Author's response to reviews

Title: In vitro tooth whitening effect of two medicated chewing gums compared to a whitening gum and saliva

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Author's response to reviews: see over
Title: In vitro teeth whitening effect of two nicotine medicated chewing gums compared to a whitening gum and saliva (MS: 2709242571870834)

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Author’s response to reviews

To: Ashleigh Manning
Assistant Editor
BMC-series journals

Dear Mrs Manning,

Please find below our answers to reviewers. We hope that the changes made to the manuscript meet the reviewer’s satisfaction.

We greatly appreciate your cooperation and look forward to hearing from you.

With best regards,

Nathalie Hasler-Nguyen, PhD

Reviewer: Darren Lath

Major Compulsory Revisions
1. Throughout the manuscript the test samples were often referred to as teeth. This is incorrect as dental enamel blocks were used as test samples. Please change teeth samples to either just samples or enamel samples.
   Answer: corrections were made according to the referee.

2. Are CIE lab values obtained from absorbance or reflective spectrophotometry, can you describe the spectrophotometer in greater detail.
   Answer: Minolta CM-503i reflectance spectrophotometer, diffuse illumination/8° viewing angle and 3mm aperture with a D65 illuminant setting. This information was updated in material and methods

3. CIE L* is a measure of lightness and not whiteness (a different concept) as is mentioned in the abstract and methods section. This needs to be consistent
throughout the manuscript.

Answer: corrections were made according to the referee.

4. In the methods section it was mentioned that the specimens were pumiced. Would the pumice not cause to the surface greater than that of previous hand polishing? If so, is it not likely that light will be diffused, possible giving misrepresentation of results? Maybe add this into the discussion

Answer: The flour of pumice used for the removal of existing extrinsic stain (to determine inherent), does impart a quantifiable polish to the specimen surface and it was similar to the prophylaxis paste used for dental cleanings in the dental office. Therefore this would not cause surface scratching, resulting in scattered light, which could interfere with the measurement. This explanation was added in the discussion.

5. Would the air drying result in desiccation and therefore affect the results? This could also be mentioned in discussion.

Answer: It is important to note, that the specimens lighten as they dry, and that within the first few minutes, the color parameters change dramatically but stabilize after 30 minutes. All readings, with all of the groups, were completed after this period, therefore ensuring reliable results. This information was added in the discussion.

6. In the discussion it states" Visual evaluation……", and figure 2 talks about visual evaluation, yet there is no mention of a visual evaluation in the methods section. Either expand on this in the methods section or remove the words visual evaluation from the manuscript.

Answer: we fully agree, so reference to `visual evaluation’ was removed from the manuscript.

7. In the discussion, there is a statement which suggests that baking soda removes extrinsic and intrinsic stains backed up by references 8 and 9. I was unable to access these references-please see below enclosed. Is it correct that baking soda can remove intrinsic stains? Yes see reference 9* From my understanding, intrinsic stains are removed by chemical processes such as peroxide bleaching and cannot be removed by abrasives. Please verify this.


Minor essential Revisions
1. References need to be in the style outlined in the author guidelines. Issue number of journal needs to be in bold and there should be no spaces between issue number and page numbers. Please modify references.

Answer: this has been completed.

2. There needs to be grammatical changes throughout the manuscript, for
example changing the word teeth for tooth. The title could be changed from “In vitro teeth whitening……” to “In vitro tooth whitening……”
Answer: this has been done.

Discretionary revisions
1. There is no mention of any limitations to this work. The authors may like to mention this, possibly in the discussion.
Answer: This method could not measure specific area of the stained enamel. This was included in the discussion.
In the last paragraph of the discussion we have added: ‘‘Considering all the above points the in vitro mastication system is a suitable method for assessing the mechanical removal of extrinsic stain by abrasive or polishing agents such as sodium bicarbonate and carbonate calcium respectively. However this procedure might not allow to underscore the effect of agent like xylitol or carbamide on reduced dental plaque formation, which contribute also to tooth whitening appearance [11-13]’’.

