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..... Advisor  
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.....Co-Advisor  
(Assistant Professor Nathapornpan Uttama, Ph. D.)

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After all it is not the proper etiquette as not to do so. Acknowledgments do not need to comply with any fixed format or structure. It should be written in simple and in a personal tone. But sometimes, simpler matters turn out to be more difficult than one assumes.

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**ABSTRACT**

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→ Describing the abstract as a summary is accurate, but is also an understatement. Generally, an abstract contains the thesis of research conducted, the methods through which the thesis was tested, the findings of the research, and any final thoughts. An abstract should be as succinct as possible, and readers should not have difficulty comprehending the purpose of the research.

According to the APA, abstract length is limited to 120 words. Abstracts longer than 120 words may be truncated when included in databases, limiting searchability. The information included in an abstract depends on the type of paper. A report of an empirical study should contain a statement of the problem, subjects, method, findings and conclusion.

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**ABBREVIATION AND SYMBOL (if any)**

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VT  
VA  
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Vermont  
Virginia  
Washington  
West Virginia  
Wisconsin  
Wyoming

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## CHAPTER 2

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### LITERATURE REVIEW

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#### 2.1 Previous Related Studies

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**-0.5 inch-** → Stratigos et al. (2000) considered treatment of cutaneous pigmentation as one of the most interesting areas of cutaneous laser surgery. They reviewed the 4 main short-pulsed, pigment-selective lasers in clinical use at that time, and Q-switched ruby laser (694 nm, 25-40 nanoseconds) was one of them which used successfully for decades in treatment of superficial pigmented lesions, such as ephelides, solar and labial lentigines, and flat seborrheic keratoses. Dermal and mixed epidermal/dermal pigmented lesions like melasma show variable responses.

##### **-0.5 inch-** → 2.1.1 Indications for Facial Resurfacing

Laser facial resurfacing treat extensive cutaneous changes duo to solar damage, and other skin lesions including (Goodman, 2007; Kilmer & Semchyshyn, 2005)

**-0.75 inch-** → 2.2.2.1 Irregular pigmentation and Dyschromia: Many epidermal pigmented lesions that are due to photoaging, such as ephelides, lentignes, seborrheic keratoses, dermatosis papulosa.

2.2.2.2 Vascular lesions: Like telangiectasia, angiomas with venous lakes, standing erythema, and flushing disorders.

##### 2.1.2 Contraindications to Nonablative Technologies

Because of the possible varied side effects and complications after cutaneous laser surgery, it is essential that each patient receive consultation before treatment to assess the risk factors of adverse sequelae and contraindications (Tanzi & Alster, 2008; Goodman, 2007; Kilmer & Semchyshyn, 2005) which include:

2.2.3.1 Concurrent isotretinoin remains a controversial issue.

2.2.3.2 Current or recent tan or intention to expose to high-dosage ultraviolet radiation. This is of much greater concern in patients who seek visible laser or light source treatment.

**-1 inch-** → 1. Pregnant or breast feeding women.



This is a prospective randomized controlled bilateral left-right comparison trial. It was performed in accordance with Good Clinical Practice. The treatment protocol has been reviewed with each patient who then signed the informed consent. The research was accomplished at Mae Fah Luang University Hospital, Bangkok (Outpatient department).

According to the Clinical Assessment of Repigmentation degree, the mean results of the three dermatologists assessment showed 14 patches (82%) out of the 17 patches were given score 1 which means 1%-24% repigmentation, while only 3 patches (18%) were given 0 score, 6 his means that carbon dioxide laser has achieved mild repigmentation effect in vitiligo patches.

One patient noticed repigmentation in areas not treated by laser, she claimed that repigmentation started to occur in her neck and chest during period of the study, this encouraging news need to be verified in the light of any immunological effects of carbon dioxide laser or it is just an accidental event or something else. But we know that Vitiligo is known as a slowly responding disease so three months of laser sessions may be not enough to achieve complete clinical improvement in repigmentation.

**Table 2.2** The Features of the CICU RF Laser Device

<b>Item</b>	<b>Feature</b>
Laser type	RF CO2 ALL METAL SEALED TYPE
Laser power	up to 30 watt
Laser mode	TEM <sub>00</sub> (10.6 μm)
Pulse duration	100-5000 μs
Repetition	0.2-1 s/single
Overlap	1-10 TH
Distance	0.1-2 mm
Treatment area	1*1 - 20*20 mm
Text	Text

**Table 2.2** (continued)

Item	Feature
Pixel quantity	up to 40,401
Pixel size	> 100 micron
Cooling	Air Cooling
Optical guide	Articulated arm

**Note** Pt. for (patient), CAR for (Clinical Assessment of the Repigmentation)

**Source** Manstein et al. (2010)



**Figure 2.1** CICU RF CO2 Laser Device

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After this relatively short period of follow up, the results, in conclusion, showed patient satisfaction score 16.7% (1 patient) were really satisfied, 66.7% (4 patients) were slightly satisfied and 16.7% (1 patient) with poor satisfaction.

