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Technical report

Aspergillus Niger reduction effectiveness test Using the Bioxigen air ionisation system

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your best indoor air quality

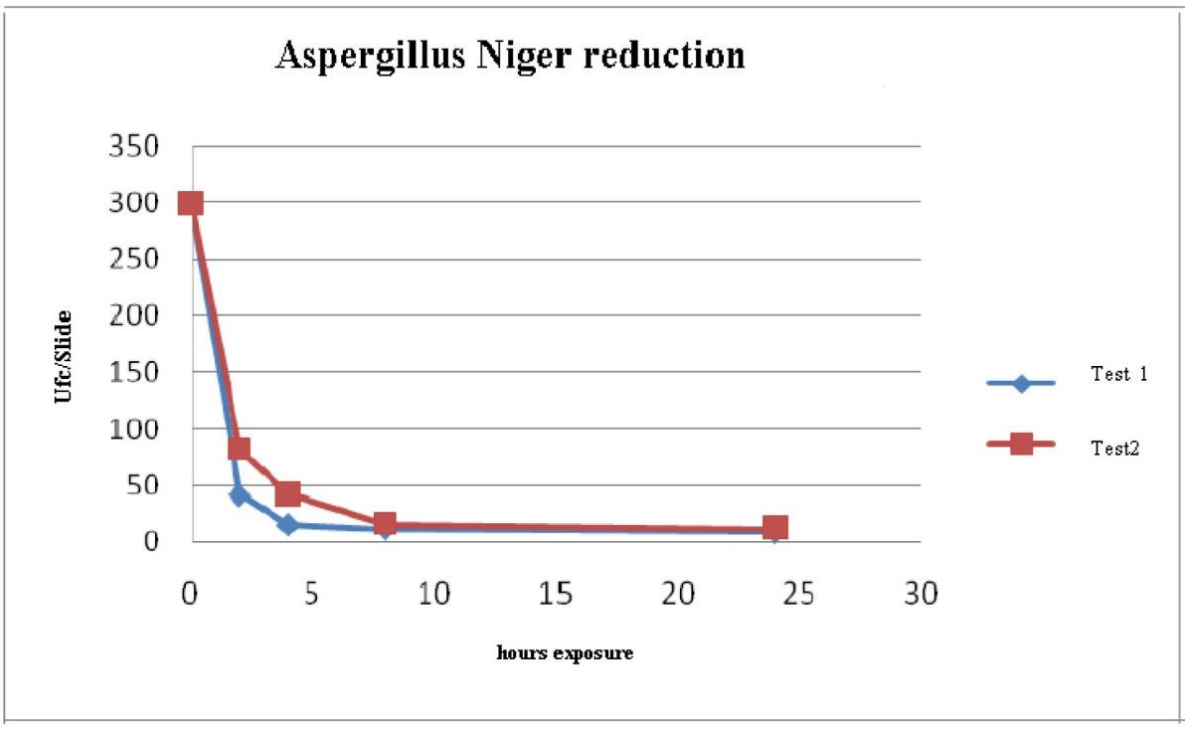
Aim
The aim of this test is to document the effectiveness of the Bioxigen air ionization system in reducing a strain of *Aspergillus Niger* (ATCC 16404).

Method
Two twin sealed boxes were prepared measuring 0,76 mc (85 x 77 x h 120 cm), each one equipped of an openable side with gaskets, to avoid accidental pollutions of the test location with *Aspergillus niger* spores and to delimit the test location only to the desired space. The strain used indeed is particularly dangerous because it produces Aflatoxins and there is a risk of human diseases if large amounts of spores are inhaled.
It has been tested the effectiveness of two different air ionizer models with Bioxigen technology; the first examination had a ionizing condenser type A (power 1,5 VA – fan 9 m3/h) and the second examination with a ionizing condenser type C (power 4,5 VA – fan 20 m3/h).
Petri slides were placed in the boxes, inoculated with known quantities of the aforesaid strain and the ionized air was applied in the boxes . The test was performed twice in double.
The soil used was Oxytetracycline – glucose yeast extract agar, incubated at 25°C for 5 days (method ISO 7954:87).
The test was carried out by exposing the Petri dishes for 2, 4, 8 and 24 hours in the two boxes and then incubated as described.
At the sample taking of the dish, the ionizing system was switched off to avoid the spread of spores in the environment; after 1 minute from the switching off, the door of the box was opened for the minimal amount just to take a sample of the dish. The box was suddendly closed and the ionizing system turned on. The turning off pause was only of 2 minutes maximum.

