

Introduce Bamboo Charcoal Toothpaste: A Natural Revolution in Oral Care

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Abstract: *Natural and eco-friendly mouth care products have become more popular in recent years, which has led to the creation of new options. One of these new ideas is bamboo charcoal toothpaste, which is made from natural bamboo and doesn't have any artificial ingredients in it. As a new mouth care product, bamboo charcoal toothpaste is becoming more popular because it is good for the environment. Its main ingredient, activated bamboo charcoal, is taken out using a low-temperature carbonization process that keeps the natural traits of bamboo and makes it better at absorbing things. Adding bamboo charcoal to toothpaste has many benefits, such as getting rid of stains effectively, improving oral health, and making brushing feel fresh. The unique thing about this toothpaste is that it is made of 100 % natural ingredients with no chemicals. Common man-made chemicals like artificial sweets, fluoride, and sodium lauryl sulfate are not used in this product. Because it doesn't contain any chemicals, it's safe for people with sensitivities and meets the growing demand for environmentally friendly and long-lasting mouth care products. Another thing that makes bamboo charcoal toothpaste stand out is that it can really soak up things. It effectively takes in and gets rid of dirt, germs, and bad smells, leaving the mouth feeling fresh and clean. Also, the gentle polishing action of the charcoal particles gets rid of surface spots well without hurting the tooth enamel. But it's important to remember that bamboo charcoal toothpaste may not work as well for everyone because everyone has different teeth needs. It's a great addition to daily oral care habits, but people who have certain dental needs or medical conditions might not be able to completely replace fluoride-based toothpaste.*

Keywords: Bamboo Charcoal Toothpaste, Organic Oral Care, Chemical-Free Dental Products, Sustainable Toothpaste, Eco-Friendly Dental Care.

I. INTRODUCTION

Oral hygiene is an important part of our daily lives, and the items we use are very important for keeping our teeth healthy. In the past few years, people have become more interested in natural, chemical-free, and environmentally friendly alternatives to common oral care items. One new idea that has gotten a lot of attention is bamboo charcoal toothpaste. People who like this toothpaste say it is a safe, effective, and good for the earth way to keep your teeth healthy. The interesting thing about bamboo charcoal toothpaste is that it is made from natural ingredients and is good for the environment. This study looks into bamboo charcoal toothpaste to find out what it is made of, how well it works for teeth, how safe it is, how it affects the environment, how users feel about it, how much it costs, and how it compares to other toothpastes. In this way, we hope to shed light on the possible benefits and things to think about when using this natural and long-lasting way to take care of your teeth. In the upcoming sections, we'll discuss the purpose, how we did our research, the practical aspects of our study, and what we learned from our case study in the parts that follow. This study looks into bamboo charcoal toothpaste to help people and doctors learn more about how it can be used as a natural, chemical-free, and eco-friendly way to clean teeth in a world that is becoming more and more concerned with the environment.

II. OBJECTIVES

General Objectives

- RQ1: Thoroughly examine the composition and characteristics of bamboo charcoal toothpaste, including an assessment of its active ingredients, texture, color, and flavor.
- RQ2: Assess the effectiveness of bamboo charcoal toothpaste in terms of its ability to clean, whiten, and protect teeth and gums, making comparisons with traditional toothpaste.

Specific Objective

- RQ3: Investigate the safety aspects and potential oral health benefits or risks associated with the usage of bamboo charcoal toothpaste, with a focus on its impact on oral hygiene, enamel, and gum health.
- RQ4: Delve into the environmental sustainability of bamboo charcoal toothpaste, encompassing its production methods, biodegradability, and carbon footprint.
- RQ5: Collect user feedback and experiences via surveys or interviews to gain insights into consumer perceptions, preferences, and satisfaction levels with bamboo charcoal toothpaste.

