|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Sediment** | | | **Fish** | | |
|  |  | R (%) | LOD | LOQ | R (%) | LOD | LOQ |
| **PBDEs** | BDE-28 | 96 | 0.01 | 0.03 | 72 | 0.04 | 0.12 |
| BDE-47 | 96 | 0.01 | 0.04 | 77 | 0.05 | 0.18 |
| BDE-100 | 91 | 0.02 | 0.07 | 67 | 0.20 | 0.67 |
| BDE-99 | 75 | 0.03 | 0.09 | 63 | 0.29 | 0.97 |
| BDE-154 | 95 | 0.08 | 0.25 | 59 | 0.43 | 1.42 |
| BDE-153 | 87 | 0.12 | 0.39 | 73 | 0.64 | 2.13 |
| BDE-183 | 83 | 1.65 | 5.49 | 57 | 10.6 | 35.4 |
| BDE-209 | 95 | 0.08 | 0.30 | 61 | 0.08 | 0.30 |
| **Emerging BFRs** | HBB | 105 | 0.03 | 0.11 | 80 | 0.20 | 0.67 |
| DBDPE | 103 | 0.11 | 0.37 | 58 | 9.66 | 32.2 |
| **HNs** | Dec 602 | 114 | 0.0013 | 0.0042 | 97 | 0.021 | 0.070 |
| Dec 603 | 86 | 0.0001 | 0.0003 | 88 | 0.0073 | 0.024 |
| Dec 604 | 65 | 0.0002 | 0.0006 | 99 | 0.007 | 0.024 |
| *syn*-DP | 86 | 0.0003 | 0.0009 | 86 | 0.0055 | 0.018 |
| *anti*-DP | 104 | 0.0002 | 0.0005 | 82 | 0.0023 | 0.0077 |
| **OPFRs** | DCP | 88 | 0.06 | 0.11 | 70 | 1.63 | 4.61 |
| EHDPP | 110 | 0.02 | 0.07 | 60 | 0.53 | 0.97 |
| IDPP | 92 | 0.05 | 0.19 | 86 | 2.96 | 5.17 |
| TNBP | 83 | 0.03 | 0.08 | 70 | 3.44 | 7.30 |
| THP | 89 | 0.06 | 0.22 | 80 | 0.88 | 2.11 |
| TPHP | 70 | 0.08 | 0.16 | 53 | 1.30 | 3.45 |
| TPPO | 48 | 0.85 | 2.51 | 49 | 0.35 | 1.30 |
| TBOEP | 73 | 0.03 | 0.05 | 63 | 0.44 | 1.44 |
| TCEP | 51 | 0.07 | 0.13 | 67 | 1.21 | 3.51 |
| TCIPP | 67 | 0.09 | 0.26 | 63 | 1.48 | 4.18 |
| TDClPP | 70 | 0.05 | 0.12 | 55 | 0.19 | 1.03 |
| TEHP | 103 | 0.11 | 0.27 | 97 | 1.95 | 3.86 |
| IPPP | 93 | 1.25 | 3.44 | 81 | 19.3 | 24.8 |
| TMCP | 90 | 0.09 | 0.15 | 77 | 2.55 | 4.63 |

**Table SI 1.** Recoveries (R), limits of detection (LODs) and quantification (LOQs) for all the studied compounds in sediment (ng/g dw) and fish (ng/g lw).

