UNIVERSITI TEKNOLOGI MARA
Cawangan Perak
Kampus Tapah

FACULTY OF APPLIED SCIENCES

SCIENTIFIC PROJECT COLLOQUIUM

2024

Final Year Project Colloquium 2024
Faculty of Applied Sciences,
Universiti Teknologi MARA,
Perak Branch Tapah Campus,
35400 Tapah Road, Perak, Malaysia.

Colloquium date 12 July 2024
Publication date 30 October 2024

Proceedings of Extended Abstracts

EDITORS
Pn. Rosliza Ali
Pn. Nunshaimah Salleh
Pn. Norsakina Zurina Zulkifli
Pn. Adibatul Husna Fadzil
Pn. Yanti Yaacob
Pn. Lili Widarti Zainuddin

e-I.S.B.N: 978-629-97630-4-8

Faculty of Applied Sciences,
Universiti Teknologi MARA,
Perak Branch Tapah Campus,
35400 Tapah Road,
Perak, Malaysia.

Preface

The Scientific Project Colloquium offers a platform for publishing Diploma Science final year projects (FYP). The objective is to effectively distribute research findings throughout all scientific disciplines. The primary objective of including final year projects into the course curriculum is to encourage students to put their theoretical knowledge into practical applications.

We would like to express our gratitude to our primary establishment, the Faculty of Applied Sciences and Universiti Teknologi MARA, Perak Branch, for their invaluable assistance.

Lastly, we would like to express our gratitude to all of the authors for the tremendous help in preparing the articles, without which this undertaking would not have been completed.

Editors

Rosliza Ali
Nunshaimah Salleh
Norsakina Zurina Zulkifli
Adibatul Husna Fadzil
Yanti Yaacob
Lili Widarti Zainuddin

Universiti Teknologi MARA
Perak Branch Tapah Campus
October 2024

PERSICARIA ODORATA AS A FLY REPELLENT

Yanti Yaacob*, Nazwa Jon, Nunshaimah Salleh
Faculty of Applied Sciences, Universiti Teknologi MARA, Perak Branch Tapah Campus,
35400 Tapah Road, Perak, Malaysia

*yanti229@uitm.edu.my

Abstract: Flies belong to the order Diptera and are insects with one pair of membrane wings, little, club-like hind wings called halters, big compound eyes, and short, simple antennae, body hair and legs are covered with tiny hair that carry illness. Due to the transfer of illnesses, which includes the spread of cholera by flies in many developing nations, several species of Diptera are crucial vectors for the transmission of various pathogens, making their control a key focus in public health efforts aimed at reducing the incidence of waterborne and foodborne diseases. They can spread germs to food or surfaces in a matter of seconds. As a result, illness transmission has a negative effect on society's health as well as the environment. According to a study, Vietnamese coriander or *Persicaria ordorata* can work as a fly repellent to help with this issue. This study aims to investigate the potential of *Persicaria ordorata* towards repelling flies in UiTM Tapah cafetria. Three conditions are examined for *Persicaria ordorata* which are fresh leaf, dried grinded leaf and pure essential oil. The most effective method of using the *Persicaria ordorata* would have to be the pure essential oil method due to the number of flies that is trapped is low. The dried leaf sample method is the least effective, so it can be said that it may not be the best way to repel flies because the compounds that were meant to do so either did not exist or may have evaporated into the surrounding air while the sample was drying in the sun. While the fresh leaf sample has outperformed the dried sample in terms of fly repellent properties, this approach is still not the most efficient.

Keywords: *Flies, Persicaria ordorata, Vietnamese coriander, UiTM Tapah Cafeteria*