III. OVERVIEW OF VARIOUS OTC DENTAL CARE PRODUCT

In 1994, the World Health Organization marked World Health Day with the theme "Oral Health for a Healthy Life".[3] Since then, a variety of materials and techniques have been recommended and adopted to promote oral hygiene. Table 1 provides a listing of prominent over-the-counter (OTC) dental products along with their primary purposes in supporting oral health[1-2].

| SNO. | OTC Dental Care Product | Main Use |
|------|---------------------------------|--|
| 1 | Toothpaste | Used for brushing teeth to remove plaque, food particles, and stains. Typically contains fluoride to strengthen tooth enamel and prevent cavities. Specialty variants address issues like sensitivity, gum health, or teeth whitening. |
| 2 | Toothbrush | Used to physically remove food particles and plaque from teeth. Manual and electric toothbrushes are popular choices. |
| 3 | Dental Floss | Used to clean between teeth and along the gum line, where a toothbrush may not reach. Helps remove debris and prevent gum disease and cavities. |
| 4 | Mouthwash (Oral Rinse) | Used to freshen breath and reduce bacteria in the mouth. Some specialty mouthwashes target issues like plaque reduction, gum disease prevention, or teeth whitening. |
| 5 | Teeth Whitening Products | Used to remove or reduce stains on teeth and brighten the overall appearance of the smile. Includes whitening strips, gels, and toothpaste. |
| 6 | Oral Pain Relievers | Used to alleviate toothaches, gum pain, and mouth sores temporarily. Includes oral gels and topical analgesics. |
| 7 | Orthodontic Wax | Used by individuals with braces to alleviate discomfort and irritation caused by brackets and wires rubbing against the cheeks and lips. |
| 8 | Tongue Cleaners | Used to remove bacteria and debris from the surface of the tongue, helping to reduce bad breath. |
| 9 | Dry Mouth Products | Provide relief for individuals with dry mouth (xerostomia) by increasing saliva production. Includes sprays, lozenges, and mouthwashes. |
| 10 | Oral Health Supplements | Support overall oral health and may help prevent conditions like tooth decay and gum disease. Typically contain vitamins and minerals like calcium and vitamin D. |

Table 1: OTC dental care products with their main use.

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IV. IMPORTANCE OF CHARCOAL WITH BAMBOO

A type of toothpaste called charcoal toothpaste has activated charcoal as one of its main ingredients. Activated charcoal is a type of carbon that has been mixed with air to make it very porous and has a lot of surface area.

4.1 Benefits

- Food and drinks like red wine, curry, coffee, tea, and smoke can stain the surface of your teeth. This can help whiten your teeth[5].
- This medicine fights viruses and fungi.
- It might help get rid of some of the germs that cause bad breath.
- It gets rid of spots on the surface of the teeth without hurting the enamel.
- It can help keep stains from happening again.
- Because it kills germs and reduces inflammation, it may help improve gum health and reduce swelling.

4.2 Various Charcoal Production Method

Table 2 summarizes various types of charcoal and their respective production methods and characteristics.

| SNO. | Type of Charcoal | Description |
|------|-----------------------------------|---|
| 1 | Common Charcoal | Made from various sources, like coal, wood, coconut shells, grass, or oil. |
| 2 | Sugar Charcoal | It is made when sugar turns into carbon dioxide and is cleaned up by boiling it with acids. To get rid of any remaining hydrogen, it is burned in a chlorine stream to clean it even more.[6] |
| 3 | Activated Charcoal | Produced from things like wood, bone char, sawdust, coconut shells, coal, or olive pits for example. It is worked on at very high temperatures, which changes the structure inside, making it more porous and giving it more surface area.[7,8] |
| 4 | Lump Charcoal | Unlike briquettes, conventional charcoal is made from hardwoods and makes less ash. |
| 5 | Japanese Charcoal | The pyrolygneous acid is taken away during the production process, leaving charcoal that burns with little smoke and smell. |
| 6 | Pillow Shaped Briquettes | Usually made from sawdust and other waste wood that has been packed with a binder and other ingredients. As a heat source, brown coal and natural carbon may be added as well as starch to keep the mixture together. As fire aids, borax, sodium nitrate, and raw sawdust are used. Limestone is added to make the ash whiter. |
| 7 | Sawdust Briquette Charcoal | Produced by pressing sawdust together without adding any glue or other ingredients. Mostly used for grilling because it gives off a lot of heat with little smoke and smell and not much ash. |
| 8 | Extruded Charcoal | Without using a glue, this is produced by forcing raw ground wood or carbonized wood into logs. The heat and pressure of the extruding process keep the charcoal together. |

