Global Review and Analysis of the Presence of Microplastics in Fish

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Abstract
This review provides an account of fish species contaminated with microplastics (MPs) across the globe (seven continents). A total of 887 fish species were found contaminated with MPs based on MPs in the gastrointestinal tract/GI. The most MPs contaminated-fish species found were marine and demersal species. Globally 45 % of fish ingested MPs with an average concentration of 5.93 MPs particles per fish species. Among all the countries, China had the highest number of fish species contaminated with MPs in the following orders: China (176 species), Brazil (84), the USA (48), India (35), the Atlantic Ocean (31), Iran (30), Bangladesh (28), Turkey (26), Indonesia (25), the UK (23), Saudi Arabia (23), Thailand (21), Portugal (20), Australia (20), Italy (18), South Africa (18), Argentina (15), Chile (14), Galapagos Islands (Ecuador) (14), the North Pacific Gyre (14), Samoa (13), Malaysia (12), Colombia (11), New Zealand (11), Fiji (10), Spain (10), the North Sea (9), South Korea (9), Tahiti (9), Vanuatu (9), Ghana (8), Canada (8), Japan (7) and Nigeria (7) and others. MPs ingestion in fishes varied (high, medium, and low) among the locations/countries. In several locations/countries, MPs ingestion/contamination occurred in up to 100 % of fish samples. Because of MPs contamination, seafood fisheries, and the livelihoods of people associated with fishing, aquaculture, and seafood business, can be threatened. It may also increase health risks to seafood fish consumers since there is a probability that high risks pollutants adsorbed in MPs can be transferred to humans via the food chain.

Keywords: microplastics, seafood, fish, contamination, pollutant

Introduction
Plastic waste is ubiquitous and is reported from the Arctic to the Antarctic, from the surface to the sediments (Cressey, 2016; Kibria, 2017). Plastic pollution in marine and freshwater environments has been identified as an emerging global problem. It is estimated that plastic debris accounts for 60–80 % of marine litter, reaching 90–95 % in some areas (Xanthos and Walker, 2017). Around 80 % of plastic pollution originates from land-based sources, with the remainder from ocean-based sources such as fishing nets and fishing ropes.

The common types of plastics are polyethylene (PE), polyester (PS), polyethylene terephthalate (PET), polyvinyl chloride (PVC), polypropylene (PP), polystyrene (PES), and polyamide/nylon (PA). Large plastic items break into smaller pieces called microplastics (MPs) that are less than five millimetres (1 µm to 5 mm) in size. MPs are the result of intentional production (primary) or fragmentation of larger plastics (secondary), e.g., plastic bags, bottles, and car tires (Hermsen et al., 2018; Kibria et al., 2021a). Weathering, wave action, wind abrasion, biodegradation, and ultraviolet photo-degradation cause the degradation of larger plastic particles or items such as fishing gears, textiles, plastic bags, bottles, and car tires into MPs (Alimi et al., 2018).

MP pollution is an emerging global concern and has been detected in soils, sediments, surface waters, drinking water, agricultural food, and seafood (Kibria et al., 2022a, b, c). MPs have been found or detected in...
several fish species across freshwater, marine, and estuarine environments (in both shallow and deep water) (Valente et al., 2019; Yuan et al., 2019; Kasamesiri and Thaimuangphol, 2020; Talley et al., 2020; Kibria et al., 2022a, b, c). Furthermore, aquacultured fish, fish bought from fish markets, and wild-caught fish have all been found with varying amounts of MPs in their guts, gills, and tissues (Rochman et al., 2015; Wootton et al., 2021a; Wu et al., 2020). Nonetheless, fish, whether fresh (Romero et al., 2015; Mallik et al., 2021), canned (Karami et al., 2018), dried (Karami et al., 2017) and or even fish meal (Karbalaei et al., 2020), has also been contaminated with MPs (Kibria et al., 2022b).

MPs can be directly ingested by pelagic and demersal fishes either mistakenly or confusing as prey or food (plankton) or while searching for food in the sediments (Kibria et al., 2021a). Due to the small or minute particle size, MPs are reported to have been ingested by various fishes (Daveison and Asch, 2011; Lusher et al., 2013; Rochman et al., 2015; Romero et al., 2015; Güven et al., 2017; Anastasopoulou et al., 2018; Pegado et al., 2018; Wieczorek et al., 2018; Ding et al., 2019; Ryan et al., 2019; Gurjar et al., 2021; Wootton et al., 2021a) and sharks (Leclerc et al., 2012; Nielsen et al., 2014; Alomor et al., 2019; Gurjar et al., 2021; Wootton et al., 2021a) and oceanic or reef-associated species (Foekema et al., 2013; Mathalon and Hill, 2014; McNieth et al., 2018). The number of MPs found in the gut contents of fish may reflect the MPs' pollutants level at a site.

Despite the omnipresence of MPs in different environmental matrices, only a few studies were carried out to document a list of fish species contaminated with MPs (e.g., Azvedo-Santos et al., 2019). Therefore, the paper aims to analyse the recent global literature (2009–2021) to investigate the concentration and frequency of occurrence of MP particles in fish. The main objectives of this article was to collect, collate, analyse, interpret, synthesise, and document a list of fish species from marine, brackish and freshwaters contaminated with MPs across the globe.

Materials and Methods

Data on fish related to MPs contamination and ingestion were obtained using the following search engines: Google Search, Science Direct, Research Gate online, Scopus, PubMed, SpringerLink, Web of Science, Wiley Online Library, Springer Nature, and RMIT University Library database. The following keywords were used for the search that generated the number of relevant articles shown in parenthesis: i) microplastics + ingestion + fish (190) ii) microplastics + ingestion + fish + oceans and seas (131); iii) microplastics + ingestion + fish + freshwater (54); iv) microplastics + ingestion + fish + location/ country (including a location or a country at one time such as the Arctic Ocean or the Atlantic Ocean or Australia or Bangladesh or Brazil or China, Iran or Thailand or Turkey or Ghana or South Africa or UK or USA) (generated more than 200+ articles). A total of 208 journal papers and technical documents published between 2009 and 2021 were selected for this review. These cover MPs ingestion data of marine, brackish, and freshwater fishes. The supplementary Table 1 of this paper contained details of each of the 887 contaminated fish species regarding, i) location/ country; ii) common names, iii) scientific names; iv) living and feeding habitats of contaminated fishes (e.g., bathymeseral or bathypelagic or bathopelagic or demersal or pelagic or pelagic-neritic or pelagic-oceanic or reef-associated), v) MPs ingestion by each fish for MPs concentration/accumulation in fish (MPs in the gastrointestinal tract or GI); frequency of MPs ingestion (% MPs ingested by fish species), and, vi) categories of contaminated fishes into marine, brackish, or freshwater. The feeding habitats and environments of marine, brackish, and freshwater fishes were based on Froese and Pauly (2021).

The following terminology has been used in this paper: bathyplagic - the deep sea where the environment is dark and cold and depth of between 1,000 and 3,000 meters; benthic - organisms that live near or on the bottom sediments; bathypelagic - species that live and feed near or on the bottom as well as throughout the water column; demersal - those live on or near the bottom and feed on organisms (plant or animal); dw - dry weight; GI - gastrointestinal tract (stomach, intestine of fish); MP - microplastics; neritic species - those living in coastal areas; oceanic species - species living in open waters of the sea; pelagic - those live at the surface or throughout the water column and forage on organisms that live therein; reef-associated species - those living and feeding on or near coral reefs (benthic or bathypelagic fishes that consistently associate with hard substrates of coral, algae or rocky reefs fishes are those individuals that live on a coral reef) (https://www.fishbase.se/glossary/Glossary.php?q=reef-associated). This review considers benthic as a synonym of demersal and vice versa. Fish was referred to as seafood and was used interchangeably and vice versa.

Results and Discussion

List of fish species contaminated with MPs across the globe

Fish species were found contaminated with MPs in all seven continents (Fig. 1; Supplementary Table 1). Based on 208 journal papers (published between 2009 and 2021), a total of 887 fish species had ingested MPs (or contaminated with MPs) in 56 locations/countries across the globe. This study reveals a much higher
number of fish species contaminated with MPs than previous studies. For example, this study found 887 fish species ingested or were contaminated with MPs, while much lower MPs contaminated fish species were reported by Jabeen et al. (2017) (150), Markic et al. (2020) (322), Azevedo-Santos et al. (2019) (427) and recently by Wotton et al. (2021b) (506). The current study’s findings of a much higher number of MPs contaminated fish species may be linked to the following facts: i) More plastics pollution occurring in recent times in the marine, brackish, and freshwater environments due to mismanagement of plastic waste; ii) More research is being done on MPs contamination of fish and seafood species across the globe; and iii) More research results are available to the general public via open-access journal papers and social media (Twitter, Facebook, Instagram).

Based on the environments, the most MPs-contaminated fish species found in this study were marine in the following orders: a). marine (42.33 %); b). marine and brackish (24.74 %); c). marine, freshwater, and brackish species (12.99 %); d). freshwater (11.17 %); e). freshwater and brackish (8.44 %) and brackish (0.34 %). Azevedo-Santos et al. (2019) also reported higher MPs contamination in marine fish, accounting for 54.6%. Considering, the feeding, and living habitats used by fish species, demersal fishes were found most contaminated with MPs in the following orders: demersal (31.03 %); benthopelagic (23.90 %); reef-associated (18.37 %); pelagic-neritic (14.21 %); bathypelagic (4.4 %); pelagic-oceanic (3.5 %); pelagic (3.04 %), and bathydemersal (1.35 %). Sequeira et al. (2020) reported that higher MPs contaminated fish groups were demersal (29.0 %), which also agrees with the current findings of 31.03 % of demersal fishes.

Based on an analysis of all the regions/continents (where a total of 887 species were found contaminated with MPs) (see Supplementary Table 1), the current study found that globally 45 % of fish ingested MPs with an average concentration of 5.93 MPs particles per fish species. These research results are close to Wotton et al. (2021b), who reported that 49 % of fish ingested MPs with 3.4 MP particles per fish species (based on an analysis of 506 fish species).

Countries and continents where fish species were contaminated with MPs

Based on an analysis of all the regions/continents (where a total of 887 species were found contaminated with MPs) (see Supplementary Table 1), China had the highest number of fish species contaminated with MPs (176 species) and was followed by other locations/countries as listed below in Table 1.

Fish species from Asia were found most contaminated (44.2 %), followed by South America (17.36 %), Europe (17.13 %), Oceania (9.7 %), North America (6.5 %), Africa (5 %) and Antarctica (0.11 %) (Fig. 2). The fact that fish from Asia is most contaminated is somewhat worrying. Fish and seafood are cheap, staple, and popular food as a source of animal protein, vitamins, and omega-3 fatty acids, in several Asian countries, including Bangladesh, China, Japan, India, Indonesia, Maldives, Malaysia, Myanmar, Philippines, South Korea, and Vietnam. As a consequence of contamination of fish species with MPs, seafood fisheries and the livelihoods of people associated with fishing, aquaculture and seafood business in Asia can be threatened. It can also increase the health risks to seafood fish consumers (Kibria, 2018; Kibria et al., 2021b).
Table 1. The number of fish species contaminated with microplastics (MPs) in various countries/locations.

| Country                              | Number of species contaminated with MPs |
|--------------------------------------|-----------------------------------------|
| China                                | 176                                     |
| Brazil                               | 84                                      |
| USA                                  | 48                                      |
| India                                | 35                                      |
| Atlantic Ocean                       | 31                                      |
| Iran                                 | 30                                      |
| Bangladesh                           | 28                                      |
| Turkey                               | 26                                      |
| Indonesia                            | 25                                      |
| UK                                   | 23                                      |
| Saudi Arabia                         | 23                                      |
| Thailand                             | 21                                      |
| Australia                            | 20                                      |
| Portugal                             | 20                                      |
| Italy                                | 18                                      |
| South Africa                         | 18                                      |
| Argentina                            | 15                                      |
| Chile                                | 14                                      |
| Galapagos Islands (Ecuador)          | 14                                      |
| North Pacific Gyre                   | 14                                      |
| Samoa                                | 13                                      |
| Malaysia                             | 12                                      |
| Colombia                             | 11                                      |
| New Zealand                          | 11                                      |
| Fiji                                 | 10                                      |
| Spain                                | 10                                      |
| North Sea                            | 9                                       |
| South Korea                          | 9                                       |
| Tahiti                               | 9                                       |
| Vanuatu                              | 9                                       |
| Ghana                                | 8                                       |
| Canada                               | 7                                       |
| Japan                                | 7                                       |
| Nigeria                              | 7                                       |
| Rapa Nui / Easter Island (Chile)     | 7                                       |
| Arctic Ocean                         | 6                                       |
| France                               | 5                                       |
| Baltic Sea                           | 4                                       |
| Ethiopia                             | 4                                       |
| Greece                               | 4                                       |
| Mexico                               | 4                                       |
| Moorea Island (French Polynesia)     | 4                                       |
| Norway                               | 4                                       |
| Peru                                 | 4                                       |
| Switzerland                          | 4                                       |
| Croatia                              | 3                                       |
| Hawaii Islands (USA)                 | 3                                       |
| Slovenia                             | 3                                       |
| Tunisia                              | 3                                       |
| Egypt                                | 2                                       |
| Poland                               | 2                                       |
| Tanzania                             | 2                                       |
| Antarctic Ocean                      | 1                                       |
| Belgium                              | 1                                       |
| Ecuador                              | 1                                       |
| Sweden                               | 1                                       |

**Fig. 2. Microplastic contamination of fish species across the seven continents as percentage of species contaminated.** The number of species contaminated in each continent are as follows: Asia (392), South America (154), Europe (152), Oceania (86), North America (58), Africa (44) and Antarctica (1) (Total 887 species contaminated in the seven continents).

**Locations/countries with high, medium, and low MPs ingestion in fish**

MPs ingestion by fish varied among the locations/countries. Based on the MP ingestion by fishes was categorised as high, medium, and low, as shown in Figure 3, and highlighted below:

i. High MPs ingestion locations, where 100 % of fishes ingested MPs - the Arctic Ocean, Argentina, the Atlantic Ocean, Bangladesh, Brazil, China, Ghana, Indonesia, Iran, Italy, North Pacific Gyre, Portugal, Slovenia, South Africa, South Korea, Tunisia, Turkey, and the USA.

ii. Medium MP ingestion where 40 % to 60 % of fishes ingested MPs - Ethiopia, Norway, Poland, Tanzania, and Tahiti.

iii. Low MP ingestion, where 1 % to 10 % of fishes ingested MPs - the Antarctic Ocean, Belgium, Ecuador, and Peru.

The locations/countries where higher ingestion (100 %) occurred may be related to high abundance and high accumulation of MPs and low availability of food forcing the fishes to ingest the higher amount of MPs (e.g., North Pacific Gyre, Indonesia, China) (Boerger et al., 2010; Woodall et al., 2014; Phillips and Bonner, 2015; Ory et al., 2017; Markic et al., 2018; Huang et al., 2020). In contrast, low MPs ingestion may have occurred in those areas (1 % to 10 %) where MPs are in low abundance, e.g., the Antarctic Ocean (Cannon et al., 2016).

According to Romeo et al. (2015) and Battaglia et al. (2016), the ingestion of MPs by fish is associated with the abundance of MPs in the local environments. Furthermore, fish are bioindicators of MPs ingestion scenarios (Bray et al., 2019). Therefore, high, medium, and low MPs ingestion locations can reflect the degree...
Fig. 3. Selected examples of the high, medium, and low microplastics (MPs) ingestion recorded in various fish species across the globe arranged alphabetically by locations/countries (see also Supplementary Table 1 for other fish species that falls under the high, medium, and low ingestion category) [Ben = benthopelagic; Bat = bathypelagic; D = demersal; P = pelagic; P -N = pelagic-neritic; P -O = pelagic-oceanic; R = Reef-associated; numbers 1 -51 in the ‘Y’-axis are references: 1. Cannon et al. (2016); 2. 13. Calderon et al. (2019); 14. Anastasopoulou et al. (2018); 15. Ory et al. (2018); 16. Merga et al. (2020); 17. Khan et al. (2020); 18. et al. (2019); 8. Slootmaekers et al. (2019); 9. Pegado et al. (2018); 10. Campbell et al. (2017); 11. Ory et al. (2017); 12. Ding et al. (2019); Granberg et al. (2020); 3. Pazos et al. (2017); 4. Wieczorek et al. (2018); 5. Wootton et al. (2021a); 6. Rummel et al. (2016); 7. Hossain al. (2021); 23. Suwartiningsih et al. (2020); 24. Hosseinpour et al. (2021); 25. Frey and Murazzi (2019); 26. Tanaka and Takada (2016); Collard et al. (2017); 19. Alfaro et al. (2019); 43. Karlsson et al. (2017); 44. Roch and Brinker (2017); 45. Markic et al. (2018); 46. Biginagwa et al. (2016); 47. Zitouni et al. (2020); 48. Güven et al. (2017); 49. McGoran et al. (2017); 50. Ryan et al. (2019); 51. Bakir et al. (2020a)].

| Rank | Fish Species                                      | Location/Category          |
|------|---------------------------------------------------|----------------------------|
| 1    | Antarctic toothfish, Dissostichiкус mawsoni (P-O) | Antarctic Ocean            |
| 2    | Greenland cod, Gadus ogac (D)                    | Arctic Ocean               |
| 3    | Common carp, Cyprinus carpio (Ben)               | (Argentina)                |
| 4    | Bristlemouths, Gonostoma denudatum (Bat)         | (Atlantic Ocean)           |
| 5    | Humpback red snapper, Lutjanus gibbus (R)        | (Australia)                |
| 6    | Atlantic mackerel, Scomber scombrus (pelagic-neritic) | Baltic Sea               |
| 7    | Bombay-duck, Harpadon hehereus (Ben)             | (Bangladesh)               |
| 8    | Gudgeons, Gobio gobio (Ben)                      | (Belgium)                  |
| 9    | Gafftopsail sea catfish, Bagre marinus (D)       | (Brazil)                   |
| 10   | Northern pike, Esox lucius (P)                    | (Canada)                   |
| 11   | Ambestripe scad, Decapterus muroads (P-O)        | (Chile)                    |
| 12   | Yellow croaker, Pseudosciaena polyactis (Ben)    | (China)                    |
| 13   | Parassi mullet, Mugil incilis (D)                | (Colombia)                 |
| 14   | Surmullet, Mullus surmuletus (D)                  | (Croatia)                  |
| 15   | Pacific thread herring, Opisthonema libertate (P-N) | (Ecuador)                |
| 16   | North African catfish, Claris gariaepinus (Ben)  | (Ethiopia)                 |
| 17   | Bayad catfish, Bagrus baju (D)                    | (Egypt)                    |
| 18   | European pilchard, Sardina pilchardus (P-N)      | (France)                   |
| 19   | Pelagic thresher, Alopias pelagicus (P-O)        | (Galapagos)                |
| 20   | Blue tilapia, Oreochromis aureus (Ben)           | (Ghana)                    |
| 21   | Common pandora, Pagellus erythrinus (Ben)        | (Greece)                   |
| 22   | Albacore tuna, Thunnus alalunga (P-O)            | (Hawaii)                   |
| 23   | Skipjack tuna, Katsuwonus pelamis (P-O)          | (Indonesia)                |
| 24   | Bartail flathead, Platycetophalus indicus (R)    | (Iran)                     |
| 25   | Salema, Sarpa salpa (Ben)                        | (Italy)                    |
| 26   | Japanese anchovy, Engraulis japonicus (P-N)      | (Japan)                    |
| 27   | Honeycomb grouper, Epinephelus merra (R)         | (Moorea Island)            |
| 28   | Parore, Girela tricusipitate (Ben)               | (New Zealand)              |
| 29   | Nile tilapia, Oreochromis niloticus (Ben)        | (Nigeria)                  |
| 30   | Bolin's lanternfish, Diaphus phillipisi (Bat)    | (North Pacific Gyre)       |
| 31   | Atlantic cod, Gadus morhua (Ben)                 | (North Sea)                |
| 32   | American plaice, Hippoglossoides platessoides (D) | (Norway)                   |
| 33   | Chub mackerel, Scomber japonicus (P-N)           | (Peru)                     |
| 34   | Gudgeon, Gobio gobio (Ben)                       | (Poland)                   |
| 35   | Surmullet, Mullus surmuletus (D)                  | (Portugal)                 |
| 36   | Yellowfin tuna, Thunnus alalunga (P-O)           | (Rapa Nui)                 |
| 37   | Dusky parrotfish, Scarus niger (R)               | (Samoa)                    |
| 38   | Common ponyfish, Leignathus equulus (D)          | (Saudi Arabia)             |
| 39   | Gilthead seabream, Sparus aurata (D)             | (Slovenia)                 |
| 40   | Silver sillage, Sillago sihama (R)              | (South Africa)             |
| 41   | Common carp, Cyprinus carpio (Ben)               | (South Korea)              |
| 42   | Atlantic chub mackerel, Scomber colias (P-N)     | (Spain)                    |
| 43   | Sea trout, Salmo trutta (P-N)                    | (Sweden)                   |
| 44   | Round goby, Neogobius melanostomus (D)           | (Switzerland)              |
| 45   | Squirreltail mullet, Ellochelon viagiensis (R)   | (Tahiti)                   |
| 46   | Nile perch, Lates niloticus (D)                  | (Tanzania)                 |
| 47   | Painted comber, Serranus scriba (D)              | (Tunisia)                  |
| 48   | Brown meagre, Sciaena umbra (D)                  | (Turkey)                   |
| 49   | European flounder, Platichthys flesus (D)        | (UK)                       |
| 50   | Blueback shad, Alosa aestivalis (P-O)            | (USA)                      |
| 51   | Yellow-fin tuna, Thunnus alalunga (P-O)         | (Vanuatu)                  |
of MPs pollution in the local environment. In short, MPs as a contaminant is of worldwide concern, and the uptake of MPs by fish could reflect the environmental MPs abundance (McNeish et al., 2018).

**Conclusion**

This review provides a snapshot of fish species contaminated with microplastics (MPs) across the globe. Based on 208 journal papers published between 2009 and 2021, a total of 887 fish species were found to have ingested MPs or contaminated with MPs in 56 locations/countries. The most MPs contaminated fish species were marine (42.53 %) and demersal (31.00 %). Globally 45 % of fish ingested MPs with an average concentration of 5.93 MPs particles per fish species.

Overall, fish species from Asia were most contaminated (44.2 %) compared to other continents. The contamination of fish with MPs across the seven continents may demonstrate that MPs pollution is widespread, and fish can be a good biological indicator of plastic pollution. The high number of MPs contaminated fish species found in this study may be related to the following facts: firstly, plastic pollution is continually occurring in the marine, brackish, and freshwater environments due to continued plastic use and indiscriminate dumping of plastics in the environments; secondly, more research is being prioritised on MPs contamination of fish and seafood species across the globe; and thirdly, more research results are published and freely available to the general public via open access journal papers, and social media (Twitter, Facebook, Instagram).

As a consequence of MPs’ contamination of fish and seafood fish species, seafood fisheries and the livelihoods of people associated with fishing can be threatened. It can also increase the health risks to seafood fish consumers since there is a probability that high risks pollutants adsorbed on MPs (such as heavy metals, pesticides, oil compounds (polycyclic aromatic hydrocarbons or PAHs), can be transferred to humans via the food chain. Some of the above chemicals (heavy metals, DDT, PAHs) are carcinogenic (Kibria et al., 2021a). People or international markets may reject MPs contaminated seafood fish species fearing the health risks of contaminated seafood. Therefore, as preventive and safety, the following measures can be undertaken to reduce the exposure of MPs to humans, including i) depuration of farmed and wild seafood in clean, plastic-free seawater before human consumption to expel or excrete gastrointestinal contents such as MPs; ii) degutting of fish before consumption; iii) monitor MPs levels and high-risk pollutants in important commercial seafood fish species; and iv) promote awareness education in schools, colleges, universities, and the public on harms caused by plastic pollution to aquatic biota, including fish, seafood and human health.

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**References**

Abbasi, S., Soltani, N., Keshavarzi, B., Moore, F., Turner, A., Hassanaghhei, M. 2018. Microplastics in different types of fish and prawn from the Musa Estuary, Persian Gulf. Chemosphere 205:80–87. https://doi.org/10.1016/j.chemosphere.2018.04.076

Abadi, Z.T.R., Abtahi, B., Grossart, H.-P., Khodabandeh, S. 2021. Microplastic content of Kutum fish, Rutulus frisii/kutum in the southern Caspian Sea. Science of the Total Environment 752:141542. https://doi.org/10.1016/j.scitotenv.2020.141542

Abidli, S., Akkari, N., Lahbib, Y., Menif, N.T. 2021. First evaluation of microplastics in two commercial fish species from the lagoons of Bizerte and Ghar El Melh (Northern Tunisia). Regional Studies in Marine Science 41:101581. https://doi.org/10.1016/j.rsma.2020.101581

Adeogun, A. O., Ibor, O. R., Khan, E. A., Chukwuka, A.V., Omogbemi, E.D., Arukwe, A. 2020. Detection and occurrence of microplastics in the stomach of commercial fish species from a municipal water supply lake in southwestern Nigeria. Environmental Science and Pollution Research 27:31035–31045. https://doi.org/10.1007/s11356-020-09031-5

Adika, S.A., Mahu, E., Crane, R., Marchant, R., Montford, J., Folorunsho, R., Gordon, C. 2020. Microplastic ingestion by pelagic and demersal fish species from the Eastern Central Atlantic Ocean, off the Coast of Ghana. Marine Pollution Bulletin 153:110998. https://doi.org/10.1016/j.marpolbul.2020.110998

Adu-Boahen, K., Dadson, I.Y., Mensah, D.K.D., Kyeremeh, S. 2020. Mapping ecological impact of microplastics on freshwater habitat in the central region of Ghana: a case study of River Akora. Geojournal 87:621–639. https://doi.org/10.1007/s10708-020-10273-6

Akbarizadeh, R., Moore, F., Keshavarzi, B. 2018. Investigating a probable relationship between microplastics and potentially toxic elements in fish muscles from northeast of Persian Gulf. Environmental Pollution 232:154–163. https://doi.org/10.1016/j.envpol.2017.09.028

Alfaro-Núñez, A., Astorga, D., Cáceres-Farias, L., Bastidas, L., Villegas, C.S., Macay, K.C., Christensen, J.H. 2021. Microplastic pollution in seawater and marine organisms across the tropical Eastern Pacific and Galápagos. Scientific Reports 11:8424. https://doi.org/10.1038/s41598-021-85939-3

Al-Lihaibi S., Al-Mehmadi A., Alarif, M.W., Sultan Al-Lihaibi A., Asmaa Al-Lihaibi, R., Moore, F., Turner, A., Hassanaghhei, M. 2018. Investigating a probable relationship between microplastics and potentially toxic elements in fish muscles from northeast of Persian Gulf. Environmental Pollution 232:154–163. https://doi.org/10.1016/j.envpol.2017.09.028

Al-Lihaibi S., Al-Mehmadi A., Alarif, M.W., Sultan Al-Lihaibi A., Asmaa Al-Lihaibi, R., Moore, F., Turner, A., Hassanaghhei, M. 2018. Investigating a probable relationship between microplastics and potentially toxic elements in fish muscles from northeast of Persian Gulf. Environmental Pollution 232:154–163. https://doi.org/10.1016/j.envpol.2017.09.028

Almimi, O.S., Budarz, J.F., Hernandez, L.M., Tufenkji, N. 2018. Microplastics and nanoplastics in aquatic environments: aggregation, deposition, and enhanced contaminant transport. Environmental Science and Technology 52:1704–1724. https://doi.org/10.1021/acs.est.7b05659

Alomar, C., Deudero, S. 2017. Evidence of microplastic ingestion in the shark Galeus melastomus Rafinesque, 1810 in the continental shelf off the western Mediterranean Sea. Environmental Pollution 223:223–229. https://doi.org/10.1016/j.envpol.2017.01.015
Andrade, M. C., Winemiller, K. O., Barbosa, P. S., Fortunati, A., Chelazzi, Amin, B., Febriani, I. C., Nurrachmi, I., Fauzi, M. 2020. Microplastics in \( \text{Euthynnus affinis} \) (Pisces: Carangidae) collected from Rapa Nui (Easter Island). Environmental Pollution 255:113348. https://doi.org/10.1016/j.envpol.2019.113348

Bisset, F., Barria, P., Neto, J.M., Frias, J.P.G.L., Otero, V., Sobral, P., Marques, C. 2018. Occurrence of microplastics in commercial fish from a natural estuarine environment. Marine Pollution Bulletin 128:575-584. https://doi.org/10.1016/j.marpolbul.2018.01.044

Biganwa, F.J., Mayoma B.S., Shashoua, Y., Syberg K., Khan, F.R. 2016. First evidence of microplastics in the African Great Lakes: Recovery from Lake Victoria Nile perch and Nile tilapia. Journal of Great Lakes Research 42(1):146-149. https://doi.org/10.1016/j.jglr.2015.10.012

Blettler, M.C.M., Garelo, N., Ginon, L., Abrial, E., Espinola, L.A., Wantzen, K.M. 2019. Massive plastic pollution in a mega-river of a developing country: Sediment deposition and ingestion by fish (Prochilodus lineatus). Environmental Pollution 255:113348. https://doi.org/10.1016/j.envpol.2019.113348

Boerger, C.M., Lattin, G.L., Moore, S.L., Moore, C. J. 2010. Plastic ingestion by planktivorous fishes in the North Pacific Central Gyre. Marine Pollution Bulletin 60:2275–2278. https://doi.org/10.1016/j.marpolbul.2010.08.007

Bour, A., Avio, C.G., Gorbi, S., Regoli, F., Hylland, K. 2018. Presence of microplastics in benthic and epibenthic organisms: Influence of habitat, feeding mode and trophic level. Environmental Pollution 243:1217-1225. https://doi.org/10.1016/j.envpol.2018.09.115

Bray, L., Digka, N., Tsangaris, C., Camedda, A., Gambiani, D., de Lucia, G.A., Matiddi, M., Miaud, C., Palazzo, L., Pérez-Del-Olmo, A., Raga, J.A., Silvestri, C., Kaberi, H. 2019. Determining suitable fish to monitor plastic ingestion trends in the Mediterranean Sea. Environmental Pollution 247:1071-1077. https://doi.org/10.1016/j.envpol.2019.01.100

Bråte, I.L.N., Eidsvoll, D.P., Steindal, C.C., Thomas K.V. 2016. Plastic ingestion by Atlantic cod (Gadus morhua) from the Norwegian coast. Marine Pollution Bulletin 112:105-110. https://doi.org/10.1016/j.marpolbul.2016.08.034

Calderon, E.A., Hansen, P., Rodriguez, A., Blettler, M.C.M., Syberg, K., Khan, F.R. 2019. Microplastics in the digestive tracts of four fish species from the Ciénaga Grande de Santa Marta Estuary in Colombia. Water Air and Soil Pollution 230:257. https://doi.org/10.1007/s11270-019-4313-8

Campbell, S. H., Williamson, P. R., Hall, B. D. 2017. Microplastics in the gastrointestinal tracts of fish and the water from an urban prairie creek. FACETS 2:396-409. https://doi.org/10.1039/facets-2017-00088

Cannon, S., Lavers, J., Figueiredo, B. 2018. Plastic ingestion by fish in the Southern Hemisphere: a baseline study and review of methods. Marine Pollution Bulletin 131:257. https://doi.org/10.1016/j.marpolbul.2018.04.040

Chagon, C., Thié, M., Antunes, J., Ferreira, J.L., Sobral, P., Ory, N.C. 2018. Plastic ingestion and trophic transfer between Easter Island flying fish (Cheilopogon rapanoueiensis) and yellowfin tuna (Thunnus albacares) from Rapa Nui (Easter Island). Environmental Pollution 243:127-133. https://doi.org/10.1016/j.envpol.2018.08.042

Chan, H.S.H., Dingle, C., Not, C. 2019. Evidence for non-selective ingestion of microplastics in demersal fish. Marine Pollution Bulletin 149:110523. https://doi.org/10.1016/j.marpolbul.2019.110523

