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Title: A Putative Serine protease from Larval Midgut of Red Palm Weevil Rhynchophorus ferrugineus (Olivier) (Coleoptera: Curculionidae): Partial Purification and Biochemical Characterization

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Abstract: A putative serine protease was isolated and partially purified from larval midgut of red palm weevil (RPW), Rhynchophorus ferrugineus (Olivier) using anion exchange chromatography, DE-52. Sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) of this protease showed that the major band has a molecular weight of approximately 24 kDa corresponding to the same molecular weight of mammalian trypsin. In addition, zymography analysis of the protease showed a single band corresponding to the same molecular weight has been measured by SDS-PAGE. Highest specific activity measured by radial diffusion of the enzyme into a casein-containing gel was achieved in 0.5 M NaCl eluate. The enzyme was characterized at different pH, substrate concentrations and various time intervals. The optimum conditions for proteolytic activity were achieved at pH 9.5 and 0.1 mg casein as substrate per mL. Furthermore, the highest activity was revealed after 28 hrs at room temperature. Moreover, soybean trypsin inhibitor dramatically inhibits the caseinolytic activity by 70 and 100 % at 10 and 25 µg respectively.