Table 2: Various Charcoal Production Method

4.3 Challenges and risks

- Charcoal toothpaste is rough, and it may take away your enamel. This could make your teeth more yellow and sensitive.
- Stains below the enamel can't be fixed properly.
- Veneers, bridges, or fillings may get stained by the charcoal.
- More research needs to be done on how safe charcoal toothpaste is in the long run.

V. LITERATURE REVIEW

The information presented in the literature review is derived from a variety of sources encompassing scientific studies, articles, and expert opinions on bamboo charcoal toothpaste. The discussion on active ingredients such as bamboo charcoal, coconut, and peppermint oil draws from the understanding of their properties and benefits for oral health. The effectiveness of bamboo charcoal toothpaste in cleaning, whitening, and protecting teeth and gums is supported by references to studies, particularly one from the Journal of Clinical and Experimental Dentistry. Safety aspects and potential oral health benefits or risks are discussed based on general knowledge and potential concerns, emphasizing the need for moderation in use. The exploration of environmental sustainability relies on information regarding bamboo as a renewable resource, organic and natural production methods, eco-friendly packaging, and the potential reduction in carbon footprint compared to traditional toothpaste. Overall, the literature review provides a comprehensive overview of bamboo charcoal toothpaste, combining scientific insights and practical considerations.

RQ1: Thoroughly examine the composition and characteristics of bamboo charcoal toothpaste, including an assessment of its active ingredients, texture, color, and flavor.

Bamboo charcoal toothpaste is a type of toothpaste that contains activated bamboo charcoal as one of its key ingredients. Activated bamboo charcoal is a type of carbon that has been mixed with air to make it very porous and have a lot of surface area.

Active Ingredients:

- **Bamboo Charcoal:** It is thought that activated coconut charcoal can help get rid of surface spots on teeth, making them look whiter. And because it is natural, it can help clean your breath and get rid of bad smells. It's also known for being able to soak up toxins and other impurities, which can help get rid of bad bacteria in the mouth.
- **Coconut:** Another natural ingredient that you can find in bamboo charcoal toothpaste is coconut. Antimicrobial properties make it well-known. These properties can help kill bad bacteria in the mouth.
- **Peppermint Oil:** The minty taste and fresh breath of peppermint oil are often added to bamboo charcoal mouthwash. It can also help kill bad germs in the mouth because it is antibacterial.
- **Texture:** When active charcoal particles are added to bamboo charcoal toothpaste, it makes it thick and gritty.
- **Color:** Because active charcoal is in bamboo charcoal toothpaste, it is usually black or dark gray in color.
- **Flavor:** To give bamboo charcoal toothpaste a fresh taste, peppermint oil, spearmint, or green tea extract are often used as flavorings.

RQ2: Assess the effectiveness of bamboo charcoal toothpaste in terms of its ability to clean, whiten, and protect teeth and gums, making comparisons with traditional toothpaste.

In the past few years, bamboo charcoal toothpaste has become more famous because it might be good for your teeth. This review looks at how well bamboo charcoal toothpaste cleans, whitens, and protects teeth and gums, comparing it to regular toothpaste:

When used as part of a regular dental care practice, both traditional toothpaste and toothpaste with bamboo charcoal can clean teeth well.

To whiten:

People think that bamboo charcoal toothpaste can help get rid of surface spots on teeth, making them look whiter. A study in the Journal of Clinical and Experimental Dentistry discovered that charcoal-based toothpaste worked better than normal toothpaste for whiter teeth. A lot of regular toothpaste also has things in it that can whiten teeth, like hydrogen peroxide or baking soda.