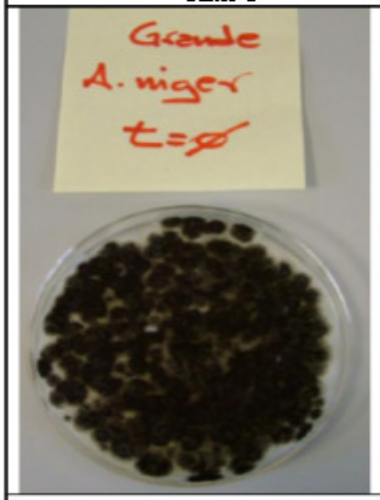
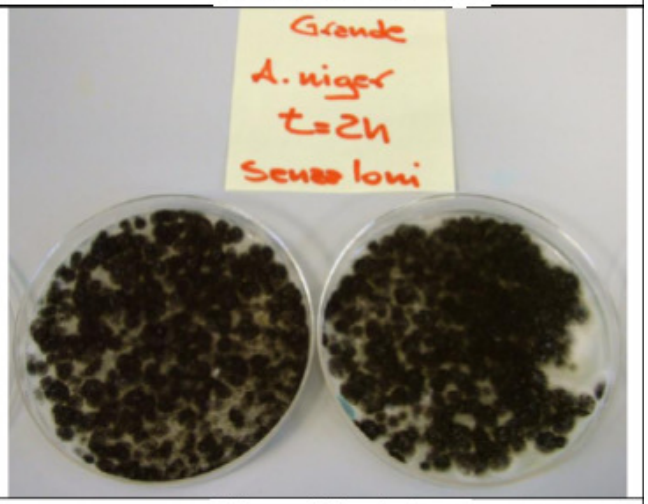
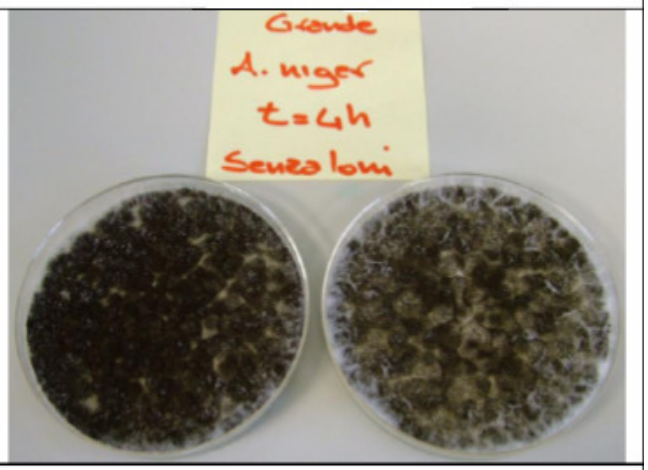
Results
The results of the ionization are clearly shown in the attached photographs with both devices adopted for the test. The table shows the average values for the two dishes expressed in CFU/dish. Both tests has similar results.

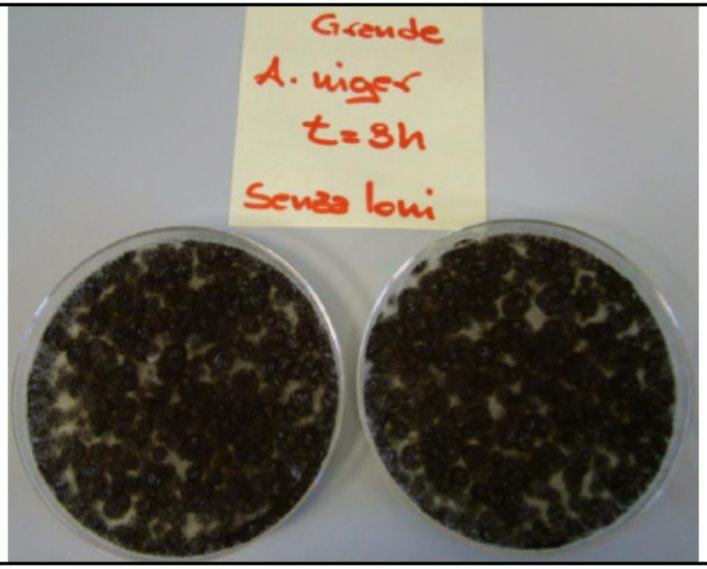
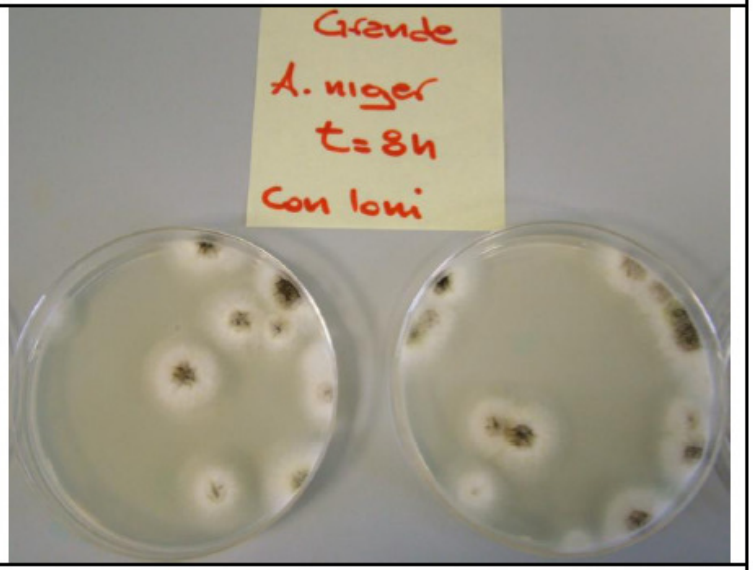
	Time 0	2 hours	4 hours	8 hours	24 hours
Test with ionizer model A (CFU/dish)	>300	82	42	16	12
Test with ionizer model C (CFU/dish)	>300	41	15	11	8

