Isolation, Molecular Characterization and Expression of Nitrite Reductase (*NiR*) Gene Responsible for the Absorption of Some Air Pollutants.

A Thesis Submitted to
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Abstract

Student name: **Warda Alaa Eldin Mahmoud Hashim.**

Title of thesis: **Isolation, molecular characterization and expression of nitrite reductase (*NiR*) gene responsible for the absorption of some air pollutants.**

Degree: **Master in Biotechnology/Biomolecular Chemistry**

A nitrite reductase (*NiR*) gene was isolated, cloned and sequenced from nitrate induced leaves of the Egyptian *Spinacia oleracea* seedlings. The sequence of the isolated *NiR* gene has 1788 bp open reading frame. The *NiR* sequence was submitted into GenBank under accession number MH729808. The deduced amino acid sequence is 595 a.a, it has 96% homology with predicted ferredoxin-nitrite reductase, chloroplastic (*Spinacia oleracea*) and highly conserved. Leucine was the highest amino acid percentage in the predicted NiR protein, which has a higher preference for the α-helix. RT-PCR analysis showed that the expression level of *NiR* was the highest at 2 hr of nitrate treatment. The NiR protein had high activity towards $NaNO_2$ substrate after 3 hr induction with potassium nitrate.

Keywords: nitrate treatment, Real Time-PCR, nitrite reductase (NiR) activity. Accession number MH729808.

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