Protection:

Because it kills germs and reduces inflammation, bamboo charcoal toothpaste may help to improve gum health and reduce swelling. Fluoride, which is found in some traditional toothpaste, is known to help keep teeth healthy and strong. When used as part of a regular dental care practice, both types of toothpaste can help protect teeth and gums.

RQ3: Investigate the safety aspects and potential oral health benefits or risks associated with the usage of bamboo charcoal toothpaste, with a focus on its impact on oral hygiene, enamel, and gum health.

Possible Benefits for Oral Health

- **Natural way to whiten teeth:** People believes that bamboo charcoal can help get rid of surface spots on teeth, making them look whiter.
- **Freshens breath[9]:** Bamboo charcoal naturally gets rid of smells, so it can help clean your breath and fight bad smells.
- **Gets rid of plaque:** Toothpaste with bamboo charcoal may help get rid of plaque on teeth[10].
- **Lessens the spread of bad bacteria:** activated charcoal can remove toxins and other impurities, which can help get rid of bad bacteria in the mouth[11].
- **Improves gum health:** Because it kills germs and reduces inflammation, bamboo charcoal toothpaste may help to improve gum health and reduce inflammation.

Safety Aspects

Charcoal is harmless and is usually thought to be safe[12].

You shouldn't use charcoal toothpaste every day because it is too rough and could hurt your teeth's enamel[13].

It won't get rid of stains below the enamel.

Toothpaste with charcoal may make teeth sensitive[14].

RQ4: Delve into the environmental sustainability of bamboo charcoal toothpaste, encompassing its production methods, biodegradability, and carbon footprint.

Compared to regular toothpaste, bamboo charcoal toothpaste might be better for the earth in some ways.

Methods of Production[15]: Bamboo is a resource that can be used over and over again, so it can be used instead of traditional toothpaste ingredients that are bad for the environment. Some brands of bamboo charcoal toothpaste use organic and natural ingredients, which means that production has less of an effect on the earth.

Biodegradability: Some brands of bamboo charcoal toothpaste use eco-friendly containers made of bamboo and tin, which lowers the product's effect on the environment and helps fight the plastic waste crisis. Bamboo toothbrushes, which can come with bristles that have been mixed with activated charcoal, are better for the earth than plastic toothbrushes.

Carbon Footprint: Bamboo charcoal toothpaste may have a smaller carbon footprint than regular toothpaste because it is made with bamboo, which is available year after year[16].

