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Research Article

Temporal variability of plastic litter in two sand beaches of San Andres Island, Colombian Caribbean

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ABSTRACT. The majority of marine plastic waste is anthropogenic. Recently, several reports have documented negative impacts on tourist beaches in the Caribbean, especially on the fauna associated with marine coastal ecosystems. This study analyzes the characteristics and seasonal variation of plastic waste considering the most common sizes on two beaches (Spratt Bight and Los Charquitos) of San Andres Island in 2021. Nine hundred twenty-six plastic items were collected from three perpendicular transects established in three beach strips. The largest number of plastic debris (416 items) was found in the dry season (March), followed by the transition (August, 280 items) and rainy season (November, 230 items). Regarding relative abundance, microplastics are the most predominant size class, while fragments are the most common form of plastic debris on San Andres Island beaches.

Keywords: plastic waste; macroplastics; mesoplastics; microplastics; tourism; sand beaches

INTRODUCTION

Historically, sand beaches have been a natural attraction for thousands of people. However, overexploitation and environmental management deficiencies have degraded these areas. Pollution from marine debris is one of the most common threats affecting these coastal ecosystems (Bergmann et al. 2015, Tudor & Williams 2019, Bolivar-Anillo et al. 2023). Marine litter is any manufactured or processed persistent solid material that reaches the marine environment from different sources and transport mechanisms (UNEP 2011). Plastics are the most abundant material among the types of marine litter due to high production (370 million tons in 2019), excessive consumption, and inadequate final disposal (Europe Plastics 2021). Nowadays, around 80% of world waste is made up of plastic (Moore 2008, Cózar et al. 2014, Pham et al. 2014, Deudero & Alomar 2015, Garcés-Ordóñez et al. 2020).

Marine plastic litter is classified according to the size of the particles; however, the terminology remains ambiguous and conflicting (Hartmann et al. 2019). For this study, megaplastics refer to those with sizes greater than 1 m; macroplastics are between 25-1,000 mm; mesoplastics are 5-25 mm large; microplastics are <5 mm, and nanoplastics are <1 μm (GESAMP 2019). The presence of macroplastics in the marine environment is attributed to the remains of elements commonly used in fishing or navigation activities (nets, boats, buoys), household appliances, construction, and cosmetic and personal hygiene products (GESAMP 2021). They are

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considered high risk for reptiles, marine mammals, birds, and fish, as they can cause entanglement, deformation, and suffocation when ingested (Li et al. 2016, Barboza et al. 2019). Once in the ocean, macroplastics fragment into smaller particles due to exposure to wind friction, erosion caused by water, solar radiation, and the waves' force (Moore 2008). Mesoplastics continue in the environment where they affect marine fauna, physically or physiologically, or they fracture into smaller particles (GESAMP 2015). In the end, primary microplastics, such as microbeads or pellets manufactured as components for other products, or secondary, derived from the fragmentation of larger elements, will accumulate in the digestive system and tissues of small invertebrates, fish and other primary consumers that integrate these particles into food webs (Cole et al. 2013, Hanvey et al. 2017, Cverenkárová et al. 2021). Also, plastics present different forms like packages, containers, kitchen utensils, straws, furniture, pellets, fragments, filaments, sheets, and foam (Wenneker & Oosterbaan 2010).

Plastics are considered one of the largest and most dangerous pollutants due to their persistence, chemical composition, and easy distribution in the world, causing negative impacts on environmental quality, marine biodiversity and ecosystem services, and especially the attractiveness tourism of the beaches (Andrady 2011, GESAMP 2015, Pettipas et al. 2016, Thushari & Senevirathna 2020). The accumulation of plastic litter on beaches affects the organisms that ingest it or become trapped in it; it also causes economic losses in coastal populations since it reduces landscape attractiveness for tourism (Pettipas et al. 2016).

The high durability and resistance to degradation of plastic materials provide great advantages in industries such as cosmetics, personal hygiene products, food, and textiles (Barnes et al. 2009, GESAMP 2016). However, persistent organic pollutants (POPs), heavy metals, and other toxic and bio-accumulative chemical substances in their composition adversely affect animals that ingest or are exposed to these materials (Mato et al. 2001, Gall & Thompson 2015).