Cheung, L.T., Lui, C.Y., Fok, L. 2018. Microplastic contamination of wild and captive flathead grey mullet (Mugil cephalus) from South Africa. Marine Pollution Bulletin 125:110523. https://doi.org/10.1016/j.marpolbul.2018.04.040

Collard, F., Gilbert, B., Eppe, G., Roos, L., Compère, P., Das, K., Parmentier, E. 2017. Morphology of the filtration apparatus of three planktivorous fishes and relation with ingested anthropogenic particles. Marine Pollution Bulletin 116:182-191. https://doi.org/10.1016/j.marpolbul.2018.12.087
| Author(s) | Title | Journal | Year | DOI |
|-----------|-------|---------|------|-----|
| Collicutt, B., Juanes, F., Dudas, S.E. | Microplastics in juvenile Chinook salmon and their nearshore environments on the east coast of Vancouver Island | Environmental Pollution | 2019 | 10.1016/j.envpol.2018.09.137 |
| Compa, M., Ventero, A., Iglesias, M., Deudero, S. | Ingestion of microplastics and natural fibres in Sardinia pilchardus (Walbaum, 1792) and Engraulis encrasicolus (Linnaeus, 1758) along the Spanish Mediterranean coast. | Marine Pollution Bulletin | 2018 | 10.1016/j.marpolbul.2018.01.009 |
| Cordova, M.R., Riani, E., Shiomoto, A. | Microplastics ingestion by blue panchax fish (Apocheilus sp.) from Ciliwung Estuary, Jakarta, Indonesia. | Marine Pollution Bulletin | 2020 | 10.1016/j.marpolbul.2020.111763 |
| Cresssey, D. | The plastic Ocean. | Nature | 2016 | 10.1038/536263a |
| Crutchett, T., Paterson, H., Ford, B.M., Speldewinde, P. | Plastic ingestion in sardines (Sardinops sagax) from Frenchman Bay, Western Australia, highlights a problem in a ubiquitous fish. | Frontiers in Marine Science | 2020 | 10.3389/fmars.2020.00526 |
| Daniel, D.B., Ashraf, P.M., Thomas, S.N. | Microplastics in the edible and inedible tissues of pelagic fishes sold for human consumption in Kerala, India. | Environmental Pollution | 2020 | 10.1016/j.envpol.2020.115365 |
| Dantas, D.V., Barletta, M., da Costa, M.F. | The seasonal and spatial patterns of ingestion of polyfilament nylon fragments by estuarine drums (Sciaenidae). | Environmental Science and Pollution Research | 2019 | 10.1007/s11356-019-0579-0 |
| Dantas, N.C.F.M., Duarte, O.S., Ferreira, W.C., Rezende, C.F., Feitosa, C.V. | Plastic intake does not depend on fish eating habits: Identification of microplastics in the stomach contents of fish on an urban beach in Brazil. | Marine Pollution Bulletin | 2020 | 10.1016/j.marpolbul.2020.110959 |
| Davison, P., Asch, R.G. | Plastic ingestion by mesopelagic fishes in the North Pacific Subtropical Gyre. | Marine Ecology Progress Series | 2011 | 10.3354/meps0942 |
| Devi S.S., Sreedevi, A.V., Kumar, A.B. | First report of microplastic ingestion by the alien fish Pirapitinga (Piaractus brachypomus) in the Ramsar site Vembanad Lake, South India. | Marine Pollution Bulletin | 2020 | 10.1016/j.marpolbul.2020.111367 |
| De-la-Torre, G.E., Dioses-Salinas, D.C., Pérez-Baca, B.L., Luis Santillán, L. | Microplastic abundance in three commercial fish from the coast of Lima, Peru. | Marine Pollutant Bulletin | 2019 | 10.1016/j.marpolbul.2019.111367 |
| de Vries, A.N., Govoni, D., Arnason, S.H., Carlsson, P. | Microplastic ingestion by fish: Body size, condition factor and gut fullness are not related to the amount of plastics consumed. | Marine Pollution Bulletin | 2020 | 10.1016/j.marpolbul.2019.110827 |
| Ding, J., Li, J., Sun, C., Jiang, F., Ju, P., Qu, L., Zheng, Y., He, C. | Detection of microplastics in local marine organisms using a multi-technology system. | Analytical Methods | 2019 | 10.1039/C8AY01974F |
| dos Santos, T., Bastian, R., Felden, J., Rauber, A.M., Augusto, D., Reynalte-Tateja, A.R., de Mello, F.T. | First record of microplastics in two freshwater fish species (Heringithys labrosus and Astyanax lacustris) from the middle section of the Uruguay River, Brazil. | Acta Limnologica Brasiliensia | 2020 | 10.1590/s2179-975x3020 |
| Dunn, M., Horn, P., Connell, A. | Ecosystem-scale trophic relationships: diet composition and gut structure of middle-depth fish on the Chatham Rise. | Final Research Report for Ministry of Fisheries Research Project ZB02004-02, Objectives 1-5. | June | 10.1016/j.envpol.2018.09.137 |
| Faure, S., Demars, C., Wieser, O., Kunz, M., de Alencastro, L. | Plastic pollution in Swiss surface waters: Nature and concentrations, interaction with pollutants. | Environmental Chemistry | 2015 | 10.12827/EnChem.12.0827 |
| Ferreira, G.V.B., Barletta, M., Lima, A.R.A., Dantas, D.V., Justino, A.K.S., Costa, M.F. | High intake rates of microplastics in a Western Atlantic predatory fish, and insights of a direct fishery effect. | Environmental Pollution | 2020 | 10.1016/j.marpolbul.2019.111085 |
| Ferreira, G.V.B., Barletta, M., Lima, A.R.A., Morley, S.A., Costa, M.F. | Dynamics of marine debris ingestion by profitable fishes along the estuarine ecocline. | Scientific Reports | 2018 | 10.1038/s41598-018-49922-3 |
| Forman, J.S., Horn, P.L., Stevens, D.W. | 2016. Diets of deepwater ores (Oresomatidae) and orange roughy, Hoplostethus atlanticus. Journal of Fish Biology | 2018 | 10.1111/jfb.12982 |
| Frey, S., Murazzi, M.E. | Microplastic sampling in fish, crustacean, squid, and bivalve species. | Marine Pollution Bulletin | 2019 | 10.1016/j.marpolbul.2019.110991 |
| Froese, R., Pauly, D. | FishBase. | https://www.fishbase.de/ |
| Gago, J., Portela, S., Filgueiras, A.V., Salinas, P., Maclaus, D. | Ingestion of plastic debris (macro and micro) by longnose lancetfish (Alepisaurus ferox) in the North Atlantic Ocean. | Regional Studies in Marine Science | 2020 | 10.1016/j.rsma.2019.100977 |
| Garcés-Ordóñez, O., Mejía-Esquiviad, K.A., Sierra-Labastida, T., Patiño, A., Blandón, L.M., Díaz, L.F.E. | Prevalence of microplastic contamination in the digestive tract of fishes from mangrove ecosystem in Cispatá, Colombian Caribbean. | Marine Pollution Bulletin | 2020 | 10.1016/j.marpolbul.2020.110885 |
| Garcia, T.D., Cardozo, A.L.P., Quinino, B.A., Yofukuji, K.Y., Ganassin, M.J.M., dos Santos, N.C.L., Fuget, R. | Ingestion of microplastic by fish of different feeding habits in urbanized and non-urbanized streams in Southern Brazil. | Water, Air, & Soil Pollution | 2020 | 10.1007/s11270-020-04802-9 |
| Garnier, Y., Jacob, H., Guerra, A.S., Bertucci, F., Lecchini, D. | Evaluation of microplastic ingestion by tropical fish from Moorea Island, French Polynesia. | Marine Pollution Bulletin | 2020 | 10.1016/j.marpolbul.2019.01.038 |
| Ghosh, O.C., Akter, S.M., Islam, R.M., Habib, A., Chakraborty, T.K., Zaman, S., Kabir, A.H.M.E., Shipin, O.V., Marfiaih A., Wahid, M.A. | Microplastics contamination in commercial marine fish from the Bay of Bengal. | Regional Studies in Marine Science | 2020 | 10.1016/j.rsma.2020.101728 |
development and microplastic accumulation. Marine Pollution Bulletin 122:403–408. https://doi.org/10.1016/j.marpolbul.2017.06.081
Karuppasamy, P.K., Ravi, A., Vasudevan, L., Elangovan, M.P., Mary, P.D., Vincent, S.G.T., Palanisami, T. 2020. Baseline survey of micro and mesoplastics in the gastro-intestinal tract of commercial fish from southeast coast of the Bay of Bengal. Marine Pollution Bulletin 153:110974. https://doi.org/10.1016/j.marpolbul.2020.110974
Kasamesiri, P., Thaimuanghol, W. 2020. Microplastics ingestion by freshwater fish in the Chi River, Thailand. International Journal of Geomate 18:114-119. https://doi.org/10.21860/2020.67.9110
Khan, F.R., Shashoua, Y., Crawford, A., Drury, A., Sheppard, K., Stewart, K., Sculthorpe, T. 2020. The plastic Nile: First evidence of microplastic contamination in fish from the Nile River (Cairo, Egypt). Toxics 8:22. https://doi.org/10.3390/toxics8020022
Kibria, G. 2017. Plastic waste and plastic pollution: A threat to all nations. https://www.researchgate.net/publication/31933174_Plastic_Waste_Plastic_Pollution-_A_Threat_to_All_Nations
Kibria, G., Karuppasamy, P.K., Ravi, A., Vasudevan, L., Elangovan, M.P., Mary, P.D., Vinayakumar, P.K., Ravi, A., Vasudevan, L., Elangovan, M.P., Mary, P.D., Kibria, G. 2017. Plastic waste and plastic pollution: A threat to all nations. https://www.researchgate.net/publication/31939174_Plastic_Waste_Plastic_Pollution-_A_Threat_to_All_Nations
Kibria, G., Nugegoda, D., Rose, G., Haroon, A.K.Y. 2022c. Microplastic (MP) contamination in fish from the Nile River (Cairo, Egypt). Toxics 8:22. https://doi.org/10.3390/toxics8020022
Kibria, G., Nugegoda, D., Rose, G., Haroon, A.K.Y. 2022b. Climate change impacts on pollutants mobilization and interactive effects of climate change and pollutants on toxicity and bioaccumulation of pollutants in estuarine and marine biota and linkage to seafood security. Marine Pollution Bulletin 167:112364. https://doi.org/10.1016/j.marpolbul.2021.112364
Kibria, G., Nugegoda, D., Haroon, A.K.Y. 2022a. Microplastic (MP) pollution in the context of occurrence, distribution, composition and concentration in surface waters and sediments: A global overview. Chapter 7. In: Microplastic pollution, emerging contaminants and associated treatment technologies, Hashmi, M.Z. (Ed.), Springer Nature, Switzerland, pp. 133–166. https://link.springer.com/chapter/10.1007/978-3-030-89220-3_7
Kibria, G., Nugegoda, D., Haroon, A.K.Y. 2022b. Microplastic pollution and contamination of seafood (including fish, shrimp, mussels, oysters, shrimps and seaweeds): A global overview. Chapter 14. In: Microplastic pollution, emerging contaminants and associated treatment technologies, Hashmi, M.Z. (Ed.), Springer Nature, Switzerland, pp. 277-322. https://link.springer.com/chapter/10.1007/978-3-030-89220-3_14
Kibria, G., Nugegoda, D., Haroon, A.K.Y. 2022c. Microplastic (MP) - An emerging global threat to food and water security: MP contamination of seafood, other foods (rice, vegetable, salt, sugar, honey), drinks (drinking water, tea, milk, soft drink) and environmental waters (surface water, sediment). Journal of Biological and Chemical Research 39:32-48.
Kripa, V., Preethea, N., Dhanya, A.M., Pravitha, V.P., Abhilash, K.S., Mohammed, A.A., Vijayan, D., Vishnu, P.G., Mohan, G., Anilkumar, P.S., Kambadakr, L.R., Prema, D. 2014. Microplastics in the gut of anchovies caught from the mudbank area of Alappuzha, Kerala. Marine Fisheries Information Services Technical and Extension Series 219:27-28. http://eprints.cmfr.in/id/eprint/10132
Koongoll, J.M., Lin, L., Fan, Y-F., Yang, C-P., Sun, D-R., Liu, S., Xu, X-R., Maharana, D., Huang, S., Li, H-X. 2020. Occurrence of microplastics in gastrointestinal tracts and gills of fish from Beibu Gulf, South China Sea. Environmental Pollution 258:113734. https://doi.org/10.1016/j.envpol.2019.113734
Kroon, F.J., Motti, C.E., Jensen, L.H., Berry, K.L.E. 2018. Classification of marine microdebris: a review and case study on fish from the Great Barrier Reef, Australia. Scientific Reports 8:16422. https://doi.org/10.1038/s41598-018-34590-6
Kühn, S., Schlaafls, F.L., van Werven, B. 2018. Plastic ingestion by juvenile polar cod (Boreogadus saido) in the Arctic Ocean. Polar Biology 41:1269-1278. https://doi.org/10.1007/s00300-018-2283-8
Kumar, V.E., Ravikumar, G., Jeyasanta, K.I. 2018. Occurrence of microplastics in fishes from two landing sites in Tuticorin, south east coast of India. Marine Pollution Bulletin 135:889-894. https://doi.org/10.1016/j.marpolbul.2019.08.023
Kušmirek, N., Poppolek, M. 2020. Microplastics in freshwater fish from Central European lowland river [Widawa R., SW Poland]. Environmental Science and Pollution Research 27:11438-11442. https://doi.org/10.1007/s11356-020-08031-9
Leclerc, L-M. E., Lydersen, M.E., Haug, C., Bachmann, L., Fisk, A.T., Kovacs, K.M. 2012. A missing piece in the Arctic food web puzzle? Stomach contents of Greenland sharks sampled in Svalbard, Norway. Polar Biology 35:1179-1208. https://doi.org/10.1007/s00300-012-1166-7
Lenz, R., Enders, K., Beer, S., Sarenk, T.K., Stedmon, C.A. 2016. Analysis of microplastic in the stomachs of herring and cod from the North Sea and Baltic Sea. DTU Aqua National Institute of Aquatic Resources, Technical University of Denmark. https://doi.org/10.13140/RG.2.1.625.1789
Lessy, M.R., Sabar, M. 2021. Microplastics ingestion by Skipjack tuna (Katsuwonus pelamis) in Ternate, North Maluku – Indonesia. IOP Conference Series: Materials Science and Engineering 1125:02085. https://doi.org/10.1088/1757-899X/1125/1/02085
Liborion, M., Liborion, F., Wells, E., Richárd, N., Zahara, A., Mather, C., Bradshaw, H., Murichi, J. 2016. Low plastic ingestion rate in Atlantic cod (Gadus morhua) from Newfoundland destined for human consumption collected through citizen science methods. Marine Pollution Bulletin 113:428-437. https://doi.org/10.1016/j.marpolbul.2016.04.043
Lin, L., Ma, L-S., Li, H-X., Yun-FengPan, Y-F., Liu, S., Zhang, L., Peng, J-P., Fok, L., Xu, X-R., He, W-H. 2020. Low level of microplastic contamination in wild fish from an urban estuary. Marine Pollution Bulletin 160:111650. https://doi.org/10.1016/j.marpolbul.2020.111650
Lusher, A.L., McHugh, M., Thompson, R.C. 2013. Occurrence of microplastics in the gastrointestinal tract of pelagic and demersal fish from the English Channel. Marine Pollution Bulletin 67:94-99. https://doi.org/10.1016/j.marpolbul.2012.11.028
Lusher, A.L., O’Donnell, C., Officer, R., O’Connor, I. 2018. Microplastic interactions with North Atlantic mesopelagic fish. ICES Journal of Marine Science 75(4):1214-1225. https://doi.org/10.1093/icesjms/fsv241
Malik, A., Xavier, K.A.M., Naidu, B.C., Nayak, B.B. 2021. Ecotoxicological and physiological risks of microplastics on fish and their possible mitigation measures. Science of the Total Environment 779:146433. https://doi.org/10.1016/j.scitotenv.2021.146433
Mancuso, M., Savoca, S., Bottari, T. 2019. First record of microplastics ingestion by European hake Merluccius merluccius from the Tyrrenhenian Sicilian coast (Central Mediterranean Sea). Journal of Fish Biology 94:517-519. https://doi.org/10.1111/jfb.13920
Phillips, M.B., Bonner T.H. 2015. Occurrence and amount of microplastic litter in the gastrointestinal tract of Solea solea from the Adriatic Sea. Environmental Pollution 234:943–952. https://doi.org/10.1016/j.envpol.2017.12.038

Peters, C.A., Bratton, S.P. 2016. Urbanization is a major influence on microplastic ingestion by sunfish in the Brazos River Basin, Central Texas, USA. Environmental Pollution 210:380–387. https://doi.org/10.1016/j.envpol.2016.01.018

Peters, C.A., Thomas, P.A., Rieper, K.B., Bratton, S.P. 2017. Foraging preferences influence microplastic ingestion by six marine fish species from the Texas Gulf Coast. Marine Pollution Bulletin 124:92–88. https://doi.org/10.1016/j.marpolbul.2017.06.080

Phillips, M.B., Bonner T.H. 2015. Occurrence and amount of microplastic ingested by fishes in watersheds of the Gulf of Mexico. Marine Pollution Bulletin 100:264–269. https://doi.org/10.1016/j.marpolbul.2015.08.041

Possatto, P., Barletta, M., Costa, M.F., do Sul, J.A.I., Dantas, D.V. 2011. Plastic debris ingestion by marine catfish: an unexpected fisheries impact. Marine Pollution Bulletin 62:1098–1102. https://doi.org/10.1016/j.marpolbul.2011.01.036

Pozo, K., Gomez, V., Torres, M., Vera, L., Nuñez, D., Oyarzun, P., Mendoza, G., Clarke, B., Fossi, M.C., Baine, M., Pribyllová, P., Kłanóvá, J. 2019. Presence and characterization of microplastics in fish of commercial importance from the Biobio region in central Chile. Marine Pollution Bulletin 140:315–319. https://doi.org/10.1016/j.marpolbul.2019.01.025

Ramos, J., Barletta, M., Costa, M. 2012. Ingestion of nylon threads by Gerreidae while using a tropical estuary as foraging grounds. Aquatic Biology 17:29-34. https://doi.org/10.3354/ab00461

Rasta, M., Sattari, M., Taleshi, M.S., Namin, J.J. 2020. Identification and distribution of microplastics in the sediments and surface waters of Anzali Wetland in the Southwest Caspian Sea, Northern Iran. Marine Pollution Bulletin 160:111541. https://doi.org/10.1016/j.marpolbul.2020.111541

Ribeiro, F., Okotto, E.D., O’Brien, J.W., Fraissinet-Tachet, S., O’Brien, S., Gallien, M., Samanipour, S., Kasernson, S., Mueller, J.F., Tamara Galloway, T., Thomas, K.V. 2020. Quantitative analysis of selected plastics in high-commercial-value Australian seafood by pyrolysis gas chromatography mass spectrometry. Environmental Science and Technology 54:9408–9417. https://doi.org/10.1021/acs.est.0c02337

Reinold, S., Herrera, A., Salú, F., Hernández-González, C., Martinez, I., Lasagni, M., Gómez, M. 2021. Evidence of microplastic ingestion by cultured European sea bass (Dicentrarchus labrax). Marine Pollution Bulletin 168:112450. https://doi.org/10.1016/j.marpolbul.2021.112450

Rios, M.F., Hernández-Moresino, R.D., Galván, D.E. 2020. Assessing urban microplastic pollution in a benthic habitat of Patagonia Argentina. Marine Pollution Bulletin 159:111491. https://doi.org/10.1016/j.marpolbul.2020.111491

Roch, S., Brinker, A. 2017. Rapid and efficient method for the detection of microplastic in the gastrointestinal tract of fishes. Environmental Science and Technology 51:4522–4530. https://doi.org/10.1021/acs.est.7b03364

Rochman, C.M., Tahir, A., Williams, S.L., Bax, D.V., Lam, R., Miller, J.T., Teh, F-C., Weroirangi, S., Teh, S.J. 2015. Anthropogenic debris in seafood: plastic debris and fibres from textiles in fish and bivalves sold for human consumption. Scientific Reports 5:14340. https://doi.org/10.1038/srep14340

Romeo, T., Pietro, B., Pedá, C., Consoli, P., Andaloro, F., Fossi, M.C. 2015. First evidence of presence of plastic debris in stomach of large pelagic fish in the Mediterranean Sea. Marine Pollution Bulletin 95:358–361. https://doi.org/10.1016/j.marpolbul.2015.04.048

Rummel, C.D., Lüder, M.G.J., Fricker, N.F., Griebeler, E-M., Janke, M., Gerdtz, G. 2016. Plastic ingestion by pelagic and demersal fish from the North Sea and Baltic Sea. Marine Pollution Bulletin 102:131-141. https://doi.org/10.1016/j.marpolbul.2015.11.043

Ryan, M.G., Watkins, L., Walter, M.T. 2019. Hudson River juvenile Blueback herring avoiding ingesting microplastics. Marine Pollution Bulletin 6:935–939. https://doi.org/10.1016/j.marpolbul.2019.07.004

Sanchez, W., Bender, C., Porcher, J.M. 2014. Wild gudgeons (Gobio gobi) from French rivers are contaminated by microplastics: preliminary study and first evidence. Environmental Research 128:98-100. https://doi.org/10.1016/j.envres.2013.11.004

Satish, N., Jayasanta, L., Patterson, J. 2020. Occurrence of microplastics in epipelagic and mesopelagic fishes from Tuticorin, southeast coast of India. Science of the Total Environment 720:137814. https://doi.org/10.1016/j.scitotenv.2020.137814

Saturno, J., Liboiron, M., Ammendolia, J., Healey, N., Earles, E., Duman, N., Schoot, I., Morris, T., Favaro, B. 2020. Occurrence of plastics ingested by Atlantic cod (Gadus morhua) destined for human consumption (Fogo Island, Newfoundland and Labrador). Marine Pollution Bulletin 153:110993. https://doi.org/10.1016/j.marpolbul.2020.110993

Sbrana, A., Valente, T., Scacco U., Bianchi, J., Silvestri, C., Palazzo, L., de Lucia, G.A., Valerani, C., Ardizzone, G., Matiddi, M. 2020. Spatial variability and influence of biological parameters on microplastic ingestion by Boops boops (L.) along the Italian coasts (Western Mediterranean Sea). Environmental Pollution 263:114429. https://doi.org/10.1016/j.envpol.2020.114429

Savoca, S., Capillo, G., Mancuso, M., Bottari, T., Crupi, R., Branca, C., Romano, V., Faggio, C., D’Angelo, G., Sparò, N. 2019. Microplastics occurrence in the Tyrrhenian waters and in the gastrointestinal tract of two congener species of seabreams. Environmental Toxicology and Pharmacology 67:35–41. https://doi.org/10.1016/j.etap.2019.01.011

Sembrining, E., Fareza, A.A., Suendo, V., Reza, M. 2020. The Presence of microplastics in water, sediment, and milkfish (Chanos chanos) at the downstream area of Citarum River, Indonesia. Water Air and Soil Pollution 231:365. https://doi.org/10.1007/s11270-020-04710-y

Sequeira, I.F., Prata, J.C., da Costa, J.P., Duarte, A.C., Teresa Rocha-Santos, T. 2020. Worldwide contamination of fish with microplastics: A brief global overview. Marine Pollution Bulletin 160:111681. https://doi.org/10.1016/j.marpolbul.2020.111681

Siddique, M.A.M., Uddin, A., Rahman, S.M.A., Rahman, M., Islam, M.S., Kibria, G. 2022. Microplastics in an anadromous national fish, Hilsa shad, Tenualosa ilisha from the Bay of Bengal, Bangladesh. Marine Pollution Bulletin 174:113236. https://doi.org/10.1016/j.marpolbul.2021.113236

Silva-Cavalcanti, J.S., Silva, J.D.B., de França, E.J., de Araújo, M.C.B., Gusmão, F. 2017. Microplastics ingestion by a common tropical shad, Tenualosa ilisha from the Bay of Bengal, Bangladesh. Marine Pollution Bulletin 124:82–89. https://doi.org/10.1016/j.marpolbul.2015.08.041
Wu, F., Wang, Y., Leung, J.Y.S., Huang, W., Zeng, J., Tang, Y., Chen, J., Shi, A., Yu, X., Xu, X., Zhang, H., Cao, L. 2020. Accumulation of microplastics in typical commercial aquatic species: a case study at a productive aquaculture site in China. Science of the Total Environment 708:135432. https://doi.org/10.1016/j.scitotenv.2019.135432

Xanthos, D., Walker, T.R. 2017. International policies to reduce plastic marine pollution from single-use plastics (plastic bags and microbeads): A review. Marine Pollution Bulletin 118:17-26. https://doi.org/10.1016/j.marpolbul.2017.02.048

Yagi, M., Kobayashi, T., Maruyama, Y., Hoshina, S., Masumi, S., Aizawa, I., Uchida, J., Knoshtita, T., Yamawaki, N., Joshua, T., Morii, Y., Shimizu, K. 2022. Microplastic pollution of commercial fishes from coastal and offshore waters, Japan. Marine Pollution Bulletin 174:113304. https://doi.org/10.1016/j.marpolbul.2021.113304

Yuan, W., Liu, X., Wang, W., Di, M., Wang, J. 2019. Microplastic abundance, distribution and composition in water, sediments, and wild fish from Poyang Lake, China. Ecotoxicology and Environmental Safety 170:180-187. https://doi.org/10.1016/j.ecoenv.2018.11.126

Zakri, N., Najj, A., Akbarzadeh, A., Uddin, S. 2020. Microplastic ingestion in important commercial fish in the southern Caspian Sea. Marine Pollution Bulletin 160:11598. https://doi.org/10.1016/j.marpolbul.2020.11598

Zheng, K., Xiong, X., Hu, H., Wu, C., Yonghong, Q., Wu, Y., Zhou, B., Lam, P.K.S., Liu, J. 2017. Occurrence and characteristics of microplastic pollution in Xiangxi Bay of Three Gorges Reservoir, China. Environmental Science and Technology 51:3794–3801. https://doi.org/10.1021/acs.est.7b00369

Zheng, F., Wang, X., Xu, J., Zhu, L., Peng, Q., Xu, P., Li, D. 2019. Food-web transfer of microplastics between wild caught fish and crustaceans in East China Sea. Marine Pollution Bulletin 146:173-182. https://doi.org/10.1016/j.marpolbul.2019.05.061

Zhang, D., Cui, Y., Zhou, H., Jin, C., Yuan, W., Liu, X., Wang, W., Di, M., Wang, J. 2019. Microplastic occurrence and distribution of microplastics in commercial fishes from estuarine areas of Guangdong, South China. Chemosphere 260:127656. https://doi.org/10.1016/j.chemosphere.2020.127656

Zheng, K., Xiong, X., Hu, H., Wu, C., Yonghong, Q., Wu, Y., Zhou, B., Lam, P.K.S., Liu, J. 2017. Occurrence and characteristics of microplastic pollution in Xiangxi Bay of Three Gorges Reservoir, China. Environmental Science and Technology 51:3794–3801. https://doi.org/10.1021/acs.est.7b00369

Zheng, F., Wang, X., Xu, J., Zhu, L., Peng, Q., Xu, P., Li, D. 2019. Food-web transfer of microplastics between wild caught fish and crustaceans in East China Sea. Marine Pollution Bulletin 146:173-182. https://doi.org/10.1016/j.marpolbul.2019.05.061

Zheng, D., Cui, Y., Zhou, H., Jin, C., Yuan, W., Liu, X., Xu, Y., Li, Y., Zhang, C. 2020a. Microplastic pollution in water, sediment, and fish from artificial reefs around the Ma'an Archipelago, Shengsi, China. Science of the Total Environment 703:134768. https://doi.org/10.1016/j.scitotenv.2019.134768

Zheng, C., Wang, S., Pan, Z., Sun, D., Xie, S., Zhou, A., Wang, J., Zou, J. 2020b. Occurrence and distribution of microplastics in commercial fishes from estuarine areas of Guangdong, South China. Chemosphere 260:127656. https://doi.org/10.1016/j.chemosphere.2020.127656

Zhang, L., Xie, Y., Zhong, S., Liu, J., Qin, Y., Gao, P. 2021a. Microplastics in freshwater and wild fishes from Lijiang River in Guangxi, Southwest China. Science of the Total Environment 755:142428. https://doi.org/10.1016/j.scitotenv.2020.142428

Zheng, F., Xu, J., Zhu, L., Peng, G., Jabeen, K., Wang, X., Li, D. 2017b. Seasonal distributions of microplastics and estimation of the microplastic load ingested by wild caught fish in the East China Sea. Journal of Hazardous Materials 419:126456. https://doi.org/10.1016/j.jhazmat.2021.126456

Zhao, Y., Sun, X., Li, Q., Shi, Y., Zheng, S., Liang, J., Liu, T., Tian, Z. 2019. Data on microplastics in the digestive tracts of 19 fish species from the Yellow Sea, China. Data in Brief 25:103989. https://doi.org/10.1016/j.dib.2019.103989

Zheng, K., Fan, Y., Zhu, Z., Chen, G., Tang, C., Peng, X. 2019. Occurrence and species-specific distribution of plastic debris in wild freshwater fish from the Pearl River catchment, China. Environmental Toxicology and Chemistry 38:1504–1513. https://doi.org/10.1002/etc.4437

Zhu, L., Wang, H., Chen, B., Sun, X., Ou, K., Xia, B. 2019. Microplastic ingestion in deep-sea fish from the South China Sea. Science of the Total Environment 677:493–501. https://doi.org/10.1016/j.scitotenv.2019.04.380

Zitouni, N., Bousserrhine, N., Belbekhouche, S., Missawi, O., Alphonse,
V., Boughatass, I., Banni, M. 2020. First report on the presence of small microplastics (3 mm) in tissue of the commercial fish Serranus scriba (Linnaeus, 1758) from Tunisian coasts and associated cellular alterations. Environmental Pollution 263:114576. https://doi.org/10.1016/j.envpol.2020.114576
### Supplementary Table 1. List of 887 fish species contaminated with microplastics across the globe.

| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) \( n = \) number of fish samples | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| Antarctic Ocean (01 species) | 1. Antarctic toothfish, Dissostichus mawsoni Norman, 1937 | 2 MPs/fish; 10 % of fish ingested MPs \( n = 10 \) | Pelagic-oceanic (M) | Cannon et al. (2016) |
| Arctic Ocean (06 species) | 1. Atlantic cod, Gadus morhua Linnaeus, 1758 | 0.23 MPs/fish; 20.5 % of fish ingested MPs \( n = 39 \) | Benthopelagic (M, B) | de Vries et al. (2020) |
| | 1. Atlantic cod, Gadus morhua Linnaeus, 1758 | 2.4 % of fish ingested MPs \( n = 205 \) | Benthopelagic (M, B) | Liboiron et al. (2016) |
| | 1. Atlantic cod, Gadus morhua Linnaeus, 1758 | 1.4 % of fish ingested MPs \( n = 216 \) | Benthopelagic (M, B) | Saturno et al. (2020) |
| | 2. Bigeye sculpin, Triglops nystei Jensen, 1944 | 34 % of fish ingested MPs \( n = 71 \) | Demersal (M) | Morgana et al. (2018) |
| | 3. Greenland cod, Gadus ogac J. Richardson, 1836 or Pacific cod, Gadus macrocephalus Tilesius, 1810 | 12 MPs/fish; 100 % of fish ingested MPs \( n = 9 \) | Demersal (M, B) | Granberg et al. (2020) |
| | 4. Greenland shark, Somniosus microcephalus (Bloch & Schneider, 1801) | 3 % of fish ingested MPs \( n = 45 \) | Benthopelagic (M, B) | Leclerc et al. (2012) |
| | 4. Greenland shark, Somniosus microcephalus (Bloch & Schneider, 1801) | 8.3 % of fish ingested MPs \( n = 30 \) | Benthopelagic (M, B) | Nielsen et al. (2014) |
| | 5. Polar cod, Boreogadus saida (Lepechin, 1774) | 18 % of fish ingested MPs \( n = 85 \) | Demersal (M, B) | Morgana et al. (2018) |
| | 5. Polar cod, Boreogadus saida (Lepechin, 1774) | 2.8 % of fish ingested MPs \( n = 72 \) | Demersal (M, B) | Kühn et al. (2018) |
| | 6. Saithe, Pollachius virens (Linnaeus, 1758) | 0.28 MPs/fish; 17.4 % of fish ingested MPs \( n = 46 \) | Demersal (M) | de Vries et al. (2020) |
| Argentina (15 species) | 1. Argentinian silverside, Odontesthes bonariensis (Valenciennes, 1835) | 100 % of fish ingested MPs \( n = 1 \) | Pelagic-neritic (M, F, B) | Pazos et al. (2017) |
| | 2. Catfish, Hypostomus commersoni / Valenciennes, 1836 | 100 % of fish ingested MPs \( n = 2 \) | Demersal (F) | Pazos et al. (2017) |
| | 3. Characin fish, Cyphocharax vogii (Hensel, 1870) | 100 % of fish ingested MPs \( n = 14 \) | Benthopelagic (F) | Pazos et al. (2017) |
| | 4. Characin fish, Oligosarcus oligolepis Steindachner, 1867 | 100 % of fish ingested MPs \( n = 5 \) | Pelagic (F) | Pazos et al. (2017) |
| | 5. Clinid fish, Ribeirocinus eigenmanni (Jordan, 1888) | 0.6 MPs/fish; 38.5 % of fish ingested MPs | Benthopelagic (M) | Pazos et al. (2017) |
| | 6. Common carp, Cyprinus carpio Linnaeus, 1758 | 100 % MPs of fish ingested MPs \( n = 2 \) | Demersal (F, B) | Pazos et al. (2017) |
| | 7. Crappie fish, Astyanax rutilus (Jenins, 1842) | 100 % of fish ingested MPs \( n = 12 \) | Benthopelagic (F) | Pazos et al. (2017) |
| | 8. Cunningham’s triplefin, Helicogrammoids cunninghami (Smitt, 1898) | 0.6 MPs/fish; 38.5 % of fish ingested MPs \( n = 39 \) | Demersal (M) | Ríos et al. (2020) |
| | 9. Long-whiskered catfish/ Pati, Luciopimelodus pati (Valenciennes, 1835) | 100 % of fish ingested MPs \( n = 9 \) | Demersal (F) | Pazos et al. (2017) |
| | 10. Long-whiskered catfish, Parapimelodus valenciennes (Lütken, 1874) | 100 % of fish ingested MPs \( n = 21 \) | Demersal (F) | Pazos et al. (2017) |
| Country/location       | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|------------------------|-------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------|------------|
| Patagonian blennie, Eleginops maclovinus (Cuvier, 1830) | 0.6 MPs/fish; 38.5 % of fish ingested MPs (n = 30) | Benthopelagic (M) | Rios et al. (2020) |
| Spotted pim, Pimelodus maculatus Lacepède, 1803 | 100 % of fish ingested MPs (n = 14) | Benthopelagic (F) | Pazos et al. (2017) |
| Spotted sorubim, Pseudoplatystoma corruscans (Spix & Agassiz, 1829) | 100 % of fish ingested MPs (n = 2) | Demersal (F) | Pazos et al. (2017) |
| Streaked prochilod, Prochilodus lineatus (Valencieniennes, 1837) | 100 % of fish ingested MPs (n = 5)(F) | Benthopelagic (F) | Pazos et al. (2017) |
| Streaked prochilod, Prochilodus lineatus (Valenciennes, 1837) | 9.9 MPs/fish; 100 % of fish ingested MPs (n = 21) | Benthopelagic (F) | Bletter et al. (2019) |
| Whitemouth croaker, Micropogonias furnieri (Desmarest, 1823) | 12.1 MPs/fish; 100 % of fish ingested MPs (n = 20) | Demersal (M, B) | Arias et al. (2019) |
| Arrowtail, Melanonus zugmayeri Norman, 1930 | 0.25 MPs/fish (n = 1) | Bathypelagic (M) | Mc Goran et al. (2021) |
| Barbeled dragonfish, Borostomias elucens (Brauer, 1906) | 6 MPs/fish (n = 1) | Bathypelagic (M) | Mc Goran et al. (2021) |
| Black dragonfish, Idiacanthus atlanticus Brauer, 1906 | 3.25 MPs/fish (n = 1) | Bathypelagic (M) | Mc Goran et al. (2021) |
| Boa dragonfish, Stomias boa (Risso, 1810) | 0.8 MPs/fish; 40 % of fish ingested MPs (n = 5) | Bathypelagic (M) | Lusher et al. (2016) |
| Bluntsnout smooth-head, Xenodermichthys copei (Gill, 1884) | 1.2 MPs/fish; 60 % of fish ingested MPs (n = 5) | Bathypelagic (M) | Lusher et al. (2016) |
| Bristlemouths, Gonostoma denudatum Rafinesque, 1810 | 2.20 MPs/fish; 100 % of fish ingested MPs (n = 5) | Bathypelagic (M) | Wieczorek et al. (2018) |
| Brown chromis, Chromis multilineata (Guichenot, 1853) | 3 MPs/fish; 5 % of fish ingested MPs (n = 22) | Reef-associated (M) | Macieira et al. (2021) |
| Common Fangtooth, Anoplogaster comuta (Valenciennes, 1833) | 6.1 MPs/fish (n = 2) | Bathypelagic (M) | Mc Goran et al. (2021) |
| Elongated bristlemouth fish, Sigmops elongatus (Günther, 1878) | 0.5 MPs/fish (n = 5) | Bathypelagic (M) | Mc Goran et al. (2021) |
| Glacier lantern fish, Benthosema glaciale (Reinhardt, 1837) | 0.33 MPs/fish; 22 % of fish ingested MPs (n = 27) | Pelagic-oceanic (M) | Lusher et al. (2016) |
| Glacier lantern, Benthosema glaciale (Reinhardt, 1837) | 1.46 MPs/fish; 68 % of fish ingested MPs (n = 69) | Pelagic-oceanic (M) | Wieczorek et al. (2018) |
| Inflated whiptail, Macrobrictus inflatus (Smith & Radcliffe, 1912) | 1.0 MPs/fish (n = 4) | Bathypelagic (M) | Mc Goran et al. (2021) |
| Lancet fish Notoscoptes kroyeri (Malm, 1861) | 0.16 MPs/fish; 14.8 % of fish ingested MPs (n = 417) | Pelagic-oceanic (M) | Lusher et al. (2016) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 13. | Longnose snouted lancetfish, *Alepisaurus ferox* Lowe, 1833 | 4.7 MPs/fish; 74 % of fish ingested MPs (n = 27) | Bathypelagic (M) | Gago et al. (2020) |
| 14. | Midwater scorpionfish, *Ectreposebastes imus* Garman, 1899 | 0.75 MPs/fish (n = 2) | Bathypelagic (M) | McGoran et al. (2021) |
| 15. | Obese dragonfish, *Opostomias micrignus* (Günther, 1878) | 1.1 MPs/fish (n = 4) | Bathypelagic (M) | McGoran et al. (2021) |
| 16. | Rakery beacon lamp, *Lampancyctus macdonaldi* (Goode & Bean, 1886) | 1.7 MPs/fish; 75 % of fish ingested MPs (n = 16) | Bathypelagic (M) | Wieczorek et al. (2018) |
| 17. | Scaly dragonfish, *Stomias boa* (Risso, 1810) | 0.8 MPs/fish; 66.7 % of fish ingested MPs (n = 9) | Bathypelagic (M) | Wieczorek et al. (2018) |
| 18. | Silvery light fish, *Maurolicus muelleri* (Gmelin, 1789) | 0.032 MPs/fish; 2.8 % of fish ingested MPs (n = 282) | Bathypelagic (M) | Lusher et al. (2016) |
| 19. | Slender snipe eel, *Nemichthys scolopaceus* Richardson, 1848 | 1 MPs/fish; 100 % of fish ingested MPs (n = 1) | Bathypelagic (M) | Lusher et al. (2016) |
| 20. | Sloane's viperfish, *Chauliodus sloani* Bloch & Schneider, 1801 | 1.25 MPs/fish (n = 4) | Bathypelagic (M) | McGoran et al. (2021) |
| 21. | Southern lanternfish, *Lampancyctus australis* Tåning, 1932 | 1.0 MPs/fish (n = 4) | Pelagic-oceanic (M) | McGoran et al. (2021) |
| 22. | Spanish hogfish, *Bodianus ruus* (Linnaeus, 1758) | 2 MPs/fish; 17 % of fish ingested MPs (n = 6) | Reef-associated (M) | Macieira et al. (2021) |
| 23. | Spotfin hogfish, *Bodianus pulchellus* (Poey, 1860) | 0.8 MP/fish; 25 % of fish ingested MPs (n = 4) | Reef-associated (M) | Macieira et al. (2021) |
| 24. | Spotted barracudina, *Arctozenus risso* (Bonaparte, 1840) | 0.29 MPs/fish; 21 % of fish ingested MPs (n = 14) | Bathypelagic (M) | Lusher et al. (2016) |
| 25. | Spotted lantern fish, *Mycophthum punctatum* Rafinesque, 1810 | 2.28 MPs/fish; 74.42 % of fish ingested MPs (n = 86) | Bathypelagic (M) | Wieczorek et al. (2018) |
| 26. | Squirrelfish, *Holocentrus adscensionis* Osbeck, 1765 | 1 MPs/fish; 100 % of fish ingested MPs (n = 1) | Reef-associated (M) | Macieira et al. (2021) |
| 27. | Stout saw palate, *Serrivomer beanie* Gill & Ryder, 1883 | 2.36 MPs/fish; 92.86 % of fish ingested MPs (n = 14) | Bathypelagic (M) | Wieczorek et al. (2018) |
| 28. | Stout sawpalate, *Serrivomer beanie* Gill & Ryder, 1883 | 1.25 MPs/fish (n = 6) | Bathypelagic (M) | McGoran et al. (2021) |
| 29. | Tomtate grunt, *Haemulon aurolineatum* Cuvier, 1830 | 1 MP/fish; 17 % of fish ingested MPs (n = 29) | Reef-associated (M) | Macieira et al. (2021) |
| 30. | White grunt, *Haemulon plumieri* (Lacepède, 1801) | 1.5 MP/fish; 60 % of fish ingested MPs (n = 4) | Reef-associated (M) | Macieira et al. (2021) |
| 31. | White-spotted lantern fish, *Diaphus rafinesquii* (Cocco, 1838) | 1.15 MP/fish; 78.6 % of fish ingested MPs (n = 34) | Bathypelagic (M) | Wieczorek et al. (2018) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| Australia (20 species) | 1. Australian herring, *Arripis georgianus* (Valenciennes, 1831) | 0.60 MPs/fish; 30 % of fish ingested MPs (n = 40) | Pelagic-neritic (M, B) | Wootton et al. (2021b) |
| | 2. Australian pilchard, *Sardinops neopilchardus* (Jenyns, 1842)/ *Sardinops sagax* (Jenyns, 1842) | Plastic: 2.9 mg/g tissue (n = 10) | Pelagic-neritic (M) | Ribeiro et al. (2020) |
| | 3. Australian salmon, *Arripis truttaceus* (Cuvier, 1829) | 1.60 MPs/fish; 43 % of fish ingested MPs (n = 88) | Benthopelagic (M, B) | Wootton et al. (2021b) |
| | 4. Australian sardine, *Sardinops sagax* (Jenyns, 1842) | 0.32 MPs/fish; 14.3 % of fish ingested MPs (n = 105) | Pelagic-neritic (M) | Wootton et al. (2021b) |
| | 4. Australian sardine, *Sardinops sagax* (Jenyns, 1842) | 0.26 MPs/fish; 26 % of fish ingested MPs (n = 27) | Pelagic-neritic (M) | Crutchett et al. (2020) |
| | 5. Blue-striped mullet/goatfish, *Upeneichthys lineatus* (Bloch & Schneider 1801) | 1.5 MPs/fish; 57.5 % of fish ingested MPs (n = 20) | Demersal (M) | Wootton et al. (2021a) |
| | 6. Common silver belly, *Gerres subfasciatus* Cuvier, 1830 | 0.1 MPs/fish; 45 % of fish ingested MPs (n = 24) | Demersal (M, B) | Halstead et al. (2018) |
| | 7. Dusky flathead, *Plectorhombus fuscus* Cuvier, 1829 | 1.14 MPs/fish; 42.9 % of fish ingested MPs (n = 28) | Demersal (M, B) | Wootton et al. (2021b) |
| | 8. Eastern mosquitofish, *Gambusia holbrooki* Girard, 1859 | 0.6 MPs/fish; 19.4 % of fish ingested MPs (n = 180) | Benthopelagic (F, B) | Su et al. (2019a) |
| | 9. Flathead grey mullet, *Mugil cephalus* Linnaeus, 1758 | 1.0 MPs/fish; 50 % of fish ingested MPs (n = 20) | Benthopelagic (M, F, B) | Wootton et al. (2021a) |
| | 9. Flathead grey mullet, *Mugil cephalus* Linnaeus, 1758 | 0.94 MPs/fish; 50 % of fish ingested MPs (n = 161) | Benthopelagic (M, F, B) | Wootton et al. (2021b) |
| | 9. Flathead grey mullet, *Mugil cephalus* Linnaeus, 1758 | 2.5 MPs/fish; 65 % of fish ingested MPs (n = 45) | Benthopelagic (M, F, B) | Halstead et al. (2018) |
| | 10. Garfish, *Hyporhamphus melanochir* | 0.27 MPs/fish; 23.3 % of fish ingested MPs (n = 90) | Pelagic-neritic (M, B) | Wootton et al. (2021b) |
| | 11. Humboldt red snapper, *Lutjanus gibbus* (Forsskål, 1775) | 2.4 MPs/fish; 75 % of fish ingested MPs (n = 20) | Reef-associated (M) | Wootton et al. (2021a) |
| | 12. Indian goat fish, *Parupeneus indicus* (Shaw, 1803) | 1.5 MPs/fish; 57.5 % of fish ingested MPs (n = 20) | Reef-associated (M, B) | Wootton et al. (2021a) |
| | 13. King George whiting, *Sillaginodes punctatus* (Cuvier, 1829) | 1.60 MPs/fish; 50.3 % of fish ingested MPs (n = 161) | Demersal (M, B) | Wootton et al. (2021b) |
| | 14. Lemon damselfish, *Pomacentrus moluccensis* Bleeker, 1853 | 7.983 MPs/fish; 95 % of fish ingested MPs (n = 60) | Reef-associated (M) | Jensen et al. (2018) |
| | 15. Leopard coral grouper, *Plectropomus leopardus* (Lacepède, 1802) | 5.9 MPs/fish; 96 % of fish ingested MPs (n = 20) | Reef-associated (M) | Kroon et al. (2018) |
| Country/Location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M=Marine, B=Brackish, F=Freshwater) | References |
|---|---|---|---|---|
| Baltic Sea (4 species) | 1. Atlantic cod, *Gadus morhua* Linnaeus, 1758 | 1.4% of fish ingested MPs (n = 74) | Benthopelagic (M, B) | Rummel et al. (2016) |
|  | 1. Atlantic cod, *Gadus morhua* Linnaeus, 1758 | 20.85 % of fish ingested MPs (n = 101) | Benthopelagic (M, B) | Lenz et al. (2016) |
|  | 2. Atlantic herring, *Clupea harengus* Linnaeus, 1758 | 11.65 % of fish ingested MPs (n = 105) | Benthopelagic (M, B) | Lenz et al. (2016) |
|  | 3. Atlantic mackerel, *Scomber scombrus* Linnaeus, 1758 | 30.8 % of fish ingested MPs (n = 13) | Pelagic-neritic (M, B) | Rummel et al. (2016) |
|  | 4. European flounder, *Platichthys flesus* (Linnaeus, 1758) | 10% of fish ingested MPs (n = 10) | Demersal (M, F, B) | Rummel et al. (2016) |
| Bangladesh (28 species) | 1. Asian leaffish, *Nandus meni*; pelagic Hossain & Sarker, 2013 | 4.8 MPs/fish (n = 3) | Pelagic (F, B) | Parvin et al. (2021) |
|  | 2. Bata, *Labeo bata* (Hamilton, 1822) | 0.8 MPs/fish (n = 3) | Benthopelagic (F) | Parvin et al. (2021) |
|  | 3. Batchwa vacha, *Eutropiichthys vacha* (Hamilton, 1822) | 0.5 MPs/fish (n = 2) | Pelagic (F, B) | Parvin et al. (2021) |
|  | 4. Bombay-duck, *Harpadon nehereus* (Hamilton, 1822) | 1.8 of fish ingested MPs (n = 10) | Benthopelagic (M, B) | Ghosh et al. (2021) |
|  | 4. Bombay-duck, *Harpadon nehereus* (Hamilton, 1822) | 8.72 MPs/fish; 100 % of fish ingested MPs (n = 25) | Benthopelagic (M, B) | Hossain et al. (2019) |
|  | 5. Bombay-duck/ Glassy Bombay duck, *Harpodon translucens* Saville-Kent, 1889 | 5.80 MPs/fish; 100 % of fish ingested MPs (n = 25) | Demersal (M, B) | Hossain et al. (2019) |
|  | 6. Butter catfish, *Ompok bimaculatus* (Bloch, 1794) | 1.0 MPs/fish (n = 3) | Demersal (F, B) | Parvin et al. (2021) |
|  | 7. Chacunda gizzard shad, *Anodontostoma chacunda* (Hamilton, 1822) | 1.4 MPs/fish (n = 10) | Pelagic-neritic (F, M, B) | Ghosh et al. (2020) |
|  | 8. Climbing perch, *Anabas testudineus* (Bloch, 1792) | 2.8 MPs/fish (n = 6) | Demersal (F, B) | Parvin et al. (2021) |
|  | 9. Common carp, *Cyprinus carpio* Linnaeus, 1758 | 3.6 MPs/fish (n = 2) | Benthopelagic (F) | Parvin et al. (2021) |
|  | 10. Common hairfin anchovy, *Setipinna tenuifilis* (Valenciennes, 1846) | 3.2 MPs/fish (n = 10) | Pelagic-neritic (M, F, B) | Ghosh et al. (2021) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| Belgium (01 species) | 1. Gudgeons, *Gobio gobio* (Linnaeus, 1758) | 0.10 MPs/fish; 9 % of fish ingested MPs (n = 78) | Benthopelagic (F, B) | Slootmaekers et al. (2019) |
| Brazil (84 species) | 1. *Acoupa weakfish, Cynoscion acoupa* (Lacepède, 1801) | 3.03 MPs/fish (n = 552) | Demersal (F, B) | Ferreira et al. (2018) |
| | 2. Argentine croaker, *Umbrina canosa* Berg, 1895 | 1.18 MPs/fish; 13.3 % of fish ingested MPs (n = 120) | Demersal (F, B) | Neto et al. (2020) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 3. Armored catfish, Hypostomus annectroides (Ihering, 1911) | 40 % of fish ingested MPs (n = 30) | Demersal (F) | Garcia et al. (2020) |
| 4. Armored catfish, Rineloricaria pentomaculata | 22.2 % of fish ingested MPs (n = 9) | Demersal (F) | Garcia et al. (2020) |
| 5. Atipa, Hoplosternum littorale (Hancock, 1828) | 3.6 MPs/fish; 83 % of fish ingested MPs (n = 48) | Demersal (F) | Silva-Cavalcanti et al. (2017) |
| 6. Atlantic bumper, Chloroscombrus chrysurus (Linnaeus, 1768) | 1.0 MPs/fish; 61 % of fish ingested MPs (n = 31) | Pelagic-neritic (M, B) | Dantas et al. (2020) |
| 7. Atlantic sabretooth anchovy, Lyencraulis grossidens (Spix & Agassiz, 1829) | 0.18 MPs/fish (n = 14B) | Pelagic-neritic (M, F, B) | Vendel et al. (2017) |
| 8. Atlantic thread herring, Opisthomeno olingum (Lesueur, 1818) | 0.22 MPs/fish (n = 56) | Reef-associated (M) | Vendel et al. (2017) |
| 8. Atlantic thread herring, Opisthomeno olingum (Lesueur, 1818) | 1.5 MPs/fish; 65 % of fish ingested MPs (n = 31) | Reef-associated (M) | Dantas et al. (2020) |
| 9. Bahia sprat, Rhinosardinia bahiensis (Steindachner, 1879) | 0.25 MPs/fish (n = 179) | Pelagic (F, B) | Vendel et al. (2017) |
| 10. Banded Astyanax, Psalidodon fasciatus (Cuvier, 1819) | 40 % fish ingested MPs (n = 5) | Benthopelagic (F) | Garcia et al. (2020) |
| 11. Banded butterflyfish, Chaetodon striatus (Linnaeus, 1758) | 1 MPsfish; 50 % fish ingested MPs (n = 2) | Reef-associated (M) | Macieira et al. (2021) |
| 12. Barred grunt, Conodon nobilis (Linnaeus, 1758) | 1.0 MPsfish; 56 % of fish ingested MPs (n = 34) | Demersal (M) | Dantas et al. (2020) |
| 13. Bluefish, Pomatomus saltatrix (Linnaeus, 1766) | 1.18 MPsfish; 19.7 % of fish ingested MPs (n = 122) | Pelagic-oceanic (M, B) | Neto et al. (2020) |
| 14. Bluewing searobin, Prionotus punctatus (Bloch, 1793) | 0.06 MPsfish; 5 % of fish ingested MPs (n = 120) | Demersal (M, B) | Neto et al. (2020) |
| 15. Bonnethead, Sphyra tiburo (Linnaeus, 1758) | 9.0 MPsfish; 100 % of fish ingested MPs (n = 2) | Reef-associated (M, B) | Pegado et al. (2018) |
| 16. Brazilian electric ray, Narcine brasiliensis (Ofiers, 1831) | 3.0 MPsfish; 16.7 % of fish ingested MPs (n = 6) | Reef-associated (M) | Pegado et al. (2018) |
| 17. Brazilian mojarra, Eugerres brasilianus (Cuvier, 1830) | 0.06 MPsfish (n = 47) | Demersal (M) | Vendel et al. (2017) |
| 17. Brazilian mojarra, Eugerres brasilianus (Cuvier, 1830) | 0.09 MPsfish (n = 240) | Demersal (M) | Ramos et al. (2012) |
| 18. Brazilian sharpnose shark, Rhizoprionodon lancingii (Valenciennes, 1839) | 62.5 % of fish ingested MPs (n = 8) | Demersal (M) | Miranda and Carvalho-Souza (2016) |
| 19. Brazilian silversides, Atheninella brasiliensis (Quoy & Gaimard, 1825) | 0.04 MPsfish (n = 405) | Benthopelagic (M, B) | Vendel et al. (2017) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 20. | Brown chromis, Chromis multilineata (Guichenot, 1853) | 3.0 MPs/fish; 5% of fish ingested MPs (n = 22) | Reef-associated (M) | Macieira et al. (2021) |
| 21. | Caitipa mojarra, Diapterus rhombeus (Cuvier, 1829) | 0.06 MPs/fish (n = 18) | Demersal (M, B) | Vendel et al. (2017) |
| 21. | Caitipa mojarra, Diapterus rhombeus (Cuvier, 1829) | 13.2% of fish ingested MPs (n = 40) | Demersal (M, B) | Ramos et al. (2012) |
| 22. | Catfish, Iheringhtyx lascrus (Lütken, 1874) | 34.5% of fish ingested MPs (n = 28) | Demersal (F) | dos Santos et al. (2016) |
| 23. | Checkered puffer, Sphoeroides testudineus (Linnaeus, 1758) | 0.09 MPs/fish (n = 22) | Reef-associated (M, B) | Vendel et al. (2017) |
| 24. | Coco sea catfish, Bagre bagre (Linnaeus, 1766) | 12.8 MPs/fish; 71.4% of fish ingested MPs (n = 7) | Demersal (M) | Pegado et al. (2018) |
| 25. | Common halfbeak, Hyporhamphus unifasciatus (Ranzani, 1841) | 0.15 MPs/fish (n = 209) | Reef-associated (M, B) | Vendel et al. (2017) |
| 26. | Common snook, Centropomus undecimalis (Bloch, 1874) | 16.7% of fish ingested MPs (n = 6) | Benthopelagic (F) | Andrade et al. (2019) |
| 27. | Crevalle jack, Caranx hippos (Linnaeus, 1766) | 30.7 MPs/fish; 100% of fish ingested MPs (n = 3) | Reef-associated (M, B) | Pegado et al. (2018) |
| 28. | Darter goby, Ctenogobius boleosoma (Jordan & Gilbert, 1882) | 0.06 MPs/fish (n = 16) | Reef-associated (M, F, B) | Vendel et al. (2017) |
| 29. | Disk tetra, Myloplus schomburgki (Jardine, 1841) | 16.7% of fish ingested MPs (n = 6) | Benthopelagic (F) | Andrade et al. (2019) |
| 30. | Drum/croaker fish, Stellifer brasiliensis (Schultz, 1945) | 9.2% of fish ingested MPs (n = 59) | Demersal (M) | Dantas et al. (2012) |
| 31. | Flagfin mojarra, Eucinostomus melanopterus (Bleeker, 1863) | 9.13% of fish ingested MPs (n = 141) | Demersal (M, F, B) | Ramos et al. (2012) |
| 32. | Gafftopsail sea catfish, Bagre marinus (Mitchill, 1815) | 1.0 MPs/fish; 37% of fish ingested MPs (n = 27) | Demersal (M, B) | Dantas et al. (2020) |
| 33. | Green weakfish, Cynoscion virescens (Cuvier, 1830) | 3.0 MPs/fish; 14.3% of fish ingested MPs (n = 7) | Demersal (M, B) | Pegado et al. (2018) |
| 34. | Guppy Poecilia reticulata (Peters, 1859) | 36.7% of fish ingested MPs (n = 30) | Benthopelagic (F, B) | Garcia et al. (2020) |
| 35. | Irish mojarra, Diapterus auratus Ranzani, 1842 | 0.97 MPs/fish (n = 29) | Demersal (M, B) | Vendel et al. (2017) |
| 36. | Jamaica weakfish, Cynoscion jamocenssis (Vaillant & Bocourt, 1883) | 0.18 MPs/fish; 10.8% of fish ingested MPs (n = 120) | Demersal (M, B) | Neto et al. (2020) |
| 37. | King mackerel, Scomberomorus cavalla (Cuvier, 1829) | 33% of fish ingested MPs (n = 8) | Pelagic-neritic (M) | Miranda and Carvalho-Souza (2016) |
| 38. | King weakfish, Macrodon ancyldodon (Bloch & Schneider, 1801) | 2.0 MPs/fish; 7.7% of fish ingested MPs (n = 13) | Demersal (M, B) | Pegado et al. (2018) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
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| 39. Lane snapper, *Lutjanus synagris* (Linnaeus, 1758) | 1.0 MPs/fish; 50 % of fish ingested MPs (n = 2) | Reef-associated (M) | Pegado et al. (2018) |
| 40. Largehead hairtail, *Trichiurus lepturus* Linnaeus, 1758 | 2.0 MPs/fish; 20 % of fish ingested MPs (n = 5) | Benthopelagic (M, B) | Pegado et al. (2018) |
| 41. Largescal fat snook, *Centropomus mexicanus* Bocourt, 1868 | 1.43 MPs/fish; 65 % of fish ingested MPs (n = 117) | Demersal (M, B) | Ferreira et al. (2019) |
| 42. Leatherjacket, *Oligoplites souros* (Bloch & Schneider, 1801) | 0.17 MPs/fish (n = 22) | Reef-associated (M, B) | Vendel et al. (2017) |
| 43. Lined sole, *Achirus lineatus* (Linnaeus, 1758) | 0.5 MPs/fish (n = 4) | Reef-associated (M, B) | Vendel et al. (2017) |
| 44. Little croaker, *Stellifer stellifer* (Bloch, 1790) | 7.9 % of fish ingested MPs (n = 569) | Demersal (M, B) | Dantas et al. (2012) |
| 45. Littlescule threadfin, *Polydactylus ologodon* (Günther, 1860) | 3.0 MPs/fish; 100 % of fish ingested MPs (n = 1) | Demersal (M, B) | Pegado et al. (2018) |
| 46. Lookdown, *Selene vomer* (Linnaeus, 1758) | 2.0 MPs/fish; 50 % of fish ingested MPs (n = 2) | Demersal (M, B) | Pegado et al. (2018) |
| 47. Madamango sea catfish, *Cathorops spixii* (Agassiz, 1829) | 2.5 MPs/fish; 75 % of fish ingested MPs (n = 33) | Demersal (M, B) | Dantas et al. (2020) |
| 48. Marini’s anchovy, *Anchoa marinii* Hildebrand, 1943 | 0.05 MPs/fish (n = 19) | Pelagic-oceanic (M) | Vendel et al. (2017) |
| 49. Mutton snapper, *Lutjanus analis* (Cuvier, 1828) | 1.0 MPs/fish; 33.3 % of fish ingested MPs (n = 3) | Reef-associated (M, B) | Pegado et al. (2018) |
| 50. Pemecou sea catfish, *Sciades herzbergii* (Bloch, 1794) | 17 % of fish ingested MPs (n = 62) | Demersal (M, F, B) | Possatto et al. (2011) |
| 51. Piranha fish, *Metynnis guaporensis* Eigenmann, 1915 | 27.3 % of fish ingested MPs (n = 11) | Pelagic (F) | Andrade et al. (2019) |
| 52. Piranha fish, *Myloplus rhomboidalis* (Cuvier, 1818) | 100 % of fish ingested MPs (n = 1) | Benthopelagic (F) | Andrade et al. (2019) |
| 53. Piranha fish, *Ossubtus xinguense* Jégu, 1992 | 52.6 % of fish ingested MPs (n = 62) | Benthopelagic (F) | Andrade et al. (2019) |
| 54. Piranha fish, *Pristobrycon eigenmanni* Norman, 1929 | 33.3 % of fish ingested MPs (n = 6) | Benthopelagic (F) | Andrade et al. (2019) |
| 55. Piranha fish, *Serrasalmus manueli* (Fernández-Yépez & Ramirez, 1967) | 14.3 % of fish ingested MPs (n = 7) | Benthopelagic (F) | Andrade et al. (2019) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M=Marine, B=Brackish, F=Freshwater) | References |
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| 56. | Piranha fish, Tometes ancylobranchus Andrade, Jégu & Giarrizzo, 2016 | 40 % of fish ingested MPs (n = 5) | Pelagic (F) | Andrade et al. (2019) |
| 57. | Piranha fish, Tometes kranponhah Andrade, Jégu & Giarrizzo, 2016 | 19 % of fish ingested MPs (n = 63) | Pelagic (F) | Andrade et al. (2019) |
| 58. | Red piranha, Pygocentrus nattereri Kner, 1858 | 75 % of fish ingested MPs (n = 4) | Pelagic (F) | Andrade et al. (2019) |
| 59. | Redeye piranha, Serrasalmus rhombeus (Linnaeus, 1768) | 22.2 % of fish ingested MPs (n = 9) | Benthopelagic (F) | Andrade et al. (2019) |
| 60. | Redhook myleus, Myloplus rubripinnis (Müller & Troschel, 1844) | 13.3 % of fish ingested MPs (n = 15) | Benthopelagic (F) | Andrade et al. (2019) |
| 61. | Rio anchovy, Anchoa januaria | 0.15 MPs/fish (n = 194) | Pelagic-neritic (M, B) | Vendel et al. (2017) |
| 62. | Roughneck grunt; Haemulopsis corvinaeformis (Steindachner, 1868) | 1.0 MPs/fish; 46 % of fish ingested MPs (n = 28) | Demersal (M, F, B) | Dantas et al. (2020) |
| 63. | Sea catfish, Citharinus agassizii (Eigenmann & Eigenmann, 1888) | 33 % of fish ingested MPs (n = 60) | Benthopelagic (F) | Possatto et al. (2011) |
| 64. | Sheep-pacu, Acodon normani Gosline, 1951 | 25 % of fish ingested MPs (n = 4) | Benthopelagic (F) | Andrade et al. (2019) |
| 65. | Silver mojarra, Eucinostomus argenteus Baird & Girard, 1856 | 0.02 MPs/fish (n = 46) | Reef-associated (M, F, B) | Vendel et al. (2017) |
| 66. | Skipjack tuna, Katsuwonus pelamis (Linnaeus, 1758) | 1.65 MPs/fish; 25.8 % of fish ingested MPs (n = 120) | Pelagic-oceanic (M) | Neto et al. (2020) |
| 67. | Slender halfbeak, Hyporhamphus roberti (Valenciennes, 1847) | 0.03 MPs/fish (n = 31) | Pelagic-neritic (M, B) | Vendel et al. (2017) |
| 68. | Smallscale weakfish, Cynoscion microlepidotus (Cuvier, 1830) | 1.3 MPs/fish; 18.7 % of fish ingested MPs (n = 16) | Demersal (M, B) | Pegado et al. (2018) |
| 69. | Smooth weakfish, Cynoscion leari (Cuvier, 1830) | 2.0 MPs/fish; 50 % of fish ingested MPs (n = 2) | Demersal (M, B) | Pegado et al. (2018) |
| 70. | South American catfish, Rhamdia quelen (Quoy & Gaimard, 1824) | 42.8 % of fish ingested MPs (n = 7) | Benthopelagic (F) | Garcia et al. (2020) |
| 71. | Southern king weakfish, Macrodon atricuda (Günther, 1880) | 1.17 MPs/fish; 13.3 % of fish ingested MPs (n = 121) | Demersal (M) | Neto et al. (2020) |
| 72. | Southern molly, Poecilia vivipara Bloch & Schneider, 1801 | 0.01 MPs/fish (n = 75) | Benthopelagic (F, B) | Vendel et al. (2017) |
| 73. | Spanish hogfish, Bodianus rufus (Linnaeus, 1758) | 2 MPs/fish; 17 % of fish ingested MPs (n = 6) | Reef-associated (M) | Macieira et al. (2021) |
| 74. | Spotfin hogfish, Bodianus pulchellus (Poey, 1860) | 5 MPs/fish; 25 % of fish ingested MPs (n = 4) | Reef-associated (M) | Macieira et al. (2021) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
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| Canada (07 species) | 75. Squirrelfish, Holocentrus adscensionis (Osbeck, 1765) | 1 MP fish; 100 % of fish ingested MP (n = 1) | Reef-associated (M) | Macieira et al. (2021) |
| | 76. Striped weakfish, Cynoscion quattuoracuda (Cuvier, 1830) | 0.23 MP/fish; 10.5 % of fish ingested MP (n = 124) | Benthopelagic (M) | Neto et al. (2020) |
| | 77. Tarpon snook, Centropomus pectinatus Poey, 1860 | 1.21 MP/fish; 51 % of fish ingested MP (n = 40) | Benthopelagic (M, F, B) | Ferreira et al. (2019) |
| | 78. Tetra fish, Astyanax lacustris (Lütken, 1875) | 0.25 MP/fish (n = 4) | Demersal (M, B) | Vendel et al. (2017) |
| | 79. Tomate grunt, Haemulon aurolineatum Cuvier, 1830 | 0.1 MP/fish; 17 % of fish ingested MP (n = 29) | Reef-associated (M) | Macieira et al. (2021) |
| | 80. Tongue fish, Symphurus tessellatus (Quoy & Gaimard, 1824) | 2.7 MP/fish; 71 % of fish ingested MP (n = 75) | Benthopelagic (F) | Campbell et al. (2017) |
| | 81. White grunt, Haemulon plumieri (Lacepède, 1801) | 1.5 MP/fish; 50 % of fish ingested MP (n = 4) | Reef-associated (M) | Macieira et al. (2021) |
| | 82. White Mullet, Mugil curema Valenciennes, 1836 | 0.01 MP/fish (n = 100) | Reef-associated (M, F, B) | Vendel et al. (2017) |
| | 83. White sucker, Catostomus commersoni (Lacepède, 1803) | 3.1 MP/fish; 72 % of fish ingested MP (n = 32) | Demersal (F, B) | Campbell et al. (2017) |
| | 84. Zabaleta anchovy, Anchovia clupeoides (Swainson, 1839) | 0.13 MP/fish (n = 8) | Benthopelagic (M, B) | Vendel et al. (2017) |
| Chile (14 species) | 75. Amberstripe scad, Decapterus muroadsi (Temminck & Schlegel, 1844) | 2.5 MP/fish; 80 % of fish ingested MP (n = 20) | Pelagic-oceanic (M) | Ory et al. (2017) |
| | 76. Anchoveta, Engraulis ringens Jenyns, 1842 | 0.1 MP/fish; 7.7 % of fish ingested MP (n = 13) | Pelagic-neritic (M) | Ory et al. (2018) |
| | 77. Araucanian herring, Strangomera bentincki (Norman, 1935) | 30 % of fish ingested MP (n = 10) | Pelagic-neritic (M) | Pozo et al. (2019) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish), (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
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| Chile | 4. Chilean jack mackerel, *Trachurus murphyi* Nichols, 1920 | 10 % of fish ingested MPs (n = 10) | Pelagic-oceanic (M) | Pozo et al. (2019) |
| | 5. Chilean silverside, *Odonotesthes regia* (Humboldt, 1821) | 0.1 MPs/fish; 11.1 % of fish ingested MPs (n = 9) | Pelagic-neritic (M, F, B) | Ory et al. (2018) |
| | 6. Combtooth blenny, *Scaurichthys viridis* (Valenciennes, 1836) | 14 MPs/fish (n = 10) | Demersal (M) | Mizraji et al. (2017) |
| | 7. Greenfish, *Dirella laevifrons* (Tschudi, 1846) | 61 MPs/fish (n = 16) | Pelagic-neritic (M) | Mizraji et al. (2017) |
| | 8. Labrissomid blenny, *Auchenionchus microcirrhis* (Valenciennes, 1836) | 10 MPs/fish (n = 16) | Demersal (M) | Mizraji et al. (2017) |
| | 9. Old black, *Graus nigra* Philippi, 1887 | 10 MPs/fish (n = 8) | Demersal (M) | Mizraji et al. (2017) |
| | 10. Patagonian blenny, *Eleginops maclovinus* (Cuvier, 1830) | 30 % of fish ingested MPs (n = 10) | Benthopelagic (M) | Pozo et al. (2019) |
| | 11. Pejerrey, *Basilichthys australis* Eigenmann, 1928 | 70 % of fish ingested MPs (n = 10) | Pelagic (F) | Pozo et al. (2019) |
| | 12. South Pacific hake, *Merluccius gayi* (Guichenot, 1848) | 10 % of fish ingested MPs (n = 10) | Bathydemersal (M) | Pozo et al. (2019) |
| China (176 species) | 1. Asian freshwater goby, *Acanthogobius ommaturus/ Synechogobius ommaturus* (Richardson, 1845) | 3.75 MPs/fish (n = 17) | Demersal (F, B) | Su et al. (2019b) |
| | 2. Asian freshwater goby, *Synechogobius ommaturus* (Richardson, 1845) | 5.3 MPs/fish (n = 18) | Demersal (F, B) | Jabeen et al. (2017) |
| | 3. Asian pencil halfbeak, *Hyporhamphus intermedius* (Cantor, 1842) | 3.7 MPs/fish (n = 18) | Pelagic-neritic (M, F, B) | Jabeen et al. (2017) |
| | 4. So-iuy mullet, *Liza haematocheilus/ Planiliza haematocheilus* (Temminck & Schlegel, 1845) | 0.85 MPs/fish (n = 17) | Pelagic-neritic (M, F, B) | Su et al. (2019b) |
| | 5. Bagrid catfish, *Pelteobagrus vachelli* (Richardson, 1846) | 1.0 MPs/fish (n = 2) | Demersal (F) | Zhang et al. (2017) |
| | 6. Barbel chub, *Squaliobarbus curriculus* (Richardson, 1846) | 50 % of fish ingested MPs (n = 52) | Benthopelagic (F, B) | Zheng et al. (2019) |
| | 7. Barbeled dragonfish, *Borostomias pacificus* (Imai, 1841) | 3.27 MPs/fish (n = 1) | Bathypelagic (M) | Zhu et al. (2018) |
| | 8. Barred knifejaw, *Oplegnathus fasciatus* (Temminck & Schlegel, 1844) | 4 MPs/fish (n = 3) | Reef-associated (M) | Zhang et al. (2020a) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
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| 9. Bartail flathead, Platycephalus indicus (Linnaeus, 1758) | 4.2 MPs/fish (n = 9) | Reef-associated (M, B) | Huang et al. (2020) |
| 9. Bartail flathead, Platycephalus indicus (Linnaeus, 1758) | 0.60 MPs/fish; 20 % of fish ingested MPs (n = 6) | Reef-associated (M, B) | Lin et al. (2020) |
| 9. Bartail flathead, Platycephalus indicus (Linnaeus, 1758) | 1.8 MPs/fish (n = 56) | Reef-associated (M, B) | Wang et al. (2021) |
| 10. Bastard halibut, Paralichthys olivoceus (Temminck & Schlegel, 1846) | 1.53 MPs/fish (n = 6) | Demersal (M) | Wang et al. (2021) |
| 11. Belanger's croaker, Johnius belangerii (Cuvier, 1830) | 0.45 MPs/fish (n = 6) | Demersal (M, B) | Wang et al. (2021) |
| 11. Belanger's croaker, Johnius belangerii (Cuvier, 1830) | 1.0 MPs/fish; 35.7 % of fish ingested MPs (n = 14) | Demersal (M, B) | Lin et al. (2020) |
| 12. Big head croaker, Collichthys lucidus (Richardson, 1844) | 0.46 MPs/fish (n = 106) | Demersal (M) | Zhang et al. (2021b) |
| 12. Big head croaker, Collichthys lucidus (Richardson, 1844) | 1.17 MPs/fish (n = 30) | Demersal (M) | Zhang et al. (2019) |
| 12. Big head croaker, Collichthys lucidus (Richardson, 1844) | 0.28 MPs/fish; 38.9 % of fish ingested MPs (n = 18) | Demersal (M) | Lin et al. (2020) |
| 12. Big head croaker, Collichthys lucidus (Richardson, 1844) | 1.2 MPs/fish (n = 17) | Demersal (M) | Su et al. (2019b) |
| 12. Big head croaker, Collichthys lucidus (Richardson, 1844) | 6.2 MPs/fish (n = 3) | Demersal (M) | Zhang et al. (2020a) |
| 12. Big head croaker, Collichthys lucidus (Richardson, 1844) | 6.2 MPs/fish (n = 18) | Demersal (M) | Jabeen et al. (2017) |
| 13. Big-head pennah croaker, Pennahia macrocephalus (Tang, 1937) | 0.05 MPs/fish (n = 18) | Demersal (M) | Koongolla et al. (2020) |
| 14. Black Amur bream, Megalobrama hoffmanni (Richardson, 1846) | 61.4 % of fish ingested MPs (n = 44) | Benthopelagic (F) | Zheng et al. (2019) |
| 15. Black/Korean rockfish, Sebastods schlegelii Hilgendorf, 1880 | 2.01 MPs/fish (n = 44) | Demersal (M) | Wang et al. (2021) |
| 16. Black scraper, Thamnacanuus modestus (Günther, 1877) | 3.04 MPs/fish (n = 16) | Reef-associated (M) | Wang et al. (2021) |
| 17. Blackfin scad, Coronx molavi (Swainson, 1839) | 1.6 MPs/fish (n = 5) | Pelagic-neritic (M, B) | Huang et al. (2020) |
| 18. Blackmouth splitfin, Synagrops japonicus (Döderlein, 1883) | 1.72 MPs/fish (n = 7) | Benthopelagic (M) | Zhu et al. (2018) |
| 19. Blackspot threadfin, Polydocytus sextorius (Bloch & Schneider, 1801) | 0.5 MPs/fish (n = 30) | Demersal (M, B) | Zhang et al. (2019) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 20. Blotched snakehead, Channa maculata (Lacepède, 1801) | 25 % of fish ingested MPs (n = 12) | Benthopelagic (F) | Zheng et al. (2019) |
| 21. Bluefin gurnard, Chelidonichthys kumu (Cuvier, 1829) | 7.3 MPs/fish (n = 3) | Demersal (M, B) | Zhang et al. (2020a) |
| 21. Bluefin gurnard, Chelidonichthys kumu (Cuvier, 1829) | 1.24 MPs/fish (n = 110) | Demersal (M, B) | Zhao et al. (2019) |
| 22. Bluntnose snake-eel, Ophichthus apicalis (Anonymous [Bennett], 1830) | 0.67 MPs/fish (n = 3) | Demersal (M, B) | Zhang et al. (2021b) |
