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Microplastics in brazilian coastal environments: a systematic review Supplementary Material

Table S1: Studies monitoring the presence of microplastics in environmental samples from Brazilian coastal environments, during the period from 2018 to 2023.

	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
				SEDIMENT			
1	Fernando de Noronha Archipelago*, PE	Beach	waste collected from beach sand	Total of 294.5 kg of plastic collected (macroplastics) on 5 beaches with restricted access (sea outside) and one beach with free access (sea inside); 98% (138.42 ± 10.2 items/m^2) on the beaches of sea outside.	Macroplastics	Bottle caps (items/m^2): 26,576 ± 5,182 (outside sea); 0.843 ± 0.252 (inside sea); Disposable plastics (items/m^2): 0.039 ± 0.011 (outside sea); 0.196 ± 0.059 (inside sea); Hospital waste (items/m^2): 0.104 ± 0.025 (outside sea); 0 (inside sea); Cigarette butts (items/m^2) 0.052 ± 0.022 (outside sea); 0.732 ± 0.256 (inland sea).	Grillo and Mello,2021
2	Fernando de Noronha Archipelago*, PE	Beach	waste collected from 6 beaches sand	947 particles were identified as microplastics (1–5 mm), being that 938 particles on the beaches at the windwaard and 9 particles on the beaches at leeward of the principle island; 0.6 ± 2.5 particles/m^2 to 1,059.3 ± 1,385.6 particles/m^2.	2.0 to 3.99mm	Fragments (96.3%), *pellets* (1.5%), XPS (1.4%) and fibers (0.8%); white and transparent particles (69.5%), blue (8.2%), yellowish (5.6%), black/gray (5.1%) and other colors (11.6%).	Carvalho et al., 2021
3	Niterói, RJ	Beach	waste collected from beach sand	Total of 5,584 marine litter items collected at 6 points on the beach (3 with kiosks and 3 without kiosks); 84.03% are macroplastics.	Macroplastics	Styrofoam (26.7%), plastic packaging (25.9%), straws (9.1%), lids (6.1%), food packaging (5.2%).	Zamora et al., 2021
4	Rio Grande, RS	Beach	waste collected from beach sand	Total of 19,457 items; 88% are macroplastics; average of 16.4 items/100m^2 (36.7 items/100 m^2 in summer and 8.1 items/100m^2 in winter).	Macroplastics	Fragments (28.4%), cigarette butts (17.0%), packaging (14.3%), miscellaneous items (straws, lids, fishing lines, bags: 24.6%) and others (15.8 %).	Ramos et al., 2021
5	Beaches on the Brazilian coast (SE, BA, ES and RJ)	Beach	beach sand	Total of 166 MPs on the 6 beaches evaluated (2.4 -30.4 MPs/m^2); largest number of MPs: Praia do Viral (SE, 30.4 items/m_2) and Ponta dos Mangues (SE, 17.4 items/m_2).	≤ 5.0 mm	Colors: white (49.3%), blue (30.9%), green (13.5%), red (4.3%), yellow (1.2%) and black (0.62%). Morphotypes: fragments (85.1%), fibers (4.3%), films (9.8%) and pellets (0.61%); Polymer: polyethylene.	Maynard et al., 2021
6	Abaís Beach, SE	Beach	waste collected from beach sand	Total of 3,557 items of marine litter (2,913 items in the dry season and 604 items in the rainy season); average dry period: 9.71 ± 2.03 items/m and plastic percentage 75.07 ± 4.81%; average rainy season: 2.01 ± 2.80 items/m and 68.62 ± 5.98% plastic.	Macroplastics	Dry period: packaging (23%), cups (21%), unidentified fragments (11%), straws (9%), cigarette butts (7%) and lids (5%); rainy season: unidentified malleable fragments (20%), lids (18%), packaging (12%), filaments (10%), unidentified rigid fragments (9%), straws (8%) and cigarette butts (5 %).	Nobre et al., 2021
7	Vitória Bay, ES	Estuary, mangrove	Surface sediment (2 cm deep)	Total of 2,175 MPs, including the basin and the mangrove edge (66.4% and 33.6%, respectively).	≤ 5.0 mm	Main colors found: blue (54%), transparent (21%), black (10%), red and green (6% each) and yellow and white (<1% each); filaments: 88.7% of the total and fragments (11.3%).	Zamprogno et al., 2021

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
8	São Sebastião, SP	Beach	beach sand	Total of 745 particles on 3 beaches; Boracéia: 667 MPS (89.5%); Juquehy: 71 MPs (9.5%); Juréia: 7 MPs (0.9%).	1-10 mm	Morphotypes: fibers (2.7%), spherical particles (6.2%), 83 pellets (11.1%) and 596 fragments (80%); Polymers: polyethylene (PE = 29.7%), polystyrene (PS = 41.4%) and polypropylene (PP = 23.9%).	Tsukada et al., 2021
9	Fishing village, Lençóis Maranhense (MA)	Beach	beach sand, samples collected randomly from the surface, n=88 sampling).	Not calculated (qualitative analysis).	9.58-15.92 mm	Polymers: high-density polyethylene (HDPE, 44.3%), low-density polyethylene (LDPE, 20.5%), polypropylene (PP, 25%), EVA (3.4%) and thermoplastic elastomers (TPE, 6 .8%)	Palombini et al., 2018
10	São Paulo state coast, SP	Beach	beach sand, pellets randomly collected from the surface.	A total of 5,700 pellets were collected from 19 beaches, n=300 pellets/beach.	Not mentioned	Not mentioned	Vedolin et al., 2018
11	Boa Viagem Beach, PE	Beach	beach sand collected from areas protected by beachrocks and exposed from a sandy beach.	Total of 835 fragments; protected area = 642.6 ±514.8 MPs/m^2, exposed area=130.6 ± 126.8 MP/m^2.	<1 mm, 1-5mm and 5–20mm	Morphotypes: fragments (99.6%), pellets (0.4%); colors: blue (49.7%).	Pinheiro et al, 2019
12	Vitória Bay, ES	Estuary, mangrove	Sediment bottom (n=20 samples)	Total of 247 MPs; average 0-38 MPs/sample (300 g/per sample);	≤ 5.0 mm	45% of the total particles found in points close to the port area; morphotypes: fibers (77%)	Baptista Neto et al, 2019
13	Corvina Beach, PA	Beach	beach sand, samples collected at 4 quadrants that were sampling in five trenches and 3 different depths.	Total of 5819 MPs; average of 492.5 ± 556.4 MPs/m^3.	≤ 5.0 mm	Fibers (95%), fragments (~5%) and pellets (< 0.01%); fibers occurred as single items or clusters; colors: predominantly blue, followed by dark green and reddish tones; whitish, brown and translucent.	Martinelli Filho e Monteiro, 2019
14	Baixada Santista, SP	Beach	beach sand, 4 samples collected at 3 different depths	Total of 13,138 pellets.	≤ 5.0 mm	Colors: white (50%), yellow (30%), orange (10%) and other colors (10%)	Izar et al., 2019
15	Catarinense coastal region, SC	Beach	waste collected in sand from25 beaches.	6,953 items grouped into 16 categories.	Macroplastics and microplastics	Pellets (9%); food packaging (0.9%); cigarette butts (8.2%); fishing supplies (0.9%); plastic thread (5.2%); plastics < 5 mm (24,1%); plastics > 5 mm (28,8%); plastic stick (1.1%); plastic packaging (0.8%); straw (0.4%); foam polystyrene < 5 mm (10.9%); foam polystyrene > 5 mm (3.0%); most of the fragments were plastic debris (80%).	Marin et al., 2019

