



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

**A Thesis Submitted to  
Biotechnology Graduate Program**

**In Partial Fulfilment for the Requirements of the M.Sc.  
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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  $\alpha$ -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<sub>2</sub> 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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## Table of Contents

<b>CHAPTER I INTRODUCTION.</b>	1
<b>CHAPTER II REVIEW OF LITERATURE.</b>	5
2.1. Air pollution as abiotic stress.	5
2.1.1. Air pollution.	5
2.1.2. Nitrogen oxides (NO <sub>x</sub> ).	11
2.1.3. Air pollution harmful effect.	13
2.1.4. Air pollution in Egypt.	13
2.2. Spinach.	14
2.3. Nitrite reductase (NiR).	15
2.3.1. The expression of NiR.	19
<b>CHAPTER III MATERIALS AND METHODS.</b>	22
Plant material.	22
Methods.	22
3.1. Germination and treatment.	22
3.2. RNA extraction from plant material.	23
3.3. cDNA synthesis using isolated RNA.	25
3.4. Polymerase chain reaction (PCR) amplification of actin and <i>NiR</i> gene.	26
3.5. Elution of target band from the gel.	28
3.6. Cloning of the eluted fragments.	29
3.6.1. Ligation of the purified <i>NiR</i> DNA into pGEM-T Easy vector.	29
3.6.2. Preparation of competent cells.	31
3.6.3. Transformation of competent cells with ligation reaction.	32
3.6.4. Minipreps of recombinant plasmid DNA.	33
3.6.5. Restriction digestion reaction.	35
3.7. Sequencing.	35

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3.8. Real time PCR (RT-PCR).	36
3.8.1. Real time PCR (RT-PCR) using actin and <i>NiR</i> primers.	36
3.9. Protein.	37
3.9.1. Protein extraction.	37
3.9.2. Bradford method.	38
3.9.3. Enzyme bioassay.	39
3.10. Computational analysis.	41
3.10.1. Analysis of the sequenced fragment using NCBI database.	41
3.10.2. Protein sequence analysis.	41
<b>CHAPTER IV RESULTS AND DISCUSSION.</b>	<b>42</b>
4.1. RNA isolation and cDNA first strand synthesis.	42
4.2. Polymerase chain reactions (PCR).	43
4.2.2. Primer design for actin gene.	43
4.2.3. Amplification of actin.	43
4.2.4. Primer design for <i>NiR</i> gene.	43
4.2.5. Amplification of <i>NiR</i> gene.	44
4.3. Cloning and sequencing of <i>NiR</i> gene.	46
4.3.1. Cloning of eluted DNA into pGEM-T Easy vector.	46
4.3.2. Screening using restriction digestion.	46
4.3.3. Sequencing of <i>NiR</i> gene.	48
4.4. Computational analysis.	48
4.4.1. Analysis of nucleotide sequence of <i>NiR</i> gene.	48
4.4.1.1. Analysis using blastn.	48
4.4.1.2. Analysis using blastx.	54
4.4.2. Multiple sequence alignment of the deduced amino acid.	54
4.4.3. Analysis of the deduced protein sequence.	59
4.4.3.1. Primary and secondary protein structure.	59
4.4.3.2. 3D structure of NiR protein.	62
4.5. Real time PCR.	64

4.6. Enzyme bioassay.	66
4.6.1. Protein concentration determination.	66
4.6.2. NiR bioassay.	67
Conclusion.	75
<b>CHAPTER V REFERENCES.</b>	76
English Summary.	84
المخلص العربي	٢
المستخلص	١

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## List of Figures

- Figure 1:** Different pollutants passing into plants. 11
- Figure 2:** PM<sub>2.5</sub> and PM<sub>10</sub> composition (Yin, & Harrison, 2008). 12
- Figure 3:** Tropospheric NO<sub>2</sub> over the Middle East. NO<sub>2</sub> column densities in 1015 molecular/cm<sup>2</sup> observed by OMI, average over the period 2005-2014. 14
- Figure 4:** pGEM-T Easy vector circular map and sequence reference points. 30
- Figure 5:** 1% Agarose electrophoresis showing total RNA isolation from control and treated spinach plants. Where from Lane 1 is the control and Lanes 2-6 are treated spinach 1, 2, 3, 4 and 24 hrs, respectively. 42
- Figure 6:** 1.5% Agarose gel electrophoresis showing PCR using Actin primers; where lane M is 100 bp DNA markers (genedirex); lane 1 is negative control; lanes 2-7 are untreated spinach seedlings and treated spinach seedling for 1, 2, 3, 4 and 24 hrs, respectively. 43
- Figure 7:** 1.5% Agarose gel electrophoresis showing PCR using *NiR* primers. Where M is 1 Kb Marker (genedirex); lane 1 is negative control; lane 2 untreated spinach seedlings. Lanes 3-7 are treated spinach seedling for 1, 2, 3, 4 and 24 hrs, respectively. 44
- Figure 8:** 1.5% Agarose gel electrophoresis showing the gradient PCR reactions on one of the prepared cDNA using *NiR* primers where M is 1 Kb DNA Marker (genedirex); lane 1 is negative control; Lanes 2-6 are different annealing temperatures 55°C, 58°C, 60°C, 62°C & 64°C, respectively. 45
- Figure 9:** 1.5% Agarose gel showing the *NiR* gene expected band after purification. Lane 1 is the purified band & M is 1 Kb marker (genedirex). 45
- Figure 10:** 1% Agarose gel electrophoresis showing plasmid miniprep. Where M is 1 Kb marker (genedirex) and lanes 1-4 are plasmids isolated from transformed white colonies. 47

