

New method cleans up textile industry's most dangerous chemicals

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Textile dying is one of the most environmentally hazardous aspects of the textile industry. During dying, harmful chemicals that are difficult to break down are released, all too often into rivers and agricultural land. However, Maria Jonstrup, a doctoral student in Biotechnology at Lund University, has developed a new, environmentally friendly purification process which leaves only clean water. The findings are presented in Maria Jonstrup's thesis.

The research is so far only research, and has therefore only been tested in the laboratory, but Maria Jonstrup is optimistic about its future potential.

"In the long term it should be possible for textile factories in India, China and Bangladesh to use the technique. If it works on a laboratory scale it is quite likely that it will also work in a real-life situation", she says.

While working on her thesis, she has conducted experiments with both fungal enzymes and bacteria from the drains at textile industry and municipal wastewater treatment plants. However, it was only when she combined two different types of purification process, one biological and one chemical, that the breakthrough came.

"First, [microorganisms](#) break down the [dyes](#) in a [reactor](#). This biological step is the most important. However, to be certain that the water is completely purified, I also use some chemicals. Small amounts of iron

and [hydrogen peroxide](#) in combination with UV light break down even the most difficult structures", she explains.

A combination of both biological and chemical purification is already used in some places, but these methods are rarely effective, which means that large quantities of [hazardous chemicals](#) are released.

Soon, two Master's students will be taking over the baton. They will spend a year testing the technique in larger volumes of water, which more closely reflect the conditions in real textile factories. Their challenge will be to study how the UV light in the chemical stage could be replaced with normal sunlight. Maria Jonstrup will be their supervisor. After that it is hoped that the technique will be tested 'live', in a real factory.

"Through contacts with the Swedish clothing company Indiska Magasinet and their suppliers, we have already taken samples and performed tests at a factory in India. Because clothing manufacture has received quite a bad reputation over recent years, it can otherwise be quite difficult to gain access to the factories", she explains.

One obstacle on the path to implementation is legislation. The law only stipulates that the water is to be clean. This has made it legally permissible to filter out large amounts of environmentally hazardous mud and dump it on [agricultural land](#) and elsewhere – since the water itself is clean!

"But sometimes factories don't bother to clean the water at all and only do it when the inspectors come round", she says.

Provided by Lund University

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