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
16	Guanabara's Bay, RJ	Continental shelf	Bottom sediment (68 samples)	Total of 2.400 MPS	≤ 5.0 mm	Morphotypes: fibers (47.8%), films (28.6%), fragments (23.1%) and pellets (0.5%); colors (fibers): blue (50%), transparent (16%), black (12%), pink (7%), white (4%), red (3%) and others (2%); colors (films): 62% transparent, 13% white, 7% blue, 7% gray, 4.4% black and the remaining colors less than 2%; colors (fragments): 33% transparent, 18% white, 10% black, 9% blue, 9% gray, 7% pink, 4% orange and the other 2%; colors (pellets): 50% white, 33% transparent, 8% yellow and 8% Orange	Baptista Neto et al., 2019
17	Guanabara's Bay, RJ	Bay	Sediment (sublittoral, n=36 samples)	Total 160 to 1,000 MPs/kg sediment (or 4,367 to 25,794 MPs/m^2)	≤ 5.0 mm	Morphotypes: fibers (89%), films (10%) and fragments (1%); colors (fibers): translucent (84%), gray (5%), black (3.2%); polymers: fragments (nylon), fibers(polyester); films (98% polyethylene)	Alves and Figueiredo, 2019
18	Niterói, RJ	Cove, beach	Cove (water, bottom sediment and beach sand, 48 samples from each environment)	Beach sand: 6,912 plastic materials, average of 166.50 items/kg; bottom sediments: 563 plastic items, average of 20.74 items/kg; surface water: 1,319 plastic items, average of 7.62 items/m^3	100µm to 17cm	Water samples: fragments (54%), fibers (27%) and plastic films (19%); beach sediments: fragments (32%) and fibers and lines (34%), films (16%), styrofoam (14%); rubbers (2%), foam (1%) and pellets (1%); bottom sediments: fibers (82%), fragments (10%) and plastic film (8%); colors: blue and black predominated in the three compartments; polymers: high-density polyethylene (HDPE) (38%), polypropylene (PP) (21%), expanded styrene (EPS) (10%), polyamide (PA) (7%), chlorinated polyethylene (CPE) (6%), chlorosulfonated polyethylene (CSPE) (4%), polystyrene (PS) (4%), nylon (3%), polyethylene, oxidized polyethylene (OP) (1%), ethylene vinyl acetate (EVA) (1%), fenoxresin (1%) and other polymers (4%).	Castro et al., 2020
19	Cotijuba island, PA	Estuary, beach	Beach sand, samples collected at 4 different depths, n=54 samples.	Total 13,007 MPs; the most contaminated beach was Pedra Branca (20,166,7 ± 13,392 MPs/m^3); MPs averages by depth: 0-20 cm =13,416,7 ± 5,070 MPs/m^3; 20-40 cm =10,510,0 ± 8,707 MPs/m^3, 40-60 cm=16,005,0 ± 16,011 MPs/m^3; 60-80 cm=9,566,7 ± 1,838 MPs/m^3	≤ 5.0 mm	Fibers (99.6%), malleable (0.25%) and rigid (0.15%) plastics; colors: transparent (38.34%), blue (27.59%), black (25.70%), red (6.11%), green (1.00%) and others (1%); shape: elongated (98.71%), tangled (0.91%) and irregular (amorphous) (0.38%)	Novaes et al., 2020
20	Fernando de Noronha Archipelago*, PE	Beach	Beach sand in coves and open sea; total of 15 beaches.	504 MPs in 15 beaches; beaches of open sea: 33.3±16.9 to 266.6±94.9 MPs/m^2; coves beaches: 85.1±9.7 a 181.4±64.2 MPs/m^2	0.1 a 24mm	Fibers: 90% (n=459); fragments: 10% (n=45); colors: blue, black and colorless synthetic fibers (100%); fragments: blue (80.0%), green (11.1%), white, yellow, gray and red (2.2% each).	Monteiro et al., 2020

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
21	Santa Isabel Biological Reserve (SIBR)* and Pirambu Beach (PB), SE	Beach	waste collected in the sand of 4 beaches	1,484 debris: 922 in SIBR and 562 in PB; plastics were the most quantified materials (~80% in PB and ~90% in SIBR)	Macroplastics	SIBR: malleable and rigid fragments (50%); strings and monofilaments (36%); PB: plastic bags and soft fragments (51%); bags and straws (34%). Lids (~15%) in both places.	Santos et al., 2020a
22	Santos, SP	Beach	pellets collected in the sand of 4 beaches	Variable amount between 0.05 to 6 pellets/m^2; regional scale: general tendency for pellets to decrease the greater the distance from the Port of Santos; seasonal scale: lower pellet densities in the dry season; significant variation according to sampling season; local scale: relationship between tidal cycles and location along the coast.	0.1 mm	Not available.	Balthazar-Silva et al., 2020
23	Santos and São Vicente Estuarine system, SP	Estuary	Sediment collected at the bottom of the estuary, 22 sampling.	1,000 to 30,000 MPs/g sediment.	0.5 to 0.25mm	Mainly fibers and threads, followed by fragments.	Gimiliani et al, 2020
24	Mansa Beach, Fortaleza, CE	Beach	Waste collected in 10 locations on the beach	7,510 itens (71.9 kg of waste): 1,494 small debris, 4,130 meso-debris and 1,886 of macrodebris.	Small debris: 1–40 mm; meso-debris: 40.01 a 200 mm; macrodebris (over 200.01 mm).	Small debris: cotton swabs (29.5%), cigarette butts (31%), lollipop sticks (36.8%), virgin pellets (2.7%); meso-debris: miscellaneous plastics (49.9%), nylon (1.1%), polystyrene foam (34.1%); macrodebris: miscellaneous plastics (33.5%), polystyrene foam (35.3%), polyurethane (1.7%), fishing material (7.8%).	Cavalcante et al., 2020
25	Santos Bay, SP	Beach	Individual protection equipments (IPE) collected in the sand at 13 bay locations (n=3)	131 unit of IPE.	Macroplastics	Face masks found in all locations (89–92.7%), latex and polyethylene gloves (4.9–5.5%), and others IPE (2.4–5.5%).	Ribeiro et al., 2022
26	Paulista coast, SP	Beach	Sediment and water manual collection of visible pellets on 17 beaches (n=4)	18,609 pellets divided by colors.	Not available	Light tones were the most abundant (52.9%), followed by yellowish (30.2%), orange (10.1%), brown (5.4%) and pigmented (1.4%) pellets.	Mendes et al., 2022
27	São Marcos Estuarine Complex, MA	Beach, estuary	anthropogenic litter on 21 sandy macrotidal beaches in the Amazon region	Total of 20,286 items collected, average density of 0.19 items/m^2 and predominance of plastics (17,151 items, average density 0.16 items/m^2). All beaches had intermediate levels of pollution; the Plastic Abundance Index (PAI) was calculated for each beach: very low (1 beach), low (13 beaches) and moderate (7 beaches).	Macroplastics	Expanded polystyrene was the most abundant (4,826 units) mainly in the form of food packaging, flotation devices and coolers.	Lima et al., 2022

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
28	Paranaguá Estuarine Complex*, PR	Beach, estuary	Sand of 19 beaches (n=32 samples)	Total of 398 MPs on 16 beaches (average of 1.2MPs/kg in dry weight); only 3 beaches did not present MPs.	≤ 5.0 mm	Morphotypes: foams (63.7%), rigid plastic fragments (13.8%), paint fragments (12.8%) and pellets (7.2%), flexible plastics (1.8%) and lines (0.5%); colors: white/translucent (23.9%), blue (7.8%), green (4.6%), red (3.8%), black (2.8%) and others (1%).	Mengatto and Nagai, 2022
29	Baía de Todos os Santos, BA	Estuary, mangrove	Bottom sediments, samples collected at three different depths, 3 marine mangroves and 3 river mangroves (n=54 samples)	Considerable MPs amount in all samples (average of 10,782 ± 7,671 MPs/kg); average at each depth: 00–03cm (7,735 MPs/kg); 10–13cm (8,391MPs/kg) and 30-33cm (8,417MPs/kg).	≤ 5.0 mm	Fibers (72%) and fragments (23.1%); films, pellets and foams (4.9%); white and transparent (57.5%); colored (38.4%) mainly green (25.4%), sometimes red and rarely yellow or black.	Paes et al., 2022
30	Niterói, RJ	Beach	Macro and microplastic waste collected in the sand of 4 beaches	Macrodebris: plastics (85% in winter and 73% in summer); total of 2,242 items; average density 0.13 to 0.86 items/m^2 (winter); Microplastics: total of 220 items: 84% in winter and 16% in summer; medium density: 20-102.4 MPs/m^2 (winter) and 2.4-8.8 MPs/m^2 (summer).	Macro and microplastic	Macroplastics: food packaging (36-45%); MPs: 52% Styrofoam, 20% filaments, 20% fragments, 4% films, 2% pellets and 1% fibers; colors: predominance of white (winter: 62% and summer 49%); type of polymer: polyethylene (43%) and polystyrene (52%).	Silva et al., 2022
31	Patos's Lagoon, RS	Estuary, restinga; saline swamp	Sediment and water (sampling meso- and microplastics in surface sediment, water, and sedimentary layers)	Surface sediment and water: total of 773 plastic items; average of 279.63 ± 410.12 items/kg sediment and 8.89 ± 8.75 items/L water; sedimentary layers: total of 1628 items, average of 366.92 ± 975.18 items/kg.	≤ 25.0 mm	Surface sediments and water: fragments (84.75%); polymers: High Density Polyethylene (HDPE, 34.72%), Polyethylene (PE, 25.92%), Polypropylene (PP, 23.15%), Polyvinyl Chloride (PVC, 6.01%), Polyester (PES , 1.38%), Nylon (0.92%), Polyamide (0.46%), Polystyrene (0.46%) and others (6.98%); colors: white (38.55%), light (25.36%) and blue (21.35%), others (14.75%); sedimentary profiles: blue (46.80%), white (23.34%) and black (14.16%); fibers (54.32%), fragments (18.80%), pellets (0.18%) and spheres (0.09%); polymers: high-density polyethylene (HDPE, 30.99%), polyethylene (PE, 30.51%), polyethylene terephthalate (PET, 11.73%) and polypropylene (PP, 11.26%), others (15 .49%).	Pinheiro et al., 2022