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Mr. A (personal communication, 2001, 18 April)

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## References

Litz, R. E. (2008). Mango. In C. Kole & T. C. Hall (Eds.), *Compendium of transgenic crop plants: Transgenic tropical and subtropical fruits and nuts* (pp. 163-174).  
-0.5 inch- → Blackwell.

The references may be presented in six different formats; however, the same format must be consistently applied throughout the entire document

1. American Psychological Association (APA)

2. Vancouver Style

3. Chicago Style

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## CHAPTER 3

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# INVESTIGATION AND EVALUATION OF IMPACT BRUISING IN GUAVA USING IMAGE PROCESSING AND RESPONSE

## SURFACE METHODOLOGY<sup>1</sup>

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<sup>1</sup> = Enter a number to indicate the footnote

### Abstract

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 → Simulated impact damage testing was investigated by fractal image analysis using response surface methodology (RSM) with a central composite design (CCF) on quality of 'Glom Sali' guava for drop heights (0.2, 0.4, and 0.6 m), number of drops (1, 3, and 5) and storage temperature conditions (10, 20, and 30 °C). After 48 h, impacted fruit were determined and analyzed for bruise area (BA), bruise volume (BV), browning index (BI), total color difference ( $\Delta E$ ), image analysis for bruise area (BAI), and fractal dimension (FD) at the bruising region on peeled guava. Results showed that the correlation coefficient ( $r = -0.6055$ ) between  $\Delta E$  and FD value was higher than  $\Delta E$  and either BA ( $r = 0.3132$ ) or BV ( $r = 0.2095$ ). The FD variable was determined as a better indicator than conventional measurement (BA or BV) for pulp browning and impact bruising susceptibility. The FD variable also exhibited highest  $R^2_{adj}$  value (81.69%) among the other five variables, as the highest precision model with high determination coefficient value ( $R^2_{adj} > 0.8$ ) for impact bruising prediction. Recommended condition of the FD variable to minimize impact bruising was drop height of 0.53 m for five drops under storage at 30 °C. FD variable assessed by image analysis was shown to be a highly capable measurement to determine impact bruising susceptibility in guava fruit.

**Keywords:** Bruise Susceptibility, Impact Bruise, Mechanical Injury, Transportation

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 → <sup>1</sup>This paper has been published in *Horticulturae Journal*, 2021, 7(10), 411. <https://doi.org/10.3390/horticulturae7100411>

### 3.1 Introduction

<sup>-0.5 inch-</sup>  
→ Guava (*Psidium guajava* L.) is one of the most famous and economically important fruits in Thailand, with an export value in 2020 worth 5.50 million USD [1]. Guava is a climacteric fruit with a round shape and thin skin that bruises easily. To maintain fruit quality and shelf life and minimize losses, guava fruit needs proper postharvest handling practices [2]. Thai agriculture and ASEAN standards of guava require slight defects on the skin not exceeding 10% of the total surface area of guava fruit [3,4]. Bruising effects can be distinguished from quality changes in guava such as browning, softening of the fruit peel, cell destruction, and reduction in intercellular air spaces resulting in the bruised tissue losing moisture and becoming desiccated [5]. Impact damage to fruit is more severe than vibration and compression damages. When a fruit falls with sufficient force against a surface, impact damage occurs, while dynamic damage of a single fruit occurs through fruit-to-fruit impact between packaging. Fruit dropping from trees to the ground during harvesting, dynamic impact between single fruit, and between the fruit and packaging or containers are all causes of impact damage [6].

### Acknowledgments

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- Li, Z., & Thomas, C. (2014). Quantitative evaluation of mechanical damage to fresh fruits. *Trends Food Science & Technology*, 35, 138–150.
- Shafie, M., Rajabipour, A., & Mobli, H. (2017). Determination of bruise incidence of pomegranate fruit under drop case. *International Journal of Fruit Sciences*, 17, 1–14.

