**Table S1.** Average values concentrations for different groups PAEs monitoring results in Lake Baikal waters (confidence intervals, P=0.95). The confidence intervals are calculated using boot strap method

|  |  |
| --- | --- |
| Data groups | PAEs, µg/L |
| DMP | DEP | DBP | DEHP |
| Lake Baikal waters | 0.016(0.015 0.020) | 0.073(0.063 0.087) | 0.548(0.474 0.662) | 0.296(0.261 0.338) |
|  *Seasons* |
| Spring | 0.015(0.012 0.020) | 0.075(0.061 0.094) | 0.712(0.597 0.893) | 0.383(0.337 0.452) |
| Autumn | 0.018(0.015 0.0223) | 0.071(0.057 0.092) | 0.311(0.251 0.410) | 0.169(0.141 0.210) |
|  *Basins* |
| Southern | 0.02(0.0157 0.0266) | 0.0726(0.0603 0.088) | 0.493(0.41 0.586) | 0.271(0.233 0.322) |
| Central | 0.012(0.009 0.015) | 0.062 (0.047 0.088) | 0.688(0.506 1.15) | 0.311(0.250 0.405) |
| Northern | 0.014(0.011 0.018) | 0.0835(0.060 0.118) | 0.521(0.396 0.765) | 0.322(0.251 0.418) |
|  *Year* |
| 2015 | - | - | 0.288(0.215 – 0.429) | 0.809(0.577 – 1.12) |
| 2016 | - | - | 0.636(0.511 – 0.792) | 0.231(0.165 – 0.35) |
| 2017 | 0.013(0.009 – 0.016) | 0.145(0.116 – 0.185) | 1.24(0.944 – 1.86) | 0.377(0.302 – 0.474) |
| 2018 | 0.001(0.001 – 0.003) | 0.056(0.048 – 0.068) | 0.719(0.563 – 0.889) | 0.529(0.376 – 0.842) |
| 2019 | 0.006(0.004 – 0.009) | 0.067(0.044 – 0.113) | 0.181(0.129 – 0.298) | 0.240(0.179 ­ 0.36) |
| 2020 | 0.003(0.002 – 0.005) | 0.038(0.030 – 0.046) | 0.787(0.542 – 1.17) | 0.238(0.166 – 0.356) |
| 2021 | 0.025(0.019 – 0.031) | 0.093(0.071 – 0.124) | 0.195(0.139 – 0.262) | 0.239(0.182 – 0.341) |
| 2022 | 0.031(0.025 – 0.046) | 0.018(0.013 – 0.024) | 0.284(0.162 – 0.518) | 0.187(0.151 – 0.243) |
|  *Ecotope* |
| Bays | 0.014 (0.001 – 0.022) | 0.054(0.030 – 0.123) | 0.591(0.350 – 1.14) | 0.311(0.195 – 0.498) |
| Central zone | 0.013(0.010 – 0.018) | 0.086(0.068 – 0.110) | 0.776(0.628 – 1.07) | 0.355(0.303 – 0.421) |
| Near-shore zone | 0.019(0.015 – 0.026) | 0.064(0.051 – 0.083) | 0.406(0.333 – 0.512) | 0.240(0.196 – 0.304) |
| Rivers | 0.017(0.011 – 0.024) | 0.079 (0.055 – 0.111) | 0.367 (0.250 – 0.518) | 0.326(0.245 – 0.476) |
|  *Central zone – miscellaneous* |
| Central zone | 0.013(0.009 – 0.019) | 0.086(0.070 – 0.110) | 0.776(0.627 – 1.09) | 0.355(0.299 ­ 0.421) |
| Bays, near-shore zone, rivers mouthes | 0.018(0.015 – 0.023) | 0.066(0.054 – 0.083) | 0.422(0.355 – 0.524) | 0.263(0.223 – 0.309) |