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
32	Trindade Island*, ES	Beach, sedimentary outcrops	Plastic debris in composition and deposition in sedimentary outcrops (n=18 samples)	Plastic outcrop: area of approximately 12m^2; 5–50cm thick; 4 types of plastic debris (regarding composition and appearance): a) in situ plastiglomerates - adhered to the coastal platform made up of beach sediments, 1-30cm thick; b) clastic (or pyroplastic) plastiglomerates - clastic plastic debris or fragments of pre-existing plastic debris forms, mixed with terrigenous grains and/or bioclasts, c) in situ plastistone - vesicular melted plastic (>90%), predominantly green; and d) clastic or pyroplastic plastistone - remobilized plastic debris composed mainly of melted plastic (>90%) and terrigenous clastic sediments on the surface (<5%), predominantly green, some gray.	Not available	Polymers: polyethylene (PE), polypropylene (PP), high-density polyethylene (HDPE), low-density polyethylene (LDPE) and linear low-density polyethylene (LLDPE).	Santos et al., 2022
33	Bahian coast, BA	Beach	Pellets in sand from 9 beaches and their contamination with metals and rare earths	Average 45.0 ± 28.3 pellets/m^2	2-5mm	Rare earth concentration: 0.36 to 1.74 mg/kg (~5x higher in white or transparent pellets than in brown ones); sum of trace metals (Fe, Cd, Cu, Ni, Pb and Zn): 357 ± 12 mg/kg (higher in white pellets)	Souza et al., 2022
34	Patos Lagoon and Mirim Lagoon, RS	Estuary, sediment	Vertical distribution of MPs in 6 sediment samples: 3 in industrial, port and urban areas (SG1, PMAN1 and COC1) and 3 in agricultural areas (MIR2, MIR4 and SL1).	SG1: average of 0.19±0.57 MPs/g; PMAN1: 0.08 ± 0.19 MPs/g; COC1: 0.06 ±0.13 MPs/g; MIR2: 0.38 ± 0.65 MPs/g; MIR4: 0.18± 0.27 MPs/g; SL1: 0.06± 0.20 MPs/g.	≤ 5.0 mm	SG1: blue (33.3%) and black (14.8%); fibers (81.5%) and fragments (18.5%); polymers: (59.2%), rayon (14.8%), PVC (10%), acrylate (7.4%), polycarbonate (3.7%) and cellophane (3.7%) PMAN1: blue (60%) and white (28%); fibers (100%); polymers: (80%), rayon (8%) and polyester (4%); COC1: blue (57.9%) and black (26.3%); fiber (89.5%) and fragments (10.5%); polymers: (63.1%), rayon, (10.5%), polycarbonate (5.2%) and polyester (5.2%); MIR2: blue (37.5%) and white (27.5%); fiber (65%) and fragments (35%), polymers: (46.6%), rayon (26.6%), acrylate (6.6%), nylon (6.6%) and polyester (6.6 %); MIR4: black (50%) and blue (33.3%); fibers (1005); polymers: (46.6%), rayon (26.7%) and polyester (6.6%); SL1: blue (50%) and white (40%), fibers (100%); polymers: rayon (45.4%), acrylic (9%), polyester (9%) and possible polymer (9%).	Alves et al., 2023
35	Brazilian coast (44 beaches covering 35 degrees of latitude (2° N – 32° S)	Beach	Debris collected in the sand of 44 beaches	Total of 17,000 debris collected on 44 beaches; average of 0.42±0.53 items/m^2; plastic was the most abundant material on 97.7% of the beaches sampled (11,812 items).	Macroplastics (≥5 mm)	The most common plastic items were food packaging.	Andrades et al., 2020

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
BIOTA							
1	Santa Cruz Canal Estuarine Complex*, PE	Estuary, mangrove	Digestive tract of 3 species of demersal fishes (*Centropomus undecimalis, Bairdiella ronchus* and *Gobionellus stomatus*, n=82 individuals)	1.2 ± 1.3 - 3.3 ± 2.9 MP/fish.	≤ 5.0 mm	fibers (47%), pellets (40%) and fragments (13%).	Justino et al., 2021
2	Camburi Beach, Vitória, ES	Beach	Polychaete washing water, tube and tissue of *Phragmatopoma caudata* (2.7 kg of total sample)	1,516 MPs from wash water, 447 from tubes and 155 from digested tissue	5.38 – 0.01mm	Wash water: blue filaments (93.1%); tubes: blue filaments (56.37%), colorless filaments (16.54%), blue fragments (13.87%) and others (13.17%); fabric: blue filaments (81.29%) and others (18.71%); identified polymers: PE, PET and PP.	Costa et al., 2021
3	Espírito Santo coastal	Beach	Digestive tract of 19 species of coastal and pelagic birds (n=126 individuals).	Total of 212 MPs; average of 1.6 ± 7.1 MPs/Bird.	0.1–1 mm: 75 items (35%); 1–5 mm: 63 items (30%), 5–25 mm: 46 items (22%) and > 25 mm: 28 items (13%)	filaments (66 items, 50%), fragments/pellets (34 items, 26%), films (24 items, 18%), natural fibers/rubber (4 items, 3%), non-plastic items (3 items, 2%) and polystyrene foam (2 items, 1.5%).	Vanstreels et al., 2021
4	Porto Seguro, BA	Beach	Gastrointestinal content of 4 commercial fish species (*Eugerres brasilianus, Mugil curema, Mugil curvidens e Mugil liza,* n=120 individuals).	Total 140 MPs in 57 fishes.	≤ 1.0 mm	Black, blue and green MPs predominated in the samples; polymer type: polyester, polypropylene, semi-synthetic rayon fiber and polyamide (nylon).	Nunes et al., 2021
5	Gulf of Maranhão, MA	Estuary	Stomach contents of the *Hypanus guttatus* species (n=23 individuals)	Total of 17 MPs in 7 individuals; average of 2.4± 1.7 MPs/stingray	≤ 5.0 mm	Morphotypes: Fibers (82%), fragments (18%); Colors: blue (47%), transparent (35.3%), black (11.8%) and red (5.9%); Polymers: polyethylene terephthalate (PET; 35.3%); polyamide (PA), acrylonitrile butadiene styrene (ABS) and polyethylene (PE), 17.6% each; polypropylene (PP) and PET + styrene butadiene rubber (SBR), 5.9% each.	Pegado et al., 2021
6	Guarapari Islands, ES	Island, reef	Digestive tract of 21 species of reef fish (n=103 individuals).	Average: 1.67± 1.23 MPs/fish (0.0 to 26.0 MP/fish)	≤ 5.0 mm	Predominantly transparent MPs (n = 5) and yellow (n = 5), followed by black (n = 4) and other colors (n = 6).	Macieira et al., 2021
7	Natal, RN; Abrolhos*, BA and Arraial do Cabo*, RJ	Island, beach, reef	Intestinal contents of 3 species of reef fish (*Acanthurus chirurgus, Sparisoma axillare* and *Kyphosus vaigiensis*, n=167 individuals)	Total of 409 MPs (average 2.46 MPs/fish)	0.10-11.75 mm	Colors: blue (52.6%), black (36.9%), red (5.9%), colored (2.7%), transparent (1.5%), and green (0.5%); morphotypes: fibers (96.1%) and fragments (3.9%).	Cardozo-Ferreira et al., 2021

