

CHAPTER I

INTRODUCTION

1.1 Research Background

Halitosis, also known as bad breath, is one of the oral health problems frequently often complained about by the public because it can disrupt with the personal lives of sufferers and those around them. This is caused by the presence of *Volatile Sulfur Compounds* (VSCs) resulting from the decomposition of anaerobic bacteria¹. One of the anaerobic bacteria commonly found in the oral cavity as a cause of *halitosis* is *Staphylococcus aureus* bacteria². In research conducted by 25% of the world's population experiencing *halitosis* and usually un aware of the condition, About 90% of *halitosis* cases are caused by a lack of oral hygiene³. Meanwhile in Indonesia, 25,9% of the population has oral problems, and as many as 28,6% of East Java residents have oral problems⁴.

Generally, *halitosis* is caused by a lack of oral hygiene, inflammation that occurs around the teeth (*periodontal*), cavities, a dry mouth, smoking, and the leftover food in the mouth⁵. Untreated *halitosis* will cause insecurity and excessive anxiety in sufferers when opening their mouths or interacting with other people⁶. The disadvantages of *halitosis* are that not only does this affect the sufferer, but can also affect one's social life, such as embarrassment, social avoidance, and decreased self-confidence⁷. A healthy oral cavity allows a person to communicate effectively,

¹ Hampelska, K., Jaworska, M. M., Babalska, Z. L., & Karprinski, T. M. 2020. The Role of Oral Microbiota in Intra-Oral *Halitosis*. *Journal of Clinical Medicine*, 9(2484), 1–17.

² Andriani, A., & Wilis, R. 2018. Efektifitas Mengonsumsi Jus Apel Dibandingkan dengan Mengonsumsi Jus Jambu Biji Terhadap Penurunan Tingkat *Halitosis*. *AcTion: Aceh Nutrition Journal*, 3(2), 164.

³ Berardi, R. R., Stefanie, P. F., Anne, L. H., et al. 2009. *Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care*, Sixteenth Edition. American Pharmacists Association, pp. 596–597.

⁴ Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI. 2013. Jakarta: Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI. P.110- 111.

⁵ Yulimatussa'diyah, A. P., Nafiis, M. M., Rosyidah, I., Sutanti, T. N. E., & Syarofi, N. M. R. (2016). Knowledge of *Halitosis* Handling in Oral Health Problems, 3(2), 5

⁶ Adnyani, N. P., & Artawa, I. M. B. 2016. Pengaruh Penyakit Gigi dan Mulut terhadap *Halitosis*. *Jurnal Kesehatan Gigi*, 4(1), 24– 28.

⁷ Djaya, A. 2001. *Halitosis- Nafas Tak Sedap*. Jakarta: PT. Dental Lintas Mediatama.

enjoy various types of food, improve quality of life and self-confidence, and have a better social life⁸.

As explained in the hadith:

قَالَ رَسُولُ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ تَحَلَّلُوا فَإِنَّهُ نِظَافَةٌ وَالنِّظَافَةُ تَدْعُو إِلَى الْإِيمَانِ وَالْإِيمَانُ مَعَ صَاحِبِهِ فِي الْجَنَّةِ (رواه الطبراني)

Meaning: “Remove the remnants of food from your teeth, for this is cleanliness, and cleanliness leads to faith, and faith will be with the one who has it in Paradise.” (H.R. At-Thabrani)

There are various ways that can be done to overcome the discomfort of bad breath conditions, such as using mouthwash. There are various types of mouthwash products and different ways to use them. The use of mouthwash containing antiseptics is done by gargling for 5 minutes; the more often you use it, the better the effect will be. However, besides that, the alcohol content in mouthwash can harm the oral mucosa if used in the long term. This is because mouthwash can kill normal flora (bacteria) in the mouth⁹.

Indonesia is famous for its many herbal plants that are beneficial for health, one of which is cardamom seeds (*Amomum compactum Sol. Ex Maton*). Cardamom seeds are commonly used as spices in cooking as well as flavor enhancers in food. Cardamom seeds contain secondary metabolite compounds such as flavonoids, tannins, saponins, steroids, and triterpenoids, and essential oils. The flavonoids, saponins, and steroids in cardamom seeds have potential as antibacterials¹⁰. Knowledge continues to develop and has proven that mouthwash containing

⁸ Pintauli, S. dan Hamada, T. 2008. *Menuju Gigi dan Mulut Sehat Pencegahan dan Pemeliharaan Karies Gigi*. Medan: USU Press.

⁹ Alwinda P Yulimatussa'diyah And Others. 2016. *Pengetahuan Penanganan Halitosis Dalam Masalah Kesehatan Mulut*, 3.

¹⁰ Dede Sukandar And Others. 2016. Aktivitas Antibakteri Ekstrak Biji Kapulaga (*Amomum Compactum Sol. Ex Maton*). *Jurnal Kimia Terapan Indonesia*, 17.2, 119-29

alcohol can cause several undesirable effects, such as a burning sensation in the oral cavity, xerostomia, and the risk of oral cancer¹¹.

Innovative inventions in the preparation of fast-disintegrating tablets (FDT) that disintegrate quickly in the mouth aim to avoid the use of mouthwash containing alcohol. This type of FDT preparation was chosen because of its advantages, namely its high dissolving speed in the oral cavity after direct contact with saliva¹². Considering these factors, the researcher wants to make FDT preparations from cardamom seed extract with variations in explotab as a practical method to prevent bad breath. The sweet, safe, and practical taste can attract people's attention instead of using mouthwash.

