



Group B02-ABS FUND
Biodiversity Inventory, Collection and Preservation (In-Situ and Ex-Situ): Prokaryotes and Leaf Blight Pathogenic Fungi on Oil Palm

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From the first year (2013) results, we have successfully isolated 6 chitinolytic and 13 cellulolytic bacteria from transformation forest (rubber and oil palm plantation) around Taman Nasional Bukit Duabelas Forest. Cellulolytic isolates (*Bacillus cereus* SAHN 13.30 and *Bacillus thuringiensis* KAHN 15.39) and chitinolytic isolates (*Bacillus thuringiensis* SAHA12.08 and *Bacillus cereus* SAHA12.13) were able to inhibit the growth of fungal pathogens such as *Curvularia affinis* and *Colletotrichum gloeosporioides* by using in-vivo test. The aims of the research (year 2014) were to select one isolate viz *Bacillus thuringiensis* SAHA 12.08 as a model on characterization and partial purification of extracellular chitinase; to determine its potency as biocontrol of *C. affinis* and *C. gloeosporioides*; and to study the ability of *B. thuringiensis* SAHA 12.08 in inhibiting *C. affinis* and *C. gloeosporioides* through detached leaf assay.

Bacillus thuringiensis SAHA 12.08 showed maximum chitinase with specific activity (7.896 U mg⁻¹ protein) at 60 h incubation. Maximum temperature and pH of chitinase activity were 35 °C and 7.0, respectively. Chitinase was partially purified by 30% ammonium sulphate precipitation could increase 2.35 fold than the specific activity. The activity of ammonium sulphate fractionation chitinase was optimum at 45 °C and 7.0, respectively. This chitinase was stable at optimum temperature for 180 minutes incubation. On zymogram analysis, the chitinase had molecular weight 82 kDa. In vitro bioassay through detached leaf assay showed that chitinase of *B. thuringiensis* SAHA 12.08 had antagonist activity and biocontrol efficacy to *C. affinis* and *C. gloeosporioides* in oil palm leaves. It was concluded that *B. thuringiensis* SAHA 12.08 had a potency as biocontrol for *C. affinis* and *C. gloeosporioides* which caused antrachnose, leaf blight, and rotting on oil palm leaves.