**Appendix 1.** Main characteristic included in our study

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Type of fish** | **Family** | **Source** | **County** | **Sample size** | **Mean concentration (µg/kg)** | **SD[[1]](#footnote-1)**  **(µg/kg)** | **Method of detection** | **LOD[[2]](#footnote-2)** | **Reference** |
| Sawtooth barracuda | Sphyraena putnamiae | Pacific | Australia | 19 | 0.140 | 0.041 | HPLC/MS[[3]](#footnote-3) | NC[[4]](#footnote-4) | [1] |
| Spanish mackerel | NM[[5]](#footnote-5) | New South Wales | Australia | 5 | 0.130 | 0.038 | LC–MS/MS[[6]](#footnote-6) | NC | [2] |
| Cheilinus undulates | NM | Pacific | China | 20 | 1.785 | 0.518 | LC-MS/MS | 0.025 | [3] |
| Cheilinus undulates | NM | Pacific | China | 20 | 3.150 | 0.914 | MBA[[7]](#footnote-7) | 0.025 | [3] |
| Epinephelus fuscoguttatus | NM | Pacific | China | 20 | 0.225 | 0.065 | MBA | 0.025 | [3] |
| Epinephelus lanceolatus | NM | Pacific | China | 20 | 0.200 | 0.058 | LC-MS/MS | 0.025 | [3] |
| Epinephelus lanceolatus | NM | Pacific | China | 20 | 0.490 | 0.142 | MBA | 0.025 | [3] |
| Epinephelus polyphekadion | NM | Pacific | China | 20 | 0.151 | 0.044 | LC-MS/MS | 0.025 | [3] |
| Epinephelus polyphekadion | NM | Pacific | China | 20 | 1.036 | 0.300 | MBA | 0.025 | [3] |
| Lates calcarifer | NM | Pacific | China | 20 | 0.840 | 0.244 | LC-MS/MS | 0.025 | [3] |
| Lates calcarifer | NM | Pacific | China | 20 | 1.302 | 0.378 | MBA | 0.025 | [3] |
| Lutjanus argentimaculatus | NM | Pacific | China | 20 | 0.615 | 0.178 | LC-MS/MS | 0.025 | [3] |
| Lutjanus argentimaculatus | NM | Pacific | China | 20 | 1.596 | 0.463 | LC-MS/MS | 0.025 | [3] |
| Lutjanus argentimaculatus | NM | Pacific | China | 20 | 1.561 | 0.453 | MBA | 0.025 | [3] |
| Lutjanus argentimaculatus | NM | Pacific | China | 20 | 3.948 | 1.145 | MBA | 0.025 | [3] |
| Lutjanus bohar | NM | Pacific | China | 20 | 0.195 | 0.056 | LC-MS/MS | 0.025 | [3] |
| Lutjanus bohar | NM | Pacific | China | 20 | 0.784 | 0.227 | LC-MS/MS | 0.025 | [3] |
| Lutjanus bohar | NM | Pacific | China | 20 | 0.191 | 0.055 | LC-MS/MS | 0.025 | [3] |
| Lutjanus bohar | NM | Pacific | China | 20 | 0.471 | 0.137 | LC-MS/MS | 0.025 | [3] |
| Lutjanus bohar | NM | Pacific | China | 20 | 2.058 | 0.597 | LC-MS/MS | 0.025 | [3] |
| Lutjanus bohar | NM | Pacific | China | 20 | 0.225 | 0.065 | MBA | 0.025 | [3] |
| Lutjanus bohar | NM | Pacific | China | 20 | 1.071 | 0.311 | MBA | 0.025 | [3] |
| Lutjanus bohar | NM | Pacific | China | 20 | 1.169 | 0.339 | MBA | 0.025 | [3] |
| Lutjanus bohar | NM | Pacific | China | 20 | 0.386 | 0.112 | MBA | 0.025 | [3] |
| Lutjanus bohar | NM | Pacific | China | 20 | 1.890 | 0.548 | MBA | 0.025 | [3] |
