

SKRIPSI

**EKSPLORASI DAN KARAKTERISASI RHIZOBAKTERIA
PEMACU PERTUMBUHAN DAN AGENS HAYATI DARI
KOMPOS KASGOT (*Hermetia illucens* .L)**

***EXPLORATION AND CHARACTRIZATION OF GROWTH
PROMOTING RHIZOBAKTERIA AND BIOLOGICAL AGENTS
FROM KASGOT COMPOST FROM *Hermetia illucens* (Linnaeus)***



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LEMBAR PENGESAHAN

**EKSPLORASI DAN KARAKTERISASI RHIZOBAKTERIA
PEMACU PERTUMBUHAN TANAMAN DAN AGENS
HAYATI DARI KOMPOS BEKAS MAGGOT
(*Hermetia illucens* .L)**

SKRIPSI

Sebagai Syarat Untuk Mendapatkan Gelar Sarjana Pertanian Pada
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SUMMARY

EVI TAMALA. Exploration and Characterization of Plant Growth Promoting Rhizobacteria (PGPR) and Biological Control Agents from Frass Compost of Black Soldier Fly (*Hermetia illucens* L.) Larvae. (Supervised by MULAWARMAN)

Pak Choy is a high-value vegetable that needs sufficient nutrients to increase its productivity. Low soil quality and plant disruptive organisms are limited factors which may reduce pak choy production in Indonesia. This experiment was aimed 1) to explore, to characterize and to identify PGPR, morphologically and physiologically, which were found in frass compost and frass isolate collection from Laboratory of Agricultural Microbiology, Centre for Biological Research, Indonesian Institute of Science, 2) to assess its influences in inhibiting pathogen activities, such as *Fusarium oxysporum*, and 3) to increase crop's growth.

Experiment was carried out in Laboratory of Agricultural Microbiology, Centre for Biological Research, Indonesian Institute of Science from June 2020 to January 2021.

Four samples of frass compost were isolated. Samples had different compositions of frass from 3 sacks (25%), 6 sacks (50%), 9 sacks (75%), and 12 sacks (85%). Morphological and physiological characterization works has been done to choose isolates and to 14 laboratory isolates.

Morphological characterization work was conducted by observing colony forms and structures, and Gram staining. Isolate-chosen physiological characterization work has been carried out by using qualitative analysis in dissolving phosphate, breaking down protein, producing IAA growth hormone, producing deaminase 1-aminocyclopropane-1-carboxylate and siderophores, and increasing the effectiveness of biological control agents by producing chitinase, HCN and ammonium. Quantitative analysis was done to determine IAA growth hormone concentration.

After being characterized, 11 best isolates were obtained. Those were selected based on number and effectiveness, and all 11 isolates were microscopically, macroscopically, and molecularly identified.

Of 11 isolates, there were 5 isolates that have been identified and considered as pathogens from *Klebsiella* genera. Six isolates were non-pathogenic, i.e., SP 3.7, FH 1.5, K9F.1, K9F.6, and K12F.3. All isolates have been significantly shown in increasing length and root wet-dry weight, and not-significantly in increasing crown wet-dry weight and chlorophyll. Four antagonist isolates might significantly inhibit pathogens where seed optimally grew for each treatment, although some were contaminated by pathogenic fungi.

Keywords: Frass Compost; Plant Growth Promoting Rhizobacteria (PGPR); Biological Control Agents; Bioassay; Pak Choy (*Brassica rapa* L.)
