



2<sup>nd</sup> AGRIFOOD SYSTEM INTERNATIONAL CONFERENCE  
FACULTY OF AGRICULTURE  
UNIVERSITAS ANDALAS



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**Letter of Acceptance**

Ref. No: 075/SE/2<sup>nd</sup> ASIC/2022

Dear Dr. Eka Susila N, SP.,MP,  
Politeknik Pertanian Negeri Payakumbuh

Based on the review process performed by our review team, we are delighted to inform you that your abstract, entitled:

**Characterization And Identification Of Endophytic Trichoderma On Shallots Isolated From Three Elevation Regions In West Sumatra**

is **accepted** to be presented orally at the 2<sup>nd</sup> Agrifood System International Conference (**ASIC 2022**). The conference will be held virtually from Faculty of Agriculture, Universitas Andalas, Padang, Indonesia during 8-9 November 2022.

We would like to convey the following additional information for you who will publish the full paper in the proceeding/journal proposed by the committee:

- Your full paper will be considered to be published in the **Biodiversitas Journal (Biodiv - Q3)**. The final decision will be based on the recommendation from the editors.
- The full paper should be formatted according to the guidelines provided by the journal/proceeding. We recommend that your article include the institutional email and Orcid ID number
- Make a payment according to the attached invoice (IOP-EES Proceeding/Biodiversitas) through:  
Bank name : MANDIRI  
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Please send the \* E-mail: [asic@agr.unand.ac.id](mailto:asic@agr.unand.ac.id)/ [asic2.2022@gmail.com](mailto:asic2.2022@gmail.com)  
proof of payment \* Nurwanita (treasurer), WA: +62- 812-6780-8809

Your interest in 2<sup>nd</sup> ASIC 2022 is very much appreciated. We look forward to meeting you at the conference virtually.

Padang, 28 September 2022  
Chairman,



Dr. My Syahrawati



## Conference Schedule

Meeting ID: 859 5528 6507

Passcode: ASIC2022

### Day 1: Tuesday, 8 November 2022

| Time*         | Program   |  | PIC  |
|---------------|---|--|--|
| 08.10 – 09.15 | Opening Ceremony<br>National Anthem<br>Opening Remarks<br>Opening Speech<br>Opening Speech<br>Art Performance | Profile of FPUA<br>Indonesia Raya<br>Organizing Committee<br>Dean<br>Rector<br><i>Pasambahan</i> Dance | MC<br>Operator<br>Dr. My Syahrawati<br>Dr. Indra Dwipa<br>Prof. Dr. Yuliandri<br>Art team - FPUA |
| 09.10 – 09.15 | Photo Session + Break   |  | MC   |
| 09.15 – 10.30 | <b>Plenary I:</b>   |  | <b>Moderator:</b>  |
| Main room     | • Prof. Norman Uphoff   | • Cornell University,<br>USA   | Prof. Dr. Musliar Kasim  |
|               | • Dr. Jauhar Ali  | • International Rice Research<br>Institute, The Philippines  |  |
| 10.30 – 12.30 | <b>Plenary II</b>   |  | <b>Moderator:</b>  |
| Main room     | • Dr. Trevor A. Jackson   | • IAPPS – Agresearch<br>New Zealand  | Prof. Dr. Hermansah  |
|               | • Prof. Shamsuddin  | • University Putra<br>Malaysia, Malaysia   |  |
|               | • Dr. Wahono  | • Universitas Muhammadiyah<br>Malang, Indonesia  |  |
| 12.30 – 13.15 | Photo Session + Break   |  |  |
| 13.15 – 17.00 | Parallel Sessions   | Breakout rooms   | Moderator/Co-Host  |
| 17.00 – 17.30 | <b>Keynote Speech:</b>  |  | <b>Moderator:</b>  |
| Main room     | Dr. Sylvain Roger Perret  | CIRAD, France  | Dr. Agustian   |

\*The time is based on Western Indonesian Time (WIB), it is 7 hours ahead of Coordinated Universal Time (UTC) GMT +7 Jakarta



## Parallel Session

Day 1: Tuesday, 8 November 2022

Breakout Room 7, Session 2

Topic : All topics related to agriculture (AT)

Link : <https://us02web.zoom.us/j/85955286507?pwd=cGF0RnRmajhUWXFHh1AwVFdhcXlDdz09>

