Feb 2019

Curriculum Vitae

HAROLD L. DRAKE

Professor and Chair
Department of Ecological Microbiology
(Lehrstuhl für Ökologische Mikrobiologie)
University of Bayreuth, 95440 Bayreuth, Germany
HLD@Uni-Bayreuth.De

EDUCATION

1971 – 1974	Kansas State University, Manhattan; B.S. Microbiology
1974 – 1978	University of Kansas, Lawrence; Ph.D. Microbiology (Advisor: James M. Akagi)
1978 – 1980	Case Western Reserve University, Cleveland; Postdoctoral Fellow, Biochemistry (Advisor: Harland G. Wood)

POSITIONS

1980 – 1983	Assistant Professor of Microbiology, University of Mississippi, USA
1983 – 1990	Associate Professor of Microbiology, University of Mississippi, USA
1990 – 1991	Professor of Microbiology, University of Mississippi, USA
1991 – date	Professor and Chair, Department of Ecological Microbiology University of Bayreuth, Germany

SELECTED AWARDS / HONORS / EDITORIAL BOARDS / EDITORSHIPS

NIH Predoctoral Trainee Award, University of Kansas, 1975
C. M. Downs Award, University of Kansas, 1976, 1978
Waksman Doctoral Fellowship, ASM Foundation, 1977
NSF Postdoctoral Fellowship, 1978
NIH Postdoctoral Fellowship, 1979, 1980
Faculty Merit Award, University of Mississippi, 1983
NIH Research Career Development Award, 1986-1991
Guest Professorship, University of Bayreuth, Germany, 1990
ASM News Journal Highlights, 1995
Ljungdahl Lecturer Award, University of Georgia, 2010
Plenary Keynote Speaker, Annual ASM Meeting, New Orleans, 2011
Elected Fellow, American Academy of Microbiology, 2013
Editorial Board, *Applied and Environmental Microbiology*, 1989-1996
Editor (Associate), *Microbiology*, 2003-2010
Editorial Board, *Environmental Microbiology*, 2007-date
Editor, *Applied and Environmental Microbiology*, 1996-2006, 2007-2011
Publications Board, American Society for Microbiology, 2011-2012
Journals Board, American Society for Microbiology, 2013-date
Editor-in-Chief, *Applied and Environmental Microbiology*, 2011-date

MONOGRAPHS

1. Drake, H. L. (Editor) 1994. *Acetogenesis*, 664 pages. Chapman and Hall Publishers, New York
2. Liu, S.-J., Drake, H. L. (Editors) 2008. *Microbes and the Environment: Perspectives and Challenges*, 160 pages. Science Press, Beijing.

PUBLICATIONS: REVIEWS, BOOK CHAPTERS, EDITORIALS

1. Wood, H. G., Drake, H. L., Hu, S. I. 1982. Studies with *Clostridium thermoaceticum* and the resolution of the pathway used by acetogenic bacteria that grow on carbon monoxide or carbon dioxide and hydrogen. In: Proc. Biochem. Symp., pp. 29-56. Annual Reviews, Inc., Palo Alto.
2. Drake, H. L. 1988. Biological transport of nickel. In: Lancaster, J. R. (ed.), Bioinorganic Chemistry of Nickel, pp. 111-139. VCH Publishers, New York.
3. Yang, H., Drake, H. L. 1990. Differential effects of sodium and carbon monoxide on the H2- and glucose-dependent growth of the thermophilic acetogen *Acetogenium kivui*. In: Belaich, J.-P. M. Bruschi, J.-L. Garcia (eds.), Microbiology and Biochemistry of Strict Anaerobes Involved in Interspecies Hydrogen Transfer, pp. 497-499. Plenum Press, New York.
4. Drake, H. L. 1992. Acetogenesis and acetogenic bacteria. In: Lederberg, J. (ed.), Encyclopedia of Microbiology, pp. 1-15. Academic Press, Inc., San Diego.
5. Drake, H. L. 1993. CO_2, reductant, and the autotrophic acetyl-CoA pathway: alternative origins and destinations. In: Murrell, C., and Kelly, D. P. (eds.), Microbial Growth on C_1 Compounds, pp. 493-507. Intercept Ltd., Andover.
6. Akagi, J. M., Drake, H. L., Kim, J. -H., Gevertz, D. 1994. Thiosulfate and trithionate reductases. In: Peck, Jr., H. D., Le Gall, J. (eds.), Methods in Enzymology: Inorganic Microbial Sulfur Metabolism, Vol. 243, pp. 260-270. Academic Press, Inc., San Diego.
7. Drake, H. L. 1994. Acetogenesis, acetogenic bacteria, and the acetyl-CoA "Wood-Ljungdahl" pathway: past and current perspectives. In: Drake, H.L. (ed.), Acetogenesis, pp. 3-60. Chapman and Hall, Inc., New York.
8. Drake, H. L., Daniel, S. L., Matthies, C., Küsel, K. 1994. Acetogenesis: reality in the laboratory, uncertainty elsewhere. In: Drake, H.L. (ed.), Acetogenesis, pp. 273-302. Chapman and Hall, Inc., New York.
9. Drake, H. L. 1995. Regulation of the CO_2-fixation potentials and substrate/product diversity of acetogenic bacteria. In: Nicholas, K.M., and Ljungdahl, L.G. (eds.), 3rd International Conference on CO_2 Utilization, pp. 61-63 (minireview in abstracts of symposium). University of Oklahoma, Norman.
10. Drake, H. L. 1996. Regulation of the C_1 metabolism of acetogens: metabolic by-passes and ecological implications. In: Lidstrom, M. E., and Tabita, F. R. (eds.), Microbial Growth on C_1 Compounds, pp. 72-79. Kluwer Academic Publishers, Dordrecht.
11. Drake, H. L., Daniel, S. L., Küsel, K., Matthies, C., Kuhner, C., Braus-Stromeyer, S. 1997. Acetogenic bacteria: what are the in situ consequences of their diverse metabolic versatilities? BioFactors 6: 13-24.
12. Drake, H. L., Küsel, K., Matthies, C. 2002. Ecological consequences of the phylogenetic and physiological diversities of acetogens. Antonie van Leeuwenhoek 81: 203-213.
13. Drake, H. L., Küsel, K. 2003. How the diverse physiological potentials of acetogens determine their *in situ* realities. In: Ljungdahl, L. G., Adams, M. W., Barton, L. L., Ferry, J. G., Johnson, M. K. (eds.), Biochemistry and Physiology of Anaerobic Bacteria, pp. 171-190. Springer-Verlag, New York, New York.
14. Drake, H. L., Daniel, S. L. 2004. Physiology of the thermophilic acetogen *Moorella thermoacetica*. Res. Microbiol. 155: 869-883.
15. Müller, V., Inkamp, F., Rauwolf, A., Küsel, K., Drake, H. L. 2004. Molecular and cellular biology of acetogenic bacteria. In: Nakano, M. M., Zuber, P. (eds.), Strict and Facultative Anaerobes: Medical and Environmental Aspects, pp. 251-281. Horizon Bioscience, Norfolk, United Kingdom.
16. Drake, H. L., Küsel, K., Matthies, C. 2004. Acetogenic Prokaryotes. In: Dworkin, M., Falkow, S., Rosenberg, E., Schleifer, K. -H., Stackebrandt, E. (eds.), The Prokaryotes, 3rd edition: An Evolving Electronic Resource for the Microbiological Community, release 3.17, August 2004, Springer, New York, http://springeronline.com.
17. Drake, H. L., Küsel, K. 2005. Acetogenic clostridia. In: Dürre, P. (ed.), Handbook on Clostridia, pp. 719-746. CRC Press, Boca Raton, Florida.

