Fishing for litter at the port of Fnideq (NW Morocco)

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Introduction

As part of the evaluation of sea floor pollution linked to marine litter at Fnideq area, a *Fishing for Litter* campaign was organized at the port of Fnideq on 11 November 2018 with the support of the National Laboratory of Pollution Studies and Monitoring and in collaboration with the Association of Scuba Diving and Environmental Protection *Campeónes Fnideq* and *Al Ahd Aljadid* Association for Development and Artisanal Fisheries.

Materials and methods

Three sites were sampled at 2.5- 3.5 m depth, with the participation of 6 divers and 4 artisanal fishing boats (Figure 1). The length of transects was 100 m, except for site 1 that was 37 m in length because it was limited by the entrance of the port (Cheshire et al., 2009). The methodology applied follows the UNEP / MED guidelines.

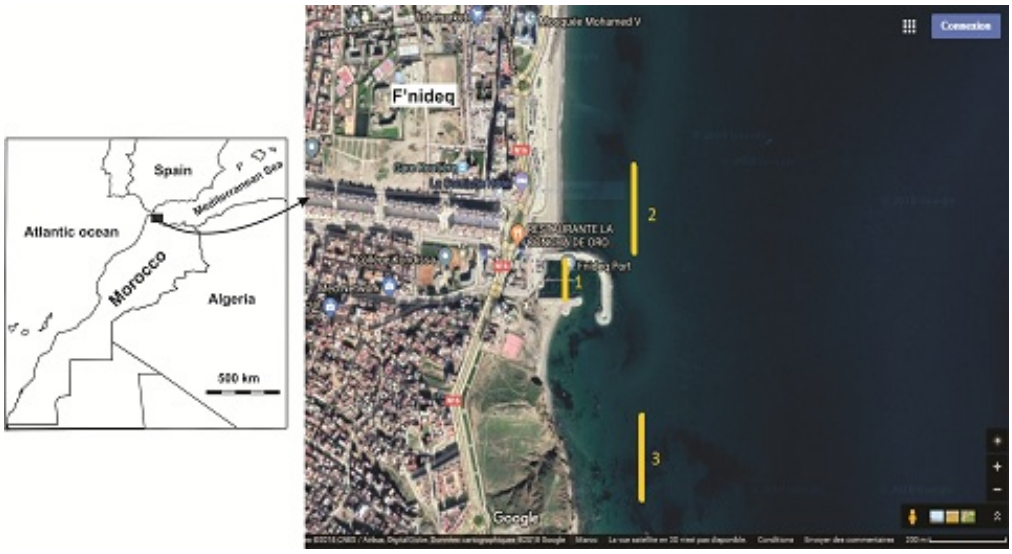

Figure 1: Location of the surveyed sites along the study area

Results and discussion

The results obtained show that in the 3 sites sampled, 881 items were collected with a total weight of 68.94 kg, which represents a density of 0.937 item/m^2 and 0.073 kg/m^2 (Table 1).

Table 1: Litter abundance and densities

Total collected items	Total weight (Kg)	Total of sea floor surface surveyed(m^2)	Items/m^2	Kg/m^2
881	68.943	940	0.977	0.073

25 types of items have been collected and grouped into 7 categories (plastic/polystyrene: 75.37%), cloth/textile (20.20%), metal (2.61%), rubber, paper/cardboard, processed/worked and sanitary waste with 0.45% each). The top 10 debris was represented by plastic bags, clothing/rags. The other categories of debris make up, respectively, 4.2% for plastic bottles, 2.27% for plastic food containers, 1.36% for cans, 1.02% for fishing lines, 0.91% for synthetic ropes and other textiles, 0.6% for metal food cans and 0.5% for plastic caps/lids.

Debris distribution by surveyed site shows that sites 2 and 3 are the most polluted, with 1.005 items/m^2 and 1.003 items/m^2 respectively (Table 2).

Table 2: Litter abundance and densities in surveyed sites

Sites	Total items collected	Total weight (Kg)	Total of surface surveyed (m^2)	Items/m^2	Kg/m^2
Site 1: Port	77	3.180	140	0.55	22.714
Site 2: Oued jdid	403	32.432	400	1.005	81.079
Site 3: Kendissa	401	33.331	400	1.003	83.328

The density of benthic debris at Fnideq is high (0.937 items/m^2) compared to regional data recollected using the same methodology, for the Adriatic and the Ionian Sea (0.028 $\pm$ 0.034 items/m^2, Abu-Hilal and Al-Najjar (2009)). However, much higher values were noted in the Gulf of Alqaba in the Red Sea (2.8 items/m^2, Vlachogianni et al. (2017)). It should also be noted that these density values are higher than those recorded at the Moroccan Mediterranean beaches (0.06 $\pm$ 0.04 items/m^2, Nachite et al. (2018)). The general composition and origin of debris seem to be similar to beach litter, with a preponderance of plastic bags and other debris from land origin (Maziane et al., 2018). Marine debris (31 items), mainly related to fishing activities, does not exceed 3.52% of the total collected items.

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