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APPENDIX A } Topic Font size 14 pt

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PUBLICATIONS

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Fungal Biology 128 (2024) 2139–2147



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Fungal Biology

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## Morpho-molecular characterization of phoma-like fungi from *Morus alba* in northern Thailand; a novel species (*Boeremia albae*) and a new host record (*B. maritima*)

Deeksha Gomdola<sup>a,b</sup>, Eric H.C. McKenzie<sup>c</sup>, Digvijayini Bundhun<sup>a,b</sup>,  
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### ARTICLE INFO

Handling Editor: G Kovács

#### Keywords:

1 new species  
1 new host and geographical report  
Dothideomycetes  
Mulberry  
Phylogeny  
Taxonomy

### ABSTRACT

*Boeremia* was established to accommodate phoma-resembling fungi. Its species occur in terrestrial ecosystems as endophytes, saprobes and pathogens, except one species reported from a marine ecosystem. *Boeremia* species are characterized by hyaline, thin-walled, and aseptate (occasionally 1–2-septate) conidia that are variable in shape, and hyaline, straight or slightly curved, thick-walled, and 1-septate ascospores that are usually constricted at the septum. In the past, host associations were used to delimit *Boeremia* species. However, since *Boeremia* taxa have overlapping morphological characters and are cryptic, it renders taxonomic identification arduous. Therefore, the use of other approaches including multi-gene phylogenetic analyses are imperative. Recommended DNA markers for species delineation are the internal transcribed spacer (ITS), nuclear rDNA consisting of ITS1-5.8S-ITS2 and large subunit (28S, D1–D2 domains of nuclear 28S rDNA) loci, and the genes for actin (*ACT1*), beta-tubulin (*TUB1*), RNA polymerase 2 (*RPB2*) and translation elongation factor 1 $\alpha$  (*TEF1*). Here, we applied morphological and molecular phylogenetic analyses to establish a new taxon (*B. albae*), and a new host and geographical record for *B. maritima* associated with leaf spots of *Morus alba* (Moraceae) in northern Thailand. By providing sequence data for three additional gene regions, our phylogenetic analyses impart a stable phylogenetic placement of the ex-type strain of *B. maritima*, as illustrated. This is the first study that reports *Boeremia* species from *M. alba*, and *B. maritima* from a terrestrial habitat.

### 1. Introduction

*Morus alba* (Oleaceae), also known as white mulberry, is a deciduous tree native to China (Ercisli and Orhan 2007; Dat et al., 2010). It is widely grown in tropical, subtropical and temperate countries, including Africa, Brazil, India, Korea and Thailand (Sánchez 2000; Dat et al., 2010). *Morus alba* has high economic significance and almost all parts of the trees are used in industries. The leaves are used as teas, infusions, and salad ingredients (Zhang et al., 2018), and are particularly important in the production of silk as they are fed to silkworm larvae, which convert the leaf protein to silk protein (Ghosh et al., 2017). Fruits are eaten directly or processed into wines, jams and juices. Mulberry fruits

are one of the most nutritious agricultural products available to consumers as they are rich in carbohydrates, proteins, fats, minerals, and vitamins (Nayab et al., 2020). The leaves and fruits of *M. alba* also possess various therapeutic compounds. They are used as a functional food, and have anti-diabetic, anti-inflammatory, anti-cancer and neuroprotective potentials, among others (Manzoor et al., 2022). The roots are boiled and added to soups and casseroles by virtue of their anthelmintic activity (Lochyńska and Oleszak 2013).

Diverse fungal groups have been reported from *Morus alba* worldwide. Examples are *Cercospora morina* in Thailand (Meeboon et al., 2007); *Colletotrichum* spp. in China (Xue et al., 2019); *Eutypella citricola* in China (Zhu et al., 2021); *Lasiodiplodia undulata*, *Pseudocercospora*

\* Corresponding author. Mae Fah Luang University, Chiang Rai, 57100, Thailand.

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**APPENDIX B** Topic Font size 14 pt

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**CLINICAL ASSESSMENT OF REPIGMENTATION FORM**

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Assessment of Repigmentation (CAR)

Please indicate your choice by applying (X);

<b>Patient no. 1</b>						
<b>Lesion no. 1</b>						
Rate of	0%	1 - 24%	25 - 49%	50 - 74%	75 - 99%	100%
Repigmentation						

<b>Patient no. 2</b>						
<b>Lesion no. 1</b>						
Rate of	0%	1 - 24%	25 - 49%	50 - 74%	75 - 99%	100%
Repigmentation						

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## NAME

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## EDUCATIONAL BACKGROUND

Year

Bachelor of Name

Name of Major

Name of Institute

## WORK EXPERIENCE *(if any)*

Year-present

Position

Institution

## SCHOLARSHIP *(if any)*

Year

Name of Scholarship

## PUBLICATION *(if any)*

Abadias, M., Alegre, I., Oliveira, M., Altisent, R., & Viñas, I. (2012). Growth potential of Escherichia coli O157:H7 on fresh-cut fruits (melon and pineapple) and vegetables (carrot and escarole) stored under different conditions. *Food Control*, 27(1), 37-44.