18. Drake, H. L., Schramm, A., Horn, M. 2006. Earthworm gut microbial biomes: their importance to soil microorganisms, denitrification, and the terrestrial production of the greenhouse gas N_2O. In: König, H, Varma, A. (eds.), Intestinal Microorganisms of Termites and other Invertebrates, pp. 65-87. Springer-Verlag, New York, New York.
19. Drake, H. L., Küsel, K., Matthies, C. 2006. Acetogenic prokaryotes. In: Dworkin, M., Falkow, S., Rosenberg, E., Schleifer, K. -H., Stackebrandt, E. (eds.), The Prokaryotes, 3rd Edition, Volume 2, pp. 354-420. Springer-Verlag, New York, New York.
20. Drake, H. L., Horn, M. A. 2006. Earthworms as a transient heaven for terrestrial denitrifying microbes: a review. Eng. Life Sci. 6: 261-265.
21. Bodelier, P. L. E., Sorrell, B., Drake, H. L., Küsel, K., Hurek, T., Reinhold-Hurek, B., Lovell, C., Megonigal, P., Frenzel, P. 2006. Ecological aspects of microbes and microbial communities inhabiting the rhizosphere of wetland plants. In: Bobbink, R., Beltman, B., Verhoeven, J. T. A., Whigham, D. F. (eds.), Wetlands as a Natural Resource, Vol. 2, Ecological Studies, Vol. 190, pp. 205-238. Springer-Verlag, New York, New York.
22. Ogram, A., Bridgham, S., Corstanje, R., Drake, H., Küsel, K., Mills, A., Newman, S., Portier, K., Wetzel, R. 2006. Linkages between microbial community composition and biogeochemical processes across scales. In: Bobbink, R., Beltman, B., Verhoeven, J. T. A., Whigham, D. F. (eds.), Wetlands as a Natural Resource, Vol. 2, Ecological Studies, Vol. 190, pp. 239-268. Springer-Verlag, New York, New York.
23. Bothe, H., Drake, H. L. 2007. Interactions among organisms that result in enhanced activities N-cycle reactions. In: Bothe, H., Ferguson, S., Newton, W. E. (eds.) Biology of the Nitrogen Cycle, pp. 397-405. Elsevier, Amsterdam.
24. Drake, H. L., Horn, M. A. 2007. As the worm turns: the earthworm gut as a transient habitat for soil microbial biomes. Ann. Rev. Microbiol. 61: 169-189.
25. Drake, H. L., Liu, S.-J. 2008. Current and future perspectives on the environmental importance of microorganisms. In: Liu, S. J., Drake, H. L. (eds.), Microbes and the Environment: Perspectives and Challenges, pp. 3-11. Science Press, Beijing.
26. Drake, H. L., Gößner, A. S. 2008. Acetogens: anaerobic gamblers at the oxic-anoxic interface. In: Liu, S. J., Drake, H. L. (eds.), Microbes and the Environment: Perspectives and Challenges, pp. 59-66. Science Press, Beijing.
27. Drake, H. L., Gößner, A. S., Daniel, S. L. 2008. Old acetogens, new light. In: Wiegel, J., Maier, R.J., Adams, M.W.W. (eds.), Incredible Anaerobes: from Physiology to Genomics to Fuels, pp. 100-128. Special Issue (Vol. 1125) of Annals of the New York Academy of Sciences, Boston, MA.
28. Horn, M. A., Wüst, P. K., Drake, H. L. 2009. Der Regenwurmdarm – ein mobiles Schlaraffenland für Bodenanaerobier. In: BioSpektrum, Vol. 4, pp. 377-379. Spektrum Akademischer Verlag GmbH, Heidelberg.
29. Drake, H. L., Horn, M. A., Wüst, P. K. 2009. Intermediary ecosystem metabolism as a main driver of methanogenesis in acidic wetland soil. Environ. Microbiol. Reports 1: 307-318.
30. Drake, H. L. 2009. *Thermicanus*. In: De Vos, P., Garrity, G. M., Jones, D., Frieg, N. R., Ludwig, W., Rainey, F. A., Schleifer, K. -H., Whitman, W. B. (eds.), Bergey's Manual of Systematic Bacteriology, 2nd Edition, Vol. 3, pp. 454-455. Springer-Verlag, New York, New York.
31. Drake, H. L. 2009. *Lactovum*. In: De Vos, P., Garrity, G. M., Jones, D., Frieg, N. R., Ludwig, W., Rainey, F. A., Schleifer, K. -H., Whitman, W. B. (eds.), Bergey's Manual of Systematic Bacteriology, 2nd Edition, Vol. 3, pp. 722-723. Springer-Verlag, New York, New York.
32. Drake, H. L. 2009. *Sporomusa*. In: De Vos, P., Garrity, G. M., Jones, D., Frieg, N. R., Ludwig, W., Rainey, F. A., Schleifer, K. -H., Whitman, W. B. (eds.), Bergey's Manual of Systematic Bacteriology, 2nd Edition, Vol. 3, pp. 1112-1116. Springer-Verlag, New York, New York.
33. Küsel, K., Drake, H. L. 2011. Acetogens. In: Reitner, J., Thiel, V. (eds.), Encyclopedia of Geobiology. DOI 10.1007/978-1-4020-9212-1, pp. 1-5. Springer-Verlag, New York, New York.
34. Antony, C. P., Kumaresan, D., Hunger, S., Drake, H. L., Murrell, J. C., Shouche, Y. S. 2013. Microbiology of Lonar Lake and other soda lakes. ISME J. 7: 468-476.
35. Drake, H. L., Küsel, K., Matthies, C. 2013. Acetogenic prokaryotes. In: Rosenberg, E., DeLong, E. F., Lory, S., Stackebrandt, E., Thompson, F. (eds.), The Prokaryotes - Prokaryotic Physiology and Biochemistry, DOI 10.1007/978-3-642-30141-4_61, pp. 3-60. Springer-Verlag, Berlin.
36. Drake, H. L. 2014. The genus *Lactovum*. In: Holzapfel, W. H., Wood, B. J. B. (eds.), Lactic Acid Bacteria – Biodiversity and Taxonomy, pp. 447-455. Wiley & Sons, Ltd., Oxford.

