Final report on research activities about marine litter in the study area

REPORT

Version n. 1

DELIVERABLE D.T1.2.5   December/2019

FINAL RESULTS OF THE RESEARCH ACTIVITIES CONDUCTED IN ITALY

Here we summarize the main results on the data collected during all the six surveys in Italy.

The field surveys were carried out in the following dates:

I survey	28/05/2018	TIME I
II survey	06/11/2018	TIME II
III survey	19/03/2019	TIME III
IV survey	22/05/2019	TIME IV
V survey	09/10/2019	TIME V
VI survey	28/11/2019	TIME VI

Overall, 14712 items were collected and a total amount of 529.81 kg of litter removed from beaches along the Italian coasts of the municipality of Lecce in the beaches of Torre Chianca, Frigole and San Cataldo. In detail, 122.51 kg of marine litter were collected at San Cataldo, 262.46 at Frigole and 144.84 at San Cataldo.

The natural wood estimated on the three beaches during surveys was about 5200 kg in total. In detail, about 1000 at Torre Chianca, about 2000 at Frigole kg and more than 2000 kg at San Cataldo.

The composition of marine litter according their specific material does not allow to separate statically transects monitored on the Municipality of Lecce since they showed a comparable composition both in space and time. These results suggest a strong identity of the dataset on the litter beached on the Italian transects monitored, both considering ITEMS (Figure 1) or WEIGHT (Figure 2). In other terms, the disposition of points in the plots indicates a homogenous composition of marine litter in the three Italian beaches with a light difference visible between Torre Chianca and San Cataldo, on the contrary Frigole shows a marked variability.

The 'artificial polymers' (Figure 3, Figure 4) resulted the most abundant material both in terms of weight (83.06% in total on six surveys) and number of items (95.84%). Contribution of 'Rubber' was 4.07% (weight) and 0.91% (items); 'glass' was 3.54% (weight) and 1.58% (items); 'metals' 1.18% (weight) and 0.89% (items); 'worked wood' 7.16% (weight) and 0.38% (items); 'clothes' 0.79% (weight) and 0.11% (items), 'other' 0.12% (weight) and 0.07% (items).

The top 20 items with their description and code are reported in the Figure 5. They belong all to the group of the 'artificial polymers' with the only exception of the code G125, the rubber balloons. The first 5 are: 'Plastic pieces 2.5 cm > < 50cm' with 4453 items, 'Plastic caps/lids from drinks' 1550 items, 'Cotton bud sticks' 1476 items; 'Polystyrene pieces 2.5 cm > < 50cm' 1039 items; 'Mussels nets' 983 items in total.

The top 20 most abundant categories in terms of weight, with their description and code, are reported in the Figure 6. The heaviest categories recorded were: G49_Rope (diameter more than 1cm), 203 kg; G79_Plastic pieces 2.5 cm > < 50cm, 32,45 kg; G8_Drink bottles >0.5l, 24.95 kg; G68_Fiberglass/fragments, 22,77 kg; G172_Other wood > 50 cm, 16.9 kg.

