

Abstract

Fusarium Head Blight is known as one of the most important plant diseases among the world. This disease contaminate seeds with mycotoxins and cause to decrease in product quality and quantity. The main goal of the present study is to determine the produced chemotypes by the West Azarbayjan province *Fusarium culmorum* isolates with detection the *tri7* and *tri13* genes. Sampling took place during june in the crop year 2010-2011 from the farms of Urmia, Mahabad, Miandoab, Khoy, Tekab and Maku. 98 Isolates were identified as *F. culmorum* by conidial morphology and colony characteristic. To confirm visual identifications of *F. culmorum*, C51F/C51R species-specific primer pair were tested. the PCR assays results approved the results of identification based on morphological properties. To determination DON and NIV chemotypes, produced by *F. culmorum* isolates, *Tri13* and *tri7* genes were detected by primer pairs Tri13F/Tri13DONR, Tri13NIVF/Tri13NIVR, Tri7F/Tri7R and MinusTri7F/MinusTri7R. according to the PCR results, 59 isolates were introduced as DON producers and 39 isolates introduced as NIV producer. In order to survey the toxin production, 6 representative *F. culmorum* isolates were examined by high performance liquid chromatography. In all six isolates analyzed by this method toxin production was observed. According to the results, producing of the both DON and NIV chemotypes in west azarbayjan province farms has been proved and the DON chemotype was introduced as the predominant type in the reviewd farms. Molecular techniques were more accurate and rapid compared with the identification of the species by morphological characteristics and the evaluation of toxins by HPLC, also no high speciality and sophistication is needed in the use of these techniques in plant pathology. The results have shown that use of specific-specific primer pair C51F/C51R could be a proper replace for the identification of *F. culmorum* species based on morphological properties. The employment of the used primers in this study is highly suggested with respect to time consuming HPLC method and its high costs. Because of rather weak results obtaind by different methods for managing this disease during the prolong years, limiting of toxin synthesis has been considered as the best way of managing this disease. Accordingly detection of biochemical and molecular mechanisms and the factors adjusting the biosynthesis of the toxins, are being accounted as the basic condition for the becoming of this subject.

Keywords: Deoxynivalenol, Nivalenol, *Fusarium culmorum*, West Azarbayjan



University of Zabol
Graduate school
Faculty of Agriculture
Department of Plant Protection

**The Thesis Submitted for the Degree of Master of Science
(in the Field of Plant Pathology)**

**Detection of Nivalenol and
Deoxynivalenol chemotypes of wheat
Fusarium culmorum isolates in West
Azarbaijan province**

Supervisor

Dr. Mohammad salari

Advisors

Dr. S. K. Sabbagh

M. sc Saeideh sepehri kia

By

Azad Lava

October 2012