Changing mycobiota of buildings

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Changing mycobiota of buildings

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Fungi and problematic substances
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LANDSBYGGEFONDEN
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Introduction

- Every natural habitat has its own mycobiota - and so do our homes
- Research has shown that water-damaged, traditional building materials have their own mycobiota (Table 1)
- The material type and moisture content determine its mycobiota
- The green transition has introduced alternative materials
- Alternative, biogenic materials may harbour other fungal species

1. Fungi on Traditional Materials

Materials [1-5]	Fungi
Gypsum wallboard	*Alternaria chartarum*
	Aspergillus versicolor
	Chaetomium globosum
	Cladosporium halotolerans
	Cladosporium sphaerospermum
	Penicillium chrysogenum
	Sarocladium strictum
	Stachybotrys chartarum
Wallpapered surfaces	*Alternaria alternariae*
	Aspergillus versicolor
	Cladosporium sphaerospermum
	Penicillium chrysogenum
	Sarocladium strictum
	Stachybotrys chartarum
Plastered surfaces	*Aspergillus versicolor*
	Cladosporium sphaerospermum
	Paecilomyces variotii
	Penicillium chrysogenum
	Sporothrix schenckii
	Wallemia sebi
Mineral insulation	*Aspergillus versicolor*
	Cladosporium langeronii
	Penicillium chrysogenum
Painted surfaces	*Aspergillus versicolor*
	Cladosporium sphaerospermum
	Penicillium chrysogenum
	Wallemia sebi

Results

- New species are emerging from traditional building materials, which can also be detected in floor dust (Table 2)
- New species with allergenic and toxic potential can be found in alternative building materials (Table 3)
- The use of traditional and alternative materials may lead to cross-contamination in water-damaged building constructions

Eelgrass & Hay

2. Emerging Fungi on Traditional Materials

Materials [2,6]	Fungi
Brick with paint	*Acremonium charticola*
(growth)	*Akanthomyces lecanii**
	Aspergillus canadensis
	*Debaryomyces hansenii**
	Niesslia tenuis
	Penicillium roseopurpureum
	Verrucocladosporium dirinae
Gypsum wallboard	*Aspergillus hiratsukae*
(growth)	*Gibellulopsis nigrescens**
	*Tausonia pullulans**
	*Wallemia muriae**
Floor dust*	*Akanthomyces spp.*
(as spores)	*Debaryomyces hansenii*
	Gibellulopsis nigrescens
	Tausonia pullulans
	Wallemia muriae

Materials and Methods

- Literature survey
- Field and laboratory sampling
- Tape preparations, culture-based & DNA identification methods

3. Potential Fungi on Alternative Materials

Materials [7-9]	Fungi
Hay	*Aspergillus fumigatus*
Grasses and other	*Aspergillus glaucus*
herbaceous plants	*Chaetomium globosum*
	Harzia acremonioides
	Sordaria fimicola
	Wallemia sebi
Hemp	*Alternaria alternata*
Cannabis sativa	*Beauveria bassiana*
	Botrytis cinerea
	Chaetomium globosum
	Cladosporium westerdijkiae
	Penicillium olsonii
	Penicillium roqueforti
	Penicillium simplicissimum
	Penicillium spathulatum
	Penicillium copticola
Eelgrass	*Chaetomium* -like fungus (Figure)
Zostera marina	*Cladosporium sphaerospermum*
	Penicillium antarcticum
	Penicillium atrovenetum
	Penicillium coprobium

Conclusions

- Need for further research in the production of allergens and toxins in the building construction
- The new, emerging species need to be surveyed and characterised
- Evaluation of the existing sampling strategies and analytical methods and ensuring they can cover the emerging mycobiota
- New sampling strategies and detection methods need to be developed for moisture- or water-damaged buildings and materials

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