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
8	Paranaguá Estuarine system, PR	Estuary, mangrove	Hepatopancreas (HP) of an oyster species (*Crassostrea gasar* (n=100 individuals)	Total of 96 MPs (average 9.6 MPs/150 mg de HP)	0.03 -5.0 mm	Morphotypes: fibers (78%) and fragments (22%); colors: blue > black > red > transparent > yellow > purple.	Vieira et al., 2021
9	Estuary of Goiana river*, PE	Estuary, mangrove	Gastrointestinal content of two estuarine fish species (*Pomadasys ramosus* and *Haemulopsis corvinaeformis*, n=126 individuals).	Occurrence of microfilaments: 100% in juveniles (lower estuary); subadults and adults: 50% to 100% in the upper and middle estuary.	≤ 5.0 mm	Colors: predominance of blue microfilaments, followed by red, green, black, purple and White.	Silva et al., 2018
10	Fluminense litoral*, RJ	Beach	Marine debris collected around the burrows of a species of crab (*Ocypode quadrata*) in 4 beaches (Iquipari, Grussaí, Vargas and Dentinho)	Total of 1696 burrows analyzed: 7% contained debris and were more occupied (50 to 80%) compared to burrows without debris (10% to 50%) on all beaches.	Macroplastics	Hard and soft plastic, foam, rope and straw were the main categories of debris reported.	Costa et al., 2018
11	Garopaba, SC	Beach	Gastric contents of fish species *Priacanthus arenatus* (n=122 individuals)	Total of 210 items in 49.7% of the individuals analyzed (60% of plastic items from fishing activities)	Macroplastics	Polymers: polyamide filaments (8%), boat paint (55%), plastic packaging (12%) and others (25%).	Cardozo et al., 2018
12	Estuary of Goiana river*, PE	Estuary, mangrove	Gastric contents of fish species *Cynoscion acoupa* (n=522 individuals)	Total of 1,073 MPs (average of 3.03 ± 4.06 MPs/fish); 51% of samples contained plastic particles.	≤ 5.0 mm	Filaments (99.9%), rigid particles (<0.01%); colors: blue (44.6%), purple (19.8%), black (13.4%), red (10.0%) and white (12.2%).	Ferreira et al, 2018
13	Estuary of Amazonas river, AM e PA*	Estuary, mangrove	Digestive tract of 46 species of fish (n= 189 individuals)	Total of 228 MPs in 26 individuals of 14 species (13.7% of total abundance and 30.4% of species richness in samples).	≤ 5.0 mm	Polymers: polyethylene, nylon and polyamide; morphotypes: pellets (97.4%), leaves (1.3%), fragments (0.4%) and threads (0.9%).	Pegado et al., 2018
14	Guanabara Bay, RJ	Bay	Mesozooplankton (n=36 samples from 3 locations)	MPs em todas as amostras (abundância: 0,6-11 MPs/m^3). Amostras coletadas com 200µm de tamanho apresentaram abundâncias de 1,3 m-3 e significância p<0,05, com tamanho de 64µm o valor da significância foi de p>0,05	≤ 5.0 mm	Morphotypes: thick fragments (55%), thin fragments (30%), films (10%), fibers (~1%); colors: blue (50%), yellow (15%), white (12%), transparent (10%), black (6%) and others (7%).	Figueiredo e Vianna, 2018
15	Rio Grande do Norte coastal, RN	Ocean water	Macroplastic ingestion by an epipelagic fish (*Coryphaena hippurus* species)	Part of a plastic bowl (99.57 cm^2 and 12.77g) occupied 80% of the volume of the fish's stomach.	Macroplastic	Not available.	Menezes et al, 2019

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
16	Laguna Estuarine system, SC	Estuary	Digestive tract of fish of the species *Genidens genidens* in different ontogenetic phases (n= 92 individuals, 26 juveniles and 66 adults).	Total of 13 fragments in adults and 8 in juveniles; frequency of 26.9% for the occurrence of plastics in the stomachs analyzed.	Variable	juvenile individuals: 2.16 mm± 1.95; adult individuals: 2.07 mm± 3.02; largest fragment found: 14.6 mm.	Dantas et al, 2019
17	Estuary of Goiana river*, PE	Estuary, mangrove	Gastrointestinal content of 2 fish species, *Centropomus undecimalis* and *C. mexicanus* (n=529 individuals)	In all ontogenetic phases, more than 50% of individuals ingested microplastics (1.5 ± 0.1 MPs/fish).	≤ 5.0 mm	Filaments (~98%)	Ferreira et al, 2019
18	Guanabara bay, RJ	Bay	Tissue from wild and cultivated mussels of the Perna Perna species, with and without depuration (n=40 individuals).	Average of 16.6 ± 6.6 – 31.2 ± 17.8 MPs/ mussel	≤ 5.0 mm	Blue, transparent and red fragments and fibers; all fibers were identified as nylon (polyamide); fragments: PMMA (polymethyl methacrylate).	Birnstiel et al, 2019
19	Pinhal balneary, RS	Beach	Gastric contents of a seabird of the species *Haematopus palliatus* (n=24 individuals)	Total of 760 pieces of debris of which 96% were plastics.	1-20mm	Pellets (71%), nylon threads (4%); fragments: 98% were rigid and only 2% were malleable plastic; majority of total plastics (86%): microplastics (1-5 mm) and 14% mesoplastics (>5-20 mm); colors: blue (62%), green (58%), brown (46%), red (37%), dark (37%), yellow (12%) and gray (8%).	Rossi et al, 2019
20	Patos Lagoon Estuarine Complex, RS	Estuary	Gastric contents of 5 species of sea turtles (*Chelonia mydas, Caretta caretta, Lepidochelys olivacea, Dermochelys coriacea* and *Eretmochelys imbricata*); n=86 individuals.	Total of 2,711 plastic items in 49 individuals; 1 to 544 items/individual.	Macroplastics	Types: packaging (82.1%), fishing lines (76.9%) and hard fragments (74.4%); the highest frequency of ingested items were transparent flexible fragments (89.7%); polymers: polyethylene (PE), polyamide (PA), polyvinyl vinyl acetate (EVA), polyurethane (PUR), polypropylene (PP), poly acrylonitrile butadiene styrene (ABS) and polystyrene (PS).	Rizzi et al, 2019
21	Southeast and South Coast	Water	Gastric contents of 8 species of fish caught in industrial fishing fleets (*Katsuwonus pelamis, Pomatomus saltatrix, Cynoscion guatucupa, C. jamaicensis Macrodon atricauda, Umbrina canosai Micropogonias furnieri Prionotus punctatus*), n=965 individuals.	210 plastic items in 134 specimens (110 items in pelagic species, 56 in demersal-pelagic species and 44 in demersal fishes).	0.1-135.0 mm	Morphotypes: 124 were fibers/lines (59%), 69 rigid fragments (32.9%), eight pellets (3.8%), eight flexible fragments (3.8%) and one glitter (0.5%); colors: transparent (32.9%), black (24.8%), blue (23.8%), white (9.0%), red (6.7%), green (2.4%) and ash (0.5%); polymers: of the 69 plastic items evaluated, polyamide (52.1%), polyurethane (25%), polypropylene (13%), polystyrene (7%) and polyethylene terephthalate (2.9%).	Neto et al., 2020