Reviewer: Anut Itthagarun

Minor Essential Revisions

1. Title: In vitro tooth whitening…instead of …teeth whitening. This should apply through the article, eg last sentence of “Background” and so on…
Answer: This has been done

2. Background : second sentence (Lines 2-6) “The natural…environment (2)” is too long and confusing, should be rewritten.
Answer: This was rewritten

3. Background : line 11… “taken of” should be , .”taken off”…Answer : This was corrected

4. Background : Line 14… “teeth staining” should be… “tooth staining”. Answer : This was corrected

5. Background : Line 15 “Since…therapy” should be shortened to “Chewing gum has also been used to…therapy” and the authors should quote the reference for this statement. Answer : This was corrected

6. Line 19 : Please clarify the reason for quoting reference 5 here(for example, refer to method used?).
Answer: this refers to the method used: this is clarified as :using the in vitro method described by Kleber [6]

7. “Products” this entire section in “Methods” is not very clear and should be re-written. Answer: this was rewritten

8. “Preparation of enamel specimen”, Line 2, add “full stop (.)” between disk and
Using Answer: this was corrected

9. Teeth Staining Apparatus should be changed to Tooth Staining Apparatus. And in order to make it clearer, Figure 1 should be labeled as explained in the text. Answer: this description was displaced in legend of Figure 1

10. Teeth Staining Broth preparation should be changed to Tooth Staining Broth Preparation (Teeth to Tooth, p to P).
Answer: this was corrected

11. Please clarify the reason(s) for adding Micrococcus Luteus into the broth. Answer: Micrococcus Luteus is a stain producing bacteria found in our oral cavity. It is added to the broth to enhance and accelerate the extrinsic stain formation on the enamel specimens. This is clarified under Method.

12. When refer to the equipments used, the company name and the country of manufacturer should be included.
Answer: Minolta CM-503i Spectrophotometer with diffuse illumination/ 8° viewing angle and 3mm aperture, Minolta Camera Co., 101 Williams Drive, Ramsey, NJ, 07446.

13. Test Procedure : second sentence (Lines 3-5) should be rewritten.
Answer: this has been done.

14. Please include the amount of saliva used (second last line of page 6).
Answer: 15 ml of human saliva was used per 20 minute treatment.

15. The explanation in this section is not very clear. It should be rewritten and/or diagram/illustration should be used.
Answer: It was rewritten and picture was added Figure 1B.

16. Results : Last sentence of the “stain removal" (Page 9, Lines 2-4) should be rewritten. In fact, I could not detect the changes from Figure 2 (This could be just my version of article?).
Answer: As shown by arrows differences in colors could be seen between samples

17. Page 10, Lines 11, 12 “sodium bicarbonate sodium”?
Answer: It was corrected

18. Page 10, Lines 15-18, this sentence is too long and confusing. It should be rewritten.
Answer: It was rewritten

19. Reference : Reference 3, title of the article should not start with “capital
Answer: this has been done
letters”;
References 13 and 17, repeated page numbers should be deleted
Answer: this has been done

20. Delete extra “full stop (.)” at the end of Legends of Figure 3 and Table 1.
Answer: this has been done
Reviewer: Pier Francesco F Porciani

Reviewer's report:

Major Compulsory Revisions
Authors must specify major components of tested chewing gums and which are whitening agents added to the gum used as positive control (i.e. xylitol and carbamide) because different types of whitening chewing gums are on the market (i.e. added with baking soda, polyphosphates. etc.) and to refer their consideration to those ingredients and not generally to all whitening chewing gums on the market.

Answer: Ingredients of all chewing gum which are expected to contribute to whitening tooth effect are discussed in the discussion from the 2nd paragraph Line 11 up to the end of this section.

Minor Essential Revisions
1. Authors have to inform that whitening appearance is more influenced by L than a and b therefore delta E is the difference in color but it may not show directly a whitening process which is more linked to factor L than to E.

   Answer: It is reported in literature both ways. In most of our lab evaluations, they (L* and E) compliment each other. We do agree that ΔE can be misleading because of a* and b* bi-directional movement, whereas L* moves in only one direction which can give you a truer assessment of what is developing. But reporting only ΔE is still valid. In this specific evaluation, ΔE does mirror the ΔL. We added the ΔL results and underlined its strong contribution to the whitening appearance of teeth in the Results and Discussion section.

2. Please avoid the use of word “benchmark” referred to that whitening chewing gum in Discussion section or support it with references

   Answer: benchmark was replaced by the positive control

3. I suggest to remove ref. [5] in M&M section Teeth Staining Broth preparation because I think it not linked to the sentence.

   Answer: the sentence was rewritten and the reference was kept.

4. I suggest to move ref. [7] from Result (where it used to avoid reference) into M&M section when it is described the use of bovine teeth.

   Answer: this has been completed.