37. Schaffner, D. W., Drake, H. L. 2014. Botulinum neurotoxin subtype A4 originating from nontoxigenic Clostridium botulinum. (Editorial) Appl. Environ. Microbiol. 80: 7131-7132.
38. Drake, H. L. 2015. PilZ-domain proteins of the plant pathogen *Xanthomonas oryzae* pv. *oryzae* function differentially in virulence. (Editorial) Appl. Environ. Microbiol. 81: 4233-4234.

PUBLICATIONS: PRIMARY LITERATURE

1. Drake, H.L., Akagi, J.M. 1976. Product analysis of bisulfite reductase activity isolated from *Desulfovibrio vulgaris.* J. Bacteriol. 126: 733-738.
2. Drake, H.L., Akagi, J.M. 1976. Purification of a unique bisulfite-reducing enzyme from *Desulfovibrio vulgaris.* Biochem. Biophys. Res. Commun. 71: 1214-1219.
3. Drake, H.L., Akagi, J.M. 1977. Characterization of a novel thiosulfate-forming enzyme isolated from *Desulfovibrio vulgaris*. J. Bacteriol. 132 132-138.
4. Drake, H.L., Akagi, J.M. 1977. Bisulfite reductase of *Desulfovibrio vulgaris*: explanation for product formation. J. Bacteriol. 132: 132-143.
5. Drake, H.L., Akagi, J.M. 1978. Dissimilatory reduction of bisulfite by *Desulfovibrio vulgaris.* J. Bacteriol. 136:916-923.
6. Drake, H.L., Goss, N.H., Wood, H.G. 1979. A new, convenient method for the rapid analysis of inorganic pyrophosphate. Anal. Biochem. 94: 117-120.
7. Drake, H.L., Hu, S.I., Wood, H.G. 1980. Purification of carbon monoxide dehydrogenase, a nickel enzyme from *Clostridium thermoaceticum*. J. Biol. Chem. 255: 7174-7180.
8. Drake, H.L., Hu, S.I., Wood, H.G. 1981. Purification of the five components from *Clostridium thermoaceticum* which catalyze synthesis of acetate from pyruvate and methyltetrahydrofolate. Properties of phosphotransacetylase. J. Biol. Chem. 256: 11137-11144.
9. Hu, S.I., Drake, H.L., Wood, H.G. 1982. Synthesis of acetyl-CoA from carbon monoxide, methyltetrahydrofolate, and CoA by enzymes from *Clostridium thermoaceticum*. J. Bacteriol. 149: 440-448.
10. Drake, H. L. 1982. Occurrence of nickel in carbon monoxide dehydrogenase from *Clostridium pasteurianum* and *Clostridium thermoaceticum.* J. Bacteriol. 149: 561-566.
11. Drake, H.L. 1982. Demonstration of hydrogenase in extracts of the homoacetate-fermenting bacterium *Clostridium thermoaceticum.* J. Bacteriol. 150: 702-709.
12. Ragsdale, S.W., Clark, J.E., Ljungdahl, L.G., Lundie, L.L., Drake, H.L. 1983. Properties of purified carbon monoxide dehydrogenase from *Clostridium thermoaceticum*, a nickel, iron-sulfur protein. J. Biol. Chem. 258: 2364-2369.
13. Martin, D.R., Lundie, L.L., Kellum, R., Drake, H.L. 1983. Carbon monoxide-dependent evolution of hydrogen by the homoacetate-fermenting bacterium *Clostridium thermoaceticum.* Curr. Microbiol. 8: 337-340.
14. Gariboldi, R.T., Drake, H.L. 1984. Glycine synthase of the purinolytic bacterium, *Clostridium acidiurici.* Purification of the glycine-CO_2 exchange system. J. Biol. Chem. 259: 6085-6089.
15. Lundie, L.L., Jr., Drake, H.L. 1984. Development of a minimally defined medium for the acetogen *Clostridium thermoaceticum.* J. Bacteriol. 159: 700-703.
16. Kellum, R., Drake, H.L. 1984. Effects of cultivation gas phase on hydrogenase of the acetogen *Clostridium thermoaceticum.* J. Bacteriol. 160: 466-469.
17. Martin, D. R., Misra, A., Drake, H.L. 1985. Dissimilation of carbon monoxide to acetic acid by glucose-limited cultures of *Clostridium thermoaceticum.* Appl. Environ. Microbiol. 49: 1412-1417.
18. Savage, M.D., Drake, H.L. 1986. Adaption of the acetogen *Clostridium thermoautotrophicum* to minimal medium. J. Bacteriol. 165: 315-318.
19. Kellum, R., Drake, H.L. 1986. Effects of carbon monoxide on one-carbon enzymes and energetics of *Clostridium thermoaceticum.* FEMS Microbiol. Lett. 34: 41-45.
20. Savage, D. M., Wu, Z., Daniel, S. L., Lundie, L.L., Jr., Drake, H.L. 1987. Carbon monoxide-dependent chemolithotrophic growth of *Clostridium thermoautotrophicum.* Appl. Environ. Microbiol. 53: 1902-1906.
21. Bryson, M. F., Drake, H.L. 1988. Energy-dependent transport of nickel by *Clostridium pasteurianum.* J. Bacteriol. 170: 234-238.
22. Daniel, S.L., Wu, Z., Drake, H.L. 1988. Growth of thermophilic acetogenic bacteria on methoxylated aromatic acids. FEMS Microbiol. Lett. 52: 25-28.