The highest abundances, both in terms of weight and number of items, were recorded in winter (FIGURE 7, FIGURE 8).
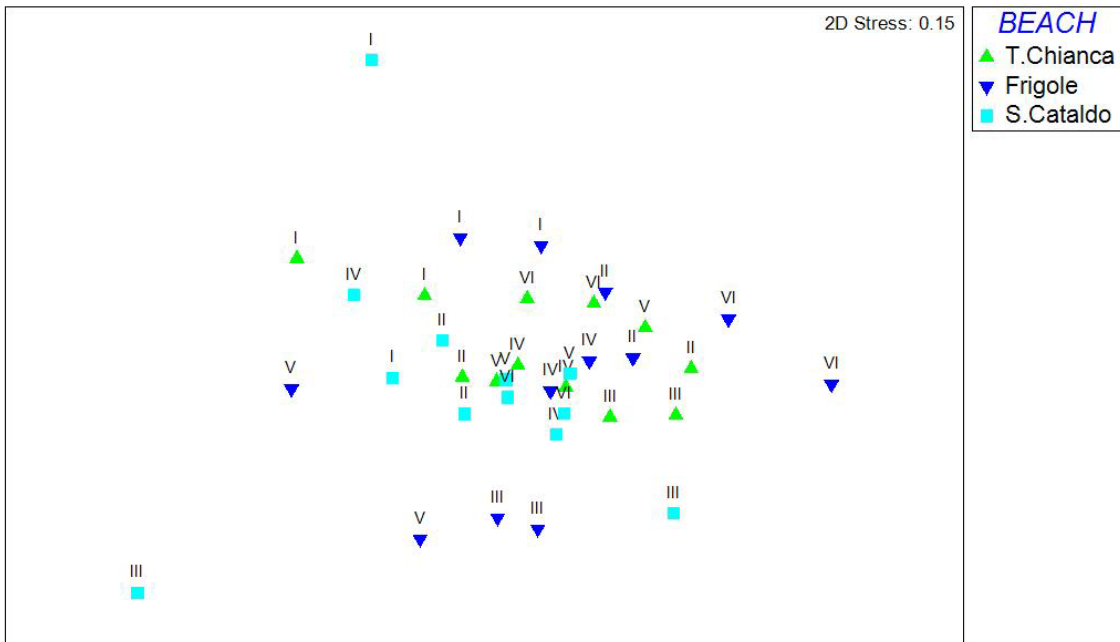

Figure 1 – Plot of nMDS performed on a Bray Curtis similarity matrix not transformed based on the number of ITEMS. I = time 1; II = time 2; III = time 3; IV= time 4; V = time 5; VI = time 6
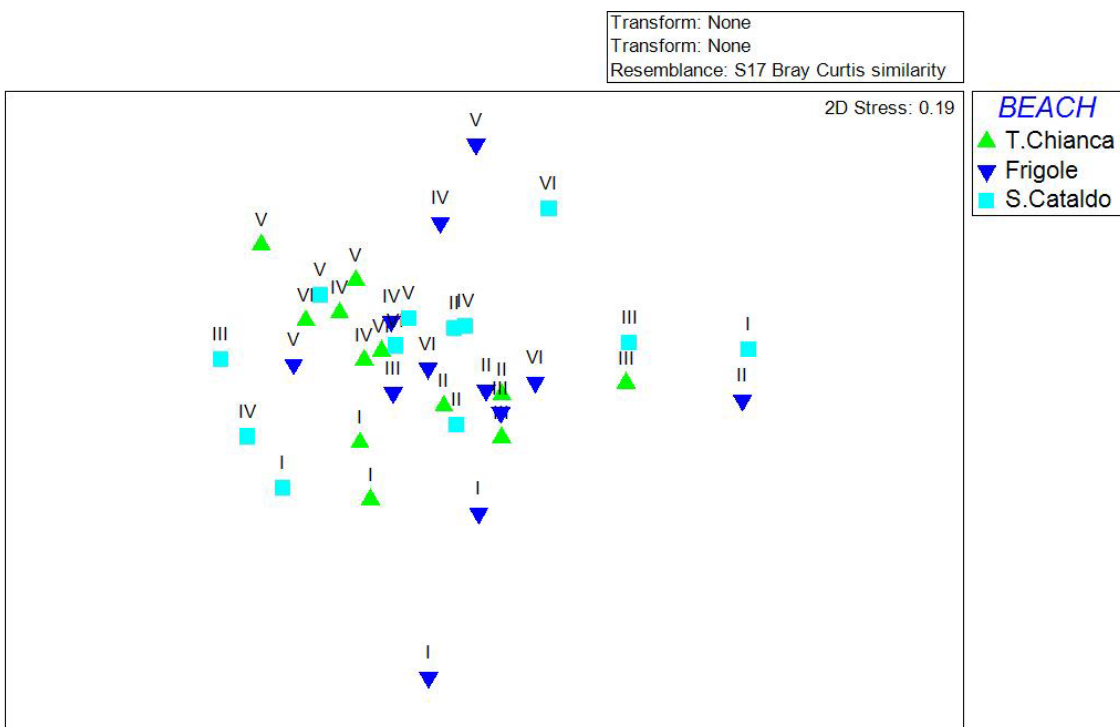