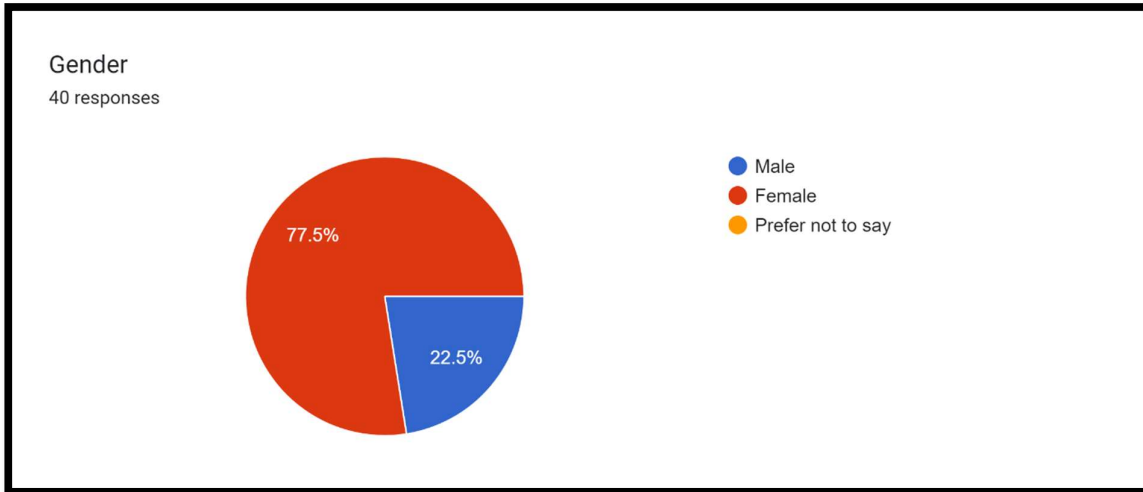
VI. HYPOTHESIS

The hypothesis of this research is based on regular use of bamboo charcoal toothpaste will result in superior teeth whitening compared to traditional toothpaste, given the presence of activated bamboo charcoal, coconut, and peppermint oil.

Bamboo charcoal toothpaste, with its natural composition and eco-friendly production, is hypothesized to not only match but surpass the overall oral health benefits provided by conventional toothpaste, encompassing changes in tooth color, reduction of surface spots, and improvements in enamel and gum health.

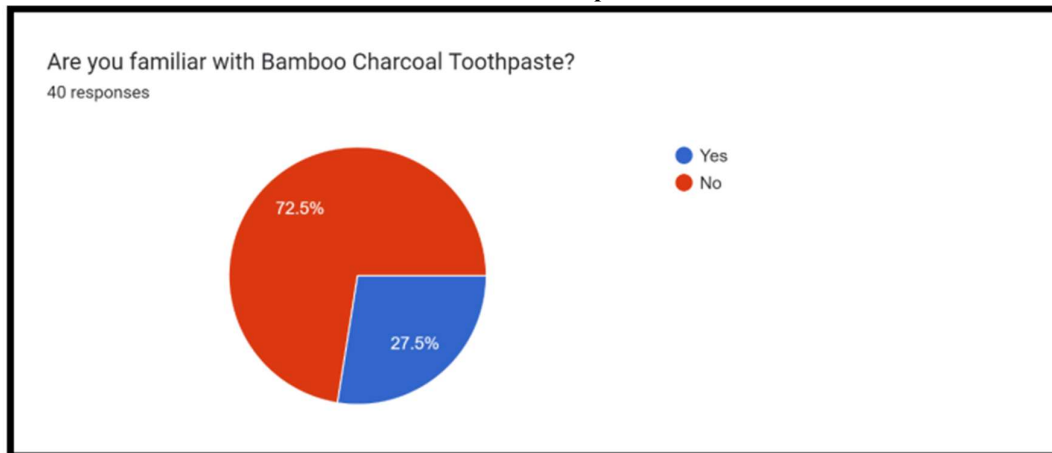
VII. METHODOLOGY

Quantitative methodologies play a crucial role in advertising research, providing a systematic approach to understanding various aspects of interest. In the context of this study on bamboo charcoal toothpaste, a quantitative methodology was adopted to assess consumer perceptions of the product. In contrast to the widely-used focus groups as a qualitative method, this research leveraged a quantitative approach to gather data from a total of 40 respondents. Among them, 22.5% identified as male, while 77.5% identified as female or other genders. The survey utilized specific questions to elicit responses and insights regarding individuals' experiences and preferences with bamboo charcoal toothpaste, as mentioned in Graph 1.



