CURRICULUM VITAE MARCO J.L. COOLEN

Molecular paleoecologist
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EDUCATION:

- Ph.D. Molecular Microbial Ecology, Institute for the Chemistry and Biology of the Marine Environment (ICBM), University of Oldenburg, Germany, 2001, (advisors: Prof. Dr. J. Overmann and Prof. Dr. H.-J. Brumsack).
- M.Sc. Cellular Biology and Microbial Ecology, University of Wageningen, NL., 1996.
- B.Sc. Microbiology, International Agricultural College Larenstein, Wageningen, NL., 1992.

RECENT RELEVANT COURSES

- Quantitative Insights Into Microbial Ecology (QIIME), University of Arizona, May 2012
- Strategies and Techniques for Analyzing Microbial Populations (STAMPS), Marine Biology Laboratory, August 2012.
- Statistical Analysis and Graphics with R, Marine Biology Laboratory, January 2013

PROFESSIONAL EXPERIENCE

- Associate Scientist, WHOI, Since May 2009.
- Assistant Scientist, WHOI, May 2005-May 2009.
- Postdoctoral Investigator, Royal Netherlands Institute for Sea Research (Royal NIOZ), Department of Marine Biogeochemistry and Toxicology, the Netherlands, August 2000 to May 2005. **Sponsor:** Prof. Dr. Jaap S. Sinninghe Damsté
- Postdoctoral Investigator, Center for Ecological and Evolutionary Studies, University of Groningen, the Netherlands, Nov. 1999 to August 2000. **Sponsor:** Prof. Dr. Larry Forney.

AWARDS

- 2008: Elected as WHOI's Ocean Life Institute Fellow (2008-2011).
- 2004: Netherlands Res. Council-Earth Life Sci. (NWO-ALW) Innovative Research "VENI" Award.

PROFESSIONAL AFFILIATIONS:

- Review editor of "Frontiers in Terrestrial Microbiology" since 2011.
- Review editor of "Frontiers in Extreme Microbiology" since 2010.
- Serving on the Institute Advisory Committee (IAC) for WHOI's Ocean Life Institute (OLI), 2008
- Organizer of mini-symposium "A selection of microbiological studies at WHOI and Wageningen University, the Netherlands", April 16, 2009. Redfield Auditorium, WHOI, Woods Hole, MA.
- Session convener, Paleoceanography and Paleoclimatology Program of the AGU Fall 2007 meeting.
- Reviewer NSF proposals, Nature, Env. Microbiol., Org. Geochem., Mol. Ecol., L&O, J. Plankton Res., ISME Journal, Earth and Planet. Sci. Lett., PlosOne.

RESEARCH INTERESTS:

- Bioavailability and fate of organic matter in ancient aquatic sediments and permafrost soils, which are of importance for our understanding of past climates and of the contemporary carbon cycle.
- Fate of nucleic acids in Glacial to Holocene marine and lacustrine sediments.
- Development and application of advanced molecular tools to analyze ancient DNA of past plankton populations and terrestrial vegetation in the geological record (i.e., *the plankton and vegetation paleomes*).

- The use of plankton and vegetation paleomes combined with (isotope) lipid geochemistry to reconstruct past ecological and environmental changes from climate variability or other perturbations.

PARTICIPATION IN EDUCATION

Postdoctoral trainees (Erin Banning); Graduate trainees (Arjan Boere, Utrecht University) and thesis committee member of Susan Theroux (Brown-MBL joint program) and Laura Epp (University of Potsdam). Undergraduate trainees: Chris Ward and Liz Zhu (Williams College); Fedor Gassner, Jeroen van de Giessen, Yves Kaganika, Cherel Balkema (Leiden University, Netherlands), Claire Moulis and Niels Schoffelen (Utrecht University, Netherlands), Nardine Marsis (American University in Cairo).

SUPERVISION

Eduard Post (Research Assistant II, Rijksuniversiteit Groningen); Ben Abbas (Research Assistant II, Royal NIOZ); Nan Trowbridge (Research Assistant III, WHOI); Tzu-Yuan Yang (Research Assistant II, WHOI); Mitchell Lee (Research Assistant I, WHOI).

