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Mouthwashes Available Nationally in Drugstore Chains, with a focus on complementary componentes

Enxaguatórios bucais disponíveis nacionalmente nas redes de drogarias com ênfase nos componentes complementares

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Abstract
Introduction: Mouthwashes are widely used as a complement to daily oral hygiene. Their formulations, which are constantly evolving, vary significantly among commercially available products. Among the main antiseptic agents used are cetylpyridinium chloride, chlorhexidine digluconate, triclosan combined with Gantrez polymer, and essential oils. In addition, mouthwashes include a variety of substances generically referred to as "other components", as described in their respective leaflets. **Objective:** This study aimed to identify and analyse mouthwashes available on the national market, with an emphasis on the "other components" listed in their formulations. The research focused on products sold in drugstores in the city of Salvador, Bahia. **Methodology:** Data collection was conducted in person in three Administrative Regions (ARs) of Salvador, Bahia, covering stores of the Drogasil, São Paulo, and Pague Menos chains. Technical information regarding the active ingredients, concentrations, formulations, and "other components" present in mouthwashes containing antiseptics was collected. The information obtained from drugstores was supplemented with data available on the manufacturers' websites to ensure completeness and reliability, with particular attention to the variability of "other components", regardless of the main active ingredient. The analysis considered product labelling and its validation through official online sources. **Results:** The analysis of the labels of mouthwashes sold in three drugstore chains, located in different Administrative Regions (ARs) of the city of Salvador, Bahia, identified a total of 16 different products. Regarding the "other components" present in the formulations, it was found that all products contained water and flavouring. The presence of sodium saccharin was observed, on average, in 91.3% of the products evaluated in the three regions. Colourants were present in 88.0% of the mouthwashes analysed, and sorbitol in 88.8%. It was also observed that active ingredients with antiseptic action tend to be repeated among products, often associated with a relatively uniform additional composition, regardless of brand or retailer. This pattern suggests partial standardisation in the formulation of mouthwashes available in the local market. **Conclusion:** The data highlight the need for greater rigour and transparency in the information provided on mouthwash labels and leaflets, particularly concerning the precise identification of active ingredients, a detailed description of other formulation components, and the recommended dosage for safe and effective use. This transparency is essential to warn of possible adverse effects, such as oral irritation, mouth ulcers, or hypersensitivity reactions, particularly in more sensitive individuals. Additionally, special attention is recommended for children's formulations containing fluoride ion, which should present uniform concentrations and avoid combination with antiseptics to ensure greater safety for paediatric patients.
Keywords: Mouthwashes, Antiseptics, Oral hygiene, Active ingredients, Drugstore

Resumo
Introdução*: os enxaguatórios bucais são amplamente utilizados como complemento à higiene oral diária. Suas formulações, em constante evolução, apresentam significativa variação entre os produtos comercialmente disponíveis. Dentre os principais agentes antissépticos utilizados destacam-se o cloreto de cetilpiridínio, o digluconato de clorexidina, o triclosan associado ao polímero Gantrez e os óleos essenciais. Além desses, os enxaguatórios incluem uma diversidade de substâncias denominadas genericamente como demais componentes, conforme descrito nos respectivos prospectos.* **Objetivo***: este estudo teve como objetivo identificar e analisar os enxaguatórios bucais disponíveis no mercado nacional, com ênfase nos demais componentes registrados em suas formulações. A pesquisa concentrou-se nos produtos comercializados em drogarias na cidade de Salvador, Bahia.* **Metodologia***: a coleta de dados foi realizada presencialmente em três Regiões Administrativas (RAs) de Salvador, Bahia, abrangendo unidades das redes Drogasil, São Paulo e Pague Menos. Foram coletadas informações técnicas referentes aos princípios ativos, concentrações, formulações e demais componentes presentes nos enxaguatórios bucais contendo antissépticos. As informações obtidas nas drogarias foram complementadas com dados disponíveis nos sites institucionais dos fabricantes, a fim*

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de assegurar a completude e a confiabilidade das informações, com especial atenção à variabilidade dos demais componentes, independentemente do princípio ativo principal. A análise considerou a rotulagem dos produtos e sua validação por meio de fontes online oficiais. **Resultados***: a análise dos rótulos de enxaguatórios bucais comercializados em três redes de drogarias, localizadas em distintas Regiões Administrativas (RAs) do município de Salvador, Bahia, identificou um total de 16 produtos distintos. Em relação aos demais componentes presentes nas formulações, verificou-se que todos os produtos continham água e aroma. A presença de sacarina sódica foi observada, em média, em 91,3% dos produtos avaliados nas três regiões. Os corantes estiveram presentes em 88,0%, e o sorbitol em 88,8% dos enxaguatórios analisados. Observou-se ainda que os princípios ativos com ação antisséptica tendem a repetir-se entre os produtos, sendo frequentemente associados a uma composição adicional relativamente uniforme, independentemente da marca ou da rede varejista. Esse padrão sugere uma padronização parcial na formulação dos enxaguantes bucais disponíveis no mercado local.* **Conclusão***: Os dados evidenciam a necessidade de maior rigor e transparência nas informações disponibilizadas nos rótulos e prospectos de enxaguatórios bucais, especialmente no que se refere à identificação precisa dos princípios ativos, à descrição detalhada dos demais componentes da formulação e à posologia recomendada para uso seguro e eficaz. Essa transparência é fundamental para alertar sobre possíveis efeitos adversos, como irritações orais, aftas ou reações de hipersensibilidade, particularmente em indivíduos mais sensíveis. Adicionalmente, recomenda-se atenção especial às formulações infantis contendo íon fluoreto, as quais devem apresentar concentrações uniformes e evitar a associação com antissépticos, a fim de garantir maior segurança ao público pediátrico.*
Palavras-chave: *enxaguatórios bucais; antissépticos; higiene bucal; princípios ativos; drogarias*

Introduction

Clinically, mouthwashes are topical pharmacological solutions with antiseptic or therapeutic properties, indicated as a complement to oral hygiene. Their adjuvant action contributes to maintaining oral health by reducing the microbiological load in the oral cavity. This helps prevent pathologies such as dental caries, gingivitis, and halitosis, while also promoting a sensation of freshness.[1]

In the context of caries prevention, fluoride stands out as an effective agent, delivered through bioavailable mouthwashes in the oral cavity, allowing for direct interference in the demineralisation and remineralisation processes of tooth enamel.[2] *This action promotes the stability of mineralised tissue. It helps inhibit the progression of carious lesions, an effect enhanced by the prolonged presence of the fluoride ion in the oral environment.*

Regarding the action of antiseptics, the prescription of mouthwashes should consider different pharmacological agents, depending on the specific indications for each case. Notable among these are cetylpyridinium chloride, chlorhexidine gluconate and digluconate, triclosan combined with the Gantrez copolymer, essential oils—such as eucalyptol, thymol, methyl salicylate, and menthol—povidone-iodine, and certain natural plant extracts, such as aroeira, chamomile, mint, tea tree, and ginger, which can act as alternatives or complements to conventional products.[1,3]

Less frequently, whitening agents are added to mouthwashes, intended to aid in the restoration of dental aesthetics. Among these, hydrogen peroxide, carbamide peroxide, and activated charcoal stand out.[4]

In addition to antiseptics, mouthwashes contain other substances generically referred to as ""other components"" that have no pharmacological activity and are added solely to colour the liquid (dyes); stabilise the formulation (stabilisers); impart a pleasant flavour (sweeteners); and extend the shelf life of the mouthwash (preservatives). Solubilise and emulsify the components—surfactants, among others.

