

Sirinan Shompoonsang 2007: Identification and Study on Characteristics of *Bacillus* sp. Strain N10.
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Thesis Advisor: Mrs. Surang Suthirawut, Dr. Agr. 161 pages

Pectinase producing *Bacillus* sp. strain N10 was isolated from paper mulberry bark and identified as *Paenibacillus polymyxa* base on its biochemical and physiological characteristics and Biolog. The abilities of this bacterium on enzymes production, acids production and microbial plant pathogens antagonism were investigated to determine its potential in compost application. The results shown that *P. polymyxa* strain N10 could produce not only pectinase but also protease, amylase, cellulase and xylanase with different activities. Among these enzymes, protease and xylanase were shown to be the highest activities. The maximum activities of neutral protease, acid protease, xylanase, β -amylase, endo-1,4- β -glucanase to hydrolyze amorphous cellulose CMC and of exo-1,4- β -glucanase to hydrolyze crystalline cellulose Whatman No.1 filter paper were shown to be 112.16, 78.60, 25.69, 14.45, 0.86 and 0.13 U/ml, respectively. This bacterium could also well inhibit the growth of many microbial plant pathogens such as *Fusarium oxysporum*, *Alternaria* sp., *Aspergillus* sp. and *Sclerotium* sp., slightly inhibit *Rhizopus oligosporus*, and also affected some mushroom mycelia such as *Pleurotus ostretus*, *Lenibus squarrosulus* Mont., *Auricularia auricular* (Hook.) Underw., *Volvariella volvacea* (Bull. Ex Fr.) Sing. and *Pleurotus albonus* Han. Moreover, it demonstrated on plant pathogenic bacteria, especially on genus *Xanthomonas*: *X. campestris* pv. *campestris*, *X. campestris* pv. *glycine*, *X. campestris* pv. *phaseoli*, however, the inhibition on *Erwinia carotovora*, *Pseudomonas syringae* pv. *mori*, *Ralstonia solanacearum* and *Burkholderia cepacia* were not observed. Acids production in the basal medium contained 0.5% of D-glucose shown the pH value in culture broth at 4.79 within 24 h. The liquid media were also studied and it was found that sporulation occurred faster in liquid medium, and GYS and AK#2 media were the best for stimulation of the highest free spore amount and the fastest spore formation reaching 100% within 3 and 4 days, respectively. However, free spore occurred in liquid medium was not resistant to heat shock at 80°C for 10 minutes.

Student's signature

Thesis Advisor's signature