23. Heinonen, J. K., Drake, H.L. 1988. Comparative assessment of inorganic pyrophosphate and pyrophosphatase levels of *Escherichia coli, Clostridium pasteurianum,* and *Clostridium thermoaceticum.* FEMS Microbiol. Lett. 52: 205-208.

24. Lundie, L. L., Jr., Yang, H., Heinonen, J.K., Dean, S. I., Drake, H. L. 1988. Energy-dependent, high affinity transport of nickel by the acetogen *Clostridium thermoaceticum.* J. Bacteriol. 170: 5705-5708.

25. Wu, Z., Daniel, S. L., Drake, H. L. 1988. Characterization of a CO-dependent O-demethylating enzyme system from the acetogen *Clostridium thermoaceticum.* J. Bacteriol. 170: 5747-5750.

26. Yang, H., Daniel, S.L., Hsu, T., Drake, H. L. 1989. Nickel transport by the thermophilic acetogen *Acetogenium kivui.* Appl. Environ. Microbiolol. 55: 1078-1081.

27. Hsu, T., Daniel, S. L., Lux, M. F., Drake, H. L. 1990. Biotransformations of carboxylated aromatic compounds by the acetogen *Clostridium thermoaceticum*: generation of growth-supportive CO_2 equivalents under CO_2-limited conditions. J. Bacteriol. 172: 212-217.

28. Yang, H., Drake, H. L. 1990. Differential effects of sodium on the hydrogen- and glucose-dependent growth of the acetogenic bacterium *Acetogenium kivui.* Appl. Environ. Microbiol. 56: 81-86.

29. Lux, M. F., Keith, E., Hsu, T., Drake, H. L. 1990. Biotransformations of aromatic aldehydes by acetogenic bacteria. FEMS Microbiol. Lett. 67: 73-78.

30. Daniel, S.L., Hsu, T., Dean, S. I., Drake, H. L. 1990. Characterization of the H_2- and CO-dependent chemolithotrophic potentials of the acetogens *Clostridium thermoaceticum* and *Acetogenium kivui.* J. Bacteriol. 172*:* 4464-4471.

31. Hsu, T., Lux, M. F., Drake, H. L. 1990. Expression of an aromatic-dependent decarboxylase which provides growth-essential CO_2 equivalents for the acetogenic (Wood) pathway of *Clostridium thermoaceticum.* J. Bacteriol. 172: 5901-5907.

32. Daniel, S. L., Keith, E. S., Yang, H., Lin, Y-S., Drake, H. L. 1991. Utilization of methoxylated aromatic compounds by the acetogen *Clostridium thermoaceticum:* expression and specificity of the CO-dependent O-demethylating activity. Biochem. Biophys. Res. Commun. 180: 416-422.

33. Parekh, M., Keith, E., Daniel, S. L., Drake, H. L. 1992. Comparative evaluation of the metabolic potentials of *Peptostreptococcus productus:* utilization and transformation of aromatic compounds. FEMS Microbiol. Lett. 94: 69-74.

34. Lux, M. F., Drake, H. L. 1992. Reexamination of the metabolic potentials of the acetogens *Clostridium aceticum* and *Clostridium formicoaceticum*: chemolithoautotrophic- and aromatic-dependent growth. FEMS Microbiol. Lett. 95: 49-56.

35. Matthies, C., Freiberger, A., Drake, H. L. 1993. Fumarate dissimilation and differential reductant flow by *Clostridium formicoaceticum* and *Clostridium aceticum*. Arch. Microbiol. 160: 273-278.

36. Daniel, S. L., Drake, H. L. 1993. Oxalate- and glyoxylate-dependent growth and acetogenesis by *Clostridium thermoaceticum*. Appl. Environ. Microbiol. 59: 3062-3069.

37. Seifritz, C., Daniel, S. L., Drake, H. L. 1993. Nitrate as a preferred electron sink for the acetogen *Clostridium thermoaceticum*. J. Bacteriol. 175: 8008-8013.

38. Gößner, A., Daniel, S. L., Drake, H. L. 1994. Acetogenesis coupled to the oxidation of aromatic aldehyde groups. Arch. Microbiol. 161: 126-131.

39. Küsel, K., Drake, H. L. 1994. Acetate synthesis in soil from a Bavarian beech forest. Appl. Environ. Microbiol. 60: 1370-1373.

40. Karsten, G. R., Drake, H. L. 1995. Comparative assessment of the aerobic and anaerobic microfloras of earthworm guts and forest soils. Appl. Environ. Microbiol. 61: 1039-1044.

41. Küsel, K., Drake, H. L. 1995. Effects of environmental parameters on the formation and turnover of acetate by forest soils. Appl. Environ. Microbiol. 61: 3667-3675.

42. Drake, H. L., Aumen, N. G., Kuhner, C., Wagner, C., Grießhammer, A., Schmittroth, M. 1996. Anaerobic microflora of Everglades sediments: effects of nutrients on population profiles and activities. Appl. Environ. Microbiol. 62: 486-493.

43. Wagner, C., Grießhammer, A., Drake, H. L. 1996. Acetogenic capacities and the anaerobic turnover of carbon in a Kansas prairie soil. Appl. Environ. Microbiol. 62: 494-500.

