

## THE BIODIVERSITY OF NEW FUSARIA SPECIES ASSOCIATED WITH THE ROOT AND BASAL ROT DISEASE OF ONION IN ISFAHAN

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### ABSTRACT

The root and basal rot of onion, *Allium cepa* L., is an important disease of this crop, with a high losses annually. There are several *Fusarium* species reporting to be associated with root and plate rot and deterioration of onion in field and storage. worth wide. It is a persistent soil-borne organism that can also contaminate onion sets and transplants or cloves of garlic used for seed. In fact it is most likely introduced into non-contaminated fields on infested garlic cloves or onion sets. The disease tends to occur more frequently in garlic than in onions and is more often a problem on Spanish onions varieties than on yellow cooking onion varieties. In this research, the involving species were identified from infected field in Isfahan province. The infected onion plants were up rooted and studied in the laboratory based on usual methods. The results indicated, out of 127 isolates, there were ten identified species of fusarias involving the disease with various frequencies. They are *F. oxysporum*, *F. solani*, *F. acuminatum*, *F. subglutinans*, *F. graminearum*, *F. semitectum*, *F. equiseti*, *F. sambucinum*, *F. culmorum* and *F. proliferatum*, which infecting onion plants in this region. *F. culmorum*, *F. semitectum*, *F. sambucinum* and *F. graminearum* are reported for the very first time. Whereas, *F. sambucinum*, *F. equiseti*, *F. proliferatum*, *F. culmorum*, *F. subglutinans*, *F. graminearum* are reported for the first time from Iran. The identified species were sent for reconfirmation. The Pathogenicity tests were carried out for these isolates using seed and root inoculation techniques. Distribution and disease severity results indicated that *F. oxysporum* was the most prevalent species with a very high frequency, than followed by *F. solani* whereas, *F. proliferatum* was the most aggressive pathogenic species in this regards as far as pathogenicity tests are concern in Esfahan provinces in comparison to other species in this research. *Fusarium* species infecting onion, affect the health safety of agricultural workers, especially those associated with processing and store houses, as well as the consumers. Fumonisin B1, beauvericin and fusaproliferin producing strains were confirmed as products of *F. proliferatum* on garlic and white onion variety. However, the other *Fusarium* species are of interest as well. Onychomycosis is usually caused by *F. solani* and *F. oxysporum*, but Hatt reported *F. proliferatum* as a causal agent of onychomycosis for the first time. It was reported to cause suppurative thrombophlebitis in an immunocompromised patient, endophthalmitis after cataract surgery, and disseminated infection in a child with lymphoblastic leukemia. Use of bioproducts would greatly contribute to an improvement of health safety of both producers and consumers.

**Keyword:** Onion, *Fusarium*, Root rot, Isfahan, Plate rot

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