

EXTRACTION OF SILK SERICIN FROM DEGUMMING WASTEWATER AND ITS REUTILIZATION IN BIOMEDICAL FIELD

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Introduction

Sericin is a valuable protein, which acts as a glue to fix fibroin fibre together in cocoon. It will be removed as waste, before dyeing and finishing. It still contains valuable protein, and has properties like anti-oxidation, antibacterial, UV resistant, absorb and release of moisture etc. The constituent of sericin is about 20-30% of the total weight of cocoon. Most of the sericin is removed during degumming and is discarded as wastewater, which also increases the treatment cost in addition to the loss of such a rich proteinous material. This sericin can be recovered and can be used for various biomedical and tissue engineering applications.

Objectives

To carryout degumming of silk with various techniques, followed by extraction of sericin from degumming wastewater by dialysis and centrifugation methods. Also to convert the extracted sericin from liquid state to powder, gel, film etc. forms and to characterize these products.

Methodology

The degumming of cocoons was carriedout by using soap (various types) and also the hot water, and the degummed wastewater was used for extraction of sericin. The degummed wastewater was subjected to dialysis to separate the low molecular weight degumming product from high molecular weight product through semi-permeable membrane with circulated distilled water and constant stirring. The heavier portion remained inside the bag. Alternately, this can be achieved by centrifugation. The dialyzed protein sample was subjected to aeration for 120 minutes, to remove the water content present in the dialysis bag. After that, the protein obtained was dried in an oven at 55°C for 10 minutes and the product was ground to get fine powder. The sericin content obtained above was tested for Nitrogen content, and also subjected to UV absorption Spectra and microscopic examination.

Results and Conclusions

The degumming of cocoon using baby soap degumming method has yielded more sericin content. The sericin powder obtained by baby soap degumming has shown better properties against UV protection, which suggests that it can be used in skin therapy effectively. Also, it is found to give fine and uniform crystals.