COLLABORATORS WITHIN THE PAST 48 MONTHS

USA: Chip Breier, Cabel Davis, Valier Galy, Liviu Giosan, Chris Lamborg, Tracy Mincer, Bernhard Peucker-Ehrenbrink, Amanda Spivak, Ben Van Mooy, Aleck Wang (WHOI); Stuart Wakeham (Skidaway Inst. of Oceanography); Mark Edlund (St. Croix Watershed Research Station); Kay Bidle and Asaf Vardi (Rutgers University); Giacomo R. DiTullio (College of Charleston); Brook Nunn (University of Washington); Sherilyn Fritz, University of Nebraska-Lincoln; Nick Drenzek (Schlumberger-Doll-Research); Cornelia Wuchter (Contractor for Schlumberger project).

Netherlands: Jaap. S. Sinninghe Damsté, Stefan Schouten, Gerard Herndl, Marcel Veldhuis (NIOZ); Gerard Muyzer (University of Delft); Gert de Lange, Henk Brinkhuis, and Francesca Sangiorgi (University of Utrecht); Marc Strous (Radboud University Nijmegen); Jack J. Middelburg (NIOO-KNAW).

Bulgaria: Galina Shtereva; Petko Dimitar (Institute of Oceanology, Bulgarian Academy of Sciences); Mariana Filipova (Natural History Museum, Varna).

Germany: Joerg Overmann (University of Munich); Marcel M.M. Kuypers, Lev Neretin (MPI Bremen).

Switzerland: Timothy I. Eglinton (ETH, Zurich); Carsten J. Schubert, Limn. Res. Centre, Kastanienbaum.

Great Brittan: Helen Talbot (University of Newcastle); Chris Quince, Keith Harris (University of Glasgow)

Australia: John K. Volkman (CSIRO Marine Research), John A.E. Gibson (University of Tasmania).

Egypt: Rania Siam (American University in Cairo).

CRUISE PARTICIPATION

- June/July 2012: NA-VICE cruise (KNORR): Azores to Iceland for project "*lipid lubrication of oceanic carbon and sulfur biogeochemistry via a host-virus chemical arms race"*.
- October 2010: Participated in field trip to Antrim gas shales, MI and collected cores during active drilling to study microbial methane production in shale formation waters.
- July/August 2008: Field trip to Toolik Field Station, Alaska to sample permafrost cores and to study the response of permafrost microbial communities and their role in soil organic matter degradation upon permafrost thaw.
- September 2006: Chief Scientist during the Black Sea cruise with the R/V *Akademik* of the Bulgarian Academy of Sciences. Sediment cores and particulate organic matter (POM) from the water column of the western basin were obtained to explore fossil DNA-based geobiologic archives and to reconstruct hydrologic changes in the Black Sea since the deglacial.
- October-December 2000: Field trip to Davis Station, Vestfold Hills, eastern Antarctica. I sampled sediment cores and particulate organic matter from permanently stratified and anoxic lakes and

fjords to explore fossil DNA-based geobiologic archives, and to reconstruct Holocene hydrologic changes as a result of postglacial sea-level rise in Antarctica.

- January/February 1998: Participating scientist on R/V Meteor Leg 40/4, Eastern Mediterranean Sea to collect Pleistocene sapropel cores and to study microbial degradation of ancient sapropel organic matter as well as to reconstruct the paleoecology and environment during sapropel deposition.

PUBLICATIONS IN INTERNATIONAL PEER-REVIEWED JOURNALS:

1. Wuchter, C., E. Banning, T. Mincer, N. Drenzek, **M.J.L. Coolen**, Diversity and methanogenic capabilities of Antrim Shale formation water microbial communities. *Environmental Microbiology* (*in review*).

2. **Coolen, M.J.L.,** Balkema, C., Quince, C., Harris K., Orsi, W., Sylva, S., Filipova-Marinova, M., Giosan, L. The Black Sea's paleome and environmental changes since the early Holocene. *Proceedings of the National Academy of Sciences USA (PNAS) (in review).*

3. Giosan, L., **Coolen, M. J. L.**, Kaplan, J. O., Constantinescu, S., Filip, F., Filipova-Marinova, M., Kettner, A., Thom, N. (2012) Early anthropogenic transformation of the Danube-Black Sea system (2012) *Sci. Rep.* 2, doi:10.1038/srep00582. (editors' choice in *Science* issue October 5, 2012)

4. Filipova-Marinova, M., Pavlov, D., **Coolen, M.J.L.**, Giosan, L. (2012) First high-resolution marinopalynological stratigraphy of Late Quaternary sediments from the central part of the Bulgarian Black Sea area. *Quaternary International* doi:10.1016/j.quaint.2012.05.002. (available online)

5. Siam, R., Mustafa, G. A., Sharaf, H., Moustafa, A., Ramadan, A., Antunes, A., Bajic, V. B., Stingl, U., Guirguis, N., **Coolen, M. J. L**., Sogin, M., Ferreira, A. J., El. Dorry, H. (2012) Comparative taxonomic analysis reveals unique prokaryotic consortia in sediments from Atlantis II and Discovery Deep brine pools in the Red Sea. *Plos One* 7(8), doi:10.1371/journal.pone.0042872.

