Biological Characterization of a C-type Lectin Purified from Bothropoides pauloensis Snake Venom upon Leishmania (Leishmania) amazonensis Promastigotes

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C-type lectins are proteins with the property of binding to carbohydrates, which are present in many organisms, including snake venoms. This work describes the purification and biochemical characterization of a C-type lectin from Bothropoides pauloensis snake venom. The protein (BpLec) was purified by an affinity resin immobilized with D-galactose, followed by reverse phase chromatography on a C2C18 column, with a reliable purity as confirmed by PAGE-SDS. Its Mr estimated by MALDI-TOFF is 16.8 kDa. BpLec is a homodimeric protein with approximately 132 amino acids in each subunit, as determined by Edman degradation. The subsequent alignment with other related lectins revealed a high identity (between 86% and 95%). Also, its primary structure confirms that BpLec exhibits the carbohydrate recognition domain (Gln96-Pro97-Asp98) and nine cysteines responsible for the formation of disulfite bridges (Cys3-Cys14, Cys31-Cys131, Cys38-Cys133, and Cys106-Cys123), common to other lectins. With respect to biological features, BpLec was capable of agglutinating Leishmania (L.) amazonensis promastigotes. This activity suggests that BpLec might bind to some glycoconjugate present in the surface of the parasite which contains D-galactose in its structure, since agglutination induced by BpLec was inhibited partially by β-galactosides (D-galactose, D-lactose and N-acetyl-D-galactosamine) at 200 mM, 100 mM and 50 mM. Moreover, lectins could be potentially used in the differentiation between amastigote and promastigote forms from the parasite, considering that D-galactose is absent in the surface cell of amastigotes. Also, this work leads to other investigations about the specific target from lectins and the probable consequences in biological functions of the parasite.

Key-words: Bothropoides pauloensis, C-type lectin, Leishmania (L.) amazonensis, snake venom
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