| 23. Bombay-duck, Harpodon nehereus (Hamilton, 1822) | 0.50 MPs/fish (n = 30) | Benthopelagic (M, B) | Zhang et al. (2019) |
| 23. Bombay-duck, Harpodon nehereus (Hamilton, 1822) | 0.85 MPs/fish (n = 136) | Benthopelagic (M, B) | Zhang et al. (2021b) |
| 23. Bombay duck, Harpodon nehereus (Hamilton, 1822) | 3.8 MPs/fish (n = 18) | Benthopelagic (M, B) | Jabeen et al. (2017) |
| 23. Bombay-duck, Harpodon nehereus (Hamilton, 1822) | 0.50 MPs/fish; 20 % of fish ingested MPs (n = 10) | Benthopelagic (M, B) | Zhao et al. (2019) |
| 24. Bone mullet, Osteomugil stronylophalus (Günther, 1861) | 3.3 MPs/fish (n = 4) | Pelagic (M, F, B) | Su et al. (2019b) |
| 25. Branded goby, Chaeturichthys stigmatias Richardson, 1844 | 1.74 MPs/fish (n = 22) | Demersal (M) | Wang et al. (2021) |
| 26. Burrowing goby, Trypauchen vagina (Bloch & Schneider, 1801) | 0.10 MPs/fish (n = 128) | Demersal (M, B) | Zhang et al. (2021b) |
| 27. Cardinal fish, Apogon lineatus/Apogonichthys lineatus (Temminck & Schlegel, 1842) | 1.1 MPs/fish (n = 10) | Demersal (M) | Zhao et al. (2019) |
| 28. Chub mackerel, Pneumatophorus japonicus/Scomber japonicus Houttuyn, 1782 | 1.15 MPs/fish (n = 38) | Pelagic-neritic (M) | Wang et al. (2021) |
| 28. Chub mackerel, Scomber japonicus Houttuyn, 1782 | 0.8 MPs/fish (n = 9) | Pelagic-neritic (M) | Su et al. (2019b) |
| 29. Commerson's anchovy, Stolephorus commersonni Lacepède, 1803 | 1.3 MPs/fish (n = 10) | Pelagic-neritic (M, B) | Zhao et al. (2019) |
| 30. Common carp, Cyprinus carpio Linnaeus, 1758 | 0.4 MPs/fish (n = 20) | Benthopelagic (F, B) | Zhang et al. (2021a) |
| 30. Common carp, Cyprinus carpio | 15.8 % fish ingested MPs (n = 19) | Benthopelagic (F, B) | Zheng et al. (2019) |
| 30. Common carp, Cyprinus carpio Linnaeus, 1758 | 2.5 MPs/fish (n = 18) | Benthopelagic (F, B) | Jabeen et al. (2017) |
| 30. Common carp, Cyprinus carpio Linnaeus, 1758 | 5 MPs/fish (n = 2) | Benthopelagic (F, B) | Wang et al. (2020) |
| 31. Crescent sweetlips, Plectorhynchus cinctus (Temminck & Schlegel, 1843) | 1.33 MPs/fish; 86.7 % of fish ingested MPs (n = 3) | Reef-associated (M) | Lin et al. (2020) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M=Marine, B=Brackish, F=Freshwater) | References |
|---|---|---|---|---|
| 32. | Croaker fish, *Johnius* spp.; | 0.48 MPs/fish (n = 30) | Demersal (M, B) | Zhang et al. (2019) |
| 32. | Croaker fish, *Johnius* spp.; | 0.53 MPs/fish (n = 43) | Demersal (M, B) | Zhang et al. (2021b) |
| 33. | Daggertooth pike conger, *Muraenesox cinereus* (Forsskål, 1775) | 0.99 MPs/fish; 44.4 % of fish ingested MPs (n = 19) | Demersal (M, F, B) | Lin et al. (2020) |
| 33. | Daggertooth pike conger, *Muraenesox cinereus* (Forsskål, 1775) | 0.33 MPs/fish (n = 30) | Demersal (M, F, B) | Zhang et al. (2021b) |
| 33. | Daggertooth pike conger, *Muraenesox cinereus* (Forsskål, 1775) | 0.77 MPs/fish (n = 30) | Demersal (M, F, B) | Zhang et al. (2019) |
| 33. | Daggertooth pike conger, *Muraenesox cinereus* (Forsskål, 1775) | 2.4 MPs/fish (n = 18) | Demersal (M, F, B) | Jabeen et al. (2017) |
| 33. | Daggertooth pike conger, *Muraenesox cinereus* (Forsskål, 1775) | 7 MPs/fish (n = 3) | Demersal (M, F, B) | Zhang et al. (2020b) |
| 33. | Daggertooth pike conger, *Muraenesox cinereus* (Forsskål, 1775) | 3.0 MPs/fish (n = 1) | Demersal (M, F, B) | Huang et al. (2020) |
| 34. | Darkbarbel catfish, *Pelteobagrus vachelli* (Richardson, 1846)/ *Pseudobagrus vachellii* (Richardson, 1846) | 0.4 MPs/fish (n = 24) | Demersal (F) | Zhang et al. (2021a) |
| 35. | Deep pugnose ponyfish, *Leiognathus ruconius* (Hamilton, 1822) | 0.39 MPs/fish; 22.2 % of fish ingested MPs (n = 18) | Demersal (M, F, B) | Lin et al. (2020) |
| 36. | Deep body boarfish, *Antigonia capros* Lowe, 1843 | 0.92 MPs/fish (n = 3) | Demersal (M) | Zhu et al. (2019) |
| 37. | Dotted gizzard shad, *Konosirus punctatus* Temminck & Schlegel, 1846 | 0.74 MPs/fish; 60 % of fish ingested MPs (n = 15) | Pelagic-neritic (M, B) | Lin et al. (2020) |
| 37. | Dotted gizzard shad, *Konosirus punctatus* Temminck & Schlegel, 1846 | 1.8 MPs/fish (n = 5) | Pelagic-neritic (M, B) | Huang et al. (2020) |
| 37. | Dotted gizzard shad, *Konosirus punctatus* Temminck & Schlegel, 1846 | 3.71 MPs/fish (n = 44) | Pelagic-neritic (M, B) | Wang et al. (2021) |
| 37. | Dotted gizzard shad, *Konosirus punctatus* Temminck & Schlegel, 1846 | 4 MPs/fish (n = 8) | Pelagic-neritic (M, B) | Zhang et al. (2020b) |
| 38. | East Asian minnow, *Culter alburnus* Basilewsky, 1855 | 1.5 MPs/fish (n = 6) | Benthopelagic (F) | Zhang et al. (2017) |
| 39. | East Asian minnow, *Hemiculter bleekeri* Warpachowski, 1888 | 2.1 MPs/fish (n = 18) | Benthopelagic (F) | Jabeen et al. (2017) |
| 40. | Eel worm goby, *Taenioides anguilloris* (Linnaeus, 1758) | 0.22 MPs/fish; 27.8 % of fish ingested MPs (n = 18) | Demersal (M, F, B) | Lin et al. (2020) |
| 41. | Eelpout, *Enchelyopus elongatus* Kner, 1868 | 1.2 MPs/fish (n = 20) | Demersal (M) | Zhao et al. (2019) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| Zoarces elongatus Kner, 1868 | 42. Eelpout, Pholis fangi (Wang & Wang, 1935) | 1.18 MPs/fish (n = 79) | Demersal (M) | Zhao et al. (2019) |
| | 43. Ell gobby, Odontamblyopus rubicundus (Hamilton, 1822) | 2.2 MPs/fish (n = 5) | Benthopelagic (M, B) | Huang et al. (2020) |
| | 44. Elongate ilisha; ilisha elongate (Anonymous [Bennett], 1830) | 1.0 MPs/fish (n = 6) | Pelagic-neritic (M, B) | Zhang et al. (2021b) |
| | 45. False kelpfish, Sebastiscus marmoratus (Cuvier, 1829) | 3.2 MPs/fish (n = 3) | Demersal (M) | Zhang et al. (2020a) |
| | 46. Fang's blenny, Enedrias fang Wang & Wang, 1935/Pholis fangi (Wang & Wang, 1935) | 1.14 MPs/fish (n = 6) | Demersal (M) | Wang et al. (2021) |
| | 47. Fat greenling, Hexagrammos otakii Jordan & Starks, 1895 | 1.05 MPs/fish (n = 30) | Demersal (M) | Zhao et al. (2019) |
| | 47. Fat greenling, Hexagrammos otakii Jordan & Starks, 1895 | 2.42 MPs/fish (n = 16) | Demersal (M) | Wang et al. (2021) |
| | 48. Filefish, Thamnaconus septentrionalis (Gunther, 1874) | 7.2 MPs/fish (n = 18) | Demersal (M) | Jabeen et al. (2017) |
| | 48. Filefish, Thamnaconus septentrionalis (Gunther, 1874) | 0.7 MPs/fish (n = 9) | Demersal (M) | Su et al. (2019b) |
| | 49. Flat fish/pointhead flounder, Cleisthenes herzensteini (Schmidt, 1904) | 0.31 MPs/fish (n = 8) | Demersal (M) | Wang et al. (2021) |
| | 49. Flatfish/pointhead flounder, Cleisthenes herzensteini (Schmidt, 1904) | 1.16 MPs/fish (n = 36) | Demersal (M) | Zhao et al. (2019) |
| | 50. Flatfish, Cynoglossus lighti Norman, 1925 | 4.8 MPs/fish (n = 3) | Demersal (M) | Zhang et al. (2020a) |
| | 51. Flathead grey mullet, Mugil cephalus Linnaeus, 1758 | 0.67 MPs/fish; 33.3 % of fish ingested MPs (n = 12) | Benthopelagic (M, F, B) | Lin et al. (2020) |
| | 51. Flathead grey mullet, Mugil cephalus Linnaeus, 1758 | 3.7 MPs/fish (n = 18) | Benthopelagic (M, F, B) | Jabeen et al. (2017) |
| | 51. Flathead grey mullet, Mugil cephalus Linnaeus, 1758 | 4.3 MPs/fish; 60 % of fish ingested MPs (n = 30) | Benthopelagic (M, F, B) | Cheung et al. (2018) |
| | 51. Flathead grey mullet, Mugil cephalus Linnaeus, 1758 | 5.2 MPs/fish (n = 13) | Benthopelagic (M, F, B) | Zhang et al. (2020b) |
| | 52. Four-eyed sleeper, Bostrychus sinensis Lacepède, 1801 | 0.23 MPs/fish; 15.4 % of fish ingested MPs (n = 13) | Demersal (M, F, B) | Lin et al. (2020) |
| | 53. Goatee croaker, Dendrophyssa russelli (Cuvier, 1829) | 5 MPs/fish (n = 2) | Demersal (M, F, B) | Huang et al. (2020) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 54. Goby fish, *Odontamblyopus lacepedii* (Temminck & Schlegel, 1845) | 2.37 MPs/fish (n = 8) | Benthopelagic (M) | Wang et al. (2021) |
| 55. Goby fish, *Synchogobius hacto* (Temminck & Schlegel, 1845)/ *Acanthogobius hacto* (Temminck & Schlegel, 1845) | 2.01 MPs/fish (n = 48) | Demersal (M, F, B) | Wang et al. (2021) |
| 56. Golden threadfin bream, *Nemipterus virgatus* (Houttuyn, 1782) | 0.07 MPs/fish (n = 14) | Demersal (M) | Koongolla et al. (2020) |
| 57. Goldfish, *Carassius auratus* (Linnaeus, 1758) | 1.9 MPs/fish (n = 18) | Benthopelagic (F, B) | Jabeen et al. (2017) |
| 58. Grass carp, *Ctenopharyngodon idella* (Valenciennes, 1844) | 37.5 % of fish ingested MPs (n = 8) | Benthopelagic (F, B) | Zheng et al. (2019) |
| 59. Gray's grenadier anchovy, *Coilia grayii* Richardson, 1845 | 1 MP/fish (n = 1) | Pelagic-neritic (M, F, B) | Wang et al. (2020) |
| 60. Great bluespotted mud hopper, *Boleophthalmus pectinirostris* (Linnaeus, 1758) | 5.3 MPs/fish (n = 9) | Demersal (M, F, B) | Su et al. (2019b) |
| 61. Greater lizardfish, *Saurida tumbil* (Bloch, 1796) | 0.11 MPs/fish (n = 36) | Reef-associated (M) | Koongolla et al. (2020) |
| 62. Greeneyes, *Chlorophthalmus albatrossis* Jordan & Starks, 1904 | 1.17 MPs/fish (n = 4) | Bathydemersal (M) | Zhu et al. (2019) |
| 63. Greenspotted goby, *Amoya chlorostigmatoides* (Bleeker, 1849)/ *Acentrogobius chlorostigmatoides* (Bleeker, 1849) | 1.0 MPs/fish (n = 1) | Demersal (F, B) | Huang et al. (2020) |
| 64. Grey Chinese catfish, *Mystus macropterus* (Bleeker, 1870)/ *Hemibagrus macropterus* Bleeker, 1870 | 1.0 MPs/fish (n = 20) | Demersal (F) | Zhang et al. (2021a) |
| 65. Grey Seabass, *Malakichthys griseus* Döderlein, 1883 | 1.8 MP/fish (n = 1) | Pelagic-oceanic (M) | Zhu et al. (2019) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish; \( n = \text{number of fish samples} \)) | Habitats and environments (M=Marine, B=Brackish, F=Freshwater) | References |
|---|---|---|---|---|
| 66. | Half-smooth golden pufferfish, *Gasterophysus spadiceus* (Richardson, 1845) | 1 MPs/fish \( n = 14 \) | Demersal (M, B) | Koongolla et al. (2020) |
| 67. | Hong Kong catfish, *Clarias fuscus* (Lacepède, 1803) | 2-8 MPs/fish \( n = 3 \) | Demersal (F) | Wang et al. (2020) |
| 68. | Hong Kong grouper, *Epinephelus akaara* (Temminck & Schlegel, 1842) | 8 MPs/fish \( n = 4 \) | Reef-associated (M) | Huang et al. (2020) |
| 69. | Horn dragonet, *Colliornus richardsoni* Valenciennes, 1837 | 2.5 MPs/fish \( n = 4 \) | Demersal (M) | Huang et al. (2020) |
| 70. | Horn dragonet, *Repomucenus richardsonii* (Bleeker, 1854) / *Colliornus curvicornis* Valenciennes, 1837 | 1.9 MPs/fish; 54 % of fish ingested MPs \( n = 13 \) | Demersal (M, F, B) | Chan et al. (2019) |
| 71. | Horsehead tilefish, *Branchiostegus japonicus* (Houttuyn, 1782) | 0.47 MPs/fish; 40 % of fish ingested MPs \( n = 15 \) | Demersal (M) | Lin et al. (2020) |
| 71. | Horsehead tilefish, *Branchiostegus japonicus* (Houttuyn, 1782) | 4.6 MPs/fish \( n = 18 \) | Demersal (M) | Jabeen et al. (2017) |
| 72. | Humpback, *Culter dabryi* (Bleeker, 1871) | 0.5 MPs/fish \( n = 2 \) | Benthopelagic (F) | Zhang et al. (2017) |
| 73. | Japanese anchovy, *Engraulis japonicus* Temminck & Schlegel, 1846 | 1.07 MPs/fish \( n = 195 \) | Pelagic-neritic (M) | Zhao et al. (2019) |
| 74. | Japanese darter dragonet, *Colliornus planus* Ochiai, 1955 | 4.8 MPs/fish \( n = 18 \) | Demersal (M) | Jabeen et al. (2017) |
| 75. | Japanese flathead, *Inegocia japonica* (Cuvier, 1829) | 3.2 MPs/fish; 47 % of fish ingested MPs \( n = 55 \) | Demersal (M) | Chan et al. (2019) |
| 75. | Japanese flathead, *Inegocia japonica* (Cuvier, 1829) | 0.67 MPs/fish; 50 % of fish ingested MPs \( n = 6 \) | Demersal (M) | Lin et al. (2020) |
| 76. | Japanese grenadier anchovy, *Coilia ectenes/Coilia nasus* Temminck & Schlegel, 1846 | 0.7 MPs/fish \( n = 36 \) | Pelagic-neritic (M, F, B) | Su et al. (2019b) |
| 76. | Japanese grenadier anchovy, *Coilia ectenes/Coilia nasus* Temminck & Schlegel, 1846 | 4.0 MPs/fish \( n = 18 \) | Pelagic-neritic (M, F, B) | Jabeen et al. (2017) |
| 76. | Japanese grenadier anchovy, *Coilia nasus* Temminck & Schlegel, 1846 | 0.56 MPs/fish \( n = 51 \) | Pelagic-neritic (M, F, B) | Zhang et al. (2021b) |
| 77. | Japanese meagre, *Argyrosomus japonicus* (Temminck & Schlegel, 1843) | 0.75 MPs/fish \( n = 4 \) | Benthopelagic (M, B) | Zhang et al. (2020) |
| 78. | Japanese sardinella, *Sardinella zunasi* (Bleeker, 1854) | 0.74 MPs/fish \( n = 6 \) | Pelagic-neritic (M) | Wang et al. (2021) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 79. | Japanese scad, Decapterus maruadsi (Temminck & Schlegel, 1843) | 0.22 MPs/fish (n = 18) | Reef-associated (M) | Zhang et al. (2021b) |
| 79. | Japanese scad, Decapterus maruadsi (Temminck & Schlegel, 1843) | 0.75 MPs/fish (n = 3) | Reef-associated (M) | Zhang et al. (2021b) |
| 79. | Japanese scad, Decapterus maruadsi (Temminck & Schlegel, 1843) | 1.27 MPs/fish (n = 58) | Reef-associated (M) | Zhao et al. (2019) |
| 80. | Japanese seabass, Lateolabrax japonicus (Cuvier, 1828) | 2.1 MPs/fish (n = 18) | Reef-associated (M, F, B) | Jabeen et al. (2017) |
| 81. | Japanese sildago, Sillago japonica Temminck & Schlegel, 1843 | 6.9 MPs/fish (n = 10) | Demersal (M) | Zhang et al. (2020b) |
| 82. | Japanese Spanish mackerel, Scomberomorus niphonius (Cuvier, 1832) | 2.97 MPs/fish (n = 22) | Pelagic-neritic (M) | Wang et al. (2021) |
| 83. | Japanese yellowtail jack, Seriola aureovittata Temminck & Schlegel, 1845 | 1.23 MPs/fish (n = 8) | Pelagic-neritic (M, B) | Wang et al. (2021) |
| 84. | Jarbua terapon, Terapon jarbua (Forskål, 1775) | 0.6 MPs/fish (n = 5) | Demersal (M, F, B) | Huang et al. (2020) |
| 84. | Jarbua terapon, Terapon jarbua (Forskål, 1775) | 3.0 MPs/fish (n = 18) | Demersal (M, F, B) | Jabeen et al. (2017) |
| 85. | John dory; Zeus faber Linnaeus, 1758 | 1.0 MPs/fish (n = 1) | Benthopelagic (M, B) | Zhang et al. (2021b) |
| 86. | Keel-jawed needle fish, Tylosurus acus melanotus (Bleeker, 1850) | 6.5 MPs/fish (n = 2) | Reef-associated (M, F, B) | Huang et al. (2020) |
| 87. | Korean rockfish, Sebastes schlegeli Hilgendorf, 1880 | 2.3 MPs/fish; 90 % of fish ingested MPs (n = 10) | Demersal (M) | Ding et al. (2019) |
| 88. | Large yellow croaker, Larimichthys crocea (Richardson, 1844) | 0.62 MPs/fish (n = 41) | Benthopelagic (M, B) | Zhang et al. (2021b) |
| 88. | Large yellow croaker, Larimichthys crocea (Richardson, 1844) | 4.6 MPs/fish (n = 18) | Benthopelagic (M, B) | Jabeen et al. (2017) |
| 88. | Large yellow croaker, Larimichthys crocea (Richardson, 1844) | 5.1 MPs/fish (n = 3) | Benthopelagic (M, B) | Zhang et al. (2020a) |
| 88. | Large yellow croaker, Larimichthys crocea (Richardson, 1844) | 0.37 MPs/fish; 46.7 % offish ingested MPs (n = 15) | Benthopelagic (M, B) | Lin et al. (2020) |
| 88. | Large yellow croaker; Larimichthys crocea (Richardson, 1844) | 0.70 MPs/fish (n = 30) | Benthopelagic (M, B) | Zhang et al. (2019) |
| 89. | Largehead hairtail, Trichiurus lepturus Linnaeus, 1758 | 0.54 MPs/fish (n = 11) | Benthopelagic (M, B) | Zhang et al. (2021b) |
| 90. | Lightfish, Polymetme elongate (Matsubara, 1938) | 3.75 MPs/fish (n = 1) | Benthopelagic (M) | Zhu et al. (2019) |
| 91. | Longarm mullet, Osteomugil ophyseni (Valenciennes, 1836) | 3.4 MPs/fish (n = 5) | Pelagic (M, F, B) | Huang et al. (2020) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 92. | Longnose trevally, Carangoides chrysophrys (Cuvier, 1833) | 0.17 MPs/fish (n = 12) | Reef-associated (M, B) | Koongolla et al. (2020) |
| 93. | Mandarin fish, Siniperca chuatsi (Basilewsky, 1855) | 2-5 MPs/fish (n = 2) | Benthopelagic (F) | Wang et al. (2020) |
| 94. | Marble goby, Deyeotrix morrortz (Bleeker, 1852) | 4.2 MPs/fish (n = 18) | Demersal (F, B) | Jabeen et al. (2017) |
| 95. | Marble flounder, Pseudopleuronectes yokohamae (Günther, 1877) | 2.27 MPs/fish (n = 8) | Demersal (M) | Wang et al. (2021) |
| 96. | Mottled spinefoot, Siganus fuscescens (Houttuyn, 1782) | 0.23 MPs/fish; 55.6 % of fish ingested MPs (n = 18) | Reef-associated (M, B) | Lin et al. (2020) |
| 97. | Mottled spinefoot, Siganus fuscescens (Houttuyn, 1782) | 6.7 MPs/fish (n = 18) | Reef-associated (M, B) | Zhang et al. (2020b) |
| 98. | Moustached thryssa, Thryssa mystax (Bloch & Schneider, 1801) | 1.65 MPs/fish (n = 8) | Pelagic-oceanic (M, B) | Wang et al. (2021) |
| 99. | Mud carp, Cirrhinus molitorella (Valenciennes, 1844) | 5-8 MPs/fish (n = 3) | Benthopelagic (F) | Wang et al. (2020) |
| 100. | Mud carp, Cirrhinus molitorella (Valenciennes, 1844) | 6.3 MPs/fish (n = 3) | Benthopelagic (F, B) | Huang et al. (2020) |
| 101. | Nile tilapia, Oreochromis niloticus (Linnaeus, 1758) | 3.3 MPs/fish (n = 4) | Benthopelagic (F, B) | Chan et al. (2019) |
| 102. | Ocellate spot skate, Raja parosa Günther, 1874 | 0.3 MPs/fish (n = 9) | Pelagic-neritic (M, F, B) | Su et al. (2019b) |
| 103. | Pacific cod, Gadus macrocephalus Tilesius, 1810 | 0.39 MPs/fish; 33.3 % of fish ingested MPs (n = 18) | Pelagic-neritic (M, F, B) | Lin et al. (2020) |
| 104. | Osbeck's grenadier anchovy, Coilia mystus (Linnaeus, 1758) | 2.0 MPs/fish (n = 4) | Demersal (M) | Huang et al. (2020) |
| 105. | Pacific crevalle jack, Caranx pectoralis (Valenciennes, 1846) | 1.1 MPs/fish (n = 3) | Demersal (M, B) | Lin et al. (2020) |
| 106. | Pacific crevalle jack, Caranx pectoralis (Valenciennes, 1846) | 1.1 MPs/fish (n = 3) | Demersal (M, B) | Zhao et al. (2019) |
| 107. | Pacific crevalle jack, Caranx pectoralis (Valenciennes, 1846) | 0.12 MPs/fish (n = 16) | Pelagic-oceanic (M, B) | Koongolla et al. (2020) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| Alepes melanoptera (Swainson, 1839) | 108. Pacific rudderfish, *Psenopsis anomala* (Temminck & Schlegel, 1844) | 0.098 MPs/fish (n = 51) | Benthopelagic (M) | Koongolla et al. (2020) |
| | 108. Pacific rudderfish, *Psenopsis anomala* (Temminck & Schlegel, 1844) | 1.1 MPs/fish (n = 18) | Benthopelagic (M) | Jabeen et al. (2017) |
| | 108. Pacific rudderfish, *Psenopsis anomala* (Temminck & Schlegel, 1844) | 1.2 MPs/fish (n = 10) | Benthopelagic (M) | Zhao et al. (2019) |
| 109. Pacific sand lance, *Ammodytes personatus* Girard, 1856 | | 1.43 MPs/fish (n = 50) | Demersal (M) | Zhao et al. (2019) |
| 110. Pompano, *Trachinotus ovatus* (Linnaeus, 1758) | | 0.76 MPs/fish; 37.5 % of fish ingested MPs (n = 8) | Pelagic-neritic (M, B) | Lin et al. (2020) |
| 111. Prussian carp, *Carassius gibelio* Bloch, 1782 | | 4.36 % fish ingested MPs (n = 39) | Benthopelagic (F, B) | Zheng et al. (2019) |
| 112. Puffer fish, *Takifugu niphobles* (Jordan & Snyder, 1901) | | 2.3 MPs/fish (n = 6) | Demersal (M) | Huang et al. (2020) |
| 113. Purple-spotted tongue sole, *Cynoglossus purpureomaculatus* Regan, 1905 | | 0.64 MPs/fish (n = 25) | Demersal (M, B) | Zhang et al. (2021b) |
| 114. Red tonguesole, *Cynoglossus joyneri* Günther, 1878 | | 2.06 MPs/fish (n = 16) | Demersal (M) | Wang et al. (2021) |
| 115. Redbelly tilapia, *Coptodon zillii* (Gervais, 1848) | | 75 % of fish ingested MPs (n = 44) | Benthopelagic (F, B) | Zheng et al. (2019) |
| 116. Reeve's croaker, *Chrysochir aureus* (Richardson, 1846) | | 0.27 MPs/fish (n = 30) | Benthopelagic (M, B) | Zheng et al. (2019) |
| 117. Rice-paddy eel, *Pseudonophis boro* | | 0.33 MPs/fish (n = 30) | Benthopelagic (M, B) | Zhang et al. (2021b) |
| | 118. Ridged-eye flounder, *Pleuronichthys cornutus* (Temminck & Schlegel, 1846) | 3.9 MPs/fish; 90 % fish ingested MPs (n = 10) | Demersal (M) | Ding et al. (2019) |
| | 119. Robust tonguefish, *Cynoglossus robustus* Günther, 1873 | 0.27 MPs/fish (n = 30) | Demersal (M) | Zhang et al. (2019) |
| | 119. Robust tonguefish, *Cynoglossus robustus* Günther, 1873 | 0.7 MPs/fish (n = 9) | Demersal (M) | Su et al. (2019b) |
| | 120. Saddleback silver-biddy, *Gerres lucidus* Cuvier, 1830/ *Gerres limbatus* Cuvier, 1830 | 3.5 MPs/fish (n = 4) | Demersal (M, B) | Huang et al. (2020) |
| 121. Scaly hairfin anchovy, *Setipinna taty* (Valenciennes, 1848) | | 1.1 MPs/fish (n = 20) | Pelagic-neritic (M, B) | Zhao et al. (2019) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) \( (n = \) number of fish samples) | Habitats and environments \( (M = \text{Marine}, B = \text{Brackish}, F = \text{Freshwater}) \) | References |
|---|---|---|---|---|
| 121. Scaly hairfin anchovy, Setipinnia taty (Valenciennes, 1848) | 2.3 MPs/fish \( (n = 3) \) | Pelagic-neritic \( (M, B) \) | Zhang et al. (2020a) |
| 122. Sea robins, Lepidotrigla guentheri Hilgendorf, 1879 | 1.52 MPs/fish \( (n = 4) \) | Demersal \( (M) \) | Zhu et al. (2019) |
| 123. Searobin fish, Lepidotrigla alata (Houttuyn, 1782) | 0.10 MPs/fish \( (n = 38) \) | Demersal \( (M) \) | Koongolla et al. (2020) |
| 124. Shokihaze goby, Tridentiger barbatus (Günther, 1861) | 2.78 MPs/fish \( (n = 8) \) | Demersal \( (B) \) | Wang et al. (2021) |
| 124. Shokihaze goby, Tridentiger barbatus (Günther, 1861) | 4.5 MPs/fish \( (n = 8) \) | Demersal \( (B) \) | Su et al. (2019b) |
| 125. Shortfin neoscopelid, Neoscopelus microchir Matsubara, 1943 | 1.89 MPs/fish \( (n = 1) \) | Bathypelagic \( (M) \) | Zhu et al. (2019) |
| 126. Shortnose greeneye, Chlorophthalmus agassizi Bonaparte, 1840 | 0.32 MPs/fish \( (n = 3) \) | Bathydemersal \( (M, B) \) | Zhu et al. (2019) |
| 127. Shortnose ponyfish, Leioptus brevostris (Valenciennes, 1835) | 0.8 MPs/fish \( (n = 8) \) | Demersal \( (M, B) \) | Huang et al. (2020) |
| 127. Shortnose ponyfish, Leioptus brevostris (Valenciennes, 1835) | 4.4 MPs/fish \( (n = 9) \) | Demersal \( (M, B) \) | Zhang et al. (2020b) |
| 128. Shrimp scad, Alepes djedaba (Forsskål, 1775) | 2.0 MPs/fish \( (n = 1) \) | Reef-associated \( (M) \) | Huang et al. (2020) |
| 128. Shrimp scad, Alepes djedaba (Forsskål, 1775) | 3 MPs/fish \( (n = 6) \) | Reef-associated \( (M, B) \) | Zhang et al. (2020b) |
| 129. Shuttles hoppfish, Periophthalmus modestus Cantor, 1842 | 4.5 MPs/fish \( (n = 2) \) | Demersal \( (M, F, B) \) | Huang et al. (2020) |
| 130. Silver carp, Hypophthalmichthys molitrix (Valenciennes, 1844) | 3.8 MPs/fish \( (n = 18) \) | Benthopelagic \( (F, B) \) | Jabeen et al. (2017) |
| 130. Silver carp, Hypophthalmichthys molitrix (Valenciennes, 1844) | 2-11 MPs/fish \( (n = 6) \) | Benthopelagic \( (F, B) \) | Wang et al. (2020) |
| 130. Silver carp, Hypophthalmichthys molitrix (Valenciennes, 1844) | 45 \% of fish ingested MPs \( (n = 20) \) | Benthopelagic \( (F, B) \) | Zheng et al. (2019) |
| 131. Silver croaker, Argyrosomus argentatus (Houttuyn, 1782)/Pennahia argentata (Houttuyn, 1782) | 2.11 MPs/fish \( (n = 20) \) | Benthopelagic \( (M) \) | Wang et al. (2021) |
| 132. Silver croaker, Pennahia argentata (Houttuyn, 1782) | 5 MPs/fish \( (n = 1) \) | Benthopelagic \( (M) \) | Wang et al. (2020) |
| 132. Silver croaker, Pennahia argentata (Houttuyn, 1782) | 0.5 MPs/fish \( (n = 5) \) | Benthopelagic \( (M) \) | Zhang et al. (2021b) |
| 133. Silver gemfish, Rexea solandri (Cuvier, 1832) | 2.14 MPs/fish \( (n = 3) \) | Benthopelagic \( (M) \) | Zhu et al. (2019) |
| 134. Silver pomfret, Pampus cinereus (Bloch, 1795) | 0.50 MPs/fish; 70 \% of fish ingested MPs \( (n = 10) \) | Benthopelagic \( (M) \) | Lin et al. (2020) |
| 134. Silver pomfret, Pampus cinereus (Bloch, 1795) | 0.66 MPs/fish \( (n = 22) \) | Benthopelagic \( (M) \) | Zhang et al. (2021b) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M=Marine, B=Brackish, F=Freshwater) | References |
|---|---|---|---|---|
| 134. Silver pomfret, *Pampus cincterus* (Bloch, 1795)/*Pampus argenteus* (Euphrasen, 1788) | 0.89 MPs/fish (n = 58) | Benthopelagic (M) | Wang et al. (2021) |
| 134. Silver pomfret, *Pampus cincterus* (Bloch, 1795) | 1.1 MPs/fish (n = 10) | Benthopelagic (M) | Zhao et al. (2019) |
| 134. Silver pomfret, *Pampus cincterus* (Bloch, 1795) | 1.1 MPs/fish (n = 9) | Benthopelagic (M) | Su et al. (2019a) |
| 134. Silver pomfret, *Pampus cincterus* (Bloch, 1795) | 3.0 MPs/fish (n = 18) | Benthopelagic (M) | Jabeen et al. (2017) |
| 135. Silver sillago, *Sillago sihama* (Forsskål, 1775) | 2.8 MP/fish (n = 5) | Reef-associated (M, B) | Huang et al. (2020) |
| 135. Silver sillago, *Sillago sihama* (Forsskål, 1775) | 0.42 MP/fish; 47.2% of fish ingested MPs (n = 17) | Reef-associated (M, B) | Lin et al. (2020) |
| 135. Silver sillago, *Sillago sihama* (Forsskål, 1775) | 0.67 MP/fish (n = 5) | Reef-associated (M, B) | Zhang et al. (2021b) |
| 135. Silver sillago, *Sillago sihama* (Forsskål, 1775) | 2.64 MP/fish (n = 6) | Reef-associated (M, B) | Wang et al. (2021) |
| 135. Silver sillago, *Sillago sihama* (Forsskål, 1775) | 2.8 MP/fish (n = 18) | Reef-associated (M, B) | Jabeen et al. (2017) |
| 136. Sixfinger threadfin, *Polydactylus sexfilis* (Valenciennes, 1831) | 0.33 MP/fish; 60% of fish ingested MPs (n = 15) | Reef-associated (M, F, B) | Lin et al. (2020) |
| 137. Slender frostfish, *Benthodesmus tenuis* (Günther, 1877) | 2.0 MP/fish (n = 2) | Benthopelagic (M) | Zhu et al. (2019) |
| 138. Slender lizardfish, *Saurida elongate* (Temminck & Schlegel, 1846) | 0.83 MP/fish (n = 8) | Demersal (M) | Wang et al. (2021) |
| 139. Small Chinese silver-biddy, *Gerreomorpha decacantha* (Bleeker, 1864) | 4.5 MP/fish (n = 2) | Demersal (M, F, B) | Huang et al. (2020) |
| 140. Small snakehead, *Channa asiatica* (Linnaeus, 1758) | 4.0 MP/fish (n = 11) | Benthopelagic (F) | Wang et al. (2020) |
| 141. Smallhead hairtail, *Eupleurogrammus muticus* (Gray, 1831) | 1.15 MP/fish (n = 15) | Benthopelagic (M, B) | Zhao et al. (2019) |
| 141. Smallhead hairtail, *Eupleurogrammus muticus* (Gray, 1831) | 1.23 MP/fish (n = 6) | Benthopelagic (M, B) | Wang et al. (2021) |
| 142. Smooth-headed catfish, *Arius leiototoccephalus* Bleeker, 1846/ *Plicofollis nella* (Valenciennes, 1840) | 5.0 MP/fish (n = 6) | Demersal (M, B) | Huang et al. (2020) |
| 143. Snakefish, *Trachiocephalus myops* (Forster, 1801) | 0.21 MP/fish (n = 14) | Reef-associated (M) | Koongolla et al. (2020) |
| 144. So-iuy mullet, *Liza haematocheilus* (Temminck & Schlegel, 1846)/ *Planliza haematocheilus* (Temminck & Schlegel, 1846) | 1.61 MP/fish (n = 28) | Pelagic-neritic (M, F, B) | Wang et al. (2021) |
| 144. So-iuy mullet, *Liza haematocheilus* (Temminck & Schlegel, 1846) | 3.3 MP/fish (n = 18) | Pelagic-neritic (M, F, B) | Jabeen et al. (2017) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) | Habitats and environments (M=Marine, B=Brackish, F=Freshwater) | References |
|---|---|---|---|---|
| Schlegel, 1845) Planiliza haematocheilus (Temminck & Schlegel, 1845) | 144. So-iuy mullet, Liza haematocheilus (Temminck & Schlegel, 1845) Planiliza haematocheilus (Temminck & Schlegel, 1845) | 0.8 MPs/fish (n = 17) | Pelagic-neritic (M, F, B) | Su et al. (2019b) |
| | | | | |
| | 144. So-iuy mullet, Liza haematocheilus (Temminck & Schlegel, 1845) Planiliza haematocheilus (Temminck & Schlegel, 1845) | 3.7 MPs/fish; 90 % of fish ingested MPs (n = 10) | Pelagic-neritic (M, F, B) | Ding et al. (2019) |
| | | | | |
| | 145. Speckled tonguesole, Cynoglossus puncticeps (Richardson, 1846) | 1.8 MPs/fish (n = 5) | Demersal (M, F, B) | Huang et al. (2020) |
| | | | | |
| | 146. Spotted green goby, Acentrogobius viridipunctatus (Valenciennes, 1837) | 1.5 MPs/fish (n = 9) | Demersal (M, F, B) | Huang et al. (2020) |
| | | | | |
| | 147. Spotted/Japanese sea bass, Lateolabrax maculatus (Cuvier, 1828) | 2.22 MPs/fish (n = 44) | Reef-associated (M, F, B) | Wang et al. (2021) |
| | | | | |
| | 148. Spotted steed, Hemibarbus maculatus Bleeker, 1871 | 0.9 MPs/fish (n = 9) | Benthopelagic (F) | Su et al. (2019b) |
| | | | | |
| | 149. Spotted velvetfish, Erisphex pottii (Steindachner, 1896) | 1.37 MPs/fish (n = 100) | Demersal (M) | Zhao et al. (2019) |
| | | | | |
| | 150. Star snapper, Lutjanus stellatus Akazaki, 1983 | 2.0 MPs/fish; 58 % of fish ingested MPs (n = 44) | Reef-associated (M) | Chan et al. (2019) |
| | | | | |
| | 151. Stone moroko, Pseudorasbora parva (Temminck & Schlegel, 1846) | 2.5 MPs/fish (n = 18) | Benthopelagic (F, B) | Jabeen et al. (2017) |
| | | | | |
| | 152. Sulphur goatfish, Upeneus sulphureus Cuvier, 1829 | 0.02 MPs/fish (n = 37) | Demersal (M, B) | Koongolla et al. (2020) |
| | | | | |
| | 153. Swallow-tail, Centroberyx lineatus (Cuvier, 1829) | 1.42 MPs/fish (n = 3) | Benthopelagic (M) | Zhu et al. (2019) |
| | | | | |
| | 154. Tanaka’s snailfish, Lepisosteus tanakae (Gilbert & Burke, 1912) | 1.07 MPs/fish (n = 230) | Demersal (M) | Zhao et al. (2019) |
| | | | | |
| | 155. Tank goby, Glossogobius giuris (Hamilton, 1822) | 0.60 MPs/fish; 80 % of fish ingested MPs (n = 5) | Benthopelagic (M, F, B) | Lin et al. (2020) |
| | | | | |
| | 156. Threadfin Porgy, Evynnis cardinalis (Lacepède, 1802) | 2.1 MPs/fish; 67 % of fish ingested MPs (n = 9) | Reef-associated (M) | Chan et al. (2019) |
| | | | | |
| | 157. Three-lined tongue sole, Cynoglossus abbreviates (Gray, 1834) | 6.9 MPs/fish (n = 18) | Demersal (M) | Jabeen et al. (2017) |
| | | | | |
| | 158. Tilefish, Branchiostegus auratus (Kishinouye, 1907) | 0.33 MPs/fish; 26.7 % fish ingested MPs (n = 150) | Demersal (M) | Lin et al. (2020) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) \( n \) = number of fish samples | Habitats and environments (M=Marine, B=Brackish, F=Freshwater) | References |
|---|---|---|---|---|
| 159. Tongue fish, Cynoglossus purpureomaculatus Regan, 1905 | 0.20 MPs/fish \( n = 161 \) | Demersal (M, B) | Zhang et al. (2021b) |
| 160. Tongue fish, Cynoglossus trigrammus Günther, 1862 | 1.26 MPs/fish; 25 % of fish ingested MPs \( n = 8 \) | Demersal (F, B) | L.in et al. (2020) |
| 161. Tongue sole, Cynoglossus semilaevis Günther, 1873 | 0.83 MPs/fish \( n = 12 \) | Demersal (M, F, B) | Wang et al. (2021) |
| 162. Ussun catfish, Pseudobagrus ussuriensis (Dybowski, 1872) | 1.0 MP particles/fish \( n = 1 \) | Demersal (F) | Zhang et al., 2017 |
| 163. Watases lanternfish, Diaphus watasesi Jordan & Starks, 1904 | 2.0 MP/fish \( n = 4 \) | Benthopelagic (M) | Zhu et al. (2019) |
| 164. Whiptail silver-biddy, Gerres filamentosus Cuvier, 1829 | 4.5 MP particles/fish \( n = 4 \) | Demersal (M, F, B) | Huang et al. (2020) |
| 165. White amur bream, Porabramis pekinensis (Basilewsky, 1855) | 2-8 MPs/fish \( n = 3 \) | Benthopelagic (F, B) | Wang et al. (2020) |
| 166. Whitespotted conger, Conge myriaster(Brevvoort, 1856) | 2.99 MPs/fish \( n = 8 \) | Bathymersal (M) | Wang et al. (2021) |
| 167. White-spotted spinefoot, Siganus caniculatus(Park, 1797) | 0.56 MP/fish \( n = 20 \) | Reef-associated (M, B) | Koongolla et al. (2020) |
| 168. Wuchang bream, Megalobrama amblycephala Yih, 1965 | 1.8 MP/fish \( n = 18 \) | Benthopelagic (F) | Jabeen et al. (2017) |
| 168. Wuchang bream, Megalobrama amblycephala Yih, 1965 | 4-14 MP/fish \( n = 3 \) | Benthopelagic (F) | Wang et al. (2020) |
| 169. Yellow catfish, Pelteobagrus fulvidraco (Richardson, 1844) / Tachysurus fulvidraco (Richardson, 1846) | 0.4 MP/fish \( n = 20 \) | Demersal (F) | Zhang et al. (2021a) |
| 169. Yellow catfish, Pelteobagrus fulvidraco (Richardson, 1844) / Tachysurus fulvidraco (Richardson, 1846) | 3 MP/fish \( n = 1 \) | Demersal (F) | Wang et al. (2020) |
| 169. Yellow catfish, Pelteobagrus fulvidraco (Richardson, 1844) / Tachysurus fulvidraco (Richardson, 1846) | 0.33 MP/fish \( n = 3 \) | Demersal (F) | Zhang et al. (2017) |
| 170. Yellow croaker, Larimichthys polyactis (Bleeker, 1877) | 0.47 MP/fish \( n = 40 \) | Benthopelagic (M) | Zhang et al. (2021b) |
| 171. Yellow croaker, Pseudosciaena polyactis / Larimichthys polyactis (Bleeker, 1877) | 2.4 MP/fish; 100 % of fish ingested MPs \( n = 10 \) | Benthopelagic (M) | Ding et al. (2019) |
| 172. Yellow goosefish, Lophius litulon(Jordan, 1902) | 1.2 MP/fish \( n = 20 \) | Bathymersal (M) | Zhao et al. (2019) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| Colombia (11 species) | 173. Yellowfin goby, *Acanthogobius flavimanus* (Temminck & Schlegel, 1845) | 0.17 MPs/fish; 66.7% of fish ingested MPs (n = 18) | Demersal (M, F, B) | Lin et al. (2020) |
| | 174. Yellowfin seabream, *Acanthopagrus latus* (Houttuyn, 1782) | 4.3 MPs/fish (n = 3) | Demersal (M, F, B) | Huang et al. (2020) |
| | 175. Yellow-spotted triggerfish, *Pseudobalistes fuscus* (Bloch & Schneider, 1801) | 2 MPAs/fish (n = not available) | Reef-associated (M) | Nie et al. (2019) |
| | 176. Zebra sole, *Zebrias zebra* (Bloch, 1787) | 1.5 MPAs/fish (n = 4) | Reef-associated (M, B) | Huang et al. (2020) |
| | Colombia (11 species) | 1. Common snook, *Centropomus undecimalis* (Bloch, 1792) | 0.30 MPs/fish (n = 33) | Reef-associated (M, F, B) | Garcés-Ordóñez et al. (2020) |
| | 2. Crevalle jack, *Caranx hippos* (Linnaeus, 1766) | 10.5% of fish ingested MPs (n = 19) | Reef-associated (M, B) | Calderon et al. (2019) |
| | 2. Crevalle jack, *Caranx hippos* (Linnaeus, 1766) | 2 MPAs/fish (n = 1) | Reef-associated (M, B) | Garcés-Ordóñez et al. (2020) |
| | 3. Horse-eye jack, *Caranx lotus Agassiz, 1831* | 2.22 MPAs/fish (n = 3) | Reef-associated (M, F, B) | Garcés-Ordóñez et al. (2020) |
| | 4. Ladyfish, *Elops saurus* Linnaeus, 1766 | 0.43 MPAs/fish (n = 7) | Reef-associated (M, B) | Garcés-Ordóñez et al. (2020) |
| | 5. New Granada sea catfish, *Notarius bonillai* Miles, 1945 | 0.077 MPAs/fish (n = 13) | Demersal (F, B) | Garcés-Ordóñez et al. (2020) |
| | 6. Pacific anchoveta, *Cetengraulis mysticetus* (Günther, 1867) | 0.03 MPAs/fish; 3.3% of fish ingested MPAs (n = 30) | Pelagic-neritic (M, B) | Dry et al. (2018) |
| | 7. Parassi mullet, *Mugil incilis* Hancock, 1830 | 21.8% of fish ingested MPAs (n = 46) | Demersal (M, B) | Calderon et al. (2019) |
| | 7. Parassi mullet, *Mugil incilis* Hancock, 1830 | 0.27 MPAs/fish (n = 128) | Demersal (M, B) | Garcés-Ordóñez et al. (2020) |
| | 8. Striped mojarra, *Eugerres plumieri* (Cuvier, 1830) | 5% of fish ingested MPAs (n = 40) | Demersal (M, F, B) | Calderon et al. (2019) |
| | 9. Tarpon snook, *Centropomus pectinatus* Poey, 1860 | 5 MPAs/fish (n = 1) | Benthopelagic (M, F, B) | Garcés-Ordóñez et al. (2020) |
| | 10. Tarpon, *Megalops atlanticus* Valenciennes, 1847 | 0.7 MPAs/fish (n = 20) | Reef-associated (M, F, B) | Garcés-Ordóñez et al. (2020) |
| | 11. Yellow mojarra, *Caquetaia kraussii* (Steindachner, 1878) | 8.6% of fish ingested MPAs (n = 35) | Demersal (F) | Calderon et al. (2019) |
| Croatia (03 species) | 1. Common pandora, *Pagellus erythrinus* Linnaeus, 1758 | 1.0 MPAs/fish; 50% of fish ingested MPAs (n = 30) | Benthopelagic (M) | Anastasopoulou et al. (2018) |
| | 2. European pilchard, *Sardina pilchardus* (Walbaum, 1792) | 0.9 MPAs/fish; 50% of fish ingested MPAs (n = 37) | Pelagic-neritic (M, F, B) | Anastasopoulou et al. (2018) |
| | 3. Surmullet, *Mullus surmuletus* Linnaeus, 1758 | 1.8 MPAs/fish; 70% of fish ingested MPAs (n = 20) | Demersal (M) | Anastasopoulou et al. (2018) |
| Ecuador (01 species) | 1. Pacific thread herring, *Opisthonemo libertate* (Günther, 1867) | 0.05 MPAs/fish; 5% of fish ingested MPAs (n = 20) | Pelagic-neritic (M) | Dry et al. (2018) |
| Ethiopia (04 species) | 1. Common carp, *Cyprinus carpio* Linnaeus, 1758 | 39% of fish ingested MPAs (n = 90) | Benthopelagic (F, B) | Merga et al. (2020) |
| Country/location | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M=Marine, B=Brackish, F=Freshwater) | References |