INTRODUCTION

The house fly (*Musca domestica* L.), a ubiquitous pest, is frequently linked to livestock facilities. There, it thrives in excrement, wet feed, and other decomposing organic matter that is frequently present (Geden & Hogsette 1994). According to Howard (2001) and Lole (2005), house flies are also connected to metropolitan areas, especially waste disposal facilities. In neighboring areas, house flies can be a major annoyance when they reproduce in huge quantities. This can lead to expensive tickets, fines, and legal action (Thomas and Skoda 1993, Winpisinger et al. 2005). According to assessments by Nayduch and Burrus 2017, the house fly is a significant mechanical vector of infections that affect humans and animals. *Persicaria odorata*, the scientific name for Vietnamese coriander, is a perennial plant that thrives in warm, humid climates found in tropical and subtropical regions. According to Rasha Saad et al. (2014), the leaf's bottom is burgundy red, while the top of the leaf is dark green with dots that resemble chestnuts. *Persicaria odorata* has a pleasant, strong scent that is frequently used in fresh salads or as a key component in the Asian dish "laksa" because the oil contains aldehydes such decanal (28%), dodecanol (44%), and decanol (11%), the components that give Vietnamese coriander its pleasant scent (Sasongko et al., 2011). The pleasant aroma of *Persicaria odorata* will function as a fly repellent, allowing us to use the organic process of extracting *Persicaria odorata* oil and monitor the percentage of flies that die as a result. Determining if *Persicaria odorata* acts as fly repellent and fly mortality in UiTM Tapah Cafeterias is the significance of this experiment. The purpose of this study is to study the potential of *Persicaria odorata* at three different methods on controlling the flies population thus improving the environmental conditions surrounding UiTM Tapah. Fly-borne diseases like cholera, trachoma, and leprosy can infect students and negatively impact their academic performance.

METHODOLOGY

Study Area

UiTM Tapah cafeteria are the best locations for the study effectiveness of *Persicaria odorata* toward flies.

Control

A control is a condition of Persicaria *odorata* leaves that is exposed to a treatment known to produce a positive result. As an example, fresh *Persicaria odorata* leaves, dry *Persicaria odorata* leaves and oil extraction of *Persicaria odorata* leaves.

Negative control

No repellent.

Fresh *Persicaria odorata* leaves

In order to employ *Persicaria odorata* fresh leaves, they were placed on fly traps surrounding the positive control region. However, the leaves were first broken and then arranged on the table to see how the flies were affected. Following placement, the flies' behavior was monitored to see if they moved in the direction of the leaves or away from it. As a result, it was decided how the fresh *Persicaria odorata* worked.

Dry *Persicaria odorata* leaves

The fresh *Persicaria odorata* leaves were ground into tiny pieces and let air dry in the sun. It is positioned all around the fly trap's positive region, which is where we employed it to draw in the flies. The quantity of flies trapped on the fly trap was counted and recorded, and the reaction of the flies toward the dried leaves was observed.

Oil extraction of *Persicaria odorata* leaves

To obtain pure extraction oil from the sample, hydro distillation was used to extract essential oils. Weighed 20g of dried Vietnamese coriander in the microwave. After the leaves had completed drying, they were ground into small fragments. The 250 mL volumetric flask was then filled with the *Persicaria odorata* leaves. For half an hour, the sample was submerged. After setting up the distillation apparatus, the material was distilled for three hours. After that, 5–10 milliliters of dichloromethane (DCM) were added to the distillate that had been put into the separating funnel. Two or three separate separations were carried out. The water and essential oil of *Persicaria odorata* leaves were separated using a rotary evaporator.

Fourier Transform Infrared (FTIR) instrument

After the extraction process, the essential oil was subjected to an analysis utilizing Fourier Transform Infrared (FTIR) to determine which chemical was the most effective at repelling flies and what other compounds were present in the sample.

FINDINGS

Flies Infestation at Café Gamma in UiTM Tapah, Perak

The flies infestation at Gamma Café was recorded using the graph as in Figure 1 and tabulated in Table 1. There were 4 flies specimens from the fresh *Persicaria odorata* leaves and 17 flies specimens from the negative control were trapped. In the meantime, 27 flies were calculated trapped for the dried *Persicaria odorata* leaves and 16 flies trapped for the negative control. For the oil extraction of *Persicaria odorata* leaves no flies were trapped and only 1 were trapped for the negative control.zero for the positive control, had the best success rate in repelling flies. This is due to the presence of several fly-repelling chemicals in *Persicaria odorata* essential oil, including dodecanal and decanal. These compounds are all present in the FTIR data as in Figure 2, which displays the existence of alcohol and aldehyde functional groups. As stated by Fujita et al. in the year 2015, 25 volatile compounds were isolated from *Persicaria odorata* leaves which are 78% were aldehyde compounds, with dodecanal (55.5%) and decanal (11.6%) being the most common. Dodecanal, a naturally occurring aldehyde, has shown promising results as an insect repellent, particularly against mosquitoes. the potential of dodecanal and similar compounds in essential oils for mosquito deterrence. These studies support the use of natural repellents like dodecanal to manage mosquito populations and prevent diseases like dengue. (Bezerra et al., 2016). Moreover, some studies done by Logan et al., 2008 stated that individuals who are less appealing to *Aedes aegypti* generate more volatile repellent substances, such as decanal.