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
22	Estuary of Goiana river*, PE	Estuary, mangrove	Gastrointestinal content of 13 fish species (n=294 individuals).	Total of 66 MPs in 63 individuals belonging to 10 species; highest number of fibers: detritivorous species (21 MPs), followed by omnivores (17 MPs), herbivores (15 MPs) and insectivores (13 MPs); all species captured in urbanized streams (five species) ingested MPs.	≤ 5.0 mm	Fibers (100%).	Barletta et al, 2020
23	Ponta Verde beach, AL	Beach	Gastrointestinal contents of a crab species (*Pachygrapsus transversus*), n=212 individuals.	Around 47.4% of crabs ingested at least one piece of plastic; no significant differences between sexes, but significant differences in the relative condition factor (Kn) between contaminated and uncontaminated individuals.	≤ 5.0 mm	Blue nylon fibers (100%).	Barros et al, 2020
24	Pará Northeast coast, PA	Beach	Contents of the gastrovascular cavity of a species of sea anemone (*Bunodosoma cangicum*), n=90 individuals.	Total of 141 items in 68 individuals (75.6%); average of 1.6 (±1.5) items/individual.	1 -25mm	Fibers 84%, fragments (~12%) and films (~4%); polymers: polyethylene terephthalate (PET), polypropylene (PP), polyamide (PA), polyurethane (PU), polyethylene (PE), acrylonitrile butadiene styrene (ABS), polystyrene (PS) and rayon.	Morais et al., 2020
25	Fortaleza, CE	Beach	Gastrointestinal contents of 7 fishes species Species of fish caught with fishing net (*Opisthonema oglinum, Bagre marinus, Cathorops spixii, Sciades herzbergii, Chloroscombrus chrysurus, Conodon nobilis, Haemulopsis corvinaeformis*), n=214 individuals.	Total of 327 MPs in 55% of individuals; 0-14 MPs/fish.	≤ 5.0 mm	Blue (28%) and transparent filaments (20%); most of the filaments found were blue synthetic fibers (polyester).	Dantas et al., 2020
26	Beaches adjacent to the Paraíba River Estuary, PB	Estuary, beach	Gastrointestinal tract of a fish species in different ontogenetic phases (*Stellifer brasiliensis*), n=443 individuals.	Total of 55 plastic items in 42 individuals (9.48%), average of 1.3 ± 0.5 MP/fish; frequency of intake: adults (13.8%; n = 9), juveniles (9.7%; n = 12) and subadults (8.3%; n = 21).	0.18 to 4.7 mm	The predominant color was blue and the fiber was the most common morphotype in all ontogenetic phases.	Amorim et al., 2020
27	Coast of Alagoas, São Paulo and Espírito Santo	Beach	Gastrointestinal contents of a species of green turtle (*Chelonia midas*), n=223 individuals.	The individuals who ingested more than 5g of plastic (n=136 individuals) were considered	≤ 5.0 mm	Not available.	Santos et al., 2020b

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
28	São Pedro and São Paulo archipelago, RN	Nest	Frequency of anthropogenic material in nests of a bird species (*Sula leucogaster*) n=296 active nests between 2015 and 2016).	2015 (93 active nests): total of 30 items in 19 nests (20.4%) and average of 1.5 ± 1.0 items; 2016 (203 active nests): total of 45 items in 27 nests (13.3%) and average of 1.6 ± 0.8 items.	Macroplastics	2015 – morphotypes: most were considered diverse (73.6%), followed by hard fragments (31.5%); laminated plastics, wires and foams were less frequent; colors: white/transparent, followed by orange/brown and blue/purple; 2016 – morphotypes: the most common was filiform plastic (81.2%), followed by miscellaneous items (29.6%), including pencils, screws, cloths and other objects; colors: blue/purple followed by white/transparent.	Brentano et al., 2020
29	Vitória, ES and SC	Water; samples collected from local markets.	Analysis of four species of bivalves commercialized in the Brazilian markets (*Crassostrea gigas, Mytilus edulis, Perna perna e Placopten magellanicus*) n=91 individuals.	MPs were found in all bivalve samples with average of 10.69 ±0.43 PMs/individual and 1.64 ±0.19 MPs/g of wet weight.	0.02 a 7 mm	Morphotypes: fibers (72 to 83%); fragments (up to 30%); films (4 to 5%) and pellets (4% maximum).	Bom e Sá, 2022
30	Vitória and Guarapari, ES	Water; rocky shore	Analysis of MPs in a species of bivalve (*Perna perna*), n=240 individuals.	Average 8.3 ± 1.0 MPs/individual and 1.4 ± 0.3MPs/g; Average concentration in surface water samples: 41.4 ± 15.7 MPs/L	≤ 5.0 mm	Fiber: more than 70%; fragments 21% and films 7%; colors: black (50%), blue (26%) and red (6%); other colors (10%).	Bom et al., 2022
31	Estuary of Itapessoca river, PE	Estuary, mangrove	MPs analysis in a bivalve species (*Anomalocardia flexuosa*), n=60 individuals.	Total of 309 MPs in 60 individuals; MPs between 0 and 16 particles (average of 5.15 ±3.80 MPs/individual and 3.66 ± 2.59 MPs/g tissue).	≤ 1.0 mm	Fragments: 54%, followed by fibers 43% and pellets 3%.	Bruzaca et al., 2022
32	Estuary of Maracaípe river, PE	Estuary; sediment	Analysis of the plastic cover effects on macrobenthic faunal sedimentary community (multiple species and taxa)	Beginning of the experiment: sediment with low OM contents; after experiments (plastic bags): significant differences between treatments for OM content; Macrofauna: total of 7,683 individuals distributed in 27 taxa; 2,354 individuals were collected at the beginning of the experiment and 5,329 at the end; At the end of the experiment: the control showed an increase in 5,162 individuals and the treatment with plastic covering showed a significant reduction (167 individuals).	Macroplastics	Plastic Bags.	Clemente et al., 2022

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
33	Fernando de Noronha archipelago*, Rocas Atoll* and adjacent seamounts	Deep water	Analysis of tissues of two cephalopod species, *Vampyroteuthis infernalis* and *Abralia veranyi* (n=27 individuals).	Total 201 MPs detected: *V. infernalis* (182 MPs; average of 9.58 ± 8.25 MPs/ individual) and *A. veranyi* (19 MPs; average of 2.37 ± 2.13 MPs/individual)	0.06 a 3.91mm	Morphotypes: fragments were most common in both species (*V. infernalis* 3.36 ± 3.67MPs/ind. and *A. veranyi* 1.5 ± 1.69MPs/ind.), followed by fibers (*V. infernalis* 3.05 ± 2.34MPs/ind. and *A. veranyi* 0.5 ± 0.75MPs/ind.) and spheres (1.84 ± 6.6MPs/ind. and 0.37 ± 0.52MPs/ind., respectively); colors: white (6 ± 7.17 MPs/ind.) prevailed in *V. infernalis*, followed by blue (1.26 ± 2.15 MPs/ind.) and red (1.15 ± 1.64 MPs/ind.), while *A. veranyi* was more contaminated by blue particles (1.12 ± 1.35 MPs/ind.), white (0.87 ± 0.64 MPs/ind.) and black (0.25 ± 0.7 MPs/ind.); polymers: polyethylene (34%); polyethylene terephthalate, polyvinyl chloride, polyamide, styrene-butadiene rubber, chlorinated polyisoprene and polyurethane, 11% each.	Ferreira et al., 2022
34	Pituba beach, BA	Beach; Porifera Collection of the Natural History Museum of Bahia.	Comparative analysis of MP in tissue of a sponge species (*Cinachyrella alloclada*) with a time interval of 36 years (1981 and 2017, n=20 individuals)	Total of 24 MPs; average size: for the 1981 samples 0.13 ±0.40MP/g sponge while in the 2017 samples 1.37 ±0.94MPs/g of sponge. Frequency: 10% of 1981 individuals presented MPs compared with 80% of the 2017 individuals.	≤ 5.0 mm	Prevalent morphotype: fibers (inner region of sponges); Polymer: polypropylene (PP).	Soares et al., 2022
35	Lakes Region, RJ	Beach; sand	Analysis of lesions and pathologies observed in two species of sea turtles (*Chelonia mydas* and *Eretmochelys imbricata*) after ingestion of fishing lines (n=28 individuals).	Among the 28 turtles, 8 ingested fishing line; of these: 3 with severe macroscopic lesions and all with microscopic lesions.	Macroplastics	Fishing lines.	Lima et al., 2022
36	Ponta Verde and Ipioca beaches, AL	Beach; reef	Gastrointestinal content of a species of crab (*Eriphia gonagra*), n=375 individuals.	Total of 187 MPs in 127 individuals (33.86% of the total); percentage frequency of MPs in stomach contents: Ponta Verde (0.48%) and Ipioca (75.59%, with 1 to 15 MPs/individual and an average of 1.12± 2.31MPs/individual); ovigerous females: greater percentage of MPs found (80%) than males (62.40%) and non-ovigerous females (57.89%)	≤ 5.0 mm	Ponta Verde: only a blue fragment ingested by a male (0.48%); Ipioca: fragments of blue and black fishing net threads (97.10%), plastic bag waste (6.34%), styrofoam (2.38%).	Santana et al., 2022