**Table SI 2.** Concentration levels of HFRs and OPFRs, obtained in sediment sample (expressed in ng/g dw), collected from Bizerte Lagoon, Tunisia.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | S1 | | S2 | | S3 | | S4 | | S5 | | S6 | |
| a | b | a | b | a | b | a | b | a | b | a | b |
| ∑PBDEs | 3.40 | 7.38 | 4.70 | 9.70 | 3.13 | 12.0 | 4.13 | 5.97 | 8.89 | 19.1 | 1.77 | 14.3 |
| *5.38* | | *7.19* | | *7.55* | | *5.05* | | *14.0* | | *8.04* | |
| Emerging BFRs | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd | nd |
| *nd* | | *nd* | | *nd* | | *nd* | | *nd* | | *nd* | |
| ∑HNs | 2.99 | 3.34 | 1.58 | 1.63 | 0.17 | 2.98 | nd | 0.50 | 0.14 | 0.86 | 3.92 | 14.2 |
| *3.16* | | *1.60* | | *1.57* | | *0.25* | | *0.54* | | *9.06* | |
| ∑HFRs | 6.71 | 10.4 | 6.29 | 11.3 | 3.30 | 15.0 | 4.63 | 5.96 | 9.02 | 19.9 | 5.70 | 28.5 |
| *8.54* | | *8.80* | | *9.13* | | *5.29* | | *14.5* | | *17.1* | |
| ∑OPFRs | 21.5 | 60.4 | 49.2 | 55.0 | 23.5 | 32.8 | 9.77 | 43.0 | 32.9 | 44.4 | 107 | 164 |
| *41.0* | | *52.0* | | *28.1* | | *26.3* | | *38.6* | | *136* | |
| *Data in italics corresponded to mean values between 2 replicas of each sampling point.* | | | | | | | | | | | | |
| *nd – below limit of detection.* | | | | | | | | | | | | |

**Table SI 3.** Concentration levels of HFRs and OPFRs, obtained in sediment sample (expressed in ng/g dw) of individual compounds in each sediment sample, collected from Bizerte Lagoon, Tunisia.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | S1 | | S2 | | S3 | | S4 | | S5 | | S6 | |
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| BDE-28  BDE-47  BDE-99  BDE-100  BDE-153  BDE-154  BDE-183  BDE-209 | 0.33  0.52  0.56  0.14  nd  1.83  nd  nq | 0.35  0.73  0.90  0.31  nd  nd  nd  5.09 | 0.53  0.37  2.77  1.05  nq  nq  nd  4.96 | 0.52  1.39  nq  1.15  nq  nq  nd  1.64 | nq  1.65  0.98  0.50  nq  nq  nd  nq | nd  1.02  0.82  0.44  nq  nq  nd  9.70 | 1.84  0.97  nq  nq  nq  nq  nd  1.32 | 0.60  0.68  1.23  2.01  nq  nq  nd  1.44 | 0.54  0.58  1.92  1.10  3.12  1.53  nd  10.3 | nq  0.53  1.12  0.83  nq  nq  nd  6.40 | nd  6.58  7.37  0.37  nd  nd  nd  nq | 0.33  0.25  0.61  0.58  nd  nd  nd  nq |
| Dec 602  Dec 603  Dec 604  *syn*-DP  *anti*-DP | 1.15  2.04  0.14  nq  nq | nd  1.02  nd  0.62  1.35 | nd  0.01  nq  0.64  0.99 | nd  0.02  nq  0.57  1.00 | nd  0.17  nd  nd  nd | nd  nd  nd  0.68  2.30 | nd  0.50  nd  nd  nd | nd  nd  nd  nd  nd | nd  0.16  0.70  nd  nd | nd  nd  0.14  nd  nd | 4.61  nq  4.58  2.71  2.30 | 2.24  nq  1.68  nq  nq |