Meeting ID : 85955286507, Passcode: ASIC2022

| Code | ID  | Author's   | Title  | Institution   | Page |
|------|-----|--|--|---|------|
| AT10 | 019 | Sri Heriza, My Syahrawati, Aisyah Safitri, Pradetia, Ratih Vionica                                     | Morphometrics and Characteristics of <i>Hospitalitermes hospitalis</i> Termites as Unpolluted Ecosystem Indicators                     | Universitas Andalas   |      |
| AT11 | 050 | Tuty Hardianti   | Insect Diversity on Siam Citrus ( <i>Citrus nobilis</i> Lour.) Plants in Sungkai, Padang   | Universitas Andalas   |      |
| AT12 | 075 | Eka Susila, Fri Maulina, Deni Emilda   | Characterization and Identification of Endophytic Trichoderma on Shallots Isolated from three Elevation Regions in West Sumatra        | Politeknik Pertanian Negeri Payakumbuh                        |      |
| AT13 | 082 | Trisnowati Budi Ambarningrum, Endang Warih Minarni, Hery Pratiknyo, Trisno Haryanto                    | Collembola Community Structure in Two Habitat Types in Serang Purbalingga Agrotourism Area   | Universitas Jenderal Soedirman                                |      |
| AT14 | 112 | Tri Astuti Wisudayati, Dian Charity Hidayat  | Paludiculture Commodities for Food Security: Ecologically and Economically Sustainable   | National Agency for Research and Innovation, Indonesia (BRIN) |      |
| AT15 | 117 | Bustomi, Akhmad Endang Zainal Hasan, Khaswar Syamsu  | Anticancer Activity of Stingless Bees Honey against Breast Cancer, Colon Cancer, and Lung Cancer                                       | IPB University  |      |
| AT16 | 119 | Akhmad Endang Zainal Hasan, Eny Ida Riyanti, Ukhradiya Magharaniq Safira Purwanto, Bunga Novia Selpani | Identification of Cellulolytic Bacteria with Activities Assays of Enzyme Isolated from Paddy's Rhizosphere                             | IPB University  |      |
| AT17 | 127 | Henny Herwina, Indah Trisnawati, Ameilia Zuliyanti Siregar, Jasmi, Muhammad N Janra, Ahmad Taufiq      | Inferring Ecosystem Service Provided by Plants-Stingless Bee Relationships (Hymenoptera: Apidae: Meliponini) Within Anthropogenic Area | Universitas Andalas   |      |



# CERTIFICATE

733/2nd ASIC/XI/2022

*Awarded with thanks to*

**Eka Susila**

**Presenter**

2nd Agrifood System International Conference (2nd ASIC)  
“Research Advancement and Innovations in Agroecology and Smart Agrifood System”  
Faculty of Agriculture, Universitas Andalas, Indonesia  
Online, 8-9<sup>th</sup> November, 2022