1.2 Research Problems

The problem formulations in this research are:

1. What are the characteristics of *Fast Disintegrating Tablet* (FDT) preparation from cardamom seed extract with variations in explotab?
2. How effectiveness is the use of cardamom seed extract FDT on the prevention of bad breath in vitro?

1.3 Research Objectives

The objectives of this study are:

1. Knowing the characteristics of the *Fast Disintegrating Tablet* (FDT) preparation from cardamom seed extract with variations in explotab.
2. Knowing the effectiveness test of the use of cardamom seed extract FDT on the prevention of bad breath in vitro.

¹¹ Lemos-Junior CA, Villoria GEM. 2018. Reviewed evidence about the safety of the daily use of alcohol-based mouthrinses. *Brazilian Oral Research*. 24-30.

¹² Oom Komala, Ismanto, And Muhammad Alan Maulana. 2020. Aktivitas Antibakteri Ekstrak Etanol Biji Kapulaga Jawa (Amomum Compactum Soland. Ex Maton) Terhadap Streptococcus Pyogenes. *Ekologia : Jurnal Ilmiah Ilmu Dasar Dan Lingkungan Hidup*, 20, 31–39.

1.4 Research Benefits

1. Theoretical Benefits

The results of this study can be used as reference material for further research on the formulation of cardamom seed extract FDT preparations (*Amomum compactum Sol. Ex Maton*), especially as a prevention of bad breath.

2. Practical Benefits

The results of this study are expected to add knowledge and insight to readers about the effectiveness of cardamom seed extract (*Amomum compactum Sol. Ex Maton*) in preventing bad breath.

1.5 Authenticity of Research

Research on FDT preparations from cardamom seed extract has been carried out by several researchers as shown in table 1 below.

Table 1 Authenticity of Research

Research Title	Research Method	Variable	Result	Research Difference
Formulation of <i>Fast Disintegrating Tablet</i> of Ethanol Extract of Cardamom Seed (<i>Amomum compactum Soland ex. Meton</i>) with explotab as superdisintegran ¹³	laboratory experiment	<p>Dependen : Formulation of <i>Fast Disintegrating Tablet</i> of Ethanol Extract of Cardamom Seed (<i>Amomum compactum Soland ex. Meton</i>)</p> <p>Independent: Konsentrasi Eksplotab sebagai bahan penghancur dan Manitol sebagai bahan pengisi</p>	The variation of Explotab <i>superdisintegrant</i> concentration affects the physical properties of Fast Disintegrating Tablets of cardamom seed ethanol extract. The more the concentration of explotab increases, the faster the destruction time of cardamom seed extract FDT shown in formula IV produces FDT with the best physical properties, this is because formula IV uses crusher with high concentration compared to other formulas	<p>Dependent : Formulation of <i>Fast Disintegrating Tablet</i> of Ethanol Extract of Cardamom Seed (<i>Amomum compactum Soland ex. Meton</i>)</p> <p>Independent: Test of bacterial inhibition against cardamom seed FDT preparation</p>

¹³ Ali Nofriyaldi And Others. 2019. Formulasi *Fast Disintegrating Tablet* Ekstrak Etanol Biji Kapulaga (*Amomum Compactum Soland. Ex Maton*) Dengan Explotab Sebagai *Superdisintegrant*. *Journal Of Pharmacopolium*. Issn : 2620-8563-Issn: 2621-1521, 2, 156–61.

Research Title	Research Method	Variable	Result	Research Difference
Antibacterial Activity of Ethanol Extract of Java Cardamom Seeds (<i>Amomum Compactum Soland. Ex Maton</i>) Against <i>Streptococcus Pyogenes</i> ¹⁴	laboratory experiment	<p>Dependent : Ethanol Extract of Java Cardamom Seeds (<i>Amomum Compactum Soland. Ex Maton</i>)</p> <p>Independent: Konsentrasi Ekstrak Biji Kapulaga Terhadap <i>Streptococcus pyogenes</i></p>	96% ethanol extract of Javanese cardamom seeds has antibacterial activity against <i>Streptococcus pyogenes</i> with the highest average inhibition zone diameter of 12.03 ± 0.14 mm at a concentration of 12%. Phytochemical test results showed that the content in 96% ethanol extract of Javanese cardamom seeds contained alkaloid compounds, flavonoids, terpenoids and tannin	<p>Dependen : Ethanol Extract of Java Cardamom Seeds (<i>Amomum Compactum Soland. Ex Maton</i>)</p> <p>Independent: Effect of Cardamom Seed Extract on <i>Staphylococcus aureus</i> bacteria</p>

¹⁴ Dede Sukandar And Others. 2016. Aktivitas Antibakteri Ekstrak Biji Kapulaga (*Amomum Compactum Sol. Ex Maton*). *Jurnal Kimia Terapan Indonesia*, 17.2, 119–29

¹⁴ Endah K. 2011. *Buruknya Kesehatan Gigi dan Mulut Memicu Penyakit Diabetes, Stroke dan Jantung*. Hanggar Kreator, Yogyakarta.

¹⁴ Ibid.

¹⁴ Madhushankari, G. S., Yamunadevi, A., Selvamani, M., Kumar, M., & Basandi, P. 2015. *Halitosis – An overview: Part-I – Classification, Etiology, and Pathophysiology of Halitosis*. *Journal of Pharmacy and Bioallied Sciences*, 7(2), 5339–5343.