شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

Evaluation of the Antiplaque and Antibacterial Effect of Aloe Vera, Chlorhexidine and Fluoride Containing Toothpastes "In-vitro Study"

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Dedication

I would like to dedicate this thesis to my dear parents; to my father's soul who was always a motive for me and my mom who was always there for me and to my dear husband.

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NOMENCLATURE

Abbreviations

BHI	Brain heart infusion
LB	Lactobacillus acidophilus
ml	Milliliter
mm	Millimeter
OD	Optical density
SM	Streptococcus mutans
TVC	Total viable count

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Introduction

Dental diseases are one of the major public health problems recognized throughout the world.[1] The diseases of the periodontium and tooth decay are among the most common afflictions of mankind.[2] Dental plaque plays a major role in the etiology of periodontal and caries diseases.[3,4]

It has been identified that a diverse microflora is found in dental plaque biofilms. Therefore, "The specific plaque hypothesis" was put forward as a major advance.[5] This hypothesis proposed that the disease is actively caused by only a few of the many species found in dental plaque biofilms. Thus, caries could be controlled by targeting preventative measures and interventions against these ''specific'' organisms, as streptococcus mutans which is considered as one of the main causative agents.[6]

On the other hand; as opposed to specific species "The nonspecific plaque hypothesis" proposed that disease is the outcome of the overall activity of the total plaque microflora.[7]

Over the years, various synthetic chemical agents have been evaluated for their antimicrobial effect in oral cavity. The chlorhexidine is the benchmark control in the removal of plaque accumulated over enamel surface. [8] However, it cannot be used for a long period of time due to its many side-effects like altered taste sensation and staining of tongue. Chemical plaque control agents are used since they have the ability to inhibit growth and metabolism as well as colonization of bacteria; however, all are associated with various side effects.[9]

Fluoride is a well-known antimicrobial agent that has significant anticariogenic and remineralization properties. However, the over use of Fluoride may cause toxicity and fluorosis. [10]

Accordingly; patients are preferring to shift away from modern medicines, and they prefer using herbal preparations like *Terminalia chebula, Aloe Vera, Azadirachta indica, Ocimum sanctum*.[11]

The present study claimed that *Aloe Vera* extract is one of the natural oral hygiene aids that helps in changing bacterial content of dental plaque.[12] The main active ingredients in the *Aloe Vera* gel are aloin, aloeemodin, aloemannan, acemannan, aloeride, naftoquinones, methylchromones, flavonoids, saponin, sterols, amino acids and vitamins.[9] The use and benefits of Aloe Vera have been mentioned in various literature worldwide like in Egypt, India, Japan, South Africa, Mexico and China[13,14].

Aloe Vera has been used in different treatments like burns, skin infections, haemorrhoids, sinusitis, and gastrointestinal pain. It is also a wound healer for bruises, burns, insect bites. It also aids in reducing radioderamtitis, psoriasis and genital herpes infection.[10] This is attributed to its various pharmacological actions including anti-inflammatory, antibacterial, antioxidant, antiviral and antifungal actions.

Literature is abundant on the health beneficial effects of *Aloe Vera* but to date, few studies have been conducted to test its antiplaque efficacy on enamel surface. [4,15,16] Hence, this study was conducted to evaluate the efficacy of *Aloe Vera* as antibacterial and antiplaque agent.

Review of Literature

Dental caries is the most common type of oral health problem globally [17]. It is known to have multifactorial etiology with number of variables that influence prevalence of the condition.

Etiology & Prevalence of dental caries in children:

One of the most prevalent chronic diseases and a main public health issue is dental caries [18]. Deciduous tooth decay was categorized as 12th most predominant condition, affecting 560 millions of children in 2015 Global Burden Disease Study[19]. Dental caries is a multifactorial, destructive disease, which can affect different ages [20]; affecting 80 to 90% of world population [21].

In children, dental caries appears to have five times higher prevalence than asthma, which is the second most common disease. For ages, streptococcus mutans have been considered one main causative agent of the disease [22]. This made most current diagnostic, preventive, therapeutic strategies directed towards this microorganism [23]. However, many other microbial species have been related to process of tooth decay; including lactobacilli and bifidobacteria [24].

Studying human microbiology showed that the oral ecosystem is inhabited by hundreds of bacterial species [25]. Species regarded as pathogens are usually found in healthy individuals as well as affected individuals but at a lower level in case of healthy ones [26,27]. Caries is highly related and influenced by the patient's dietary habit, sugar intake, salivary flow, salivary fluoride level and preventive