Plastic garbage on sandy beaches has been the subject of several studies. Due to logistical and budget limitations and the need to cushion the visual or landscape environmental impact, cleaning tasks in public spaces, especially on beaches, commonly focus on larger-sized plastics (GESAMP 2010, Pettipas et al. 2016). Nevertheless, the direct and indirect costs resulting from this problem are considered a latent threat to the tourism industry (Gregory 1999, Barnes et al. 2009). In Greece, Piperagkas et al. (2019) recommend considering variability related to location and the local climate regime. These authors also highlight the importance of sampling superficially and deeply since plastics can be found in deeper sediment layers, with concentrations different from those in the superficial layer.

In Colombia, Rangel-Buitrago et al. (2018), in a census of marine litter on 13 sandy beaches in the Atlantico Department, estimated an average presence of 6.05 items m^{-2}, among which plastic represented more than 80% of the waste. Garcés-Ordóñez et al. (2020), in an analysis of the presence of microplastics on sandy beaches in the Caribbean, including five beaches in San Andres and the Pacific of Colombia, conclude that the amount of microplastics in Caribbean beaches is much higher compared to the Pacific, and even higher than those estimated for sand beaches world around. In both cases, the presence of plastics in the marine environment is related to inadequate solid waste management strategies, tourism activities (Acosta-Coley & Olivero-Verbel 2015), fishing, and recreation abandoned boats, among other local sources (Acosta-Coley et al. 2019a). Several studies on Cartagena de Indias, Coveñas, Puerto Colombia, Riohacha, and Santa Marta also related the presence of microplastics on the city's beaches with marine currents, wind direction (Acosta-Coley & Olivero-Verbel 2015, Acosta-Coley et al. 2019b, Garcés-Ordóñez et al. 2020).

San Andres Island (SAI) is the capital city of the Archipelago of San Andres, Providencia, and Santa Catalina Department. Tourism and commercial trade are the main economic activities (Aguilera-Díaz 2016). After confinement due to the COVID-19 pandemic in 2021, the island faced the challenge of reactivating tourism, registering 1,095,556 visitors (Ortiz 2022). Since 2022, the tourist income has been increasing, and this tendency is expected to be maintained for the next few years (Ortiz 2022). This insular region in the Colombian Caribbean was declared a Seaflower Biosphere Reserve by UNESCO in 2000 (Taylor et al. 2011). It is home to the third largest coral reef on the planet and some of the most visited sandy beaches in Colombia (Conservation International 2008), which also are recognized as areas of landscape heritage interest in the island's Territorial Planning Plan (POT) (Walters-Álvarez 2019).

Island ocean areas are considered areas susceptible to the accumulation of plastic waste, which is related to the role of the local population as a potential source of plastic waste, added to the retention of waste that arrives through different surface currents (Monteiro et al. 2018). Pollution by marine litter on SAI has been documented in recent years, pointing out the threat it represents to ecosystems and tourism (Garcés-Ordóñez et al. 2021, Gavio et al. 2022). In the Albuquerque atoll, Portz et al. (2020) analyze the composition of marine litter, again finding that plastics from fishing activities and sea-based sources predominate in abundance over other materials such as metals, glass, or wood. Likewise, Gavio et al. (2022), analyzing the garbage present on three main tourist beaches for 10 weeks, found that most of the waste corresponds to plastic (59.5% of the total weight) and glass (20.4%) and classified these areas as dirty and very dirty according to the Clean Coast Index estimates.

Despite these studies, information on the influence of climatic seasons and tourism dynamics on the abundance and composition of plastic waste is still scarce. This study addresses the dynamics of abundance, size composition, and most common shapes of plastic litter on two beaches during three climatic seasons (dry, transition, and rainy) in 2021 to identify its main sources and the most common type of plastics in this ecosystem.

MATERIALS AND METHODS

Study area

The San Andres Archipelago, Providencia, and Santa Catalina are 800 km from Cartagena de Indias and 150 km from the Nicaraguan coast west of the "Greater Caribbean Region". It has an approximate area of 300,000 km^2, equivalent to 10% of the total area of the Colombian Caribbean (Vides & Sierra-Correa 2003). It is home to the second-largest barrier reef in the Caribbean Sea, one of the most productive marine-coastal systems in the Atlantic Ocean. It was declared a Seaflower Biosphere Reserve in 2000 by UNESCO's International Man and Biosphere Coordination Council. Then, in 2005, a significant portion of the Archipelago was declared a Marine Protected Area (MPA) and after, as an Integrated Management District (IMD) (Gómez-López et al. 2012, Sánchez-Jabba 2012). The production, marketing, distribution, and entry of single-use plastic products (straws, plastic cups, polystyrene, plates) Started in 2021 and was prohibited for this region by the 1973 law promulgation in 2019. This measure was established to reduce the environmental impact of these materials' entry and use in the area.