| TCEP  TPPO  TCIPP  TDClPP  TPHP  TNBP  DCP  TBOEP  TMCP  EHDPP  IDPP  IPPP  THP  TEHP | 3.05  6.98  1.33  nq  20.1  5.08  0.22  0.13  0.85  11.5  nd  11.2  nq  nd | 0.98  nq  0.52  nq  14.8  4.07  0.49  0.22  nq  nq  nd  nq  nq  0.42 | 14.7  nq  1.35  nq  6.86  7.08  0.26  0.36  0.46  8.98  nd  nq  nq  9.13 | 1.75  2.62  10.4  nq  6.94  8.40  nq  0.53  0.44  4.77  nd  7.99  nq  11.1 | 2.02  nq  nq  nq  11.4  8.34  0.11  0.27  1.44  3.28  nd  5.13  nq  0.81 | 0.79  nq  nq  0.13  6.80  6.08  nq  0.28  0.68  2.07  nd  5.58  nq  1.07 | 0.40  nq  nq  nq  4.94  3.02  nq  0.12  nq  0.99  nd  nq  nd  0.30 | 0.31  4.20  8.50  2.17  3.99  8.19  0.15  1.28  0.35  3.77  nd  5.30  nd  4.69 | 3.50  nq  3.79  nq  9.80  10.9  0.16  0.31  0.47  3.11  nd  11.0  nd  1.34 | 3.07  nq  nq  nq  10.4  12.7  0.17  0.44  0.65  3.89  nd  nd  nq  1.62 | 34.5  51.6  21.4  3.84  30.0  6.96  0.76  0.09  nq  14.7  nd  nq  nq  nq | 2.80  11.2  17.1  nq  21.5  15.4  0.33  0.51  0.84  31.9  nd  nq  nq  5.66 |
| *nd – below limit of detection; nq – below limit of quantification.* | | | | | | | | | | | | |

**Table SI 4.** Concentration levels of HFRs and OPFRs (expressed in ng/g lw), in eel samples from Bizerte Lagoon, Tunisia. Mean data correspond to mean value obtained from 6 different samples in each sampling point.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | S1 | S2 | S3 | SM |
| ∑PBDEs | Mean  Range  % of detection | 18.6  9.23-59.0  100 | 6.62  3.03-10.7  100 | 5.60  3.55-8.48  100 | 12.4  5.25-22.7  100 |
| ∑emerging BFRs | Mean  Range  % of detection | nd  nd  0 | nd  nd  0 | nd  nd  0 | nd  nd  0 |
| ∑HNs | Mean  Range  % of detection | 57.4  12.5-103  100 | 25.6  1.12-50.5  100 | 2.41  nd-6.85  50 | 16.7  nd-76.1  83 |
| ∑HFRs | Mean  Range  % of detection | 76.0  20.3-151  100 | 33.0  4.72-61.2  100 | 8.01  5.62-10.5  100 | 29.1  9.25-89.5  100 |
| ∑OPFRs | Mean  Range  % of detection | 574  63-2154  100 | 842  161-1661  100 | 111  19.7-342  100 | 90.7  26.3-167  100 |
| *nd – below limit of detection.* | | | | | |

**Table SI 5.** Concentration levels of HFRs and OPFRs, obtained in eel sample (expressed in ng/g lw), of individual compounds in each eel sample, collected from Bizerte Lagoon, Tunisia.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | S1 | | | | | | S2 | | | | | | S3 | | | | | | SM | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 | 5 | 6 |
| BDE-28  BDE-47  BDE-99  BDE-100  BDE-153  BDE-154  BDE-183  BDE-209 | nq  19.4  18.0  9.96  7.23  1.96  nq  2.36 | nq  5.48  4.77  2.02  nq  nq  nq  nq | nq  6.55  nq  nq  nq  nq  nq  2.67 | nq  4.32  2.75  2.72  nq  nq  nq  nq | nq  2.70  4.08  1.05  nq  nq  nq  nq | nq  5.35  nq  3.57  nq  nq  nq  4.58 | nq  1.72  1.31  nq  nq  nq  nq  nq | nq  3.89  3.14  3.65  nq  nq  nq  nq | nq  2.92  1.81  2.59  nq  nq  nq  nq | nq  3.68  3.01  3.25  nq  nq  nq  nq | nq  0.47  nq  0.85  3.88  nq  nq  nq | nq  3.17  3.45  0.84  nq  nq  nq  nq | nq  4.68  1.60  2.20  nq  nq  nq  nq | nq  2.18  1.57  1.72  nq  nq  nq  0.31 | nq  1.73  1.86  2.88  nq  nq  nq  nq | nq  1.48  1.02  1.37  nq  nq  nq  nq | nq  2.51  1.04  nq  nq  nq  nq  nq | nq  1.34  2.57  1.58  nq  nq  nq  nq | nq  9.25  nq  nq  nq  nq  nq  nq | nq  2.42  1.54  1.29  nq  nq  nq  nq | nq  4.03  4.67  1.85  nq  nq  nq  nq | nq  1.62  9.68  2.19  nq  nq  nq  nq | nq  3.96  7.19  2.31  nq  nq  nq  nq | nq  12.1  nq  nq  10.1  nq  nq  0.48 |