The two inoculations between the first and second test were different, and therefore also the following development had a different trend between the two tests. The negative control (without ionizer) did not highlighted any microbic reduction. It has been verify that with at least 10 air renewals/hour there is a good microbial reduction (>96%).

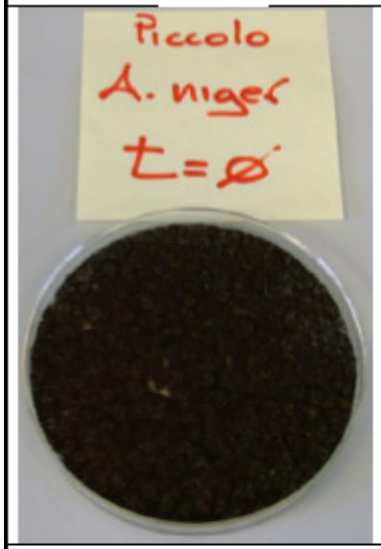
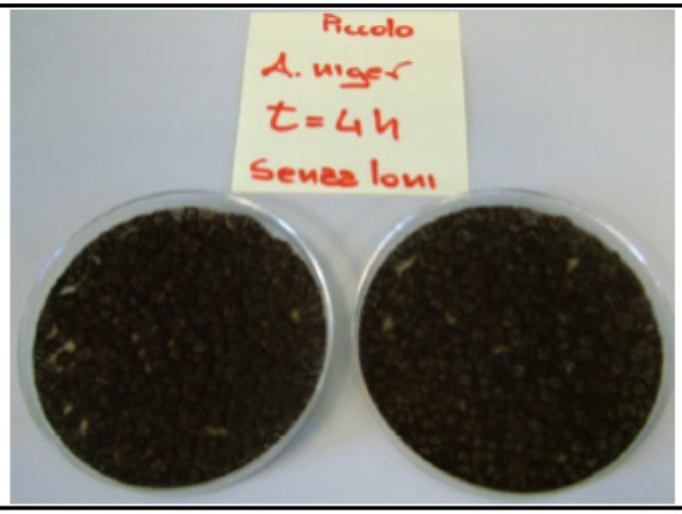
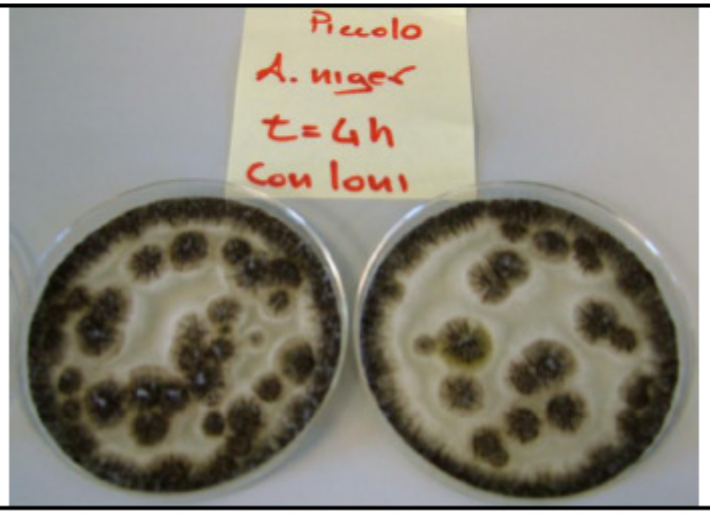


Attachment to the Reduction test using the LARGE ioniser

Time 0	2 hours without air ioniser	2 hours with air ioniser
		
	4 hours without ioniser	4 hours with air ioniser
		

	 Grande A. niger t=8h Senza loni	 Grande A. niger t=8h Con loni
	 Grande A. niger t=24h Senza loni	 Grande A. niger t=24h Con loni

Reduction test with SMALL ioniser

Time 0	2 hours without ioner	2 hours with ioner
		
		

	 Piccolo A. niger t = 8h Senza lonì	 Piccolo A. niger t = 8h Con lonì
	 Piccolo A. niger t = 24h Senza lonì	 Piccolo A. niger t = 24h Con lonì

Report "Aspergillus niger" performed by LABORATORY MICRAL accredited SINAL 0757, on the effects of Bioxigen technology

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