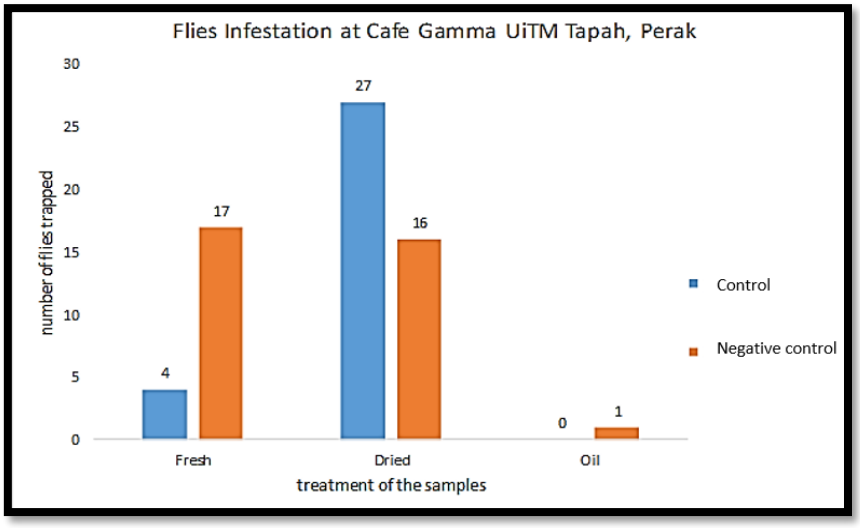
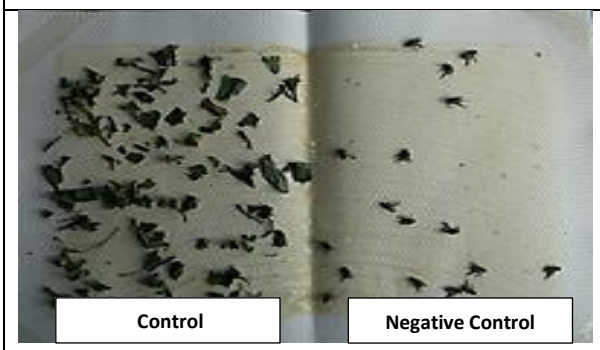
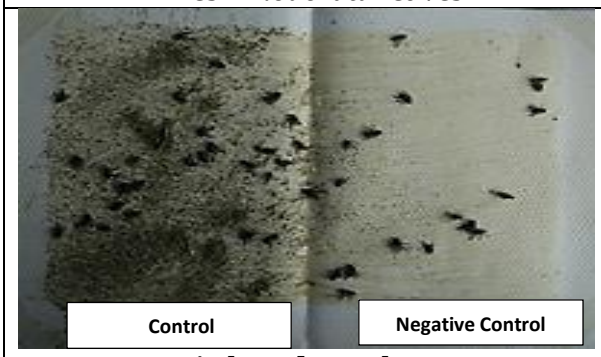
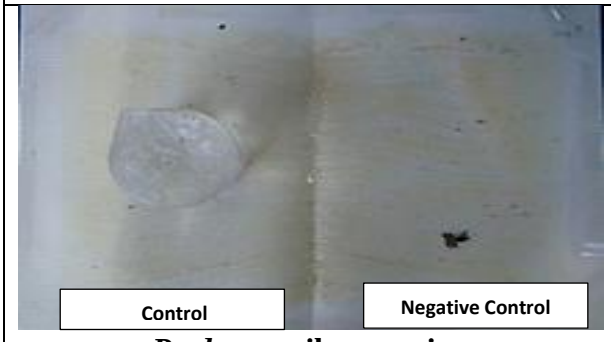


Figure 1. Flies infestation at Gamma cafeteria

Table 1. Flies infestation at Gamma cafeteria

Types of treatments	Number of trapped flies	
	Control	Negative control
 **Fresh *P.odorata* leaves**	4	17
 **Dried *P.odorata* leaves**	27	16
 ***P.odorata* oil extraction**	0	1

