
Tetraplex Pcr Reveals *Aspergillus Welwitschiae* Incidence in Onion Bulbs.

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Resumo

Aspergillus section Nigri are widely distributed fungi in nature, as well as are often found in foods. Currently, 28 species are recognized in this section but differences between them are often subtle requiring the combination of molecular and morphological methods for their identification. Some species are known as toxin producers, including ochratoxins and fumonisins. In Brazil, *Aspergillus* seção Nigri has been found in onions, but its contribution for increasing the consumption of ochratoxins and fumonisins is unknown. We aim to examine the incidence of *Aspergillus niger* sensu stricto and *A. welwitschiae* in onion bulbs (*Allium cepa*) commercialized in Paraná State (Brazil), and determine the possible occurrence of strains harboring ochratoxin and fumonisin genes. Pieces of skins from the outer and inner side of the bulb scale as pieces of roots from 23 onion samples, collected monthly, were treated with 0.4% NaOCl for 2 min, plated in DG18 medium and incubated (25 °C for 7 days). All isolates were analyzed by means of a tetraplex polymerase chain reaction to simultaneously detect: *A. niger*/*A. welwitschiae* species, the presence of the R-oxoamine synthase (An01g06870) gene, essential for fumonisin biosynthesis, FAD-binding oxidoreductase (An15g07880) and polyketide synthase (An15g07920), both essential for ochratoxin biosynthesis. The frequency of *Aspergillus* section Nigri species in skins from the outer and inner side of the bulb scale was 37.9% and 54.1%,

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respectively; in roots the occurrence was 39.1%. Approximately 92% of the isolates belong to *A. welwitschiae* and 8% to *A. niger* and isolates varied relative to the presence of genes involved in mycotoxin biosynthesis. The gene encoding R-oxoamine synthase was found in 40% of the isolates, but only 10% were found to have FAD-binding oxidoreductase and polyketide synthase encoding genes. Concluding, *A. welwitschiae* is the most frequent species in onions and about half of the isolates have genes encoding key enzymes involved in toxin biosynthesis. The investigation on the *A. welwitschiae* ability to produce fumonisins and ochratoxin in onions is a predominant need.

Palavras-Chave: *Aspergillus*, fumonisin, ochratoxin, onion

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