

ABSTRACT

The growth of biofouling on the underwater hull of a vessel poses various problems. For instance, the increased fuel consumption due to an increased surface roughness of the hull. The TBT (tributyltin) ban can be seen as a milestone within the antifouling coatings. Current biocidal antifouling coatings have a negative impact on the environment and will eventually have to be replaced by innovative and effective antifouling coatings. So far, we cannot speak of a suitable antifouling coating that does not harm marine life. So, there is still need for environmentally friendly antifouling coatings. In this master thesis, the antifouling activity of natural compounds in marine coatings is investigated. The field of biomimicry is being investigated as a potential source in the search for antifouling coatings. Furthermore, the antifouling activity of marine micro-organisms, sponges and corals is discussed in more detail. Their antifouling activity relies largely on the production of secondary metabolites.

As part of the research to the antifouling activity of natural compounds in marine coatings, an experiment was started in collaboration with Dr. MC Najarro on the antifouling activity of lignin. Lignin is a natural biopolymer that shows antibacterial properties in several studies. It is a naturally degradable substance that is not harmful to the marine environment. If lignin could be incorporated into an effective antifouling coating, this would be a milestone for the current antifouling coatings.

Based on this information, nine different coatings based on lignin, were developed by Dr. MC Najarro which showed an antibacterial effect under laboratory conditions. These paints were applied to 49 coupons that were divided over two racks. The coupons of the first rack were exposed to seawater for 26 weeks and the coupons of the second rack for 7 weeks. The experiment took place in the port of Ostend. After a comparative analysis of the data, it was concluded that this experiment could not distinguish the test coupons with the lignin-based coupons.