Characterization of Lectin from Hemolymph, Cocoon and Fecal Matter of Silkworm

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The objective of this study is to determine the effect of lectin isolated from hemolymph and silk gland of the silkworm, on cell agglutination and protein synthesis by the *in vitro* method. This is a preliminary study to unravel the role of lectins in silk gland protein synthesis, and ascertain whether they enhance protein synthesis or not.

First instar eri silkworm larvae were fed on papaya, castor and mulberry leaves and their growth was monitored. The worms survived only when fed on castor leaves. Different fractions of lectins (30%, 50% and 70%) were extracted from the haemolymph and the silk glands by ammonium sulfate precipitation. The different fractions of lectins were checked for the amount of protein present. It was found that the 50% fraction had the highest protein content in both silk gland and haemolymph, followed by the 30% fraction, while the 70% fraction had the lowest proein content. The lectins were analyzed for their sugar-binding properties using glucose and galactose, and they were found to be specific for glucose. Blood agglutination studies were done using the obtained lectins; however, no agglutination was observed.

The silk gland cells were cultured by the explant method in HBSS medium. After sub-culturing, the cells were treated with the different lectin fractions and checked for agglutination. The results were positive. The cells were then trypsinized and checked for cell viability using trypan blue. The protein content was estimated in the supernatant, while the sugar moieties were checked in the pellet. The supernatant and the pellet were subjected to acid hydrolysis using 0.1 N HCl, after which the amino acids present were analyzed by paper chromatography. The cocoons of eri silkworm and *Bombyx mori* were homogenized using phosphate buffer, and protein and sugar estimation were done. SDS-PAGE was carried out in order to depict the presence of protein synthesis and determine the molecular weight of the isolated lectin.

The three fractions of lectin showed silk gland cell agglutination and enhanced protein synthesis. This effect was greater for silk gland lectins. Qualitatively, the presence of amino acids specific to the eri silk worm was observed in the cellular protein.