Ecological and Biochemical Studies on the Effect of Some Lining Materials of Water Bodies on the Nile Tilapia *Oreochromis niloticus* (Linnaeus, 1766) in Egypt

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بِسم اللهِ الرَّحمنِ الرَّحِيمِ

وعَلَّمَكَ مَا لَمْ تَكُن تَعْلَم

وَكَانَ فَضْلُ اللهِ عَلَيْكَ عَظِيماً

صَدَقَ اللهُ العَظِيم

سورة النساء " آية ١١٣"

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Approval Sheet

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Dedication

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ABSTRACT

Lining of watercourses is one of the environmental modifications that have a lot of benefits such as reducing the water seepage and save water of a good quality. The objective of the present work is to study the effect of lining water bodies on the fish *Oreochromis niloticus* on the laboratory and the field investigation. The laboratory study was conducted by maintaining the fish in different lining substrata (cement, plastic and mud) and control (without lining). On the other hand, the field investigation was carried out seasonally on lined and unlined sites in different governorates.

The laboratory results indicated that the growth performance, protein banding and the biochemical analysis of the fish were not significantly ($P>0.05$) different among the different groups. However, the field results indicated a significant ($P<0.05$) difference among the water measurements (physico-chemical parameters and heavy metals analysis) of the lined sites (slightly good case) and the unlined sites (poor water quality). This was reflected in the growth performance and the biochemical assays of the blood samples of the collected fish; as the fish samples of the lined sites were healthy, to some extent, in contrast to those of the unlined sites; which showed a significant ($P<0.05$) elevation in the blood enzymes. This was confirmed by the tissue examination of gills and liver that showed mild to severe alterations in the fish samples collected from the lined and the unlined sites, respectively.

In conclusion, lining (whatever its material) hasn`t negative impact on the fish as well as the water quality. However, the lining of

watercourses could preserve water in a good case that would correspondingly be reflected on the fish and other aquatic organisms.

Keywords: Lining, watercourses, Nile tilapia, *Oreochromis niloticus*, Growth performance, SDS-PAGE, biochemical assays, fish tissues, gills, liver, histopathological alterations.

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