

Prevalence of *Vibrio parahaemolyticus*, *V. cholerae* and *V. vulnificus* in the German North and Baltic Sea coastal waters

Herrig Ilona¹, Fleischmann Susanne¹, Reifferscheid Georg¹, Szewzyk Regine² and Brennholt Nicole¹

¹ Department Biochemistry and Ecotoxicology, Federal Institute of Hydrology, Am Mainzer Tor 1, 56068 Koblenz, Germany
E-mail: herrig@bafg.de

² Department Microbiological Risks, German Environment Agency, Corrensplatz 1, 14195 Berlin, Germany

Vibrio is a genus of facultative anaerobe Gram negative bacilli, which are medium to highly halophile and occur naturally in **marine environments**. Several species of *Vibrio* are **pathogens** and associated with gastroenteritis, wound infections and septicemia. For the Baltic Sea outbreaks of *Vibrio*-related wound infections have been reported following hot summer months whereas for the more saline waters of the North Sea, only single cases of *Vibrio*-related wound infections have been reported up to now (Huehn et al. 2014; Breidenbach & Frank 2012). Despite growing concern that ***Vibrio* infections** may increase in Northern European coastal waters due to rising sea surface temperatures in the course of climate change, there is only insufficient knowledge of the ecology of *Vibrio* and their **health risk** potential in these regions, however.

Therefore, a monitoring study was carried out at bathing sites along the **German North and Baltic Sea** coast and within the Ems estuary. Thereby water and sediment samples were taken monthly at 7 sites in total over a 1-year period. Because vibrios seem to be highly variable in habitat preference (Schmidt et al., 2014) sampling sites were further chosen in various water body types according to the European Water Framework Directive to be able to compare *Vibrio* prevalence in different habitats.

Samples were analysed with culture-dependent as well as with molecular methods like **qPCR** for potentially pathogenic *Vibrio spp.* in the context of biotic and physico-chemical parameters in order to determine the driving factors governing their occurrence and distribution.

Thus, the present study aims to give a contribute of knowledge on the prevalence of ***V. parahaemolyticus*, *V. cholerae* and *V. vulnificus*** in different areas of the German North and Baltic Sea coastal waters in relation to **driving factors** governing their occurrence and **distribution**.

References

- Breidenbach J., Frank C. (2012) Informationsbroschüre zu Nicht-Cholera-Vibrionen in Deutschland. Robert Koch-Institut (RKI).
- Huehn, S., Eichhorn, C., Urmersbach, S., Breidenbach, J., Bechlars, S., Bier, N., et al. (2014). Pathogenic vibrios in environmental, seafood and clinical sources in Germany. International Journal of Medical Microbiology, 304(7), 843-850.
- Schmidt, V. T., Reveillaud, J., Zettler, E., Mincer, T. J., Murphy, L., & Amaral-Zettler, L. A. (2014). Oligotyping reveals community level habitat selection within the genus *Vibrio*. Frontiers in microbiology, 5, 563.

Keywords: marine environments; pathogens; vibrio infections; health risk; German North & Baltic Sea; qPCR; *V. parahaemolyticus*; *V. cholerae*; *V. vulnificus*; distribution