| Lutjanus malabaricus | NM | Pacific | China | 20 | 0.307 | 0.089 | LC-MS/MS | 0.025 | [3] |
| Lutjanus malabaricus | NM | Pacific | China | 20 | 0.707 | 0.205 | MBA | 0.025 | [3] |
| Lutjanus stellatus | NM | Pacific | China | 20 | 0.096 | 0.028 | LC-MS/MS | 0.025 | [3] |
| Lutjanus stellatus | NM | Pacific | China | 20 | 0.210 | 0.061 | MBA | 0.025 | [3] |
| Plectropomus laevis | NM | Pacific | China | 20 | 0.169 | 0.049 | LC-MS/MS | 0.025 | [3] |
| Plectropomus laevis | NM | Pacific | China | 20 | 0.553 | 0.160 | MBA | 0.025 | [3] |
| Plectropomus leopardus | NM | Pacific | China | 20 | 0.381 | 0.110 | LC-MS/MS | 0.025 | [3] |
| Plectropomus leopardus | NM | Pacific | China | 20 | 0.544 | 0.158 | LC-MS/MS | 0.025 | [3] |
| Plectropomus leopardus | NM | Pacific | China | 20 | 0.372 | 0.108 | LC-MS/MS | 0.025 | [3] |
| Plectropomus leopardus | NM | Pacific | China | 20 | 0.210 | 0.061 | MBA | 0.025 | [3] |
| Plectropomus leopardus | NM | Pacific | China | 20 | 0.175 | 0.051 | MBA | 0.025 | [3] |
| Plectropomus leopardus | NM | Pacific | China | 20 | 0.186 | 0.054 | MBA | 0.025 | [3] |
| Plectropomus leopardus | NM | Pacific | China | 20 | 0.245 | 0.071 | MBA | 0.025 | [3] |
| NM | NM | Pacific | China | 20 | 1.001 | 0.290 | LC-MS/MS | 0.025 | [3] |
| NM | NM | Pacific | China | 20 | 0.654 | 0.190 | LC-MS/MS | 0.025 | [3] |
| NM | NM | Pacific | China | 20 | 0.241 | 0.070 | LC-MS/MS | 0.025 | [3] |
| NM | NM | Pacific | China | 20 | 0.798 | 0.231 | LC-MS/MS | 0.025 | [3] |
| NM | NM | Pacific | China | 20 | 0.987 | 0.286 | MBA | 0.025 | [3] |
| NM | NM | Pacific | China | 20 | 1.386 | 0.402 | MBA | 0.025 | [3] |
| NM | NM | Pacific | China | 20 | 0.158 | 0.046 | MBA | 0.025 | [3] |
| NM | NM | Pacific | China | 20 | 0.770 | 0.223 | MBA | 0.025 | [3] |
| Variola albimarginata | NM | Pacific | China | 20 | 0.177 | 0.051 | LC-MS/MS | 0.025 | [3] |
| Variola albimarginata | NM | Pacific | China | 20 | 0.582 | 0.169 | LC-MS/MS | 0.025 | [3] |
| Variola albimarginata | NM | Pacific | China | 20 | 1.120 | 0.325 | MBA | 0.025 | [3] |
| Variola albimarginata | NM | Pacific | China | 20 | 0.581 | 0.168 | MBA | 0.025 | [3] |
| Gymnothorax javanicus | NM | Viti Levu Island | Fiji | 5 | 0.079 | 0.023 | LC–MS/MS | 0.001 | [4] |
| Variola louti | NM | Viti Levu Island | Fiji | 5 | 0.250 | 0.073 | LC–MS/MS | 0.001 | [4] |
| Acanthurus xanthopterus | Acanthuridae | Nuku Hiva Island (Marquesas) | French | 5 | 0.660 | 0.255 | RBA[[8]](#footnote-8) | NC | [5] |
| Caranx lugubris | NM | Guadeloupe | French | 50 | 13.790 | 3.999 | LC-MS | NC | [6] |
| Caranx melampygus | Carangidae | Nuku Hiva Island (Marquesas) | French | 5 | 2.065 | 0.443 | RBA | NC | [5] |
