

# Assessment of litter ingestion by loggerhead sea turtles (*Caretta caretta*) in the Mediterranean Sea, an INDICIT outcome

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QR Code 1 (EU MSFD)

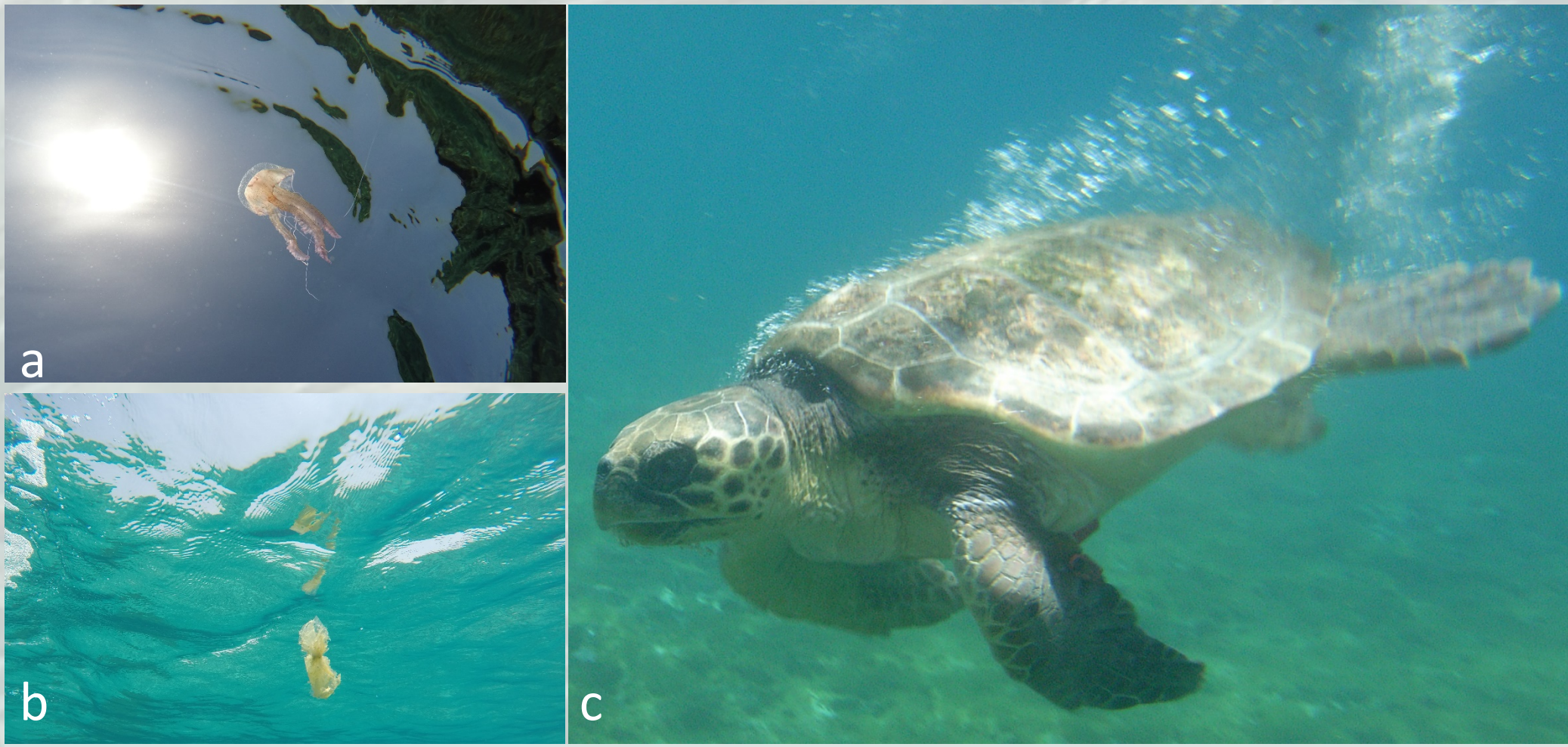
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QR Code 2 (INDICIT)

## Introduction

Marine anthropogenic litter is considered a pollutant that affects marine environments causing harm to marine fauna and particularly to sea turtles. The European Commission issued the 2008/56/EC Marine Strategy Framework Directive (MSFD) (QR Code 1) with the objective of achieving the Good Environmental Status (GES)



A Jellyfish (*Pelagia noctiluca*) a) and a sheet plastic item b) floating in the water column; a loggerhead sea turtle c) after a release in Sardinian waters

