

RESEARCH ARTICLE

(Open Access)**The Pollution of the Coastline of Durres by Macro-Plastics**ENKELEJDA BUDA^{1*}, JERINA KOLITARI², NADJANA CORO³, RIGERS BAKIU⁴, EMOND HALA⁵, ELVIS KAMBERI⁶, EDLIRA SADIKU⁷^{1*}Laboratory of Aquaculture and Fisheries ,Faculty of Agriculture and Environment, Department of Aquaculture and Fisheries Management, Agricultural University of Tirana, Durres city, Albania² Laboratory of Aquaculture and Fisheries ,Faculty of Agriculture and Environment, Department of Aquaculture and Fisheries Management, Agricultural University of Tirana, Durres city, Albania³ Department of Aquaculture and Fisheries Management, Faculty of Agriculture and Environment, Agricultural University of Tirana, Koder-Kamez Tirana, Albania⁴ Department of Aquaculture and Fisheries Management, Faculty of Agriculture and Environment, Agricultural University of Tirana, Koder-Kamez Tirana, Albania⁵ Department of Aquaculture and Fisheries Management, Faculty of Agriculture and Environment, Agricultural University of Tirana, Koder-Kamez Tirana, Albania⁶ Department of Aquaculture and Fisheries Management, Faculty of Agriculture and Environment, Agricultural University of Tirana, Koder-Kamez Tirana, Albania⁷ Department of Aquaculture and Fisheries Management, Faculty of Agriculture and Environment, Agricultural University of Tirana, Koder-Kamez Tirana, Albania**Abstract**

The plastic products are slowly to degrade and their degradation requires many years .The plastic pollution is divided in macro-plastic debris and micro-plastic-debris. The plastic pollution impose at the human corps the lower function of thyroid hormone and sex hormones. They can cause dermatitis once they are in contact with the human skin. In some plastic products some toxic chemicals have been used as additives in plastic compound. The aim of this study is to estimate the quality of Durres coastline using CCI valuation .The Methods used is the same with in project ; “De fish Gear”. Thus, the classification for plastic pollution of the coastal area of Durres is completed thanks to the collection of plastic in them. This research shows how is contaminated with plastic pollution are part of the coastal area of Durres in Albania. The sapling was done in two different points along the cost of Durres: the first sampling was done in Plepa beach meanwhile the second one was done in Ishmi beach. The results show that the pollution in Ishmi area is higher compared to Plepa beach. This study suggest that there is a need to raise the public awareness of Government, NGOs, scientists etc., to reduce as much as possible the use of plastic products.

Keywords: micro-plastics debris , macro-plastics debris, plastic pellets.**1.Introduction**

Quiet, slowly silently and a lot of toxicity the plastic pollution take worst environment dead-end. The many specification of plastic pollution are very slowly degradation. A plastic foam cup will degrade nearby 50 years into marine waters. A plastic beverage holder will take 400 years to degrade, and Fishing line will take 600 years to degrade [3]. The plastic pollution is divided primary and secondary degree. The primary degree are natural manner for example: cigarette buds

and filters, small plastic bottles, cups etc. Secondary degree takes with degradation of primary plastics pollution. The plastic debris kills an estimated 100,000 marine mammals annually, as well as millions of birds and fishes. The small pieces found into the tissues of animals and respiration apparatus [3].Marine pollution, is estimated that land-based sources account for up to 80 percent of the world’s marine pollution, 60 to 95 percent of the waste being

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plastics debris [3]. The Mediterranean is considered the sixth greatest accumulation zone for marine litter: this sea holds only 1% of the world's waters, but the seas with the highest levels of plastic pollution in the world [8]. The purpose of this study is to determine the pollution of the coastal area of Durres, Albania

2. Material and Methods

This study was conducted following the De Fish Gear methodology. The methodology has been prepared based on EU MSFD TG10 "Guidance on Monitoring of Marine litter in European Seas (2013), the OSPAR Maritime Area (2010) [5] and the NOAA "Marine Debris Monitoring and Assessment: Recommendation of Monitoring Debris Trends in Marine Environment (2013), and the draft "UNEP/MAP MEDPOL Monitoring Guidance Document on Ecological objective 10: Marine Litter (2014)" [6]. One sampling unit will be used: 100 meter stretch from strandline to

concentrates 7% of all global micro-plastics [8]. The Mediterranean Sea, cradle of civilization and centre of extraordinary environmental heritage, is today one of from macro-plastics. This study was performed during summer and autumn 2020 with the aim of evaluating the level of pollution in the coastal area of Durres.

the back of the beach [7]. Two sections of a 100 meter stretch and 10 meter widths on the same beach are monitored in order to identify the start and end point of each sampling unit, permanent reference points are used and coordinates, are obtained by GPS [7]. The selected beaches were located in the vicinity of ports, river mouths, coastal urban areas, tourism destinations; and in relatively remote areas. The survey period was conducted in: July 2020 and September 2020. There are no upper size limits to litter recorded on beaches. Litter items with a lower limit of 2,5 cm in the longest dimension will be monitored.

