

Production and Some Biochemical Properties of an Alkaline Protease from
Humicola insolens.

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In the last decade, considerable efforts have been expended in research on the biochemistry and physiology of thermophilic fungi. Thermophilic microorganisms are good producers of enzymes with high thermal stability, which are preferred for industrial purposes. Proteases are the most commercialized enzymes in the world. A preliminary study in our laboratory showed that *Humicola insolens* is a good producer of alkaline protease activity. This work aims to describe the production and some biochemical properties of the alkaline protease from *H. insolens*. Maximal production of extracellular protease was achieved after 72 h growth, when 1% glucose was offered as carbon source (1073 U/mg prot). Interestingly, in the presence of protein or sugar-cane bagasse as carbon sources the levels of protease activity were 9.6 and 98.0 U/mg prot., respectively. The crude protease was virtually stable when incubated in aqueous solution at 50°C up to 1 hour and exhibited a half-life of 11 min at 55°C. Optimal activity was achieved at 50°C and pH 8.0. The protease was stable in an ample interval of pH (3-11) for up to 6 hours. The crude protease was activated by calcium (87%), magnesium (59%), β -mercaptoethanol (88%), sodium (79%), ammonium (72%), barium (79%) and inhibited by cobalt (27%), mercurium (29%), iron (100%) and zinc (66%). Synergistic stimulation was not observed in the presence of both calcium and magnesium, suggesting that these ions act at a single site. The thermal resistance, high stability at extreme pH and large production in sugar-cane bagasse suggest that the *Humicola* alkaline protease may be useful for industrial applications.

Keywords: alkaline protease, *Humicola*, thermophilie
CAPES, CNPq.