



Plastic pollution on the Tuscan coast: environmental measures municipalities can put in place to reduce it

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Background

- Pollution by plastics and other chemical pollutants is already outside of safe operating space of the planetary boundary for humanity (Persson et al. 2022).
- Municipalities can significantly limit single-use plastic pollution on their territory through integrated strategies, including public procurement, exemplarity, territorial animation (Azzurro et al. 2021).

Objective

- Monitor litter items on three beaches of the Tuscan coast in the municipalities of Marina di Vecchiano, Livorno and Rosignano Marittimo;
- Identify environmental measures put in place by municipalities to address single-use plastic (SUP) items that are banned by the EU Single-Use Plastics Directive (SUPD);
- Highlight further possible environmental measures by to reduce plastic pollution at the local level.

Main results of the beach monitoring

- A total of 11'237 litter items were collected and categorized for a median litter abundance of 1'266 items / 100 m;
- Litter items made of Artificial Polymers represented 88.39% of litter items (Figure 1);
- The top 20 litter items correspond to 89.04% of total litter items;
- Six of them are single-use plastic (SUP) according to the EU Single-Use Plastics Directive. They are:
 - cigarette butts (22.69%),
 - plastic drink bottles (4.38%, including all sizes),
 - plastic cotton bud sticks (2.79%),
 - plastic crisps packets/sweets wrappers (1.61%).
- Overall, SUP items correspond to 36.96% of total litter items.