In addition to antiseptic agents, mouthwashes contain several substances, generically referred to as ""other components""[5]*, that have no pharmacological activity. The other frequently mentioned components, along with their respective concentrations, reflect the heterogeneity and availability of marketed products. These additives are incorporated into the formulation with specific functions, such as adding colour (dyes), stabilising the composition (stabilisers), providing a pleasant flavour (sweeteners), extending the product's shelf life (preservatives), and enabling solubilization and emulsification of ingredients (surfactants), among others.*

Considering the aforementioned points and in line with the topic at hand, this study's main objective is to analyse the "other components" present on the labels of mouthwashes available to the general public. For this purpose, a sample comprised of three distinct units of the Drogasil, São Paulo, and Pague Menos chains, located in three different Administrative Regions of the municipality of Salvador, was used.

Methodology

This project was approved by the Research Ethics Committee of the Institute of Health Sciences of the Federal University of Bahia under Opinion No. 1,043,946, CAAE 43685815.3.0000.5662.

As a reference for this research, the Salvador Urban Development Master Plan (PDDU) was adopted, a strategic instrument that guides the city's planned and sustainable growth.[6] *The PDDU covers aspects such as zoning, land use and occupation, urban mobility, infrastructure, and environmental preservation, and was developed with broad public participation to ensure the population's quality of life and balanced development of the Bahian capital.*

The city is divided into eight Administrative Regions (RAs), six of which have unique characteristics reflecting their urban functions and socioeconomic composition. For this study, three of these regions were selected, chosen for their relevance and urban diversity:

Region I – Downtown

Located in the heart of Salvador, the Downtown Region is a dynamic hub of commercial, cultural, and administrative activities. With diverse land uses, the area is home to historic buildings, shopping centres, and government headquarters. The population is heterogeneous, composed of longtime residents, workers, and tourists. The preservation and revitalisation of older town are fundamental to enhancing the city's urban heritage and cultural identity.[6]

Region V – Brotas

Marked by significant social diversity, the Brotas region requires specific guidelines for its urban development. High-rise buildings coexist with more modest residential areas, distributed along cross streets. This heterogeneity poses planning challenges, especially in the areas of infrastructure, mobility, and land use [6]

Region VI – Barra

Strategically located and with a strong tourist appeal, Barra stands out for its historical heritage, natural landscapes, and vibrant urban life. The region is home to well-structured neighbourhoods with a wide range of services—hospitals, schools, shopping centres, and hotels—as well as high-end residences. It is a hub for leisure and culture, boasting beaches, bars, restaurants, and cultural venues.[6]

Study Protocol

This study was structured in three main stages:

1. Selection and Characterisation of the Study Regions

The research focused on three Administrative Regions (ARs) of the city of Salvador, Bahia: RA I, RA V, and RA VI.[6] *These areas were chosen due to their distinct socio-spatial characteristics:*

RA I: encompasses historic neighbourhoods with intense tourist, residential, and commercial circulation; RA V: predominantly composed of middle-class communities, with a greater demand for infrastructure and public services; and RA VI: comprises upscale, high-end residential areas, whose infrastructure is well-established, requiring only occasional maintenance and improvements. This selection allowed for a comparative analysis of diverse population profiles, representing the diverse urban realities of Salvador.

2. Product Identification and Composition Analysis

Samples of mouthwashes, widely distributed nationwide and containing antiseptic agents, fluoride ions, and "other components", were analysed. The collection took place at three different locations of the Drogasil, São Paulo, and Pague Menos chains, present in the selected regions of the RAs. These chains operate in the capitals of 26 states and the Federal District, ensuring the representativeness of the analysed products. The mouthwashes were evaluated based on the presence of active ingredients, concentration, formulations, and "other components". Product selection considered criteria such as shelf availability, local consumption, and market interest from pharmaceutical companies.

3. In-Person Survey and Online Data Complementation

This study focused on the "other components" of mouthwashes, considering the diversity of substances present in the formulations, regardless of the active ingredients. To this end, a systematic, in-person survey of the products available in the pharmacies visited was conducted. The following information was collected: manufacturer, trade name, active ingredients and their respective concentrations, recommended dosage, excipients, and availability. To ensure data completeness and accuracy, the information extracted from the labels was supplemented by consultations with the manufacturers' official websites.

Data Analysis

The collected information was processed and analysed using R software (R Core Team, 2025).[7] *A descriptive analysis with absolute and relative frequencies was applied. Each product was characterised according to its availability in the three pharmacy chains in each region, allowing for an estimate of the proportion of presence by location. The results are presented in tables stratified by Administrative Region, allowing for comparative views and consistent interpretations.*

Results

Based on the analysis of data obtained from the labels of mouthwashes available in three drugstore chains located in Administrative Regions RA I, RA V, and RA VI of the city of Salvador, Bahia, Brazil – duly confirmed on the manufacturers' official websites and supported by scientific literature – 16 distinct products were identified. Their corresponding compositions are systematised in Tables 1 and 2.

Table 1. Classification of mouthwashes according to the nature of the antiseptic, the active ingredient and the complementary components, distributed by the Administrative Regions RA I, RA V and RA VI of the city of Salvador, Bahia