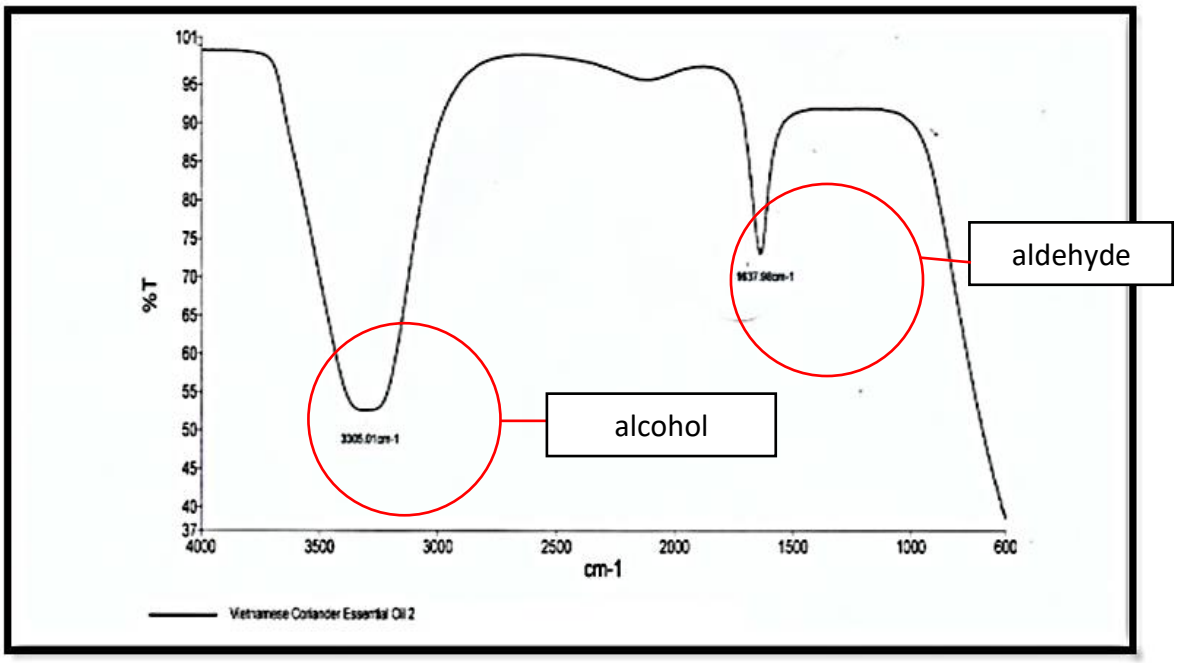


Figure 2. *Persicaria odorata* essential oil peaks

CONCLUSIONS

The essential oil extraction process is the most efficient way to use *Persicaria ordorata* since it traps a relatively small number of flies. A graph was produced by using the Fourier Transform Infrared (FTIR) to test the essential oil that was collected. According to the graph, there was an alcohol and aldehyde in the oil sample. Based on it, the substances were recognized as dodecanal and decanal. Due to the known repellent properties of these chemicals, the oil sample with the highest ability to repel flies was the result. The dried sample method is the least effective, so it can be said that it may not be the best way to repel flies because the compounds that were meant to do so either did not exist or may have evaporated into the surrounding air while the sample was drying in the sun. While the fresh sample has outperformed the dried sample in terms of fly repellent properties, this approach is still not the most efficient. This might be because, in contrast to the oil sample, the fresh sample's *Persicaria odorata* scent was weaker and the components meant to repel flies may have quickly evaporated into the surrounding air.

COMPLIANCE OF ETHICAL STANDARDS

Not applicable.

REFERENCES

Bezerra-Silva PC, Dutra KA, Santos GKN, Silva RCS, Iulek J, Milet-Pinheiro P, et al. (2016) Evaluation of the Activity of the Essential Oil from an Ornamental Flower against *Aedes aegypti*: Electrophysiology, Molecular Dynamics and Behavioral Assays. PLoS ONE 11(2): e0150008. https://doi.org/10.1371/journal.pone.0150008

Fujita KI, Chavasiri W, Kubo I. AntiSalmonella activity of volatile compounds of Vietnam Coriander. Phytotherapy Research. 2015;29(7):1081–7.