6. Boere, A. C., Sinninghe Damsté, J. S., Rijpstra, W. I. C., Volkman, J. K., and **Coolen, M. J. L.** (2011) Source-specific variability in post-depositional DNA preservation with potential implications for DNA based paleoecological records. *Organic Geochemistry* **42**, 1216-1225.

7. Boere, A. C., Rijpstra, W. I. C., De Lange, G. J., Sinninghe Damsté, J. S., and **Coolen, M. J. L.** (2011) Preservation potential of ancient plankton DNA in Pleistocene marine sediments. *Geobiology* **9**, 377-393.

8. **Coolen, M. J. L**. (2011) 7000 years of *Emiliania huxleyi* viruses in the Black Sea, *Science, 333*, 451-452. *(Also appeared as a research highlight in Nature Reviews Microbiology, 2011: 9, 630).*

9. **Coolen, M. J. L**., van de Giessen, J., Zhu, E. Y., and Wuchter, C. (2011) Bioavailability of soil organic matter and microbial community dynamics upon permafrost thaw. *Environmental Microbiology* **13**, 2299-2314.

10. Boere, A. C., W. I. Rijpstra, G. J. de Lange, E. Malinverno, J. S. Sinninghe Damsté and **M. J. L. Coolen** (2011) Exploring preserved fossil dinoflagellate and haptophyte DNA signatures to infer ecological and environmental changes during deposition of sapropel S1 in the eastern Mediterranean, *Paleoceanography, 26*(2), A2204.

11. **Coolen, M.J.L.** and J.A.E. Gibson (2009) Ancient DNA in lake sediment records, *PAGES News*, 17(3), 104-106.

12. Boere, A. C., B. Abbas, W. I. C. Rijpstra, G. J. M. Versteegh, J. K. Volkman, J. S. S. Damste and **M. J. L. Coolen** (2009) Late-Holocene succession of dinoflagellates in an Antarctic fjord using a multi-proxy approach: paleoenvironmental genomics, lipid biomarkers and palynomorphs, *Geobiology, 7*(3), 265-281.

13. **Coolen, M. J. L.** and G. Shtereva (2009) Metabolically active eukaryotes along a vertical nutrient and redox gradient in the water column and sulfidic surface sediment of the Black Sea, *FEMS Microbiol. Ecol., 70*, 525-539.

14. **Coolen, M. J. L.**, J. P. Saenz, L. Giosan, N. Y. Trowbridge, P. Dimitrov, D. Dimitrov and T. I. Eglinton (2009) DNA and lipid molecular stratigraphic records of haptophyte succession in the Black Sea during the Holocene, *Earth. Planet. Sc. Lett., 284*(3-4), 610-621.

15. Herfort, L., J.-H. Kim, **M. J. L. Coolen**, B. Abbas, S. Schouten, G. J. Herndl and J. S. Sinninghe Damsté (2009) Diversity of Archaea and potential for crenarchaeotal nitrification of group 1.1a in the rivers Rhine and Têt, *Aquat Microb Ecol* 55: 189-201.

16. **Coolen, M. J. L**., H. M. Talbot, B. A. Abbas, C. Ward, S. Schouten, J. K. Volkman and J. S. Sinninghe Damsté (2008) Sources for sedimentary bacteriohopanepolyols as revealed by 16S rDNA stratigraphy, *Environ. Microbiol., 10*(7), 1783-1803.

17. Talbot, H. M., **M. J. L. Coolen** and J. S. Sinninghe Damsté (2008) An unusual 17[α],21[β](H)-bacteriohopanetetrol in Holocene sediments from Ace Lake (Antarctica), *Org. Geochem., 39*(8), 1029-1032.