**Prof. Dr. Yuliandri**

Rector of Universitas Andalas,  
Indonesia



**Dr. Indra Dwipa**

Dean of Agriculture Faculty,  
Universitas Andalas



**Dr. My Syahrwati**

Chairman of the  
Committee



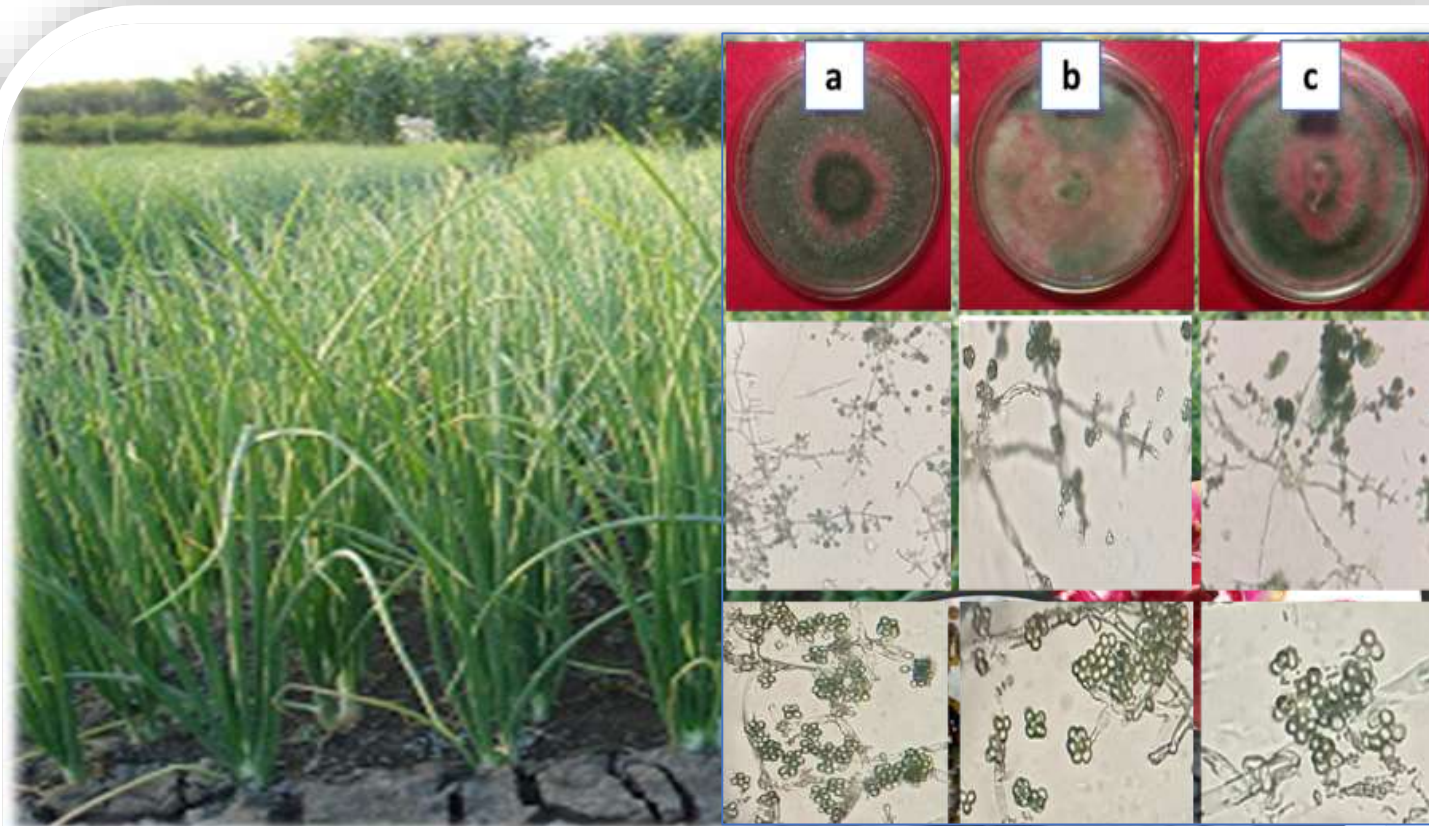
**CHARACTERIZATION AND  
IDENTIFICATION OF ENDOPHYTIC  
TRICHODERMA on SHALLOTS  
ISOLATED FROM THREE ELEVATION  
REGIONS IN WEST SUMATRA**

PRESENTER : Eka Susila

INSTITUTION : Politeknik Pertanian Negeri  
Payakumbuh

Team : Fri Maulina<sup>2</sup>, and Deni Emilda<sup>3</sup>

# Characterization and Identification of Endophytic Trichoderma on Shallots Isolated from Three Elevation Regions in West Sumatra

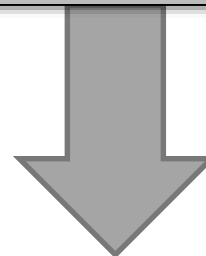


Eka Susila,  
Fri Maulina, and  
Deni Emilda

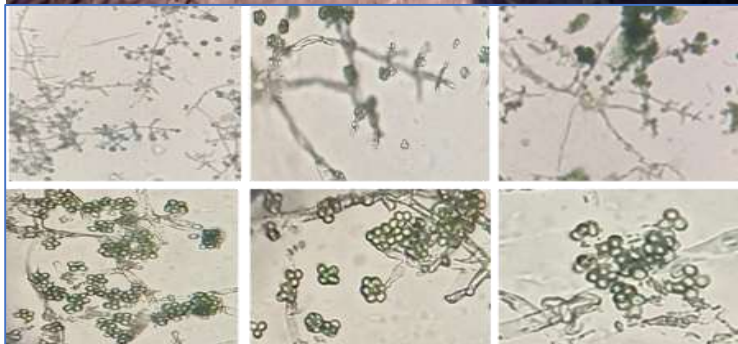
# INTRODUCTION



Shallots are herbaceous plants with shallow root systems, do not grow deep into the soil



One of the limiting conditions for shallot plants to grow optimally is dry land conditions.