San Andres has a warm-humid climate with temperatures that vary between 26 and 31°C (IDEAM 2014). It is influenced by trade winds blowing from the northeast, the subtropical high position of the North Atlantic, and the dynamics of the Intertropical Convergence Zone (ITCZ); also, the occasional occurrence of hurricanes in the second half of the year has some influence in the local clime (Osorio et al. 2016, Dagua et al. 2018). Generally, this region presents a rainy season, which extends from December to April, and the dry season, between April and November (Gómez-López et al. 2012, Montoya 2014). During the dry season, only 8% of the total annual rainfall is recorded, and trade winds predominate; from May to November, cloud cover and precipitation increase (Osorio et al. 2016). However, the rainy season can be interrupted by the reduction of precipitation during the July and August months, a phenomenon known as "Veranillo de San Juan" or mid-summer drought (MSD) (IDEAM 2014, Osorio et al. 2016).

SAI is the capital and the largest island in the Archipelago. It is located at 12°28'58"-12°35'55"N and 81°40'49"-81°43'23"W (IGAC 2008). It is mostly flat, although it also has mountainous formations with heights of up to 86 m above sea level. The island has 27 km^2, at least 53,000 inhabitants, and around 7 km of beaches with white sands of biogenic origin, consisting of calcium carbonate structures from coral fragments, mollusks, and foraminifera shells (Vides & Sierra-Correa 2003, Echeverry-Hernández & Marriaga-Rocha 2013).

For this study, Spratt Bight Beach (12°35'14"N, 81°41'55"W), also named Bahía Sardina, in the north; and Los Charquitos (12°29'26"N, 81°43'20"W), in the south border of the island, were sampled (Fig. 1). Spratt Bight faces northwest and is bordered at the back by a pedestrian street and multiple home buildings. On the other hand, Los Charquitos is located on the island's south end and is bordered by a vehicular road. In the back, mostly urban vegetation (grasses and palm trees) without buildings around.

According to the methodology proposed by Hidalgo-Ruz et al. (2018) and Garcés-Ordóñez et al. (2020), for one day in three climatic seasons of the year 2021, the dry season (March 2-5), rainy season (November 9-18) and San Juan summer (August 2-4), three transects perpendicular to tide line were established. For collecting macro and meso plastics, using 1 m^2 quadrants fixed to the substrate, all the plastic elements present in the most superficial layer of the substrate were manually collected. The quadrants were located considering placing one quadrant on one of three beach sectors (strips): 1) Supralitoral: corresponding to the area from the high tide line to the vegetation border; 2) Mesolitoral: between the high

