

Tissue specific characterization of sugar binding proteins from *Eudrilus eugeneae*

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Lectins occur widely in the animal and plant kingdom. In animals, there is a wide range of reports of the presence of lectins in vertebrates and invertebrates, but their function is not fully understood in invertebrates. They may either have a role in the developmental stages or in the defence mechanism by providing immunity. In earthworm species like *Eudrilus eugeniae*, the presence of lectin-like proteins has been reported. The aim of this study is to isolate the sugar binding lectin-like proteins from the coelomocytes (CC), muscles (MC), gut/whole body (WE) and vermicompost (VC) of earthworms, and characterize them. Partially purified lectins were estimated for their protein content by the Biuret method and it was observed that lectins isolated from CC have higher protein content (0.178 mg/mL) than lectins isolated from MC, WE and VC. The sugar-binding specificity of the isolated lectins was checked by the DNS method, and it was observed that CC and VC lectins have a greater affinity for glucose (CC glu & VC glu) while MC and WE lectins have a greater affinity for galactose (MC gal & WE gal). The molecular weight was found to be 26 kDa, as checked by SDS-PAGE. The lectins were tested for their heme agglutination property for human blood types A+ve, B+ve, AB+ve & O+ve, and they showed no agglutination. Antimicrobial property at various concentrations of lectin was checked for different pathogenic bacteria and fungi. *Escherichia coli* showed no zone of inhibition. *Bacillus subtilis* with MC gal showed 2.4 cm zone of inhibition. *Staphylococcus aureus* with both CC glu and VC glu showed the maximum zone of inhibition of 2.6 cm at 200 μ l of 1 mg/mL lectin. The fungus *Aspergillus niger* showed 1.0 cm zone of inhibition with VC glu. *Penicillium chrysogenum* showed 1.5 cm zone of inhibition with CC glu at 200 μ l of 1 mg/mL lectin, while *Fusarium oxysporum* showed no zone of inhibition. The different lectins were then assessed for their mitogenic activity on vertebrate (chicken liver) and invertebrate (earthworm) cells. The cells were cultured in HBSS media and three different concentrations (0.1 mg/mL, 0.01 mg/mL and 0.001 mg/mL) of lectins were added to the cells along with control. It was observed that invertebrates showed higher mitogenicity or proliferation at a higher concentration of lectin, with a proliferation of 83.6% at 0.1 mg/mL of lectin from WE, whereas vertebrates showed inhibitory effect with lectin, that is, with a higher concentration of lectin a reduced amount of proliferation was observed.