Region	*Network – Drugstore*	*Commercial Name of Mouthwash*	*Manufacturer*	*Active ingredient fluoride in the antiseptic*	*Antiseptic*	*Other components of the antiseptic*	*Occurrence of the active ingredient fluoride in the other components of the antiseptic*
REGION I	*DROGASIL*	*Listerine Cool Mint*	*Johnson & Johnson*	*NO*	*Thymol 0.064%, Eucalyptol 0.092%, Menthol 0.042%, Methyl Salicylate 0.060%*	*Purified water, ethyl alcohol, sorbitol, poloxamer 407, sodium saccharin, benzoic acid, eucalyptol, methyl salicylate, thymol, sodium benzoate, levomenthol, dye Cl42053/fast green 143, aroma (D-limonene)*	*NO*
		Colgate Plax Fresh Mint	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cloreto de cetilpiridínio 0,075%*	*Water, glycerol, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, citric acid, menthol, dyes Cl.42053/fast green 143, Cl.15985/sunset yellow, aroma (Flavor)*	*YES*
		Água Rabelo	*Água Rabelo*	*NO*	*Aroeira, hortelã e eucalipto (concentrações NO especificadas no rótulo)*	*Água, álcool, sorbitol, glicerina, poloxamer 407, benzoato de sódio, sacarina sódica, corante, aroma*	*NO*
		Listerine antitartaro	*Johnson & Johnson*	*NO*	*Cloreto de zinco (cerca de 0,064%) e outros agentes antissépticos (fenóis, óleos essenciais)*	*Água, álcool etílico, sorbitol, poloxamer 407, cloreto de zinco, sacarina sódica, ácido benzoico, benzoato de sódio, eucaliptol, salicilato de metila, timol, levomentol, corante Cl.42090 azul brilhante, aroma*	*NO*
REGION V	*DROGASIL*	*NEEDS multibeneficios sem álcool*	*Needs (marca própria da rede Raia/ Drogasil)*	*Sodium fluoride 226 ppm*	*Chlorhexidine digluconate (no concentration)*	*Água, sorbitol, PEG-40 óleo de rícino hidrogenado, glicerina, aroma, limoneno, benzoato de sódio, benzil álcool, ciclamato de sódio, cloreto de cetil piridínio, ácido cítrico, Sodium fluoride, sacarina sódica, corante*	*NO*
		Colgate Plax Odor Control	*Colgate-Palmolive*	*NO*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, sorbitol, cetylpyridinium chloride, sodium fluoride 225ppm, propylene glycol, poloxamer 407, poloxamer 338, PEG-40 hydrogenated castor oil, sodium benzoate, sodium saccharin, sucralose, menthol, dyes C.I 42051 and C.I 17200, aroma*	*YES*
		Colgate total 12	*Colgate-Palmolive*	*NO*	*Cetylpyridinium chloride 0.075%*	*Água, Glicerina, Propilenoglicol, Sorbitol, Poloxamer 407, Aroma (menta), Cloreto de cetilpiridínio, Sorbato de potássio, Sodium fluoride 225ppm, Sacarina sódica, Mentol, Extrato de Camellia sinensis (chá verde), Óóleo de casca de limão, Corantes C.I.42051 e C.I 17200*	*YES*
		Listerine Cool Mint	*Johnson & Johnson*	*NO*	*Thymol 0.064%, Eucalyptol 0.092%, Menthol 0.042%, Methyl Salicylate 0.060%*	*Água purificada, álcool etílico, sorbitol, pPoloxamer 407, sacarina sódica, ácido benzoico, eucaliptol, salicilato de metila, timol, benzoato de sódio, levomentol, corante Cl42053/verde rápido 143, aroma (D-limonene)*	*NO*
		Oral – B 100% de sua boca cuidada	*Procter & Gamble*	*Sodium fluoride 225 ppm*	*Digluconatto de clorexidina (sem concentração)*	*Water, glycerol, cetylpyridinium chloride, poloxamer 407, sodium saccharin, methylparaben, sucralose, cinnamaldehyde, propylparaben, dye Cl.42090 (brilliant blue), aroma*	*NO*
		Colgate Luminous White	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, menthol, camellia sinensis (green tea) extract, lemon peel oil, colorants, aroma (mint)*	*YES*
		Listerine antitartaro	*Johnson & Johnson*	*NO*	*Cloreto de zinco (cerca de 0,064%) e outros agentes antissépticos (fenóis, óleos essenciais)*	*Água, álcool etílico, sorbitol, poloxamer 407, cloreto de zinco, sacarina sódica, ácido benzoico, benzoato de sódio, eucaliptol, salicilato de metila, timol, levomentol, corante Cl.42090 azul brilhante, aroma*	*NO*
REGION VI	*DROGASIL*	*Oral – B 100% de sua boca cuidada*	*Procter & Gamble*	*Sodium fluoride 225 ppm*	*Chlorhexidine digluconate (no concentration)*	*Water, glycerol, cetylpyridinium chloride, poloxamer 407, sodium saccharin, methylparaben, sucralose, cinnamaldehyde, propylparaben, dye Cl.42090 (brilliant blue), aroma*	*NO*
		NEEDS multibeneficios sem álcool	*Needs (marca própria da rede Raia/ Drogasil)*	*Sodium fluoride 226 ppm*	*Chlorhexidine digluconate (no concentration)*	*Água, glicerol, sorbitol, propilenoglicol, cloreto de cetil piridínio, Sodium fluoride, polissorbato, benzoato de sódio, óleo de rícino hidroxilado etoxilado, mentol, álcool benzílico, sacarina sódica, ciclamato de sódio, ácido cítrico, corante Cl.4209 azul brilhante, aroma (menta ou hortelã)*	*NO*

		Colgate Plax Fresh Mint	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerol, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, citric acid, menthol, dyes Cl.42053/fast green 143, Cl.15985/sunset yellow, aroma (Flavor)*	*NO*
		Colgate Plax Odor Control	*Colgate-Palmolive*	*NO*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, sorbitol, cetylpyridinium chloride, sodium fluoride 225ppm, propylene glycol, poloxamer 407, poloxamer 338, PEG-40 hydrogenated castor oil, sodium benzoate, sodium saccharin, sucralose, menthol, dyes C.I 42051 and C.I 17200, aroma*	*YES*
		Listerine Cool Mint	*Johnson & Johnson*	*NO*	*Thymol 0.064%, Eucalyptol 0.092%, Menthol 0.042%, Methyl Salicylate 0.060%*	*Água purificada, álcool etílico, sorbitol, poloxamer 407, sacarina sódica, ácido benzoico, eucaliptol, salicilato de metila, timol, benzoato de sódio, levomentol, corante Cl42053/verde rápido 143, aroma (D-limonene)*	*NO*
		Colgate total 12	*Colgate-Palmolive*	*NO*	*Cloreto de cetilpiridínio 0,075%*	*Água, glicerina, propilenoglicol, sorbitol, poloxamer 407, aroma (menta), cloreto de cetilpiridínio, sorbato de potássio, Sodium fluoride 225ppm, sacarina sódica, mentol, extrato de camellia sinensis (chá verde), óóleo de casca de limão, corantes C.I.42051 e C.I 17200*	*YES*
		Close Up 360 Fresh	*UNILEVER Brasil*	*Sodium fluoride 226 ppm*	*Chlorhexidine digluconate (no concentration)*	*Aqua, sorbitol, PEG-40 hydrogenated castor oil, glycerin, sodium benzoate, benzyl alcohol, sodium cyclamate, cetylpyridinium chloride, citric acid, sodium fluoride, sodium saccharin, color, flavor, limonene*	*YES*
REGION I	*SÃO PAULO*	*Colgate Plax Fresh Mint*	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerol, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, citric acid, menthol, dyes Cl.42053/fast green 143, Cl.15985/sunset yellow, aroma (Flavor)*	*YES*
		Colgate total 12	*Colgate-Palmolive*	*NO*	*Cetylpyridinium chloride 0.075%*	*Água, glicerina, propilenoglicol, sorbitol, poloxamer 407, cloreto de cetilpiridínio, sorbato de potássio, Sodium fluoride 225ppm, sacarina sódica, mentol, extrato de camellia sinensis (chá verde), óleo de casca de limão, corantes C.I.42051 e C.I 17200, aroma (menta)*	*YES*
		Listerine Cool Mint	*Johnson & Johnson*	*NO*	*Thymol 0.064%, Eucalyptol 0.092%, Menthol 0.042%, Methyl Salicylate 0.060%*	*Água purificada, álcool etílico, sorbitol, poloxamer 407, sacarina sódica, ácido benzoico, eucaliptol, salicilato de metila, timol, benzoato de sódio, levomentol, corante Cl42053/verde rápido 143, aroma (D-limonene)*	*NO*
		Listerine antitartaro	*Johnson & Johnson*	*NO*	*Cloreto de zinco (cerca de 0,064%) e outros agentes antissépticos (fenóis, óleos essenciais)*	*Água, álcool etílico, sorbitol, poloxamer 407, cloreto de zinco, sacarina sódica, ácido benzoico, benzoato de sódio, eucaliptol, salicilato de metila, timol, levomentol, corante Cl.42090 azul brilhante, aroma*	*NO*
		Close Up 360 Fresh	*UNILEVER Brasil*	*Sodium fluoride 226 ppm*	*Chlorhexidine digluconate (no concentration)*	*Aqua, sorbitol, PEG-40 hydrogenated castor oil, glycerin, sodium benzoate, benzyl alcohol, sodium cyclamate, cetylpyridinium chloride, citric acid, sodium fluoride, sodium saccharin, color, flavor, limonene*	*YES*
		Colgate Natural Extracts	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, menthol, camellia sinensis (green tea) extract, lemon peel oil, colorants, aroma (mint)*	*YES*
REGION V	*SÃO PAULO*	*Listerine Cool Mint*	*Johnson & Johnson*	*NO*	*Thymol 0.064%, Eucalyptol 0.092%, Menthol 0.042%, Methyl Salicylate 0.060%*	*Purified water, ethyl alcohol, sorbitol, poloxamer 407, sodium saccharin, benzoic acid, eucalyptol, methyl salicylate, thymol, sodium benzoate, levomenthol, dye Cl42053/fast green 143, aroma (D-limonene)*	*NO*
		Colgate Plax Odor Control	*Colgate-Palmolive*	*NO*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, sorbitol, cetylpyridinium chloride, sodium fluoride 225ppm, propylene glycol, poloxamer 407, poloxamer 338, PEG-40 hydrogenated castor oil, sodium benzoate, sodium saccharin, sucralose, menthol, dyes C.I 42051 and C.I 17200, aroma*	*YES*
		Colgate total 12	*Colgate-Palmolive*	*NO*	*Cloreto de cetilpiridínio CPC 0,075%*	*Water, Glycerin, Propylene Glycol, Sorbitol, Poloxamer 407, Aroma (mint), Cetylpyridinium Chloride, Potassium Sorbate, Sodium Fluoride 225ppm, Sodium Saccharin, Menthol, Camellia Sinensis Extract (Green Tea), Lemon Peel Oil, Colors C.I. 42051 and C.I. 17200*	*YES*
		Colgate Plax Fresh Mint	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerol, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, citric acid, menthol, dyes Cl.42053/fast green 143, Cl.15985/sunset yellow, aroma (Flavor)*	*YES*