Various microorganisms are found in the rhizosphere of plants, one of which is the Trichoderma fungus. Endophytic Trichoderma fungus application is one way to overcome this condition.

# METHOD

## 1. Research purposes

This study purpose to explore, collect, and identify endophytic *Trichoderma* species on shallots based on morphological characters and molecular technic.

## 2. Time and Place

The study was carried out for 8 months at Laboratory of Payakumbuh Agricultural Polytechnic for morphological observation and Laboratory of Plant Protection and Laboratory of Molecular, Indonesian Tropical Fruit Research Institute (ITFRI) for molecular identification

## 3. Method

1. Ekplorasi
2. Isolasi
3. Identifiction as morphological and moleculer

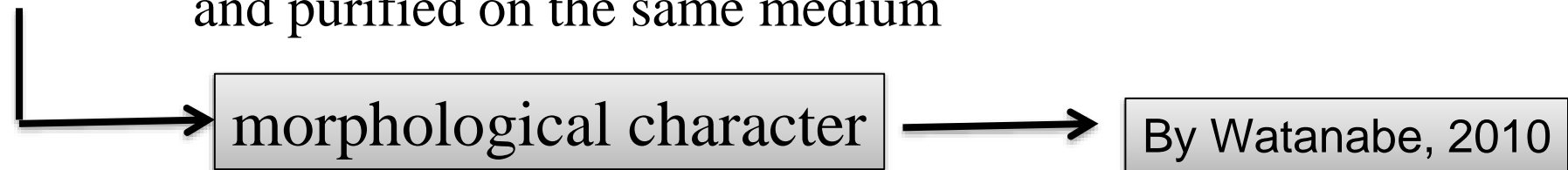


*Trichoderma* spp. was explored from the rhizosphere of shallots at three locations in West Sumatra.



- Alahan Panjang :  
high elevation - 1700 asl
- Solok :  
medium elevation - 400 asl
- Kambang :  
low elevation - <200 asl

Isolation : Samples were isolated on Potato Dextrose Agar (PDA)  
and purified on the same medium



macroscopic : colony color, colony shape and growth diameter  
microscopic : conidiophore, phyalid, and conidia shape

## Molecular identification

DNA extraction of three *Trichoderma spp.* isolates (AP, SLK and KMB) was performed by using Zymo Quick DNATM Fungal/Bacterial Miniprep Kit (Cat. No. D6005)

Electrophoresis process used SB buffer on 1.2% agarose gel at voltage 50V for 60 minutes. Gel Doc 2000 Video Gel Documentation System was used for visualization of these bands.

Four specific primer pairs were used for molecular identification.

| Species                   | Gene        | Primer | Sequen (5'-3')                | Product (bp) |
|---------------------------|-------------|--------|-------------------------------|--------------|
| <i>T. asperellum</i>      | <i>tef1</i> | T2A F  | 5'- CTCTGCCGTTGACTGTGAACG -3' | 507          |
|                           |             | T2A R  | 5'-CGATAGTGGGGTTGCCGTCAA -3'  |              |
| <i>T. harzianum</i>       | <i>rpb2</i> | Th1 F  | 5'-TTGCATGGGTTCGCTAAAGG-3'    | 330          |
|                           |             | Th1 R  | 5'-TCTTGTCAGCATCATGGCCGT-3'   |              |
| <i>T. longibrachiatum</i> | <i>tef1</i> | T1 F   | 5'- CCGTGAGTACACACCGAGCTT -3' | 824          |
|                           |             | T1 R   | 5'- CGGCTTCCTGTTGAGGGGA -3'   |              |
| <i>T. virens</i>          | <i>tef1</i> | T2 F   | 5'- CCGTTTGATGCGGGGAGTCTA-3'  | 452          |
|                           |             | T2 R   | 5'- GGCAAAGAGCAGCGAGGTA-3'    |              |