Geden, C. J., and J. A. Hogsette (eds.) 1994. Research and extension needs for integrated pest management of arthropods of veterinary importance, p. 328. In Proceedings of a Workshop, 12–14 April 1994, Lincoln, NE.

Howard, J. 2001. Nuisance flies around a landfill: patterns of abundance and distribution. Waste Manag. Res. 19: 308-313. Jaenson, T.G., Palsson, K., Borg-Karlson, A.K., 2006. Evaluation of extracts and oils of mosquito (Diptera: Culicidae) repellent plants from Sweden and Guinea-Bissau. J. Med. Entomol. 43, 113–119.

Logan JG, Birkett MA, Clark SJ, Powers S, Seal NJ, Wadhams LJ, et al. Identif ication of human-derived volatile chemicals that interfere with attraction of Aedes aegypti mosquitoes; 2008. p. 308–22. https://doi.org/10.1007/ s10886-008-9436-0.

Lole, M. J. 2005. Nuisance flies and landfill activities: an investigation at a West Midlands landfill site. Waste Manag.Res. 23: 420–428.

Nayduch, D., and R. G. Burrus. 2017. Flourishing in filth: house fly-microbe interactions across life history. Ann. Entomol. Soc. Am. 110: 6–18.

Rasha Saad, Jiyauddin Khan, Viveganath Krishnanmurthi, Fadli Asmani & Eddy Yusuf. 2014. Effect of different extraction Technique of Persicaria odorata Extracts utilizing Anti-Bacterial Bioassay. British Journal of Pharmaceutical Research, Management and Science University 4(18): 2146-2154, 2014.

Sasongko P, Laohankunjit N & Kerdchoechuen O (2011). Evaluation of physicochemical properties of plant extracts from Persicaria odorata. Agricultural Science Journal, 42(2): 333-336.

Thomas, G. D., and S. R. Skoda (eds.) 1993. Rural flies in the urban environment? In Proceedings of a symposium presented at the Annual Meeting of the Entomological Society of America, December 1989, San Antonio, TX. Agricultural Research Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, Lincoln, NE.

Winpisinger, K. A., A. K. Ferketich, R. L. Berry, and M. L. Moeschberger. 2005. Spread of Musca domestica (Diptera: muscidae), from two caged layer facilities to neighboring residences in rural Ohio. J. Med. Entomol. 42: 732–738.

Pejabat Perpustakaan
Library Office

Universiti Teknologi MARA
Cawangan Perak
Kampus Seri Iskandar
32610 Bandar Baru Seri Iskandar,
Perak Darul Ridzuan, MALAYSIA
Tel: (+605) 374 2093/2453 Faks: (+605) 374 2299

UNIVERSITI TEKNOLOGI MARA

Surat kami : 700-KPK (PRP.UP.1/20/1)
Tarikh : 20 Januari 2023

Prof. Madya Dr. Nur Hisham Ibrahim
Rektor
Universiti Teknologi MARA
Cawangan Perak

Tuan,

PERMOHONAN KELULUSAN MEMUAT NAIK PENERBITAN UiTM CAWANGAN PERAK MELALUI REPOSITORI INSTITUSI UiTM (IR)

Perkara di atas adalah dirujuk.

2. Adalah dimaklumkan bahawa pihak kami ingin memohon kelulusan tuan untuk mengimbas (*digitize*) dan memuat naik semua jenis penerbitan di bawah UiTM Cawangan Perak melalui Repositori Institusi UiTM, PTAR.

3. Tujuan permohonan ini adalah bagi membolehkan akses yang lebih meluas oleh pengguna perpustakaan terhadap semua maklumat yang terkandung di dalam penerbitan melalui laman Web PTAR UiTM Cawangan Perak.

Kelulusan daripada pihak tuan dalam perkara ini amat dihargai.

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Setuju.

27.1.2023

PROF. MADYA DR. NUR HISHAM IBRAHIM
REKTOR
UNIVERSITI TEKNOLOGI MARA
CAWANGAN PERAK
KAMPUS SERI ISKANDAR

Saya yang menjalankan amanah,

SITI BASRIYAH SHAIK BAHARUDIN
Timbalan Ketua Pustakawan

nar