Bulletin of Nexus
Multidisciplinary International Research Journal, Double-Blind Peer Reviewed, Open Access Journal
ISSN : 3065-7865 / Volume-2, Issue-2 / February - 2025

Original Article

Analytical Detection and Toxicological Evaluation of Potassium Sorbate in Food Products

Manushree Patil[1], Archana Tajane[2], Riddhi Savala[3], Khushi Nigam[4], Tanzeel Nachan[5], Samiksha Cheripelli[6], Arshiya Ansari[7], Poonam Gavhane[8], Anaam Ansari[9], Sapna Patil[10]

[1,2,5.6,7,8,9,10] Assistant Professor, B. N. N. College of Arts, Commerce, and Science Bhiwandi (Thane)

[3,4]T. Y. B. Sc, B. N. N. College of Arts, Commerce, and Science Bhiwandi (Thane)

Manuscript ID: BN-2025-020201

ISSN: 3065-7865

Volume 2

Issue 2

February 2025

Pp. 1-5

Submitted: 25 Dec 2024

Revised: 10 Jan 2025

Accepted: 15 Feb 2025

Published: 28 Feb 2025

DOI: 10.5281/zenodo.15233645

DOI Link: https://doi.org/10.5281/zenodo.15233645

Quick Response Code:

Website: https://bnir.us

OPEN ACCESS

Abstract

This research assumes the task of examining the preservative function and toxicity issues of potassium sorbate, which is one of the most widely used food preservatives. The overall aim is to assess its efficacy in maintaining food preservation and investigate its risk to human health. Through examining its dual aspect, the research intends to develop a holistic knowledge of the compound's merits and demerits.One of the main aims of the research is the preparation of an efficient but economical analysis technique for potassium sorbate in food samples. It is done with the help of a precipitation reaction with silver nitrate ($AgNO_3$), upon which a new analytical method is constructed. The optimal conditions for application of the detection process are determined in the research as well as its sensitivity, specificity, and application in different food matrices and storage conditions. Additionally, the stability of potassium sorbate in various conditions of the environment is investigated to understand how it holds up when stored and processed. Moreover, the research criticizes current law and policy that regulates the application of potassium sorbate in foods. By highlighting loopholes and shortcomings in the policies, the research provides suggestions for promoting safe and rightful usage. The current research adds to the broader literature of food safety matters by illuminating how food preservation meets public safety needs.

Keywords: *Potassium Sorbate, health risk, food samples, food preservatives, Mayonnaise, packaged cake, silver nitrate.*

Introduction

Food preservatives have been the preservative savior of food for centuries and have been the decision-maker in food safety delivery against microbial spoilage. By prevention of spoilage through decomposition in nutritional content, texture, and appearance, the preservatives have protected humans and made suitable food available for eating. In the modern age, based on the increase in demand for convenience foods as well as processing food, Preservatives are now a part of modern-day food technology to tackle the problem of mass production as well as transportation Other chemical preservatives such as benzoats, sorbates, nitrates, and sulphites are used widely in food because they possess antimicrobial action For example, chemicals such as sorbates (E200–E209) and benzoates (E210–E219) curb microbial growth as well as safeguard food safety as well as the shelf life. The prime target of the preservatives in food is prevention of decomposing microorganism activity causing spoilage such as yeast, molds, and bacteria. They also inhibit oxidative reactions that can spoil the quality, texture, and color of food items Nowadays, with increased consumption of convenience foods and processed foods, food preservatives are more important than ever.

Address for correspondence:

Manushree Patil, Assistant Professor, B. N. N. College of Arts, Commerce, and Science Bhiwandi (Thane)
Email: manushri1994@gmail.com

How to cite this article:

Patil, M., Tajane, A., Savala, R., Nigam, K., Nachan, T., Cheripelli, S., Ansari, A., Gavhane, P., Ansari, A., & Patil, S. (2025). Analytical Detection and Toxicological Evaluation of Potassium Sorbate in Food Products. Bulletin of Nexus, 2(2), 1–5. https://doi.org/10.5281/zenodo.15233645

They also prevent oxidative reactions that would spoil the texture, quality, and general appearance of food products. Application of chemical preservatives has, however, raised growing consumer alarm concerning their safety and potential impact on human health. Protection while providing food quality.