| Cephalopholis argus | Serranidae | Nuku Hiva Island (Marquesas) | French | 5 | 0.280 | 0.140 | RBA | NC | [5] |
| Crenimugil crenilabi | Mugilidae | Nuku Hiva Island (Marquesas) | French | 5 | 10.675 | 5.173 | RBA | NC | [5] |
| Ctenochaetus striatus | Acanthuridae | Nuku Hiva Island (Marquesas) | French | 5 | 6.760 | 2.945 | RBA | NC | [5] |
| Grey snapper | NM | Guadeloupe | French | 50 | 0.240 | 0.070 | LC-MS | NC | [6] |
| Grouper (serranidae) | NM | Guadeloupe | French | 50 | 0.900 | 0.261 | LC-MS | NC | [6] |
| Gymnosarda unicolor | Scombridae | Nuku Hiva Island (Marquesas) | French | 5 | 1.100 | 0.319 | RBA | NC | [5] |
| Kyphosus cinerascens | Kyphosidae | Nuku Hiva Island (Marquesas) | French | 5 | 0.475 | 0.048 | RBA | NC | [5] |
| Lethrinus olivaceus | Lethrinidae | Nuku Hiva Island (Marquesas) | French | 5 | 0.555 | 0.018 | RBA | NC | [5] |
| Liza vaigiensis | Mugilidae | Nuku Hiva Island (Marquesas) | French | 5 | 16.230 | 4.707 | RBA | NC | [5] |
| Lutjanus bohar | Lutjanidae | Nuku Hiva Island (Marquesas) | French | 5 | 0.555 | 0.083 | RBA | NC | [5] |
| Lutjanus gibbus | Lutjanidae | Nuku Hiva Island (Marquesas) | French | 5 | 1.190 | 0.345 | RBA | NC | [5] |
| Lutjanus monostigma | Lutjanidae | Nuku Hiva Island (Marquesas) | French | 5 | 5.830 | 1.691 | RBA | NC | [5] |
| Monotaxis grandoculis | Lethrinidae | Nuku Hiva Island (Marquesas) | French | 5 | 0.330 | 0.096 | RBA | NC | [5] |
| Naso brachycentron | Acanthuridae | Nuku Hiva Island (Marquesas) | French | 5 | 2.865 | 0.468 | RBA | NC | [5] |
| Naso brevirostris | Acanthuridae | Nuku Hiva Island (Marquesas) | French | 5 | 9.030 | 2.619 | RBA | NC | [5] |
| Naso hexacanthus | Acanthuridae | Nuku Hiva Island (Marquesas) | French | 5 | 1.470 | 0.235 | RBA | NC | [5] |
| Naso lituratus | Acanthuridae | Nuku Hiva Island (Marquesas) | French | 5 | 6.560 | 1.902 | RBA | NC | [5] |
| Naso unicornis | Acanthuridae | Nuku Hiva Island (Marquesas) | French | 5 | 6.310 | 1.830 | RBA | NC | [5] |
| Parupeneus insularis | Mullidae | Nuku Hiva Island (Marquesas) | French | 5 | 3.880 | 1.125 | RBA | NC | [5] |
| Sargocentron spiniferum | Holocentridae | Nuku Hiva Island (Marquesas) | French | 5 | 2.360 | 0.684 | RBA | NC | [5] |
| Scarus rubroviolaceus | Scaridae | Nuku Hiva Island (Marquesas) | French | 5 | 9.050 | 4.463 | RBA | NC | [5] |
| Tectus niloticus | NM | Nuku Hiva Island (Marquesas) | French | 19 | 5.970 | 1.731 | LC-MS/MS | NC | [7] |
| Lionfish | NM | Guadeloupe | French | 30 | 0.105 | 0.030 | CBA-N2a | NC | [8] |
| Lionfish | NM | Guadeloupe | French | 30 | 0.000 | 0.000 | LC-MS/MS | NC | [8] |
| Epinephelus polyphekadion | NM | Okinawa | Japan | 20 | 0.350 | 0.102 | LC/MS | NC | [9] |
