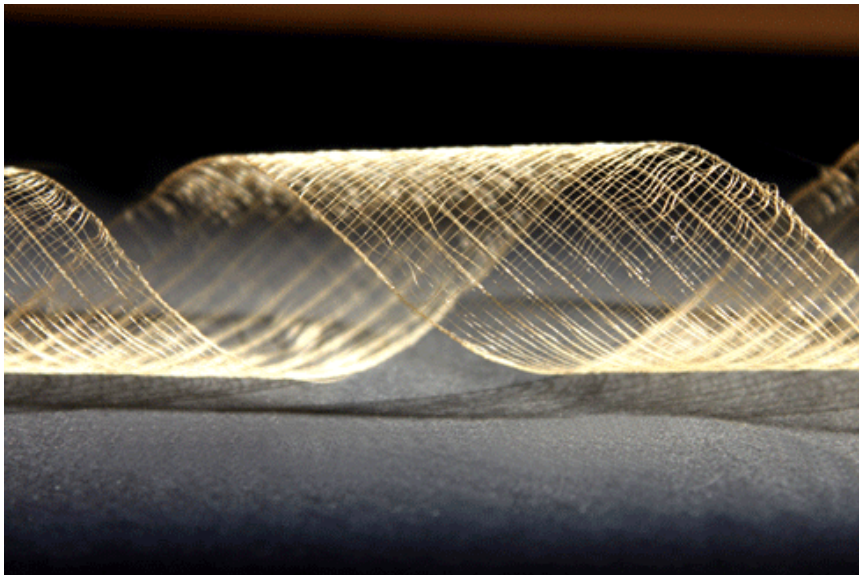


Tough, strong and durable: new insect silks coming to a market near you

Bringing new insect silk products to the global market is the focus of a partnership announced by Australian research agency CSIRO and global life science industry supplier, Lonza.



Credit: CSIRO

Silks produced by many invertebrates are comprised of large proteins with repetitive amino acid sequences that are difficult to reproduce artificially. But some species, such as bees and ants, produce different silk proteins consisting of a coiled-coil structure. These proteins are neither large or repetitive and have a number of desirable properties including:

1. strength
2. high extensibility
3. stability
4. retention of properties in aqueous and non-aqueous environments.

[Dr Tara Sutherland](#) and her group from CSIRO Ecosystem Sciences have been researching silks produced by insects.

‘The cocoon and nest silks we looked at consist of coiled coils – a protein structural arrangement where multiple helices wind around each other. This structure produces a light weight, very tough silk,’ says Dr Sutherland.

Honeybee larvae produce silk to reinforce the wax cells in which they pupate and bulldog ant larvae spin solitary cocoons for protection during pupation.

Insect silk is potentially a key component in a wide range of new products and applications under development by the fast growing biotechnology manufacturing industry due to superior strength and toughness, among other properties. Potential uses include composite fibres for the aviation and marine industries and medical applications including wound repair, drug delivery, and repairing and replacing human tissues such as membranes, ligaments, blood vessels and cartilage.

‘CSIRO has identified a broad range of insect silks that could be produced sustainably and used for a wide range of industrial and medical applications,’ says [Cameron Begley](#), CSIRO Business Development and Commercialisation General Manager.

‘We have found ways to convert the bee silk into a range of different forms, from micro-particles and sponges through to spun fibres that can lead to knitted and woven fabrics.’

Lonza is already providing process development for the recombinant bee silk protein.

Source: CSIRO

More information

[Bees are the new silkworms](#), CSIRO

[Researching silk genes](#), CSIRO

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