Food for bacteria: a plastic exposure trial at sea

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Recently we showed that plastic items form a distinct marine habitat for bacteria (De Tender et al., 2015). We observed that the structure of these plastic-related bacterial communities are correlated with environmental factors and the plastic characteristics. Even the stage of colonization could play a role in the colonization process. To understand these processes better, we constructed an exposure experiment at sea. This however, turned out to be a bigger challenge then we thought.

Within the experiment, fifteen constructions were placed at two different locations in the North Sea: the harbour of Ostend and offshore at the Thorton Bank. Once a month one of the constructions is sampled, to observe the evolution in the microbial colonization pattern. Each construction consists of two different types of polyethylene plastic (dolly rope and plastic sheet) to observe differences in bacterial colonization between those two main plastic litter types. The two locations were chosen to look at differences in bacterial communities due to environmental factors.

We expect that after a few months, a stable community on the plastic will be formed, which can maintain on the plastic. This community will be studied by using whole-genome shotgun sequencing (WGS). Using WGS, we are able to look at the taxonomy of all organisms present on the plastic (e.g. bacteria, fungi, eukaryotes,...). Additionally the technique also provides information on the functions of these organisms within the community. Therefore, we hope to detect some bacteria or other micro-organisms, which are able to act in a plastic biodegradation process. And hopefully, those biodegrading micro-organisms could be the solvers of all our plastic litter in sea!

References

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