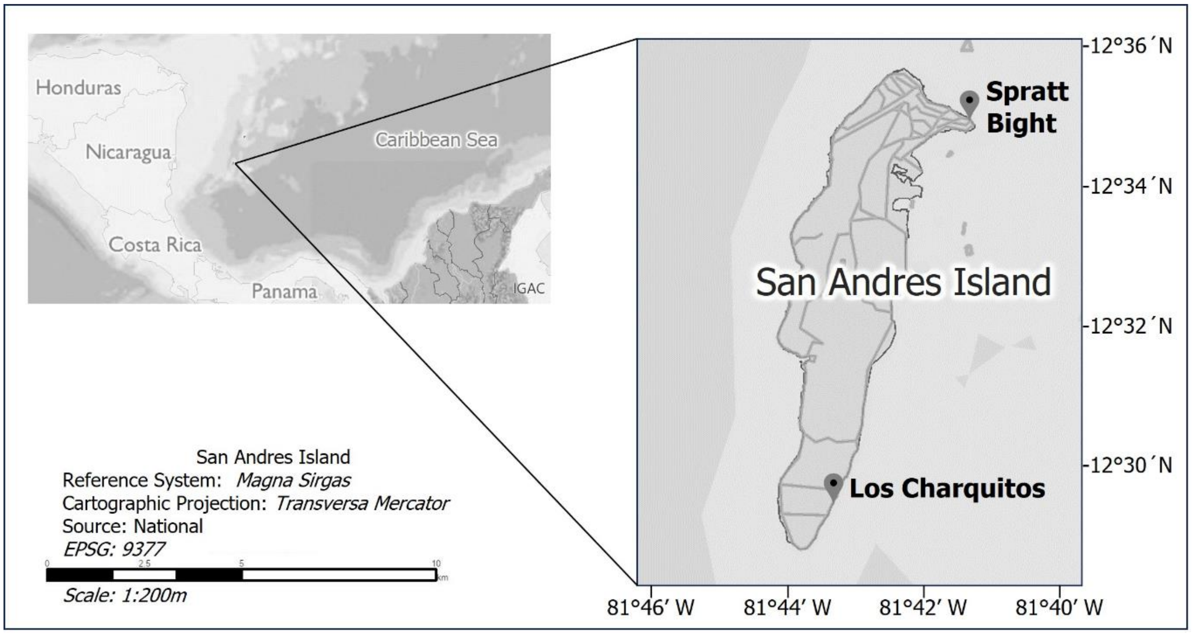

Figure 1. Location of sampling points at San Andres Island (Colombian, Caribbean Sea). Image constructed with the web tool (https://www.colombiaenmapas.gov.co/) of the Agustin Codazzi Geographic Institute.

tide line and low tide line; and 3) Infralitoral: from the low tide line to the water border (Hidalgo-Ruz & Thiel 2013, Pérez-Alvelo et al. 2021). Once collected, the plastic particles were long measured and classified according to their size in macroplastics (25-1,000 mm) and mesoplastics (5-25 mm). Then after, macroplastics were classified according to some of the GESAMP (2019) categories: fragments, straws, lids, expanded polystyrene, syringes, ropes, and toothbrushes.

For microplastics, a 0.25 m^2 subquadrant was placed to collect a ~500 g substrate sample together with all elements present, using a putty knife. Once collected, substrate samples were dried at room temperature and sifted using a craft sieve with a mesh eye of 1 mm. Then, under a stereoscope (10x), the organic matter was manually separated, and selected items were water-submerged to confirm their plastic nature. Then, sifted plastic elements were classified according to size and form using some GESAMP (2019) categories: fragments, pellets, and granules.

Abundance estimates were analyzed using descriptive statistics (mean, mode, variance, range, normality) and non-parametric tests (Kruskal-Wallis) to determine the influence of the factors considered (climatic season, beaches, and sector) on the presence of plastic litter on the beach. Standard software packages, such as Excel (Microsoft Office 365 Version 2204) and R (R version 4.1.2, 2021-11-01), were used for data management and analysis.

RESULTS

Abundance of plastic litter on SAI: macroplastics

According to the observations based on 51 quadrants (1 m^2), Los Charquitos and Spratt Bight beaches present 4.196 ± 5.4 macroplastic items m^{-2} (Fig. 2). These estimations present homogeneity of variances between climatic seasons (Fligner-Killeen test of homogeneity of variances; χ^2 = 9.0861, df = 2, *P*-value = 0.01064), sectors (χ^2 = 0.009829, df = 1, *P*-value = 0.921) and strip (χ^2 = 0.152, df = 2, *P*-value = 0.9268); but did not meet the assumption of normality (Shapiro-Wilk normality test; W = 0.73369, *P*-value = $2.814e^{-08}$). The Kruskal-Wallis analysis determined statistically significant differences in macroplastic abundance between climatic seasons (χ^2 = 20.837, df = 2, *P*-value = $2.988e^{-05}$), with the highest abundance concentrated during the dry season. While there were no significant differences between the beaches (χ^2 = 0.17676, df = 1, *P*-value = 0.6742) or beach strips (χ^2 = 0.036689, df = 2, *P*-value = 0.9818). However, regarding the total of items collected during sampling, the abundance of macroplastics was higher at Spratt Bight Beach (183 items m^{-2}) than at Los Charquitos Beach (132 items m^{-2}).

