Research project

Date of Issue:  
Submission Deadline: 
1st Examiner: Prof. Dr.-Ing. Regina Nogueira 
2nd Examiner: 
Supervisor: Prof. Dr.-Ing. Regina Nogueira

Working Time: 180 hours 
Working Period: 6 months

Topic: Substitution of plastic with biodegradable plastic: what can we learn from the microbial composition of biofilms in the plastosphere about the half-life of plastics in the marine environment?

Task Description
Biodegradable plastics might be part of an integrated solution to minimize plastic pollution in the ocean. However, little is known about the half-life of biodegradable plastics under relevant environmental conditions. It can be hypothesized that the composition of the microbial community thriving on plastic surfaces can give important information about the time that the material has already been in the environment and its expected half-life.

Within the scope of the Research Project, the following tasks are to be achieved:

The following points should be included in particular:

- Comparison of the state-of-the-art methods to analyse the bacterial compositions of biofilms 
- Identification of the environmental parameters typical for a particular marine environment 
- Correlate the bacterial diversity in the biofilm with the predominant environmental conditions and plastic type 
- Estimation the half-life of biodegradable plastic compared to conventional plastic in the marine environment 

The results should be presented comprehensively, supported by graphics and tables. Special attention should be paid to comments and explanations concerning the chosen approach, the concise explanation of the underlying theory and the comprehensive presentation of results. The extent of the individual tasks should be coordinated with the supervisor during the work. Selected peer-review literature specific to the topic will be provided.

The basic outline of the work must be submitted after 6 weeks. Preliminary drafts of the written chapters should be submitted regularly throughout the ongoing work to provide a basis for scientific discussion with the supervisor.

The research project report is to be printed, bound and submitted in triplicate. Additionally, all literature, data and calculations have to be provided digitally. The Institute of Sanitary Engineering and Waste Management, Leibniz Universität Hannover, reserves the right to use this thesis’ results for other scientific purposes.

A 20-minute presentation of the thesis is to be given after which the content will be put up to discussion.

It is recommended a background knowledge in biology and a good English level to be able to address the topic