		Colgate Luminous White	*Colgate-Palmolive*	*Sodium fluoride 500 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, menthol, camellia sinensis (green tea) extract, lemon peel oil, colorants, aroma (mint)*	*YES*
		Colgate Natural Extracts	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, menthol, camellia sinensis (green tea) extract, lemon peel oil, colorants, aroma (mint)*	*YES*
		Close Up 360 Fresh	*UNILEVER Brasil*	*Sodium fluoride 226 ppm*	*Chlorhexidine digluconate (no concentration)*	*Aqua, sorbitol, PEG-40 hydrogenated castor oil, glycerin, sodium benzoate, benzyl alcohol, sodium cyclamate, cetylpyridinium chloride, citric acid, sodium fluoride, sodium saccharin, color, flavor, limonene*	*YES*
REGION VI	*SÃO PAULO*	*LISTERINE Cool Mint*	*Johnson & Johnson*	*NO*	*Thymol 0.064%, Eucalyptol 0.092%, Menthol 0.042%, Methyl Salicylate 0.060%*	*Purified water, ethyl alcohol, sorbitol, poloxamer 407, sodium saccharin, benzoic acid, eucalyptol, methyl salicylate, thymol, sodium benzoate, levomenthol, dye Cl42053/fast green 143, aroma (D-limonene)*	*NO*
		Colgate Plax Odor Control	*Colgate-Palmolive*	*NO*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, sorbitol, cetylpyridinium chloride, sodium fluoride 225ppm, propylene glycol, poloxamer 407, poloxamer 338, PEG-40 hydrogenated castor oil, sodium benzoate, sodium saccharin, sucralose, menthol, dyes C.I 42051 and C.I 17200, aroma*	*YES*
		Colgate Plax Fresh Mint	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerol, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, citric acid, menthol, dyes Cl.42053/fast green 143, Cl.15985/sunset yellow, aroma (Flavor)*	*YES*
		Colgate Plax Total Prevenção	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, propylene glycol, sorbitol, poloxamer 407, menthol, cetylpyridinium chloride, potassium benzoate, sodium fluoride, sodium saccharin, citric acid, colorants, aroma/flavor (mint)*	*YES*
		Close Up 360 Fresh	*UNILEVER Brasil*	*Sodium fluoride 226 ppm*	*Cloreto de cetilpiridínio (sem concentração)*	*Aqua, sorbitol, PEG-40 hydrogenated castor oil, glycerin, sodium benzoate, benzyl alcohol, sodium cyclamate, cetylpyridinium chloride, citric acid, sodium fluoride, sodium saccharin, color, flavor, limonene*	*YES*
		Oral – B 100% de sua boca cuidada	*Procter & Gamble*	*Sodium fluoride 225 ppm*	*Digluconatto de clorexidina (sem concentração)*	*Water, glycerol, cetylpyridinium chloride, poloxamer 407, sodium saccharin, methylparaben, sucralose, cinnamaldehyde, propylparaben, dye Cl.42090 (brilliant blue), aroma*	*NO*
		Colgate Natural Extracts	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, menthol, camellia sinensis (green tea) extract, lemon peel oil, colorants, aroma (mint)*	*YES*
REGION I	*PAGUE MENOS*	*Listerine Cool Mint*	*Johnson & Johnson*	*NO*	*Thymol 0.064%, Eucalyptol 0.092%, Menthol 0.042%, Methyl Salicylate 0.060%*	*Purified water, ethyl alcohol, sorbitol, poloxamer 407, sodium saccharin, benzoic acid, eucalyptol, methyl salicylate, thymol, sodium benzoate, levomenthol, dye Cl42053/fast green 143, aroma (D-limonene)*	*NO*
		Colgate Plax Fresh Mint	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerol, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, citric acid, menthol, dyes Cl.42053/fast green 143, Cl.15985/sunset yellow, aroma (Flavor)*	*YES*
		Oral – B 100% de sua boca cuidada	*Procter & Gamble*	*Sodium fluoride 225 ppm*	*Chlorhexidine digluconate (no concentration)*	*Water, glycerol, cetylpyridinium chloride, poloxamer 407, sodium saccharin, methylparaben, sucralose, cinnamaldehyde, propylparaben, dye Cl.42090 (brilliant blue), aroma*	*NO*
		DAUF Oral Care	*DAUF Ind. e Com. Ltda*	*Sodium fluoride*	*Triclosan (concentration not reported)*	*Water, alcohol, sorbitol, glycerin, poloxamer 407, EDTA, methylparaben, sodium phosphate, triclosan, disodium phosphate, sucralose, flavor*	*NO*
		Colgate total 12	*Colgate-Palmolive*	*NO*	*Cetylpyridinium chloride 0.075%*	*Water, Glycerin, Propylene Glycol, Sorbitol, Poloxamer 407, Aroma (mint), Cetylpyridinium Chloride, Potassium Sorbate, Sodium Fluoride 225ppm, Sodium Saccharin, Menthol, Camellia Sinensis Extract (Green Tea), Lemon Peel Oil, Colors C.I. 42051 and C.I. 17200*	*YES*
		Listerine Cuidado total	*Johnson & Johnson*	*Sodium fluoride 100 ppm*	*NO informado*	*Água purificada, sorbitol, álcool etílico, poloxamer 407, ácido benzoico, eucaliptol, cloreto de zinco, sacarina sódica, salicilato de metila, timol, mentol, benzoato de sódio, sucralose, aroma (incluindo cinamaldeído)*	*NO*
REGION V	*PAGUE MENOS*	*Listerine Cool Mint*	*Johnson & Johnson*	*NO*	*Thymol 0.064%, Eucalyptol 0.092%, Menthol 0.042%, Methyl Salicylate 0.060%*	*Purified water, ethyl alcohol, sorbitol, poloxamer 407, sodium saccharin, benzoic acid, eucalyptol, methyl salicylate, thymol, sodium benzoate, levomenthol, dye Cl42053/fast green 143, aroma (D-limonene)*	*NO*