Figure 2 - – Plot of nMDS performed on a Bray Curtis similarity matrix not transformed based on the WEIGHT. I = time 1; II = time 2; III = time 3; IV= time 4; V = time 5; VI = time 6
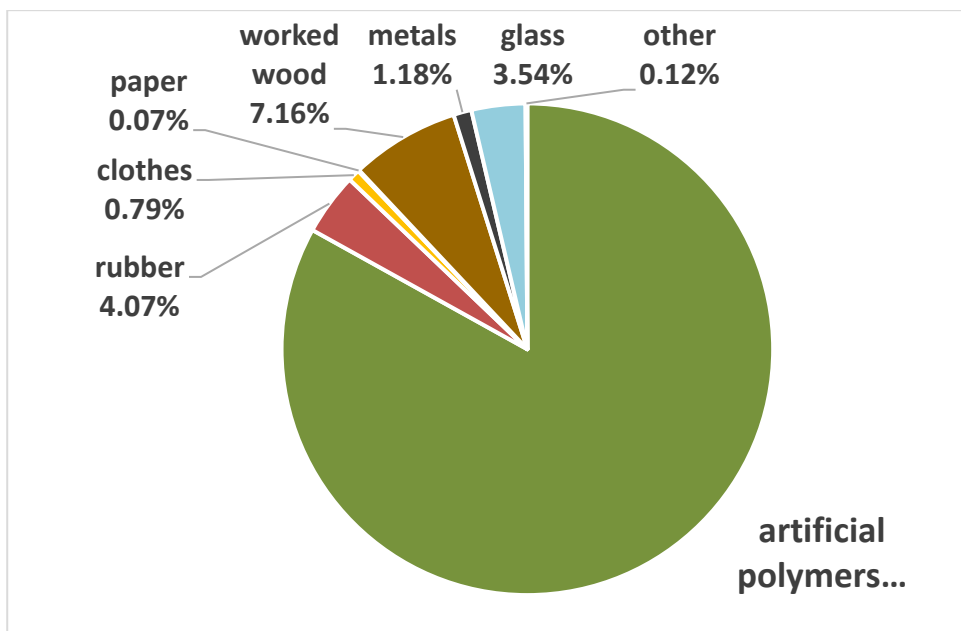
Figure 3 – Composition of marine litter removed in Italy in terms of WEIGHT during all the six surveys
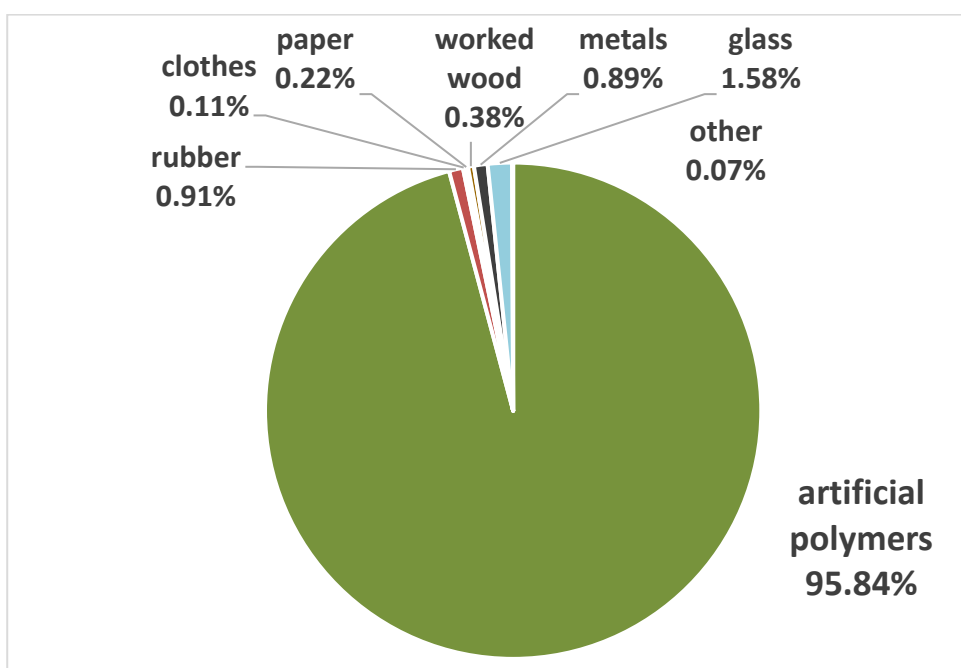

