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Dec 25, 2004

Sun block from a spider?

NUS professor and student hope to harness jumping spider's UV-reflecting abilities

By Natalie Soh

ASSISTANT Professor Li Daiqin's lab - with its hundreds of spiders - would send shivers up many people's spines, but his collection of striped, spotted and furry bodies might just yield some surprising scientific discoveries.

SPIDERMAN OF NUS



-- JOYCE FANG

ASSISTANT professor Li Daiqin (above, right), nicknamed Spiderman at NUS, and PhD student Matthew Lim have their eye on the *Cosmophasis umbratica* or jumping spider to figure out the exact compounds or structures within the creature that can scatter ultraviolet light, so as to make the perfect sun block. They're also hoping to isolate the gene that enables spiders to spin their webs to make super-strong silk fibres. Spider silk is elastic and 10 times stronger than conventional silk.



Prof Li, affectionately nicknamed Spiderman at the National University of Singapore, keeps hundreds of spiders in transparent tanks at his Department of Biological Sciences lab - from speck-size babies to giants as large as an outspread hand.

He has 15 different varieties in all, from countries like Singapore, Malaysia, Australia and China.

But one particular family - called Salticidae, or jumping spiders - is a subject of keen interest, as Prof Li and PhD student Matthew Lim hope they can harness the creatures' unique abilities to create an all-natural super sun block.

Jumping spiders have extremely good eyesight. Unlike humans, they can see the full spectrum of light, from infra-red to ultraviolet.

Not only can they see UV light, they can reflect it too.

Apparently, tiny scales on the bodies of mature male jumping spiders actually reflect UV light. In this way, the spiders are able to tell who is male and who is

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The jumping spider (above) has extremely good eyesight. It can see the full spectrum of light, from infra-red to ultraviolet. Not only can it see UV light, it can reflect it too, by means of tiny scales on its body. This is true of the male species, which uses UV to communicate in very specific ways. That's also how spiders can tell who is male and who is female.

female.

Prof Li and Mr Lim have shown that the male *Cosmophasis umbratica* actually becomes agitated and tries to fight its own reflection when shown a mirror.

But if the UV light is filtered out, the male becomes coy and

loving, and tries to induce its reflection into mating.

This is proof that the males use UV to communicate, and in very specific ways.

And if the two scientists can one day find out the exact compounds or structures that can reflect or scatter this ultraviolet light, they could perhaps unlock the key to making the perfect sun block.

That's not the only project Prof Li is working on. He is also attempting to isolate the gene that enables spiders to spin their webs.

By isolating this gene and placing it into silkworms, they may then be able to produce super-strength silk fibres.

Spider silk is comparatively as strong as steel. It is elastic and 10 times stronger than conventional silk. One piece as thick as a pencil could pull a Boeing 747.

However, it is impossible to mass-breed spiders for silk since they are all predators and would kill each other if kept together.

Prof Li, who has been working with and researching spiders for more than 15 years, happily admits that he is fascinated by the leggy creatures - an interest he developed as a young boy in China.

'We used to stick spider webs on top of a bamboo pole, and use the contraption to catch cicadas!' he said.

Now, he enjoys watching spiders, which he claims look like cats when they stalk their prey.

And yes, he even says they look as contented as felines while they munch on their flies.

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