18. **Coolen, M. J. L**., J. K. Volkman, B. Abbas, G. Muyzer, S. Schouten and J. S. Sinninghe Damsté (2007) Identification of organic matter sources in sulfidic late Holocene Antarctic fjord sediments from fossil rDNA sequence analysis, *Paleoceanography, 22*(2), PA2211, doi:10.1029/2006PA001309.

19. Herfort, L., Schouten, S., Abbas, B., Veldhuis, M.J.W., **Coolen, M.J.L**. (2007) Wuchter, C. et al. Variations in spatial and temporal distribution of Archaea in the North Sea in relation to environmental variables. *FEMS Microbiol Ecol* 62: 242-257.

20. **Coolen, M. J. L.**, B. Abbas, J. van Bleijswijk, E. C. Hopmans, M. M. M. Kuypers, S. G. Wakeham and J. S. Sinninghe Damsté (2007) Putative ammonia-oxidizing Crenarchaeota in suboxic waters of the Black Sea: a basin-wide ecological study using 16S ribosomal and functional genes and membrane lipids, *Environ. Microbiol., 9*(4), 1001-1016.

21. **Coolen, M. J. L.** and J. Overmann (2007) 217 000-year-old DNA sequences of green sulfur bacteria in Mediterranean sapropels and their implications for the reconstruction of the paleoenvironment, *Environ. Microbiol., 9*(0), 238-249.

22. Sinninghe Damsté, J. S., W. I. Rijpstra, **M. J. L. Coolen**, S. Schouten and J. K. Volkman (2007) Rapid sulfurisation of highly branched isoprenoid (HBI) alkenes in sulfidic Holocene sediments from Ellis Fjord, Antarctica, *Org. Geochem., 38*(1), 128-139.

23. Schubert, C. J., **M. J. L. Coolen**, L. N. Neretin, A. Schippers, B. Abbas, E. Durisch-Kaiser, B. Wehrli, E. C. Hopmans, J. S. Sinninghe Damsté, S. Wakeham and M. M. M. Kuypers (2006) Aerobic and anaerobic methanotrophs in the Black Sea water column, *Environ. Microbiol., 8*(10), 1844-1856.

24. Sinninghe Damsté, J.S. and **M.J.L. Coolen** (2006) Fossil DNA in Cretaceous Black Shales: Myth or Reality? *Astrobiology* 299-302.

25. **Coolen, M. J. L**., G. Muyzer, S. Schouten, J. K. Volkman and J. S. Sinninghe Damsté (2006) Sulfur and methane cycling during the Holocene in Ace Lake (Antarctica) revealed by lipid and DNA stratigraphy, in Past and Present Marine Water Column Anoxia, NATO Science Series: IV-Earth and Environmental Sciences, edited by L. N. Neretin, pp. 41-65, Springer, Dordrecht.

26. **Coolen, M. J. L.**, A. Boere, B. Abbas, M. Baas, S. G. Wakeham and J. S. Sinninghe Damsté (2006) Fossil DNA derived from alkenone-biosynthesizing haptophytes and other algae in Holocene sediment from the Black Sea, *Paleoceanography, 21*, PA1005-doi:10.1029/2005PA001188,.

27. Wuchter, C., B. Abbas, **M. J. L. Coolen**, L. Herfort, B. J. van, P. Timmers, M. Strous, E. Teira, G. J. Herndl, J. J. Middelburg, S. Schouten and J. S. Sinninghe Damsté (2006) Archaeal nitrification in the ocean, *Proc. Natl. Acad. Sci. U. S. A., 103*(33), 12317-12322. *This paper resulted in the prestigious Raymond Lindeman Award (ASLO) to Cornelia Wuchter in 2008*.

28. Stadnitskaia, A., G. Muyzer, B. Abbas, **M. J. L. Coolen**, E. C. Hopmans, M. Baas, T. C. E. Van Weering, M. K. Ivanov, E. Poludetkina and J. S. Sinninghe Damsté (2005) Biomarker and 16S rDNA evidence for anaerobic oxidation of methane and related carbonate precipitation in deep-sea mud volcanoes of the Sorokin Trough, Black Sea, *Mar. Geol., 217*(1-2), 67-96.

29. **Coolen, M. J. L.**, E. Post, C. C. Davis and L. J. Forney (2005) Characterization of microbial communities found in the human vagina by analysis of terminal restriction fragment length polymorphisms of 16S rRNA genes, *Appl. Environ. Microbiol., 71*(12), 8729-8737.

