

Tools and approaches to introducing the marine litter problem in the classroom: first results of MALIA project

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Marine Litter is a global problem affecting marine and coastal ecosystems. Macro and microplastics are now recognised as major components of marine litter, contaminating wildlife and ecosystems worldwide. Recently, the presence of microplastics in human stools has also been reported (Liebmann et al., 2018). To tackle this problem, Hartley et al. (2018) stated that introducing marine litter topics in school programs can increase students' awareness of causes and impacts. Previously, Veiga et al. (2016) had also highlighted that involving citizens, from different target groups, in marine litter activities helped improving their knowledge about the problem and made them willing to be part of the solution. Hence, developing educational activities directed at students, the whole school community and citizens in general, is urgently needed. To proactively contribute to this, we designed a project aimed at introducing school communities and the general public to the marine litter global issue. The project takes advantage of a positive approach, promoting system thinking, hands-on activities and a holistic view across different European countries.

Marine litter awareness hands-on actions through learning by doing (MALIA), is a project funded by Erasmus+ programme carried out in Portugal, Cyprus, Italy and Spain. It started in January 2018 and aims at including marine conservation practices and marine litter educational guidelines in the national school curriculum enhancing students and teachers awareness on marine litter problems. To fulfil this goal, open educational resources (OER) and guidelines for outdoors hands-on activities, to be used by teachers to engage their students in this global issue, are being prepared.

In this communication, we show an outdoor activity to learn from rubbish collected on beaches. The activities carried out in Cyprus (Faros beach, Kato Paphos) and Spain (Cabo Cope Regional Park, Aguillas beach, Murcia Region), involved the following steps: 1) establishment of a protocol to collect and learn from litter found on the beach, working in groups. The protocol establishes guidelines for running a School Coastal Clean-up Event; 2) Tailoring of the Ocean Conservancy protocol for collecting marine litter at European beaches in the 4 countries involved in the MALIA project. The original protocol was prepared by a Spanish working group on Marine litter while working on EU Marine Strategies (BOE-A-2018-15734). This adjustments lead to a harmonised collection of more precise data from Mediterranean and Atlantic beaches, favouring the comparability of data available from beach cleanup activities around Europe; 3) Collection/ Classification of marine litter along a chosen beach, qualitative and quantitative analysis of marine litter collected and data analysis involving the students; 4) Students presentation of data to their school community, improving their scientific and social competences. The adjusted protocol - translated in 5 languages will be shown as a tool for learning about marine litter sources, as well as data on marine litter findings with their geographical location (<https://www.coastalcleanupdata.org/>).