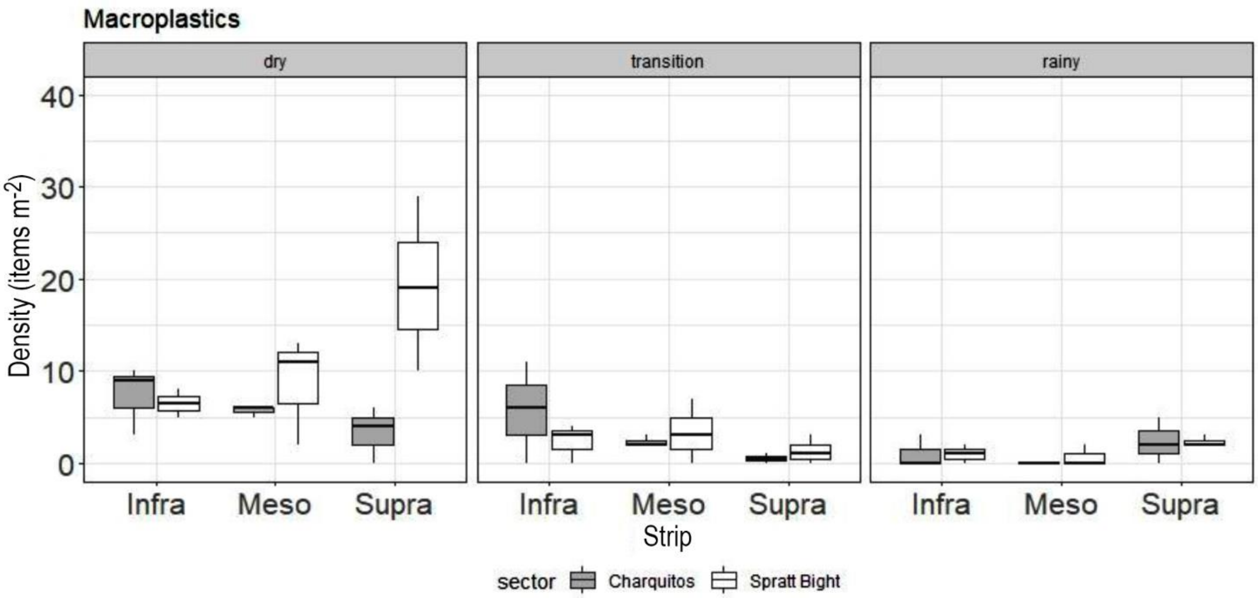

Figure 2. Density of macroplastics in San Andres Island beaches estimated according to manual collection and dry sieving from samples taken in 2021. Infra: infralitoral, Meso: mesolitoral, Supra: supralitoral.

Mesoplastics

Similarly, for mesoplastic items, present observations allow us to estimate a mean abundance of 2.27 ± 3.65 items m^{-2} (Fig. 3). These data presented a non-normal distribution (W = 0.6776, *P*-value = $2.637e^{-09}$) and homogeneity of variances between sectors (Fligner-Killeen test; χ^2 = 1.7066, df = 1, *P*-value = 0.1914) and beach strips (χ^2 = 1.9056, df = 2, *P*-value = 0.3857), but not between climatic seasons (χ^2 = 13.637, df = 2, *P*-value = 0.001093). The Kruskal-Wallis analysis found statistically significant differences in the abundances recorded between climatic seasons (χ^2 = 8.7639, df = 2, *P*-value = 0.0125), with a greater abundance during the transition period. In contrast, no statistically significant differences were determined between the beaches (χ^2 = 0.63584, df = 1, *P*-value = 0.4252) and beach strips (χ^2 = 0.45738, df = 2, *P*-value = 0.7956).

Microplastics

Regarding microplastics, based on 54 quadrants (0.25 m^2) observations, on the SAI beaches, we estimated a mean abundance of 27.04 ± 38.07 items m^{-2} (Fig. 4). These estimates did not fit a normal distribution (Shapiro-Wilk normality test; W = 0.5395, *P*-value = $2.716e^{-11}$), but present homogeneity of variances between sectors (Fligner-Killeen test; χ^2 = 3.6759, df = 1, *P*-value = 0.0552), climatic seasons (χ^2 = 2.4489, df = 2, *P*-value = 0.2939) and beach strips (χ^2 = 3.9089, df = 2, *P*-value = 0.1416). According to non-parametric analysis, significant differences existed between the number of microplastics by beaches (χ^2 = 10.742, df = 1, *P*-value = 0.001047). At the same time, there are no differences between climatic periods (χ^2 = 4.067, df = 2, *P*-value = 0.1309) nor beach strips (χ^2 = 0.16867, df = 2, *P*-value =0.9191). In this study, the highest abundances of microplastics occurred in the rainy season and always in the strip of the beach furthest from the water (supralitoral). Microplastics abundance was minimal or non-existent at the water's edge.

Types of plastic litter present at Charquitos and Spratt Bight beaches

For this study, 926 macro- and mesoplastic elements were collected. The largest number of these comes from the dry season (March), with a total of 416 items, followed by the transition season (August) with 280 items, and the rainy season (November) with 230 items. Los Charquitos Beach presented more items (519) than Spratt Bight Beach (407). For Spratt Bight Beach and Los Charquitos Beach, most macroplastics comprised fragments during all three climatic seasons. On the other hand, straws, lids, and expanded polystyrene were among the most common macroplastics found, especially during the transition period. Particles such as syringes, ropes, and toothbrushes, among others, were also present but in a minor proportion. For the dry season, only bags were present in the strip closest to the water border; balloons, pellets, and bottle caps were present during the transition and rainy seasons. Only in Los Charquitos Beach we found remains of PVC pipes, shoes, and marker pencils.

