

## **Abstract**

Environmental Stress are of the most important decreasing elements of .agricultural products all around the world. Stress entails unbalance between reactive Oxygen species (ROS) and anti-oxidant defense in different parts of the plant. Unfavorable conditions such as salinity and terra firma increases reactive Oxygen species ROS during the plant's growth period. Antioxidant enzymes such as Ascorbate Peroxidase (APX), Catalase (CAT), Glutathione Reductase (GR), and Superoxide Dismutase (SOD), under tension circumstances, become activate to restrain ROS. Ascorbate peroxidase is an enzyme that plays a vital role in detoxifying Hydrogen Peroxide (H<sub>2</sub>O<sub>2</sub>). Ascorbate peroxidase can be found in Chloroplast and cytosols of plant cells. 5 APX Isoforms are recognized in plants: Cytosolic, Mitochondrial, Peroxisomal, Glyoximal and Chloroplast isoforms. Chloroplast and Cytosol APXs play important role in Antioxidants' metabolism in plant cells. In this research, the Partial sequencing of APX gene in Hirmand wheat has been investigated. 2 pairs of primer in Praxosiom region, and 3 pairs of primer in Thylakoid region of Ascorbate Peroxidase gene's cell, out of 5 pairs of designed specific primers, were used. In the end, a 724bp fragment with consolidated primer F4R5 in peroxisome region of the cell and a 720bp fragment with consolidated primer F1R2 in Thylakoid region of the cell were amplified. The produced fragments were approved by digestion with restriction enzyme *Pst*I, *Eco*RI, *Bgl*III. The proliferated fragments were sequenced and analyzed by Clustalw2, clc Workbench, and Mega5 soft wars. The proliferated fragments showed respectively 96 and 82 percent homology with sequences related to Ascorbate Peroxidase gene in Peroxisome region with accession number EF555121.1 and Thylakoid region with accession number AY513261.1.

Key words: Wheat, APX gene, PCR, Sequencing



University of Zabol  
Graduate school  
Faculty of Agriculture  
Department of Biotechnology & Plant Breeding

The Thesis Submitted for M.Sc. Degree in Biotechnology

Titel:

# **Partial sequencing of *APX* gene in Hirmand Wheat**

**Supervisors:**

Dr. B. A. Fakheri

Dr. H. Kamaladini

**Advisors:**

Dr. M. Solouki

Dr. M. Forootan

**By:**

N. Mohammadinia

December 2013