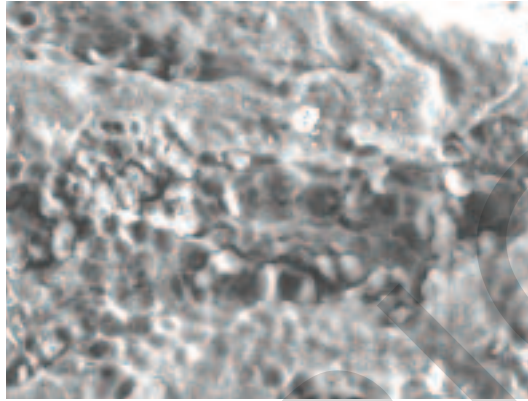




Small moulds can cause big problems

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Panel 7: Footprint of fungal spores on contaminated wet blue after dyeing. (Magnification x4000)

A significant cause of loss in value in leather processing is due to fungal or bacterial growth, and even biocidal agents fail in certain cases. These small microorganisms are not visible to the naked eye, and are normally only identified when the defect reaches a certain level.

In particular, irregular, green stains randomly spread on the grain of wet blue can sometimes be observed, as shown below in *Panel 1*, and it is easy to suspect chrome sedimentation as the reason for this defect. However, these areas remain as light patches after dyeing as shown on *Panel 2*. If the problem was due to chrome contamination it would be expected that the dyeing would be more intense.

Samples taken from these wet blue leathers when scanned under a scanning electron microscope reveal that this defect is caused by fungal damage. Examples are shown in *Panel 3* and *Panel 4*.

Due to their hygroscopic structure, these fungi lose their

water content and are flattened as the wet blue leather loses its moisture. In turn, when these leathers are dyed, the dye uptake is hampered on the sections where the conidia are located, but the light-coloured sections may also be formed as these layers of spores tear off from the grain structure. Examples of these lightly coloured sections are shown as *Panels 5* and *6*, and the footprint of fungal spores is shown in *Panel 7* (above).

Samples taken from affected areas of these wet blue and dyed leathers when incubated in malt extract agar (MEA) at 27°C (to identify the fungal growth) and in plate count agar (PCA) at 37°C (to identify bacterial growth) reveal the presence of bacterial and fungal growth. This is shown in *Panels 8* and *9*: bacterial growth was not detected in this example, but fungus was identified as *Penicillium sp.* ☺

Acknowledgements

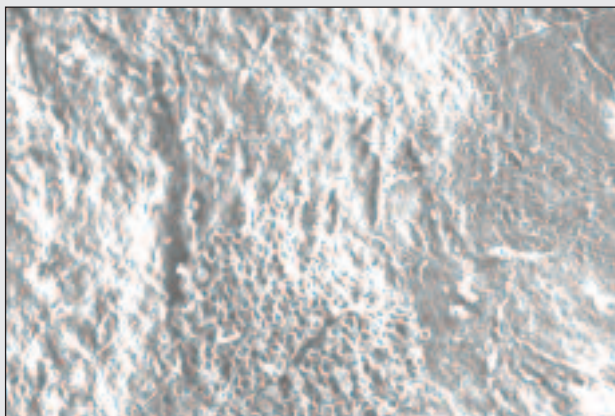
Prof. Dr. Gülay Turhan and Prof. Dr. İsmail Karaboz



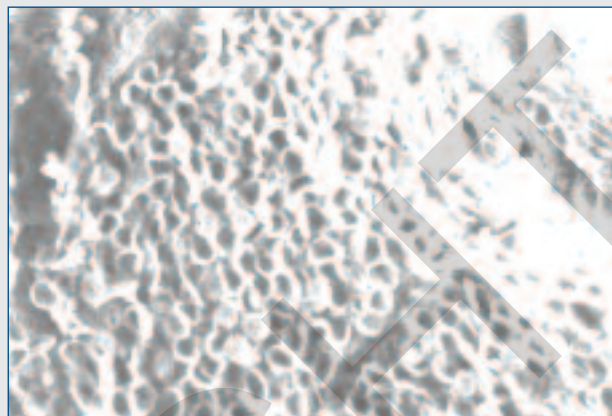
Panel 1: Chrome tanned leather showing green contamination.