The loggerhead sea turtle (*Caretta caretta*, Linnaeus 1758) was selected as indicator of the amount and composition of litter ingested by marine animals. The present study contributes to the development of a definition of the GES for “Trends in the amount and composition of litter ingested by marine animals”

The project INDICIT (QR Code 2) collected standard data to monitor litter ingestion by alive and dead sea turtles in both the Mediterranean and in the North-Eastern Atlantic through a standard protocol (QR Code 3) established by the consortium and an advisory board (representatives of national authorities) with the partnership of the stakeholders (e.g. rescue centres and stranding networks). The protocol can be requested to: marco.matiddi@isprambiente.it or coordination@indicit-europa.eu



QR Code 3 (Protocol)



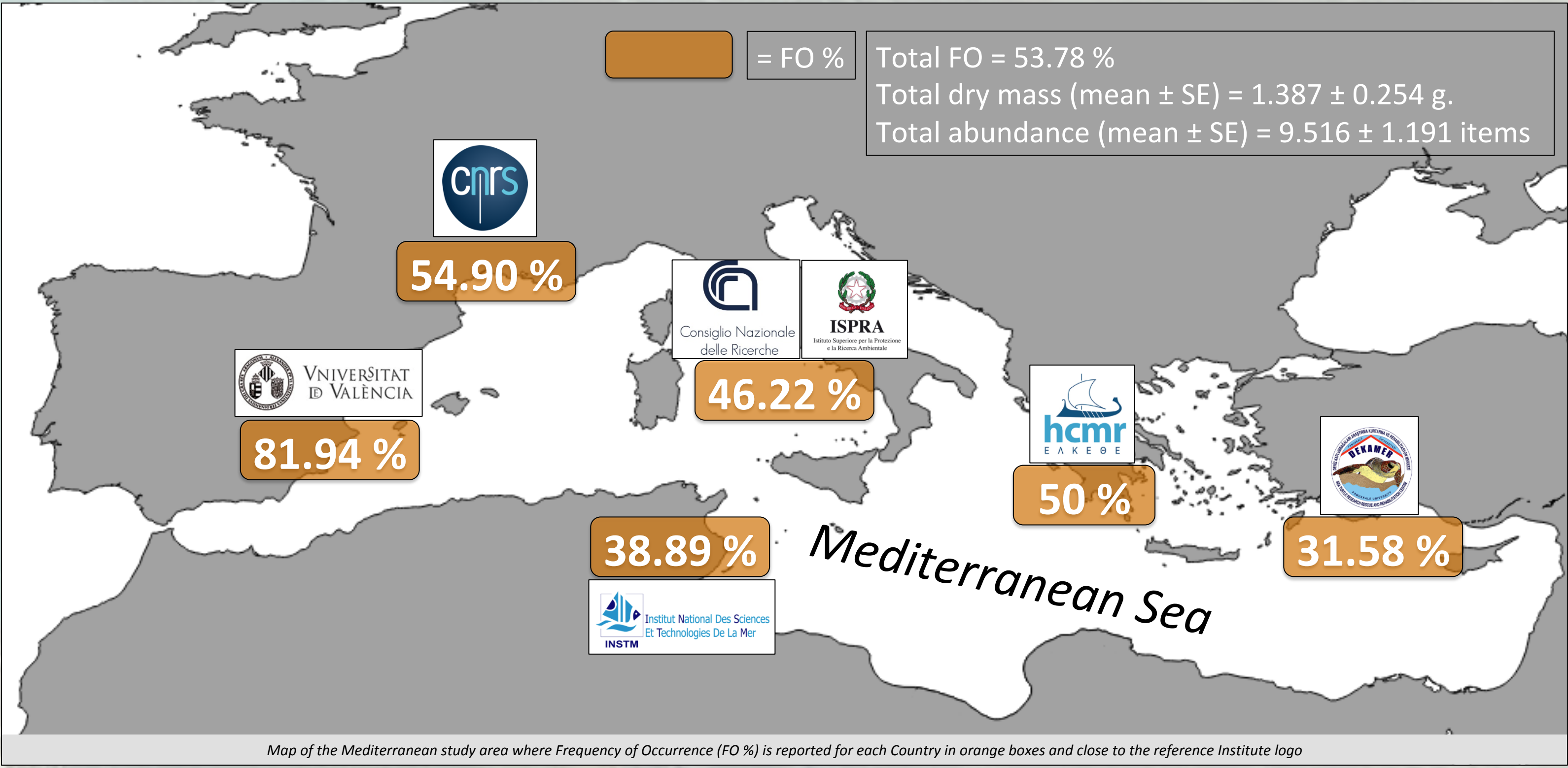
Partners of the INDICIT consortium during the 4th meeting in Sao Miguel (Azores)

