

## Efficacy of a whitening toothpaste containing ImerCare® PearlWhite 19 and Bromelain: A Clinical Trial

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### Abstract

A randomized clinical trial evaluated the efficacy, esthetics and acceptance of an FDA approved, SLS Free tooth whitening paste containing ImerCare® PearlWhite 19 and Bromelain using Vita 3D Master shade guide in maxillary and mandibular anterior teeth among randomly selected 30 subjects. Participants were assigned to brush twice daily (morning and evening) for 2 minutes each using rolls technique. Shade changes using Vita 3 D master tooth shade guide were examined on day 1, after 15 days and day 30 of assigned toothpaste to subjects. All visual inspections were performed under the same lighting conditions and by the same examiner. Results revealed a shade difference by 1 to 2 shades lighter teeth in most subjects.

### Introduction

Today, a pure and brilliant smile with natural teeth is considered as an integral part of aesthetic beauty in modern communities [1, 2]. According to a number of published studies, patients and consumers reported a certain level of discomfort with their natural tooth color [3-6] and give more importance to the cosmetic profits obtained from their natural. Although in the past, the discolorations of the teeth were known to be a challenge, in today's modern dentistry, tooth whitening is well accepted as an indispensable component of aesthetic dentistry via two routes: whitening by whitening gels in a dental office or supervised at home and/or by the removing and controlling of external tooth staining [3, 4].

Intrinsic colorations and the precipitation of antiseptics, such as chlorhexidine, or of chromogenic dietary substances, such as coffee, could affect the color of natural dentition [7, 8].

Whitening toothpastes are regarded as a quite cost-effective and user-friendly method to whiten teeth compared to whitening techniques [9-12] and several manufacturers have launched a variety of whitening toothpastes with promising results within 2-4 weeks, as an alternative to home/office whitening. Brooks et al. [13] stated that 96% of the toothpastes in the market have tooth whitening capabilities as they contain hydrogen peroxide or abrasive components [10, 14]. The intensity and appearance of discoloration are thought to be reduced by the hydrated silica, calcium carbonate, dicalcium phosphate dihydrate, calcium pyrophosphate, alumina, perlite or sodium bicarbonate in the whitening toothpastes by removing pigmented biofilms and chromophores from the tooth surface or by modifying pigments adhered to the tooth surface [14, 15] such as optical modifying toothpastes, which have a potential of forming a fine, semitransparent film layer on the tooth surface via bluish special pigments. Thus, teeth seem whiter and brighter. [14-17]

Additionally, abrasion level in a toothpaste to be incorporated into the chemical composition of the toothpaste is limited and regulated internationally to use it safely.

Bromelain on the basis of their proteolytic action has been used in cancer therapy, cardiovascular function and maintenance of general health. It is known to possess the ability to hydrolyze large proteins into smaller peptides and amino acids. Bromelain is extracted from the stem and fruit of Pineapple (*Ananas comosus*) plant. It prevents the propagation of inflammation by blocking pro-inflammatory metabolites used extensively to treat arthritis, trauma and other inflammatory processes [13].

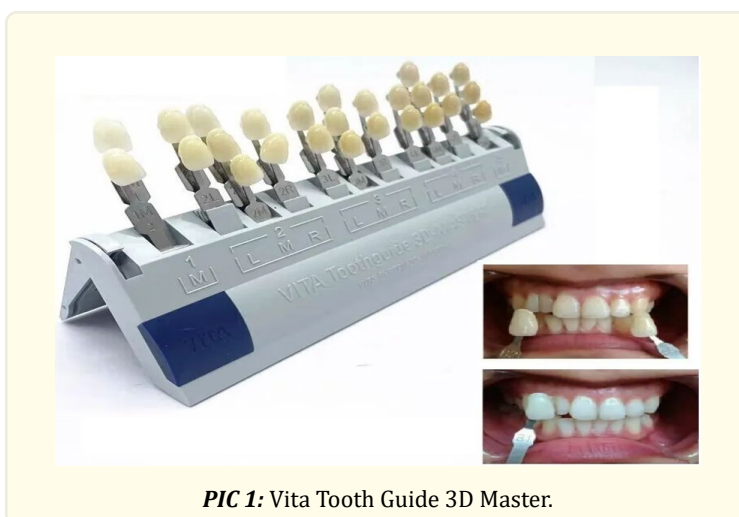
Medically, bromelain in conjunction with animal proteases like trypsin and chymotrypsin offer a wide spectrum of therapeutic effects. Their collective anti-edematous, anti-inflammatory, anti-thrombotic and fibrinolytic action has been established in laboratory and human studies. They modulate the functions of adhesion molecules on blood and endothelial cells, and also regulates and activates various immune cells and their cytokine production [14].

