Short report

Causes of mould attack on organs in Mitteldeutschland (OSCHI)

Initial point

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Subject of the project

Initial point of the project has been the observation of increased mould attack on organs during the past twenty years. The project applied by Evangelische Kirche Mitteldeutschlands (EKM, i.e. Lutheran Church in Thuringia, Saxony-Anhalt and parts of Brandenburg) was started in autumn 2014 and finished in February of 2018.
The congregations as owners of the instruments, also the cantors, the building administrations of the churches and many organ builders are concerned about mold related health risks and decay affecting the historic and modern organs.
The project followed an interdisciplinary approach. Experts for organbuilding, microbiology, materials, climate and conservation worked together in order to find out about the causes of the increasing issue of mould attack.

To gain a solid data basis first of all an online questionnaire was arranged which provided data for 400 objects concerning for example the construction type of the organs and the church buildings where they are situated. Informations about the history of conservation measures, about heating, the habit of use, characteristics of the environment and many more were collected and evaluated.
The fact, that some results of the statistics seemed to be contradictory, confirmed the hypothesis that different factors interfere with each other.
Nearly 50 objects were visited and finally 19 model cases were investigated more intensely. First the mould fungi were identified and their activity tested. In comparison ome organs without mould attack were investigated, too.

Further tests were carried out on-site and in the laboratory focussing on individual climatic conditions, probably existing coatings on surfaces of the instrument or in the room interior which influenced the increase of mould growth.
Research concerning emission and components in the air as well as research mentioning the instruments history of former preservation treatments provided more evidence and allowed to render the problem more precisely. On-site isolated mould fungi were cultivated under different conditions in the laboratory. Finally the requirements of different mould fungi which are active and mainly involved in the mould attacks have been identified. Longterm-measurements and fog tests helped to understand the climatic conditions in the church rooms. Often the organs seem to act like a dehumidifier.for the church interior.

Conclusion

The aim of the project has been achieved. Causes of the increasing mould attack on organs have been identified. Based on research the requirements of the involved mould species have been identified. The project succeeded in describing the crucial interaction between climate, microbes and changes in air quality. Possibilities of intervention which were identified during the project shall be tested in a second project.
Health threats caused by the identified mould fungi turned out not to become a serious problem.

Keydata

Short title: OSCHI

Researchers:
Insa Christiane Hennen (Bauforschung – Denkmalpflege, Wittenberg: researches, coordination), Uwe Kalisch (IDK Halle: climatic impacts), Henning Kersten (IDK Halle: computing, geology), Jens Klocke (Dipl. Restaurator, Hildesheim: preservation/materials), Thomas Löther (IDK Dresden: climatic impacts), Karin Petersen (INTOX GmbH Jever: mikrobiology) und Christoph Zimmermann (EKM: organ building/project administration)

Budget: 246.9864,36€

Part of Federal Republic of Germany: 74.478,98€

Term: 40 months (36 months plus 4)

Pictures:

Bild 1: Schimmelbefall an den Holzpfeifen einer Orgel.jpg

Bildunterschrift: Schimmelbefall an den Holzpfeifen einer Orgel, Foto: Christoph Zimmermann
Mould on the wooden pipes of an organ, picture: Christoph Zimmermann

Bild 2: Schimmelbefall am Spieltisch einer Orgel.jpg

Bildunterschrift: Schimmelbefall am Spieltisch einer Orgel, Foto: Jens Klocke

Mould growing on the keyboard of an organ, picture: Jens Klocke

Bild 3: Schimmelbefall an einer Holzpfeife einer Orgel.jpg

Bildunterschrift: Schimmelbefall an einer Holzpfeife einer Orgel, Foto: Jens Klocke

Mould on a wooden pipe of an organ, picture: Jens Klocke

Bild 4: Schimmelbefall am Gehäuse einer Orgel.jpg

Bildunterschrift: Schimmelbefall am Gehäuse einer Orgel, Foto: Christoph Zimmermann

Mould on the body of an organ, picture: Christoph Zimmermann

Bild 5: Anzuchtversuche Nährböden mit Schimmelkulturen

Bildunterschrift: Anzuchtversuche im Labor: Nährböden mit Schimmelkulturen, Foto: Jens Klocke

Laboratory tests: nutrient media with cultures of mould fungi, picture: Jens Klocke

Bild 6: Schimmelbefall an einem Orgelgehäuse UV Licht

Bildunterschrift: Im UV-Licht sichtbarer Schimmelbefall an einem Orgelgehäuse, Foto: Jens Klocke

Mould induced fluorescent spots visible in UV radiation, picture: Jens Klocke