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“Optimizing Innovation in Knowledge, Education and Design”

EXTENDED ABSTRACT



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|----|--|---------|
| 5 | CNN-Based Model on Potential Dyslexia Detection Based on Automated Handwriting Features Extraction
<i>Siti Azura Ramlan, Iza Sazanita Isa, Ahmad Puad Ismail, Muhammad Khusairi Osman & Zainal Hisham Che Soh</i> | 584-588 |
| 6. | EDUxic for Dyslexic: A Framework for Teaching Aids
<i>Norarifah Ali, Azhari Md Hashim, Roslinda Alias & Muhammad Nidzam Yaakob</i> | 589-595 |

CATEGORY: BST YOUNG INVENTOR

- | | | |
|----|--|---------|
| 1. | Flood, Earthquake, Air Pollution (FEAR) Alert and Monitoring System with WiFi Module
<i>Mohd Sufian Ramli, Siti Sufiah Abd Wahid, Khairul Kamarudin Hasan & Danial Zarif Mohammad Zaharuddin</i> | 596-600 |
| 2. | C++ Rush: Interactive Game for Novices in Learning Basic Computer Language
<i>Muhammad Salman Hakim Shaiful Nizam & Arifah Fasha Rosmani</i> | 601-606 |
| 3. | GoBox
<i>Aqib Syahir Bin Ahmad Tarmizee, Ariff Hakimi Bin Ahmad Khusairi, Muhammad Zulhilmi Bin Mohamad Fauzi, Nur Afiqah Binti Zakaria, Nur Nadiah Binti Zuber, Nur Farahah Binti Mohd Fauzi & Amilia Binti Saidin</i> | 607-611 |
| 4. | Smart Vision the Smart Projector
<i>Muhammad Hazim Bin Roslan, Harith Danial Bin A.S Azmi, Muhamad Hakim Bin Anuar, Muhammad Faris Syazwi Bin Shukri, Muhammad Zahiruddin Bin Omar, Afidah Binti Sapari & Dr Vani A/P Tangamani</i> | 612-618 |
| 5. | UniEase
<i>Muhammad Haziq Syukran Bin Abdul Manaf, Muhammad Sallehudin Bin Samudin, Muhammad Syukran Bin Mohamed Desa, Aisya Nurdania Binti Mohd Noor Azian, Alia Hasanah Binti Abdul Rahim, Nurin Syakira Binti Ahmad Zainuddin & Nor 'Asyiqin Abu</i> | 619-622 |
| 6. | Exploring the Potential of Aloe Vera and Coconut Oil in Natural Toothpaste Tablets
<i>Muhammad Nazrul Afiq Zulkifli, Muhammad Irfan Mustakim, Nurul Ain Jaaizah Muhamad Zaki, Nur Syabila Husna Mohd Bakti, Nurul Aimi Zakaria, Zubainun Mohamed Zabidi & Ahmad Nazib Alias</i> | 623-627 |
| 7. | Building Resilient Start-Up: A Comprehensive Strategic Framework for Start-Up Survival
<i>Irme Rafhan Ibrahim, Ammar Yasir Mustafa, Aqilah Hanif, Batrisyia Tihani Hamdan, Maisarah Ruslan, Wan Hafiz Aizuddin Wan Yusoff & Suriana Ramli</i> | 628-638 |

Assalamualaikum warahmatullahi wabarakatuh,



First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality. I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services. By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality. I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

Professor Dr. Roshima Haji Said
RECTOR
UiTM KEDAH BRANCH



WELCOME MESSAGE (i-SPIKE 2023 CHAIR)



We are looking forward to welcoming you to the 3rd International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is "*Optimizing Innovation in Knowledge, Education, & Design*". We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPIKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPIKE 2023; your dedication and hard work are greatly appreciated.

Dr. Junaida Ismail

Chair

3rd International Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023)

EXPLORING THE POTENTIAL OF ALOE VERA AND COCONUT OIL N NATURAL TOOTHPASTE TABLETS

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ABSTRACT

Plastic toothpaste tubes take an extremely long time to biodegrade. The initiative to produce natural toothpaste tablets can be a big step toward lessening the plastics nightmare the Earth currently finds itself. However, it is very necessary to make sure toothpaste tablet production process and raw materials used does not intent any harm to environment. Furthermore, natural toothpaste tablets use plant-based ingredients such as aloe vera and coconut oil which are a better version compared to chemical toothpaste. To test the hypothesis that durability and efficacy will influence the quality of toothpaste production, water resistance method was used to examine the durability of the toothpaste tablets. In addition, eggshell experiment method was also used to study the effectiveness of natural toothpaste tablets. The result showed that toothpaste tablets that been produced during this project wasproved effective by using all natural ingredients. Sample 3 is the best and most suitable to produce an effective toothpaste tablet as it gives ideal ingredients measurement and perfect texture as pills. These result

suggest that natural tablets toothpaste is a better version compared to chemical toothpaste because of it using all natural ingredients. This can be proved that the natural ingredient that been used which is coconut oil can help in the reduction of plaque formation on the teeth. Besides, tablets toothpaste is not using plastic toothpaste tubes as its storage place. Hence, by this initiative, which is using natural tablets toothpaste, it will help to reduce the environmental pollution. This research mainly deals with making non-chemical based, eco-friendly and cost-effective tablet toothpaste from aloe vera and coconut oil also replace the normally used toothpaste in future.