Graph: 1- Statistical Data of Participants

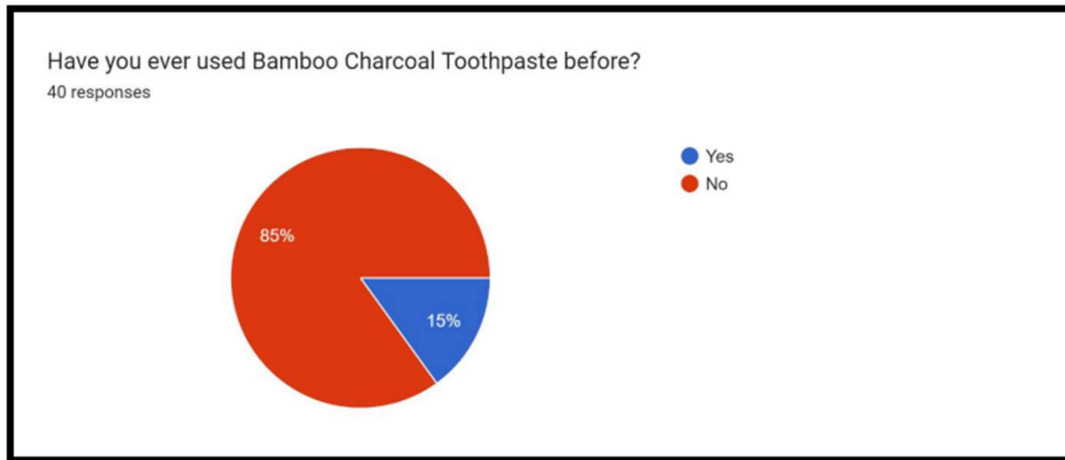
Question 1: Are Your Familiar with Bamboo Charcoal Toothpaste?



Graph: 2 – Familiar with Bamboo Charcoal Toothpaste

ANALYSIS: The survey results present a clear picture, with approximately 72.5% of respondents showing limited familiarity with Bamboodent Toothpaste. This highlights a significant lack of awareness regarding the product. To address this issue, it is crucial to initiate comprehensive marketing and awareness campaigns aimed at effectively introducing and educating consumers about Bamboodent Toothpaste, as mentioned in Graph 2.

Question 2: Have yo ever used Bamboo Charcoal Toothpaste before?



Graph 3: Potential for expanding the product

ANALYSIS: The survey results indicate a substantial untapped market, with a significant 85% of respondents reporting no prior usage of Bamboodent Toothpaste. This suggests a noteworthy opportunity for product adoption and growth among new users. In contrast, only 15% of participants have previous experience with the product, underscoring the potential for expanding its user base, as mentioned in Graph 3.

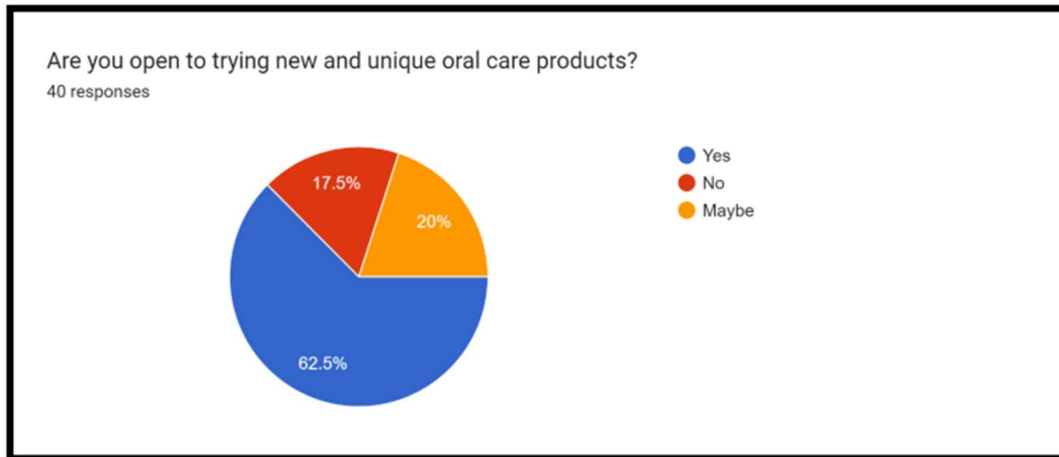
Question 3: Do You prioritize eco-friendly and sustainable products in your daily life?



Graph 4: Eco preference

ANALYSIS: The survey unveils a clear preference for eco-friendly and sustainable products among respondents' daily choices, with 65% actively prioritizing them, 30% occasionally doing so, and just 5% not prioritizing these products. This favorable stance suggests a receptive audience for environmentally friendly offerings, like Bamboodent Toothpaste, as mentioned in Graph 4.

Question 4: Do Are you open to trying new and unique Oral Care Products?