**Table S2.** Assessment of the environmental risk (RQ) for hydrobionts by average concentrations of priority congeners PAEs1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| PAEs | Hydrobiont | Species | PNEC, µg/L | C average 2, µg/L | RQ |
| DMP | Algae | Pseudokirchneriella subcapitata | 142 | 0.02 | 0.0001 |
| Cladoceran | Daphnia magna | 33 | 0.0005 |
| Fish | Lepomis macrochirus | 50 | 0.0003 |
| DEP | Algae | Pseudokirchneriella subcapitata | 16 | 0.07 | 0.0046 |
| Cladoceran | Daphnia magna | 86 | 0.0008 |
| Fish | Lepomis macrochirus | 16.5 | 0.0044 |
| D*n*BP | Algae | Pseudokirchneriella subcapitata | 142 | 0.55 | 0.0039 |
| Cladoceran | Daphnia magna | 33 | 0.017 |
| Fish | Danio rerio (Zebra danio) | 10 | 0.055 |
| DEHP | Algae | Pseudokirchneriella subcapitata | 0.1 | 0.30 | 2.96 |
| Cladoceran | Daphnia magna | 0.77 | 0.384 |
| Fish | Lepomis macrochirus | 6.0 | 0.049 |

Note: 1 – average concentrations of priority PAEs in Lake Baikal waters for monitoring period of 2015-2022; 2 –PNEC – the concentration that is not expected to affect aquatic organisms, data from [**25**,**26**].

Criteria of the assessment of PAEs risk: RQ ˂0.01 –no risk or a very low level of risk; RQ = 0.01-1.0 – average level of risk; RQ ˃ 1.0 – high level of risk.

**Table S3.** Assessment of ecological risk (RQ) with increasing concentrations of dominant congeners of PAEs (C, μg/l) in the water of the lake Baikal and at the mouths of the tributaries of the lake

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| PAEs | Pelagic zone | Under the ice, 5 m | Deep horizons,1500-1600 m | Selenga shallow water | Tributaries in spring | Near-shore zone |
| St., No 6 | St., No 11 | St., No 3 | St., No 10 | St., No 24 | St., No 32 | St., No 22 | St., No 28 | St., No 29 |
| C  | RQ | C | RQ | C | RQ | C | RQ | C | C | C | RQ | C | RQ | C | RQ | C | RQ |
| D*n*BP | 2.5 | 0.018 | 1.4 | 0.010 | 0.13 | 0.001 | 3.7 | 0.026 | 11 | 0,081 | 0.04 | 0.000 | 0.08 | 0.001 | 1.3 | 0.009 | 8.1 | 0.057 |
| 2.5 | 0.077 | 1.4 | 0.042 | 0.13 | 0.004 | 3.7 | 0.112 | 11 | 0,348 | 0.04 | 0.001 | 0.08 | 0.002 | 1.3 | 0.039 | 8.1 | 0.245 |
| 2.5 | 0.253 | 1.4 | 0.140 | 0.13 | 0.013 | 3.7 | 0.370 | 11 | 1.2 | 0.04 | 0.004 | 0.08 | 0.008 | 1.3 | 0.130 | 8.1 | 0.810 |
| DEHP | 0.38 | 3.8 | 2.2 | 22 | 5.8 | 58 | 1.2 | 12 | 0.70 | 7.0 | 0.25 | 2.5 | 0.34 | 3.4 | 0.24 | 2.4 | 0.70 | 7.0 |
| 0.38 | 0.494 | 2.2 | 2.9 | 5.8 | 7.5 | 1.2 | 1.6 | 0.70 | 0.909 | 0.25 | 0.325 | 0.34 | 0.442 | 0.24 | 0.312 | 0.07 | 0.909 |
| 0.38 | 0.063 | 2.2 | 0.367 | 5.8 | 0.967 | 1.2 | 0.200 | 0.70 | 0.117 | 0.25 | 0.042 | 0.34 | 0.057 | 0.24 | 0.040 | 0.70 | 0.117 |

Criteria of the assessment of PAEs risk: RQ ˂0.01 –no risk or a very low level of risk; RQ = 0.01-1.0 – average level of risk; RQ ˃ 1.0 – high level; RQ ˃˃ 1.0 – high level.

Hydrobionts species and quantities values of PNEC (µg/L) are presented in the **Table S2**.