

ARENAS BLANCAS BEACH (EL HIERRO, CANARY ISLANDS, SPAIN): A NEW HOT SPOT OF MICROPLASTIC DEBRIS?

INTRODUCTION

El Hierro is the southern and westernmost of the Canary Islands (Spain). With a population under 11,000 inhabitants during 2019¹ and with the absence of industries, it is the first of the islands to cover more than half of its energetical needs through renewable energy. However, all these relevant issues do not make the island immune to the microplastic problem. In the Canary Islands, the presence of microplastics has already been studied in Tenerife, Gran Canaria, Fuerteventura, Lanzarote and La Graciosa since 2014^{2,3}; however, until now there are no studies of the arrival of plastic litter to the most occidental islands of La Palma, La Gomera or El Hierro.

The present work has studied the incidence and type of microplastics (1-5 mm) and mesoplastics (5-25 mm) that have reached Arenas Blancas beach, located in the northwest coast of El Hierro island (with northeast orientation), from October 2019 to March 2020 (10 sampling dates with 3 sampling points each). The amount of microplastic debris that arrive to the beach is comparable to those of the most contaminated of the archipelago. Moreover, the abundance of pellets found repeatedly during the samplings shows that this contamination does not come from the island or those nearby as a result of the lack of this type of industry.

EXPERIMENTAL

SAMPLED BEACH

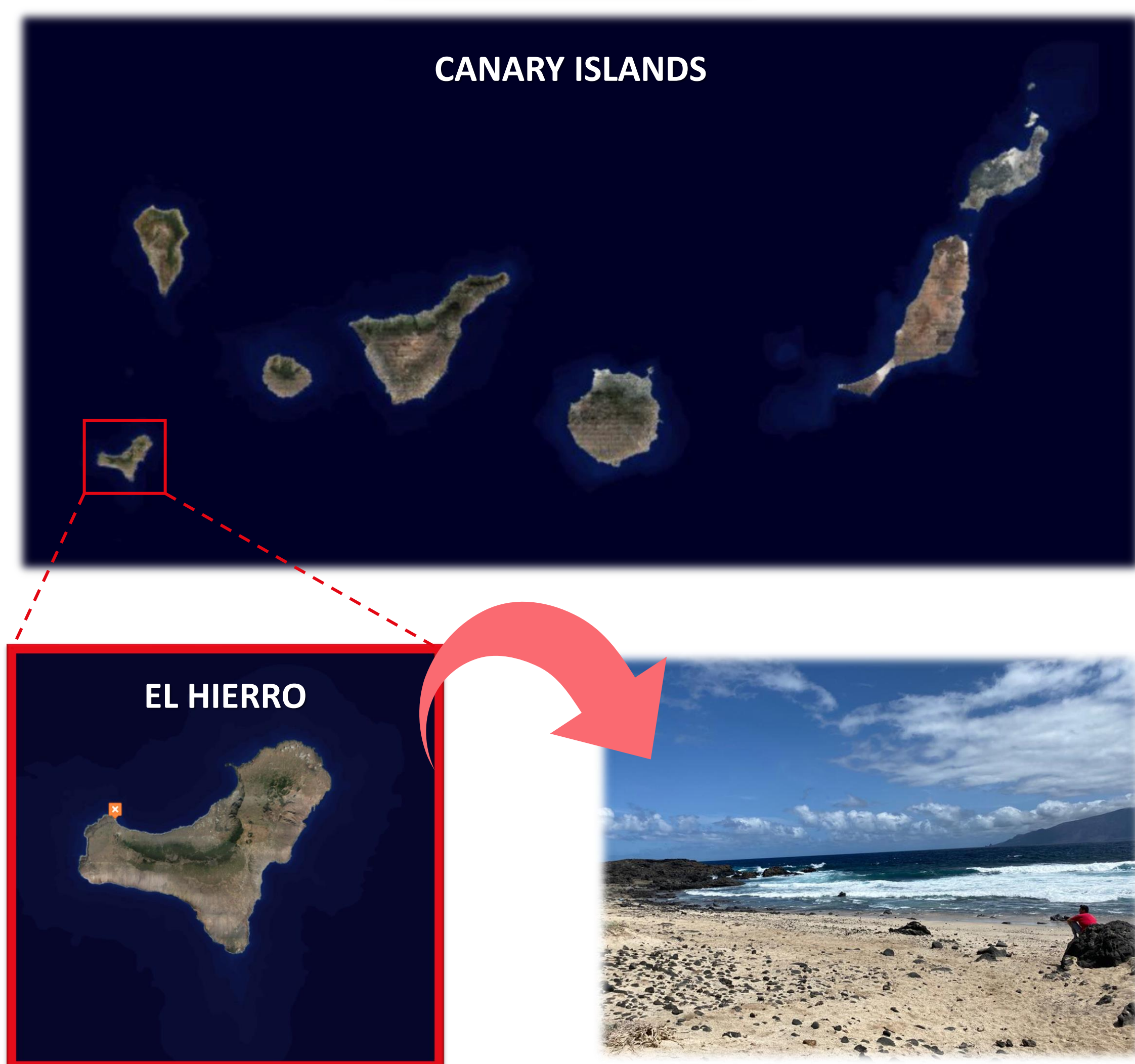
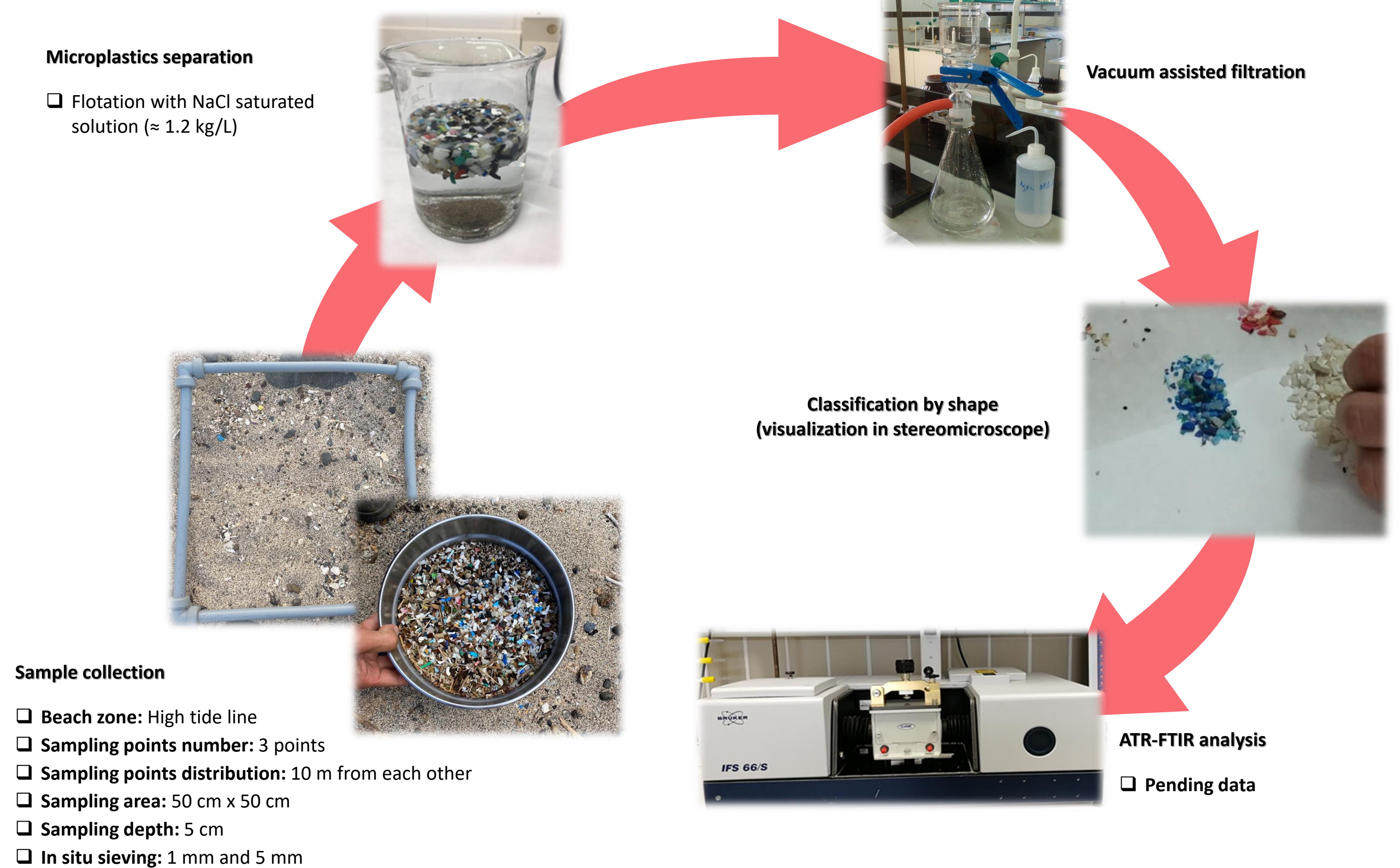


Fig. 1. Location of the El Hierro island and of Arenas Blancas beach.

