

# Eco-treatment for wool muncher?

A simple nano-scale silicon-based product may be able to replace traditional permethrin treatments for moth-proofing wool garments, if new research from Germany can be replicated in on-going trials.

Speaking to *Ecotextile News* in Frankfurt last month, Friedrich Baur managing director of Baur Vliesstoffe, which supplies a range of wool-based textiles says the new 'nano-modified' silicon ingredient has already been successfully used in commercial wool-based building insulation to deter moths from laying their eggs and eating their way through the material.

"We found this out by accident," Baur told us at last month's Heimtextil Interior fabrics show in Germany. "We were testing the new active ingredient for its effectiveness in terms of a fire-retardant performance and as a potential new alternative to bromine-based chemical treatment."

Tests showed the product did work well combined with wool – which is also a natural flame retardant – but stringent regulations on wood-based houses also require application of additional fire suppressants. "The scientists who we worked with said this type of molecule could also be used to repel insects. I asked out loud if it could possibly repel moths ... and they said it could!"

The larvae of the common clothing moth (*Tineola bisselliella*) is well known with many people who own wool suits. Stashed away in wardrobes, often untouched for months and in some cases years, these moths see wool suits as a nutritional place to lay their eggs; and the voracious offspring can chew big holes through a favourite and probably expensive piece of wool clothing.

Historically, camphor laced moth-balls used to keep this common clothing pest at

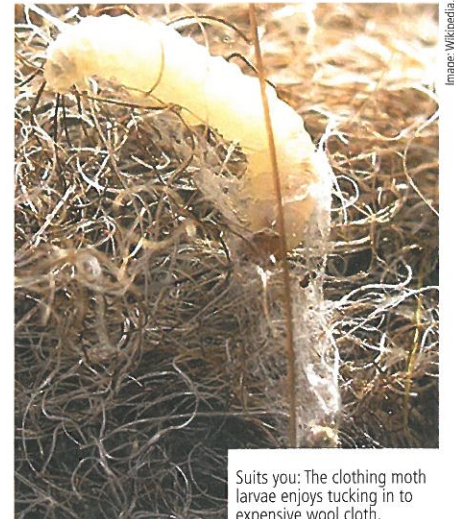
bay but more recently, wool textiles have been treated with permethrin to repel moths, but this is coming under increasing scrutiny from brands and this chemical finds itself on the RSL of many leading retailers and top brands.

Permethrin is a synthetic pyrethroid, and as such has low mammalian toxicity but it is very toxic to fish and aquatic invertebrates. Used as a pesticide it has come under scrutiny and control in Europe and some other markets. It is covered under the European IPPC regulations and as a consequence, it has effectively been banned as a residue on scoured wool likely to be processed in Europe – the issue being that in all subsequent processing there is a good chance that residue will be released to water.

Nevertheless it is still in very widespread use, from dermatological preparations to common household insecticides and textiles treatments.

## Testing

So far, Baur says that tests have been encouraging on wool nonwovens materials used in insulation for the construction sector, "and we think we can apply this to wool clothing and interior textiles," he said. First of all though, the company needs to finish testing the product which will not be done quickly. "The problem for us is one of time," he told *Ecotextile News*. "Our test methods are dictated by the life-cycle of the insect which can take around 6 - 9 months to complete. This means there are only roughly four on-going testing studies per year."



Suits you: The clothing moth larvae enjoys tucking in to expensive wool cloth.

Baur says the company has perfected a technique to apply the silica finish to textiles but admits that at this stage the researchers still need to clarify its durability. "The efficacy of the product is not in doubt," he claimed, "but we need to ensure that this finish is durable. At the moment it can be used on wool insulation which never goes through a wash-cycle. If we can do this, then our treatment certainly has good environmental credentials, unlike permethrin."

However, if the product is to be marketed as a nano-scale product then there will also need to be additional testing and safety checks before any product launch.

The mode of action of the silica differs from permethrin-based wool treatments. It does not kill the moth larvae when treated fabric is ingested, but deters the moth from laying its eggs on the textile in the first place. At this stage, the company declined to say exactly how this is achieved.

Baur is not new to working with leading apparel brands on innovative new textile fibre projects. Most recently it has been experimenting with wool fillings for sportswear in particular for outdoor jackets with brands such as Germany's Ortovox and Sweden's Mover. Bauer has also helped to source and develop a very lightweight 60 gram nonwoven camel hair and Ingeo nonwoven insulation layer that is sandwiched between a Schoeller shell fabric and liner. "It uses 8% Ingeo PLA fibre which is fully renewable and helps to bind the camel hair together so the whole thing can be safely washed at 60°C," he concluded. ■