| Gambierdiscus toxicus | NM | Pacific | Japan | 240 | 0.010 | 0.003 | LC-MS/MS | NC | [10] |
| Grouper | NM | Pacific | Japan | 2 | 0.390 | 0.113 | LC-MS/MS | 0.003 | [11] |
| Lutjanus bohar | NM | Okinawa | Japan | 20 | 0.700 | 0.203 | LC/MS | NC | [9] |
| Lutjanus monostigm | NM | Pacific | Japan | 5 | 0.181 | 0.052 | LC/MS/MS | NC | [12] |
| Lutjanus monostigm | NM | Amami and Kakeroma Islands | Japan | 5 | 8.780 | 2.546 | LC-MS/MS | 1 | [13] |
| Lutjanus monostigm | NM | Amami and Kakeroma Islands | Japan | 5 | 1.110 | 0.322 | LC-MS/MS | 1 | [13] |
| Lutjanus monostigm | NM | Okinawa | Japan | 20 | 1.974 | 0.572 | LC/MS | NC | [9] |
| Lutjanus bohar | NM | Pacific | Japan | 19 | 0.348 | 0.101 | LC-MS/MS | NC | [14] |
| Lutjanus stellatus | NM | Okinawa | Japan | 20 | 2.030 | 0.589 | LC/MS |  | [9] |
| Red snapper | NM | Pacific | Japan | 2 | 0.200 | 0.058 | LC-MS/MS | 0.003 | [11] |
| NM | NM | Amami and Kakeroma Islands | Japan | 5 | 0.130 | 0.038 | LC-MS/MS | 1 | [13] |
| Variola louti | NM | Pacific | Japan | 19 | 0.362 | 0.105 | LC-MS/MS |  | [14] |
| Variola louti | NM | Pacific | Japan | 5 | 0.079 | 0.023 | LC/MS/MS | NC | [12] |
| Variola louti | NM | Amami and Kakeroma Islands | Japan | 5 | 1.120 | 0.325 | LC-MS/MS | 1 | [13] |
| Variola louti | NM | Okinawa | Japan | 20 | 1.120 | 0.325 | LC/MS | NC | [9] |
| Variola louti | NM | Okinawa | Japan | 5 | 0.325 | 0.094 | LC-MS/MS | NC | [15] |
| White-edged grouper | NM | Pacific | Japan | 2 | 0.190 | 0.055 | LC-MS/MS | 0.003 | [11] |
| Carnivorous | NM | Coral reef | Kiribati | 19 | 34.750 | 10.078 | Stable Nitrogen Isotope | NC | [16] |
| Gymnothorax undulatus | Muraenidae | Marakei and Tarawa | Kiribati | 20 | 17.170 | 4.979 | Microplate reader (Molecular Devices Spectra Max M2) | NC | [17] |
| Groupers | Epinephelinae | Marakei and Tarawa | Kiribati | 20 | 2.020 | 0.586 | microplate reader (Molecular Devices Spectra Max M2) | NC | [17] |
| Herbivorous | NM | Marakei and Tarawa | Kiribati | 20 | 0.360 | 0.104 | microplate reader (Molecular Devices Spectra Max M2) | NC | [17] |
| Herbivorous | NM | Coral reef | Kiribati | 19 | 0.835 | 0.242 | Stable Nitrogen Isotope | NC | [16] |
| Moray eels | Muraenidae | Marakei and Tarawa | Kiribati | 20 | 5.650 | 1.639 | microplate reader (Molecular Devices Spectra Max M2) | NC | [17] |
| Moray eels | Lycodontïa .lamnlcur | Pacific | Kiribati | 1 | 1.150 | 0.334 | LC/MS | NC | [18] |
| Omnivorous | Cyprinidae | Marakei and Tarawa | Kiribati | 20 | 0.690 | 0.200 | microplate reader (Molecular Devices Spectra Max M2) | NC | [17] |
| Omnivorous | NM | Coral reef | Kiribati | 19 | 0.905 | 0.262 | Stable Nitrogen Isotope | NC | [16] |