MICROPLASTICS ANALYSIS



RESULTS AND DISCUSSION

Table 1. Concentration of plastic particles found in Arenas Blancas.

Sampling date	Total items/m ²
30 th October 2019	1968
16 th November 2019	2496
2 nd December 2019	3656
17 th December 2019	2288
2 nd January 2020	2800
15 th January 2020	2312
31 st January 2020	2756
17 th February 2020	2540
2 nd March 2020	4128
13 th March 2020	156
20 th April 2020	1644
30 th April 2020	1328
15 th May 2020	6796
30 th May 2020	1160
Average	2573

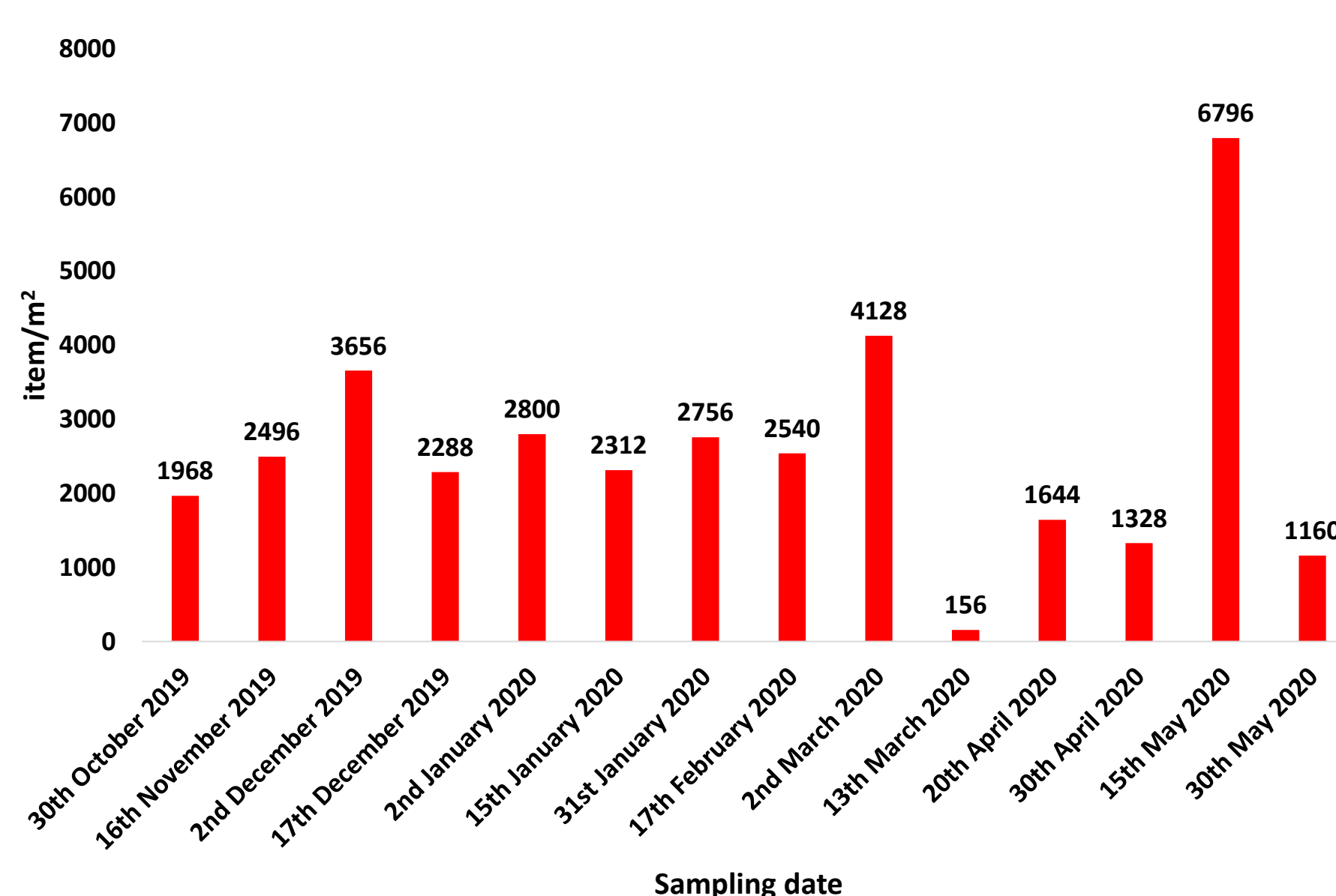
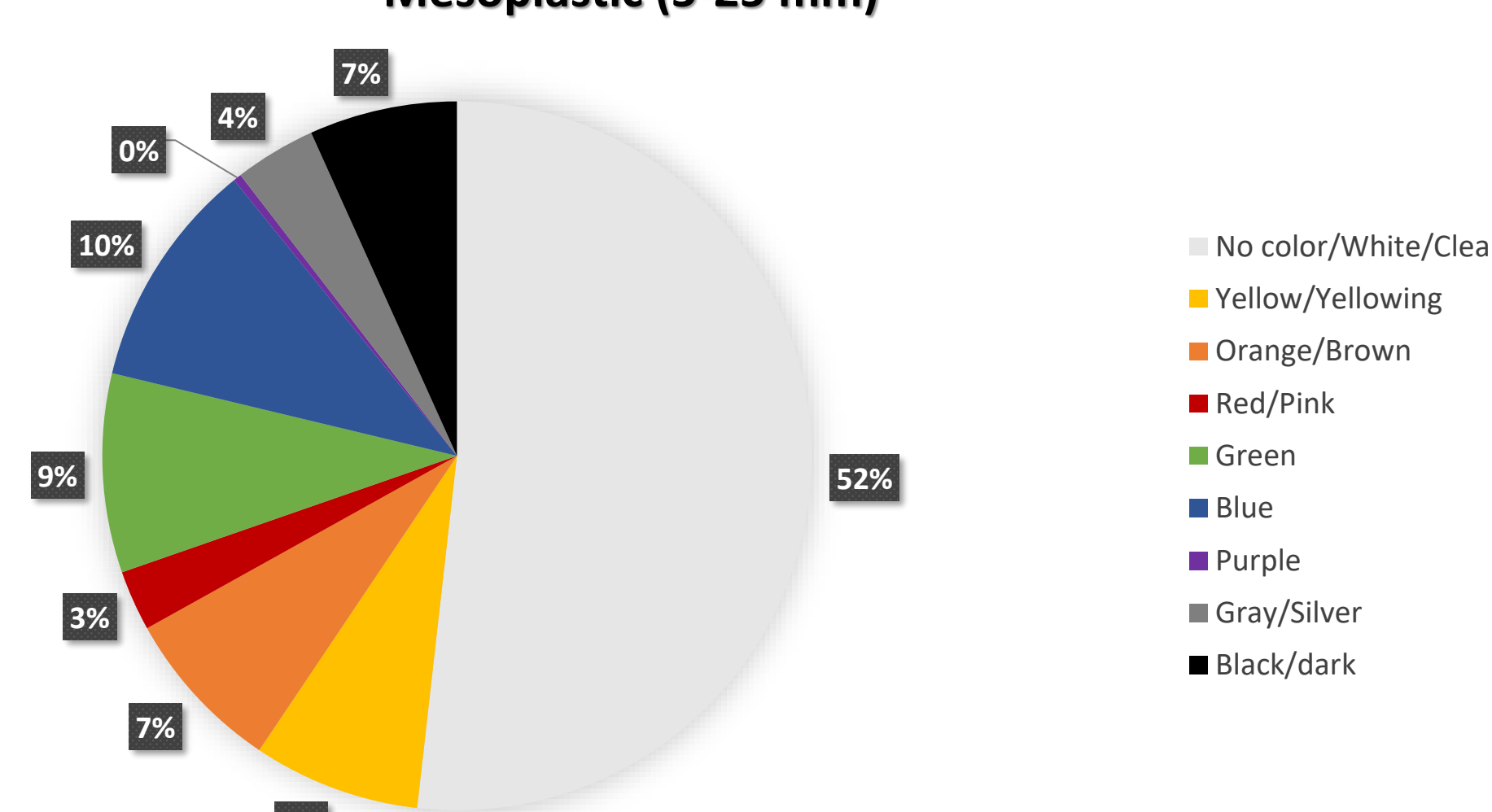


Fig. 2. Concentration of plastic particles found in Arenas Blancas.