44. Limmer, C., Drake, H. L. 1996. Nonsymbiotic N_2 fixation by acidic and pH-neutral forest soils: aerobic and anaerobic differentials. Soil Biol. Biochem. 28: 177-183.

45. Parekh, M., Drake, H. L., Daniel, S. L. 1996. Bidirectional transformation of aromatic aldehydes by *Desulfovibrio desulfuricans* under nitrate-dissimilating conditions. Lett. Appl. Microbiol. 22: 115-120.

46. Misoph, M., Drake, H. L. 1996. Effect of CO_2 on the fermentation capacities of the acetogen *Peptostreptococcus productus* U-1. J. Bacteriol. 178: 3140-3145.

47. Fröstl, J., Seifritz, C., Drake, H. L. 1996. Effect of nitrate on the autotrophic metabolism of the acetogens *Clostridium thermoautotrophicum* and *Clostridium thermoaceticum*. J. Bacteriol. 178: 4597-4603.

48. Misoph, M., Daniel, S. L., Drake, H. L. 1996. Bidirectional usage of ferulate by the acetogen *Peptostreptococcus productus* U-1: CO_2 and aromatic acrylate groups as competing electron acceptors. Microbiology 142: 1983-1988.

49. Küsel, K., Drake, H. L. 1996. Anaerobic capacities of leaf litter. Appl. Environ. Microbiol. 62: 4216-4219.

50. Kuhner, C. H., Frank, C., Grießhammer, A., Schmittroth, M., Acker, G., Gößner, A., Drake, H. L. 1997. *Sporomusa silvacetica* sp. nov., an acetogenic bacterium isolated from aggregated forest soil. Int. J. Syst. Bacteriol. 47: 352-358.

51. Karsten, G. R., Drake, H. L. 1997. Denitrifying bacteria in the earthworm gastrointestinal tract and the in vivo emission of nitrous oxide (N_2O) by earthworms. Appl. Environ. Microbiol. 63: 1878-1882.

52. Matthies, C., Erhard, H. -P., Drake, H. L. 1997. Effects of pH on the comparative culturability of fungi and bacteria from acidic and less acidic forest soils. J. Basic Microbiol. 37: 335-343.

53. Braus-Stromeyer, S. A., Drake, H. L. 1997. Carbonic anhydrase in *Acetobacterium woodii* and other acetogenic bacteria. J. Bacteriol. 179: 7197-7200.

54. Limmer, C., Drake, H. L. 1998. Effects of carbon, nitrogen, and electron acceptor availability on anaerobic N_2 fixation by a beech forest soil. Soil Biol. Biochem. 30: 153-158.

55. Frank, C., Schwarz, U., Matthies, C., Drake, H. L. 1998. Metabolism of aromatic aldehydes as co-substrates by the acetogen *Clostridium formicoaceticum*. Arch. Microbiol. 170: 427-434.

56. Küsel, K, Drake, H. L. 1999. Microbial turnover of low molecular weight organic acids during leaf litter decomposition. Soil Biol. Biochem. 31: 107-118.

57. Seifritz, C., Fröstl, J. M., Drake, H. L., Daniel, S. L. 1999. Glycolate as a metabolic substrate for the acetogen *Moorella thermoacetica*. FEMS Microbiol. Lett. 170: 399-405.

58. Küsel, K., Wagner, C., Drake, H. L. 1999. Enumeration and metabolic product profiles of the anaerobic microflora in the mineral soil and litter of a beech forest. FEMS Microbiol. Ecology 29*:* 91-103.

59. Matthies, C., Grießhammer, A., Schmittroth, M., Drake, H. L. 1999. Evidence for the involvement of gut-associated denitrifying bacteria in the emission of nitrous oxide (N_2O) by earthworms obtained from forest and garden soil. Appl. Environ. Microbiol. 65: 3599-3604.

60. Küsel, K., Pinkart, H. C., Drake, H. L., Devereux, R. 1999. Acetogenic and sulfate-reducing bacteria inhabiting the rhizoplane and deep cortex cells of the seagrass *Halodule wrightii*. Appl. Environ. Microbiol. 65: 5117-5123.

61. Gößner, A., Devereux, R., Ohnemüller, N., Acker, G., Stackebrandt, E., Drake, H. L. 1999. *Thermicanus aegyptius* gen. nov., sp. nov., isolated from oxic soil, a facultative microaerophile that grows commensally with the thermophilic acetogen *Moorella thermoacetica*. Appl. Environ. Microbiol. 65: 5124-5133.

62. Küsel, K., Dorsch, T., Acker, G., Stackebrandt, E., Drake, H. L. 2000. *Clostridium scatologenes* strain SL1 isolated as an acetogenic bacterium from acidic sediments. Int. J. System. Evol. Microbiol. 50: 537-546.

63. Kuhner, C. H., Matthies, C., Acker, G., Schmittroth, M., Gößner, A., Drake, H. L. 2000. *Clostridium akagii* sp. nov. and *Clostridium acidisoli* sp. nov.: acid-tolerant N_2-fixing clostridia isolated from acidic forest and litter soil. Int. J. System. Evol. Microbiol. 50: 873-881.

64. Matthies, C., Kuhner, C. H., Acker, G., Drake, H. L. 2001. *Clostridium uliginosum* sp. nov., a novel acid-tolerant, anaerobic bacterium with connecting filaments. Int. J. System. Evol. Microbiol. 51: 1119-1125.

65. Küsel, K., Karnholz, A., Trinkwalter, T., Devereux, R., Acker, G., Drake, H. L. 2001. Physiological ecology of *Clostridium glycolicum* RD-1, an aerotolerant acetogen isolated from sea grass roots. Appl. Environ. Microbiol. 67: 4734-4741.

66. Karnholz, A., Küsel, K., Gößner, A., Schramm, A., Drake, H. L. 2002. Tolerance and metabolic response of acetogenic bacteria toward oxygen. Appl. Environ. Microbiol. 68: 1005-1009.

67. Küsel, K., Wagner, C., Trinkwalter, T., Gößner, A. S., Bäumler, R., Drake, H. L. 2002. Microbial reduction of Fe(III) and turnover of acetate in Hawaiian soils. FEMS Microbiol. Ecology 40: 73-81.