| Dec 602  Dec 603  Dec 604  *syn*-DP  *anti*-DP | 24.1  18.7  11.0  18.2  19.9 | 85.4  4.85  2.86  4.87  5.14 | 38.1  nq  nq  3.32  3.74 | 61.9  4.70  2.55  4.34  4.92 | nq  3.49  2.36  3.31  3.30 | nq  3.60  2.45  3.63  3.82 | nq  nq  1.69  nq  nq | 44.6  3.82  2.11  nq  nq | nq  nq  1.12  nq  nq | 36.5  3.21  1.51  3.13  3.39 | nq  3.36  1.62  3.44  3.66 | 35.8  3.17  1.49  nq  nq | nd  nd  2.01  nd  nd | nd  nd  nd  nd  nd | nd  nd  nd  nd  nd | nd  nd  1.75  nd  nd | nd  2.59  1.44  nd  2.82 | nd  nd  1.29  2.56  nd | nd  nd  nd  nd  nd | nd  nd  3.20  6.77  nd | nd  nd  2.94  nd  nd | nd  nd  nd  nd  2.95 | 74.1  nd  nd  nd  1.96 | nd  nd  nd  nd  8.13 |
| TCEP  TPPO  TCIPP  TDClPP  TPHP  TNBP  DCP  TBOEP  TMCP  EHDPP  IDPP  IPPP  THP  TEHP | nd  nq  nq  20.8  221  32.6  298  12.3  25.6  603  908  32.4  nd  nd | nd  nq  nq  4.95  53.6  nq  53.6  2.94  5.75  130  172  nq  nd  nd | nd  nq  14.3  3.33  14.2  nq  26.7  2.97  nq  36.5  129  nq  nd  nd | nd  nq  nq  nq  nq  nq  63.0  nq  nq  nq  nq  nq  nd  nd | nd  nd  nq  3.01  14.2  nq  15.5  2.17  nq  19.0  230  nq  nd  nd | nd  2.11  5.72  4.48  22.0  14.7  45.5  2.50  nq  64.3  100  34.4  nd  nd | nd  527  nq  14.0  16.5  20.5  51.2  nd  nd  431  nd  601  nd  nd | nd  nq  nq  4.70  32.6  nq  96.3  2.63  675  nq  202  nq  nd  nd | nd  nq  nq  3.00  20.3  nq  63.7  1.53  496  49.8  nq  nq  nd  nd | nd  nq  nq  4.16  24.8  nq  91.0  2.19  710  71.3  nq  nq  nd  nd | nd  nq  nq  3.73  10.5  nq  29.7  4.41  nq  113  nq  nq  nd  nd | nd  nq  nq  3.30  9.12  nq  30.2  1.93  631  2.48  nq  nq  nd  nd | 7.94  nq  8.31  4.18  18.4  nq  67.1  2.38  nq  80.2  nd  nq  nd  nq | nq  nq  18.5  3.65  17.3  nq  56.1  2.23  nq  244  nd  nq  nd  nq | 3.69  nq  nq  4.14  12.8  nq  28.1  2.69  nq  nq  nd  nq  nd  nq | nq  nq  nq  1.20  6.37  nq  21.6  2.24  nq  nq  nd  nd  nd  6.25 | nq  nq  nq  2.11  6.14  nq  15.6  1.61  nq  1.64  nd  nq  nd  nq | nq  nq  nq  2.69  4.63  nq  8.86  1.70  nq  1.84  nd  nq  nd  nq | nq  nq  nq  16.1  56.1  17.2  30.1  nq  18.9  nd  nd  nq  nd  nd | 6.65  nq  nq  6.41  23.0  nq  nq  3.94  6.65  nd  nd  nd  nd  4.31 | 3.79  nq  nq  3.91  nq  nq  58.2  2.47  nq  nd  nd  nd  nd  nq | nd  nq  nq  5.65  18.5  nq  55.1  3.84  6.33  nq  nd  nd  nd  4.20 | nq  nq  nq  3.52  7.22  nq  10.5  2.25  nq  2.80  nd  nd  nd  nq | 11.5  nq  nq  14.7  29.0  30.4  22.1  10.3  37.6  nq  nd  nd  nd  11.3 |
| *nd – below limit of detection; nq – below limit of quantification.* | | | | | | | | | | | | | | | | | | | | | | | | |