

APPLICATION OF IONIC LIQUID WITH PINEAPPLE LEAF JUICE IN MICROBIAL GROWTH INHIBITION

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INTRODUCTION

Pineapple plants have been affected badly by microbe-causing diseases in Malaysia. Several chemical and natural microbe growth inhibitor (MGI) agents are believed that they are able to stop the diseases. Ionic Liquid (IL) posses high antimicrobial potential due to its large organic cations such as ammonium, imidazolium and etc while extracted pineapple leaf juice (PLJ) are believed to contain these MGI properties due to its natural phenolic compound which acts as a defensive mechanism. Therefore, ionic liquid pineapple leaf juice (ILPLJ) is seen as potential valuable product in controlling diseases on pineapple plants. From this research, the best microbial growth inhibition time is **31.25 min**.



Figure 1: Infected pineapple leaf

METHODOLOGY



Uninfected pineapple leaves were extracted using electrical sugarcane press machine.



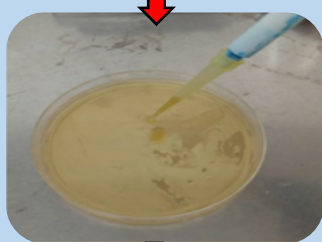
PLJ extract was obtained.



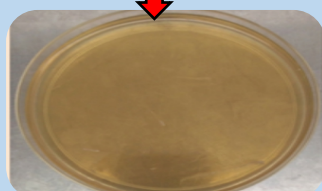
IL mixed with extracted PLJ to form ILPLJ.



ILPLJ and microbe (1:1) were mixed to allow inhibition reaction for selected time.



The mixture was left to grow onto a new medium.



Microbe was observed on the medium after 24 hours.

Figure 2: Microbial growth inhibition process using ILPLJ

NOVELTY

The novelty of this research is mixture of IL and PLJ used in microbial growth inhibition.

PERFORMANCE of ILPLJ as MGI



Without ILPLJ

With ILPLJ (94% Inhibition)

Figure 3: Growth of microbe without and with ILPLJ after 24 hours

MARKETABILITY & COMMERCIALISATION

- For IL of ILPLJ

Table 1: Comparison between commercial product (Chemical) and ILPLJ (Natural + Chemical)

| COMMERCIAL PRODUCTS | ILPLJ |
|--|--|
| Inhibit the growth of microbe in pineapple plants | |
| Large amount of chemicals needed. | Small amount of chemical needed. |
| Total production cost = RM 401 | Total production cost (Including Raw Material, Electricity and labour) = RM 153 |
| *****ILPLJ is 61.85% cheaper than commercial product in microbial growth inhibition process. | |

BENEFITS of USING ILPLJ



Early plant protection from development of microbe



No personal protective equipment needed during application



Utilize abundant of pineapple leaves waste



Low production cost



Easy to applied on pineapple plants