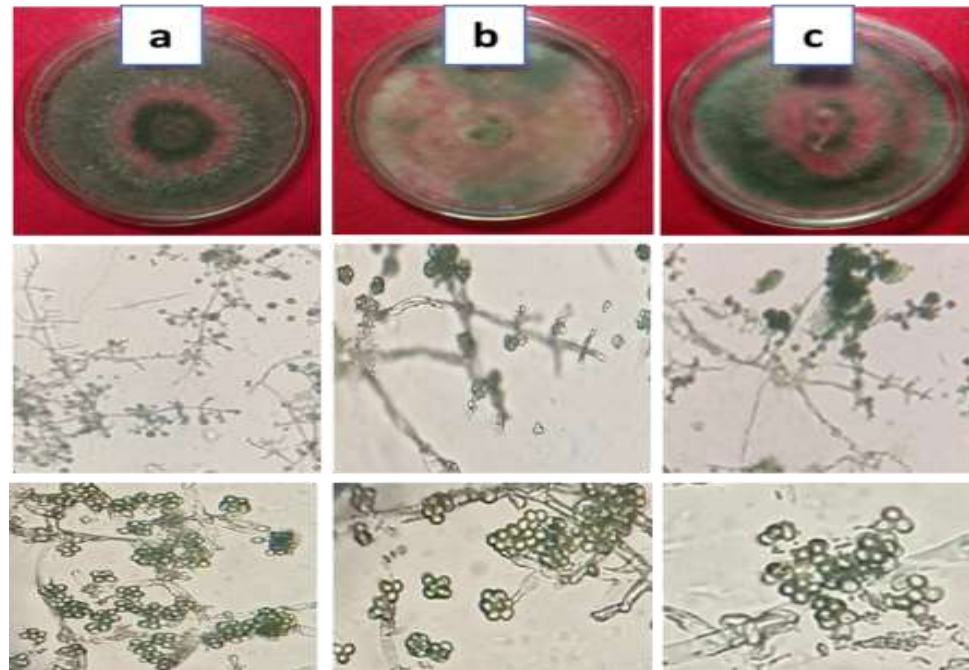
# RESULT

## Macroscopic characterization

**Table 1.** Development of *Trichoderma sp.* propagule color and diameter at 1-7 days after isolation cultured on 9 cm petri dish containing PDA medium and incubated at room temperature

| Isolat | Observation period (days after isolation) |                |                      |                      |                      |            |            | Propagule shape            |
|--------|---|----------------|----------------------|----------------------|----------------------|------------|------------|----------------------------|
|        | 1   | 2              | 3                    | 4                    | 5                    | 6          | 7          |                            |
| AP     | White                                     | Whitish green  | Whitish green        | Whitish green        | Whitish dark green   | Dark green | Dark green | Round<br>Forming a circle  |
|        | 5,25cm                                    | 7,25cm (d)     | 9cm (d)              | 9cm (d)              | 9cm (d)              | 9cm (d)    | 9cm (d)    |                            |
| Slk    | White                                     | Whitish yellow | Whitish yellow green | Whitish yellow green | Whitish yellow green | Green      | Dark green | Grow evenly on the surface |
|        | 2,5cm                                     | 5,5cm          | 6,8cm                | 9cm                  | 9cm                  | 9cm        | 9cm        |                            |
| Kmb    | White                                     | Whitish green  | Whitish green        | Whitish green        | Dark green           | Dark green | Dark green | Round<br>Forming a circle  |
|        | 3,35cm                                    | 6,05cm         | 7,9cm                | 9cm                  | 9cm                  | 9cm        | 9cm        |                            |