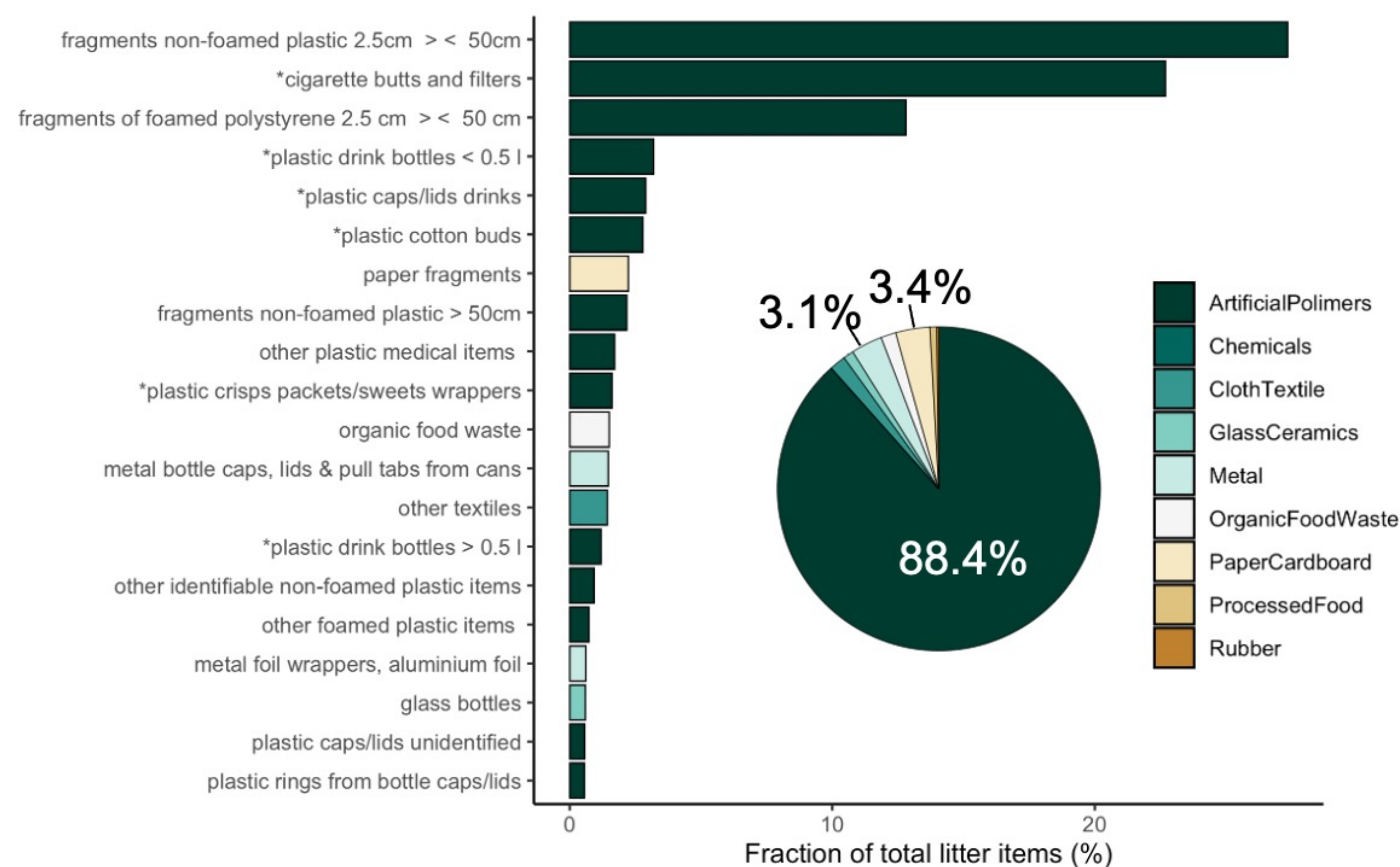


Figure 1. Top litter items and materials found on the Tuscan beaches between 2022 - 2023. Top 20 litter items are shown as fraction of the total. Percentages <2% are not shown. The symbol "*" indicates Single-use plastic items according to the EU Single-Use Plastics Directive (SUPD, 2019/904/EU).

Main results about environmental measures

- Two out of three municipalities put in place administrative acts that ban single-use plastic items on beaches, in parks and during festivals and events. Generally, the acts ban cutlery and plates if made of conventional plastics but allow it if made with "biodegradable plastic".
- These disposition are in agreement with the Italian transposition (the Legislative Decree No. 196[1] of 8 November 2021) of the EU SUPD, but on 23/05/2024, the European Commission decided to open an infringement procedure by sending a letter of formal notice to Italy (INFR(2024)2053) in which it commented that "Italy has failed to transpose, or to transpose correctly, several provisions of the Single-Use Plastics Directive into national law, which affects its scope and application".
- Indeed, the SUPD bans these SUP items made in all types of plastic materials, including those with characteristics of biodegradability in industrial facilities.
- A lack of specific-in house expertise was identified in municipalities, such as that regarding the environmental impacts of different types of plastics.
- Municipalities asked to have more details about the scientific evidence relative to the environmental impacts of biodegradable and compostable plastics, including those corresponding to UNI EN 13432:2002 standard (the standard adopted by the Italian transposition of the SUPD for plastics with characteristics of biodegradability), as well as their sustainability.
- A resolution on banning smoking on beaches prepared by one municipality was never put in place because of lack of resources for enforcement.
- Other challenges encountered by municipalities include lack of human resources and expertise, challenges in effective communication with citizens.

Methods

- Beach litter monitoring was carried out at Bocca di Serchio (Marina di Vecchiano), Cala del Leone (Livorno) and Lillatro (Rosignano Marittimo) (Figure 2) during three surveys in each site from November 2022 to July 2023;
- Litter items were categorized according to the MSFD Joint List of Litter Items (Fleet et al. 2021);
- Information about environmental measures put in place by the municipalities were collected through a questionnaire submitted to the environmental councillors and compared with those listed in the Manifesto #MoNUso, a report of guidelines for municipalities on how to reduce waste from single-use items and promote reuse developed by ANCI Emilia Romagna (Azzurro et al. 2020);
- A SWOT (strengths, weaknesses, opportunities, and threats) analysis permitted to identify further environmental measures that can be put in place by municipalities to tackle the problem of plastic pollution.