|------------------|----------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------|------------|
| Egypt (02 species) | 2. Crucian carp, Carassius Carassius (Linnaeus, 1758) | 37 % of fish ingested MPs (n = 90) Demersal (F, B) | Merga et al. (2020) |
|                  | 3. Nile tilapia, Oreochromis niloticus (Linnaeus, 1758) | 22 % of fish ingested MPs (n = 90) Benthopelagic (F, B) | Merga et al. (2020) |
|                  | 4. North African catfish, Clarias gariepinus (Burchell, 1822) | 41 % of fish ingested MPs (n = 90) Benthopelagic (F) | Merga et al. (2020) |
| Fiji (10 species) | 1. Nile tilapia, Oreochromis niloticus (Linnaeus, 1758) | 7.5 MPs/fish; 75.9 % of fish ingested MPs (n = 29) Benthopelagic (F, B) | Khan et al. (2020) |
|                  | 2. Bayad catfish, Bagrus bajad (Forsskål, 1775) | 4.7 MPs/fish; 78.6 % of fish ingested MPs (n = 29) Demersal (F) | Khan et al. (2020) |
|                  | 3. Bluestriped goatfish, Upeneichthys lineatus (Bloch & Schneider, 1801) | 0.5 MPs/fish (n = 30) Demersal (M) | Wootton et al. (2021a, b) |
|                  | 4. Emperor fish, Lethrinus spp. | 16.4 MPs/fish (n = not available) Reef-associated (M, B) | Ferreira et al. (2020) |
|                  | 5. Flathead grey mullet, Mugil cephalus Linnaeus, 1758 | 0.5 MPs/fish (n = 30) Benthopelagic (M, F, B) | Wootton et al. (2021a, b) |
|                  | 6. Humpback red snapper /Paddletail, Lutjanus gibbus (Forsskål, 1775) | 1.0 MPs/fish (n = 30) Reef-associated (M) | Wootton et al. (2021a, b) |
|                  | 7. Indian goatfish, Parupeneus indicus (Shaw, 1803) | 0.5 MPs/fish (n = 30) Benthopelagic (M, B) | Wootton et al. (2021a, b) |
|                  | 8. Leopard coralgrouper, Plectropomus leopardus (Lacepède, 1802) | 1.5 MPs/fish (n = 30) Reef associated (M) | Wootton et al. (2021a, b) |
|                  | 9. Milk fish, Chanos chanos (Forsskål, 1775) | 2.7 MPs/fish (n = not available) Benthopelagic (M, F, B) | Ferreira et al. (2020) |
|                  | 10. Mullet, Mugil spp., | 5 MPs/fish (n = not available) Benthopelagic (M, F, B) | Ferreira et al. (2020) |
|                  | 11. Rabbit fish, Siganus spp., | 17 MPs/fish (n = not available) Reef-associated (M, B) | Ferreira et al. (2020) |
|                  | 12. Snapper, Lutjanus spp., | 11.8 MPs/fish (n = not available) Reef-associated (M) | Ferreira et al. (2020) |
| France (05 species) | 1. Atlantic herring, Clupea harengus Linnaeus, 1758 | 40 % of fish ingested MPs (n = 20) Demersal (M, B) | Collard et al. (2017) |
|                  | 2. Bogues, Boops boops (Linnaeus, 1758) | 1.77 MPs/fish (n = 20) Demersal (M) | Tsagaris et al. (2020) |
|                  | 3. European anchovy, Engraulis encrasicolus (Linnaeus, 1758) | 50 % of fish ingested MPs (n = 100) Pelagic-neritic (M, B) | Collard et al. (2017) |
|                  | 4. European pilchard, Sardina pilchardus (Walbaum, 1792) | 45 % of fish ingested MPs (n = 20) Pelagic-neritic (M, F, B) | Collard et al. (2017) |
|                  | 5. Gudgeons, Gobio gobio (Linnaeus, 1758) | 12 % of fish ingested MPs (n = 186) Benthopelagic (F, B) | Sanchez et al. (2014) |
| Galapagos Islands (Ecuador) (14 species) | 1. Blotched stingray, Urotrygon chiensis (Günther, 1872) | 80 % of fish ingested MPs (n = not available) Demersal (M) | Alfaro-Núñez et al. (2021) |
|                  | 2. Common dolphinfish, Coryphaena hippurus Linnaeus, 1758 | 87 % of fish ingested MPs (n = not available) Pelagic-neritic (M, B) | Alfaro-Núñez et al. (2021) |
| **Country/location** (total number of fish species contaminated with MPs) | **Common and Latin name of fish species (and their authority)** | **MPs concentrations in fish** (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | **Habitats and environments** (M= Marine, B= Brackish, F= Freshwater) | **References** |
|---|---|---|---|---|
| Ghana (08 species) | 3. Flathead grey mullet, Mugil cephalus Linnaeus, 1758 | 60 % of fish ingested MPs (n = not available) | Benthopelagic (M, F, B) | Alfaro-Núñez et al. (2021) |
| | 4. Pacific bumper, Chloroscombrus orqueta Jordan & Gilbert, 1883 | 60 % of fish ingested MPs (n = not available) | Benthopelagic (M, B) | Alfaro-Núñez et al. (2021) |
| | 5. Pacific harvestfish, Peprilus medius (Peters, 1869) | 53 % of fish ingested MPs (n = not available) | Benthopelagic (M) | Alfaro-Núñez et al. (2021) |
| | 6. Pelagic thresher, Aloplos pelagicus Nakamura, 1935 | 87 % of fish ingested MPs (n = not available) | Pelagic-oceanic (M) | Alfaro-Núñez et al. (2021) |
| | 7. Peruvian mojarra, Diapterus brevirostris (Cuvier, 1830) | 80 % of fish ingested MPs (n = not available) | Demersal (M, B) | Alfaro-Núñez et al. (2021) |
| | 8. Peruvian moonfish, Selene peruviana (Guichenot, 1866) | 73 % of fish ingested MPs (n = not available) | Demersal (M) | Alfaro-Núñez et al. (2021) |
| | 9. Peruvian weakfish, Cynoscion analis (Jenyns, 1842) | 73 % of fish ingested MPs (n = not available) | Demersal (M, B) | Alfaro-Núñez et al. (2021) |
| | 10. Silver drum, Larium argenteus (Gill, 1863) | 60 % of fish ingested MPs (n = not available) | Pelagic-neritic (M) | Alfaro-Núñez et al. (2021) |
| | 11. Splittail bass, Hemanthios peruanus (Steindachner, 1875) | 60 % of fish ingested MPs (n = not available) | Pelagic-neritic (M) | Alfaro-Núñez et al. (2021) |
| | 12. Stolzmann’s weakfish, Cynoscion stolzmanni (Steindachner, 1879) | 73 % of fish ingested MPs (n = not available) | Demersal (M, B) | Alfaro-Núñez et al. (2021) |
| | 13. Torpedo sand perch, Diplectrum maximum Hildebrand, 1946 | 67 % of fish ingested MPs (n = not available) | Benthopelagic (M) | Alfaro-Núñez et al. (2021) |
| | 14. Yellowfin snook, Centropomus robalito (Jordan & Gilbert, 1882) | 60 % of fish ingested MPs (n = not available) | Pelagic-neritic (M, B) | Alfaro-Núñez et al. (2021) |
| | **Ghana (08 species)** | 1. Angolan dentex, Dentex angolensis Poll & Maul, 1953 | 32 MPs/fish; 53 % of fish ingested MPs (n = 28) | Demersal (M) | Adika et al. (2020) |
| | 2. Blackchin tilapia, Sarotherodon melanotheron Rüppell, 1852 | 0.16 MPs/fish; 12.9 % of fish ingested MPs (n = 31) | Demersal (M, F, B) | Adu-Boahen et al. (2020) |
| | 3. Blue tilapia, Oreochromis aureus (Steindachner, 1864) | 2 MPs/fish; 100 % of fish ingested MPs (n = 1) | Benthopelagic (F, B) | Ado-Boahen et al. (2020) |
| | 4. Madeiran sardinella, Sardinella maderensis Lowe, 1838 | 40 MPs/fish; 41 % of fish ingested MPs (n = 80) | Pelagic-neritic (M, B) | Adika et al. (2020) |
| | 5. Mozambique tilapia, Oreochromis mossambicus (Peters, 1852) | 0.16 MPs/fish; 10.9 % of fish ingested MPs (n = 64) | Benthopelagic (F, B) | Ado-Boahen et al. (2020) |
| | 6. Mudfish, Clarias anguillaris (Linnaeus, 1758) | 0.5 MPs/fish; 100 % of fish ingested MPs (n = 2) | Demersal (F) | Ado-Boahen et al. (2020) |
| | 7. Nile tilapia, Oreochromis niloticus (Linnaeus, 1758) | 0.17 MPs/fish; 10.7 % of fish ingested MPs (n = 65) | Benthopelagic (F, B) | Ado-Boahen et al. (2020) |
| | 8. Round sardinella, Sardinella aurita Valenciennes, 1847 | 26 MPs/fish; 26 % of fish ingested MPs (n = 47) | Pelagic-neritic (M, B) | Adika et al. (2020) |
| Greece (04 species) | 1. Bogues, Boops boops (Linnaeus, 1758) | 0.33 MPs/fish; 25.2 % of fish ingested MPs (n = 153) | Demersal (M) | T sangaris et al. (2020) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 2. Common pandora, Pagellus erythrinus (Linnaeus, 1758) | 0.8 MPs/fish; 70 % of fish ingested MPs (n = 42) | Benthopelagic (M) | Anastasopoulou et al. (2018) |
| 2. Common pandora, Pagellus erythrinus (Linnaeus, 1758) | 1.9 MPs/fish; 42.1 % of fish ingested MPs (n = 19) | Benthopelagic (M) | Digka et al. (2018) |
| 3. European pilchard, Sardina pilchardus (Walbaum, 1792) | 0.8 MPs/fish; 50 % of fish ingested MPs (n = 47) | Pelagic-neritic (M, F, B) | Anastasopoulou et al. (2018) |
| 3. European pilchard, Sardina pilchardus (Walbaum, 1792) | 1.8 MPs/fish; 47.2 % of fish ingested MPs (n = 36) | Pelagic-neritic (M, F, B) | Digka et al. (2018) |
| 4. Red mullet, Mullus barbatus Linnaeus, 1758 | 0.5 MPs/fish; 70 % of fish ingested MPs (n = 32) | Demersal (M) | Anastasopoulou et al. (2018) |
| 4. Red mullet, Mullus barbatus Linnaeus, 1758 | 1.5 MPs/fish; 32 % of fish ingested MPs (n = 25) | Demersal (M) | Digka et al. (2018) |
| Hawaii Islands (USA) (03 species) | 1. Albacore tuna, Thunnus alalunga (Bonnaterre, 1788) | 2.0 MPs/fish; 85.7 % of fish ingested MPs (n = 7) | Pelagic-oceanic (M) | Hyrenbach et al. (2021) |
| | 2. Common dolphinfish, Coryphaena hippurus Linnaeus, 1758 | 0.1 MPs/fish; 40 % of fish ingested MPs (n = 8) | Pelagic-oceanic (M, B) | Hyrenbach et al. (2021) |
| | 3. Kawakawa, Euthynnus affinis (Cantor, 1849) | 0.7 MPs/fish; 40 % of fish ingested MPs (n = 10) | Pelagic-oceanic (M, B) | Hyrenbach et al. (2021) |
| India (35 species) | 1. Barracuda fish, Sphyraena sp.; | 14.28 % of fish ingested MPs (n = 14) | Pelagic-neritic (M) | James et al. (2021) |
| | 2. Bombay-duck, Harpodon nehereus (Hamilton, 1822) | 3.64 MPs/fish (n = 20) | Benthopelagic (M, B) | Sathish et al. (2020) |
| | 3. Chacunda gizzard shad, Anodontostoma chacunda (Hamilton, 1822) | 0.73 MPs/fish (n = 30) | Pelagic-neritic (M, F, B) | Daniel et al. (2020) |
| | 4. Commerson's anchovy, Stolephorus commersonni Lacepède, 1803 | 35 % of fish ingested MPs (n = not available) | Pelagic-neritic (M, B) | Kripa et al. (2014) |
| | 5. Common ponyfish, Leiognathus equulus (Forskål, 1775) | 3.33 % of fish ingested MPs (n = 30) | Demersal (M, F, B) | James et al. (2021) |
| | 6. Dorab wolf-herring, Chirocentrus dorab (Forskål, 1775) | 2.61 MPs/fish (n = 20) | Reef-associated (M, B) | Sathish et al. (2020) |
| | 7. Dussumier's thryssa, Thryssa dussumieri (Valenciennes, 1848) | 0.70 MPs/fish (n = 30) | Pelagic-neritic (M, F, B) | Daniel et al. (2020) |
| | 8. Fourfinger threadfin, Eleutheronoma tetradactylum (Shaw, 1804) | 10 % of fish ingested MPs (n = 10) | Pelagic-neritic (M, F, B) | Karuppasamy et al. (2020) |
| | 9. Fourlined terapon, Pelates quadrilineatus (Bloch, 1790) | 12 % of fish ingested MPs (n = 25) | Reef-associated (M, B) | James et al. (2021) |
| | 10. Goldspotted grenadier anchovy, Coilia dussumieri (Valenciennes, 1848) | 6.98 MPs/fish; 100 % of fish ingested MPs (n = 150) | Pelagic-neritic (M, F, B) | Gurjar et al. (2021) |
| | 11. Goldstripe sardinella, Sardinella gibboset (Bleeker, 1849) | 2.5 % of fish ingested MPs (n = 40) | Pelagic-neritic (M) | James et al. (2020) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 11. | Goldstripe sardinella, *Sardinella gibbose* (Bleeker, 1849) | 0.73 MPs/fish (n = 30) | Pelagic-neritic (M) | Daniel et al. (2020) |
| 12. | Honeycomb grouper, *Epinephalus merra* Bloch, 1793 | MPs detected; no data (n = 20) | Reef-associated (M) | Kumar et al. (2018) |
| 13. | Indian anchovy, *Stolephorus indicus* (van Hasselt, 1823) | 0.57 MPs/fish (n = 30) | Pelagic-neritic (M, B) | Daniel et al. (2020) |
| 13. | Indian anchovy, *Stolephorus indicus* (van Hasselt, 1823) | 2.5 % of fish ingested MPs (n = 40) | Pelagic-neritic (M, B) | James et al. (2020) |
| 13. | Indian anchovy, *Stolephorus indicus* (van Hasselt, 1823) | 10 % of fish ingested MPs (n = 10) | Pelagic-neritic (M, B) | Karuppasamy et al. (2020) |
| 14. | Indian mackerel, *Rastrilliger kanagurta* (Cuvier, 1816) | 0.76 MPs/fish (n = 30) | Pelagic-neritic (M) | Daniel et al. (2020) |
| 14. | Indian mackerel, *Rastrilliger kanagurta* (Cuvier, 1816) | 0.98 MPs/fish (n = 20) | Pelagic-neritic (M) | Sathish et al. (2020) |
| 14. | Indian mackerel, *Rastrilliger kanagurta* (Cuvier, 1816) | 28.75 % of fish ingested MPs (n = 80) | Pelagic-neritic (M) | James et al. (2020) |
| 14. | Indian mackerel, *Rastrilliger kanagurta* (Cuvier, 1816) | MPs detected (no data available) (n = 21) | Pelagic-neritic (M) | Kumar et al. (2018) |
| 15. | Indian oil sardine, *Sardinella longiceps* Valenciennes, 1847 | 0.23 MPs/fish (n = 30) | Pelagic-neritic (M) | Daniel et al. (2020) |
| 15. | Indian oil sardine, *Sardinella longiceps* Valenciennes, 1847 | 7.0 % of fish ingested MPs (n = 73) | Pelagic-neritic (M) | James et al. (2020) |
| 16. | Indian sard, *Decapterus russelli* (Rüppell, 1830) | 10 % of fish ingested MPs (n = 10) | Benthopelagic (M) | Karuppasamy et al. (2020) |
| 17. | Indo-Pacific king mackerel, *Scomberomorus guttatus* (Bloch & Schneider, 1801) | 40 % of fish ingested MPs (n = 10) | Pelagic-neritic (M, B) | Karuppasamy et al. (2020) |
| 18. | Indo-Pacific sailfish, *Istiophorus platypterus* (Shaw, 1792) | 0.11 MPs/fish (n = 10) | Pelagic-oceanic (M) | Sathish et al. (2020) |
| 19. | Island mackerel, *Rastrelliger faughnil* Matsui, 1967 | 10 % of fish ingested MPs (n = 10) | Pelagic-neritic (M) | Karuppasamy et al. (2020) |
| 20. | Jack and pompano fish, *Caranx* sp; | 10.34 % of fish ingested MPs (n = 29) | Reef-associated (M, F, B) | James et al. (2020) |
| 21. | Japanese threadfin bream, *Nemipterus japonicus* (Bloch, 1791) | 35 % of fish ingested MPs (n = 20) | Demersal (M) | Karuppasamy et al. (2020) |
| 22. | Malabar tonguesole, *Cyagonlossus macrostomus* Norman, 1928 | 5 % of fish ingested MPs (n = 40) | Benthopelagic (M, B) | James et al. (2020) |
| 23. | Mudskipper, *Boleophthalmus dussouieri* Valenciennes, 1837 | 5.04 MPs/fish; 74 % of fish ingested MPs (n = 50) | Demersal (M, F, B) | Kumar et al. (2018) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M=Marine, B=Brackish, F=Freshwater) | References |
|---|---|---|---|---|
| 24. Obtuse barracuda, *Sphyraena obtusata* Cuvier, 1829 | 0.067 MPs/fish (n = 30) | Reef-associated (M, B) | Daniel et al. (2020) |
| 25. Orange chromide, *Etroplus maculatus* (Bloch, 1795)/ *Pseudetroplus maculatus* (Bloch, 1795) | 10 MPs/fish (n = 10) | Benthopelagic (F, B) | Nikki et al. (2021) |
| 26. Pearlspot, *Etroplus suratensis* (Bloch, 1790) | 13 MPs/fish (n = 10) | Benthopelagic (B) | Nikki et al. (2021) |
| 27. Pirapitinga, *Piaractus brachypomus* (Cuvier, 1818) | 0.56 MPs/fish; 26 % of fish ingested MPs (n = 123) | Pelagic (F) | Devi et al. (2020) |
| 28. Rainbow sardine, *Dussumierio acuta* Valenciennes, 1847 | 0.67 MPs/fish (n = 30) | Pelagic-neritic (M, F, B) | Daniel et al. (2020) |
| 29. Sardine, *Sardinella sp.* | 2.5 % of fish ingested MPs (n = 40) | Pelagic-neritic (M, B) | James et al. (2020) |
| 30. Skipjack tuna, *Katsuwonus pelamis* | 0.2 MPs/fish (n = 10) | Pelagic-oceanic (M) | Sathish et al. (2020) |
| 31. Spotted catfish, *Anus maculatus* (Thunberg, 1792) | 21 MPs/fish (n = 10) | Demersal (M, F, B) | Nikki et al. (2021) |
| 32. Torpedo scad, *Megalaspis cordyla* (Linnaeus, 1758) | 0.57 MPs/fish (n = 30) | Reef-associated (M, B) | Daniel et al. (2020) |
| 33. White sardine, *Escualosa thoracata* (Valenciennes, 1847) | 20 % of fish ingested MPs (n = 10) | Pelagic-neritic (M, F, B) | Karuppasamy et al. (2020) |
| 34. White sardine, *Sardinella abella* (Valenciennes, 1847) | 1.2 MPs/fish (n = 20) | Reef-associated (M, B) | Sathish et al. (2020) |
| 35. White sardine, *Sardinella abella* (Valenciennes, 1847) | 5.75 % of fish ingested MPs (n = 180) | Reef-associated (M, B) | James et al. (2020) |
| 36. Yellowstripe scad, *Selaroides leptolepis* (Cuvier, 1833) | 27.77 % of fish ingested MPs (n = 18) | Reef-associated (M, B) | James et al. (2020) |
| Indonesia (25 species) | | | | |
| 1. Anchovy fish, *Stolephorus spp.* | 88 MPs/fish (n = 15) | Pelagic-neritic (M, B) | Ningrum and Patria (2019) |
| 2. Bluespot mullet, *Crenimugil seheli* (Forsskål, 1775) | 9.17 MPs/fish (n = 12) | Reef-associated (M, F, B) | Hastuti et al. (2019) |
| 3. Bombay-duck, *Harpodon nehereus* (Hamilton, 1822) | 55.56 MPs/fish (n = 12) | Benthopelagic (M, B) | Amin et al. (2020) |
| 4. Chacunda gizzard shad, *Anodontostoma chacunda* (Hamilton, 1822) | 14 MPs/fish (n = 10) | Pelagic-neritic (M, F, B) | Hastuti et al. (2019) |
| 5. Croaker fish, *Johnius spp.* | 10 MPs/fish (n = 12) | Demersal (M, B) | Ismail et al. (2019) |
| 6. Cutlassfish, *Trichiurus sp.* | 3.5 MPs/fish (n = 6) | Benthopelagic (M, B) | Ismail et al. (2019) |
| 7. Flathead grey mullet, *Mugil cephalus* Linnaeus, 1758 | 10.07 MPs/fish (n = 27) | Benthopelagic (M, F, B) | Hastuti et al. (2019) |
| 8. Frigate tuna, *Auxis thazard* (Lacepède, 1800) | 95.65 MPs/fish; 100 % of fish ingested MPs (n = 20) | Pelagic-neritic (M) | Suwartiningsih et al. (2020) |
| 9. Fringescale sardinella, *Sardinella timbriata* (Valenciennes, 1847) | 20 MPs/fish (n = 10) | Pelagic-neritic (M, B) | Hastuti et al. (2019) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) \( (n = \text{number of fish samples}) \) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 10. | Indian mackerel, Rastrelliger kanagurta (Cuvier, 1816) | 1.0 MPs/fish; 55 % of fish ingested MPs \( (n = 9) \) | Pelagic-neritic (M) | Rochman et al. (2015) |
| 11. | Japanese threadfin bream, Nemipterus japonicus (Bloch, 1791) | 57.5 MPs/fish; 95 % of fish ingested MPs \( (n = 20) \) | Demersal (M) | Suwartiningsih et al. (2020) |
| 12. | Killi fish, Aplocheilus sp.; | 1.97 MPs/fish; 75 % of fish ingested MPs \( (n = \text{not available}) \) | Benthopelagic (F, B) | Cordova et al. (2020) |
| 13. | Large-scale croaker, Johnius heterolepis Bleeker, 1873 | 7.3 MPs/fish; 95 % of fish ingested MPs \( (n = 20) \) | Benthopelagic (M) | Suwartiningsih et al. (2020) |
| 14. | Milkfish, Chanos chanos (Forsskål, 1775) | 9.7 MPs/fish; 90 % of fish ingested MPs \( (n = 10) \) | Benthopelagic (M, F, B) | Hastuti et al. (2019) |
| 14. | Milkfish, Chanos chanos (Forsskål, 1775) | 2.0 MPs/fish \( (n = 6) \) | Benthopelagic (M, F, B) | Sembiring et al. (2020) |
| 15. | Mozambique tilapia, Oreochromis mossambicus (Peters, 1852) | 4.9 MPs/fish; 70 % of fish ingested MPs \( (n = 10) \) | Benthopelagic (F, B) | Hastuti et al. (2019) |
| 16. | Shortfin scad, Decapterus macrosoma Bleeker, 1851 | 2.5 MPs/fish; 29.4 % of fish ingested MPs \( (n = 17) \) | Reef-associated (M) | Rochman et al. (2015) |
| 16. | Shortfin scad, Decapterus macrosoma Bleeker, 1851 | 2.5 MPs/fish; 29.4 % of fish ingested MPs \( (n = 17) \) | Reef-associated (M) | Rochman et al. (2015) |
| 17. | Shorthead hairfin anchovy, Setipinna breviceps (Cantor, 1849) | 60 MPs/fish \( (n = 12) \) | Pelagic-neritic (M, B) | Amin et al. (2020) |
| 18. | Silver-striped round herring, Spratelloides gracilis (Temminck & Schlegel, 1846) | 1.1 MPs/fish \( (n = 10) \) | Pelagic-neritic (M) | Rochman et al. (2015) |
| 19. | Skipjack tuna, Katsuwonus pelamis (Linnaeus, 1758) | 21.9 MPs/fish; 100 % of fish ingested MPs \( (n = 20) \) | Pelagic-oceanic (M) | Suwartiningsih et al. (2020) |
| 19. | Skipjack tuna, Katsuwonus pelamis (Linnaeus, 1758) | 59.25 MPs/fish; 100 % of fish ingested MPs \( (n = 16) \) | Pelagic-oceanic (M) | Leesy and Sabar (2021) |
| 20. | Skipjack tuna/Kawakawa, Euthynnus affinis (Cantor, 1849) | 4 MPs/fish \( (n = 50) \) | Pelagic-neritic (M) | Andreas et al. (2021) |
| 21. | Spotted catfish, Arius maculatus (Thunberg, 1792) | 72.22 MPs/fish \( (n = 12) \) | Demersal (M, F, B) | Amin et al. (2020) |
| 22. | Spotted scat, Scatophagus argus (Linnaeus, 1766) | 5.89 MPs/fish \( (n = 35) \) | Reef-associated (M, F, B) | Hastuti et al. (2019) |
| 23. | Starry triggerfish, Abalistes stellari (Anonymous, 1798) | 16.33 MPs/fish \( (n = 30) \) | Demersal (M) | Hastuti et al. (2019) |
| 24. | Streamlined spinefoot, Siganus argenteus (Quoy & Gaimard, 1825) | 0.5 MPs/fish \( (n = 7) \) | Reef-associated (M) | Rochman et al. (2015) |
| 25. | White-spotted spinefoot, Siganus canaliculatus (Park, 1797) | 0.3 MPs/fish \( (n = 2) \) | Reef-associated (M, B) | Rochman et al. (2015) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| Iran (30 species) | 1. Bartail flathead, *Platycephalus indicus* (Linnaeus, 1758) | 2.5 MPs/fish; 100 % of fish ingested MPs (n = 2) | Reef-associated (M, B) | Akhbarizadeh et al. (2018) |
| | 1. Bartail flathead, *Platycephalus indicus* (Linnaeus, 1758) | 21.8 MPs/fish (n = 12) | Reef-associated (M, B) | Abbasi et al. (2018) |
| | 2. Caspian kutum, *Rutilus kutum* (Kamensky, 1901) | 1.66 MPs/fish; 34 % of fish ingested MPs (n = 5) | Benthopelagic (F) | Zaken, et al. (2020) |
| | 3. Common carp, *Cyprinus carpio* Linnaeus, 1758 | 2.0 MPs/fish (n = 5) | Benthopelagic (F, B) | Rasta et al. (2020) |
| | 4. Dory snapper, *Lutjanus fulviflamma* (Forsskål, 1775) | 3.5 MPs/fish; 50 % of fish ingested MPs (n = 2) | Reef-associated (M, B) | Hosseinpour et al. (2021) |
| | 5. European perch, *Perca fluviatilis* Linnaeus, 1758 | 0.45 MPs/fish (n = 44) | Demersal (F, B) | Rasta et al. (2020) |
| | 6. Freshwater bream, *Abramis brama* (Linnaeus, 1758) | 0.1 MPs/fish (n = 23) | Benthopelagic (F, B) | Rasta et al. (2020) |
| | 7. Golden grey mullet, *Chelon auratus* (Risso, 1810) | 2.95 MPs/fish; 68.33 % of fish ingested MPs (n = 60) | Pelagic-neritic (M, F, B) | Zaken, et al. (2020) |
| | 8. Greater lizardfish, *Saurida tumbil* (Bloch, 1795) | 13.5 MPs/fish (n = 4) | Reef-associated (M) | Abbasi et al. (2018) |
| | 9. Indian Mackerel, *Rastreliger kanagurta* (Cuvier, 1816) | 1.2 MPs/fish; 44.4 % of fish ingested MPs (n = 18) | Pelagic-neritic (M) | Hosseinpour et al. (2021) |
| | 10. John’s snapper, *Lutjanus johni* (Bloch, 1792) | 1.10 MPs/fish; 40 % of fish ingested MPs (n = 10) | Reef-associated (M, B) | Hosseinpour et al. (2021) |
| | 11. King soldier bream, *Argyrops spinifer* (Forsskål, 1775) | 2.0 MPs/fish; 50 % of fish ingested MPs (n = 4) | Demersal (M) | Hosseinpour et al. (2021) |
| | 12. Klunzinger’s mullet, *Liza klunzingri* (Day, 1888) | 0.5 MPs/fish; 40 % of fish ingested MPs (n = 10) | Demersal (M) | Hosseinpour et al. (2021) |
| | 13. Kutum fish, *Rutilus frisii* (Nordmann, 1840) | 11.4 MPs/fish; 36.4 % of fish ingested MPs (n = 44) | Benthopelagic (F, B) | Abadi et al. (2021) |
| | 14. Longtail tuna, *Thunnus tonggol* (Bleeker, 1851) | 3.0 MPs/fish; 66.7 % of fish ingested MPs (n = 3) | Pelagic-neritic (M) | Hosseinpour et al. (2021) |
| | 15. Malabar blood snapper, *Lutjanus malabaricus* (Bloch & Schneider, 1801) | 1.4 MPs/fish; 80 % of fish ingested MPs (n = 5) | Reef-associated (M, B) | Hosseinpour et al. (2021) |
| | 16. Malabar trevally, *Carangoides malabaricus* (Bloch & Schneider, 1801) | 3.65 MPs/fish; 82 % of fish ingested MPs (n = 17) | Reef-associated (M) | Hosseinpour et al. (2021) |
| | 17. Narrowbarred Spanish mackerel, *Scomberomorus commerson* (Lacepède, 1800) | 4.4 MPs/fish; 85.7 % of fish ingested MPs (n = 7) | Pelagic-neritic (M) | Hosseinpour et al. (2021) |
| | 18. Northern pike, *Esox lucius* Northern pike, *Esox lucius* | 0.7 MPs/fish (n = 23) | Pelagic (F, B) | Rasta et al. (2020) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) \( (n = \text{number of fish samples}) \) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 19. Orange-spotted grouper, *Epinephelus coioides* (Hamilton, 1822) | 7.75 MPs/10 g fish muscle \( (n = 20) \) | Reef-associated \( \{M, B\} \) | Akhbarizadeh et al. (2018) |
| 20. Pickhandle barracuda, *Sphyraena jello* Cuvier, 1829 | 5.66 MPs/10 g fish muscle \( (n = 15) \) | Reef-associated \( \{M\} \) | Akhbarizadeh et al. (2018) |
| 21. Prussian carp, *Carassius gibelio* (Bloch, 1782) | 1.5 MPs/fish \( (n = 54) \) | Benthopelagic \( \{F, B\} \) | Rasta et al. (2020) |
| 22. Rudd, *Scardinus erythrophthalmus* (Linnaeus, 1758) | 1.0 MPs/fish \( (n = 3) \) | Benthopelagic \( \{F, B\} \) | Rasta et al. (2020) |
| 23. Sawtooth barracuda, *Sphyraena putnamae* Jordan & Seale, 1905 | 5.7 MPs/fish; 100 % of fish ingested MPs \( (n = 3) \) | Reef-associated \( \{M\} \) | Hosseinpour et al. (2021) |
| 24. Shrimp scad, *Alepes djedaba* (Forskal, 1775) | 8 MPs/10 fish muscle \( (n = 20) \) | Reef-associated \( \{M\} \) | Akhbarizadeh et al. (2018) |
| 25. Silver sillago, *Silago sihama* (Forskål, 1775) | 1.47 MPs/fish; 78.6 % of fish ingested MPs \( (n = 14) \) | Reef-associated \( \{M, B\} \) | Hosseinpour et al. (2021) |
| 26. Spangled Emperor, *Lethinus nebulosus* (Forskål, 1775) | 2.6 MPs/fish; 100 % of fish ingested MPs \( (n = 5) \) | Reef-associated \( \{M\} \) | Hosseinpour et al. (2021) |
| Italy (18 species) | 1. Albacore tuna, *Thunnus alalunga* (Bonnaterre, 1788) | 0.29 MPs/fish; 12.9 % of fish ingested MPs \( (n = 31) \) | Pelagic-oceanic \( \{M\} \) | Romeo et al. (2015) |
| 2. Atlantic bluefin tuna, *Thunnus thynnus* (Linnaeus, 1758) | 0.47 MPs/fish; 32.4 % of fish ingested MPs \( (n = 34) \) | Pelagic-oceanic \( \{M\} \) | Romeo et al. (2015) |
| 3. Blackmouth catshark, *Galeus melastomus* Rafinesque, 1810 | 4.47 MPs/fish; 78.1 % of fish ingested MPs \( (n = 32) \) | Pelagic-oceanic \( \{M\} \) | Valiente et al. (2019) |
| 4. Blackspot seabream, *Pagellus bogaraveo* (Brünich, 1768) | 12.5 % of fish ingested MPs \( (n = 24) \) | Pelagic-oceanic \( \{M\} \) | Savoca et al. (2019) |
| 5. Bogue, *Boops boops* (Linnaeus, 1758) | 1.8 MPs/fish; 56 % of fish ingested MPs \( (n = 379) \) | Benthopelagic \( \{M, B\} \) | Savoca et al. (2019) |
| 6. Common pandora, *Pagellus erythrinus* (Linnaeus, 1758) | 6.67 % of fish ingested MPs \( (n = 15) \) | Benthopelagic \( \{M\} \) | Savoca et al. (2019) |
| 7. Common sole, Solea solea (Linnaeus, 1758) | 1.68 MPs/fish; 95 % of fish ingested MPs \( (n = 533) \) | Benthopelagic \( \{M, B\} \) | Pellini et al. (2018) |
| 8. European hake, *Merluccius merluccius* (Linnaeus, 1758) | 1.39 MPs/fish; 26.8 % of fish ingested MPs \( (n = 971) \) | Benthopelagic \( \{M\} \) | Giani et al. (2019) |
| 9. European hake, *Merluccius merluccius* (Linnaeus, 1758) | 46 % of fish ingested MPs \( (n = 971) \) | Benthopelagic \( \{M\} \) | Mancuso et al. (2019) |
| 10. European hake, *Merluccius merluccius* (Linnaeus, 1758) | 1.33 MPs/fish \( (n = 3) \) | Benthopelagic \( \{M\} \) | Avio et al. (2015) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) \(n = \) number of fish samples | Habitats and environments \(\text{M} = \text{Marine}, B = \text{Brackish}, F = \text{Freshwater}\) | References |
|---|---|---|---|---|
| Japan (07 species) | 9. European pilchard, *Sardina pilchardus* (Walbaum, 1792) | 1.78 MPs/fish \(n = 99\) | Pelagic-neritic (M, F, B) | Avio et al. (2015) |
| | 10. Flathead grey mullet, *Mugil cephalus* Linnaeus, 1758 | 1.2 MPs/fish; 20 % of fish ingested MPs \(n = 5\) | Benthopelagic (M, F, B) | Frey and Murazzi (2019) |
| | 11. Lesser spotted dogfish, *Scyliorhinus canicula* (Linnaeus, 1758) | 2.5 MPs/fish; 66.7 % of fish ingested MPs \(n = 30\) | Demersal (M) | Valente et al. (2019) |
| | 12. Picked dogfish, *Squalus acanthias* | 1.25 MPs/fish \(n = 9\) | Benthopelagic (M, B) | Avio et al. (2015) |
| | 13. Pompano, *Trachurus ovatus* (Linnaeus, 1758) | 24.3 % fish ingested MPs \(n = 116\) | Pelagic-neritic (M, B) | Battaglia et al. (2016) |
| | 14. Red mullet, *Mullus barbatus* Linnaeus, 1758 | 1.08 MPs/fish; 19.7 % of fish ingested MPs \(n = 132\) | Demersal (M) | Giani et al. (2019) |
| | 15. Salema, *Sarpa salpa* Linnaeus, 1758 | 2.3 MPs/fish; 100 % of fish ingested MPs \(n = 5\) | Benthopelagic (M, B) | Frey and Murazzi (2019) |
| | 16. Swordfish, *Xiphias gladius* Linnaeus, 1758 | 0.07 MPs/fish; 12.5 % of fish ingested MPs \(n = 56\) | Pelagic-oceanic (M) | Romeo et al. (2015) |
| | 17. Tub gurnard, *Chelidonichthys lucernus* (Linnaeus, 1758) | 1.0 MPs/fish \(n = 3\) | Demersal (M) | Avio et al. (2015) |
| | 18. Velvet belly lantern shark, *Etmopterus spinax* (Linnaeus, 1758) | 1.18 MPs/fish; 61.8 % of fish ingested MPs \(n = 34\) | Bathydemersal (M) | Valente et al. (2019) |
| Malaysia (12 species) | 1. Chub mackerel, *Scomber japonicus* Houttuyn, 1782 | 1.5 MPs/fish; 52.5 % of fish ingested MPs \(n = 64\) | Marine, pelagic-neritic | Yagi et al. (2022) |
| | 2. Japanese anchovy, *Engraulis japonicus* Temminck & Schlegel, 1846 | 2.3 MPs/fish; 77 % of fish ingested MPs \(n = 64\) | Marine, Pelagic-oceanic | Tanaka and Takada (2016) |
| | 3. Japanese jack mackerel, *Trachurus japonicus* Temminck & Schlegel, 1844 | 1.3 MPs/fish; 30.1 % of fish ingested MPs \(n = 86\) | Marine, pelagic-neritic | Yagi et al. (2022) |
| | 4. John dory, *Zeus faber* Linnaeus, 1758 | 1.17 MPs/fish; 16.17 % of fish ingested MPs \(n = 59\) | Marine, brackish, benthopelagic/demersal | Yagi et al. (2022) |
| | 5. Longspine snipefish, *Macroramphosus scolopax* (Linnaeus, 1758) | 1.0 MPs/fish; 7.7 % of fish ingested MPs \(n = 39\) | Marine, demersal | Yagi et al. (2022) |
| | 6. Whitefin trevally, *Carangoides equula* (Temminck & Schlegel, 1844) | 1.10 MPs/fish; 13.7 % of fish ingested MPs \(n = 73\) | Marine, reef-associated | Yagi et al. (2022) |
| | 7. Yellowback seabream, *Dentex tumifrons* (Temminck & Schlegel, 1843) | 1.0 MPs/fish; 6.7 % of fish ingested MPs \(n = 20\) | Marine, demersal | Yagi et al. (2022) |
| | 8. Belanger's croaker, *Johnius belangerii* (Cuvier, 1830) | 13 MPs/fish \(n = 30\) | Demersal (M, B) | Karami et al. (2017) |
| | 9. Cachama, *Colossoma macropomum* (Cuvier, 1816) | 5 MPs/fish \(n = 10\) | Benthopelagic (F) | Karbalaei et al. (2019) |
| | 10. Delagoa threadfin bream, *Nemipterus bipunctatus* (Valenciennes, 1830) | 1 MPs/fish \(n = 10\) | Demersal (M) | Karbalaei et al. (2019) |
| | 11. Grass carp, *Ctenopharyngodon idella* (Valenciennes, 1844) | 4 MPs/fish \(n = 10\) | Benthopelagic (F, B) | Karbalaei et al. (2019) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M=Marine, B=Brackish, F=Freshwater) | References |
|---|---|---|---|---|
| Mexico (04 species) | | | | |
| 5. Greenback mullet, *Chelon subviridis* (Valenciennes, 1836)/ *Planiliza subviridis* (Valenciennes, 1836) | 24 MPs/fish (n = 30) | Demersal (M, F, B) | Karami et al. (2017) |
| 6. Indian mackerel, *Rastrelliger kanagurta* (Cuvier, 1816) | 3 MPs/fish (n = 30) | Pelagic-neritic (M) | Karami et al. (2017) |
| 7. Longtail tuna, *Thunnus tonggol* (Bleeker, 1851) | 3 MPs/fish (n = 10) | Pelagic-neritic (M) | Karbalaei et al. (2019) |
| 8. North African catfish, *Clarias gariepinus* (Burchell, 1822) | 5 MPs/fish (n = 10) | Pelagic-neritic (F) | Karbalaei et al. (2019) |
| 9. Orange-spotted grouper, *Epinephelus coioides* (Hamilton, 1822) | 4 MPs/fish (n = 10) | Reef-associated (M, B) | Karbalaei et al. (2019) |
| 10. Spotty-face anchovy, *Stolephorus waitei* Jordan & Seale, 1926 | 2 MPs/fish (n = 30) | Pelagic-neritic (M, F, B) | Karami et al. (2017) |
| 11. Threefinger threadfin, *Eleutheronema tridactylum* (Bleeker, 1849) | 10 MPs/fish (n = 10) | Pelagic-neritic (M, B) | Karbalaei et al. (2019) |
| 12. Torpedo scad, *Megalaspis cordyla* (Linnaeus, 1758) | 2 MPs/fish (n = 10) | Reef-associated (M, B) | Karbalaei et al. (2019) |
| Moorea Island (French Polynesia) (04 species) | | | | |
| 1. Honeycomb grouper, *Epinephelus merra* Bloch, 1793 | 0.39 MPs/fish; 30% of fish ingested MPs (n = 33) | Reef-associated (M) | Garniera et al. (2020) |
| 2. Rabbitfish, *Siganus* spp.; | 0.15 MPs/fish; 15% of fish ingested MPs (n = 33) | Reef-associated (M, B) | Garniera et al. (2020) |
| 3. Short-nosed flyingfish, *Cheilopogon simus* (Valenciennes, 1847) | 0.24 MPs/fish; 18% of fish ingested MPs (n = 34) | Pelagic-neritic (M) | Garniera et al. (2020) |
| 4. Soldier fish, *Myripristis* spp.; | 0.27 MPs/fish; 21% of fish ingested MPs (n = 33) | Reef-associated (M, B) | Garniera et al. (2020) |
| New Zealand (11 species) | | | | |
| 1. Australasian snapper/silver seabream, *Pagrus auratus* (Forster, 1801) | 1.0 MPs/fish; 4.5% of fish ingested MPs (n = 22) | Reef-associated (M, B) | Markic et al. (2018) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % of fish ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| Nigeria (07 species) | 1. African pike, *Hepsetus odoe* (Bloch, 1794) | 5 % of fish ingested MPs (n = 1) | Demersal (F) | Adeogum et al. (2020) |
|  | 2. Bagrid catfish, *Chrysichthys nigrodigitatus* (Lacepède, 1803) | 6 % of fish ingested MPs (n = 3) | Demersal (F) | Adeogum et al. (2020) |
|  | 3. Blackchin tilapia, *Sarotheron melanotheron* Rüppell, 1852 | 13 % of fish ingested MPs (n = 19) | Demersal (F, B) | Adeogum et al. (2020) |
|  | 4. Nile perch, *Lates niloticus* (Linnaeus, 1758) | 6 % of fish ingested MPs (n = 3) | Demersal (F) | Adeogum et al. (2020) |
|  | 5. Nile tilapia, *Oreochromis niloticus* (Linnaeus, 1758) | 34 % of fish ingested MPs (n = 43) | Benthopelagic (F, B) | Adeogum et al. (2020) |
|  | 6. African obscure snakehead, *Paranchanna obscura* (Gunther, 1861) | 5 % of fish ingested MPs (n = 1) | Demersal (F) | Adeogum et al. (2020) |
|  | 7. Redbelly tilapia; *Coptodon zillii* | 32 % of fish ingested MPs (n = 38) | Benthopelagic (F, B) | Adeogum et al. (2020) |
| North Pacific Gyre (14 species) | 1. Andersen's lanternfish, *Diaphus anderseni* Tåning, 1932 | 15.38 % of fish ingested MPs (n = 13) | Bathypelagic (M) | Davison and Asch (2011) |
|  | 2. Bigfin lanternfish, *Symbolophorus californiensis* (Eigenmann & Eigenmann, 1889) | 7.2 MPs/fish (n = 73) | Pelagic-oceanic (M) | Boergart et al. (2010) |
|  | 3. Bolin's lanternfish, *Diaphus phillipsi* Fowler, 1934 | 100 % of fish ingested MPs (n = 1) | Bathypelagic (M) | Davison and Asch (2011) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) \( n= \) number of fish samples | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 4. Cocco’s lanternfish, Lobianchia gemellarii (Cocco, 1838) | 33 % of fish ingested MPs \( n=3 \) | Bathypelagic (M) | Davison and Asch (2011) |
| 5. Diaphanous hatchet fish, Stenopteryx diaphana Hermann, 1781 | 25 % of fish ingested MPs \( n=4 \) | Bathypelagic (M) | Davison and Asch (2011) |
| 6. Golden lanternfish, Myctophum aurolanternatum Garman, 1899 | 6.0 MPs/fish \( n=42 \) | Bathypelagic (M) | Boerger et al. (2010) |
| 7. Highlight hatchetfish, Stenopteryx pseudobscura Baird, 1971 | 16.7 % of fish ingested MPs \( n=6 \) | Bathypelagic (M) | Davison and Asch (2011) |
| 8. Indo-Pacific snaggletooth, Astronesthes indopacificus Parin & Borodulina, 1997 | 1.0 MPs/fish \( n=7 \) | Bathypelagic (M) | Boerger et al. (2010) |
| 9. Lanternfish, Diaphus fulgens (Brauer, 1904) | 28.6 % of fish ingested MPs \( n=7 \) | Bathypelagic (M) | Davison and Asch (2011) |
| 10. Lantern fish, Loweina interrupta (Tåning, 1928) | 1.0 MPs/fish \( n=26 \) | Bathypelagic (M) | Boerger et al. (2010) |
| 11. Pacific blackdragon, Idiacanthus antrostomus Gilbert, 1890 | 25 % of fish ingested MPs \( n=4 \) | Bathypelagic (M) | Davison and Asch (2011) |
| 12. Pacific saury, Cololabis soinarum (Brevort, 1856) | 3.2 MPs/fish \( n=53 \) | Pelagic-oceanic (M) | Boerger et al. (2010) |
| 13. Pearly lanternfish, Myctophum nitidulum Garman, 1899 | 16 % of fish ingested MPs \( n=25 \) | Bathypelagic (M) | Davison and Asch (2011) |
| 14. Reinhardt’s lantern fish, Hygophum reinhardtii (Lütken, 1892) | 1.3 MPs/fish \( n=47 \) | Bathypelagic (M) | Boerger et al. (2010) |