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**Figure 11:** 1.5% Agarose gel electrophoresis showing the DNA digestion of the isolated plasmids using EcoRI enzyme restriction. Where lane M is 1 Kb marker (genedirex); lanes 1-2 are undigested and digested pGEM-T easy vector respectively as negative controls and lanes 3-6 are some digested isolated plasmids. 47

**Figure 12:** (A) Nucleotide sequence of *NiR* gene (1788 bp) with GenBank accession number MH729808. (B) The deduced coded 595 amino acid residues. 49

**Figure 13:** Blastn alignment results of *NiR* sequence using NCBI. 53

**Figure 14:** Blastx alignment results of *NiR* sequence using NCBI. 56

**Figure 15:** Multiple sequence alignment of the isolated NiR amino acid sequence with nitrite reductase of several other plants including Silene (*Silene vulgaris*, AGO67239.1), Beta (*Beta vulgaris*, ADN97117.1), Chenopodium (*Chenopodium quinoa*, XP\_021754875.1), Spinacia (*Spinacia oleracea*, XP\_021866794.1), Carica (*Carica papaya*, XP\_021896718.1) and Durio (*Durio zibethinus*, XP\_022727235.1). 58

**Figure 16:** Phylogenetic tree showing the relatedness between a number of Nitrite reductase (NiR) proteins including Silene (*Silene vulgaris*, AGO67239.1), Beta (*Beta vulgaris*, ADN97117.1), Chenopodium (*Chenopodium quinoa*, XP\_021754875.1), Spinacia (*Spinacia oleracea*, XP\_021866794.1), Carica (*Carica papaya*, XP\_021896718.1) and Durio (*Durio zibethinus*, XP\_022727235.1). 59

**Figure 17:** The percent of different Amino Acid residues. 61

**Figure 18:** The secondary structure of deduced NiR protein. 61

**Figure 19:** Predicted protein structure of NiR using SWISS-MODEL program. Where: A) 3D Model of Isolated Nitrite reductase (NiR). B) Siroheme (SRM) ligand of Nitrite reductase. C) SF4 ligand of Nitrite Reductase. 62

- Figure 20:** NiR protein structure and sequence hydrophobicity, where the blue areas and residues are the least hydrophobic and red ones are the most hydrophobic using program (SWISS-MODEL). 63
- Figure 21:** Nitrite Reductase expression chart using real time-PCR reactions. It shows the fold change in the *NiR* gene expression with different treatment hours (1 hr, 2 hr, 3 hr, 4 hr, & 24 hr, respectively). 66
- Figure 22:** The standard curve of different BSA concentrations using Bradford method. 68
- Figure 23:** The standard curve for different concentration of nitrites. 71
- Figure 24:** The effect of potassium nitrate on the nitrite reductase activity. 74
- Figure 25:** The effect of potassium nitrate on the nitrite reductase specific activity. 74



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## List of Tables

<b>Table 1:</b> Air pollutants and their sources.	6
<b>Table 2:</b> Air pollutants and their environmental/climatic impacts.	7
<b>Table 3:</b> Air quality standards for different organizations.	10
<b>Table 4:</b> List of used primers and sequences.	26
<b>Table 5:</b> List of used primers in Real Time-PCR.	36
<b>Table 6:</b> Real-Time PCR results.	65
<b>Table 7:</b> The absorbance results for the different concentrations of BSA (Standard absorbance).	68
<b>Table 8:</b> The absorbance and deduced proteins' concentrations.	69
<b>Table 9:</b> The absorbance results for the different known concentrations of sodium nitrite.	70
<b>Table 10:</b> The absorbance of the remained nitrite concentrations and concentration of consumed nitrite.	72
<b>Table 11:</b> The Enzyme Activity & the Specific Enzyme Activity after the different nitrate treatments.	73