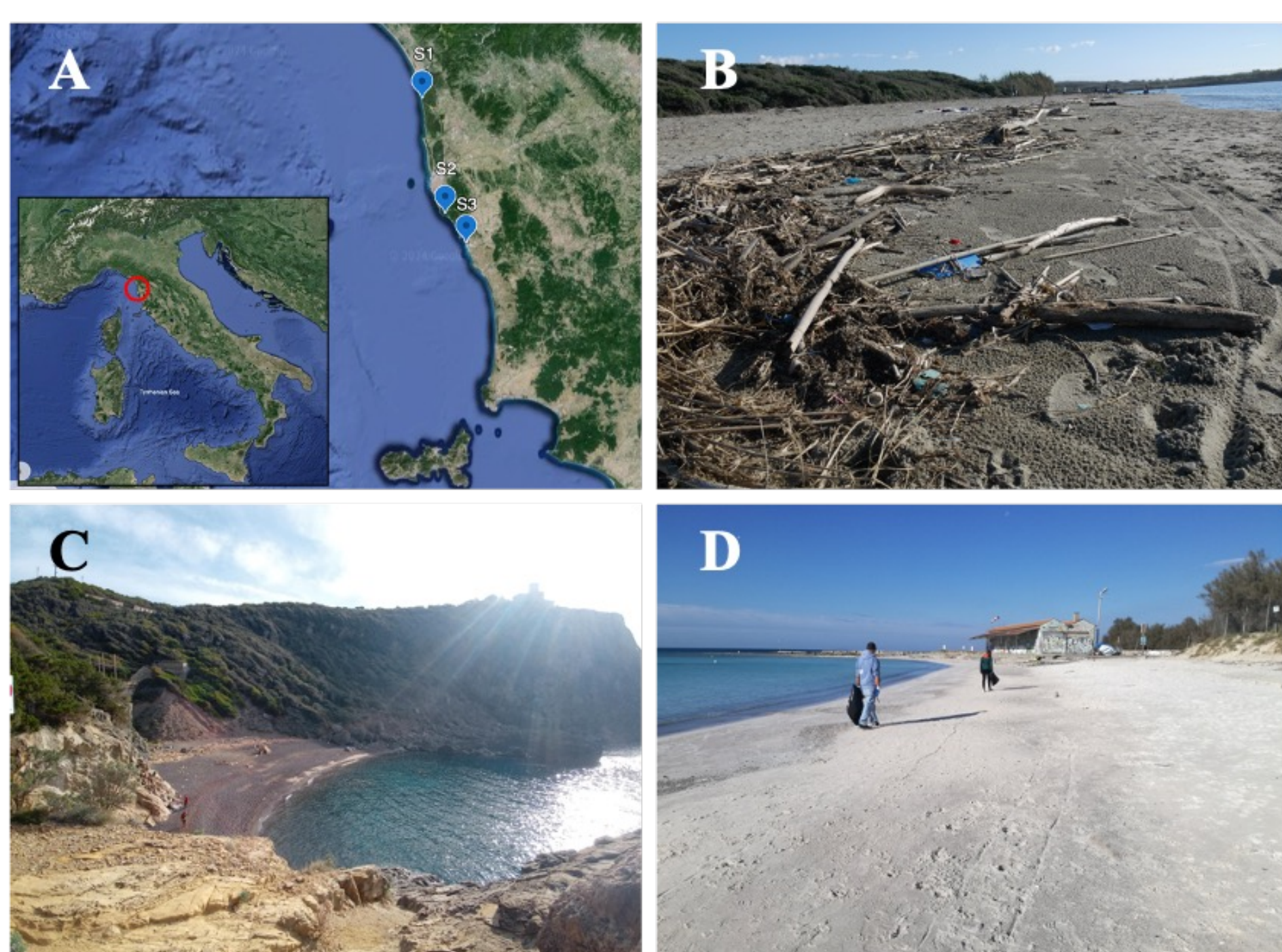


Figure 2. Figure 1. Map of the Tuscan coast (A) and the three study sites: S1 - Bocca di Serchio (B), S2 - Cala del Leone (C), Lillatro (D).

Take-Away

- On one hand, municipalities have the power to significantly limit plastic pollution through the development of integrated strategies and targeted regulations (Strengths).
- On the other, they face a lack of resources and knowledge (Weaknesses), and find themselves in an Italian regulatory framework in partial contrast to the EU directive on single-use plastics and not promoting actions to reduce single-use products (Threats).
- Despite the strong connection of municipalities with the territory, the weaknesses and threads that have been identified hinder the transition of cities towards circular consumption models, which promote reuse and regeneration systems over disposable ones.
- However, the creation of synergies among municipalities, research institutes, local associations, and citizens can lead to tangible results in the fight against plastic pollution (Opportunities).

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