| Carnivorous | NM | Marakei and Tarawa | Kiribati | 20 | 0.390 | 0.113 | microplate reader (Molecular Devices Spectra Max M2) | NC | [17] |
| Cephalopholis argus | NM | Coral reef | Kiribati | 5 | 2.860 | 0.092 | LC-MS/MS | 0.1 | [19] |
| Epinephelus fuscoguttatus | NM | Coral reef | Kiribati | 5 | 1.380 | 0.035 | LC-MS/MS | 0.1 | [19] |
| Epinephelus spilotoceps | NM | Coral reef | Kiribati | 5 | 2.700 | 0.042 | LC-MS/MS | 0.1 | [19] |
| Gymnothorax undulatus | NM | Coral reef | Kiribati | 5 | 7.830 | 0.106 | LC-MS/MS | 0.1 | [19] |
| Amberjack | NM | Pacific | Macaronesia | 15 | 1.400 | 0.406 | LC-MS/MS | NC | [20] |
| Gambierdiscus | lionfish | Caribbean | Mexico | 5 | 0.150 | 0.044 | RBA | 0.1 | [21] |
| B. Vetula | NM | Oceanic | NM | 100 | 0.029 | 0.008 | LC-MS/MS | NC | [22] |
| Epinephelus fuscoguttatus | NM | Oceanic | NM | 100 | 0.027 | 0.008 | LC-MS/MS | NC | [22] |
| Haemulon plumierii | NM | Oceanic | NM | 100 | 0.008 | 0.002 | LC-MS/MS | NC | [22] |
| Horse-eye jack | Caranx latus | St Barthelemy (French West Indies) | NM | 50 | 7.875 | 2.284 | HPLC/MS | NC | [23] |
| Lutjanus bohar | NM | Pacific | NM | 171 | 0.020 | 0.006 | Polarographic and Radiochemical | NC | [24] |
| Ocyurus chrysurus | NM | Oceanic | NM | 100 | 0.004 | 0.001 | LC-MS/MS | NC | [22] |
| Balistes capriscus | NM | Selvagens Islands | Portugal | 15 | 0.030 | 0.009 | LC–MS/MS | 0.0045 | [25] |
| Bodianus scrofa | NM | Selvagens Islands | Portugal | 15 | 0.110 | 0.032 | LC–MS/MS | 0.0045 | [25] |
| Bodianus scrofa | NM | Selvagens Islands | Portugal | 15 | 0.060 | 0.017 | LC–MS/MS | 0.0045 | [25] |
| Balistes capriscus | NM | Selvagens Islands | Portugal | 15 | 0.002 | 0.001 | LC–MS/MS | 0.0045 | [25] |
| Bodianus scrofa | NM | Selvagens Islands | Portugal | 10 | 0.395 | 0.178 | LC-MS/MS | NC | [26] |
| Bodianus scrofa | NM | Selvagens Islands | Portugal | 15 | 0.002 | 0.001 | LC–MS/MS | 0.0045 | [25] |
| Diplodus cervinus | NM | Selvagens Islands | Portugal | 10 | 0.370 | 0.107 | LC-MS/MS | NC | [26] |
| Epinephelus marginatus | NM | Selvagens Islands | Portugal | 15 | 0.050 | 0.015 | LC–MS/MS | 0.0045 | [25] |
| K. Sectatrix | NM | Selvagens Islands | Portugal | 15 | 0.002 | 0.001 | LC–MS/MS | 0.0045 | [25] |
| Kyphosus sectatrix | NM | Selvagens Islands | Portugal | 15 | 0.002 | 0.001 | LC–MS/MS | 0.0045 | [25] |
| Mycteroperca fusca | NM | Selvagens Islands | Portugal | 15 | 0.250 | 0.073 | LC–MS/MS | 0.0045 | [25] |
| Pagrus pagrus | NM | Selvagem Islands | Portugal | 15 | 0.760 | 0.220 | LC-MS/MS | 0.0045 | [27] |
| Serranus atricauda | NM | Selvagens Islands | Portugal | 10 | 0.013 | 0.004 | LC-MS/MS | NC | [26] |
| Serranus atricauda | NM | Selvagens Islands | Portugal | 15 | 0.002 | 0.001 | LC–MS/MS | 0.0045 | [25] |