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
37	Fernando de Noronha Archipelago*, Rocas Atoll* and adjacent seamounts	Water	Analysis of the gastrointestinal content of 4 species of mesopelagic fish: *Argyropelecus sladeni, Sternoptyx diaphana (Sternoptychidae), Diaphus brachycephalus* and *Hygophum taaningiII* (n=170 individuals).	Total of 213 MPs in 170 individuals; frequency by species: *A. sladeni* 1.66 ± 1.23 MPs/individual; *D. brachycephaly* 1.63 ± 1.41 MPs/individual; *H. taaningi* 1.07 ± 1.20 MPs/individual and *S. diaphana* 0.54 ± 0.71 MPs/individual.	≤ 5.0 mm	Morphotypes: fibers (64%), fragments (19%), pellets (6%), films and foams (4%); polymers: polyamide (25%), polyethylene (19%), polyethylene terephthalate (19%); ethylene vinyl acetate (EVA), polyvinyl chloride (PVC), styrene butadiene rubber (SBR), polylactic acid (PLA), alkyd varnish and chlorinated polyisoprene (6-7%).	Justino et al., 2022
38	Maracajaú*, RN	Coastal Reef	Experimental evaluation of the presence of plastic debris in the reef substrate and its effect on fish feeding in the benthos (n=212 individuals); field experiment: a) reef control area (without addition of plastic debris); b) adjacent area with the addition of 8 standardized plastic debris (plastic treatment); c) area with 8 standardized plastic debris + microbial biofilm; video image monitoring: number of bites given by fish in the benthos within each treatment, species identification and total length of each individual in the sampled area.	Total of 212 fish were recorded feeding on benthos; only 6 individuals (~3% of total bites) bit the implanted plastic debris (36 bites total), mainly when the plastic was covered with biofilm (83%, 31 bites). Total 2,272 bites on the substrate: 49% (1,123) occurred in the control treatment, 31% (704) in the plastic treatment and 20% (445) in the plastic treatment with biofilm; the presence of plastic reduced fish feeding in the benthos, regardless of the presence of biofilm and the fish almost did not interact with plastic debris.	Macroplastics	Standardized plastic debris: polystyrene (PS) and polypropylene (PP).	Menezes et al., 2022
39	Vitória, ES	Beach, sediment	Analysis of MPs in sediment and 4 species of bivalves: the oyster *Crassostrea brasiliana*, the mussels *Mytella strigata* and *Perna perna* and the clam *Tivela mactroide*	Total of 3,337 MPs: 1,488 in the sediment, 463 in the bivalve mollusk pool (average: 31.22±7.32 to 7.30±1.11 MPs/individual) and 1,386 in the bivalve tissues analyzed in two sampled locations.	≤ 5.0 mm	sediment: morphotypes - filaments (> 51%); colors - black 17.5%, transparent 12.5% and other types (red and green) 18.7%; Bivalves (pool): blue filament (72.9%), transparent fragment (37.9%); Bivalves (individuals): blue filaments 57.3%; polymers: polypropylene, polyethylene and polyethylene terephthalate (PET).	Costa et al. 2023

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
40	Fernando de Noronha Archipelago*, Rocas Atoll* and adjacent seamounts	Ocean waters	Digestive tract of 9 species of lanternfish (Myctophidae, n=364 individuals).	Total of 462 MPs in 248 individuals (68%); average: 1.27 MPs/individual.	≤ 5.0 mm	Morphotypes: fibers, fragments and foams; colors: blue (49%), white (35%), red (8%), black (7%) and green (1%); polymers: polyethylene (17%), polyethylene terephthalate (PET, 17%), polyamide (14%), styrene-butadiene (14%), polyvinyl chloride (10%), acrylonitrile butadiene styrene (7%), alkyd varnish (7%), ethylene vinyl acetate (3%), polycarbonate (3%) and polybutadiene rubber (3%).	Ferreira et al., 2023
	WATER						
1	North Coast, RS	Water	Analysis of content retained in fishing nets (marine litter, discarded fish and used fish).	Total of 4,213 items: 1,500 discarded fish, 1,384 fragments of marine debris and 1,329 used fish; macroplastics were the most frequent items (98.4% of marine litter).	Macroplastics	Bags (n = 1,191), rigid plastic cups and lids (n = 89), plastic threads and filaments exclusive to fishing (n = 55), packaging (n = 17) and bottles (n = 11).	Pinheiro et al, 2021
2	Acaraí lagoon, Babitonga Bay Estuarine Complex*, SC	Water	Floating fragments of plastic and microplastic.	Average 0.0014–0.108 MP units/m^3.	<5mm-200mm	Main polymers: polyethylene, polyester, polypropylene, polybutadiene and polystyrene.	Lorenzi et al., 2021
3	Guanabara bay, RJ	Water	Thermotolerant bacteria and floating plastic debris.	Total of 14 plastic debris; 120 bacterial strains were isolated from water and plastic samples, of which 59 *E. coli* and 61 *Vibrio* spp.	Macroplastics	Polymers: 35.71% polyethylene (PE), 28.57% polypropylene (PP) and 35.71% polyethylene tephthalene (PET).	Silva et al., 2019
4	Guanabara bay, RJ	Water	Surface water sample at 3 points in the bay (n=2 sampling)	Total of 4,894 MPs, from 1.40 to 21.3 particles/m^3.	≤ 5.0 mm	Polymers: 81.7% polyethylene (PE), 16.20% polypropylene (PP) and 2.1% unknown composition; aged (9.3%) and colored (37.8%) particles.	Olivatto et al, 2019
5	Estuary of the Paraíba river, PB	Water, estuary, sand beach	Analysis of marine debris retained in fishing nets (two points on the beach at different tides).	Total of 966.08 items/km^2 and 17,778.87 g/km^2.	2.3-923.0 mm	38 samples (79.2%) showed marine litter: hard plastic (68.75%) and soft plastic (19.62%); hard plastics: bottles, disposable plates, cups and cutlery; malleable plastics: shopping bags, food packaging and plastic film; nylon: ropes and fishing fragments.	Ramos and Pessoa, 2019
6	Acaraí lagoon, Babitonga Bay Estuarine Complex*, SC	Water	Analysis of plastic fragments in 4 points of the lagoon in winter and summer.	Volumetric average 0.22 ± 0.25 MPs/100m^3 (summer) and 2.45 ±2.94 MPs/100m^3 (winter); average area of MPs: 5.03 ±9.36mm^2 (summer) and 20.56 ±24.69mm^2 (winter); higher density values of plastic fragments were observed in external areas (3.4 ± 3.8/100 m^3) and bottom (1.4 ± 1.2/100 m^3) of the lagoon.	<5mm-24mm	Paint fragments, rigid MPs, filament and flexible MPs; winter: flexible MP (11.2 ± 13.1 mm^2), filament (1.0 ±1.4 mm^2) and greater average surface area of plastic debris (20.5 ± 24.6 mm^2).	Lorenzi et al., 2020
7	Brazilian Equatorial Margin	Water	MPs collected on two different mesh sizes (120 and 300 µm).	120µm mesh: average density 0.14 ± 0.11MPs/m^3; 300 µm mesh: average density 0.02 ± 0.01 MPs/m^3.	≤ 5.0 mm	Morphotypes: fibers and filaments (~80%) occurred in all seasons and in both mesh sizes. Hard plastic (78%) only in 120 µm mesh; highest density of MPs in the 120 µm mesh: station P7 (0.46 items/m^3), while for the 300µm network the sample with the highest value was at station P8 (0.06 item/m^3)	Garcia et al., 2020

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	Location	Environment	Matrices analyzed	Average quantification	Size	Types	Reference
8	Laguna Lagoon Estuarine System (LES), SC	Water	Analysis of floating meso and microplastics collected with a plankton net (n=30 samples).	Total of 8,668 plastic fragments (total density: 7.32/m^3).	0.005 to 0.71mm^2	Morphotypes: filaments (7,786 fragments, density 6.61/m^3), malleable plastics (576 fragments and density 0.45/m^3), rigid plastics (306 fragments, density 0.24/m^3); filaments: polyester, polypropylene and polyethylene; malleable plastics: polyethylene and polybutadiene; rigid plastics: polyethylene.	Monteiro et al., 2022
9	Fortaleza, CE	Water	MPs (n=5 samples)	Total of 619 MPs.	≤ 5.0 mm	Morphotypes: fibers (57%) and fragments (36.2%); polymers: polyurethane and alkyd resin, polyethylene, polypropylene, polystyrene, polyamide mixtures, thermoplastic rubber and polyester fibers; colors: dark green fibers (22%), transparent fibers (15.1%), blue fibers and blue fragments (11% and 13.3%, respectively), white fragments (6.2%) and black (6, 8%).	Nolasco et al., 2022
10	South Coast, SC and RS	Water	Qualitative and quantitative assessment of floating plastics and associated biota in coastal and oceanic Waters.	Total of 371 plastic particles of different sizes: average of 4,461± 3,914 items/km^2, 2,989 items/km^2 at the oceanic station and 5 to 19,267 items/km^2 at the coastal station; MPs (0.5 -5 mm) were the majority. Several groups of prokaryotes (20 phyla of bacteria) and eukaryotes (41 groups) have been associated with plastics.	Macro and microplastics	Morphotypes: fragment (65%), line (33%); other forms (pellet, foam and film: 1%); flexible plastics (75%); colors: white/transparent and blue (44% and 32%, respectively); polymers: polyamide (PA, 48%), polyurethane (PU, 21%), polyethylene (PE, 9%), polystyrene (PS, 9%), polypropylene (PP, 7%), polyethylene terephthalate (PET, 7%), cellulose acetate (CA, 3%) and ethylene vinyl acetate (EVA, 1%).	Lacerda et al., 2022

*locations in environmental protection areas.