Mesoplastic (5-25 mm)



Microplastic (1-5 mm)

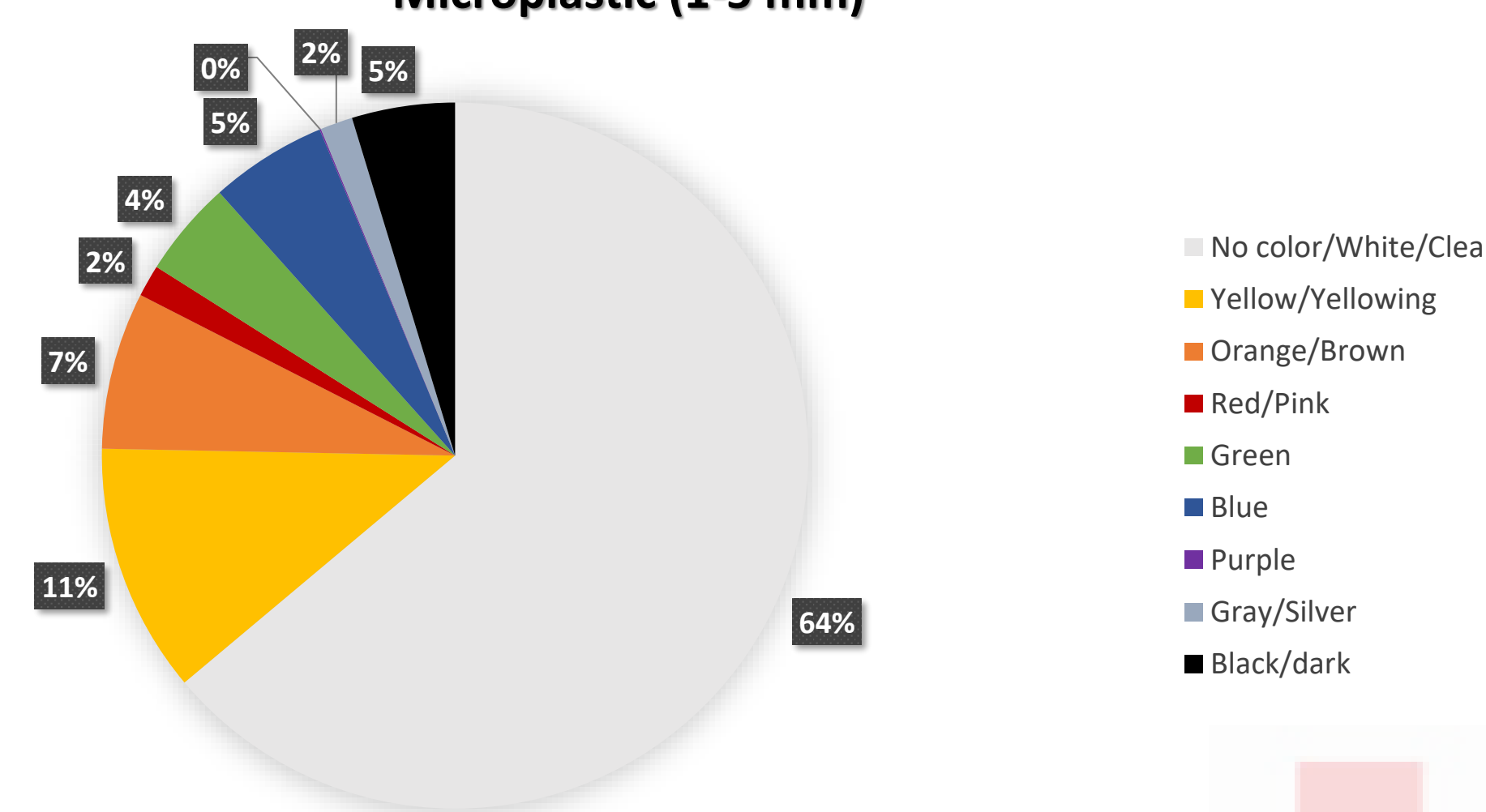
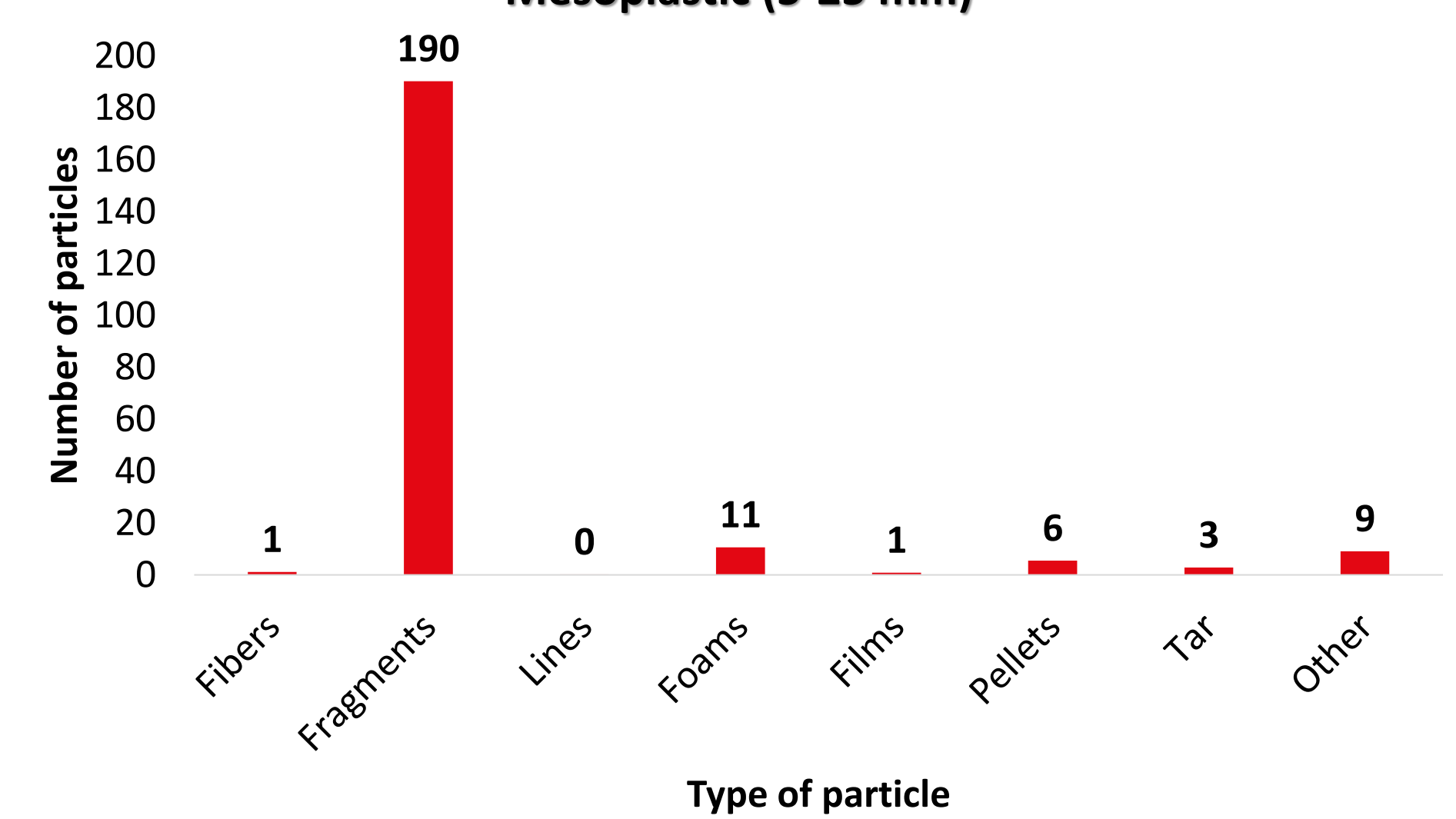