### *Clinical Intervention*

To standardize the oral hygiene regimen, subjects were instructed to brush their teeth for 90 seconds, twice a day with the provided toothpaste (Perfora Dream White tooth paste), for 30 days.

### *Experimental design*

A sample size of 30 patients were inspected. Recruitment criteria were similar shade, size, and surface texture. Tooth shade evaluation was performed by (vita 3D MASTER) on day 1, 15 days and at 30<sup>th</sup> day interval. Patients were instructed to brush twice a day using rolls technique.



**PIC 1:** Vita Tooth Guide 3D Master.

### *Brushing protocol*

The tooth was brushed using soft manual toothbrushes with rolls technique (brushing twice daily for 2 min).

### *Color evaluation*

The tooth shade determination was performed the following day after the first application of toothpaste. The other tooth shade measurements were done at 15 and 30 days intervals. At each evaluation period, tooth shade was observed using the same protocol applied at baseline. Whitening was considered by increasing in lightness and by yellowness reduction.

<i>PATIENT NO.</i>	<i>SHADE DAY 1</i>	<i>SHADE DAY 15</i>	<i>SHADE DAY 30</i>
1.	2M3	2M2	2M1
2.	4L2.5	4L1.5	4L1.5
3.	2R2.5	2R1.5	2R1.5
4.	3R2.5	3R1.5	3R1.5
5.	5M3	5M2	5M1
6.	2L2.5	2L1.5	2L1.5
7.	4M3	4M2	4M2
8.	2M2	2M1	2M1
9.	3L2.5	3L2.5	3L1.5
10.	4R2.5	4R1.5	4R1.5
11.	2R2.5	2R1.5	2R1.5
12.	5M3	5M2	5M1
13.	2M3	2M2	2M1
14.	4M3	4M2	4M1
15.	3L2.5	3L2.5	3L1.5
16.	2M3	2M2	2M1
17.	5M3	5M2	5M1
18.	4L2.5	4L2.5	4L1.5
19.	2L2.5	2L1.5	2L1.5
20.	4M3	4M2	4M1
21.	3R2.5	3R2.5	3R1.5
22.	5M3	5M2	5M1
23.	2R2.5	2R1.5	2R1.5
24.	4M3	4M2	4M2
25.	3L2.5	3L2.5	3L1.5
26.	5M3	5M2	5M1
27.	2R2.5	2R1.5	2R1.5
28.	3M3	3M2	3M1
29.	1M2	1M1	1M1
30.	4L2.5	4L2.5	4L1.5

**Table 1:** Color Evaluation Of Shade On Day 1, Day 15 And Day 30 Respectively Using Vita 3d Master Shade Guide.

## Discussion

Our study evaluated the effect of Perfora Dream White toothpastes. It was tested in terms of shade, size and surface texture of teeth evaluated.

The toothpaste was deposited onto the enamel surface and brushed, and over 30 days of use, it provided an instant and favorable change in the tooth color and created a visual perception that teeth appeared whiter and brighter.

At all evaluation periods, significant tooth color changes were noticed after visual inspection of teeth on day 15 and day 30. Therefore, according to our findings, the null hypothesis was accepted because the whitening toothpaste tested behaved as the conventional whitening toothpaste however added benefits being SLS free, incorporation of bromelain, ImerCare and PearlWhite19.

Studies have reported that vita 3D master tooth shade guide are more sensitive to detecting and measuring minutest color differences on tooth surface.

## Conclusion

Based on the observations, it can be concluded that Perfora Dream White whitening toothpaste revealed 1 to 1.5 lighter shade in subjected teeth. The tooth paste has active ingredients like ImerCare PearlWhite19 and bromelain enzymes that have clinically proven to remove surface stains and whiten teeth. It has triple mint formula which is known for antibacterial properties and leaves with long lasting freshness enhances the natural color of the teeth. Moreover, the toothpaste doesnot contain any harmful oxides to enhance tooth shade by causing any effervescence.

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