		Oral B Complete	*Procter & Gamble*	*NO*	*Cloreto de cetilpiridínio monohidratado*	*Water, glycerol, PEG-40, hydrogenated castor oil, methylparaben, cetylpyridinium chloride monohydrate, sodium fluoride, sodium saccharin dihydrate, sodium benzoate, propylparaben, brilliant blue dye, aroma*	*NO*
		Colgate Plax Fresh Mint	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerol, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, citric acid, menthol, dyes Cl.42053/fast green 143, Cl.15985/sunset yellow, aroma (Flavor)*	*YES*
		DAUF Oral Care	*DAUF Ind. e Com. Ltda*	*Sodium fluoride 225 ppm*	*Triclosan (concentration not reported)*	*Water, alcohol, sorbitol, glycerin, poloxamer 407, EDTA, methylparaben, sodium phosphate, triclosan, disodium phosphate, sucralose, flavor*	*NO*
		Cepacol	*Reckitt Benckiser (RB)*	*NO*	*Cetylpyridinium chloride 0.05% (500 ppm)*	*Water, alcohol, sorbitol, poloxamer 407, sodium benzoate, sodium saccharin, colorant, flavor*	*NO*
		Colgate Luminous White	*Colgate-Palmolive*	*Sodium fluoride 500 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, menthol, camellia sinensis (green tea) extract, lemon peel oil, colorants, aroma (mint)*	*YES*
		Oral – B 100% de sua boca cuidada	*Procter & Gamble*	*Sodium fluoride 225 ppm*	*Chlorhexidine digluconate (no concentration)*	*Water, glycerol, cetylpyridinium chloride, poloxamer 407, sodium saccharin, methylparaben, sucralose, cinnamaldehyde, propylparaben, dye Cl.42090 (brilliant blue), aroma*	*NO*
REGION VI	*PAGUE MENOS*	*Listerine Cool Mint*	*Johnson & Johnson*	*NO*	*Thymol 0.064%, Eucalyptol 0.092%, Menthol 0.042%, Methyl Salicylate 0.060%*	*Purified water, ethyl alcohol, sorbitol, poloxamer 407, sodium saccharin, benzoic acid, eucalyptol, methyl salicylate, thymol, sodium benzoate, levomenthol, dye Cl42053/fast green 143, aroma (D-limonene)*	*NO*
		Colgate Plax Fresh Mint	*Colgate-Palmolive*	*Sodium fluoride 225 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerol, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, citric acid, menthol, dyes Cl.42053/fast green 143, Cl.15985/sunset yellow, aroma (Flavor)*	*YES*
		DAUF Oral Care	*DAUF Ind. e Com. Ltda*	*Sodium fluoride 225 ppm*	*Triclosan (concentration not reported)*	*Water, alcohol, sorbitol, glycerin, poloxamer 407, EDTA, methylparaben, sodium phosphate, triclosan, disodium phosphate, sucralose, flavor*	*NO*
		Close Up 360 Fresh	*UNILEVER Brasil*	*Sodium fluoride 226 ppm*	*Chlorhexidine digluconate (no concentration)*	*Aqua, sorbitol, PEG-40 hydrogenated castor oil, glycerin, sodium benzoate, benzyl alcohol, sodium cyclamate, cetylpyridinium chloride, citric acid, sodium fluoride, sodium saccharin, color, flavor, limonene*	*YES*
		Colgate total 12	*Colgate-Palmolive*	*NO*	*Cetylpyridinium chloride 0.075%*	*Water, Glycerin, Propylene Glycol, Sorbitol, Poloxamer 407, Aroma (mint), Cetylpyridinium Chloride, Potassium Sorbate, Sodium Fluoride 225ppm, Sodium Saccharin, Menthol, Camellia Sinensis Extract (Green Tea), Lemon Peel Oil, Colors C.I. 42051 and C.I. 17200*	*YES*
		Colgate Luminous White	*Colgate-Palmolive*	*Sodium fluoride 500 ppm*	*Cetylpyridinium chloride 0.075%*	*Water, glycerin, propylene glycol, sorbitol, poloxamer 407, cetylpyridinium chloride, potassium sorbate, sodium fluoride, sodium saccharin, menthol, camellia sinensis (green tea) extract, lemon peel oil, colorants, aroma (mint)*	*YES*
		Cepacol	*Reckitt Benckiser (RB)*	*NO*	*Cetylpyridinium chloride 0.05% (500 ppm)*	*Water, alcohol, sorbitol, poloxamer 407, sodium benzoate, sodium saccharin, colorant, flavor*	*NO*

The data presented in Table 2 describe the distribution of mouthwashes, based on availability in the Administrative Regions RA I, RA V, and RA VI of the municipality of Salvador, Bahia.

Table 2. *Distribution of mouthwashes (trade names and respective manufacturers) by Administrative Region of the municipality of Salvador, Bahia, based on the analysis of three drugstore chains (n = 3)*

Mouthwash (trade name)	***Manufacturer***	***Administrative Regions (ARs)***	***Frequency (%) of Drugstore Chains that sell***
Água Rabelo	*Água Rabelo*	*AR I*	*1 (33,3%)*
		AR V	*0 (0,0%)*
		AR VI	*0 (0,0%)*
Cepacol	*Reckitt Benckiser (RB)*	*AR I*	*0 (0,0%)*
		AR V	*1 (33,3%)*
		AR VI	*1 (33,3%)*

Mouthwash (trade name)	*Manufacturer*	*Administrative Regions (ARs)*	*Frequency (%) of Drugstore Chains that sell*
Close Up 360 Fresh	*UNILEVER Brasil*	*AR I*	*1 (33,3%)*
		AR V	*1 (33,3%)*
		AR VI	*3 (100,0%)*
Colgate Luminous White	*Colgate-Palmolive*	*AR I*	*0 (0,0%)*
		AR V	*3 (100,0%)*
		AR VI	*1 (33,3%)*
Colgate Natural Extracts	*Colgate-Palmolive*	*AR I*	*1 (33,3%)*
		AR V	*1 (33,3%)*
		AR VI	*1 (33,3%)*
Colgate Plax Fresh Mint	*Colgate-Palmolive*	*AR I*	*3 (100,0%)*
		AR V	*2 (66,7%)*
		AR VI	*3 (100,0%)*
Colgate Plax Odor Control	*Colgate-Palmolive*	*AR I*	*0 (0,0%)*
		AR V	*2 (66,7%)*
		AR VI	*2 (66,7%)*
Colgate Plax Total Prevenção	*Colgate-Palmolive*	*AR I*	*0 (0,0%)*
		AR V	*0 (0,0%)*
		AR VI	*1 (33,3%)*
Colgate total 12	*Colgate-Palmolive*	*AR I*	*2 (66,7%)*
		AR V	*2 (66,7%)*
		AR VI	*2 (66,7%)*
DAUF Oral Care	*DAUF Ind. e Com. Ltda*	*AR I*	*1 (33,3%)*
		AR V	*1 (33,3%)*
		AR VI	*1 (33,3%)*
Listerine antitártaro	*Johnson & Johnson*	*AR I*	*2 (66,7%)*
		AR V	*1 (33,3%)*
		AR VI	*0 (0,0%)*
Listerine Cool Mint	*Johnson & Johnson*	*AR I*	*3 (100,0%)*
		AR V	*3 (100,0%)*
		AR VI	*3 (100,0%)*
Listerine Cuidado total	*Johnson & Johnson*	*AR I*	*1 (33,3%)*
		AR V	*0 (0,0%)*
		AR VI	*0 (0,0%)*
NEEDS multibenefícios sem álcool	*Needs (marca própria da rede Raia/Drogasil)*	*AR I*	*0 (0,0%)*
		AR V	*1 (33,3%)*
		AR VI	*1 (33,3%)*
Oral – B 100% de sua boca cuidada	*Procter & Gamble*	*AR I*	*1 (33,3%)*
		AR V	*2 (66,7%)*
		AR VI	*2 (66,7%)*
Oral B Complete	*Procter & Gamble*	*AR I*	*0 (0,0%)*
		V	*1 (33,3%)*
		RA VI	*0 (0,0%)*

Table 3 presents the relative frequency of complementary components identified in mouthwash formulations, with data stratified by Administrative Region (RA I, RA V, and RA VI) of the city of Salvador, Bahia.