Fig. 3. Colour distribution of plastic particles found in Arenas Blancas.

Mesoplastic (5-25 mm)



Microplastic (1-5 mm)

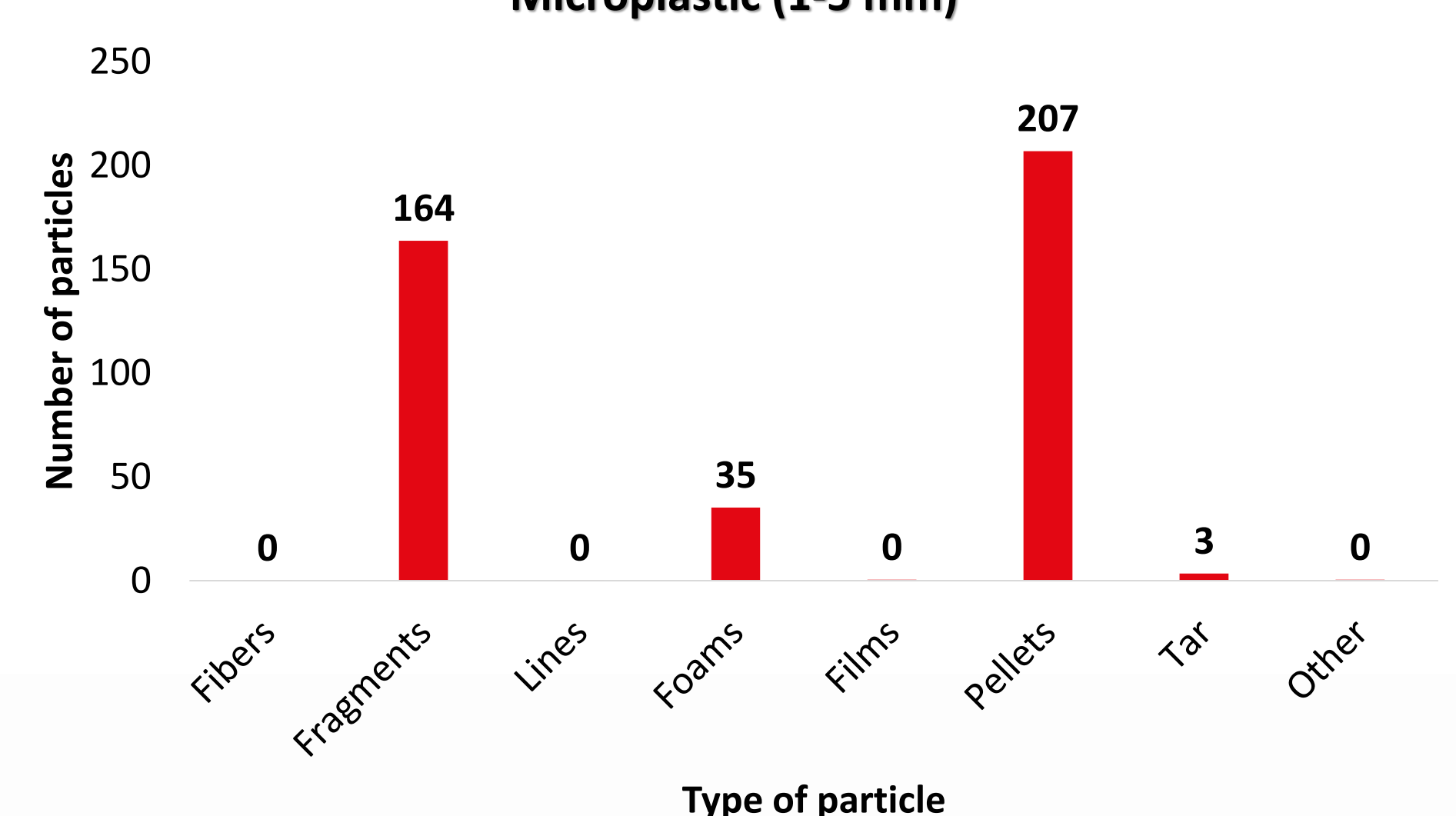


Fig. 4. Morphological classification data of plastic particles found in Arenas Blancas.

CONCLUSIONS

- The sampling of Arenas Blancas beach revealed a mean concentration of 2573 items/m² of meso and microplastics during October 2019-May 2020, which is comparable to those of the most contaminated beaches in the Canary Islands, warning about a possible new hotspot of massive arrival of plastic particles.
- Most plastic particles found showed light and transparent colours (52 % of mesoplastics and 64 % of microplastics), followed by yellow microplastics (11 %) and blue mesoplastics (10 %).
- Most mesoplastics were fragments, while the most abundant microplastics were pellets followed by fragments, which suggests that this contamination does not come from El Hierro island.
- IR analyses are being currently developed in order to determine the composition of the plastic particles found in Arenas Blancas beach.

REFERENCES

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