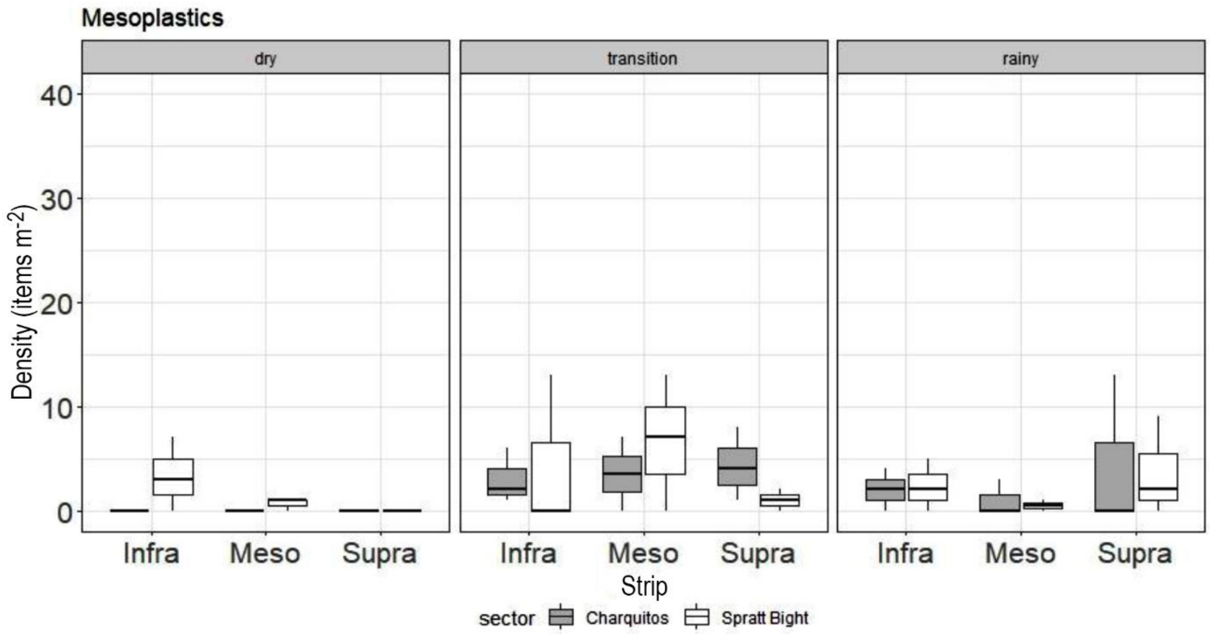

Figure 3. Density of mesoplastics in San Andres Island beaches estimated according to manual collection and dry sieving from samples taken in 2021. Infra: infralitoral, Meso: mesolitoral, Supra: supralitoral.

