

## RESEARCH OF MOULD CONTAMINATION ON WOODEN SURFACES OF HISTORICAL MONUMENTS WITH MODERN DEVICES

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*Moisture conditions. The difference between fragments taken from contaminated surfaces can be partially caused by the differences in the material moisture conditions. As was shown in the experiments comparing fungal growth on agar and ceiling tiles, the moisture from agar can penetrate the thick layer of fungi and thus can increase the adhesion forces and reduce the release of fungal propagules. It should also be noted that the adhesion forces are higher for fungal fragments than for fungal spores due to the smaller size of the fragments.*

**Introduction.** One of the important problems facing the architects was the problem of earthquake resistance of the structures being built. Azerbaijani masters paid serious attention to the issues of seismic resistance, the resolution of which often led to a change in the conceived architectural and planning composition.

The builders, knowing the destructive effect of the earthquake, first of all paid attention to the choice of building materials corresponding to the spatial-compositional system, the total weight of the structure, and its distribution in different parts of the building. Elastic building materials and structures are one of the most effective anti-seismic factors.

As anti-seismic measures, along with an increase in the thickness of the wall, wooden anti-seismic belts made of archan (*Juniperus L. juniper*) were inserted into every 4-5 rows of masonry.

The state of the palace, taking into account the strong seismicity of the area, testifies to the wise constructive correspondence between the mass of brickwork and the wooden frame of the building, found by the folk craftsmen-builders [1].

The quality of protective measures should be systematically controlled. Quality assessment is carried out taking into account:

- completeness and thoroughness of cleaning of structures from fungi, beetles and debris, as well as disinfection of opened parts of structures;
- the quality of chemical processing of wood (depth of antiseptic penetration into wood, lack of passes, processing of ends and cuts), the name and consumption of antiseptics;
- disposal quality of the used materials;
- moisture content of structures;
- the quality of the backfill of the floors.

Weatherproof coatings are used to protect outdoor wooden elements of buildings and structures, as well as to protect wooden structures used in conditions of high air humidity (above 61%). These coatings are good to resist the action of moisture, sunlight, sharp temperature fluctuations, weathering, etc. Various organochlorine compounds are introduced into them as binders; phosphoric acid esters and halogenated mineral oils - as plasticizers. Minerals with low thermal conductivity (asbestos, vermiculite) or salts (carbonates, borates), have the properties of fire retardants. [2].

The transition towards a digital society pushes the wood industry to apply smart and robust methods for material properties evaluation.

Ten Side-boards (the flat-sawn sapwood part of the log) of Scots pine were single stacked on stickers and naturally dried indoors at 20°C during 30 days to average moisture content (MC) of 4.6%. Another ten side-boards were dried in a small-scale laboratory air-circulation kiln. The boards were then double-stacked with the bark-side surfaces (the surface of the boards oriented to the bark-side of the tree) in each pair oriented outwards in order to get a high flow of moisture from the inner part of the boards towards the bark-side surfaces. In this way, extractives could migrate with the water transport during drying and accumulate on the wood surfaces. The total drying time was 44 hours of which 1.7 hours was a heating regime, and the cycle ended with a 5-hour cooling regime giving a final moisture content of 14%. No conditioning regime was applied in order to prevent the influence of re-distribution of extractives after drying.

A microNIR OnSite Spectrometer (VIAVI Solutions Inc., San Jose, CA, USA) with NIR wavelengths from 908 to 1676 nm with step 6 nm was used (Figure 1) was used for samples evaluation. The assessment classes were: *No mold/Mold, Drying type, Plaining depth, and NIR wavelengths* [3].



Figure 1. – MicroNIR portable spectrometer

**Results and Discussion.** The exploratory PCA model was initially built using the data obtained from air and kiln-dried samples containing no mould, and the same samples after mould test for discovering the grouping pattern. The drying type and planing depth were not efficient for classification of the spectroscopic data.

#### REFERENCES

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