Bi-ennial Global Interlaboratory Assessment on Persistent Organic Pollutants – Fourth Round 2018

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• 3rd Exercise in series
• 175 Laboratories from 66 countries registered: a sharp increase in comparison to the previous assessment with 105 laboratories
• Test materials:
  • test solutions
  • sediment
  • air (extract)
  • water (PFASs only)
  • fish
  • human milk
  • human plasma (PFASs only)
SATISFACTORY Z-SCORES

The bar chart illustrates the percentage of satisfactory data across various samples, including test solution, sediment, fish, human milk, human plasma, air extract, and water. Different categories of pollutants are represented by distinct colors:
- OCPs
- PCB
- PCDD/PCDF
- PBDE
- HxBB
- Toxaphene
- HBCD
- PFAS

The chart shows varying percentages of satisfactory data across these samples, indicating the levels of detection or absence of contaminants.
Dieldrin in sediment, per method
DIELDRIN IN FISH - EXPERIENCED AND NEW LABS

The graph shows the concentration of DIELDRIN in fish for laboratories that participated before and for those participating for the first time. The concentration is measured in μg/kg. The graph is divided into two sections: 

1. **Participated before**: Laboratories that have previously participated in the study.
2. **First time participation**: Laboratories participating for the first time.

The concentration levels are indicated with different markers and colors, allowing for a comparison between the two groups. The laboratory codes are represented on the x-axis, with different regions indicating the geographic distribution: Asia, WECC, GRULAC, Africa, and CEE.
P,P’-DDE IN SEDIMENT, EXPERIENCED AND NEW LABS

![Graph showing P,P’-DDE concentrations in sediment for experienced and new labs.](image-url)
PCB 153 IN SEDIMENT, PER METHOD

![Graph showing concentration in ng/g vs laboratory code. The x-axis represents laboratory code with markers for ECD and MS. The y-axis shows concentration in ng/g. There are horizontal lines indicating different concentration levels (z=2, z=1, z=-1, z=-2). The graph contains data points that are distributed across the range.]
TOXAPHENE TEST SOLUTION
PBDE AIR
## PBDE AND PBB RESULTS (CV%)

<table>
<thead>
<tr>
<th>Congener</th>
<th>Test solution</th>
<th>Sediment</th>
<th>Fish</th>
<th>Human milk</th>
<th>Air extract</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=39</td>
<td>n=27</td>
<td>n=23</td>
<td>n=10</td>
<td>n=25</td>
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<tr>
<td>47</td>
<td>16</td>
<td>75</td>
<td>20</td>
<td>31</td>
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<td>99</td>
<td>8</td>
<td>96</td>
<td>8</td>
<td>49</td>
<td>12</td>
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<td>100</td>
<td>19</td>
<td>92</td>
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<td>98</td>
<td>19</td>
</tr>
<tr>
<td>183</td>
<td>21</td>
<td>23</td>
<td>14</td>
<td>32</td>
<td>18</td>
</tr>
<tr>
<td>BB153</td>
<td>37</td>
<td>429</td>
<td>20</td>
<td>9</td>
<td>51</td>
</tr>
</tbody>
</table>

(n = 5 - 9)
## HBCD RESULTS (CV%)

<table>
<thead>
<tr>
<th>Diastereomer</th>
<th>Test solution</th>
<th>Sediment</th>
<th>Fish</th>
<th>Human Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>α</td>
<td>14</td>
<td>48</td>
<td>21</td>
<td>167</td>
</tr>
<tr>
<td>β</td>
<td>13</td>
<td>91</td>
<td>120</td>
<td>-</td>
</tr>
<tr>
<td>γ</td>
<td>12</td>
<td>36</td>
<td>97</td>
<td>-</td>
</tr>
</tbody>
</table>
PCB RESULTS OF LAST THREE EXERCISES
OCP RESULTS OF LAST THREE EXERCISES

The bar chart illustrates the CV% for different categories over three periods: 2010/2011 (blue bars), 2012/2013 (red bars), and 2016 (green bars). The categories include:

- Test solution
- Sediment
- Fish
- Human milk
- Air extract

The chart shows the variability in each category for each period, with the highest variability observed in the sediment category for the 2010/2011 period, and the lowest in the test solution category for the 2012/2013 period.
SUM OCPS - CV

The graph displays the coefficient of variation (CV) for various samples:
- Test solution
- Sediment
- Fish
- Human milk
- Air extract

The CV values are shown for different chemical compounds:
- Sum Drins
- Sum Chlordane
- Sum Heptachlor
- Sum DDTs
- Sum HCHs
- Sum Endosulfan

The CV values range from 0 to 350, with each sample category having a specific color code for easy identification.
CONCLUSIONS AND RECOMMENDATIONS AFTER 3 ILS

- Laboratories need to carry out POP analyses on a regular basis in order not to lose the built up knowledge. Governments should support their laboratories herein.
- Laboratories are encouraged to train their own technicians by repeatedly analysing certified and internal reference materials.
- Laboratories analysing OCPs are encouraged to use GC-MS and $^{13}$C labelled standards to improve their analysis.
- As it is extremely difficult to obtain test materials with a relevant contamination degree for all POPs, in future materials may need to be fortified for some of the POPs, in order to provide materials with realistic levels.
- Continuation of this interlaboratory assessment studies is needed to monitor and improve the overall level of performance of POPs analysis.
- Training, instruction and capacity building is necessary in the developing regions (CEE, Africa, GRULAC and parts of the Asian and Pacific region) for all POPs with particular attention to clean up of difficult matrices such as sediment and fish.
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Test samples

- Fish
- Water
- Test solutions
- Sediment
Preparing test samples (Fish)

Pike perch originating from a river in The Netherlands
Preparing test samples (Fish)
Preparing test samples (Fish)
Preparing test samples (Fish)
Preparing test samples (water)
Preparation of test samples (status)

- Is ready for all compounds except Toxaphenes
- Will be prepared for Toxaphenes next week

- Compounds are ordered and delivered
- Will be prepared next week

- Has been prepared
- Will be irradiated next week

- Sediment is approved for all compounds
- Analyses for PFASs suitability is going on right now