| North Sea (09 species) | Atlantic cod, Gadus morhua Linnaeus, 1758 | 13 % of fish ingested MPs \( n=80 \) | Benthopelagic (M, B) | Foekema et al. (2013) |
|---|---|---|---|---|
| 1. Atlantic cod, Gadus morhua Linnaeus, 1758 | 31.4 % of fish ingested MPs \( n=100 \) | Benthopelagic (M, B) | Lenz et al. (2016) |
| 2. Atlantic herring, Clupea harengus Linnaeus, 1758 | 1.4 % of fish ingested MPs \( n=566 \) | Benthopelagic (M, B) | Foekema et al. (2013) |
| 3. Atlantic horse mackerel, Trachurus trachurus (Linnaeus, 1758) | 23 % of fish ingested MPs \( n=100 \) | Benthopelagic (M, B) | Lenz et al. (2016) |
| 4. Atlantic mackerel, Scomber scombrus Linnaeus, 1758 | 1.0 % fish ingested MPs \( n=100 \) | Pelagic-neritic (M) | Foekema et al. (2013) |
| 5. Common dab, Limanda limanda (Linnaeus, 1758) | 6.2 % fish ingested MPs \( n=38 \) | Pelagic-neritic (M, B) | Foekema et al. (2013) |
| 6. European sprat, Sprattus sprattus (Linnaeus, 1758) | 0.005 MPs/fish; 0.25 % fish ingested MPs \( n=400 \) | Pelagic-neritic (M, B) | Hermsen et al. (2017) |
| 7. Grey gurnard, Eutrigla gymnura (Linnaeus, 1758) | 1 % fish ingested MPs \( n=171 \) | Demersal (M) | Foekema et al. (2013) |
| 8. Haddock, Melanogrammus aeglefinus (Linnaeus, 1758) | 6.2 % fish ingested MPs \( n=97 \) | Demersal (M) | Foekema et al. (2013) |
| Country/location | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|------------------|------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|------------|
| Norway (04 species) | 9. Whiting, Merlangius merlangus (Linnaeus, 1758) | (5.7 % fish ingested MPs (n = 105)) | Benthopelagic (M, B) | Foekema et al. (2013) |
| | 1. American plaice, Hippoglossoides platessoides (Fabricius, 1780) | 55 % of fish ingested MPs (n = 20) | Demersal (M) | Bour et al. (2018) |
| | 2. Atlantic cod, Gadus morhua (Linnaeus, 1758) | 1.77 MPs/fish; 2.98 % of fish ingested MPs (n = 302) | Benthopelagic (M, B) | Bråte et al. (2016) |
| | 3. Four beard rockling, Enchelyopus cimbrius (Linnaeus, 1766) | 5.9 % of fish ingested MPs (n = 17) | Demersal (M) | Bour et al. (2018) |
| | 4. Norway pout, Trisopterus esmarki (Nilsson, 1855) | 25 % of fish ingested MPs (n = 20) | Benthopelagic (M) | Bour et al. (2018) |
| Peru (04 species) | 1. Chub mackerel, Scomber japonicus Houttuyn, 1782 | 0.03 MPs/fish; 3.3 % of fish ingested MPs (n = 30) | Pelagic-neritic (M) | Dry et al. (2018) |
| | 2. Peruvian grunt, Anisotremus scapularis (Tschudi, 1846) | 5.0 MPs/fish (n = 8) | Reef-associated (M) | De-la-Torre et al. (2019) |
| | 3. Peruvian morwong, Cheilodactylus variegatus Valenciennes, 1833 | 6.13 MPs/fish (n = 8) | Benthopelagic (M) | De-la-Torre et al. (2019) |
| | 4. Peruvian silverside, Odontesthes regia | 0.43 MPs/fish (n = 40) | Pelagic-neritic (M, F, B) | De-la-Torre et al. (2019) |
| Poland (02 species) | 1. Gudgeon, Gobio gobio (Linnaeus, 1758) | 1.15 MPs/fish; 54.5 % of fish ingested MPs (n = 202) | Benthopelagic (F, B) | Kuśmierek and Popiołek (2020) |
| | 2. Roach, Rutilus rutilus (Linnaeus, 1758) | 1.18 MPs/fish; 53.9 % of fish ingested MPs (n = 187) | Benthopelagic (F, B) | Kuśmierek and Popiołek (2020) |
| Portugal (20 species) | 1. Angler, Lophius piscatorius Linnaeus, 1758 | 0.5 MPs/fish; 50 % of fish ingested MPs (n = 2) | Bathydemersal (M) | Neves et al. (2015) |
| | 2. Atlantic horse mackerel, Trachurus trachurus Linnaeus, 1758 | 0.07 MPs/fish; 7 % of fish ingested MPs (n = 44) | Pelagic-neritic (M) | Neves et al. (2015) |
| | 3. Atlantic mackerel, Scomber scombrus Linnaeus, 1758 | 0.46 MPs/fish; 31 % of fish ingested MPs (n = 13) | Pelagic-neritic (M, B) | Neves et al. (2015) |
| | 4. Atlantic pomfret, Brama brama (Bonnaterre, 1768) | 0.67 MPs/fish; 30 % of fish ingested MPs (n = 3) | Pelagic-neritic (M) | Neves et al. (2015) |
| | 5. Axillary seabream, Pagellus acarne (Risso, 1827) | 1 MP/fish; 100 % of fish ingested MPs (n = 1) | Benthopelagic (M) | Neves et al. (2015) |
| | 6. Blue jack mackerel, Trachurus picturatus (Bowdich, 1825) | 0.03 MPs/fish; 3 % of fish ingested MPs (n = 29) | Benthopelagic (M) | Neves et al. (2015) |
| | 7. Bogue, Boops boops (Linnaeus, 1758) | 0.09 MPs/fish; 9 % fish ingested MPs (n = 32) | Demersal (M) | Neves et al. (2015) |
| | 8. Chub mackerel, Scomber japonicus Houttuyn, 1782 | 0.57 MPs/fish; 31 % fish ingested MPs (n = 35) | Pelagic-neritic (M) | Neves et al. (2015) |
| | 9. Common two-banded seabream, Diplodus vulgaris (Geoffroy Saint-Hilaire, 1817) | 3.14 MPs/fish; 73 % of fish ingested MPs (n = 20) | Benthopelagic (M) | Bessa et al. (2018) |
| | 10. European flounder, Platichthys flesus (Linnaeus, 1758) | 0.18 MPs/fish; 13 % of fish ingested MPs (n = 40) | Demersal (M, F, B) | Bessa et al. (2018) |
| | 11. European hake, Merluccius merluccius (Linnaeus, 1758) | 0.34 MPs/fish; 24.5 % of fish ingested MPs (n = 12) | Demersal (M) | Neves et al. (2015) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish; n = number of fish samples) | Habitats and environments (M=Marine, B=Brackish, F=Freshwater) | References |
|---|---|---|---|---|
| Rapa Nui/Easter Island (Chile) (07 species) | 1. Amberstripe scad, Decapterus muroadsi (Temminck & Schlegel, 1844) | 2.4 MPs/fish; 64 % of fish ingested MPs (n = 25) | Pelagic-oceanic (M) | Markic et al. (2018) |
|  | 2. Easter Island flying fish, Cheilopogon rapanouensis Parin, 1961 | 16 % of fish ingested MPs (n = 43) | Pelagic-neritic (M) | Chagnon et al. (2018) |
|  | 3. Glasseye, Heteropriacanthus cruentatus (Lacepède, 1801) | 1.0 MPs/fish; 30 % of fish ingested MPs (n = 10) | Reef-associated (M) | Markic et al. (2018) |
|  | 4. Pacific chub, Kyphosus sandwichensis (Sauvage, 1880) | 4.0 MPs/fish; 51.3 % of fish ingested MPs (n = 39) | Reef-associated (M) | Markic et al. (2018) |
|  | 5. Snoek, Thyrisites atun (Euphrasen, 1731) | 1.9 MPs/fish; 28.6 % of fish ingested MPs (n = 28) | Benthopelagic (M, B) | Markic et al. (2018) |
|  | 6. Violet warehou, Schedophilus velaini (Sauvage, 1879) | 2.5 MPs/fish; 57.1 % of fish ingested MPs (n = 14) | Bathypelagic (M) | Markic et al. (2018) |
|  | 7. Yellowfin tuna, Thunnus obacca (Bonnaterre, 1788) | 3.1 MPs/fish; 70 % of fish ingested MPs (n = 10) | Pelagic-oceanic (M, B) | Markic et al. (2018) |
| Samoa (13 species) | 1. Ambon emperor, Lethrinus amboinensis Bleeker, 1854 | 1.7 MPs/fish; 23.1 % of fish ingested MPs (n = 26) | Reef-associated (M) | Markic et al. (2018) |
|  | 2. Bigeye barracuda, Sphyraena forsteri Cuvier, 1829 | 1.5 MPs/fish; 16.7 % of fish ingested MPs (n = 12) | Reef-associated (M) | Markic et al. (2018) |
|  | 3. Bluespine unicornfish, Naso unicornis (Forsskål, 1775) | 1.4 MPs/fish; 16.7 % of fish ingested MPs (n = 30) | Reef-associated (M) | Markic et al. (2018) |
|  | 4. Dark capped parrotfish, Scarus aonide Valenciennes, 1840 | 2.8 MPs/fish; 11.1 % of fish ingested MPs (n = 45) | Reef-associated (M) | Markic et al. (2018) |
|  | 5. Dusky parrotfish, Scarus niger Forsskål, 1775 | 1.1 MPs/fish; 23.3 % of fish ingested MPs (n = 30) | Reef-associated (M) | Markic et al. (2018) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
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| 6. | Goldspotted spinefoot, *Siganus punctatus* (Schneider & Forster, 1801) | 1.8 MPs/fish; 13.8 % of fish ingested MPs (n = 29) | Reef-associated [M] | Markic et al. (2018) |
| 7. | Humpback red snapper, *Lutjanus gibbus* (Forsskål, 1775) | 1.7 MPs/fish; 20.7 % of fish ingested MPs (n = 29) | Reef-associated [M] | Markic et al. (2018) |
| 8. | Lined surgeonfish, *Acanthurus lineatus* (Linnaeus, 1758) | 1.5 MPs/fish; 16.7 % of fish ingested MPs (n = 24) | Reef-associated [M] | Markic et al. (2018) |
| 9. | Orangespine unicornfish, *Naso lituratus* (Forster, 1801) | 1.8 MPs/fish; 13.8 % of fish ingested MPs (n = 28) | Reef-associated [M] | Markic et al. (2018) |
| 10. | Orange-striped emperor, *Lethrinus obsoletus* (Forsskål, 1801) | 1.3 MPs/fish; 13.3 % of fish ingested MPs (n = 30) | Reef-associated [M] | Markic et al. (2018) |
| 11. | Skipjack tuna, *Katsuwonus pelamis* (Linnaeus, 1758) | 1.5 MPs/fish; 23.1 % of fish ingested MPs (n = 26) | Pelagic-oceanic [M] | Markic et al. (2018) |
| 12. | Striated surgeonfish, *Ctenochaetus striatus* (Quoy & Gaimard, 1825) | 1.0 MPs/fish; 20.7 % of fish ingested MPs (n = 29) | Reef-associated [M] | Markic et al. (2018) |
| 13. | Yellowfin tuna, *Thunnus albacares* (Bonnaterre, 1788) | 1.8 MPs/fish; 24 % of fish ingested MPs (n = 25) | Pelagic-oceanic [M, B] | Markic et al. (2018) |
| Saudi Arabia (23 species) | 1. Areolate grouper, *Epinephelus areolatus* (Forsskål, 1775) | 20 % of fish ingested MPs (n = 5) | Reef-associated [M] | Baalkhuyur et al. (2018) |
| 2. | Black surgeonfish, *Acanthurus gahhm* (Forsskål, 1775) | 10 % of fish ingested MPs (n = 10) | Reef-associated [M] | Baalkhuyur et al. (2018) |
| 3. | Blackspotted rubberlip, *Plectorhinchus gaterinus* (Forsskål, 1775) | 33.3 % of fish ingested MPs (n = 6) | Reef-associated [M] | Baalkhuyur et al. (2018) |
| 4. | Blacktail butterflyfish, *Chaetodon austriacus* Rüppell, 1836 | 10 % of fish ingested MPs (n = 10) | Reef-associated [M] | Baalkhuyur et al. (2018) |
| 5. | Blue-lined large-eye bream, *Gymnocranius grandoculis* (Valenciennes, 1830) | 20 % of fish ingested MPs (n = 10) | Reef-associated [M] | Baalkhuyur et al. (2018) |
| 6. | Bluestripe herring, *Herklotsichthys quadrimaculatus* (Rüppell, 1837) | 51 % of fish ingested MPs (n = 61) | Reef-associated [M, F, B] | Al-Lihaibi et al. (2019) |
| 7. | Brownspotted grouper, *Epinephelus chlorostigma* (Valenciennes, 1828) | 33.3 % of fish ingested MPs (n = 3) | Reef-associated [M] | Baalkhuyur et al. (2018) |
| 8. | Common bluestripe snapper, *Lutjanus kasmira* (Forsskål, 1775) | 16.7 % of fish ingested MPs (n = 12) | Reef-associated [M] | Baalkhuyur et al. (2018) |
| 9. | Common ponyfish, *Leiognathus equulus* (Forsskål, 1775) | 73 % of fish ingested MPs (n = 44) | Demersal [M, F, B] | Al-Lihaibi et al. (2019) |
| 10. | Common silver-biddy, *Gerres oyena* (Forsskål, 1775) | 35 % of fish ingested MPs (n = 23) | Reef-associated [M, B] | Al-Lihaibi et al. (2019) |
| 11. | Dotted grouper, *Epinephelus pisticeps* (Temminck & Schlegel, 1842) | 20 % of fish ingested MPs (n = 5) | Demersal [M] | Baalkhuyur et al. (2018) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F=F Freshwater) | References |
|---|---|---|---|---|
| Slovenia (83 species) | 1. Common sole, Solea solea (Linnaeus, 1758) | 1.9 MPs/fish; 65 % fish ingested MPs (n = 20) | Demersal (M, B) | Anastasopoulou et al. (2018) |
| | 2. Giltthead seabream, Sparus aurata Linnaeus, 1758 | 7.3 MPs/fish; 100 % fish ingested MPs (n = 20) | Demersal (M, B) | Anastasopoulou et al. (2018) |
| | 3. Golden grey mullet, Chelon auratus (Risso, 1810) | 9.5 MPs/fish; 95 % fish ingested MPs (n = 20) | Pelagic-neritic (M, F, B) | Anastasopoulou et al. (2018) |
| South Africa (18 species) | 1. Cape gurnard, Chelidonichthys capensis (Cuvier, 1829) | 3.4 MPs/fish (n = 15) | Demersal (M) | Sparks and Immelman (2020) |
| | 2. Cape horse mackerel, Trachurus capensis Castelnau, 1861 | 3.9 MPs/fish (n = 15) | Pelagic-neritic (M) | Sparks and Immelman (2020) |
| | 3. Carpenter seabream, Argyropelecus argyropelecus (Valenciennes, 1830) | 2.8 MPs/fish (n = 15) | Benthopelagic (M) | Sparks and Immelman (2020) |
| | 4. Chub mackerel, Scomber japonicus Houttuyn, 1782 | 3.3 MPs/fish (n = 15) | Pelagic-neritic (M) | Sparks and Immelman (2020) |
| | 5. Common sole, Solea solea | | | |
| | 6. Gilthead seabream, Sparus aurata Linnaeus, 1758 | | | |
| | 7. Golden grey mullet, Chelon auratus (Risso, 1810) | | | |
| | 8. Cape gurnard, Chelidonichthys capensis (Cuvier, 1829) | | | |
| | 9. Cape horse mackerel, Trachurus capensis Castelnau, 1861 | | | |
| | 10. Carpenter seabream, Argyropelecus argyropelecus (Valenciennes, 1830) | | | |
| | 11. Chub mackerel, Scomber japonicus Houttuyn, 1782 | | | |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
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| 5. Deep-water Cape hake, *Merluccius paradoxus* | 3.8 MPs/fish (n = 15) | Bathydemersal (M) | Sparks and Immelman (2020) |
| 6. European anchovy, *Engraulis encrasicolus* (Linnaeus, 1758) | 1.13 MPs/fish; 57% of fish ingested MPs (n = 178) | Pelagic-neritic (M, B) | Bakir et al. (2020b) |
| 7. Flathead grey mullet, *Mugil cephalus* Linnaeus, 1758 | 3.8 MPs/fish; 73% of fish ingested MPs (n = 70) | Benthopelagic (M, F, B) | Naidoo et al. (2016) |
| 8. Jarbua terapon, *Terapon jarbua* (Forsskål, 1775) | 0.66 MPs/fish; 48% of fish ingested MPs (n = 178) | Demersal (M, F, B) | Naidoo et al. (2020) |
| 9. Kelee shad, *Hilsa kelee* (Cuvier, 1829) | 9 MPs/fish; 100% of fish ingested MPs (n = 9) | Pelagic-neritic (M, F, B) | Naidoo et al. (2017) |
| 10. Malabar glassy perchlet, *Ambassis dussumieri* Cuvier, 1828 | 0.93 MPs/fish; 69% of fish ingested MPs (n = not available) | Demersal (M, F, B) | Naidoo et al. (2020) |
| 11. Mozambique tilapia, *Oreochromis mossambicus* (Peters, 1852) | 0.50 MPs/fish; 38% of fish ingested MPs (n = not available) | Benthopelagic (F, B) | Naidoo et al. (2020) |
| 12. Mullet, *Mugil* sp; | 1.07 MPs/fish; 57% fish ingested MPs (n = not available) | Benthopelagic (M, F, B) | Naidoo et al. (2020) |
| 13. Shallow-water Cape hake, *Merluccius capensis* Castelnau, 1861 | 4.2 MPs/fish (n = 15) | Bathydemersal (M) | Sparks and Immelman (2020) |
| 14. Silver, *Sillago, Sillago sihama* (Forsskål, 1775) | 6 MPs/fish; 100% of fish ingested MPs (n = 9) | Reef-associated (M, B) | Naidoo et al. (2017) |
| 15. South African sardine *Sardinops sagax* (Jenyns, 1842) | 1.58 MPs/fish; 72% of fish ingested MPs (n = 27) | Pelagic-neritic (M) | Bakir et al. (2020b) |
| 16. West Coast round herring, *Etrumeus whiteheadii* Wongratana, 1983 | 1.38 MPs/fish; 72% of fish ingested MPs (n = 188) | Pelagic-neritic (M) | Bakir et al. (2020b) |
| 17. Whipfin silver-biddy, *Gerres filamentosus* Cuvier, 1829 | 8 MPs/fish; 100% of fish ingested MPs (n = 9) | Demersal (M, F, B) | Naidoo et al. (2017) |
| 18. White head round herring, *Etrumeus whiteheadii* Wongratana, 1983 | 3.3 MPs/fish (n = 15) | Pelagic-neritic (M) | Sparks and Immelman (2020) |

