

Fish Scales as a Nonlethal Screening Tools for Assessing the Effects of Surface Water Contaminants in Cyprinus Carpio

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Abstract : There is an increasing need for an effective tool to estimate the risks derived from the large number of pollutants released to the environment by human activities. Typical screening procedures are highly invasive or lethal to the fish. Recent studies show that fish scales biochemically respond to a range of contaminants, including toxic metals, organic compounds, and endocrine disruptors. The present study evaluated the effects of the surface water contaminants on *Cyprinus carpio* in the Ravi River by comparing DNA extracted non-lethally from their scales to DNA extracted from the scales of fish collected from a controlled fish farm. A single, random sampling was conducted. Fish were broadly categorised into three weight categories (W1, W2 and W3). The experimental samples in the W1, W2 and W3 categories had an average DNA concentration ($\mu\text{g}/\mu\text{l}$) that was lower than the control samples. All control samples had a single DNA band; whereas the experimental samples in W1 fish had 1 to 2 bands, the experimental samples in W2 fish had two bands and the experimental samples in W3 fish had fragmentation in the form of three bands. These bands exhibit the effects of pollution on fish in the Ravi River. On the basis findings of this study, we propose that fish scales can be successfully employed as a new non-lethal tool for the evaluation of the effect of surface water contaminants.

Keywords : fish scales, *Cyprinus carpio*, heavy metals, non-invasive, DNA fragmentation

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