Figure 4 - Composition of marine litter removed in Italy in terms of number of ITEMS during all the six surveys
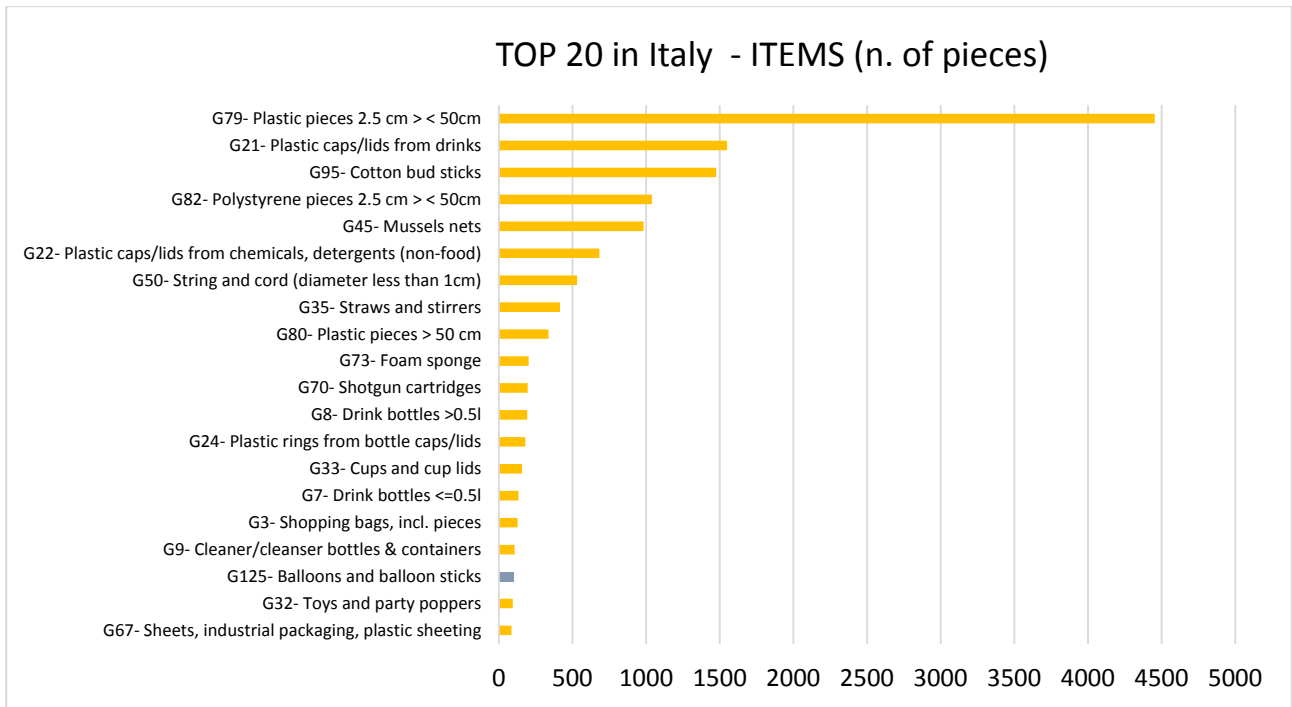
TOP 20 in Italy - ITEMS (n. of pieces)