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Table S2: Review articles about of microplastics presence in Brazilian coastal environments from 2018 to 2023.

	Objective	Period; articles evaluated	Main results and conclusions	Gaps for future works	Reference
1	Compile previous studies that investigated MPs in Brazilian ecosystems with intention of reaching the state of the art of studies on MPs in Brazil, identifying possible gaps in this knowledge, in order to direct future research on the topic in the country	Until 2017; 35 articles.	Most scientific investigations on MPs in Brazilian ecosystems were related to the presence of MPs in biota; broader studies have been carried out on the Northeast and Southeast coast, mainly in the states of Pernambuco (Federal University of Pernambuco) and São Paulo (University of São Paulo), showing the need to form new groups outside these regions. Studies were carried out independently and collaboratively with the same frequency.	In addition to the coastal area, monitoring in freshwater ecosystems deserves attention, as only one of the studies was carried out in this environment. Microplastic studies are important to assess risks and impacts and improve the monitoring of this pollutant in the aquatic environment, in order to contribute to public awareness processes, environmental planning and coastal zone management.	Castro et al., 2018
2	Explore the aspects: a) systematic operation of the plastic industry production chain, with descriptions of the main polymers produced and consumption percentages; b) MPs: definition by size and origin, destinations in the environment and impacts and c) studies on MPs carried out in Brazil and the analytical methods used.	Until 2018; 21 articles.	Studies on the occurrence of MPs in Brazil have been carried out, largely in the marine environment; Rivers are identified as the main source of microplastics in the marine environment (80%). The extreme consumption and lack of management of plastic waste, considering factors such as its wide distribution, slow degradation and potential for accumulation in sediments, microplastics are now being considered as a new candidate to be a stratigraphic marker of the Anthropocene. Interest in this subject has grown in Brazil, in line with the relevance of the topic in the area of environmental sciences in the country.	Understanding and dynamics in freshwater systems; effects caused by microplastics; evaluation and development of more efficient analysis protocols for the collection procedures and qualitative identification of these residues.	Olivatto et al., 2018
3	Consolidate records of plastic ingestion by biota in different environments: freshwater and estuary, estuary, marine environment and estuary and marine environment.	Until 2019; 108 articles.	Records of plastic ingestion were found in different environments: freshwater (17.1% of the species investigated), freshwater and estuarine (0.2%), undetermined (0.2%), estuarine (22.2%), estuarine and marine (5.6%) and marine (54.6%). Increasing plastic intake could increase negative effects on biodiversity and human well-being because many fish species have commercial value or perform important ecosystem functions.	The results obtained reinforce the need for policies that aim to minimize the consumption of plastic materials and the resulting pollution.	Azevedo-Santos et al., 2019

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	Objective	Period; articles evaluated	Main results and conclusions	Gaps for future works	Reference
4	Review the interactions between MPs and benthic fauna (mainly through their absorption and ingestion) and their consequences, presenting an overview of the ecological interference of this pollutant in the benthic community.	Until 2019; 67 articles.	Uptake and ingestion are clearly identified as the main routes of introduction of microplastics into marine benthos species. It is also clear from this review that researchers are exploring new animal models and experimental setups on microplastics-benthic biota interactions, which is extremely important and can be encouraged.	Studies focusing on the distribution of microplastics and the effects on sediments following interaction with biota (e.g. bioturbidity, excretion) will be important, as this pollutant is a strong candidate to serve as an indicator of anthropogenic interference in the benthic environment.	Pinheiro et al., 2020
5	Survey of the methods available for sampling, separation, characterization and detection of MPs in various matrices, elucidating the limitations and proposing the necessary improvements to increase data precision; promising techniques for detecting MPs; current protocols for evaluating the in vitro and in vivo toxicity of MPs, exposing the challenges and future directions towards expanding knowledge about the absorption, distribution and toxic effects of MPs in different organisms.	2010-2019; not available.	Water: most used sampling techniques: (i) Neuston nets and blankets; (ii) plankton networks; (iii) sieves; (iv) pumps and (v) ex situ filtration and screening; Sediment: for this sampling it is very important to consider the depth and sampling areas (e.g. high tide line, intertidal areas, transects) as sediment deposition is uneven; separation: filtration, sequential filtration, centrifugation, density, size, among others; Air: assessment of the presence of Mps is still limited. Polymer characterization techniques: FT-IR is the most used, followed by Raman spectroscopy; In vivo studies: various animal models such as zebrafish (embryos and adults), brine shrimp, zooplankton, bivalves, rats, mice, etc.	Need to improve currently available protocols to improve data accuracy; more studies that focus on the kinetics of absorption, accumulation and biodistribution of MNPs in biological systems.	Barbosa et al., 2020
6	The study presents a compilation of works that address macrodebris on the Brazilian coast. The main objective is to enable a better understanding of the current scenario, seeking to identify gaps that can be filled to better contribute to mitigating the problem.	2008–2019; 81 articles.	Scientific production consulted: 19 studies in the South Region, 30 in the Southeast Region, 28 in the Northeast Region and 2 on the South, Southeast and Northeast coast. The Southeast and Northeast regions participated with the largest number of universities and institutions that carry out these studies. Debris present in marine and coastal environments: cigarette butts are the most frequently found item; two articles carried out environmental education activities; seven articles had as main objective to verify the perception of beach users in relation to the problem of marine litter using questionnaires; the results show that despite the growing number of studies on the topic, there is still much to be done to understand the impacts of litter on the marine environment and seek solutions to mitigate the problem. The lack of standardization in methodology and presentation of results continues, as observed in this review for work carried out in Brazil, and is perhaps the biggest challenge to be explored in depth.	i) areas not yet studied: debris distribution patterns in marine and coastal environments; ii) environmental perception and environmental education studies are important to identify how much society knows about the problem of marine litter and test methods of raising awareness among uninformed people; iii) studies seeking to relate the presence of debris with the reduction in the economy of a municipality and management actions in these municipalities; iv) in mangroves: studies in areas of retention and export of debris to understand the dynamics of debris in these ecosystems; v) distribution of marine litter on the seabed and interaction with benthic marine fauna; vi) experimental work verifying the consequences of debris on fauna beyond entanglement or blockage of the digestive system through ingestion; vii) study the plastisphere (community associated with plastic) and understand the role of marine litter as a disperser of pathogens, and viii) carry out work to compare methodologies to achieve standardization.	Videla and Araújo, 2021