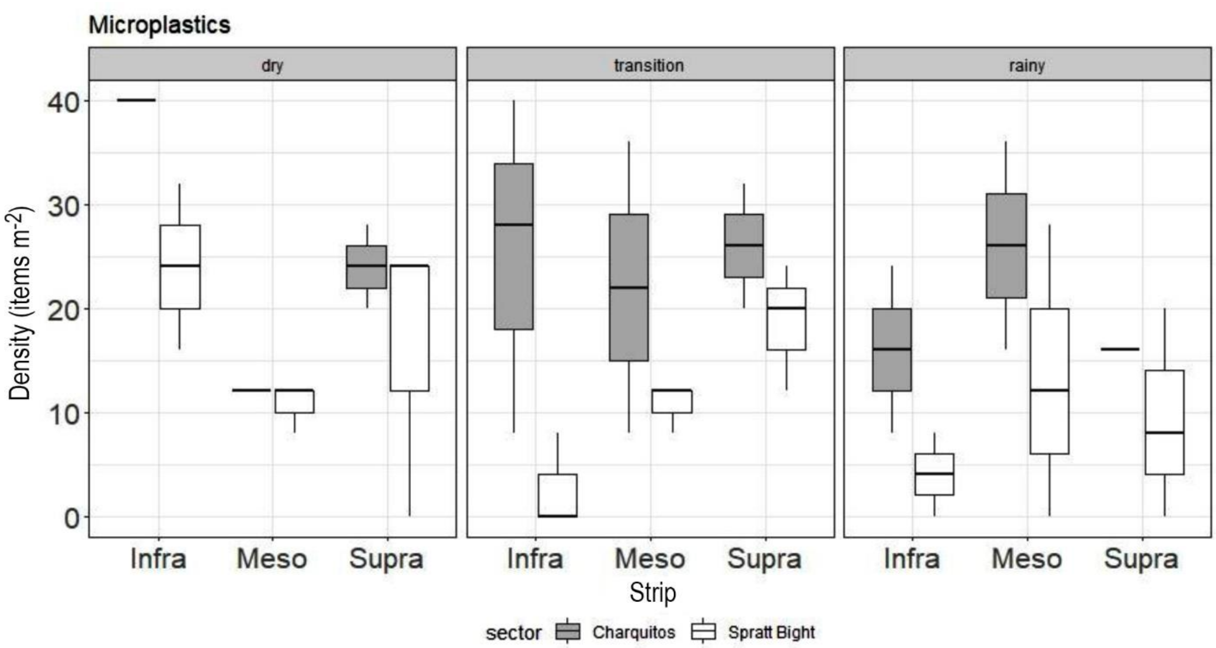

Figure 4. Density of microplastics in San Andres Island beaches estimated according to manual collection and dry sieving from samples taken in 2021. Infra: infralitoral, Meso: mesolitoral, Supra: supralitoral.

Regarding microplastics, the collected particles were categorized as fragments, pellets, and granules. These categories were present in both beaches during all three climatic seasons, although fragments predominated proportionately over pellets and granules; later, they were not even present in most Spratt beach samples.

Table 1. Microplastics' relative abundance on sandy beaches around the world. n: quadrants.

Location	Beach Strip	Particles size (mm)	Ítems m^{-2}	Reference
Caribbean (n = 21)	High tide line	1-5	0.40-2,500 1.23 ± 1.69	Schmuck et al. (2017)
Panama (n = 4)	High tide line	1-5	56-420, 294 ± 316 353 at the Caribbean coast, 187 at the Pacific coast	Delvalle de Borrero et al. (2020)
Puerto Rico (n = 6)	High tide line	0.3-4.75	52-432	Pérez-Alvelo et al. (2021)
Mexico			32-546 151.7 ± 205.6 (2018) 95.5 ± 97.3 (2019)	Álvarez-Zeferino et al. (2020)
Brazil (n = 17)	Guanabara Bay, southeast Brazil high tide line	<5	12-1,300	de Carvalho & Neto (2016)
Spain (n = 6)	Beyond high tide line	1-5	3.5 g m^{-2} 2.0-2,971	Álvarez-Hernández et al. (2019)
Indian (n = 26), Tamil Nadu	Low- high tide line	1-5 nm	High tide line 48.9 - 4747.6 mg m^{-2}; 1323 ± 1228 mg m^{-2} Low tide line: 14.3 to 1,020.4 mg m^{-2}; 178 ± 261 mg m^{-2}	Karthik et al. (2018)
Malta Island (n = 8)	Low- high tide line		0-1,462, 0.7 ± 57.1 - 57.7 ± 41.7	Turner & Holmes (2011)
Russia (n = 13)	High tide line	0.5-5 nm	7-5,560 1.3 -36.3 items kg dry sediment^{-1}	Esiukova (2017)
Sri Lanka	Beach-surface water; intertidal area	3-4.5	0-738; 0 ± 0 to 738 ± 195	Bimali-Koongolla et al. (2018)
Auckland (New Zealand) (n = 39)	High tide and intertidal zones	0.032–5	0 to 2,615 mean abundance 459	Bridson et al. (2020)
Colombia / July-Nov 2017, May 2018		3 to 1,387 318 ± 314 Caribbean beaches 138 ± 125 Pacific 32- 201 San Andres Island		Garcés-Ordóñez et al. (2020)
San Andres Island, Colombia (n = 54)	All complete beach	1-5	0-265 33.0 ± 43.08 (8.25 ± 10.77 items 0.25 m^{-2}	This work

DISCUSSION

Overall, the abundance of plastic litter on sand beaches follows a gradient related to the size of the particles. Microplastics used to be more abundant than mesoplastics and even more abundant than macroplastics (Rodríguez et al. 2020). According to this, the abundance of plastic litter recorded in San Andres Island (SAI) presented a higher abundance of microplastics, followed by macro- and mesoplastics. This behavior relates to the time plastic litter is exposed to the environment and the resultant particles of the fragmentation process (Lee et al. 2013).