68. Reith, K., Drake, H. L., Küsel, K. 2002. Anaerobic activities of bacteria and fungi in moderately acidic conifer and deciduous leaf litter. FEMS Microbiol. Ecology 41: 27-35.

69. Küsel, K., Roth, U., Drake, H. L. 2002. Microbial reduction of Fe(III) in the presence of oxygen under low pH conditions. Environ. Microbiol. 4: 414-421.

70. Seifritz, C., Fröstl, J. M., Drake, H. L., Daniel, S. L. 2002. Influence of nitrate on oxalate- and glyoxylate-dependent growth and acetogenesis by *Moorella thermoacetica*. Arch. Microbiol. 178: 457-464.

71. Horn, M. A., Matthies, C., Küsel, K., Schramm, A., Drake, H. L. 2003. Hydrogenotrophic methanogenesis by moderately acid-tolerant methanogens of a methane-emitting acidic peat. Appl. Environ. Microbiol. 69: 74-83.

72. Ihssen, J., Horn, M., Matthies, C., Gößner, A., Schramm, A., Drake, H. L. 2003. N_2O-producing microorganisms in the gut of the earthworm *Aporrectodea caliginosa* are indicative of ingested soil bacteria. Appl. Environ. Microbiol. 69: 1655-1661.

73. Horn, M., Schramm, A., Drake, H. L. 2003. The earthworm gut: an ideal habitat for ingested N_2O-producing microorganisms. Appl. Environ. Microbiol. 69: 1662-1669.

74. Seifritz, C., Drake, H. L., Daniel, S. L. 2003. Nitrite as an energy-conserving electron sink for the acetogenic bacterium *Moorella thermoacetica*. Curr. Microbiol. 46: 329-333.

75. Schramm, A., Davidson, S. K., Dodsworth, J. A., Drake, H. L., Stahl, D., Dubilier, N. 2003. *Acidovorax*-like endosymbionts in the nephridia of earthworms. Environ. Microbiol. 5: 804-809.

76. Daniel, S. L., Pilsl, C., Drake, H. L. 2004. Oxalate metabolism by the acetogenic bacterium *Moorella thermoacetica*. FEMS Microbiol. Lett. 231: 39-43.

77. Matthies, C., Gößner, A., Acker, G., Schramm, A., Drake, H. L. 2004. *Lactovum miscens* gen. nov., sp. nov., an aerotolerant, psychrotolerant, mixed-fermentative anaerobe from acidic forest soil. Res. Microbiol. 155: 847-854.

78. Loy, A., Küsel, K., Lehner, A., Klein, M., Drake, H. L., Wagner, M. 2004. Microarray and functional gene analyses of sulfate-reducing prokaryotes in low sulfate, acidic fens reveal cooccurrence of recognized genera and novel lineages. Appl. Environ. Microbiol. 70: 6998-7009.

79. Horn, M.A., Ihssen J., Matthies, C., Schramm, A., Acker, G., Drake, H. L. 2005. *Dechloromonas denitrificans* sp. nov., *Flavobacterium denitrificans* sp. nov., *Paenibacillus anaericanus* sp. nov., and *Paenibacillus terrae* strain MH72, N_2O-producing bacteria isolated from the gut of the earthworm *Aporrectodea caliginosa*. Int. J. System. Evol. Microbiol. 55: 1255-1265.

80. Horn, M. A., Mertel, R., Kästner, M., Gehre, M., Drake, H. L. 2006. In vivo emission of dinitrogen by earthworms via denitrifying bacteria in the gut. Appl. Environ. Microbiol. 72: 1013-1018.

81. Horn, M. A., Drake, H. L., Schramm, A. 2006. Nitrous oxide reductase genes (*nosZ*) of denitrifying microbial populations in soil and the earthworm gut are phylogenetically similar. Appl. Environ. Microbiol. 72: 1019-1026.

82. Gößner, A. S., Küsel, K., Acker, G., Lovell, C. R., Drake, H. L. 2006. Trophic interaction of the aerotolerant anaerobe *Clostridium intestinale* and the acetogen *Sporomusa rhizae* sp. nov. isolated from roots of the black needlerush *Juncus roemerianus*. Microbiology 152: 1209-1219.

83. Schnurr-Pütz, S., Bååth, E., Guggenberger, G., Drake, H.L., Küsel, K. 2006. Compaction of forest soil by logging machinery favours occurrence of prokaryotes. FEMS Microiol. Ecol. 58: 503-516.

84. Küsel, K., Trinkwalter, T., Drake, H. L., Devereux, R. 2006. Comparative evaluation of anaerobic bacterial communities associated with roots of submerged macrophytes growing in marine or brackish water sediments. J. Expt. Marine Biol. Ecol. 337: 49-58.

85. Daniel, S. L., Pilsl, C., Drake, H. L. 2007. Anaerobic oxalate consumption by microorganisms in forest soil. Res. Microbiol. 158: 303-309.

86. Liu, X. -Y. Wang, B. -J., Jiang, C. -Y., Zhao, K. -X., Drake, H. L., and Liu, S. -J. 2007. Simultaneous biodegradation of nitrogen-containing aromatic compounds in a sequencing batch bioreactor. J. Environ. Sci. 19: 530-535.

87. Foesel, B. U., Gößner, A. S., Drake, H. L., Schramm, A. 2007. *Geminicoccus roseus* gen. nov., sp. nov., an aerobic phototrophic *Alphaproteobacterium* isolated from a marine aquaculture biofilter. System. Appl. Microbiol. 30: 581-586.

88. Edwards, L., Küsel, K., Drake, H. L., Kostka, J. E. 2007. Electron flow in acidic subsurface sediments co-contaminated with nitrate and uranium. Geochim. Cosmochim. Acta 71: 643-654.

89. Schmalenberger, A., Drake, H. L., Küsel, K. 2007. High unique diversity of sulfate-reducing prokaryotes characterized in a depth gradient in an acidic fen. Environ. Microbiol. 9: 1317-1328.

