

## **Evaluation of the degradability of bioplastics in open air and marine coastal water**

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The increasing number of plastic debris and their impact to the natural environment have led the society to the developed alternatives plastics, grouped under the term “bioplastics”. We have tested the degradability of seven samples from three types of bioplastics, polylactic acid (PLA), polyvinyl alcohol (PVA)/starch blends and modified low-density polyethylene (LDPE) with prodegradant additives, during 6 months in situ deployment in the open air and coastal marine water of Hong Kong. The only samples that show total degradation after 6 months is PLA in marine coastal water. Plastics that are PLA and PVA/starch blends show larger mass losses and polymer chemical changes than modified LDPE samples. PLA and PVA/Cassava starch blend are more sensitive to degradation in marine coastal water conditions, whereas PVA/Corn starch blend and modified LDPE are more sensitive to degradation in open air conditions. Our findings highlight the differences of degradability of bioplastics between natural conditions and certified end of life conditions. Without proper bioplastic waste management facilities, bioplastic and conventional plastic debris represent a threat to natural ecosystem.