Textiles made from Flies? Usage of Chitin for Textiles

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Abstract

The transition towards a circular textile economy requires renewable feedstocks that do not compete with food production while enabling high-value material applications. Chitin, one of the most abundant natural biopolymers, represents a promising candidate for future textile materials. Although traditionally sourced from crustaceans, the increasing industrial production of the black soldier fly (*Hermetia illucens*) creates a new and readily available source of chitin through insect-derived side streams such as larval exuviae and adult insects. These resources remain largely unexplored despite their considerable material potential. Chitin can be converted into chitosan, a bio-based polymer that has attracted increasing interest for textile applications. Previous studies have demonstrated that chitosan can be processed into continuous fibres using wet-spinning technologies, providing valuable insights into the processing of this class of biopolymers. Against this background, insect-derived chitin represents an intriguing and largely unexplored resource for textile applications. Investigating its suitability as a feedstock for fibre production could broaden the value chain of insect farming beyond protein production while contributing to more circular and resource-efficient material concepts. By connecting insect-derived side streams with established textile processing technologies, this concept highlights the potential of interdisciplinary approaches at the interface of biotechnology and textile engineering and raises the question of whether insect-derived biopolymers could become a future source of renewable textile fibres.

Keywords: chitin, chitosan, fibre, biobased materials, black soldier fly

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