to consider the role of biological fragmentation in plastic degradation and should be considered when developing models to predict the fate and behaviour of microplastics in the environment.

3.10.P-We068 Release of Micro- and NanoPlastics From Single-Use and Reusable Facemasks

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Release of micro- and nanoplastics from single-use and reusable facemasks Yuyue Huang (**presenter**), Elvis Genbo Xu Department of Biology, University of Southern Denmark, Odense 5230, Denmark Presentation type: **Poster**Face masks helped prevent the spread of coronavirus and mass masking is recommended by almost all health groups and countries to control the COVID-19 pandemic. The massive production, use, and inappropriate disposal of plastic face masks result in new concerns of the plastic problem. The single-use masks ended in the natural environments may fragment into micro- and nanoplastics (MNPs) that are known hazardous to environmental organisms. Some new reusable face masks, therefore, are made and recommended but they may also release MNPs during sterilization and washing. In this study, we investigated the release of MNPs from both single-use and reusable face masks under both environmental aqueous and sedimentary conditions, as well as during sterilization, hand, and machine washing procedures. The efficiency and recovery of different MNP extraction/separation methods were also compared, including chemical digestion (acids, alkalis, and Fenton's reagent), enzymatic digestion (Proteinase-K and cellulose), density floatation (NaCl, $ZnCl_2$, and NaI), centrifugation, and sequential filtrations. This study provides important data on face masks as a new MNP source and it is urgent to recognize this environmental threat, particularly under the circumstance of facing new challenges of the coronavirus variants. **Key words:** microplastics; disposals masks; sediments; soils

3.10.P-We069 Release of Microplastics From a Newly Developed Bio-Based Composite After Ultraviolet Irradiation

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The dependence on petroleum-based polymers such as polypropylene (PP) has led to a series of environmental issues, including the persistence of microplastic (MP), i.e. plastic particles smaller than 5 mm in diameter, in the global ocean. Polymers made from a natural-sourced feedstock, like polylactic acid (PLA), known as bio-based polymers, are seen as more sustainable alternatives. However, our knowledge remains limited about their degradation and fate in the marine environment. Studies have provided evidence of the release of MP from larger debris under Ultraviolet (UV) radiation in laboratory conditions. However, the most direct and quantitative evidence of MP formation, i.e. observation, identification and enumeration of MPs formed after UV radiation, is limited. Indeed, only a few studies have assessed the disintegration of bio-based polymers and their capacity to form MPs. As part of the Interreg 2 Seas Mers Zeeën project SeaBioComp (seabiocomp.eu), we aim to compare, quantify and characterise the MP formation of a newly developed bio-based composite (i.e. bio-based polymers integrated with synthetic or natural fibres) and a reference petroleum-based polymer during their degradation under UV radiation. To do so, we exposed 3D printed cylinders (d=h=1cm) of self-reinforced PLA (SR-PLA) and PP respectively, immersed in natural seawater, to accelerated UV radiation for up to 1368h, simulating about 18 months of natural solar exposure in central Europe. Dark controls (i.e. sealed from the UV) were incubated in the same conditions also for 1,368h. To identify, characterise and quantify the formed MPs, we used a combination of fluorescent microscopy, infrared technology (?FT-IR) and image analysis. We found that 1,368h UV exposure accelerated the MP formation of PP samples but not SR-PLA samples, suggesting that the newly developed bio-based composite SR-PLA is more resistant to releasing MPs than the reference petroleum-based polymer. We anticipate that our results will contribute to assessing the sustainability of future bio-based polymers and composites applications and to supporting a transition process to more sustainable plastic materials.

3.10.P-We070 Response to Microplastic Exposure: An Exploration Into the Sea Urchin Immune Cell Proteome

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Nowadays, it is undeniable that marine organisms are interacting with plastic debris with serious consequences on organism and population health mostly based on size lower than 5 mm defined as microplastics (MPs). Despite the growing attention on MPs pollution, there are still several scientific issues to be addressed in understanding MPs toxicity especially related to the molecular mechanisms and the cellular processes that are activated in response to MPs exposure. Translating this knowledge-gap on the biological impacts of MPs on one of the key species of the Mediterranean Sea, the *Paracentrotus lividus*, this study aims to explore for the first time the sea urchin immune cells profile combined to their proteome upon *in vivo* exposure to different concentration of polystyrene-microplastics (micro-PS). In detail, adult specimens of the sea urchin *P. lividus* were exposed to different concentration of fluorescent micro-PS (45 µm) (0, 10, 50, 1000, 10^4 particles/L) for 72h. Already after 24h of micro-PS exposure, immune cells showed a significant increase at highest concentration tested (10^4 particles/L), while the low micro-PS concentrations tested (10 and 50 particles/L) reported no significant differences. Moreover, coelomocytes showed an increase in both intracellular reactive oxygen and nitrogen species levels (ROS and RNS) at 24h and 48h, compared to the control. In the case of the RNS, the increase is maintained after 72h of exposure also to 10 and 1000 particles/L. Proteomics analysis revealed the presence of 2060 control group proteins. By comparing these proteins to the total proteins found in the treatments, 69 unique proteins were identified for 10 part/L, 75 for 50 part/L, 93 for 1000 part/L and 82 for 10^4 part/L. Among these unique proteins, only the 8% of proteins (n=13) are shared by all four concentration tested simultaneously and mostly involved in cytoskeletal organization, intracellular membrane trafficking as well as protein metabolism. Overall, these findings provide new insights in