Complementary information on the presentation 'Microplastics - Stressors on caddisflies & Plasticrusts in the Mediterranean Sea'

To give additional information on both Microplastics in freshwater ecosystems and Plasticrusts, a paper on each of these topics has been summarized in the following passage.

'Microplastics profile along the Rhine River' (2015)

Authors: Thomas Mani, Armin Hauk, Ulrich Walter, Patricia Burkhardt-Holm

This paper states the abundance and composition of microplastics (< 5mm) at the surface of the river Rhein between Basel and Rotterdam, with a focus on light-weight plastics (< 1g/cm³). The catchment area is a densely populated region, and moreover characterized by intense chemical and manufacturing industry. All 31 samples, at 11 locations, contained microplastics, while the cities Rees and Duisburg combined accounted for more than 66% of the found particles (also see figure below). This underlines the influence of high population densities with high-capacity waste water treatment plants and the accompanying emissions and pollution with microplastics. Among fragments, fibres and other categories of microplastics, almost 60% of the found pieces were spherules. These manufactured plastic products are found particularly downstream of plastic manufacturers or the associated waste water treatment plant.

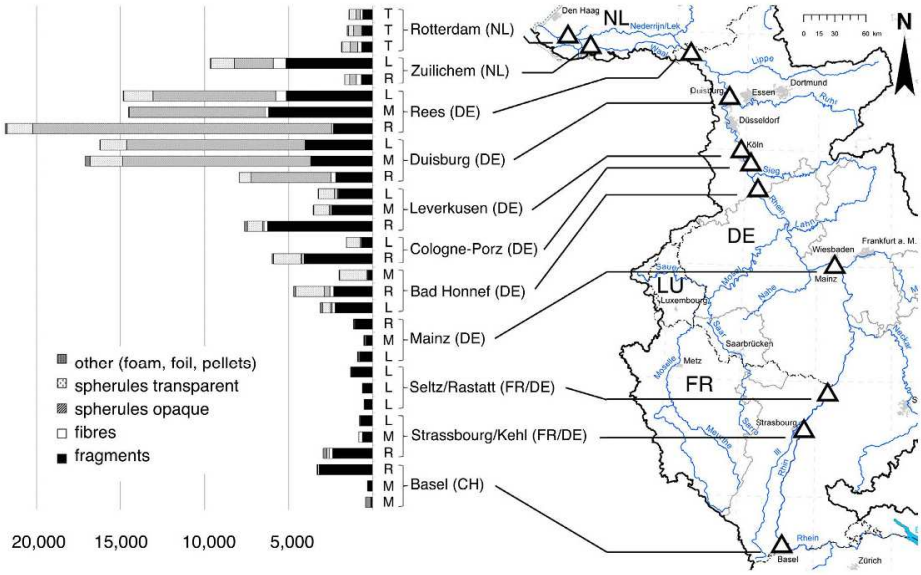

Figure 1. Number of microplastic particles (300 µm—5 mm) 1000 m^{-3} in categories at all sampling sites (Δ). The horizontal columns present microplastic abundance 1000 m^{-3} and the respective fraction of categories. *L*: *left bank*, M: *mid-river*, R: *right bank*, T: *transect* (position in the river cross section). The figure was created using Adobe Photoshop CS4, Version 11.0.2 to assemble the columns (Microsoft Excel for Mac 2011, Version 14.4.8) and the map (intern map by the ICPR Secretariat, 2011[44]; modified).

Exceptions to the increasing microplastic pollution along the Rhein river can be explained by higher sedimentation rates due to impoundment (between Basel and Mainz) or a low slope of the riverbed (Zuilichem and Rotterdam). Attached fouling organisms might also play a role in enhanced sedimentation by increasing the particle density.
The recommendation of immediate measures for managing plastic debris are stated to reduce and avoid the ongoing pollution by microplastics.

'Plasticrusts: A new potential threat in the Anthropocene's rocky shores' (2019)

Authors: Ignacio Gestoso, Eva Cacabelos, Patricio Ramalhosa, Joao Canning-Clode

Plastic debris pollution can be found globally and gives reason for serious concern by affecting marine ecosystems in particular. A new plastic pollutant are so-called Plasticrusts, which describe encrusted particles on a rocky surface and were first found on the offshore Atlantic island Madeira. They develop by continuous crashing of plastic debris against the rocky surface by sea waves. Sharing the space with several benthic invertebrate species, the damage potential needs to be further assessed. One risk being the entrance into the food web via ingestion by intertidal organisms.

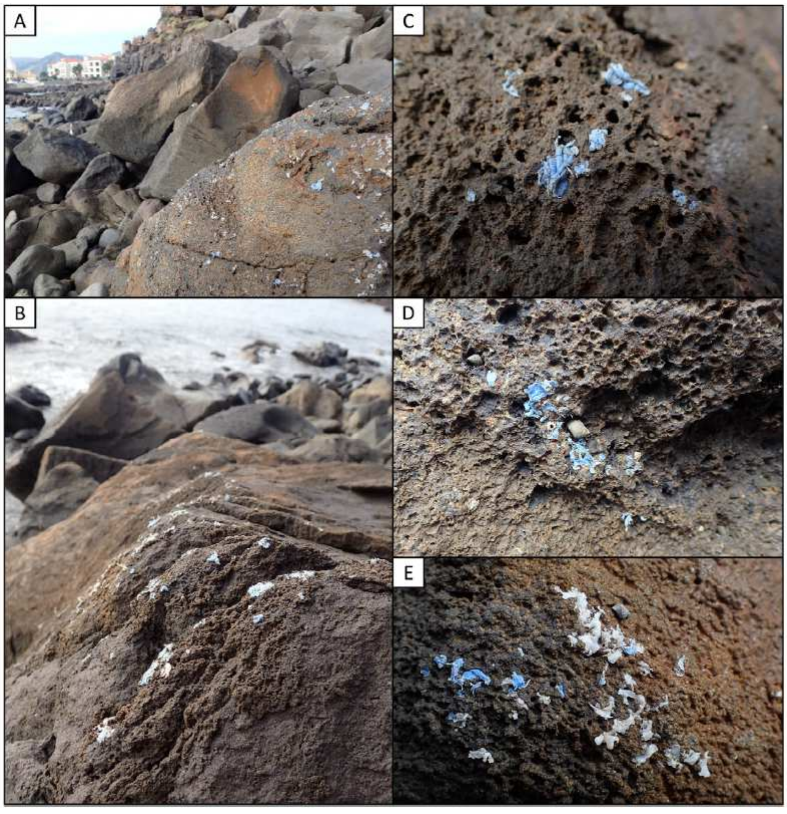

Fig. 1. Pictures showing (A, B) a general overview of mid-upper intertidal rocky shore in Madeira Island encrusted by plastic; (C) detail of 'plasticrusts' on the surface of the rocks; and (D, E) view of 'plasticrusts' surrounded by the littorinid gastropod *Tectarius striatus*.