Table 3. *Frequency of complementary components ("other components") of mouthwashes, according to information on the labels of products sold in the Administrative Regions RA I, RA V, and RA VI of Salvador, Bahia.*

Other components of the antiseptic	Administrative region			Total
	AR I	AR V	AR VI	
Number of products	10 (100,0%)	13 (100,0%)	12 (100,0%)	16 (100,0%)
Benzoic acid	3 (30,0%)	2 (15,4%)	1 (8,3%)	3 (18,8%)
Citric acid	2 (20,0%)	3 (23,1%)	4 (33,3%)	4 (25,0%)
Water/Purified Water/Aqua	10 (100,0%)	13 (100,0%)	12 (100,0%)	16 (100,0%)
Alcohol/Benzyl Alcohol/Ethyl Alcohol	6 (60,0%)	6 (46,2%)	5 (41,7%)	8 (50,0%)
Aroma	10 (100,0%)	13 (100,0%)	12 (100,0%)	16 (100,0%)
Potassium Benzoate	0 (0,0%)	0 (0,0%)	1 (8,3%)	1 (6,3%)
Sodium Benzoate	5 (50,0%)	5 (38,5%)	5 (41,7%)	9 (56,3%)
Sodium Cyclamate	1 (10,0%)	2 (15,4%)	2 (16,7%)	2 (12,5%)
Cinnamaldehyde	2 (20,0%)	1 (7,7%)	1 (8,3%)	2 (12,5%)
Dye	8 (80,0%)	12 (92,3%)	11 (91,7%)	14 (87,5%)
Cetylpyridinium Chloride / Cetylpyridinium Chloride Monohydrate	5 (50,0%)	8 (61,5%)	8 (66,7%)	9 (56,3%)
Zinc Chloride	2 (20,0%)	2 (15,4%)	1 (8,3%)	2 (12,5%)
EDTA	1 (10,0%)	1 (7,7%)	1 (8,3%)	1 (6,3%)
Eucalyptol	3 (30,0%)	2 (15,4%)	2 (16,7%)	3 (18,8%)
Camellia Sinensis (Green Tea) Extract	2 (20,0%)	3 (23,1%)	3 (25,0%)	3 (18,8%)
Sodium Fluoride	4 (40,0%)	8 (61,5%)	8 (66,7%)	9 (56,3%)
Disodium phosphate/ Sodium phosphate	1 (10,0%)	1 (7,7%)	1 (8,3%)	1 (6,3%)
Glycerin	1 (10,0%)	1 (7,7%)	1 (8,3%)	1 (6,3%)
Glycerol	2 (20,0%)	4 (30,8%)	3 (25,0%)	4 (25,0%)
Levomenthol	2 (20,0%)	2 (15,4%)	1 (8,3%)	2 (12,5%)
Limonene	2 (20,0%)	3 (23,1%)	3 (25,0%)	3 (18,8%)
Menthol	6 (60,0%)	8 (61,5%)	8 (66,7%)	10 (62,5%)
Methylparaben	2 (20,0%)	3 (23,1%)	2 (16,7%)	3 (18,8%)
Lemon Peel Oil	2 (20,0%)	3 (23,1%)	3 (25,0%)	3 (18,8%)
Castor oil	1 (10,0%)	4 (30,8%)	3 (25,0%)	4 (25,0%)
Polysorbate	0 (0,0%)	1 (7,7%)	1 (8,3%)	1 (6,3%)
Poloxamer	1 (10,0%)	4 (30,8%)	3 (25,0%)	4 (25,0%)
Propylene glycol	1 (10,0%)	2 (15,4%)	1 (8,3%)	2 (12,5%)
Propylparaben	1 (10,0%)	2 (15,4%)	1 (8,3%)	2 (12,5%)
Sodium Saccharin	9 (90,0%)	12 (92,3%)	11 (91,7%)	15 (93,8%)
Methyl Salicylate	3 (30,0%)	2 (15,4%)	1 (8,3%)	3 (18,8%)
Potassium Sorbate	3 (30,0%)	5 (38,5%)	5 (41,7%)	5 (31,3%)
Sorbitol	9 (90,0%)	11 (84,6%)	11 (91,7%)	14 (87,5%)
Sucralose	3 (30,0%)	3 (23,1%)	3 (25,0%)	4 (25,0%)
Thymol	3 (30,0%)	2 (15,4%)	1 (8,3%)	3 (18,8%)
Triclosan	1 (10,0%)	1 (7,7%)	1 (8,3%)	1 (6,3%)

Discussion

Based on the analysis of the information on the labels of the pharmacological products studied—with emphasis on the "other components" of the mouthwashes—a considerable diversity, both qualitative and quantitative, is observed among their constituent elements (Table 1). This information is confirmed by data available on the respective manufacturers' websites, considering the products marketed in the administrative regions RA I, RA V, and RA VI of the municipality of Salvador, Bahia, in 2025 (Table 2).

It is noteworthy, however, that the laboratories responsible for the technical formulation of these products need to present a complete list of their components in a more detailed and standardised format. This measure is essential, given the pharmacological relevance of these ingredients and the potential for adverse effects associated with their use.

The "other components" found in mouthwashes, as listed on the labels and websites provided by the manufacturers and shown in Table 3, indicate that all products contain water and flavouring. Furthermore, 90.0%, 92.3%, and 91.7% of the products from regions RA I, RA V, and RA VI contain sodium saccharin, and 80.0%, 92.3%, and 91.7%, respectively, contain dyes. It is also observed that 90.0%, 84.6%, and 91.7% contain sorbitol, respectively. It was also assessed whether the active ingredient fluoride was included in the "other components", noting that the labels of 30.0%, 30.8%, and 41.7% of the products from regions RA I, RA V, and RA VI included it. It is essential to emphasise in this analysis that the "other components" of mouthwashes are discussed according to their classification: surfactants, stabilisers, preservatives, sweeteners, colours, flavours, types of alcohol, solvents, and active ingredients (Table 3).