South Korea (09 species)

| 1. Amur catfish, *Silurus asotus* Linnaeus, 1758 | 22 MPs/fish; 100% of fish ingested MPs (n = 1) | Demersal (F) | Park et al. (2020a) |
| 2. Bluegill, *Lepomis macrochirus* Rafinesque, 1819 | 10 MPs/fish; 100% of fish ingested MPs (n = 1) | Benthopelagic (F) | Park et al. (2020a) |
| 3. Common carp, *Cynxus carpio* Linnaeus, 1758 | 32 MPs/fish (n = 3) | Benthopelagic (F, B) | Park et al. (2020b) |
| 4. Common carp, *Cynxus carpio* Linnaeus, 1758 | 48 MPs/fish; 100% of fish ingested MPs (n = 1) | Benthopelagic (F) | Park et al. (2020a) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M = Marine, B = Brackish, F = Freshwater) | References |
|---|---|---|---|---|
| 4. Freshwater minnow, Zacco platypus (Temminck & Schlegel, 1846) | 2.9 MPs/fish (n = 1) | Benthopelagic (F) | Park et al. (2020b) |
| 5. Goby minnow, Pseudogobio esocinus (Temminck & Schlegel, 1846) | 3 MPs/fish (n = 1) | Benthopelagic (F) | Park et al. (2020b) |
| 6. Goldfish, Carassius auratus (Linnaeus, 1758) | 14 MPs/fish (n = 1) | Benthopelagic (F, B) | Park et al. (2020b) |
| 7. Japanese white crucian carp, Carassius cuvieri Temminck & Schlegel, 1846 | 4 MPs/fish; 100% of fish ingested MPs (n = 1) | Demersal (F) | Park et al. (2020a) |
| 8. Largemouth black bass, Micropterus salmoides (Lacepède, 1802) | 16 MPs/fish; 100% of fish ingested MPs (n = 1) | Benthopelagic (F) | Park et al. (2020a) |
| 9. Snakehead, Channa argus (Cantor, 1842) | 32 MPs/fish; 100% of fish ingested MPs (n = 1) | Benthopelagic (F) | Park et al. (2020a) |
| Spain (10 species) | | | | |
| 1. Bogues, Boops boops (Linnaeus, 1758) | 3.75 MPs/fish; 68% of fish ingested MPs (n = 337) | Demersal (M) | Nadal et al. (2016) |
| 2. Atlantic chub mackerel, Scomber colias Gmelin, 1789 | 2.77 MPs/fish; 78.3% of fish ingested MPs (n = 120) | Pelagic-neritic (M, B) | Herrera et al. (2019) |
| 3. European anchovy, Engraulis encrasicolus (Linnaeus, 1758) | 0.18 MPs/fish; 14.28% of fish ingested MPs (n = 105) | Pelagic-neritic (M, B) | Compa et al. (2018) |
| 4. European pilchard, Sarda pilchardus (Walbaum, 1792) | 0.21 MPs/fish; 15.24% of fish ingested MPs (n = 105) | Pelagic-neritic (M, F, B) | Compa et al. (2018) |
| 5. Blackmouth catshark, Galeus melastomus Rafinesque, 1810 | 0.34 MPs/fish; 16.8% of fish ingested MPs (n = 125) | Demersal (M) | Alomor and Deudero (2017) |
| 6. Surmullet, Mullus surmuletus Linnaeus, 1758 | 0.50 MPs/fish; 27% of fish ingested MPs (n = 417) | Demersal (M) | Alomar et al. (2017) |
| 7. European hake, Merluccius merluccius (Linnaeus, 1758) | 1.0 MPs/fish; 16.7% of fish ingested MPs (n = 12) | Demersal (M) | Bellas et al. (2016) |
| 8. Lesser spotted dogfish, Scyliorhinus canicula (Linnaeus, 1758) | 1.2 MPs/fish; 15.3% of fish ingested MPs (n = 72) | Demersal (M) | Bellas et al. (2016) |
| 9. European sea bass, Dicentrarchus labrax (Linnaeus, 1758) | 1.43 MPs/fish; 65% of fish ingested MPs (n = 83) | Demersal (M, F, B) | Reinold et al. (2021) |
| 10. Red mullet, Mullus barbatus Linnaeus, 1758 | 1.75 MPs/fish; 18.8% of fish ingested MPs (n = 128) | Demersal (M) | Bellas et al. (2016) |
| Sweden (01 species) | | | | |
| 1. Sea trout, Salmo trutta Linnaeus, 1758 | 1.97 MPs/fish; 68% of fish ingested MPs (n = 62) | Pelagic-neritic (M, F, B) | Karlsson et al. (2017) |
| Switzerland (04 species) | | | | |
| 1. Bleak, Alburnus alburnus (Linnaeus 1758) | 10% of fish ingested MPs (n = 10) | Benthopelagic (F, B) | Faure et al. (2015) |
| 2. Common barbel, Barbus barbus (Linnaeus 1758) | 1.25 MPs/fish; 20% of fish ingested MPs (n = 15) | Benthopelagic (F) | Roch and Brinker (2017) |
| 3. Common dace, Leuciscus leuciscus (Linnaeus, 1758) | 20% of fish ingested MPs (n = 10) | Benthopelagic (F, B) | Faure et al. (2015) |
| 4. Round goby, Neogobius melanostomus (Pallas, 1814) | 1 MPs/fish; 27% of fish ingested MPs (n = 15) | Demersal (M, F, B) | Roch and Brinker (2017) |
| Country/location | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) \( \text{(n = number of fish samples)} \) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|------------------|----------------------------------------------------------|-------------------------------------------------|-------------------------------------------------|------------|
| Tahiti (09 species) | 1. Brassy trevally, *Caranx papuensis* Alleyne & MacLeay, 1877 | 2.4 MPs/fish; 43.8 % of fish ingested MPs \( \text{(n = 32)} \) | Reef-associated [M, B] | Markic et al. (2018) |
|                  | 2. Common dolphinfish, * Coryphaena hippurus* Linnaeus, 1758 | 2.0 MPs/fish; 20 % of fish ingested MPs \( \text{(n = 10)} \) | Pelagic-neritic [M, B] | Markic et al. (2018) |
|                  | 3. Common parrotfish, *Scarus psittacus* Forsskål, 1776 | 1.0 MPs/fish; 16.7 % of fish ingested MPs \( \text{(n = 30)} \) | Reef-associated [M] | Markic et al. (2018) |
|                  | 4. Flying fish, *Cheiopogon pitcairnensis* (Nichols & Breder, 1935) | 1.0 MPs/fish; 9.5 % of fish ingested MPs \( \text{(n = 21)} \) | Pelagic-neritic [M] | Markic et al. (2018) |
|                  | 5. Shortfin scad, *Decapterus macrosoma* Bleeker, 1851 | 1.1 MPs/fish; 29 % of fish ingested MPs \( \text{(n = 25)} \) | Reef-associated [M] | Markic et al. (2018) |
|                  | 6. Squaretail mullet, *Ellochelon vaigiensis* (Quoy & Gaimard, 1825) | 4.3 MPs/fish; 48.5 % of fish ingested MPs \( \text{(n = 33)} \) | Reef-associated [M, F, B] | Markic et al. (2018) |
|                  | 7. Striated surgeonfish, *Ctenochaetus striatus* (Quoy & Gaimard, 1825) | 1.6 MPs/fish; 25.9 % of fish ingested MPs \( \text{(n = 27)} \) | Reef-associated [M] | Markic et al. (2018) |
|                  | 8. Striped large-eye bream, *Gnathodentex aureolineatus* (Lacepède, 1802) | 1.0 MPs/fish; 6.9 % of fish ingested MPs \( \text{(n = 29)} \) | Reef-associated [M] | Markic et al. (2018) |
|                  | 9. Yellowfin tuna, *Thunnus albacares* (Bonnaterre, 1788) | 1.4 MPs/fish; 15.2 % of fish ingested MPs \( \text{(n = 33)} \) | Pelagic-oceanic [M, B] | Markic et al. (2018) |
| Tanzania (02 species) | 1. Nile perch, *Lates niloticus* (Linnaeus, 1758) | 55% of fish ingested MPs \( \text{(n = 20)} \) | Demersal [F] | Bignagwa et al. (2016) |
|                  | 2. Nile tilapia, *Oreochromis niloticus* (Linnaeus, 1758) | 35 % of fish ingested MPs \( \text{(n = 20)} \) | Benthopelagic [F, B] | Bignagwa et al. (2016) |
| Thailand (21 species) | 1. Bagrid catfish, *Hemibagrus spilopterus* Ng & Rainboth, 1999 | 1.8 MPs/fish \( \text{(n = 6)} \) | Demersal [F] | Kasamesiri and Thaimuangphol (2020) |
|                  | 2. Bagrid catfish, *Mystus bocourti* (Bleeker, 1864) | 1.75 MPs/fish \( \text{(n = 20)} \) | Demersal [F] | Kasamesiri and Thaimuangphol (2020) |
|                  | 3. Bigeye scad, *Selar crumenophthalmus* (Bloch, 1793) | 0.18 MPs/fish \( \text{(n = 11)} \) | Reef-associated [M] | Kasamesiri and Thaimuangphol (2020) |
|                  | 4. Black sharkminnow, *Labeo chrysophekadion* (Bleeker, 1849) | 1.8 MPs/fish \( \text{(n = 14)} \) | Benthopelagic [F] | Kasamesiri and Thaimuangphol (2020) |
|                  | 5. Bushytooth lizardfish, *Saurida undosquamis* (Richardson, 1848) | 0.09 MPs/fish \( \text{(n = 85)} \) | Reef-associated [M] | Kasamesiri and Thaimuangphol (2020) |
|                  | 6. Catfish, *Lales longibarbis* (Fowler, 1934) | 1.25 MPs/fish \( \text{(n = 4)} \) | Demersal [F] | Kasamesiri and Thaimuangphol (2020) |
|                  | 7. Dwarf flathead, *Elates ransonnetii* (Steindachner, 1876) | 0.06 MPs/fish \( \text{(n = 69)} \) | Demersal [M] | Kasamesiri and Thaimuangphol (2020) |
|                  | 8. Goldstripe sardinella, *Sardinella gibbose* (Bleeker, 1849) | 0.29 MPs/fish \( \text{(n = 7)} \) | Pelagic-neritic [M] | Kasamesiri and Thaimuangphol (2020) |
|                  | 9. Indian mackerel, *Rastrelliger kanagurta* (Cuvier, 1816) | 0.40 MPs/fish \( \text{(n = 5)} \) | Pelagic-neritic [M] | Kasamesiri and Thaimuangphol (2020) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| Tunisia (03 species) | 1. Golden grey mullet, *Liza aurata* (Risso, 1810) /*Chelon auratus* (Risso, 1810) | 43.86 MPs/fish; 100 % of fish ingested MPs (n = 5) | Pelagic-neritic (M, F, B) | Abidi et al. (2021) |
| | 2. Painted combber, *Serranus scriba* (Linnaeus, 1758) | 100 % of fish ingested MPs (n = 12) | Demersal (M) | Zitouni et al. (2020) |
| | 3. Salema, *Sarpa salpa* (Linnaeus, 1758) | 54.2 MPs/fish; 100 % of fish ingested MPs (n = 5) | Benthopelagic (M, B) | Abidi et al. (2021) |
| Turkey (26 species) | 1. Annular seabream, *Diplodus annularis* (Linnaeus, 1758) | 1.98 MPs/fish; 69 % of fish ingested MPs (n = 48) | Benthopelagic (M, B) | Güven et al. (2017) |
| | 2. Axillary seabream; *Pagellus acarne* (Risso, 1827) | 1.63 MPs/fish; 67 % of fish ingested MPs (n = 52) | Benthopelagic (M, B) | Güven et al. (2017) |
| | 3. Bastard grunt, *Pomadasys incises* (Bowdich, 1825) | 0.79 MPs/fish; 56 % of fish ingested MPs (n = 29) | Demersal (M, B) | Güven et al. (2017) |
| | 4. Blue runner, *Caranx crysos* (Mitchill, 1815) | 100 % of fish ingested MPs (n = 1) | Reef-associated (M, B) | Güven et al. (2017) |
| | 5. Brown meagre, *Sciaena umbra* (Linnaeus, 1758) | 100 % of fish ingested MPs (n = 1) | Demersal (M, B) | Güven et al. (2017) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
| --- | --- | --- | --- | --- |
| 6. | Brushtooth lizardfish, *Saurida undosquamis* (Richardson, 1848) | 1.22 MPs/fish; 55 % of fish ingested MPs (n = 99) | Reef-associated (M) | Güven et al. (2017) |
| 7. | Chub mackerel, *Scomber japonicus* Hourety, 1782 | 6.71 MPs/fish; 71 % of fish ingested MPs (n = 7) | Pelagic-neritic (M) | Güven et al. (2017) |
| 8. | Common yellowtail, *Seriola quinqueradiata* (Linnaeus, 1758) | 5.10 MPs/fish; 75 % of fish ingested MPs (n = 6) | Demersal (M) | Güven et al. (2017) |
| 9. | Common pandora, *Pagellus erythrinus* (Linnaeus, 1758) | 0.63 MPs/fish; 53 % of fish ingested MPs (n = 54) | Benthopelagic (M) | Güven et al. (2017) |
| 10. | Dusky spinefoot, *Signorus luridus* (Rüppell, 1829) | 3.13 MPs/fish; 87 % of fish ingested MPs (n = 15) | Reef-associated (M) | Güven et al. (2017) |
| 11. | European pilchard, *Sardina pilchardus* (Walbaum, 1792) | 2.14 MPs/fish; 57 % of fish ingested MPs (n = 7) | Pelagic-neritic (M, F, B) | Güven et al. (2017) |
| 12. | Fourlined terapon, *Pelates quadrilineatus* (Bloch, 1790) | 1.48 MPs/fish; 65 % of fish ingested MPs (n = 135) | Reef-associated (M, B) | Güven et al. (2017) |
| 13. | Gilthead seabream, *Sparus aurata* Linnaeus, 1758 | 0.87 MPs/fish; 44 % of fish ingested MPs (n = 110) | Demersal (M, B) | Güven et al. (2017) |
| 14. | Goldband goatfish, *Upeneus moluccensis* (Bleeker, 1855) | 0.78 MPs/fish; 44 % of fish ingested MPs (n = 18) | Reef-associated (M, B) | Güven et al. (2017) |
| 15. | Golden grey mullet, *Liza aurata* (Risso, 1810) | 3.26 MPs/fish; 44 % of fish ingested MPs (n = 39) | Pelagic-neritic (M, F, B) | Güven et al. (2017) |
| 16. | Leaping mullet, *Chelon saliens* (Risso, 1810) | 2.50 MPs/fish; 64.8 % of fish ingested MPs (n = 62) | Demersal (M, B) | Gündoğdu et al. (2020) |
| 17. | Meagre, *Argyrosomus regius* (Asso, 1801) | 1.84 MPs/fish; 75 % of fish ingested MPs (n = 51) | Benthopelagic (M, B) | Güven et al. (2017) |
| 18. | Mediterranean horse mackerel, *Trachurus mediterraneus* (Steindachner, 1868) | 1.77 MPs/fish; 68 % of fish ingested MPs (n = 98) | Pelagic-oceanic (M, B) | Güven et al. (2017) |
| 19. | Pink dentex, *Dentex gibbosus* (Rafinesque, 1810) | 0.29 MPs/fish; 29 % of fish ingested MPs(n = 14) | Benthopelagic (M) | Güven et al. (2017) |
| 20. | Por’s goatfish, *Upeneus pori* Ben-Tuvia & Golani, 1989 | 0.69 MPs/fish; 41 % of fish ingested MPs (n = 78) | Demersal (M) | Güven et al. (2017) |
| 21. | Randall’s threadfin bream, *Nemipterus randalli* Russell, 1986 | 1.31 MPs/fish; 55 % of fish ingested MPs (n = 135) | Demersal (M) | Güven et al. (2017) |
| 22. | Red mullet, *Mullus barbatus* Linnaeus, 1758 | 21.10 MPs/fish; 63 % of fish ingested MPs (n = 63) | Demersal (M) | Gündoğdu et al. (2020) |
| 23. | Red porgy, *Pagrus pagrus* Linnaeus, 1758 | 1.44 MPs/fish; 78 % of fish ingested MPs (n = 9) | Benthopelagic (M) | Güven et al. (2017) |
| 24. | Sand steenbras, *Lithognathus mormyrus* (Linnaeus, 1758) | 0.60 MPs/fish; 34.3 % of fish ingested MPs (n = 25) | Demersal (M, B) | Gündoğdu et al. (2020) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| United Kingdom (UK) (23 species) | 25. Surmullet, *Mullus surmuletus* Linnaeus, 1758 | 0.4 MPs/fish; 32.8 % of fish ingested MPs (n = 38) | Demersal (M) | Gündoğdu et al. (2020) |
| | 25. Surmullet, *Mullus surmuletus* Linnaeus, 1758 | 1.18 MPs/fish; 65 % of fish ingested MPs (n = 51) | Demersal (M) | Güven et al. (2017) |
| | 26. Tub gurnard, *Trigla lucerna* Linnaeus, 1758/ *Chelidonichthys lucerna* (Linnaeus, 1758) | 0.75 MPs/fish; 37 % of fish ingested MPs (n = 24) | Demersal (M) | Güven et al. (2017) |
| | 1. Atlantic horse mackerel, *Trachurus trachurus* (Linnaeus, 1758) | 1.5 MPs/fish; 28.6 % of fish ingested MPs (n = 56) | Pelagic-neritic (M) | Lusher et al. (2013) |
| | 2. Blue whiting, *Micromesistius poutassou* (Risso, 1827) | 2.1 MPs/fish; 51.9 % of fish ingested MPs (n = 27) | Bathypelagic (M) | Lusher et al. (2013) |
| | 3. Common dab, *Limanda limanda* (Linnaeus, 1758) | 1.3 MPs/fish (n = 19) | Demersal (M) | Murphy et al. (2017) |
| | 3. Common dab, *Limanda limanda* (Linnaeus, 1758) | 75 % of fish ingested MPs (n = 308) | Demersal (M) | McGoran et al. (2018) |
| | 4. Dragonet, *Callionymus lyra* Linnaeus, 1758 | 1.9 MPs/fish; 38 % of fish ingested MPs (n = 50) | Demersal (M) | Lusher et al. (2013) |
| | 5. European flounder, *Platichthys flesus* (Linnaeus, 1758) | 0.8 MPs/fish (n = 47) | Demersal (M, F, B) | Murphy et al. (2017) |
| | 5. European flounder, *Platichthys flesus* (Linnaeus, 1758) | 35 % of fish ingested MPs (n = 118) | Demersal (M, F, B) | McGoran et al. (2018) |
| | 5. European flounder, *Platichthys flesus* (Linnaeus, 1758) | 81.33 % of fish ingested MPs (n = 66) | Demersal (M, F, B) | McGoran et al. (2017) |
| | 6. European plaice, *Pleuronectes platessa* Linnaeus, 1758 | 0.9 MPs/fish (n = 62) | Demersal (M, B) | Murphy et al. (2017) |
| | 7. European smelt, *Osmerus eperlanus* (Linnaeus, 1758) | 20 % of fish ingested MPs (n = 10) | Pelagic-neritic (M, F, B) | McGoran et al. (2018) |
| | 8. Greater argentine, *Argentina silus* (Ascanius, 1775) | 0.1 MPs/fish (n = 15) | Bathypelagic (M) | Murphy et al. (2017) |
| | 9. John Dory, *Zeus faber* Linnaeus, 1758 | 2.7 MPs/fish; 47.6 % of fish ingested MPs (n = 42) | Benthopelagic (M, B) | Lusher et al. (2013) |
| | 10. Lesser spotted dogfish, *Scyliorhinus caniculair* (Linnaeus, 1758) | 28 % of fish ingested MPs (n = 7) | Demersal (M) | McGoran et al. (2018) |
| | 10. Lesser spotted dogfish, *Scyliorhinus caniculair* (Linnaeus, 1758) | 66.6 % of fish ingested MPs (n = 12) | Demersal (M) | Parton et al. (2020) |
| | 11. Megrim, *Lepidorhombus whiffiagonis* (Walbaum, 1792) | 0.1 MPs/fish (n = 10) | Bathydemersal (M) | Murphy et al. (2017) |
| | 12. Nursehound, *Scyliorhinus stellaris* (Linnaeus, 1758) | 70 % of fish ingested MPs (n = 10) | Reef-associated (M) | Parton et al. (2020) |
| | 13. Picked dogfish, *Squalus acantias* Linnaeus, 1758 | 0.68 % of fish ingested MPs (n = 12) | Benthopelagic (M, B) | Parton et al. (2020) |
| | 14. Poor cod, *Trisopterus minutus* (Linnaeus, 1758) | 1.95 MPs/fish; 40 % of fish ingested MPs (n = 50) | Benthopelagic (M) | Lusher et al. (2013) |
| | 15. Pouting, *Trisopterus luscus* (Linnaeus, 1758) | 29 % of fish ingested MPs (n = 7) | Benthopelagic (M, B) | McGoran et al. (2018) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) \( (n = \text{number of fish samples}) \) | Habitats and environments \( (M = \text{Marine}, B = \text{Brackish}, F = \text{Freshwater}) \) | References |
|---|---|---|---|---|
| United States of America (USA) (48 species) | 1. American gizzard shad, *Dorosoma cepedianum* (Lesueur, 1818) | 24.75 MPs/fish; 100% of fish ingested MPs \( (n = 72) \) | Pelagic-neritic \( (M, F, B) \) | Hurt et al. (2020) |
| | 1. American gizzard shad, *Dorosoma cepedianum* (Lesueur, 1818) | 3.2% of fish ingested MPs \( (n = 16) \) | Pelagic-neritic \( (M, F, B) \) | Phillips and Bonner (2015) |
| | 2. Atlantic croaker, *Micropogonias undulates* (Linnaeus, 1766) | 1.93 MPs/fish \( (n = 383) \) | Demersal \( (M, B) \) | Peters et al. (2017) |
| | 3. Atlantic spadefish, *Chaetodipterus faber* (Broussonet, 1782) | 2.96 MPs/fish \( (n = 103) \) | Reef-associated \( (M, B) \) | Peters et al. (2017) |
| | 4. Blackstripe topminnow, *Fundulus notatus* (Rafinesque, 1820) | 9.2% of fish ingested MPs \( (n = 2) \) | Benthopelagic \( (F) \) | Phillips and Bonner (2015) |
| | 5. Blacktail shiner, *Cyprinella venusta* Girard, 1856 | 8.2% of fish ingested MPs \( (n = 39) \) | Benthopelagic \( (F) \) | Phillips and Bonner (2015) |
| | 6. Blue rockfish, *Sebastes mystinus* (Jordan & Gilbert, 1881) | 0.2 MPs/fish \( (n = 10) \) | Reef-associated \( (M) \) | Rochman et al. (2015) |
| | 7. Blue tilapia, *Oreochromis aureus* (Steindachner, 1864) | 8.2% fish ingested MPs \( (n = 4) \) | Benthopelagic \( (F, B) \) | Phillips and Bonner (2015) |
| | 8. Blueback shad, *Alosa aestivalis* (Mitchill, 1814) | 9 MPs/fish; 100% of fish ingested MPs \( (n = 44) \) | Pelagic-neritic \( (M, F) \) | Ryan et al. (2019) |
| | 9. Bluegill, *Lepomis macrochirus* Rafinesque, 1819 | 45.3% of fish ingested MPs \( (n = 318) \) | Benthopelagic \( (F) \) | Peters and Bratton (2016) |
| | 9. Bluegill, *Lepomis macrochirus* Rafinesque, 1819 | MPs ingested (data is not available) \( (n = 12) \) | Benthopelagic \( (F) \) | Phillips and Bonner (2015) |
| | 10. Bullhead minnow, *Pimephales vigilax* (Baird & Girard, 1853) | 8.2% of fish ingested MPs \( (n = 3) \) | Demersal \( (F) \) | Phillips and Bonner (2015) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish; \(n = \) number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 11. Californian anchovy, Engraulis mordax Girard, 1854 | 0.3 MPs/fish (\(n = 10\)) | Pelagic-neritic (M) | Rochman et al. (2015) |
| 12. Central stoneroller, Compostoma anconum (Rafinesque, 1820) | 8.2 % of fish ingested MPs; mean of all fish (\(n = 31\)) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 13. Channel catfish, Ictalurus punctatus (Rafinesque, 1818) | 8.2 % of fish ingested MPs (\(n = 10\)) | Demersal (F) | Phillips and Bonner (2015) |
| 14. Chinook salmon, Oncorhynchus tschawytscha (Walbaum, 1792) | 0.25 MPs/fish (\(n = 4\)) | Benthopelagic (M, F, B) | Phillips and Bonner (2015) |
| 15. Common dolphinfish, Coryphaena hippurus Linnaeus, 1758 | 0.1 MPs/fish (\(n = 11\)) | Pelagic-neritic (M, B) | Phillips and Bonner (2015) |
| 16. Green sunfish, Lepomis cyanellus Rafinesque, 1819 | 8.2 % of fish ingested MPs (\(n = 6\)) | Demersal (F) | Peters and Bratton (2016) |
| 17. Grey snapper, Lutjanus griseus (Linnaeus, 1758) | 8.2 % of fish ingested MPs (\(n = 5\)) | Reef-associated (M, F, B) | Phillips and Bonner (2015) |
| 18. Jack silverside, Atherinopsis californiensis Girard, 1854 | 1.6 MPs/fish (\(n = 7\)) | Pelagic-neritic (M) | Phillips and Bonner (2015) |
| 19. Largemouth black bass, Micropterus salmoides (Lacepede, 1802) | 5.5 MPs/fish; 100 % of fish ingested MPs (\(n = 24\)) | Benthopelagic (F) | Hurt et al. (2020) |
| 19. Largemouth black bass, Micropterus salmoides (Lacepede, 1802) | 8.2 % of fish ingested MPs (\(n = 12\)) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 19. Largemouth black bass, Micropterus salmoides (Lacepede, 1802) | 2.5 MPs/fish (\(n = 34\)) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 20. Lingcod, Ophiodon elongatus Girard, 1854 | 0.1 MPs/fish (\(n = 11\)) | Demersal (M) | Rochman et al. (2015) |
| 21. Longear sunfish, Lepomis megalotis (Rafinesque, 1820) | 44.1 % of fish ingested MPs (\(n = 118\)) | Benthopelagic (F) | Peters and Bratton (2016) |
| 22. Mexican tetra, Astyanax mexicanus (De Filippi, 1853) | 8.2 % fish ingested MPs (\(n = 12\)) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 23. Mimic shiner, Notropis volucellus (Cope, 1865) | 8.2 % of fish ingested MPs (\(n = 32\)) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 24. Mosquitofish, Gambusia affinis (Baird & Girard, 1853) | 8.2 % of fish ingested MPs (\(n = 5\)) | Benthopelagic (F, B) | Phillips and Bonner (2015) |
| 25. Northern red Snapper, Lutjanus campechanus (Poey, 1860) | 8.2 % of fish ingested MPs (\(n = 2\)) | Reef-associated (M) | Phillips and Bonner (2015) |
| 26. Orangespotted sunfish, Lepomis humilis (Girard, 1854) | 8.2 % of fish ingested MPs (\(n = 4\)) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 27. Pacific sanddab, Citharichthys sordidus (Girard, 1854) | 1.0 MPs/fish; 60 % of fish ingested MPs (\(n = 5\)) | Demersal (M) | Rochman et al. (2015) |
| 28. Pig fish, Orthopristis chrysoptera (Linnaeus, 1766) | 2.0 MPs/fish (\(n = 157\)) | Demersal (M, B) | Phillips and Bonner (2015) |
| Country/location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish; (n = number of fish samples)) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---|---|---|---|---|
| 29. | Pinfish, Lagodon rhomboids (Linnaeus, 1766) | 8.2 % of fish ingested MPs (n = 48) | Demersal (M, F, B) | Phillips and Bonner (2015) |
| 30. | Red drum, Sciaenops ocellatus (Linnaeus, 1766) | 8.2 % of fish ingested MPs (n = 28) | Demersal (M, B) | Phillips and Bonner (2015) |
| 31. | Red shiner, Cyprinella lutrensis (Baird & Girard, 1853) | 8.2 % of fish ingested MPs (n = 67) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 32. | Redbreast sunfish, Lepomis auratus (Linnaeus, 1758) | 8.2 % of fish ingested MPs (n = 8) | Demersal (F) | Phillips and Bonner (2015) |
| 33. | Redear sunfish, Lepomis microlophus (Günther, 1859) | 8.2% of fish ingested MPs (n = 5) | Demersal (F) | Phillips and Bonner (2015) |
| 34. | Redspot darter, Etheostoma artesiae (Hay, 1881) | 8.2 % of fish ingested MPs (n = 11) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 35. | Rio grande cichlid, Herichthys cyanoguttatus Baird & Girard, 1854 | 8.2 % of fish ingested MPs (n = 6) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 36. | Round goby, Neogobius melanostomus (Pallas, 1814) | 1.8 MPs/fish (n = 15) | Demersal (M, F, B) | Hou et al. (2021) |
| 37. | Sabine shiner, Notropis sabinae Jordan & Gilbert, 1886 | 8.2 % of fish ingested MPs (n = 12) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 38. | Sand shiner, Notropis stramineus (Cope, 1865) | 8.2 % of fish ingested MPs (n = 7) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 38. | Sand shiner, Notropis stramineus (Cope, 1865) | 5 MPs/fish (n = 23) | Benthopelagic (F) | Hou et al. (2021) |
| 39. | Sand weakfish, Cynoscion arenarius Ginsburg, 1930 | 1.83 MPs/fish (n = 139) | Demersal (M, B) | Peters et al. (2017) |
| 40. | Southern flounder, Paralichthys lethostigma Jordan & Gilbert, 1884 | 8.2 % of fish ingested MPs (n = 8) | Demersal (M, B) | Phillips and Bonner (2015) |
| 41. | Southern kingcroaker, Menticirrhus americanus (Linnaeus, 1758) | 1.62 MPs/fish (n = 150) | Demersal (M, B) | Peters et al. (2017) |
| 42. | Spotted weakfish, Cynoscion nebulosus (Cuvier, 1830) | 8.2 % of fish ingested MPs (n = 20) | Demersal (M, B) | Phillips and Bonner (2015) |
| 43. | Striped bass, Morone saxatilis (Walbaum, 1792) | 0.9 MPs/fish (n = 7) | Demersal (M, F, B) | Rochman et al. (2015) |
| 44. | Tadpole madtom, Noturus gyrinus (Mitchell, 1817) | 8.2 % of fish ingested MPs (n = 2) | Demersal (F) | Phillips and Bonner (2015) |
| 45. | Texas shiner, Notropis amabilis (Girard, 1856) | 8.2 % of fish ingested MPs (n = 16) | Benthopelagic (F) | Phillips and Bonner (2015) |
| 46. | Threadfin shad, Dorosoma petenense (Günther, 1867) | 8.2 % of fish ingested MPs (n = 5) | Pelagic-neritic (M, F, B) | Phillips and Bonner (2015) |
| 47. | Yellow bullhead, Ameiurus natalis (Lesueur, 1819) | 8.2 % of fish ingested MPs (n = 7) | Demersal (F) | Phillips and Bonner (2015) |
### Table 1: Occurrence of MPs in Fish in Vanuatu