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	Objective	Period; articles evaluated	Main results and conclusions	Gaps for future works	Reference
7	Review of microplastic pollution in the marine waters of the South Atlantic Ocean (SAO), highlighting current trends, sources and perspectives.	2010-2020; 122 articles.	Discrepancy between studies on PM contamination in marine surface waters compared to those based on biota and sediment: need to expand studies in the SÃO; low number of studies compared to the Northern Hemisphere; current trend: sampling (using trawls), however without uniformity in relation to the mesh size of the trawls to be used; Concentration levels of MPs in the South African region (east of the SAO) have been significantly higher than those found in the western region; it is important to expand studies to other geographic regions such as Brazil, Uruguay and Argentina; plastic waste: growing global concern; large variation in the abundance of MPs and secondary sources: inefficiency of Sewage Treatment Plants; production, disposal and recycling of plastics must be a priority on the international political agenda.	a) monitor MPs in different environmental compartments (atmosphere, freshwater, seawater, soil, biota and sediment) and investigate their exposure levels and chemical and biological interactions to better understand potential risks to the environment and human health; b) studies that address issues related to maximum depth of the water column for sampling MPs and the optimal mesh size of trawl nets; c) need for comprehensive studies of analytical methods to clarify non-consensual points regarding sampling, sample treatment and characterization of MP samples; d) studies with the objective of reporting ocean circulation and its influence on the distribution of MPs are highly recommended in the future; e) studies on the influence of MPs on food chains are highly necessary.	Rocha et al., 2021
8	Track how research on MPs has been conducted in environmental samples in Latin America; summarize the main sampling, extraction and characterization methods used in different environmental compartments; provide a better understanding of the contamination and abundance of MPs in Latin American countries; compile information on impacts and toxicological effects caused by MPs; identify current gaps regarding these particles in Latin America.	1990-2021; 196 articles (16 territories of Latin America)	The sampling and treatment procedures used are quite variable, which makes comparisons between studies difficult; most of the work did not carry out quality control measures; Most studies carried out visual characterization and categorization of MPs in relation to shape, size and color; greater concentration of MPs in regions with high population density and/or regions without adequate sanitation and solid waste management; different sampling methods directly influence the quantity of MPs collected; studies in marine matrices (59%) and freshwater (16%); MPs can induce toxicological effects in living organisms; MPs have been identified as a potential vector in the transport of microorganisms across environmental compartments; MPs can be transferred between trophic levels of the food chain, although in some organisms these particles are ingested and directly excreted.	(i) need for more studies in Central America and the Caribbean; (ii) airborne contamination is ubiquitous; QA/QC measurements are crucial to better represent the real contamination by MPs in the different compartments; (iii) limited information on freshwater contamination in Latin American ecosystems; (iv) most of the organisms studied are from marine environments: need to carry out more investigations on freshwater and terrestrial organisms; (v) concentration of MPs: standard and consistent units, such as items/m^3 or items/L for water samples, items/kg or items/g for sediment samples, and items/ind or items/g for biota; (vii) need to use analytical techniques to identify the polymeric composition	Fernandes et al., 2022
9	Assess contamination levels of MPs in sediments and biota of marine protected areas (MPAs) using a geographic information systems (GIS) approach	2010-2021; not included	MPs were found in 186 MPAs, with levels ranging from 0 to 9,187.5 items/kg in sediments and up to 17,461.9 items/kg in organisms; maximum concentrations of MPs in multiple-use áreas (less restrictive to anthropogenic actions and located close to urban centers), but in restricted-use places MPAs were also affected; around half of the levels of MPs found in MPAs: higher concentration quartiles, suggesting potential impacts in these areas; in general, benthic species were more affected than pelagic species due to the higher concentrations of MPs reported in their tissues; alarmingly, MPs were found in tissues of two threatened species on the IUCN Red List (fish *Notarius bonillai* and sea turtle *Caretta caretta*).	Molluscs were the group most used to evaluate contamination by MPs, among the affected organisms; the conclusions denote urgent concerns about the effectiveness of the global protected areas system and conservation objectives.	Nunes et al., 2023

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	Objective	Period; articles evaluated	Main results and conclusions	Gaps for future works	Reference
10	Summarize and critically address the data available in the scientific literature on the ecotoxicological impact of MPs and nanoplastics (NPs) on gastropods.	Until 2021; 42 articles.	Bioaccumulation of MPs/NPs in 40 species of gastropods collected in the field; 15 gastropod species were used to evaluate the potential toxicity of MPs/NPs; Asia was responsible for the highest level of MPs/NPs bioaccumulated in gastropods followed by the South American, European and Antarctic continents; the toxicity of MPs/NPs depends on their composition, shape and size, as well as differences in the methodological approaches adopted by different studies; results showed that MPs/NPs induce several damages - such as behavioral changes, developmental toxicity, dysbiosis, histopathological changes, oxidative stress, induce ecological changes, in addition to acting as vectors of pollutants and increasing the toxicity of enantiomerically active chemicals.	The study demonstrated the need for a better understanding of the toxicity of MPs/NPs in gastropods and invertebrates living in terrestrial and aquatic environments through research focused on the description of the main organs that bioaccumulate micro(nano)plastics; toxicity trials focused on evaluating new biomarkers of embryotoxicity and toxicity for newly hatched snails; studies addressing the trophic transfer of MPs/NPs through snail predation and its effect on prey digestion; studies focused on the use of microbiota as a toxicity biomarker; studies focused on describing the toxicity mechanism that leads to physiological deficiencies; new and relevant histopathological biomarkers, such as cellular and tissue damage in skin, blood, as well as reproductive and nervous tissues; studies of the effects of MPs/NPs on the nervous system of gastropods.	Rodrigues et al., 2023
11	Characterize studies of contamination by MPs in sediment, water and biota, specifically on sandy beaches in Brazil; evaluate the current scenario of scientific publications related to MPs on Brazilian beaches to identify information gaps and current research demands in the country, as well as list the methodologies applied to analyze this material and their limitations.	2009-2021; 34 articles.	a) compartments with the highest number of studies on MPs: sediment (76%), water (12%) and biota (12%); b) most studies in the Southeast and Northeast regions; highest number of publications: SP (n = 10; 29.5%), RJ (n = 6; 17.6%) and PE (n = 6; 17.6%), followed by CE (n=3.88 %), SC (n=3.88%) and BA (n=2.59%); in MA, PA, PR and SE, only one publication each was found (11.8%); d) of the 17 coastal states in Brazil, 7 (41%) do not have studies on MPs on sandy beaches; e) main institutions that publish articles on MPs in the marine environment: USP, UFF and UFPE; f) 26 articles on sediments; plastic fragments constitute the predominant morphotype; g) MPs are found regardless of the level of urbanization and tourism; proximity to estuaries has a greater influence on the accumulation of trash on beaches than urbanization; h) predominance of MP morphotypes on different beaches is related to the main local anthropogenic activities; i) 4 articles on water; j) 4 articles on biota; 60% showed that fibers are the morphotype most found in the digestive tract; this type of MP is one of the categories most found in coastal areas and can easily be ingested by different foraging species on beaches, such as invertebrates; to date: no bioassay has been conducted using Brazilian beach animals as experimental model.	a) studies on the incorporation or excretion of pollutants by beach organisms after ingesting MPs, including ecotoxicological tests; b) scant information about the adsorption of toxic substances by organisms.	Oliveira et al., 2023

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Table S3: Articles retrieved in the systematic search for literature on microplastics in Brazilian coastal environments and classified in a different scope from other studies in the data group for the period from 2018 to 2023.

Tipology	Principal goals	Highlights	Reference
Review article	To understand the mechanisms which control the pellets deposition and which locations are most favorable for deposition on the beach.	The analysis of the altimetric, geomorphometric and meteoceanographic indicated that the accumulation of this pollutant on the beach is controlled not only by its physical characteristics, but mainly by storm surge events.	Ferreira et. al, 2021
Original article	Quantify the available surface area of micro- and macroplastics in different oceanic regions and assess the potential role of floating plastics as vectors for the transfer of toxins fromthree widespread benthic dinoflagellates,	The plastic relative colonization risks will be greater in the Mediterranean Sea and in the subtropical and temperate western margins of the oceans, such as the North American and Asian eastern coasts and, to a lesser extent, southern Brazil and Australia.	Leite et. al, 2022
Original article	To evaluate the effects of the interaction between microplastics and triclosan based on a mechanistic approach with oyster *Crassostrea brasiliana* as model.	The results demonstrate the ability of microbeads to carry pharmaceuticals and personal care products to marine ecosystems and promote physiological disturbances in coastal organisms.	Nobre et al., 2020
Original research	Understanding how microplastic particles move and accumulate within estuarine and coastal Waters by comparing the individual and combined ability of Particle Tracking Models (PTMs) and seasonal rainfall data.	Model outputs suggested that the dispersion of the PTM were strongly modulated by season and rainfall. An approach using Generalized Additive Modeling was employed to integrate the PTM outputs with rainfall data to successfully improve predictions of beached particles.	Gorman et. al, 2020
Original article	Propose a Plastic Waste Management Program for implementation in the city of Recife, Brazil.	The plastic waste management in Recife is relevant considering an integrated water environment on a river basin-to-ocean scale by. The integrated program recognized major connected water environments that could be made for other coastal áreas.	Moura et al., 2020
	Identify the perceptions of coast-based accommodation facilities managers regarding single-use plastics.	The results indicate that economic-driven decisions take precedence over environmental decisions, and there is not an existing common view around a direct relations-hip between plastic pollution and the reduction in tourist flows. The linear logic of continuous use and disposal prevails against the circular economy. Significant perception variations among the categories of accommodation companies were not noticed, as these are predominantly connected to their management.	Silva et al., 2022

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