Emerging Pollutants--Plastics in the environment

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On the final day of the SETAC Europe meeting in beautiful and sunny Seville, a ‘new’ topic was introduced to the SETAC community. Research on plastics in the environment has been ongoing for a number of years, but never before has a specific session been devoted to this field of research at a SETAC Europe meeting. The interest in the session was overwhelming and the session room overflowed.

Plastics play a major role in everyday life, and are produced in vast and increasing amounts, with plastics production taking up around 8% of the world oil production. The environmental consequences of the use of plastics are felt globally, with plastic debris found from urban centers to remote island shores. Interest in this issue is “emerging” both in the media (e.g., the North Pacific gyre “plastics island”) and the environmental scientific community (e.g., Special Issue Phil. Trans. R. Soc. B 364 (2009); No. 1526).

An overview of the varied approaches that have been used in recent years to investigate what the actual environmental issues are with plastics in the environment and how solutions can be found were key features of this session. The complex topic asks specifically for a life cycle approach, as improvements in the environmental performance of plastics can be achieved in the production, use and waste treatment phases.

Presentations covered analytical methods for collection, identification and quantification of (micro)plastics in environmental samples. While methods are becoming more and more sophisticated, researchers were unanimous in calling for standardized methods that allow temporal and spatial comparison. Our understanding of the factors influencing the distribution of plastics in the environment (e.g., polymer type, wind and currents) is increasing as well.

Sorption of organic contaminants to plastics particles and subsequent distribution in the environment and uptake by organisms was discussed by several presenters, and it was shown that in some cases this plastic-mediated exposure pathway for organic chemicals including plastic additives can be as important as bioaccumulation via the food chain. Another talk presented data on leaching of endocrine disrupting chemicals from plastic food packaging as assessed with in vitro bioassays.

Using Life Cycle Assessment methods, several challenges occur (e.g., a correct allocation of the environmental benefits of recycling) when modeling the recycling of plastics, which were discussed in another presentation. In an excellent example of life cycle planning, experiences were presented on how we can learn from the treatment and separation of plastics waste to improve the design of products in order to make them more recyclable.

The session showed the value of a multi-faceted approach to assessing the issues associated with plastics, improving risk assessments, and arriving at solutions (e.g., improvements in recycling, use of biologically-based feedstocks, change in consumer behavior and product
design, reduction of littering). It was also suggested that the SETAC community, having gained expertise in relevant subjects, can and should play a valuable role in this process.

The very active participation of the audience during the discussions proved that the topic has the interest of many SETAC members. We are looking forward to another exciting session on plastics in the environment at the next SETAC North America annual meeting in Portland!

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