## Materials and Methods & Results

From 2000 to 2018, a total of 688 loggerhead turtles were collected. Of these, 239 individuals were found alive, while 449 individuals were dead



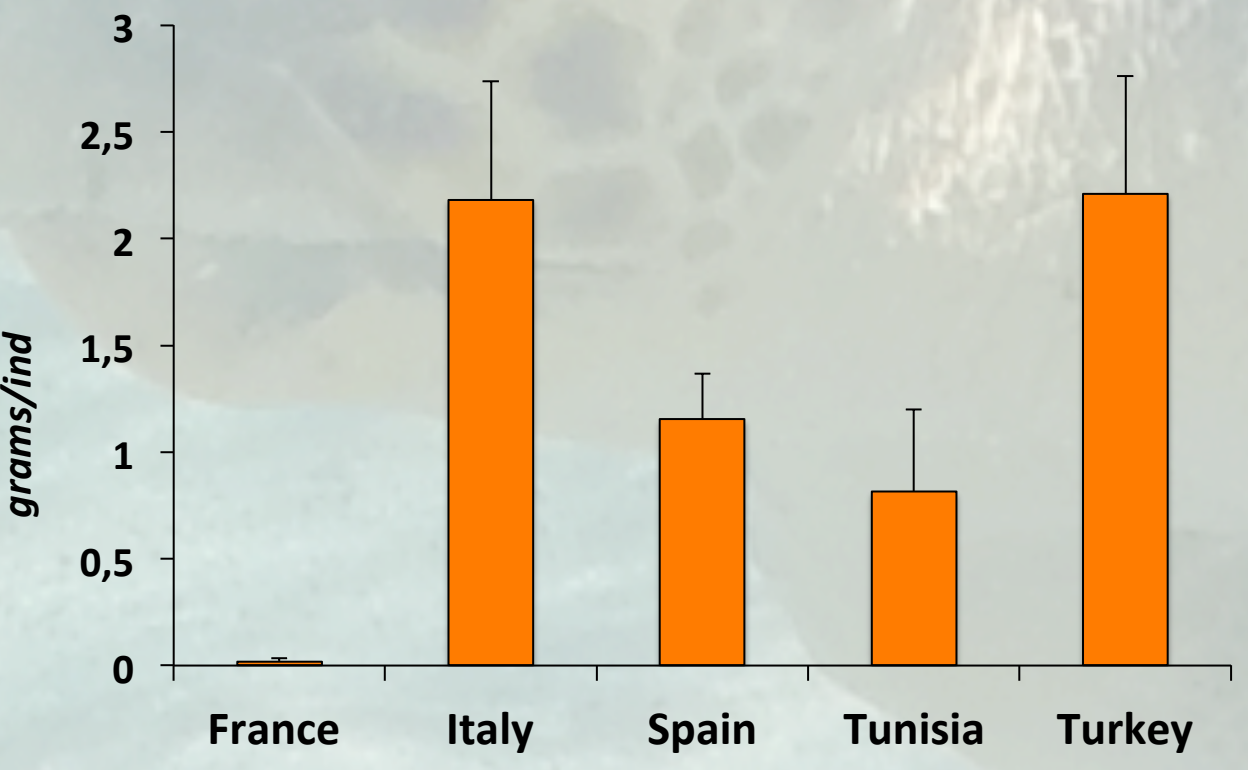
Loggerhead turtle expelling ingested litter at a rescue centre



Anthropogenic items collected in the turtles gut were subdivided into three main categories: 1. “IND-Industrial plastic”, 2. “USE-User plastic” and 3. “Other non plastic-litter” and 7 subcategories



