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Isolation and determination of mutated characteristics of the result of irradiation by UV ray in white button mushroom (Agaricus bisporus)

Rasouli Farzad and **Mottallebiazaralireza**
University of Maraghe, Iran

Despite the long cultivation and importance of *Agaricus bisporus*, but efforts in breeding of this species are minimal. One of the major reasons for the little efforts is the life cycle. Because of the life cycle the cross cannot happen between single spores of different strains. So variation in *Agaricus bisporus* is very low and most of strains that are available in the markets are very similar. One of the ways to make variation is using mutagens like UV irradiation, we selected A15 strain that is one of the important strains in Iran. We used three methods for mutagenesis of *A. bisporus.* In the first method fragments of mycelium were plated on PDA medium and then were placed under irradiation for eight exposure periods (0, 4, 8, 16, 24, 48, 72 and 96 hours). In the second method spore suspension was exposed under UV radiation for 6 exposures (0, 60, 90, 120, 180 and 240 minutes). After irradiation each exposure 1 ml of the spore suspension was plated on PDA medium and spread on the medium by shaking of plates. Third 1 ml of sterile spore suspension was first plated on PDA medium and spread them on the medium and immediately exposed to UV radiation for 6 variable periods (0, 1, 5, 10, 20 and 40 minutes). All of the samples in three methods irradiated by UV lamp 10 W at a distance of 10 cm. In this research time required to spawn running, pin production and harvest, fruit body number, fruit body size, yield, biological efficiency (BE), antioxidant activity, activities of peroxidase, catalase, polyphenol oxidase, laccase and manganese peroxidase enzymes were evaluated. Considering the fact that our main aim in this research was making diversity in *A. bisporus,* the results showed all of the methods were successful. In all the traits that mentioned above, variation or some probable mutants were found. Results showed the most variation found in protein content and the minimum of variation was found in dry weight and ash. Above all we archived to pick out one mutated isolate in the exposure of 24 hours in first methods was different in gill morphology, the rate of spawn running and it cannot produce spores. It is the first report that one spore less isolate of *Agaricus bisporus* introduced. This study shows that mutagenesis by UV can be useful and a quick way method to make diversity and help to progress of *A. bisporus* breeding.

Farrasoli@gmail.com

In vitro survey of triazole resistance among 172 clinical isolates of Aspergillus fumigatus in Iran

Jamal Hashemi[1], **F Mohammadi**[1], **M R Velashjerdifarahani**[2], **S M Seyedmousavi**[3] and **S J Hashemi**[1]
[1]Tehran University of Medical Sciences, Iran
[2]Hamedan University of Medical Sciences, Iran
[3]Erasmus University Medical Centre, Netherlands

Background: *Aspergillus fumigatus*is a major cause of allergic syndromes, aspergilloma and life threatening invasive infections in immunocompromised hosts. To date, a wide range of mutations in *A. fumigates* have been described conferring azole-resistance, which commonly involves modifications in the *cyp51A*-gene (substitutions at codons G54, G138, P216, F219, M220, G448 and specifically codon L98 in combination with a 34-bp tandem repeat in the promoter region of the gene), the target for azole antifungals.

Aim: We investigated the prevalence of azole-resistance in clinical *A. fumigatus* isolates obtained from patients in Iran during 2010 to 2014.

Methods: 172 clinical *A. fumigatus* isolates obtained from patients underlying invasive pulmonary aspergillosis, chronic pulmonary aspergillosis, allergic bronchopulmonary aspergillosis and aspergilloma, were investigated for the antifungal activity of itraconazole, voriconazole and posaconazole using a broth microdilution test, according to EUCAST reference method. All isolates were confirmed by amplification of amplification of the tubulin gene.

Results: Of the 172 *A. fumigates* isolates tested during 2010 to 2014, 6 (3.5%) had high MIC values of itraconazole (>16 mg/L) and voriconazole (≥4 mg/L). All 6 isolates showed a multi-resistant phenotype with high MICs of ITC and VRC.

Conclusion: We report azole-resistant among clinical isolates of *Aspergillus fumigates* in Iran over the recent 5 years (2010 to 2014). Azole resistance wide-spread and emerging and international surveillance is warranted.

sjhashemi@tums.ac.ir