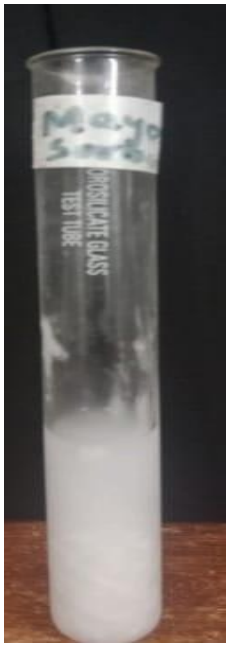
Materials and Methods

For the analysis of sorbates in food or drink samples, the test is the reaction with silver nitrate ($AgNO_3$) to produce a precipitate. The diluted sample of the product is prepared initially by mixing it with distilled water and the dilution ratio varying with the product and expected concentration of sorbates. The diluted solution is again charged with a minute amount of the recently prepared 5% $AgNO_3$ solution. The formation of precipitates confirms the existence of sorbate ions.

Results

Sample 1: Mayonnaise

The filled mayonnaise sample exhibited precipitation when 5% $AgNO_3$ solution was added to it, and it is an indication that the presence of potassium sorbate in this sample.



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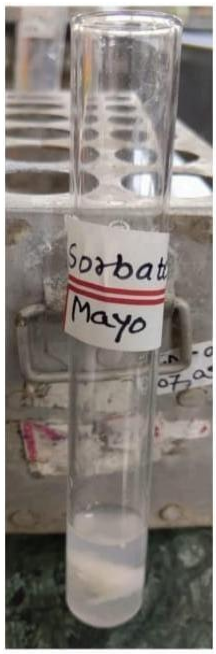
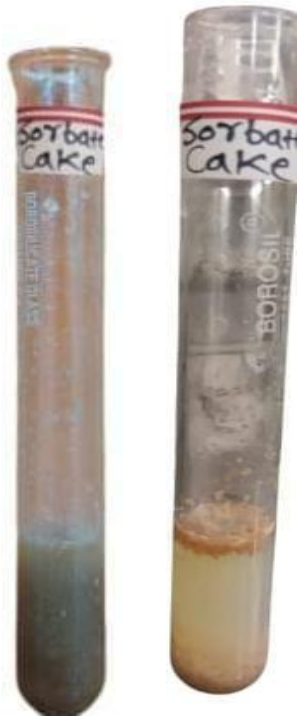


Test

Sample 2 Packaged cake

The cake sample in packet demonstrated precipitate on the addition of 5% $AgNO_3$ solution, and it suggests that potassium sorbate is available in the sample.



Blank **Test**

Conclusion

Detection of the potassium sorbate in the samples of mayonnaise and cake packages using the simple silver nitrate ($AgNO_3$) precipitation test is a good reflection of the widespread utilization of the preservative in processed foods. Formation of precipitates in the samples attested to the presence of the sorbate ions, confirming the efficiency of the technique in the detection of preservatives in food samples. These findings make one remember the copious amount of potassium sorbate used in our foods, particularly our processed foods and packaged foods. Although it is crucial in terms of shelf life and prevention of decay, its potential effect on health through ingestion, as we have argued earlier, must be monitored and regulatedNot only does it confirm the application of potassium sorbate to the food that we consume on a daily basis, but also indicates a field of safety against food against total long-term impact to our bodies. We depend on such preservatives for the quality of food but then also have to keep a guard along with it at the same time for the threats. These results point towards the need for more research on safety levels and the potassium sorbate levels in our food chain and developing safer alternatives that are better working in proportion to safeguarding human health.

Discussion

Potassium sorbate is one of the most prevalent food preservatives utilized to prevent microbial growth. Potassium sorbate is classically applied to cheese, yogurt, and baked products. Potassium sorbate naturally occurs in cheese, yogurt, and baked products. Potassium sorbate is also utilized to apply wine, beer, and fermented beverages. Potassium sorbate is safe to ingest orally in government-approved amounts. Potassium sorbate is unhealthy when applied in high concentrations, causing stomach pain, diarrhea, and stomach cramps. Potassium sorbate is safe to be taken orally by the government-approved quantities. Potassium sorbate is unsafe when used at high concentrations, leading to stomach ache, diarrhea, and stomach cramps. Authorities like EFSA and FDA approve potassium sorbate for use as a food preservative. However, there are some research studies that indicate potassium sorbate may not be as innocuous as previously believed but more research has to be conducted so as to understand all about the impact of potassium sorbate on human health Meanwhile, it has to be ensured that consumers come to know about the risk factor that this preservative may cause.Food companies must look into the use of safer preservatives as alternatives as well. Potassium

sorbate in food is a complex matter that must be well-balanced. While it can be useful in preventing spoilage, its possible effect on one's health must not be underestimated. There is more research needed to better align the effects of potassium sorbate on human health and whether it is safe or not for people to consume at current levels.

Acknowledgments

I am Manushree Prasad Patil thankful to Coordinator Miss. Archana Tajane mam Department of Biotechnology and Microbiology B. N. N. College Bhiwandi for granting permission to carry out the work.

Financial support and sponsorship

Nil.

Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper

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