# Macroscopic and microscopic

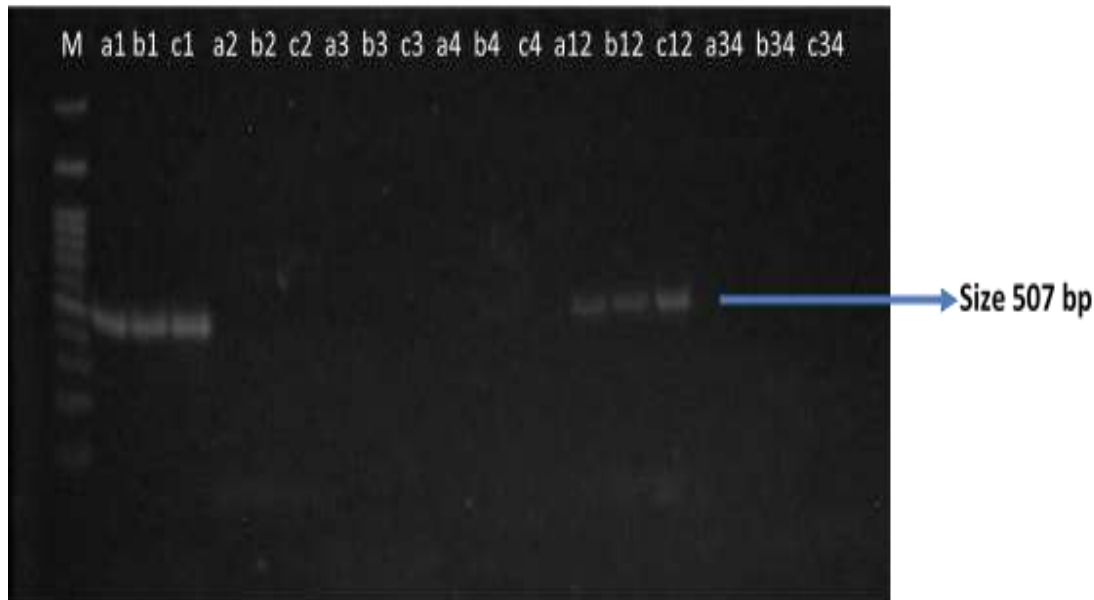


**Figure 1.** Macroscopic and microscopic appearances of *Trichoderma sp* isolated from the root of shallots. These isolates collected from Alahan Panjang at elevation 1.700m above sea level (a), Solok at elevation 400m asl (b) and Kambang at elevation <200m asl (c).

**Table 2.** Microscopic observation of three *Trichoderma sp.* isolates

| Isolates | Microscopic observation |              |                |               |                |                 |
|----------|-------------------------|--------------|----------------|---------------|----------------|-----------------|
|          | Conidiophore            | Phialides    | Conidium shape | Conidium wall | Conidium color | Hypha           |
| AP       | Upright branching       | Short, thick | Oval           | Thick         | Green          | Hyalin, septate |
| Slk      | Upright branching       | Short, thick | Oval           | Thick         | Green          | Hyalin, septate |
| Kmb      | Upright branching       | Short, thick | Oval           | Thick         | Green          | Hyalin, septate |

# Molecular identification



These specific primer pairs were used on this study : *T. asperellum*, *T. harzianum*, *T. longibrachiatum* and *T. virens* (Prabakaran, 2014)

The result revealed that the species of three endophytic Trichoderma isolates on shallots as one species i.e *T. asperellum*

**Fig 2.** PCR products derived from amplification of *Trichodermasp* genes by using 4 specific primer pairs for *T. asperellum*, *T. harzianum*, *T. longibrachiatum* and *T. virens*. M = marker, a = Isolate AP, b = Isolate SLK, c = Isolate KMB, 1 = specific primer pairs for *T. asperellum*, 2 = specific primer pairs for *T. harzianum*, 3 = specific primer pairs for *T. longibrachiatum*, 4. specific primer pairs for *T. virens*

Degani et al. (2021) ; *T. asperellum* for the control of various plant diseases include : the following recent examples : Fusarium wilt in *Stevia rebaudiana*, *Pratylenchus brachyurus* in soybeans, and pearl millet downy mildew caused by *Sclerosporagrammicola*. Taribuka et al. (2016) reported *T. asperellum* as one of endophytic fungi on banana.



## CONCLUSION

This study concludes that three isolates of endophytic *Trichoderma* on shallots was isolated. Those isolates identified, were of the same types, as *Trichoderma asperellum* based on molecular identification.

These endophytic *Trichoderma* had different growth rates even though they were including in one species. The fastest growth rate isolate was AP isolated from shallots root at Alahan Panjang.



***THANKS FOR YOUR ATTENTION,  
SEE YOU NEXT ....***



**2<sup>nd</sup> ASIC**  
8-9 NOVEMBER 2022