungal Ecology*, *Symbiosis*, *Mycoscience*, and *Scientific Reports*, and also serves on the editorial boards of MDPI journals *Biology* and *Microorganisms*. Dr. White serves as the Chief Editor for the Plant-Microbes Interactions section of journal *Microorganisms*. Dr. White and collaborators helped to develop much of what is currently known regarding the 'rhizophagy cycle'. The rhizophagy cycle is a nutrient acquisition process in plant roots where plants internalize microbes and extract nutrients from them.

Keywords: Endophytes ; Plant Microbiome ; Beneficial Microbes ; Plant Nutrients ; Rhizophagy Cycle ; Plant Health

1. Biography

James F. White, Jr. was born in Leavenworth, Kansas December 26, 1958. Dr. White obtained the B.S. and M.S. in Botany and Plant Pathology, respectively at Auburn University in Alabama where he specialized in mycology, studying with Dr. Gareth Morgan-Jones. He obtained the Ph.D. in Botany/Mycology (Dissertation topic = 'Biology of Endophytic Fungi') from the University of Texas, Austin in 1987 where he was advised by Dr. Richard Starr. After a post-doc at Ohio State University working on fossil fungi with Dr. Thomas Taylor, he joined the faculty of Auburn University in Montgomery,

Alabama in 1988 where he taught courses in Botany, Ecology and Mycology. In 1995 Dr. White joined the faculty of Rutgers University in the Department of Plant Biology, where he teaches courses in Mycology, and he, students and collaborators conduct research on beneficial microbes (endophytes) that inhabit plant tissues.^[1]

2. Achievements and Career Development

James White is the author of more than 240 articles (Google Scholar H-Index = 56; articles cited more than 14,000 times; ResearchGate Research Interest Score greater than 99% of researchers), and author and editor of reference books on the biology of endophytes, including *Biotechnology of Acremonium Endophytes of Grasses* (1994), *Microbial Endophytes* (2000), *The Clavicipitalean Fungi* (2004), *The Fungal Community: Its Organization and Role in the Ecosystem* (2005, 2017), *Defensive Mutualism in Microbial Symbiosis* (2009), and *Seed Endophytes: Biology and Biotechnology* (2019). Dr. White served as the founding Secretary of the International Symbiosis Society (ISS) from 1992-1995, playing a key role in establishing the ISS. Dr. White was awarded the distinguished researcher award at Auburn University Montgomery in 1994, and the Constantine Alexopoulos Prize by the Mycological Society of America in 1996 for his research on endophytic fungi. Dr. White is a fellow (elected in 2005) of the American Association for the Advancement of Science (AAAS), and Associate Editor for journals *Fungal Ecology*, *Symbiosis*, *Mycoscience*, and *Scientific Reports*, and also serves on the editorial boards of MDPI journals *Biology* and *Microorganisms*. Dr. White serves as the Chief Editor for the Plant-Microbes Interactions section of journal *Microorganisms*. Dr. White and collaborators helped to develop much of what is currently known regarding the 'rhizophagy cycle' (Figure 1). The rhizophagy cycle is a nutrient acquisition process in plant roots where plants internalize microbes and extract nutrients from them.^[2] James White is a frequent invited speaker on the topic of the rhizophagy cycle at conferences and workshops on plant microbiome applications and regenerative agriculture. In 2017, he and students published a hypothesis (Endoparasitism Driven Eukaryogenesis) that holds that bacterial endoparasitism into archaeans drove early evolution of eukaryotic cells.^[3] A Triassic fossil fungus genus '*Jimwhitea*' was named by Drs. Michael Krings and Thomas Taylor in recognition of the work that he did in the area of fossil fungi early in his career.^[4]

