Pathogenic Leptospira secretes proteases capable of cleaving extracellular matrix and coagulation cascade molecules from the host

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Leptospirosis, a zoonosis widely spread around the world, is caused by spirochetes of the genus Leptospira. Highly frequent in tropical and subtropical areas, the disease represents an important public health problem. In the last years, researches have been focused on factors related to the pathogenesis of the disease. Pathogenic leptospires have the ability to circumvent host´s defense mechanisms by avoiding complement mediated lysis. Moreover, they express membrane proteins that interact with cells and extracellular matrix proteins from the host. The aim of this work is to evaluate the secretion of proteases by different *Leptospira* species capable of directly degrading extracellular matrix and coagulation cascade proteins. Proteolytic activity in the supernatants of virulent, culture-attenuated and saprophytic *Leptospira* strains was assessed by direct cleavage of extracellular matrix components as well as human plasminogen and fibrinogen. The cleavage products were analyzed by SDS-PAGE and silver staining or by Western blotting. The presence of gelatinases in the supernatants was assessed by zymography analysis. Here we demonstrate that the supernatant of the pathogenic Leptospira strain LPF displays proteolytic activity, being able to degrade human fibrinogen, fibronectin and decorin. 1,10-phenantroline was able to inhibit the proteolytic activity, which points towards the participation of metalloproteases. Moreover, fibrinogen and collagen type I zymography analyses revealed that the supernatant of the pathogenic strain LPF contains at least two gelatinases with molecular weights of approximately 72 and 35 kDa. Production of proteases might be an important virulence determinant since culture-attenuated or saprophytic *Leptospira* did not display proteolytic activity against ECM components or fibrinogen. The ability to cleave conjunctive tissue molecules may certainly contribute to invasion and tissue destruction observed upon infection with these bacteria.

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