ICM / PazLab Biocide Decontamination Study – intermediate Results

In the course of the various trials, it was possible to show the extent to which the various biocidal active substances can be deposited in the different types of wood.

During the first test, six different types of wood (birch, Douglas fir, oak, spruce, pine and larch) were coated with different biocidal substances. Subsequently, the test wood samples were decontaminated at a temperature of 55°C and a relative humidity of 55% for 24, 48 or 72 hours in the climate test chamber. Measurements were made by using both p-XRF and GC/MS.

The best decontamination results were found for lindane or wood preservatives containing lindane. Active substances containing DDT or PCP also showed relatively good depletion rates.

With regard to the impregnation of the test cubes with the wood preservative Impra Hgf (test II), good to very good depletion rates were found for lindane and tetrachlorophenol in the Douglas fir, spruce and pine. In birch and oak, the active substances were only moderately depleted. In contrast, only low depletion rates were determined in larch wood.

With regard to the surface measurements using p-XRF, the best depletion rate was found for in pine wood. A very low depletion rate in birch wood. For the wood samples made of larch and spruce, which have a high natural salt load, a surface enrichment of the measured values for chlorine was detected after the 24-hour treatment cycle. A summary of the effectiveness of the second decontamination test on the different types of wood is shown in Table 2.

Table 2: Documentation of the results of the second decontamination test with regard to the different types of wood:

	Impra Hgf			
	PCP	Lindane	Tertachlorophenol	Chlorine
Birch	+	+	+	+
Douglas fir	+	++	++	+
Oak	+	++	++	++
Spruce	++	++	+++	-
Scots pine	+	+++	+++	+++
Larch	-	+	+	-

+ Depletion rate< 50%,
++ Depletion rate <75%,
+++ Depletion rate > 75%;
- Enrichment

Another test group of objects consisted of historic samples which had been contaminated decades ago. The best depletion rates in these sample samples were found for lindane. PCP was sufficiently well depleted during the 24-hour decontamination test. The depletion rates for tetrachlorophenol and DDT were between 19 and 40%.

Further material and object groups (among them paper, leather, feathers, herbaria, textiles) and treatment protocols are being researched; results will be published in due time.

The further development of this already long-established method of pest control is another important milestone both for IPM in general and for the occupational health and safety of people working in museums, who come into direct contact with contaminated objects in the course of their activities.