Table 1. The Sampling area in Plepa, Durres

The Sampling	Sampling area	Date of survey	GPS coordinates
Macro-plastic	Plepa, Durres	02/07/2020	N41°19'36"N41°17'05" E19°25'58"E19°30'58"
Macro-plastic	Plepa, Durres	01/09/2020	N41°19'36"N41°17'05" E19°25'58"E19°30'58"

Table 2. The date of survey in Plepa, Durres

Nr.	Sampling area	Date of survey	Items number
1.	Plepa, Durres	02/07/2020	603
2.	Plepa, Durres	01/09/2020	536

The Clean coast index (CCI) is a classification form, we can see the cleanness or dirtiness are our beaches with macro-plastic pollution, and the first time is used

by Ronen Alkalay [1] and was successful in "Clean Coast" Coastal Management at Mediterranean Sea, in Israel -2007 years.

Table 3. The sampling area in Ishmi coast

The Sampling	Sampling area	Date of survey	GPS coordinates
Macro-plastic	Ishmi, Durres	15/07/2020	N41°32'43"N19°36'00" E19°36'00"E19°30'58"
Macro-plastic	Ishmi, Durres	03/09/2020	N41°19'36"N41°17'05" E19°25'58"E19°30'58"

Table 4. The date of survey in Ishmi coast

Nr.	Sampling area	Date of survey	Items number
1.	Ishmi, Durres	15/07/2020	2976
2.	Ishmi, Durres	03/09/2020	3098

The macro-plastics found during our samplings in Durres coastline are: Plastic caps, drink bottles, plastic nets ,cleaner bottles,balloons,cigarette butts, jerry cans, mesh vegetable bags,foam sponge, plastic pieces 0-2,5 cm, pens, toys and party poppers, polystyrene pieces 2,5> < 50 cm, shoes, sandals,other cosmetic bottles,plastic flower pots etc. The calculation of the CCI is presented in the equation:

$$\frac{\text{Total plastic part no. in Z lines}}{Z \times 2[\text{m}] \times \text{beach width} [\text{m}]} = \text{Parts} / \text{m}^2$$

The evaluation is :0–0.1 parts/m² -very clean-no litter is seen ; 0.1–0.25 parts/m² –clean-no litter is seen over a large area0.25–0.5 parts/m² –moderate-a few pieces of litter can be detected; 0.5–1 parts/m² -a lot of waste on the shore; More than 1 part/m² -extremely dirty-most of the shore is covered with plastic debris. K=20 insert into equation and the values CCI are as follows: According to the CCI scale: values from 0 to 2 indicate very clean beaches, 2-5 clean, 5-10 moderately clean, 10-20 dirty and > 20 extremely dirty.[1],[7].

3. Results and Discussion

The valuation of plastic parts /m²= 0,30 and CCI = 6,3 in 02 July 2020 and the valuation of plastic parts /m²= 0,26 and CCI = 5,36 in 01 September 2020 in Plepa beach . For Ishmi area the results are as follows : the valuation of plastic parts /m²= 1,48, CCI =29,76 ,for the period of time in 15 July 2020 and the valuation of plastic parts /m²= 1,54 ,CCI= 30,98 in 03 September 2020.We are carried out the results in Plepa and Ishmi coastline in Durres . Our study was carried out in two different areas along Durres coast: in Plepa and Ishmi area. The level of pollution in Plepa can be considered as moderate meanwhile Ishmi area is classified as very dirty with a lot of plastic items distributed all over the beach area. The results in neighboring countries in 2016 are : Croatia the average abundance of litter is : 2,9 parts/m², or 2914 items/100 stretch; Slovenia is: 0,50 parts/m² or 494,9 items/100 m stretch; in Montenegro with 0.37

items/m² (374.2 items/100 m stretch). For the beaches in Italy, Greece and Albania the following averages were calculated: 0.28 items/ m² (280 items/100 m stretch); 0,24 items/m² (201 items/100 m stretch) and(Albania)0.22 items/m² (219 items/100 m stretch).This average is calculated for Plepa,(Durres) is: 0,30 items/m² and CCI =5,9 (moderately) and for Lezhe, Shengjin coastline the results indicate the beaches are very clean[7].In this study, our results are different from the other study for Albania in 2016, because the measuring of sampling is different in period of time, and in different Albanian areas. Only Plepa area is the same for the two studies. The Results are the same for 2016 and 2020 in Plepa (Durres) you can see in the pollution scale. The results in 2020 for Plepa beach classified as moderate was urban area . The Ishmi beach classified as extremely dirty, because was semi-rural area and located close to a river outflow.

4. Conclusions

The present study, shows that for this period of time in Durres area , (Plepa , Ishmi beach) , the samples indicate: that this area the value of the cleanness is moderate (Plepa) and very dirty (Ishmi) with concentration of plastic pollution. Comparison between the results of the present study with the other study is not easy because this study is focused only Durres area, part of Albanian coastline. We suggest that to reorganize the fertilizer and processing Industry and the highest priority should be given to plastic processing and recycling in our country. We propose that the Albanian law on Integrated Waste Management should be fixed. Waste Plastic products have to be separated so that the source and recycling companies can have the raw material. Our results in this study may be important for the development of management directives and to raise awareness among the population, local authority, the Government, regional authority, fisherman, tourism transport etc., to reduce as much as possible the use of plastic products.

5. References

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