30. Wuchter, C., S. Schouten, **M. J. L. Coolen** and J. S. Sinninghe Damsté (2004) Temperature-dependent variation in the distribution of tetraether membrane lipids of marine Crenarchaeota: Implications for TEX_{86} paleothermometry, *Paleoceanography, 19*(4), PA4028, doi:10.1029/2004PA001041.

31. **Coolen, M. J. L**., G. Muyzer, W. I. C. Rijpstra, S. Schouten, J. K. Volkman and J. S. Sinninghe Damsté (2004), Combined DNA and lipid analyses of sediments reveal changes in Holocene haptophyte and diatom populations in an Antarctic lake, *Earth. Planet. Sc. Lett., 223*, 225-239.

32. **Coolen, M. J. L.**, E. C. Hopmans, W. I. C. Rijpstra, G. Muyzer, S. Schouten, J. K. Volkman and J. S. Sinninghe Damsté (2004) Evolution of the methane cycle in Ace Lake (Antarctica) during the Holocene: Response of methanogens and methanotrophs to environmental change, *Org. Geochem., 35*(10), 1151-1167.

33. **Coolen, M. J. L.**, H. Cypionka, A. M. Sass, H. Sass and J. Overmann (2002) Ongoing modification of Mediterranean Pleistocene sapropels mediated by prokaryotes, *Science, 296*(5577), 2407-2410.

34. Sass, A. M., H. Sass, **M. J. L. Coolen**, H. Cypionka and J. Overmann (2001), Microbial communities in the chemocline of a hypersaline deep-sea basin (Urania basin, Mediterranean Sea), *Appl. Environ. Microbiol., 67*(12), 5392-5402.

35. **Coolen, M. J. L.** and J. Overmann (2000) Functional exoenzymes as indicators of metabolically active bacteria in 124,000-year-old sapropel layers of the Eastern Mediterranean Sea, *Appl. Environ. Microbiol., 66*(6), 2589-2598.

36. Overmann, J., **M. J. L. Coolen** and C. Tuschak (1999), Specific detection of different phylogenetic groups of chemocline bacteria based on PCR and denaturing gradient gel electrophoresis of 16S rRNA gene fragments, *Arch. Microbiol., 172*(2), 83-94.

37. **Coolen, M. J. L.** and J. Overmann (1998), Analysis of subfossil molecular remains of purple sulfur bacteria in a lake sediment, *Appl. Environ. Microbiol., 64*(11), 4513-4521.

38. Nijburg, J. W., **M. J. L. Coolen**, S. Gerards, P. J. A. K. Gunnewiek and H. J. Laanbroek (1997) Effects of nitrate availability and the presence of *Glyceria maxima* the composition and activity of the dissimilatory nitrate-reducing bacterial community, *Appl. Environ. Microbiol., 63*(3), 931-937.

PAPERS PRESENTED AT MEETINGS AND INVITED LECTURES

- **Coolen, M.J.L.** Reconstruction of hydrological and ecological changes in the Black Sea during the alst 11.4 ka: insights from paired fossil DNA and molecular level isotopic measurements. Joint Seminar Series, Utrecht University, Netherlands. March 15, 2012.

