## Abstract

This research was performed to detect the genes involved in trichothecnes production in Fusarium graminearum isolates, the causal agents of wheat Fusarium Head Blight (FHB) in Golestan Province. The wheat ear samples were collected from seven cities in Golestan province including; Gorgan, Kordkuy, Bandar gaz, Gonbad kaboos, Minoodasht, Kalale and Azadshar sampling was performed in May 2010. The fungal isolates were seperated, purified, and identified using Fusarium keys. Totally, 344 isolates of *Fusarium* species belonging to nine species were isolated and identified. Among the isolates identified as FHB, F. graminearum showed the highest frequency (48.2%) compared to other species. When the isolates of F. graminearum were morphologically identified, 100 isolates were chosen using species-specific primer pairs (Fg16F/Fg16R). In these isolates, the presence of three genes: Tri13, Tri3 and Tri7 were detected by using PCR and specific primers for the genes (Tri13, Tri315, Tri303, Tri3NIV, and Tri7). With gene specific primer pairs, the four trichothecene chemotype including; NIV, DON, 3-AcDON and 15-AcDON was detected among isolates of F. graminearum. The results of PCR reaction with primers showed that all isolates tested possess the genes involved in production of trichothecene. Also in this study, two populations of 7C1 and 6A5 were identified in between F. graminearum isolates. 7C1 population (Lineage 7) was highly disribuited in different regions and the dominant chemotype in this population was NIV. Farm location and chemotype analysis of F. graminearum showed that both NIV and DON chemotypes were prevalent in investigated regions and the dominant chemotype among the isolates was NIV. The significant difference was observed between the wheat fields of Gorgan and distribution of NIV cheomtype (P < 0.05, P < 0.0001). DON chemotype was dominant in the wheat fields of Gonbad kaboos which significant difference was found between this fields and distribution of DON chemotype (P < 0.05, P < 0.0001). Trichothecene production was tested by HPLC in eight isolates of F. garminearum. The results confirmed the capability of trichothecene production in the studied isolates. Therefore, the detection of genes involved in trichothecene production using species-specific primers determine *Fusarium* isolates that produce trichothecene can alternative the chemical expensive and time procedure.

**Key words:** Trichothecene, chemotype, population structure, *Fusarium graminearum*, NIV, DON



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## Determination of Trichothecen chemotypes of *Fusarium graminearum* Isolates in Golestan Province

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