Spatial and temporal changes of marine litter along beaches adjacent an estuary in northeast Brazil

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Abstract

The accumulation of marine litter (ML) in the oceans, have been a major concern in the lasts years. Plastics are the most principal component, and his presence on marine environment could cause chemical e physical damage to the biota. Unfortunately, there is a lack of published information about abundance and spreading of ML along many coastal areas of Brazil. Based on this, the objective of this study, was evaluate spatial and seasonal changes of the abundance of ML in the surf zone of two beaches (Costinha and Miramar) adjacent to the mouth of the Rio Paraíba estuary, northeast Brazil. Sample hauls were threereplicated, taken once month, during an ichthyofauna survey from May 2014 to April 2015, using a beach seine net (5 mm mesh-size) at 1.5 meter depth. For each sample, swept area was calculated, ML were washed, dried $(60\circ C)$, type identified, measured, categorized, and estimated in terms of items.km-2 and g.km-2. From the total of 144 samples, 88% showed occurrence of ML, accounting 1,441 items, weighting 17.39 kg. Plastics (hard 68.7% and soft 19.6%), metals (6.6%) and cloths (2.3%), were the most representative items. Others types, in small amount, were nylon, construction material, rubber, fiber glass, wood and non identified items. When size evaluated, macro debris were the most frequent (69.8%), followed by mega debris (28.5%). Spatial-temporal analyzes conducted using ANOVA, found significative interactions (p < 0.05) among seasons and beaches areas for total litter, plastics, clothes and metal. They showed high mean abundance in Area 2 of the Miramar beach (south), mainly during the early dry season. We concludes that most part of ML comes from local tourism and also, land bases left by raining season. Moreover, we hope that theses finds could be useful for strategies of monitoring and conservations plans for the coasts of South America.

Keywords: Plastic pollution, Surf zone, underwater litter

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