- **Coolen, M.J.L.**, L. Giosan, M. Filipova-Marinova, S. Sylva, T-H. Yang, T.I. Eglinton. A postglacial DNA record of plankton and vegetation changes in the Black Sea. WHOI Paleolunch Seminar, December 6, 2011.
- **Coolen, M.J.L.**, Holocene virus/host molecular dynamics and environmental changes in the Black Sea. The Microbial Systems Seminar series, MIT, Cambridge. November 30, 2011. (**Invited**).
- **Coolen, M.**J.L., J. van de Giessen, E. Zhu. Bioavailability of soil organic matter upon Arctic permafrost thaw. WHOI Chemistry seminar series. September 27, 2011.
- **Coolen, M.J.L.** 14,000 years of environmental changes and plankton dynamics in the Black Sea as revealed by ancient DNA and isotope lipid geochemistry. China-US Collaborative Research on Tibetan Lake Ecology Workshop, Xining, China. August 1-5, 2011.
- **Coolen, M.J.L**., J. van den Giessen, L. Giosan, S. Sylva, M, Filipova, and T.I. Eglinton. 14,000 years of molecular plankton succession dynamics in the Black Sea. Session 18. Paleobiogeochemistry and Ancient Microbial Environments of the International Symposium on Microbial Ecology (ISME13). Seattle, WA, USA. 22-27 August, 2010. (**Invited**).
- **Coolen, M.J.L**., J. van den Giessen, S. Sylva, L. Giosan, and T.I. Eglinton. 14,000 years of molecular plankton succession dynamics in the Black Sea. Workshop: US-China Collaborative Research on Geomicrobiological Processes in Extreme Environments. Penn State University, May 18-23, 2010. (**Invited, plenary presentation**).
- **Coolen, M.J.L.** Sedimentary paleogenomics: a novel window into palaeoecology, palaeoenvironment, and palaeoclimate". Gordon Research Conference on Chemical Oceanography, Process, Dynamics, And Change In The Anthropocene Ocean, Tilton School, Tilton, NH August 5, 2009 (**Invited**).
- **Coolen, M.J.L.** The post-glacial biota of the Black Sea as revealed by paleogenetics. American Genetic Association Annual Symposium. Genetics and Genomics of Environmental Change 8-11 June 2009 Brown University Providence, RI (**Invited**).
- **Coolen, M.J.L.** Pyrosequencing: A window into the Holocene coastal plankton, fauna, and vegetation of the Black Sea. International Census of Marine Microbes (ICoMM) 454 Users Spring Meeting, April 6-9th, 2009. Marine Biology Laboratory (MBL), Woods Hole.
- Liz Zhu and **M.J.L. Coolen**. Is thawing permafrost as a result of global warming a significant source of degradable organic matter for microbiota residing in situ and in Arctic rivers? AGU Fall Meeting, San Francisco, 2008. (*Liz Zhu was 1 of 18 students nation-wide to be selected for an award via the University of Wisconsin-Milwaukee NSF-OCE REU program to present this poster at the AGU)*.
- **Coolen, M.J.L**., J. Saenz, N. Trowbridge, S. Sylva, L. Giosan, and T.I. Eglinton. The Holocene ecology and environment of the Black Sea as revealed by sedimentary paleogenomics. Workshop Evolution Across Scales, University of Potsdam, Germany. May 2008 (**Invited**).
- **Coolen, M.J.L.** Sedimentary paleogenomics: A new window into paleoecology and paleoenvironments. MIT Chemical Oceanography and Biogeochemistry seminar, Cambridge, MA, March 14, 2008 (**Invited**).
- Boere, A.C. Rijpstra, W.I.C. de Lange, G., Sinninghe Damsté, J.S., and **M.J.L. Coolen**. Combining lipidomics with fossil DNA from Holocene settings to provide a window on past marine microbial ecology. ISME 12 Microbial Diversity-Sustaining the Blue Planet, Cairns, Australia, 17-22 August 2008.
- Volkman, J.K.' **Coolen, M.J.L.**, Talbot, H.M., Abbas, B, Ward, C, Shouten, S., Sinninghe Damsté. Organic matter sources in Holocene sediments of Ace Lake (Antarctica) deduced from lipid biomarkers and 16S rDNA stratigraphy. ISME 12 Microbial Diversity-Sustaining the Blue Planet, Cairns, Australia. 17-22 August 2008.