Therefore, Poloxamer 407 and Poloxamer 338 are nonionic surfactants widely used in pharmaceutical and cosmetic formulations. These compounds are block copolymers formed by polyethene glycol (PEG) and polypropylene glycol (PPG) segments, which give them unique properties that make them ideal as gelling, emulsifying, and solubilising agents. In formulations such as mouthwashes, both Poloxamer 407 and 338 work by promoting uniform dispersion of the active ingredients.[8] *This action promotes effective oral cleansing and provides a lasting sensation of freshness. Both are considered safe and well-tolerated by most people. Adverse effects are rare and may include, in isolated cases, allergic reactions, mild irritation of the oral mucosa, or temporary changes in taste.*

Chemically, PEG-40 Hydrogenated Castor Oil is an ester copolymer derived from hydrogenated castor oil, widely used in personal hygiene formulations, including mouthwashes. It is a nonionic surfactant obtained by the ethoxylation of castor oil triglycerides with polyethene glycols (PEGs), resulting in a substance with solubilising, emulsifying, and stabilising properties.9 Its primary function is to reduce the surface tension of the formulation, facilitating the homogeneous dispersion of lipophilic active ingredients, fragrances, colourants, and essential oils in aqueous solutions. In addition to its role as a solubilising agent, PEG-40 Castor Oil acts as an emollient, improving the mouthwash's texture and contributing to suspension stability, which prevents phase separation.[9] *Although considered safe for topical use, including in mouthwashes, continued use may cause adverse effects in sensitive individuals, such as irritation, canker sores, or hypersensitivity reactions. Furthermore, there are theoretical concerns regarding possible toxic byproducts generated during the ethoxylation process, such as traces of 1,4-dioxane, which leads some consumers to avoid its use in intraoral products, especially those used frequently.*

In turn, polysorbate 20 and polysorbate 80, included in mouthwash formulations, are nonionic surfactants widely used in the cosmetic, food, and pharmaceutical industries. Its primary function is to act as a solubiliser, emulsifier, and stabiliser, promoting the homogeneous incorporation of lipophilic compounds, such as essential oils and fragrances, into aqueous solutions. Polysorbate 20, a monolaurate derivative, has a greater affinity for predominantly aqueous systems and is preferentially used in water-soluble emulsions and solutions. Polysorbate 80, a monooleate derivative, has greater lipid solubility and is more suitable for oil-in-water emulsions, contributing to the stability and uniformity of these formulations. Both are considered safe for topical use, including in oral hygiene products.[10] *However, they can cause mild adverse effects, such as irritation, allergic reactions, or sensitisation of the oral mucosa, especially in predisposed individuals. The risk of these effects can be increased by prolonged use or by formulations with inadequate concentrations. Therefore, individuals with oral sensitivity or seeking a more natural approach to their oral care routine should choose polysorbate-free products.*

Among stabilisers, sodium phosphate is a widely used additive in mouthwashes due to its multiple technological and therapeutic functions. Its primary role is to regulate the pH of the formulation,[11] *which contributes to the stability of preservatives, active ingredients, and antimicrobial agents, preserving their effectiveness over time. In addition to its function as a buffer, sodium phosphate also plays a remineralising role, helping to strengthen tooth enamel. By helping to control oral pH, it makes the oral environment less susceptible to the action of acids and demineralisation, improving teeth's resistance to erosion and cariogenic processes.*[12] *Although it is considered safe and effective for topical use, including in daily products, individuals with oral sensitivity or those exposed to more aggressive formulations may experience adverse effects, such as mucosal irritation, canker sores, or disturbances in oral pH balance. Although the systemic risks associated with its use are low, sensitive consumers or those seeking more natural formulations can choose products free of this ingredient.*

In the form of disodium phosphate (Na_2HPO_4), this functional stabiliser is commonly used in mouthwash formulations and is considered safe in most cases.[12,13] *Its primary function is to act as a buffering agent, stabilising the solution's pH and contributing to the formulation's integrity and effectiveness. Additionally, it sequesters metal ions through chelation mechanisms, which favours the stability of components sensitive to the presence of metals.*[13] *Although widely tolerated, disodium phosphate can trigger adverse effects in individuals with sensitive oral mucosa, a history of allergic reactions, or inflammatory conditions in the oral cavity. Continuous use, especially in synergy with other chemical additives, can increase the risk of irritation, especially in formulations with inadequate pH control. Therefore, although its action is predominantly technical and focused on formulation stability, the presence of disodium phosphate should be evaluated with caution in products intended for sensitive users or those who prioritise gentler formulations.*

The citric acid incorporated into mouthwashes has a stabilising effect due to its effective buffering action, which helps maintain the ideal pH of the formulation. This function is essential for preserving the stability of preservatives, flavourings, and other sensitive ingredients, while also giving the product a slightly citrus flavour.[14] *In specific formulations, citric acid also exerts chelating activity, binding to metal ions that could compromise the integrity of the active ingredients or accelerate the degradation of the formulation. Despite its functional and sensory benefits, citric acid requires judicious use, especially in daily-use products. Its acidity can, over time, contribute to erosion of tooth enamel, irritation of the oral mucosa, and imbalance in oral pH, particularly in predisposed individuals.*[14] *People with a history of recurrent mouth ulcers, tooth sensitivity, or inflammatory conditions in the oral mucosa should avoid mouthwashes containing citric acid, opting instead for formulations with a neutral or slightly alkaline pH, which offer greater compatibility with sensitive oral physiology.*

EDTA (ethylenediaminetetraacetic acid) stands out among the stabilisers, as it is a chelating agent used in mouthwashes due to its ability to sequester metal ions, such as calcium and magnesium.[15] *This action inhibits unwanted mineralisation, preventing the accumulation of calcium deposits on surfaces of dental plaque, such as tartar. Furthermore, by interfering with the availability of metal ions essential for certain metabolic processes, EDTA helps reduce the formation of oral biofilms, hindering microbial proliferation.*[15,16] *It is a functional ingredient and, within the concentration limits established by regulatory agencies, is considered safe for topical use. However, its continuous use in individuals with sensitive oral mucosa can cause mild adverse reactions, such as irritation, discomfort, or dryness. Additionally, there is evidence that EDTA can alter the permeability of the oral mucosa and impact the oral microbiota, factors that should be considered when developing formulations for daily use. Individuals seeking to reduce exposure to synthetic additives or who experience oral sensitivity may prefer mouthwashes formulated without EDTA, opting for alternatives with natural ingredients and a neutral pH, more compatible with the physiology of the oral cavity.*

The importance of preserving the shelf life of mouthwashes is ensured by the addition of preservatives, including methylparaben, an ingredient belonging to the paraben class, as well as ethylparaben and propylparaben.[17] *Chemically, it is the methyl ester of p-hydroxybenzoic acid, widely used for its effectiveness in inhibiting the growth of bacteria, fungi, and yeast, even at low concentrations. This antimicrobial action significantly contributes to increasing the shelf life of cosmetics, foods, medications, and mouthwashes. Its use is authorised by regulatory agencies, which consider methylparaben safe for topical use.*[17] *However, despite this approval, methylparaben can cause adverse reactions, such as irritation or allergies, in sensitive individuals. Furthermore, its continuous daily use is discouraged due to the ongoing scientific debate about potential hormonal effects from prolonged exposure. Propylparaben, in turn, is another preservative in the same family, characterised by its solubility in oil and alcohol, which expands its applications in various formulations.*

Due to its effectiveness in inhibiting the growth of fungi, yeast, and bacteria, the synthetic preservative sodium benzoate is widely used in topical products, such as mouthwashes. Its antimicrobial action helps maintain the quality and microbiological safety of the product over time.[18] *Chemically, it is the sodium salt of benzoic acid, which dissociates into Na^+ and $C_6H_5COO^-$ ions in aqueous solutions. Benzoic acid is an aromatic carboxylic acid widely used in mouthwashes due to its recognised preservative and antimicrobial properties.*[19] *To improve its solubility in aqueous media and optimise its effectiveness, benzoic acid is commonly used in the form of soluble salts, such as sodium benzoate, which contributes to the microbiological stability of the formulation. When used in appropriate concentrations, benzoic acid acts as an effective and safe preservative, inhibiting the growth of microorganisms and extending the shelf life of the mouthwash without compromising its functional efficacy over time. However, it is essential that its concentrations—in free or salt form—be carefully adjusted in the formulation.*[19] *The goal is to achieve effective antimicrobial activity without compromising the tolerability of the oral mucosa, the sensory profile, or the taste of the mouthwash. Although well tolerated in most cases, benzoic acid can, in isolated situations, cause local irritation or mild allergic reactions, particularly in individuals with sensitive mucosa or a history of hypersensitivity to preservatives.*

In turn, although sodium benzoate is considered safe by regulatory agencies, its continued use can cause adverse reactions in sensitive individuals.[18] *Given the potential for cumulative effects associated with prolonged exposure, it is recommended that people who wish to reduce contact with synthetic preservatives opt for formu-*

lations free of sodium benzoate, especially in frequently used products.

