
Plasto-tarball - a sinkhole for microplastic (Croatian coast case study)

Hana Fajković*¹, Vlado Cuculić², Neven Cukrov², Željko Kwokal², Kristina Pikelj¹,
Laura Huljek¹, and Slavica Marinović³

¹Department of Geology, Faculty of Science, University of Zagreb – Horvatovac 102a, 10 000 Zagreb, Croatia, Croatia

²Ruer Bošković Institute – Bijenička cesta 54, Croatia

³INA-Industrija nafte d.d. – Lovinciceva bb, 10002 Zagreb, Croatia

Abstract

Tarballs are black, often spherical objects; when crushed, develop a strong petroleum odour, and are usually related to the oil spills. The occurrence of tarballs in nature is frequent and they are recorded in several countries, such as Malaysia, India, Iran, Cameroon, USA, etc. Aggregation of plastic debris, pellets, and fragments with tar-balls were observed during the exploration in the 80s, and the expression "plasto-tarball" was proposed.

Tarballs can be found along the Croatian eastern Adriatic coast, often on the islands. Samples of plasto-tarballs were sampled at the natural beach on Žirje Island, situated in the Croatian middle Adriatic coast, 22 km from the mainland.

After analyses (FTIR and GC/MS) the origin of tarballs was determined as well as a type of microplastic particles caught in it. It was concluded that analyzed tarballs are connected with crude oil, probably related to oil spill incidents, and as such the result of the human activity. Particles identified by FTIR were divided into three groups: (a) rounded particles, 3-8 mm in diameter; (b) fibers, 10 - 27 mm length, and (c) and tabular particles, 1- 12 mm in diameter. If microplastic (MP) is defined as particles smaller than 5 mm, than the majority of analyzed plastic particles fall in this category. Particles were defined as PE, PP, and PVC. Due to its high-density, tarballs are considered as a sinkhole for some amount of MP particles. Based on the described occurrence, the stability of tarballs should be considered, especially plasto-tarballs as they can serve as a secondary source of afterward pollution, and/or source of remobilized MP particles.

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*Speaker