Likewise, plastic litter abundance might be related to proximity to local sources, especially those related to tourism activity (Garcés-Ordóñez et al. 2020). Also, environmental factors such as winds, currents, and beach orientation might promote the presence of plastic particles (Rodríguez et al. 2020). For this study, the abundance of macro- and mesoplastics varied during the climatic season, which was higher during the dry season, and macroplastics and mesoplastics during the transition season. Although the sampled beaches are placed at opposite end borders of SAI (Spratt Bight at the north end and Los Charquitos at the south end), the abundance of major-size plastic particles followed the same pattern. Winds, waves, and surface currents transport sediment from and to the ocean, shaping the beach's width and slope (Coca-Domínguez et al. 2019). As these oceanographic features change along the year, the capacity to transport sediment and other elements, like plastic litter, changes. During the dry season (December-April), winds at SAI usually increase (Coca-Domínguez et al. 2019), which will probably intensify its capacity to transport plastic garbage to these beaches. Therefore, it can be considered that the intensity of climatic seasons, especially winds, influences the amount, size, and shapes of plastic particles present, as our results showed for SAI beaches. However, without longer-term monitoring, it is not yet possible to make accurate conclusions in this regard.

On the other hand, although there were no significant differences, the abundance of macro- and mesoplastics was greater on Spratt Bight Beach. Due to its proximity to homes and hotels, this beach has a regular (daily) cleaning service funded by the local government. Despite this, previous studies classify it as a 'very dirty' beach (Gavio et al. 2022), highlighting the abundant and permanent presence of garbage on its surface, relating its proximity to urban centers and the presence of tourists in the area as major sources of trash. Likewise, the present study focuses on characterizing plastics on beaches on the SAI.

Regarding the distribution of plastic garbage in the different strips of the beach, in this study, the number of plastic particles was highest in the strip furthest from the edge of the water, followed by the central part of the beach, and lowest at the sand on the edge of the water. This pattern is related to the action of wind, waves, and currents, as well as the transport of plastic particles to the most stable area of the beach. Previous studies carried out in the Caribbean affirm that winds, ocean currents, as well as activities of anthropic origin influence the accumulation of plastics on the beaches of the Caribbean Sea (De Scisciolo et al. 2016, Monteiro et al. 2018).

In this study, the relative abundance of micro-plastics was higher than that observed for meso- and macroplastics. However, compared to studies on other Caribbean beaches, the abundance of microplastic items observed here was lower (Table 1). In this case, fragments are the most abundant form, similar to what was reported by De Scisciolo et al. (2016), Schmuck et al. (2017), and Hidalgo-Ruz et al. (2018). Likewise, pellets were also very abundant, similar to what was observed by Rodríguez et al. (2020) on oceanic beaches of Uruguay (Atlantic Ocean).

Plastic litter forms related to tourist activity are normally found on beaches near urban centers and habitation sites (Suciu et al. 2017, Tavares et al. 2020). In this study for Spratt Bight Beach, the presence of straws, lids, bottles, and glasses predominated over the other forms of plastic litter identified. On the other hand, industrial fragments and pellets are more common on remote beaches or with moderate tourism (Lavers & Bond 2017), as demonstrated by what was observed here on Los Charquitos Beach.

Although the use of single-use plastics has been prohibited in SAI since 2019, according to this study, the presence of single-use plastics is still common on the island's beaches. Thus, it can also be inferred that cleaning and garbage collection services on the beaches and citizen awareness programs remain insufficient.

CONCLUSIONS

According to our results, the beaches of San Andres (Los Charquitos and Spratt Bight) are still contaminated by plastic litter. However, the relative abundance of these elements is lower than that observed for other beaches in the Caribbean region. In this case, the fragments are the most common type of plastic litter. The climatic seasons influence the presence of plastics on these beaches, being more abundant during higher wind periods, although factors associated with tourism might also be determinants. The plastic litter in SAI beaches especially accumulates on the strip further away from the water.

Credit author contribution

N. Castellón-Mena: conceptualization, validation, review, methodology, funding and formal analysis; R. Sarmiento-Devia: statistical and formal analysis, supervision writing-original draft; P. Romero: funding acquisition, project administration, supervision, review, formal analysis and editing, review and editing. All authors have read and accepted the published version of the manuscript.

Conflict of interest

The authors declare no potential conflict of interest in this manuscript.

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