- **Coolen, M.J.L**., J. Saenz, N. Trowbridge, S. Silva, L. Giosan, and T.I. Eglinton. Fossil DNA stratigraphy revealed multiple sources of alkenones in the Holocene Black Sea at the strain level: Implications for UK37 paleothermometry. AGU Fall 2007 meeting, San Francisco, CA. Published abstract PP53A-03. (**Invited**).
- Boere, B. Abbas, G. Versteegh, J.K. Volkman, J.S. Sinninghe Damsté, and **M.J.L. Coolen**. A qualitative and quantitative comparison of sedimentary palynomorphs, lipid biomarkers, and fossil DNA: Which tool provides the most detailed paleoecological and paleoenviornmental information? AGU Fall 2007 meeting, San Francisco, CA. Published abstract PP32B-07 (**Invited**).
- **Coolen, M.J.L.**, H.M. Talbot, B. Abbas, C. Ward, S. Schouten, J.K. Volkman, and J.S. Sinninghe Damsté. Bacteriohopanepolyols in Ace Lake (Antarctica) and their possible biological sources as revealed by 16S rDNA stratigraphy. International Meeting on Organic Geochemistry (IMOG), 9-14 September, 2007, Torque, Great Brittan. Published abstract O46 (replaced cancelled talk by Charrié-Duhaut et al.).
- Boere, A.C., B. Abbas, W.I.C. Rijpstra, J.K. Volkman, J.S. Sinninghe Damsté, and **M.J.L. Coolen**. Fossil DNA as a new biomarker: A study on taxon-specific preservation of fossil DNA in Ellis Fjord, Antarctica. IMOG, 9-14 September, 2007, Torque, Great Brittan. (Poster).
- **Coolen, M.J.L.** Preserved genetic signatures reveal what traditional biomarkers failed to tell us about the Holocene Black Sea environment. Gordon Research Conference on Applied and Environmental Microbiology, Mount Holyoke College, South Hadley, MA, July 15-20, 2007 (**Invited**).
- **Coolen, M.J.L**., B. Abbas, A. Boere, G. Muyzer, S. Schouten, J.K. Volkman, and J.S. Sinninghe Damsté. Preserved DNA in Holocene lake sediments: a window on past microbial communities and paleoenvironments. 10th International Paleolimnology Symposium, Duluth, MN, June 25-29, 2006.
- **Coolen, M.J.L**., B. Abbas, and J.S. Sinninghe Damsté. Ammonia-oxidizing planktonic Crenarchaeota in the Black Sea. Ocean Science Meeting, Honolulu, HI, February 2005. (Oral). Published abstract OS52K-04.
- **Coolen, M.J.L**., B. Abbas, A. Boere, G. Muyzer, S. Schouten, J.K. Volkman, and J.S. Sinninghe Damsté. Fossil DNA as a recorder of ancient microbial communities and paleo-environments. Presented at:
  1. AGU Fall 2005 Meeting, San Francisco, CA. Published abstract PP14B-04
  2. Brown University, RI (10/14/2005).
  3. MIT, MA Chemical Oceanography and Biogeochemistry seminar (09/30/2005).
  4. WHOI Redfield Auditorium (09/01/2005).
  5. International Meeting on Organic Geochemisty (IMOG), Seville, Spain (09/12/2005). Published Abstract PMP-1, 22 IMOG Abstract Book. (**Invited and Plenary**)
- **Coolen, M.J.L**., G. Muyzer, S. Schouten, J.K. Volkman, and J.S. Sinninghe Damsté. Lipid and fossil rDNA stratigraphy reveals impact of environmental changes on the ancient microbial community of meromictic, euxinic Ace Lake (Antarctica). Presented at:
  1. CSIRO Marine Research, Hobart, Tasmania, Australia. 20 October 2003.
  2. NATO Advanced Research Workshop on Past and Present Water Column Anoxia. 4-8 October 2003, Sevastopol, Crimea, Ukraine.
- **Coolen, M.J.L**., G. Muyzer, S. Schouten, J.K. Volkman, and J.S. Sinninghe Damsté. Impact of Holocene climate change on the ancient species composition of Ace Lake (Antarctica) as revealed by stratigraphic analysis of lipids and fossil rRNA genes. Special Seminar Series on the Deep Biosphere, WHOI, 16 September 2003.

- **Coolen, M.J.L**., G. Muyzer, S. Schouten, J.K. Volkman, and J.S. Sinninghe Damsté. DNA stratigraphy reveals Holocene haptophyte population dynamics and sources at the species level. EGS-AGU-EGU Joint Assembly, April 06-11, 2003, Nice, France (poster P1530).
- **Coolen, M.J.L.,** G. Muyzer, S. Schouten, J.K. Volkman, and J.S. Sinninghe Damsté. Impact of Holocene environmental changes on the species diversity in Ace Lake (Antarctica) based on the analysis of fossil DNA and lipids. Gordon Research Conference on Organic Geochemistry, July 28-August 2, 2002, Plymouth, USA (poster).
- **Coolen, M.J.L**., G. Muyzer, S. Schouten, J.K. Volkman, and J.S. Sinninghe Damsté. Lipid, pigment and rRNA gene sequence analysis of particulate organic matter and surface sediments of a meromictic lake and a stratified fjord in Antarctica.). 20th International Meeting on Organic Geochemistry, September 10-14, 2001, Nancy, France (poster P/WED/1/1).
- **Coolen, M.J.L.** and J. Overmann. Diversity of extant and fossil bacteria in Pleistocene eastern Mediterranean sapropels. Symposium of the VAAM, March 12-16, 2000, Munich, Germany. (Oral) Published abstract in: VAAM Biospectrum Sonderausgabe 2000.
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