

Who are the cable bacteria?

Burdorf Laurine¹, Geelhoed Jeanine², Thorup Casper³, Schramm Andreas³ and Meysman Filip⁴

¹ AMGC, Vrije Universiteit Brussel, Pleinlaan 2, 1050 Brussel, Belgium

E-mail: laurineburdorf@gmail.com

² Ecosystem management, Department of Biology, Universiteitsplein 1, 2690 Wilrijk Belgium

³ Center for Electromicrobiology, Department of Bioscience, Ny Munkegade 116, 8000 Aarhus, Denmark

⁴ Ecosystem Management, Department of Biology, Universiteitsplein 1, 2690 Wilrijk Belgium

Recently long, multicellular, filamentous bacteria were discovered to transport electrons over centimeters in marine sediments. These so-called cable bacteria have a unique metabolism, where electrons are first harvested from sulfide at centimeters deep in the sediment, then transported from cell-to-cell along the longitudinal axis of the cable bacteria and finally shuttled to oxygen near the sediment-water interface. By establishing such electrical circuitry, these microorganisms turn the seafloor into an “electrical ecosystem”, where both ions and organisms are influenced by electrical fields. Recent studies have demonstrated that cable bacteria are present and active in globally widespread environments. Cable bacteria are found in highly diverse environments and up to date six candidate species of cable bacteria are reported. Using the BMRI grant we were able to sequence new samples originating from globally diverse environments (e.g. Australia, The Netherlands, Belgium) and found that “cable bacteria” are more diverse than previously reported.