90. Foesel, B. U., Armin Gieseke, A., Schwermer, C., Stief, P., Koch, L., Cytryn, E., de la Torré, J. R., van Rijn, J., Minz, D., Drake, H. L., Schramm, A. 2008. *Nitrosomonas* Nm143-like ammonia oxidizers and *Nitrospira marina*-like nitrite oxidizers dominate the nitrifier community in a marine aquaculture biofilm. FEMS Microbiol. Ecol. 63: 192-204.

91. Blöthe, M., Akob, D. M., Kostka, J. E., Göschel, K., Drake, H. L., Küsel, K. 2008. pH gradient-induced heterogeneity of Fe(III)-reducing microorganisms in coal mining-associated lake sediments. Appl. Environ. Microbiol. 74: 1019-1029.

92. Whitehead, T. R., Price, N. P., Drake, H. L., Cotta, M. A. 2008. Catabolic pathway for the production of skatole and indoleacetic acid by the acetogen *Clostridium drakei*, *Clostridium scatologenes*, and swine manure. Appl. Environ. Microbiol. 74: 1950-1953.

93. Hamberger, A., Horn, M. A., Dumont, M. G., Murrell, J. C., Drake, H. L. 2008. Anaerobic consumers of monosaccharides in a moderately acidic fen. Appl. Environ. Microbiol. 74: 3112-3120.

94. Gößner, A. S., Picardal, F., Tanner, R. S., Drake, H. L. 2008. Carbon metabolism of the moderately acid-tolerant acetogen *Clostridium drakei* isolated from peat. FEMS Microbiol. Lett. 287: 236-242.

95. Küsel, K. Blöthe, M., Schulz, D., Reiche, M., Drake, H. L. 2008. Microbial reduction of iron and porewater biogeochemistry in acidic peatlands. Biogeosciences 5: 1537-1549.

96. Schmalenberger, A., Tebbe, C. C., Kertesz, M., Drake, H. L., Küsel, K. 2008. Two-dimensional single strand conformation polymorphism (SSCP) of 16S rRNA gene fragments reveals highly dissimilar bacterial communities in an acidic fen. Eur. J. Soil Biol. 44: 495-500.

97. Liu, Y. -J., Li, P. -P., Zhao, K. -X., Wang, B. -J., Jiang, C. -Y., Drake, H. L., Liu, S. -J. 2008. *Corynebacterium glutamicum* contains 3-deoxy-D-arabino-heptulosonate 7-phosphate synthases that display novel biochemical features. Appl. Environ. Microbiol. 74: 5497-5503.

98. Wüst, P. K., Horn, M. A., Drake, H. L. 2009. In situ hydrogen and nitrous oxide as indicators of concomitant fermentation and denitrification in the alimentary canal of the earthworm *Lumbricus terrestris*. Appl. Environ. Microbiol. 75: 1852-1859.

99. Degelmann, D. M., Kolb, S., Dumont, M., Murrell, J. C., Drake, H. L. 2009. *Enterobacteriaceae* facilitate the anaerobic degradation of glucose by a forest soil. FEMS Microbiol. Ecol. 68: 312-319.

100. Wüst, P. K., Horn, M. A., Henderson, G., Janssen, P. H., Rehm, B.H.A., Drake, H. L. 2009. Gut-associated denitrification and in vivo emission of nitrous oxide by the earthworm families *Megascolecidae* and *Lumbricidae* in New Zealand. Appl. Environ. Microbiol. 75: 3430-3436.

101. Wüst, P. K., Horn, M. A., Drake, H. L. 2009. Trophic links between fermenters and methanogens in a moderately acidic fen soil. Environ. Microbiol. 11: 1395-1409.

102. Palmer, K., Drake, H. L., Horn, MA. 2009. Genome derived criteria for assigning environmental *narG* and *nosZ* sequences to operational taxonomic units of nitrate reducers. Appl. Environ. Microbiol. 75: 5170-5174.

103. Zaprasis, A., Liu, Y. J., Liu, S. -J., Drake, H. L., Horn, M. A. 2010. Abundance of novel and diverse *tfdA*-like genes, encoding putative phenoxyalkanoic acid herbicide-degrading dioxygenases, in soil. Appl. Environ. Microbiol. 76: 119-128.

104. Palmer, K., Drake, H. L., Horn, M. 2010. Association of novel and highly diverse acid-tolerant denitrifiers with N_2O fluxes of an acidic fen. Appl. Environ. Microbiol. 76: 1125-1134.

105. Schmidt, O., Drake, H. L., Horn, M. A. 2010. Hitherto unknown [Fe-Fe]-hydrogenase gene diversity in anaerobes and anoxic enrichments from a moderately acidic fen. Appl. Environ. Microbiol. 76:2027-2031.

106. Kotzerke, A., Klemer, S., Kleineidam, K., Horn, M. A., Drake, H. L., Schloter, M., Wilke, B. -M. 2010. Manure contaminated with the antibiotic sulfadiazine impairs the abundance of *nirK*- and *nirS*-type denitrifiers in the gut of the earthworm *Eisenia fetida*. Biol. Fertil. Soils 46:415-418.

107. Schellenberger, S., Kolb, S., Drake, H. L. 2010. Metabolic responses of novel cellulolytic and saccharolytic agricultural soil bacteria to oxygen. Environ. Microbiol. 12: 845-861.

108. Degelmann, D. M., Borken, W., Drake, H. L., Kolb, S. 2010. Different atmospheric methane-oxidizing communities in European Beech and Norway Spruce soils. Appl. Environ. Microbiol. 76: 3228-3235.

109. Depkat-Jakob, P., Hilgarth, M., Horn, M.A., Drake, H.L. 2010. Effect of earthworm feeding guilds on ingested dissimilatory nitrate reducers and denitrifiers in the alimentary canal of the earthworm. Appl. Environ. Microbiol. 76: 6205-6214.

110. Wüst, P. K., Horn, M. A., Drake, H. L. 2011. *Clostridiaceae* and *Enterobacteriaceae* as active fermenters in earthworm gut content. ISME J. 5: 92-106.

111. Liu, Y.-J., Zaprasis, A., Liu, S.-J., Drake, H. L., Horn, M. A. 2011. The earthworm *Aporrectodea caliginosa* stimulates abundance and activity of phenoxyalkanoic acid herbicide degraders. ISME J. 5: 473-485.