Keywords: Plastic toothpaste tubes, Aloe vera, Coconut oil, Natural tablets toothpaste, Chemical toothpaste, Environmental pollution

INTRODUCTION

Every consumer uses toothpaste, which is a necessary product in everyday life. To promote and maintain dental and oral health, many people use toothpaste, a personal hygiene item (Demir et al., 2021). When compared to earlier times, oral health knowledge has greatly increased. A person can grow healthier and more at ease with others by taking good care of their oral health. The overall aims for this project are to innovate a new toothpaste tablets formula by only using natural ingredients without using any additional chemicals. They deliver the same oral health benefits as toothpaste from a tube without affecting our environment. The small toothpaste tablets are convenient to carry and will not leak like the one in the tube. Additionally, an attempt is made to produce a toothpaste tablet from plant-based ingredients that have powerful cleaning properties which are aloe vera and coconut oil.

LITERATURE REVIEW

Maintaining oral hygiene and avoiding dental issues like tooth decay, gum disease, and bad breath require the use of toothpaste (Elkhodary et al., 2023). Due of their potential advantages over conventional toothpaste, natural and herbal toothpaste formulations have attracted increasing attention in recent years (Sohta et al., 2023). Two organic components that have drawn interest are coconut oil and aloe vera because of their potential advantages for dental health. According to a study, the effect of aloe vera toothpaste on gingival and plaque indices was comparable to that of fluoride toothpaste, suggesting that it might be used as a substitute for chemical toothpaste (Sayar et al., 2021).

Another study on toothpaste with coconut oil, when visiting the dentist after three and six months, the autistic children who frequently used coconut oil continued to exhibit good oral hygiene, whereas those who used toothpaste displayed the highest level of fair oral hygiene (Al-Rawi, 2018). This shows that coconut oil is one of the ingredients that improved oral hygiene. The alternative use of an herbal toothpaste instead of a non-herbal toothpaste formulation should be considered for promoting oral health care (Vajrabhaya et al., 2022). Beside that a study by using toothpaste tablets had a greater impact than using toothpaste cream, according to a comparison of a single score per functional unit of brushing teeth for two minutes twice a day for six months in both cases (Suppipat et al., 2022).

METHODOLOGY

In this project, there are two ingredients that act as the base which is coconut oil and aloe vera gel. There are five samples of toothpaste. The base of the first sample is coconut oil and the base of the toothpaste in the second sample is made from aloe vera gel. The remaining sample is a combination of aloe vera and coconut oil in varying ratios. Sample 3 has aloe vera

and coconut oil in a 1:1 ratio. While sample 4 is when there is a 2:1 ratio between coconut oil and aloe vera. Lastly, sample 5 has a ratio of 1:2 aloe vera and coconut oil. Then all the samples will be added with bicarbonate soda and peppermint oil respectively and whipped well until it mixed and form a paste. All the samples will be put inside of ice cube tray separately by using pipping bag and left until it cold and solidify. The effectiveness of the samples was tested by putting them on an eggshell. Half of the eggshell surface was smeared with the samples and the other half surface does not smear with the samples. The eggshells then were put inside a container contained with vinegar and left soaked. The eggshells were observed after half of hour or more and recorded. While for the durability test of the samples, a few drops of water were dropped to the sample. The samples were observed and recorded.



Figure 1. Toothpaste Tablet

RESULT AND DISCUSSION

Table 1. Sample and Main Ingredients

Sample	Name
1	Coconut Oil
2	Aloe Vera Gel
3	Mixture of coconut oil and aloe vera oil with a ratio of 1:1
4	Mixture of coconut oil and aloe vera oil with a ratio of 2:1
5	Mixture of coconut oil and aloe vera oil with a ratio of 1:2

Table 2. Results for both effectiveness and durability

Sample	Durability		Effectiveness	
	Durable	Brittle	Effective	Ineffective
1	—			—
2		—	—	
3	—		—	
4	—			—
5		—	—	

The first sample was made using a 100% of coconut oil base. The texture of this sample is quite moist and convenient to shape. It is because oil-based are very greasy, non-porous, and almost impervious. Therefore, it is quite easy to mix with other ingredients to stay in form this is due to coconut oil which is entirely made up of fat with 80-90 percent of it being saturated fat (Archibald, 2021). For the effectiveness test, the result obtained that this sample of toothpaste tablets was useful but not entirely functional as the regular toothpaste. It is because the eggshell's side covered with this toothpaste was moderately affected only certain part of the

eggshells is eroded.

