Schneider, G., Kolk, A., Maskus, M., Otte, Y. and P. Wattrodt [1)]

BIA
Berufsgenossenschaftliches Institut für Arbeitsschutz

Sampling of bioaerosols in occupational environments

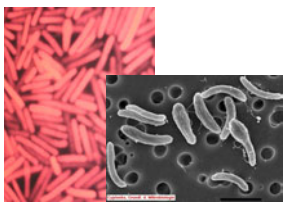
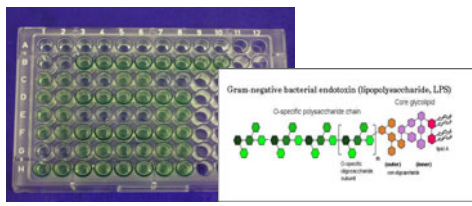
Background

Bioaerosols
...are found in many sectors. They include bacteria, fungi (yeasts and moulds), their decomposition and metabolic products and viruses.

The BIA
... is an institute for research and testing of the German Berufsgenossenschaften (BG), the institutions for statutory accident insurance and prevention.

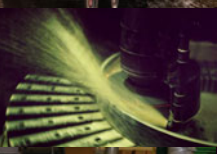
Our scope
... support the BG and their members in biological questions
... sampling and analysing of biological agents
... development and standardisation of sampling and analysing methods



Occurance of bioaerosols






- Building and construction industry: organic materials like soil, clay, straw etc.
- Farming and animal houses: plant materials (hay, straw, etc.); substances of animal origin (wool, hair, etc.)
- Food production and storage, bakeries (cheese, yoghurt, salami, beer, wine)
- Waste and compost management, sewage plants
- Textile industry: cotton, silk, flax, wool etc.
- Workplaces equipped with air conditioning systems with humidifiers
- Metal processing industry (metal working fluids)
- Archives, museums, libraries
- Indoor working areas with water damages

Sampling methods

All methods are based on cultivation of the sampled microorganisms on agar plates except the endotoxin-test.

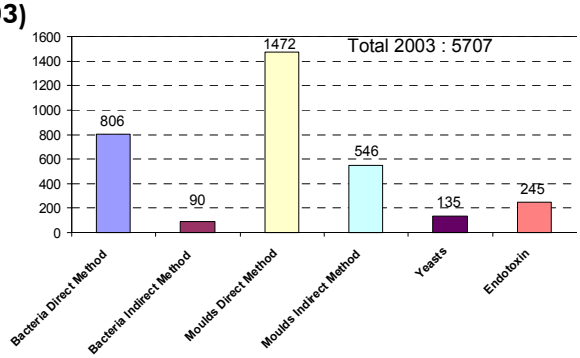


Filtration
... on membrane-filters with the GSP-System (BIA). Standardised sampling method for airborne fungi (BIA-Arbeitsmappe, no. 9420).

- Impaction
... on agar-plates through a single stage sieve sampler MAS (Merck). Easy and exact method for lower bioaerosol-concentrations (e.g. indoor-environments).

- Impingement
... collection in a liquid body, suitable for a wide range of concentrations. Allows sampling of sensitive viable cells. The diluted suspension can be spread onto different media. Standard: AGI-30 (Ace-Glass)

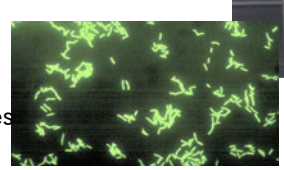
Number of biological agents analysed in BIA (2003)



Developing of new methods

Sampling by impingement
Adapted impinger according to EN 481 based on the AGI-30 with modified inlet.

Analysing by FISH
Fluorescence-based detection of bacterial cells and fungal spores on membrane filters



Address
1) Berufsgenossenschaftliches Institut für Arbeitsschutz (BIA) / BG-Institute for Occupational Safety and Health, F 2.4. Biologische Arbeitsstoffe / Department 2.4 Biological agents, Alte Heerstraße 111, D-53754 Sankt Augustin, Kontakt: BIOLOGIE@hvbg.de