Item	
G79- Plastic pieces 2.5 cm > < 50cm	
G21- Plastic caps/lids from drinks	
G95- Cotton bud sticks	
G82- Polystyrene pieces 2.5 cm > < 50cm	
G45- Mussels nets	
G22- Plastic caps/lids from chemicals, detergents (non-food)	
G50- String and cord (diameter less than 1cm)	
G35- Straws and stirrers	
G80- Plastic pieces > 50 cm	
G73- Foam sponge	
G70- Shotgun cartridges	
G8- Drink bottles >0.5l	
G24- Plastic rings from bottle caps/lids	
G33- Cups and cup lids	
G7- Drink bottles <=0.5l	
G3- Shopping bags, incl. pieces	
G9- Cleaner/cleanser bottles & containers	
G125- Balloons and balloon sticks	
G32- Toys and party poppers	
G67- Sheets, industrial packaging, plastic sheeting	

Figure 5 – Top 20 items collected during all the six surveys in Italy.

TOP 20 in Italy - WEIGHT (kg)

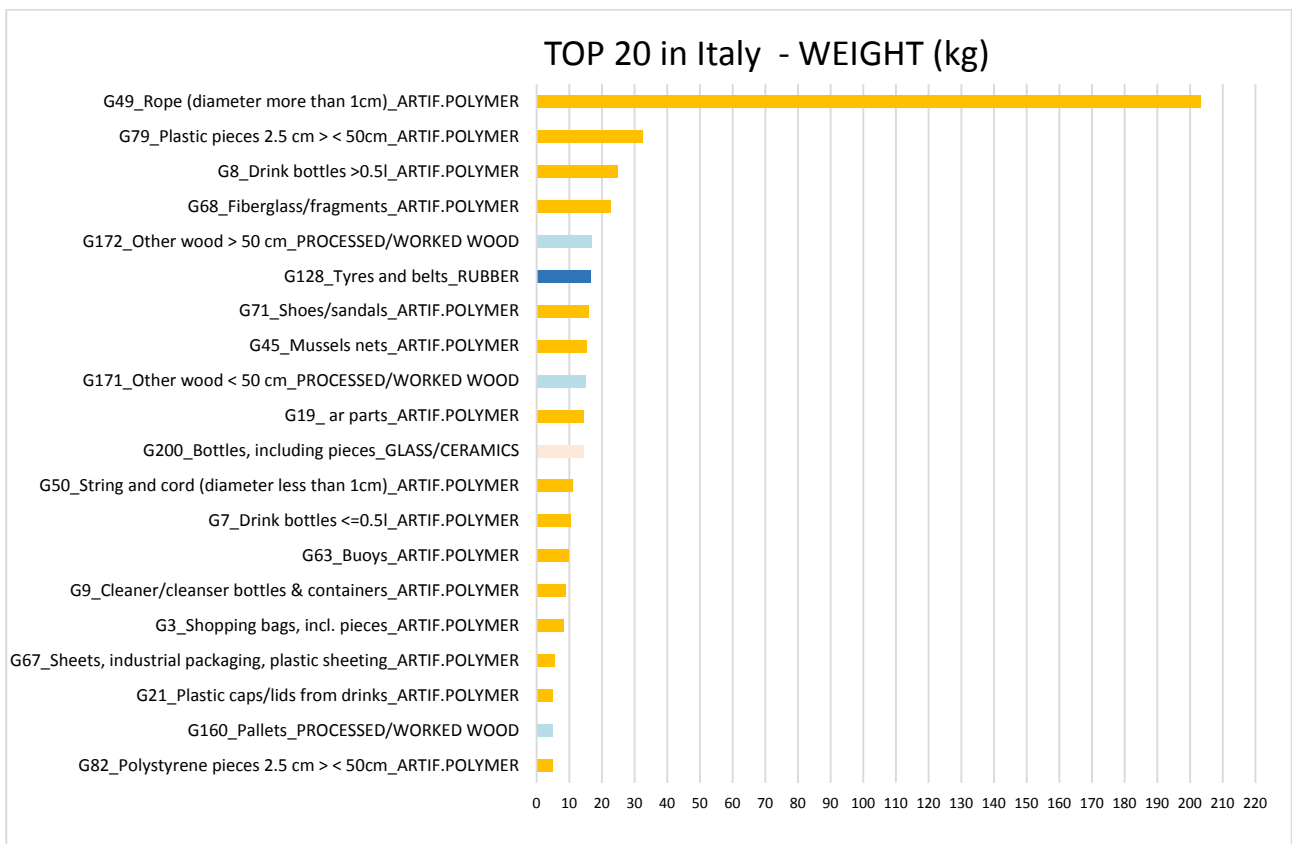| Item	
G49_Rope (diameter more than 1cm)_ARTIF.POLYMER	
G79_Plastic pieces 2.5 cm > < 50cm_ARTIF.POLYMER	
G8_Drink bottles >0.5l_ARTIF.POLYMER	
G68_Fiberglass/fragments_ARTIF.POLYMER	
G172_Other wood > 50 cm_PROCESSED/WORKED WOOD	
G128_Tyres and belts_RUBBER	
G71_Shoes/sandals_ARTIF.POLYMER	
G45_Mussels nets_ARTIF.POLYMER	
G171_Other wood < 50 cm_PROCESSED/WORKED WOOD	
G19_ ar parts_ARTIF.POLYMER	
G200_Bottles, including pieces_GLASS/CERAMICS	
G50_String and cord (diameter less than 1cm)_ARTIF.POLYMER	
G7_Drink bottles <=0.5l_ARTIF.POLYMER	
G63_Buoys_ARTIF.POLYMER	
G9_Cleaner/cleanser bottles & containers_ARTIF.POLYMER	
G3_Shopping bags, incl. pieces_ARTIF.POLYMER	
G67_Sheets, industrial packaging, plastic sheeting_ARTIF.POLYMER	
G21_Plastic caps/lids from drinks_ARTIF.POLYMER	
G160_Pallets_PROCESSED/WORKED WOOD	
G82_Polystyrene pieces 2.5 cm > < 50cm_ARTIF.POLYMER	

