



Biotransformation of Compounds in Laja Gowah Oil (*Alpinia malaccensis* (Burm.f) Roscoe) by *Aspergillus niger* and Its Antibacterial Activity

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BACKGROUND



- It has been used as a traditional medicine
- has antibacterial activity [1], antipyretic, analgesic, and anti-inflammatory activity [2]
- contains **methyl cinnamate** and **1,8-cineole** as the main compounds

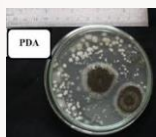
Biotransformation by *Aspergillus niger*

Antibacterial Activity Test

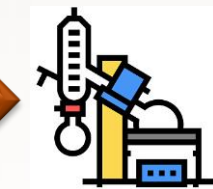
METHODS



identification by GC-MS



Fermentation on 24, 48, 72, 96 h



Separation fermented products



Characterization by TLC, FT-IR, & GC-MS

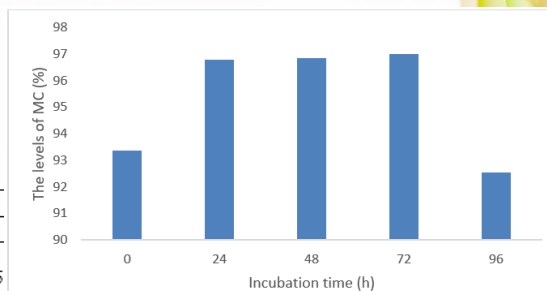


Antibacterial test against *E. coli* (-) & *S. aureus* (+)

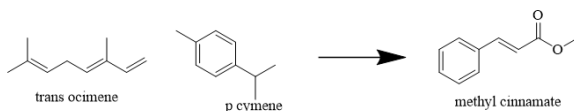
RESULTS

The composition of the constituent chemical compounds of biotransformation products

Compound Name	Incubation time (h)				
	0	24	48	72	96
Trans-ocimene	0.55	-	-	-	-
Beta-pinene	1.34	0.69	0.51	-	0.25
Para cymene	0.94	-	-	-	-
Eucalyptol	1.5	0.98	1.25	0.95	3.24
Camphor	0.88	0.87	0.92	1.00	2.97
Methyl cinnamate	93.35	96.79	96.84	96.98	92.54
Decane	1.44	0.67	0.49	0.79	0.88



The level of methyl cinnamate in various incubation time



Antibacterial activity => Inhibition zone of laja gowah oil and its biotransformation products

Sample	Inhibition zone (cm)	
	<i>E. coli</i>	<i>S. aureus</i>
Laja gowah oil	0.9	0.5
LG-24	0.4	0.8
LG-48	0.3	1.1
LG-72	-	1.4
LG-96	-	1.9
DMSO 15%	-	-
Ciproflaxacine	1.84	2.73

CONCLUSIONS

- The biotransformation process of *A. niger* is influenced by the growth phase of *A. niger*.
- The optimum incubation time for biotransformation of laja gowah oil was 72 h with a methyl cinnamic content reaching 96.98%.
- Biotransformation of laja gowah oil by *A. niger* did not produce new derivatives but increased levels of methyl cinnamic compounds.
- Methyl cinnamate levels affect the antibacterial activity of the biotransformation products, which is more effective at inhibiting *S. aureus* than *E. coli*.