PIPER SARMENTOSUM'S POTENTIAL AS ANTI-ACANTHAMOEBIC AGENTS FOR CONTACT LENS SOLUTION

Maizatul Akma Ibrahim¹ & Farah Farisha Mustafa¹

¹Department of Plant Science, Kulliyyah of Science, International Islamic University Malaysia, Kuantan Campus, Bandar Indera Mahkota, 25200 Kuantan Pahang.

By the late of 1990's only, there were approximately 70 million people throughout the world wearing contact lenses and the users are at increased risk of *Acanthamoeba* keratitis. Many reports showed that approximately 85% of all amoebic keratitis cases were associated with contact lens users. *Piper sarmentosum* leaves extract were found to be active against pathogenic *Acanthamoeba* cells, with IC_{50} value obtained at 74.64 and 22.13 µg/mL for *Acanthamoeba castelanii*, and *Acanthamoeba* sp. (Hospital Kuala Lumpur isolate) respectively. The plant extract was also found to cause apoptosis in the tested amoeba cells. The mechanism of action toward *Acanthamoeba* was attributed to the phenolic composition from the plant sample. The transport and distribution through the cells membrane is the main target of compounds. The hydroxylation of the plant phenolics plays an important role for the effectiveness of the compounds transport through the amoeba cells' membrane.

Keyword: Piper sarmentosum, Acanthamoeba, phenolic compound, contact lens solution.

PIPER SARMENTOSUM'S POTENTIALS AS ANTI-ACANTHAMOEBIC AGENTS FOR CONTACT LENS SOLUTION

<u>Maizatul Akma Ibrahim, PhD.</u>

Department of Plant Science, Kulliyyah of Science, International Islamic University Malaysia

This work is funded Prototype Research Grant Scheme (PRGS20-017-00610) of the Ministry of Higher Education Malaysia.

RESEARCH BACKGROUND

- □ Acanthamoebic keratitis challenging ocular disease caused by parasitic protozoan *Acanthamoeba*.
- Red eye, photophobia, decreased vision, pain, irritation.
- 90% of cases occur in contact lens users. (CDC, 2020).
- □ With an increasing number of contact lens wearers (>125 mil), the cases have also shown to increase.
- □ Bioactive compounds of *Piper sarmentosum* (Kaduk) were explored for new formulation in contact lens solution.



RESEARCH OUTPUT



METHODOLOGY I

Compounds elucidation & identification

Compounds cytotoxicity

Mode of cell death

Cell membrane integrity assessment

Microscopical morphology analysis

*THE FOLLOWING PROCEDURES FOLLOW THE GUIDELINES SET BY FDA UNDER "GUIDANCE FOR INDUSTRY-PREMARKET NOTIFICATION (510(k)) GUIDANCE DOCUMENT FOR CONTACT LENS CARE PRODUCTS"

RESEARCH NOVELTY



alaysia.



maizatulakma@iium.edu.my

017-7050071



PURIFICATION

 Isolation of compounds i.e Moupinamide & Cimidahurine

*METHODOLOGY II

MICROBIOLOGY

In-vitro cytotoxicity

CHEMISTRY

- Solution Compatibility
- Cleaning Efficacy
 MPS FORMULATION
- Sterility
- Stability

CONCLUSION

First local MPS product, to substitute the imported products - cheaper

Effectively cleans, loosens, and removes accumulations of film, protein, and other deposits and debris from contact lenses

Prevent risks of *Acanthamoeba* contaminants more effectively from the predecessors.



THE 4TH INTERNATIONAL CONFERENCE ON BIOSCIENCE & MEDICAL ENGINEERING 2022



CERTIFICATE OF PARTICIPATION

THIS IS TO CERTIFY THAT

Dr. Maizatul Akma Ibrahim

HAS PARTICIPATED IN THE 4TH INTERNATIONAL CONFERENCE ON BIOSCIENCES & MEDICAL ENGINEERING HELD FROM 21-22 JUNE 2022 (VIRTUAL)

> AS POSTER PRESENTER

PROF. DR. DR. KAHAR OSMAN CO-CHAIRMAN I ICBME 2022 ASSOC. PROF. DR. AZZMER AZZAR ABDUL HAMID CHAIRMAN ICBME 2022 L DON OS-

DR. IDA BAGUS WAYAN GUNAM CO-CHAIRMAN II ICBME 2022





