

Cytotoxicity testing and roridin A-ELISA of samples originating from water damaged dwelling pavilions on post-flood areas.

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Within the last few years the interest in construction materials and the microclimate of rooms infected by different fungi and contaminated with mycotoxins has rapidly grown in Poland. This is due to several floods which occurred in Poland during the last years and the possible adverse health effects which could be caused by the presence of fungi such as *Stachybotrys sp.*, *Aspergillus sp.* or *Penicillium sp.* in these particular environments.

The study was carried out with 74 dwelling pavilions placed in 1997 at a residential area on the post-flooded areas of Wrocław, Poland. After two years of living there, the lodgers were displaced due to visible high levels of fungal contamination found in these houses. Mycological investigations and analyses of mycotoxins by use of the MTT-cell culture bioassay with swine kidney target cells and a roridin A-enzyme immune assay have been carried out since 2001 in 10 selected houses. For that purpose air and bulk samples from the cardboard-gypsum walls have been taken from the kitchen, bathroom and the bedroom of each house.

Results of the mycological investigations showed that the most popular varieties of fungi found on the walls were: *Penicillium sp.* (27%), *Aspergillus sp.* (20%), *Chaetomium sp.* (10%), *Alternaria sp.* (7%), *Paecilomyces sp.* (7%) and *Stachybotrys sp.* (7%). The remaining 14% included: *Botrytis sp.*, *Byssoscladomyces sp.*, *Trichoderma sp.*, *Acremonium sp.*, *Fusarium sp.*, *Moniliella sp.* and yeasts. The average contamination of the walls were found to be $25,2 \times 10^6$ cfu/cm². Highest levels were found in kitchens ($33,4 \times 10^6$ cfu/cm²), followed by bathrooms ($24,2 \times 10^6$ cfu/cm²) and bedrooms ($18,0 \times 10^6$ cfu/cm²). Air sampling resulted in average levels of 850 cfu/m³ with highest levels found in the bathroom 1031 cfu/m³ and nearly same levels in kitchens and bedrooms (745 and 775 cfu/m³, respectively).

Different toxicities were found in 30 bulk samples originating from the problem buildings. While 33% of the gypsum boards showed no toxicity, in 67% of the samples varying degrees of cytotoxicities could be measured in the crude extracts. The samples with the highest toxicities (3%) were found to originate only from the bathrooms of the bungalows. Analyses by EIA confirmed the occurrence of macrocyclic trichothecenes in a range of <1 to 270 ng Roridin A equivalents per g of samples. The level of toxicity obtained by the MTT-bioassay in samples contaminated with or without *Stachybotrys chartarum* was found to correlate on an excellent way with the amount of macrocyclic trichothecenes detected by use of the EIA and thus underlay the usefulness of these methods for exposure assessment in problem buildings.

The results of the study altogether demonstrate the possible health risk for people living in water damaged houses such as these from the Wrocław area and which could be caused by highly toxic strains of *S. chartarum*.