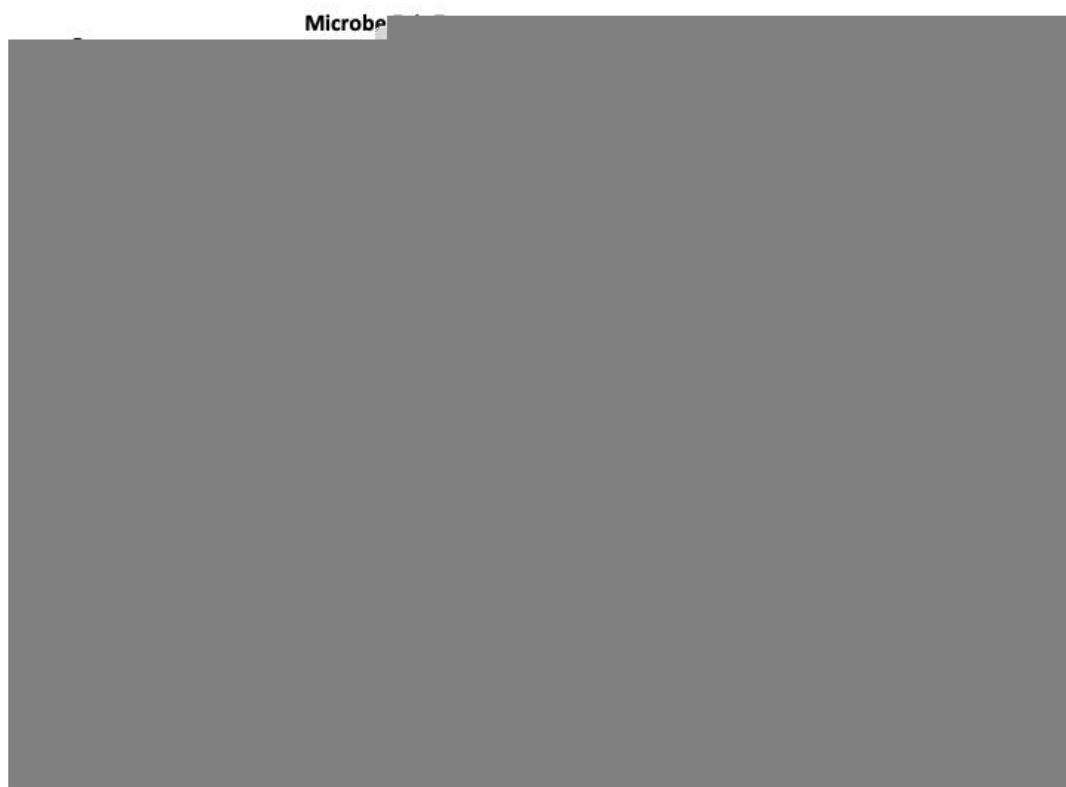


Fig. 1A-C. Diagrammatic representation of the rhizophagy cycle. 1A. Diagram of the rhizophagy cycle showing microbes entering root cells at the root tip meristem and exiting root cells at the tips of elongating root hairs. Rhizophagy cycle microbes alternate between an intracellular endophytic phase and a free-living soils phase; soil nutrients are acquired in the free-living soil phase and extracted oxidatively in the intracellular endophytic phase. 1B. Shows bacteria (arrow) in the periplasmic space of parenchyma cell near root tip meristem of an *Agave* sp. seedling (bar = 20 μ m; stained with DAB followed by aniline blue). 1C. Bacteria (arrow) emerging from root hair tip of grass seedling (bar = 20 μ m; stained with fluorescent nucleic stain SYTO 9).^[2]

3. Conclusion

Dr. James White is known for research on endophytic microbes (bacteria and fungi) of plants.^[1] Dr. White, his students and collaborators have contributed significantly to knowledge of endophytic microbes in plants and the roles they play in plant development and plant health.^{[5][6][3][4][7][8][9][9]} Current research is focused on nutrient functions of endophytic microbes in crops with the aims of improving crop yields and reducing environmental degradation due to excessive nutrient applications.^[4]