Graph 5: Openness with Oral Care Product

ANALYSIS: The survey indicates that a significant 62% of respondents are open to the idea of trying new and unique oral care products, displaying a clear willingness to explore innovative options. However, it's worth noting that 17.5% are not open to experimenting with such products, and 20% remain open to the possibility but are uncertain. This diversity in responses underscores the opportunity to focus marketing efforts on the receptive portion of the audience interested in trying new oral care solutions like Bamboodent Toothpaste, as mentioned in Graph 5.

VIII. CONCLUSION

In conclusion, bamboo charcoal toothpaste is a natural, chemical-free, and environmentally friendly option to traditional dental products. Using activated bamboo charcoal keeps the natural qualities while making it better at absorbing things. This toothpaste gets rid of spots well, keeps your teeth healthy, and makes brushing feel great without using any artificial ingredients. But everyone's teeth needs are different, and some people still need toothpaste with fluoride in it. As an extra choice for daily oral care, bamboo charcoal toothpaste shows how eco-friendly and effective personal care products can be.

REFERENCES

- [1]. Goryawala, S.N., Chavda, P., Udhani, S., Pathak, N.V., Pathak, S., Ojha, R., A survey on oral hygiene methods practiced by patients attending Dentistry Department at a Tertiary Care Hospital from Central Gujarat. *J. Int. Soc. Prev. Community Dent.*, 6, 2, 115–119, 2016
- [2]. Frank, C., Everything you need to know about dental and oral health, <https://www.healthline.com/health/dental-and-oral-health>, 2018.
- [3]. Anonymous. Previous World Health Days, World Health Association, Geneva, 2016
- [4]. Thakur, A., Ganeshpurkar, A., & Jaiswal, A. (2020). *Charcoal in Dentistry. Natural Oral Care in Dental Therapy, 197–209.*
- [5]. Tony, Dental DIY teeth whitening with activated ,2019
- [6]. Hugh, C. (Ed.), *Eyclopædia Britannica 5*, 11th ed., pp. 305–307, Cambridge University Press, Chicago, 1911.
- [7]. Petre, A., What Is Activated Charcoal Good For? Benefits and Uses, <https://www.healthline.com/nutrition/activated-charcoal>, 2017.
- [8]. Juurlink, D.N., Activated charcoal for acute overdose: A reappraisal. *Br. J. Clin. Pharmacol.*, 81, 3, 482–487, 2016.
- [9]. Middleton, A., Tooth whitening versus stain removal. *BDJ*, 49, 17175, 2017.
- [10]. Karkkainen, S. and Neuvonen, P.J., Pharmacokinetics of amitriptyline influenced by oral charcoal and urine pH. *Int. J. Clin. Pharmacol. Ther. Toxicol.*, 24, 6, 326–332, 1986.

- [11]. Panda, S., Mishra, S.R., Kar, P.K., A review on activated charcoal tooth paste. *Int. J. Sci. Res.*, 7, 1, 253–254, 2018.
- [12]. Magalhaes, C.A., Wiegand, A., Rioss, D., Honorio, H.M., Buzalaf, M.A.R., Insights into prevention measures for dental erosion. *J. Appl. Oral. Sci.*, 17, 2, 75–86, 2009.
- [13]. Brucculieri, J., Is Charcoal Toothpaste Safe? Dentists Explain The Risks, *Style & Beauty*, beauty. org., 2018
- [14]. Lewis, J., Charcoal Toothpaste: Benefits and Side Effects, 2017
- [15]. Azeez, Mayowa Akeem & Orege, Joshua. (2018). Bamboo, Its Chemical Modification and Products. 10.5772/intechopen.76359.
- [16]. Martin N, Mulligan S. Environmental Sustainability Through Good-Quality Oral Healthcare. *Int Dent J.* 2022 Feb;72(1):26-30. doi: 10.1016/j.identj.2021.06.005. Epub 2021 Aug 16. PMID: 34412896; PMCID: PMC9275203.