| Sparisoma cretense | NM | Selvagens Islands | Portugal | 10 | 0.050 | 0.005 | LC-MS/MS | NC | [26] |
| Sphyraena viridensis | NM | Selvagens Islands | Portugal | 15 | 0.002 | 0.001 | LC–MS/MS | 0.0045 | [25] |
| Amberjack | NM | Canary Islands | Spain | 19 | 0.080 | 0.023 | LC-MS/MS | NC | [28] |
| Amberjack | NM | Canary Islands | Spain | 1 | 0.109 | 0.091 | LC-MS/MS | 0.004 | [29] |
| Australian spanish mackerel | NM | Pacific | Spain | 5 | 2.400 | 0.696 | LC–MS/MS | 0.004 | [30] |
| Black moray eel (m. Helena) | NM | Canary Islands | Spain | 1 | 0.035 | 0.021 | LC-MS/MS | 0.004 | [29] |
| Common two-banded seabream | NM | Canary Islands | Spain | 1 | 0.040 | 0.017 | LC-MS/MS | 0.004 | [29] |
| Dusky grouper | NM | Canary Islands | Spain | 1 | 0.057 | 0.059 | LC-MS/MS | 0.004 | [29] |
| Epinephelus marginatus | NM | Tenerife | Spain | 15 | 0.120 | 0.035 | LC-MS/MS | 0.0045 | [27] |
| Lutjanus cyanopterus | NM | Fuerteventura | Spain | 15 | 0.490 | 0.142 | LC-MS/MS | 0.0045 | [27] |
| Samoan moray eel | NM | Pacific | Spain | 5 | 2.700 | 0.783 | LC–MS/MS | 0.014 | [30] |
| Seriola spp. | NM | Tenerife | Spain | 15 | 0.370 | 0.107 | LC-MS/MS | 0.0045 | [27] |
| Lionfish | NM | Virgin Islands | UK | 5 | 0.133 | 0.039 | CBA-N2a | NC | [31] |
| Lionfish | NM | Virgin Islands | UK | 5 | 0.214 | 0.062 | LC-MS/MS | NC | [31] |
| Cephalopholis argus | NM | Island of Hawai’i | USA | 100 | 0.170 | 0.030 | LC-MS/MS | 0.001 | [32] |
| Dog snapper | NM | Caribbean | USA | 5 | 0.550 | 0.160 | LC-MS/MS | 0.075 | [33] |
| Gambierdiscus polynesiensis | NM | Hobcaw Creek | USA | 11 | 0.300 | 0.087 | Neuroblastoma Neuro2a cytotoxicity assay | NC | [34] |
| Horse eye jack | NM | Caribbean | USA | 5 | 0.550 | 0.160 | LC-MS/MS | 0.075 | [33] |
| Lionfish | NM | Caribbean | USA | 5 | 0.550 | 0.160 | LC-MS/MS | 0.075 | [33] |
| Schoolmaster snapper | NM | Caribbean | USA | 5 | 0.550 | 0.160 | LC-MS/MS | 0.075 | [33] |
| Yellow goatfish | NM | Caribbean | USA | 5 | 0.550 | 0.160 | LC-MS/MS | 0.075 | [33] |
| Yellow jack | NM | Caribbean | USA | 5 | 0.550 | 0.160 | LC-MS/MS | 0.075 | [33] |
| Lutjanus bohar | Red snapper | Pacific | Vietnam | 5 | 1.880 | 0.545 | LC/MS | 22.22 | [35] |

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1. Standard deviation [↑](#footnote-ref-1)
2. Limit of detection [↑](#footnote-ref-2)
3. High-performance liquid chromatography mass spectrometry [↑](#footnote-ref-3)
4. Not calculated [↑](#footnote-ref-4)
5. Not mentioned [↑](#footnote-ref-5)
6. Liquid chromatography coupled to either low or high resolution mass spectrometry [↑](#footnote-ref-6)
7. Mouse bio-assay [↑](#footnote-ref-7)
8. **Radiolabeled receptor binding assay**  [↑](#footnote-ref-8)