| Country/Location (total number of fish species contaminated with MPs) | Common and Latin name of fish species (and their authority) | MPs concentrations in fish (MPs/fish and % MPs ingested by fish) (n = number of fish samples) | Habitats and environments (M= Marine, B= Brackish, F= Freshwater) | References |
|---------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------|
| Vanuatu (9 species)                                           |                                                              |                                                                                                |                                                               |           |
|                                                              | 1. Chocolate surgeonfish, *Acanthurus pyroferus* Kittlitz, 1834 | 2.9 MPs/fish; 38 % of fish ingested MPs (n = 1)                                                | Reef-associated (M)                                           | Bakir et al. (2020a) |
|                                                              | 2. Convict surgeonfish, *Acanthurus triostegus* (Linnaeus, 1758) | 2.9 MPs/fish; 38 % of fish ingested MPs (n = 8)                                                | Reef-associated (M)                                           | Bakir et al. (2020a) |
|                                                              | 3. Dark capped parrotfish, *Scarus oviceps* Valenciennes, 1840 | 2.9 MPs/fish; 38 % of fish ingested MPs (n = 1)                                                | Reef-associated (M)                                           | Bakir et al. (2020a) |
|                                                              | 4. Lined surgeon fish, *Acanthurus lineatus* (Linnaeus, 1758) | 2.9 MPs/fish; 38 % of fish ingested MPs (n = 2)                                                | Reef-associated (M)                                           | Bakir et al. (2020a) |
|                                                              | 5. Orange-socket surgeonfish, *Acanthurus auranticavus* Randall, 1956 | 2.9 MPs/fish; 38 % of fish ingested MPs (n = 7)                                                | Reef-associated (M)                                           | Bakir et al. (2020a) |
|                                                              | 6. Parrot fish, *Chlorusus spp.*                               | 2.9 MPs/fish; 38 % of fish ingested MPs (n = 4)                                                | Reef-associated (M)                                           | Bakir et al. (2020a) |
|                                                              | 7. Trevally, *Carangidae spp.*                                 | 2.9 MPs/fish; 38 % of fish ingested MPs (n = 1)                                                | Reef-associated (M)                                           | Bakir et al. (2020a) |
|                                                              | 8. Titan triggerfish, *Balistoides viridescens* (Bloch & Schneider, 1801) | 2.9 MPs/fish; 38 % of fish ingested MPs (n = 1)                                                | Reef-associated (M)                                           | Bakir et al. (2020a) |
|                                                              | 9. Yellow fin-tuna, *Thunnus obesus* (Bonnaterre, 1788)       | 4.3 MPs/fish; 83 % of fish ingested MPs (n = 6)                                                | Pelagic-oceanic (M, B)                                       | Bakir et al. (2020a) |

Note: MPs/fish = the concentration of MPs particles in fish; % MPs ingested by fish = the frequency of occurrence of MPs in fish. (Please note that there could be some overlap in the placement of species under some geographical country/location).