References

1. James White; Kathryn L. Kingsley; Qiuwei Zhang; Rajan Verma; Nkolika Obi; Sofia Dvinskikh; Matthew T. Elmore; Satish Kumar Verma; Surendra K. Gond; Kurt P. Kowalski; et al. Review: Endophytic microbes and their potential applications in crop management.. *Pest Management Science* **2019**, 75, 2558-2565, [10.1002/ps.5527](https://doi.org/10.1002/ps.5527).
2. James White; Kathryn L. Kingsley; Satish Kumar Verma; Kurt Kowalski; Rhizophagy Cycle: An Oxidative Process in Plants for Nutrient Extraction from Symbiotic Microbes. *Microorganisms* **2018**, 6, 95, [10.3390/microorganisms6030095](https://doi.org/10.3390/microorganisms6030095).
3. James White; Kathryn Kingsley; Carla Harper; Satish Kumar Verma; Lara Brindisi; Qiang Chen; Xiaoqian Chang; April Micci; Marshall Bergen; Reactive Oxygen Defense Against Cellular Endoparasites and the Origin of Eukaryotes. *Transformative Paleobotany* **2017**, 1, 439-460, [10.1016/b978-0-12-813012-4.00018-8](https://doi.org/10.1016/b978-0-12-813012-4.00018-8).
4. Michael Krings; T.N. Taylor; N. Dotzler; Fossil evidence of the zygomycetous fungi. *Persoonia - Molecular Phylogeny and Evolution of Fungi* **2013**, 30, 1-10, [10.3767/003158513X664819](https://doi.org/10.3767/003158513X664819).
5. Surendra Kumar Gond; Marshall S. Bergen; Mónica S. Torres; James White; Ravindra N. Kharwar; Effect of bacterial endophyte on expression of defense genes in Indian popcorn against *Fusarium moniliforme*. *Symbiosis* **2015**, 66, 133-140, [10.1007/s13199-015-0348-9](https://doi.org/10.1007/s13199-015-0348-9).
6. J. F. White; Widespread Distribution of Endophytes in the Poaceae. *Plant Disease* **1986**, 71, 340, [10.1094/pd-71-0340](https://doi.org/10.1094/pd-71-0340).
7. Miguel J. Beltrán-García; James White; Fernanda M. Prado; Katia R. Prieto; Lydia F. Yamaguchi; Mónica S. Torres; Massuo Kato; M.H.G. Medeiros; Paolo Di Mascio; James White; et al. Nitrogen acquisition in *Agave tequilana* from degradation of endophytic bacteria. *Scientific Reports* **2014**, 4, 6938, [10.1038/srep06938](https://doi.org/10.1038/srep06938).
8. Satish Kumar Verma; Kathryn L. Kingsley; Marshall S. Bergen; Kurt Kowalski; James White; Fungal Disease Prevention in Seedlings of Rice (*Oryza sativa*) and Other Grasses by Growth-Promoting Seed-Associated Endophytic Bacteria from Invasive *Phragmites australis*. *Microorganisms* **2018**, 6, 21, [10.3390/microorganisms6010021](https://doi.org/10.3390/microorganisms6010021).
9. Ivelisse Irizarry; James White; *Bacillus amyloliquefaciens* alters gene expression, ROS production and lignin synthesis in cotton seedling roots. *Journal of Applied Microbiology* **2018**, 124, 1589-1603, [10.1111/jam.13744](https://doi.org/10.1111/jam.13744).
10. Ivelisse Irizarry; James White; *Bacillus amyloliquefaciens* alters gene expression, ROS production and lignin synthesis in cotton seedling roots. *Journal of Applied Microbiology* **2018**, 124, 1589-1603, [10.1111/jam.13744](https://doi.org/10.1111/jam.13744).
11. James White; Mónica S. Torres; Raymond F. Sullivan; Rabih E. Jabbour; Qiang Chen; Mariusz Tadych; Ivelisse Irizarry; Marshall S. Bergen; Daphna Havkin-Frenkel; Faith C. Belanger; et al. Occurrence of *Bacillus amyloliquefaciens* as a systemic endophyte of vanilla orchids. *Microscopy Research and Technique* **2014**, 77, 874-885, [10.1002/jemt.22410](https://doi.org/10.1002/jemt.22410).

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