112. Liu, Y.-J., Liu, S.-J., Drake, H. L., Horn, M. A. 2011. *Alphaproteobacteria* dominate active 2-methyl-4-chlorophenoxyacetic acid herbicide degraders in agricultural soil and drilosphere. Environ. Microbiol. 13: 991-1009.

113. Wieczorek A. S., Drake, H. L., Kolb, S. 2011. Organic compounds and ethanol inhibit the oxidation of methane by mire methanotrophs. FEMS Microbiol. Ecol. 77: 28-39.

114. Hunger, S., Schmidt, O., Hilgarth, M., Horn, M.A., Kolb, S., Conrad, R., Drake, H.L. 2011. Competing formate- and carbon dioxide-utilizing prokaryotes in an anoxic methane-emitting fen soil. Appl. Environ. Microbiol. 77: 3773-3785.

115. Schmidt, O., Wüst, P. K., Hellmuth, S., Borst, K., Horn, M. A., Drake, H. L. 2011. Novel [NiFe]- and [FeFe]-hydrogenase gene transcripts indicative of active facultative aerobes and obligate anaerobes in earthworm gut contents. Appl. Environ. Microbiol. 77: 5842-5850.

116. Foesel. B. U., Drake, H. L. Schramm, A. 2011. *Defluviimonas denitrificans* gen. nov., sp. nov., and *Pararhodobacter aggregans* gen. nov., sp. nov., non-phototrophic *Rhodobacteraceae* from the biofilter of a marine aquaculture. System. Appl. Microbiol. 34: 498-502.

117. Schellenberger, S., Drake, H. L., Kolb, S. 2011. Functionally redundant cellobiose-degrading soil bacteria respond differentially to oxygen. Appl. Environ. Microbiol. 77: 6043-6048.

118. Hunger, S., Gößner, A. S., Drake, H. L. 2011. Trophic links between the acetogen *Clostridium glycolicum* KHa and the fermentative anaerobe *Bacteroides xylanolyticus* KHb, isolated from Hawaiian forest soil. Appl. Environ. Microbiol. 77: 6281-6285.

119. Depkat-Jakob, P., Hunger, S., Schulz, K., Brown, G. G., Tsai, S. M., Drake, H. L. 2012. Emission of methane by *Eudrilus eugeniae* and other earthworms from Brazil. Appl. Environ. Microbiol. 78: 3014-3019.

120. Schellenberger, S., Drake, H. L., Kolb, S. 2012. Impairment of anaerobic cellulose- and cellobiose-degrading soil *Bacteria* by two acidic herbicides. FEMS Microbiol. Lett. 327: 60-65.

121. Depkat-Jakob, P., Brown, G. G., Tsai, S. M., Horn, M. A., Drake, H. L. 2013. Emission of nitrous oxide and dinitrogen by diverse earthworm families from Brazil and resolution of associated denitrifying and nitrate-dissimilating taxa. FEMS Microbiol. Ecol. 83: 375-391.

122. Stacheter, A., Noll, M., Lee, C. K., Selzer, M., Glowik, B., Ebertsch, L., Mertel, R., Schulz, D., Lampert, N., Drake, H. L., Kolb, S. 2013. Methanol oxidation by temperate soils and environmental determinants of associated methylotrophs. ISME J. 7: 1051-1067.

123. Liu, Y.J., Liu, S.J., Drake, H.L., Horn, M.A. 2013. Consumers of 4-chloro-2-methylphenoxyacetic acid from agricultural soil and drilosphere harbour *cadA*, *r/spdA*, and *tfdA*-like gene encoded oxygenases. FEMS Microbiol. Ecol. 86: 114-129.

124. Schmidt, O., Horn, M.A., Kolb, S., Drake, H.L. 2015. Temperature impacts differentially on the methanogenic food web of cellulose-supplemented peatland soil. Environ. Microbiol. 17: 720-734.

125. Schulz, K., Hunger, S., Brown, G.G., Tsai, S.M., Cerri, C.C., Conrad, R., Drake, H.L. 2015. Methanogenic food web in gut contents of the methane-emitting earthworm *Eudrilus eugeniae* from Brazil. ISME J. 9: 1778-1792.

126. Hunger, S., Gößner, A.S., Drake, H.L. 2015. Anaerobic trophic interactions of contrasting methane-emitting mire soils: processes versus taxa. FEMS Microbiol. Ecol. 91 (doi: 10.1093/femsec/fiv045).

127. Schmidt, O., Hink, L., Horn, M.A., Drake, H.L. 2016. Peat: home to novel syntrophic species that feed acetate- and hydrogen-scavenging methanogens. ISME J 10: 1954-1966.

128. Hunger, S., Schmidt, O., Gößner, A.S., Drake, H.L. 2016. Formate-derived H_2, a driver of hydrogenotrophic processes in the root-zone of a methane-emitting fen. Environ. Microbiol. 18: 3106-3119.

129. Braga, L.P.P., Yoshiura, C.A., Borges, C.D., Horn, M.A., Brown, G.G., Drake, H.L., Tsai, S.M. 2016. Disentangling the influence of earthworms in sugarcane rhizosphere. Sci. Reports 6:38923 (DOI:10.1038/srep38923).

130. Meier, A., Hunger, S., Drake, H.L. 2018. Differential engagement of fermentative taxa in gut contents of the earthworm *Lumbricus terrestris*. Appl. Environ. Microbiol 84: e01851-17.

131. Zeibich, L., Schmidt, O., Drake, H.L. 2018. Protein- and RNA-enhanced fermentation by gut microbiota of the earthworm *Lumbricus terrestris*. Appl. Environ. Microbiol 84: e00657-18.

132. Zeibich, L., Schmidt, O., Drake, H.L. 2019. Fermenters in the earthworm gut: do transients matter? FEMS Microbiol. Ecol. (doi: 10.1093/femsec/fiy221).

133. Zeibich, L., Schmidt, O., Drake, H.L. 2019. Dietary polysaccharides: fermentation potentials of an ancient gut ecosystem. Environ. Microbiol. (in press)