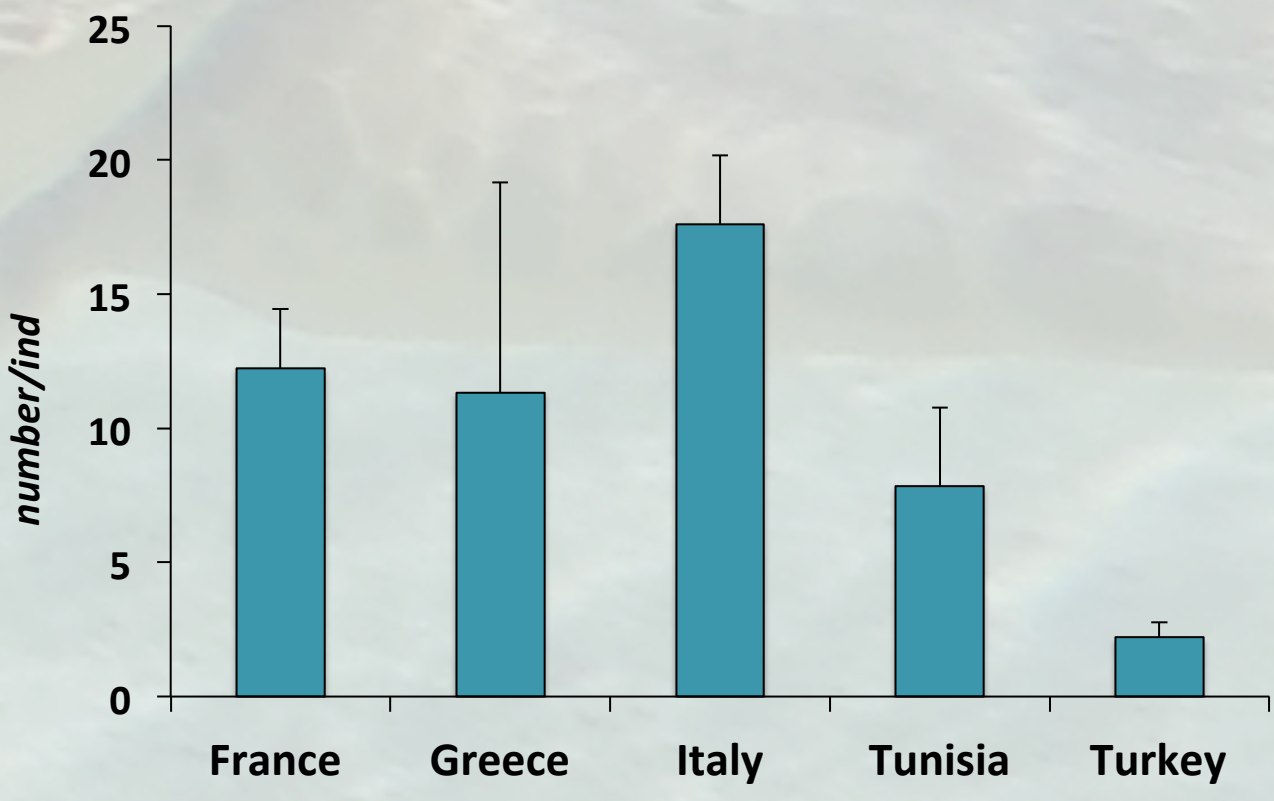
Samples of litter to be analysed excreted from a loggerhead turtle



Litter dry mass reported as mean ± SE for each Mediterranean study area

	N° Samples <i>C. caretta</i>			N° interactions with litter		FO %
	Total	Alive	Dead	Yes	No	
France	102	53	49	56	46	54.90
Tunisia	18	14	4	7	11	38.89
Spain	155	0	155	127	28	81.94
Greece	6	0	6	3	3	50.00
Turkey	76	8	68	24	52	31.58
Italy	331	164	167	153	178	46.22
TOTAL	688	239	449	370	318	53.78

Table reporting the data analysed and Frequency of Occurrence (FO %) for Mediterranean study area and for each Country



Litter abundance reported as mean ± SE for each Mediterranean study area

## Discussion and conclusions

These results are critical to confirm *Caretta caretta* as a target indicator species for monitoring the impact of marine litter on biota. Ongoing analyses will help in determining the best criteria to obtain GES values according to the following scenarios which have been targeted by the INDICIT consortium:

- 1<sup>st</sup> Scenario:** “There should be less than X% of loggerheads having Y g or more plastic in the stomach in samples of 50 stranded loggerheads from each sub-region”, where Y is the average value of plastic ingested and X% the percentage of sea turtles with more grams of plastics than Y;
- 2<sup>nd</sup> Scenario:** “There should be less than X% of loggerheads having more plastic grams than food remains (Foo) in the stomach in samples of 50-100 stranded loggerheads from each sub-region”, where there is no fixed value. Plastic grams are compared with food remain for each loggerhead

Mediterranean facing countries, involved in the MSFD and the Barcelona Convention process, are invited to join the network and participate in the collection of data using a harmonised approach

Special thanks to: Vigilance bodies, Coast Guard, fishermen, volunteers and citizens for their commitment in signalling and helping the recovery of dead and live turtles as well as rescue centres, stranding networks and other stakeholders collaborating in the project