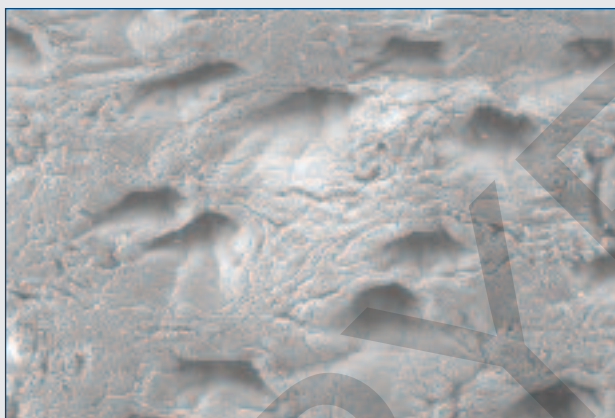
Panel 2: The contaminated chrome tanned leather after dyeing.



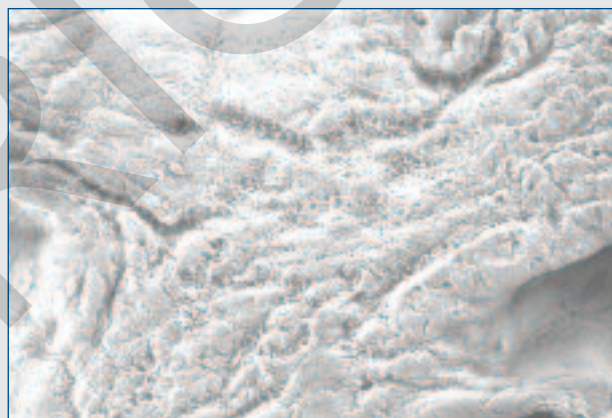
Panel 3: Fungal spores identified on sample of wet blue leather (Magnification: x1500).



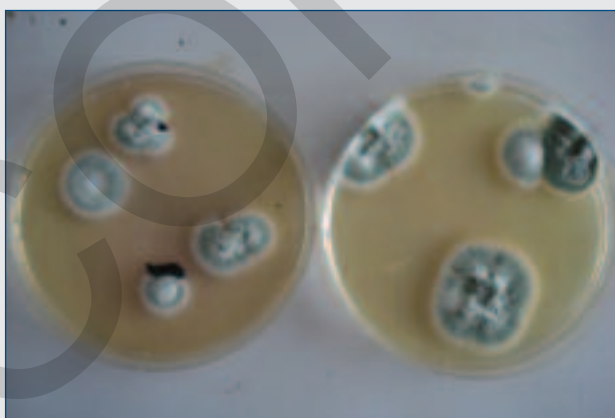
Panel 4: Fungal spores identified on sample of wet blue leather (Magnification: x4000).



Panel 5: Light coloured sections observed on contaminated wet blue after dyeing.



Panel 6: Light coloured sections observed on contaminated wet blue after dyeing.



Panel 8: Fungal growth from contaminated wet blue and black dyed leather. Moulds grown on MEA after six day incubation at 27°C. Wet blue and dyed samples left and right Petri dishes respectively.

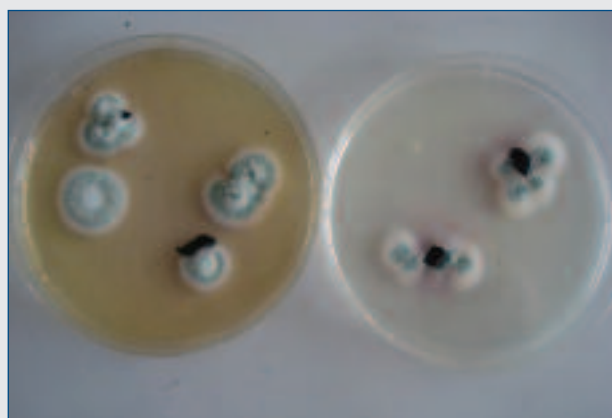


Figure 9: Fungal growth from contaminated dyed leather. Moulds grown from dyed leather samples. Six day incubation in MEA at 27°C (left) and PCA at 37°C (right)