Figure 6 - Top 20 categories (in terms of weight) collected during all the six surveys in Italy.
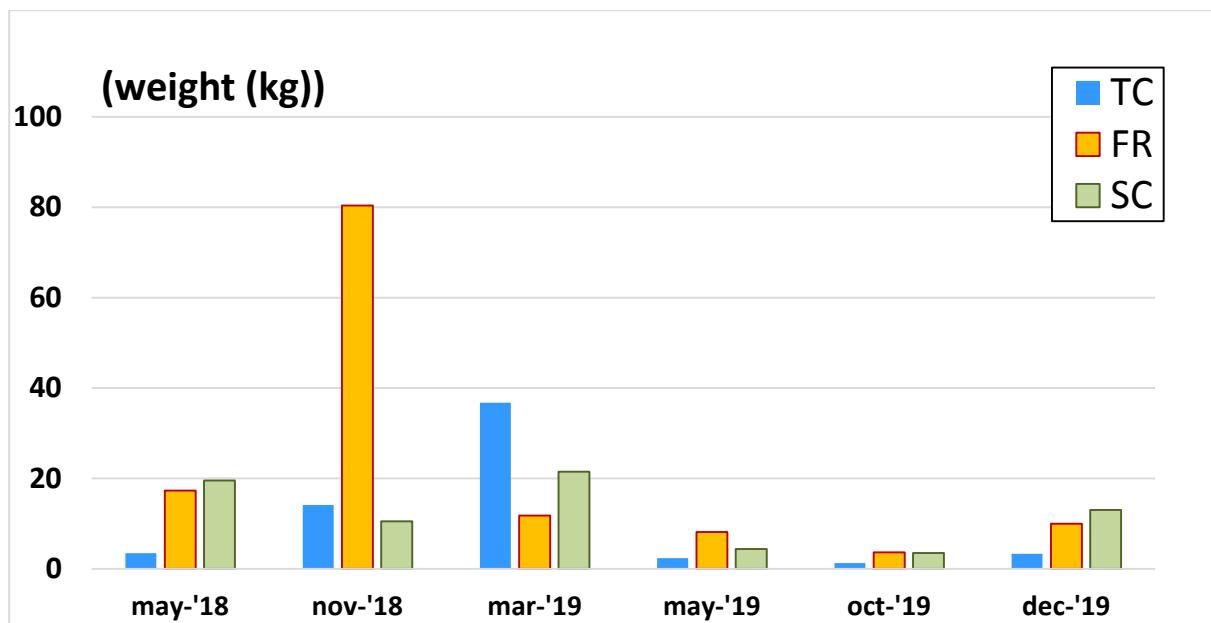
Figure 7 – Marine litter accumulation, in term of weight, measured during the six surveys in Italy. TC= Torre Chianca, FR= Frigole, SC= San Cataldo. Total accumulation: TC= 122.51 kg; FR = 262.45 kg; SC= 144.84 kg
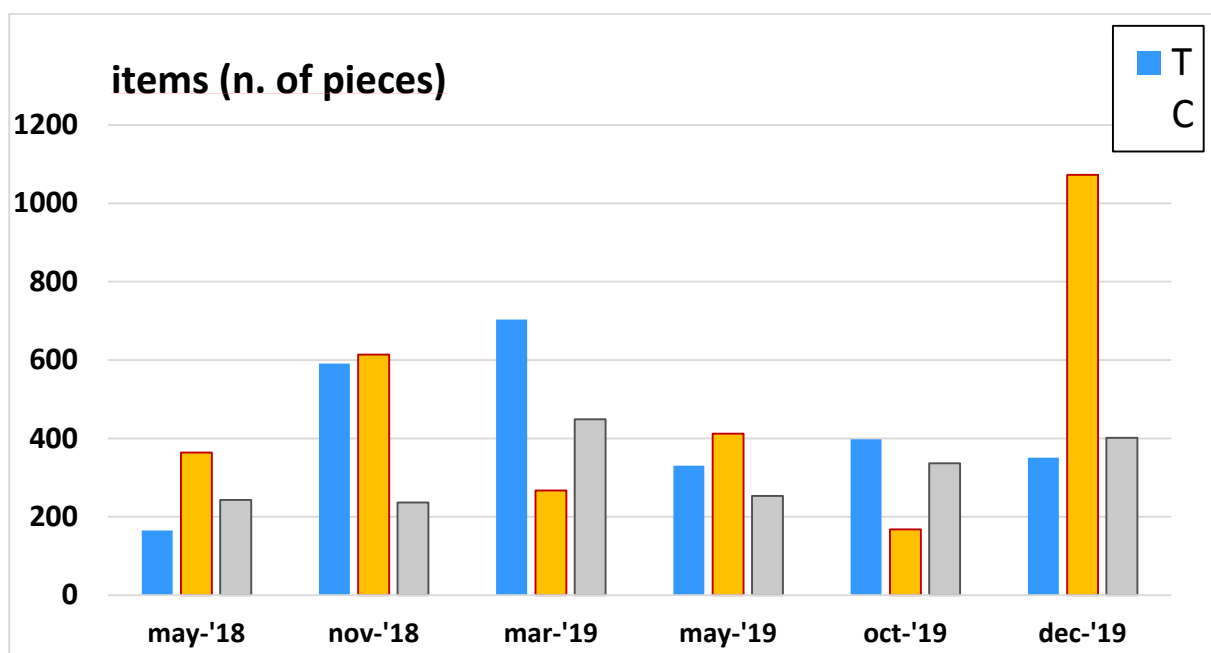

Figure 8 - Marine litter accumulation, in term of number of ITEMS, measured during the six surveys in Italy. TC= Torre Chianca, FR= Frigole, SC= San Cataldo. Total accumulation: TC= 5078 pcs; FR = 5795 pcs; SC= 3839 pcs

Project Partners

N°	Participant name	Short name	Country
LP	National Interuniversity Consortium for Marine Sciences	CoNISMa	Italy
PP2	Municipality of Lecce	ML	Italy
PP3	National Coastal Agency	NCA	Albania
PP4	Polytechnic University of Tirana	F.GJ.M.	Albania
PP5	Public enterprise for coastal zone management of Montenegro	JMDCG	Montenegro
PP6	University of Montenegro	UNIME	Montenegro