The outcome from this sample 2 (100% aloe vera) is it easily breaks and is shattered after undergoing the durability test. As the consequence, all the tablet toothpaste falls to pieces and does not stay in its original structure. The effectiveness test for sample 2 shows that its is effective compare to sample 1.

The third sample was produced by using the mixture ratio of 1:1 from coconut oil and aloe Vera gel which these two main ingredients were equally scaled. The texture of this sample is tremendously firm and a bit hard to shape. It takes more time to mix with other ingredients and the toothpaste tablet was unbreakable and remains in shape after carrying out the durability test. All the toothpaste tablets of sample 3 do stay in their original structure due tois fat in coconut oil that helps this sample to stay in shape. As for the effectiveness testsample 3 do pass the test as well as durability test it can be classified as ideal ratio of sample. The outcomes for sample 4 are identical to those for sample 1. even though the sample is durable, it is ineffective. Regarding sample 5, it is similar with sample 2, which is brittle but effective.

CONCLUSION

In the conclusions, toothpaste tablets that were produced during this project were proved effective by using all-natural ingredients. Toothpaste is now more convenient when it is available as a tablet form. There will be no more painful squeezing or complicated tube origami to remove the last speck of paste. Nevertheless, there are still more aspects to improve in the making of these toothpaste tablets. While all these findings support theantibacterial qualities of toothpaste tablets for oral bacteria and indicate that they have a high potential for commercialization, more research is needed to ensure that the formula is safe and has no major side effects. After considering all outcomes from the experiment, it was convinced that sample 3 is the best and most suitable to produce an effective toothpastetablet. It is because sample 3 has ideal ingredients measurement and perfect texture as pills.

REFERENCES

- Al-Rawi, B. A. O. (2018). Coconut Oil for Improving Oral Health of Autistic Children. *Journal of Research in Medical and Dental Science*, 6(6).
- Archibald, J. (2021). Benefits, how to, and risks of oil pulling with coconut oil. *Medical News Today*. <https://www.medicalnewstoday.com/articles/323757#overview>
- Demir, S., Keskin, G., Akal, N., & Zer, Y. (2021). Antimicrobial effect of natural kinds of toothpaste on oral pathogenic bacteria. *Journal of Infection in Developing Countries*. <https://doi.org/10.3855/jidc.14966>
- Elkhodary, H. M., Abdelnabi, M. H., Swelem, A. A., Sabbagh, H. J., El Meligy, O. A. E. S., Talaat, I. M., Abdellatif, E. B., Khader, Y., Al-Batayneh, O. B., Al-Khanati, N. M., Nurelhuda, N. M., Alhabli, S., Mostafa, M. H., Qureshi, S., Qureshi, N., Yousaf, M. A., Taha, D., Marafi, Y. F., Al Harrasi, S. N., ... El Tantawi, M. (2023). Individual, familial and country-level factors associated with oral hygiene practices in children: an international survey. *BMC Oral Health*, 23(1). <https://doi.org/10.1186/s12903-023-02746-0>

- Sayar, F., Farahmand, A. H., & Rezazadeh, M. (2021). Clinical Efficacy of Aloe Vera Toothpaste on Periodontal Parameters of Patients with Gingivitis—A Randomized, Controlled, Single-masked Clinical Trial. *Journal of Contemporary Dental Practice*, 22(3), 242–247. <https://doi.org/10.5005/jp-journals-10024-3059>
- Sohta, A., Kakar, S., Singh, R., & Garg, U. (2023). Comprehensive Review on Herbal or Medicated Toothpaste--A Review on Herbal v/s Medicated Toothpaste. *Research in Health Science*, 8(1). <https://doi.org/10.22158/rhs.v8n1p12>
- Suppipat, S., Hu, A. H., Trinh, L. T. K., Kuo, C. H., & Huang, L. H. (2022). A comparative life cycle assessment of toothpaste cream versus toothpaste tablets. *Sustainable Production and Consumption*, 29, 357–369. <https://doi.org/10.1016/j.spc.2021.10.021>
- Vajrabhaya, L. ongthong, Korsuwannawong, S., Ruangsawasdi, N., Phruksaniyom, C., & Srichan, R. (2022). The efficiency of natural wound healing and bacterial biofilm inhibition of Aloe vera and Sodium Chloride toothpaste preparation. *BMC Complementary Medicine and Therapies*, 22(1). <https://doi.org/10.1186/s12906-022-03548-7>

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