**Assessment of trace metals in water, sediment and fish species of some urban rivers in Bangladesh**

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**Introduction:** The present study observed at the situation of three urban rivers (Turag, Buriganga and Shitalakha) around Dhaka city, Bangladesh. The greater Dhaka city is one of the most densely populated area in the world with approximately 12 million people of which less than 25% are served by sewage treatment facilities. Trace metals from natural and anthropogenic sources pose serious threats to the environment. Hence, trace metals are vital indicators for monitoring the change of aquatic environment. The consumption of fish has increased notably in recent decades to satisfy high protein demand. However, trace metals in fish has become an important worldwide concern, not only threat to fish but also to the human health risk.

**Objectives:** To assess the contamination of trace metals in the aquatic environment

**Results and Discussions**

**Fish species:**
- Spotted snakehead
- Stinging catfish
- Banded gourami

**Study area and methods**

Eighteen pairs of water and sediment and three species of fifty four fish samples were collected in March 2012 (winter) and September 2012 (summer).

**Analytical procedure:**
- 0.2 g sediment / 0.3 g fish / 20 ml water sample
- 5 ml 69% HNO₃ (Kanto chemical Co, Japan)
- + 2 ml 30% H₂O₂ (Wako chemical Co, Japan)
- Digestion by using microwave digestion system
- Filtration by DISMIC®-25HP PTFE (0.45 µm) syringe filter
- Metal analysis by using ICP-MS (Agilent 7700 x)

**Analytical procedure:**

**Conclusion:** This study has shown that the water and sediment of the rivers was heavily polluted with metals. As some of the selected metals exceeded the safe levels, therefore, it suggested that the water from contaminated sites should not be used without treatment. Target carcinogenic risk values were larger than the threshold risk level set by USEPA (10⁻⁶), indicating carcinogenic risks for all adult people of the study area.

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**Results and Discussions**

**Calculation of target carcinogenic risk :**

\[ TR = \frac{EFr \times ED \times FIR \times C \times CSFo}{BW \times AT} \times 10^{-6} \]

Where, \( EFr \) is the exposure frequency (365 days/year), \( ED \) is the exposure duration (70 years), \( EFr \) is the metal concentration in fish (mg/kg, fresh weight), \( BW \) is the body weight (60 kg for adult), \( AT \) is the averaging time for non-carcinogens and CSAo is the oral carcinogenic slope factor.

**Table 1. Carcinogenic risk due to fish consumption**

<table>
<thead>
<tr>
<th>Fish</th>
<th>Target Canceric Risk (TR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ni</td>
</tr>
<tr>
<td>SS</td>
<td>2.6 x 10⁻⁶</td>
</tr>
<tr>
<td>SC</td>
<td>3.7 x 10⁻⁶</td>
</tr>
<tr>
<td>BG</td>
<td>5.5 x 10⁻⁶</td>
</tr>
</tbody>
</table>

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