In summary, potassium sorbate is a widely used preservative in topical products, such as mouthwashes, due to its effectiveness in inhibiting the growth of fungi and yeast, microorganisms responsible for product degradation. Its antifungal action, often in synergy with sodium chloride, significantly contributes to the microbiological stability and extended shelf life of the formulation.[20] *Chemically, it is the potassium salt of sorbic acid, which acts by inhibiting essential metabolic processes in microorganisms, preventing their proliferation. Although it is considered a low-toxicity preservative and generally better tolerated than other preservatives, such as parabens, potassium sorbate can trigger allergic reactions or irritation in sensitive individuals, especially when used continuously and for a prolonged period. Therefore, their presence in products used daily should be carefully evaluated, especially by individuals predisposed to skin or mucous membrane sensitisation.*

Some ingredients, although devoid of therapeutic action, are incorporated into mouthwash formulations to induce sensory stimuli that make the product more pleasant to use. These components—such as sweeteners, colours, and flavours—contribute to patient acceptance of the mouthwash, promoting treatment adherence and, consequently, the pharmacological efficacy of the antiseptic agents present.

In general, mouthwashes contain specific colourants in their formulations, such as CI 42053, CI 42090, CI 42051, CI 17200, and CI 15985. These colourants play an essential role in differentiating between product variants and positively influencing the perception of freshness and the visual appeal of the formulation. Although most colourants are highly stable in aqueous solutions, discolouration is observed in commercial products after exposure to radiation, especially sunlight.[21] *The presence of colourants in mouthwash contributes to the aesthetic identity and adds functional value to the product, especially when high-quality colours are used. In low concentrations, these colours are considered safe. However, in exceptional cases, they can cause adverse reactions, especially in allergic or sensitive individuals or in children. The most common reactions include irritation of the oral mucosa and hypersensitivity. Therefore, the choice of colourants for mouthwashes should be judicious. Whenever possible, it is recommended to opt for natural or less allergenic alternatives, such as mineral colours or plant extracts, to minimise risks and promote greater consumer safety.*[21]

Sweeteners are substances of natural or synthetic origin used to impart a sweet flavour to foods, beverages, medications, and oral products, such as mouthwashes, without necessarily having a caloric value equivalent to that of sucrose. Their use is intended to fully or partially replace conventional sugars, motivated by dietary, metabolic, technological, or sensory reasons. Non-caloric sweeteners are distinguished by their high sweetening power, often hundreds to thousands of times greater than that of sucrose. Among the main representatives of this group are sucralose, saccharin, aspartame, acesulfame-K, and steviol glycosides (stevia).[22] *Due to their high potency, they are used in minimal concentrations and do not significantly contribute to the energy value of the products in which they are incorporated.*

Sodium saccharin[22] *is a high-intensity, non-caloric synthetic sweetener widely used in mouthwashes to mask undesirable aftertastes of certain active ingredients. It is a nitrogenous heterocyclic organic compound belonging to the aromatic sulfonamide group. Its acidic form has the molecular formula $C_7H_5NO_3S$ and, when neutralised with a base, produces the sodium salt—sodium saccharin, with the formula $C_7H_4NNaO_3S$. Considered safe and effective for use in oral formulations, sodium saccharin has a low potential for adverse effects. The central aspect to consider is the possibility of a metallic or bitter aftertaste, which some people perceive and can affect the sensory acceptance of the product. It is essential to highlight that there is no relevant evidence of systemic toxicity associated with its use in mouthwashes at the concentrations commonly used. This makes it a viable and functional alternative for consumers requiring sugar-free products.*

However, the non-caloric artificial sweetener, sodium cyclamate,[22] *which is also incorporated into mouthwashes, is produced by the salification of cyclohexylsulfamic acid and has the chemical formula $Na(C_6H_{11}NHSO_3)$. It appears as a white, odourless powder, is stable in aqueous solutions, and has a high sweetening power, being approximately 30 times sweeter than sucrose. In mouthwash formulations, sodium cyclamate is valued for its ability to mask bitter or unpleasant flavours from other active ingredients. It is often used in combination with other sweeteners, aiming for sensory synergy and a better flavour profile. It is considered a safe sweetener for oral use, with a low potential for adverse effects. When present, undesirable events are rare and generally mild, and may include taste alterations, local irritation, or, in isolated cases, allergic reactions, especially in individuals with sensitive mucosa. Due to its stability, sweetening power, and safety profile, sodium cyclamate is an effective option in sugar-free formulations aimed at individuals with calorie restrictions.*

In contrast, the artificial sweetener derived from sucrose through a selective chlorination process, in which chlorine atoms replace three hydroxyl groups, produces a molecule with significantly greater sweetening power than sucrose. This structural modification prevents the resulting sucralose from being recognised by the body as a carbohydrate. As a result, it is not metabolised and passes through the digestive tract virtually unchanged, resulting in negligible caloric value. In mouthwashes, sucralose[22] *is used in very small quantities to mask residual flavours and improve sensory acceptance. Because it is a mouthwash, and therefore a topical product not intended for ingestion, the systemic risks associated with its use*

are minimal. Despite its widely recognised safety profile, caution is recommended in individuals with a history of hypersensitivity to artificial sweeteners, inflammatory bowel disease, or food allergies, even though the risk is low with this type of application. In these situations, the use of more natural and well-tolerated alternatives, such as stevia and xylitol, may be considered.

Furthermore, although often used interchangeably, flavourings and aromas are not synonymous, despite their related concepts. Flavourings contribute to and intensify both the flavour and aroma of foods, acting in an integrated manner on the two main sensory perceptions of taste. Aromas, on the other hand, predominantly affect the sense of smell, without significantly influencing flavour. The distinction, therefore, lies in the sensory range: flavourings affect both aroma and flavour, while aromas affect only the aroma.

Among the most common flavourings are natural flavourings, such as essential oils of mint (menthol), peppermint, eucalyptus, lemon, orange, cinnamon, and natural vanilla, among others.[23] *Extra-strength peppermint oil, for example, is frequently used for its intense, refreshing effect, which consumers highly value. However, it is important to highlight that, although they are generally well-tolerated, these compounds can trigger adverse reactions in sensitive individuals, including hypersensitivity, allergic reactions, and oral mucosa irritation. Therefore, the choice of flavourings should consider not only sensory appeal but also the tolerability profile of the formulation's target audience. Camellia sinensis extract, a plant of Asian origin likely originating from the forested regions of China and India, is widely known as green tea and has been incorporated into mouthwash formulations due to its functional properties.*[24] *Depending on the extraction method and concentration used, the extract may contain polyphenols, flavonoids, and caffeine, bioactive compounds with potential antioxidant, anti-inflammatory, and antimicrobial effects. In addition to contributing to the stability of the formulation, it enhances sensory perception and provides a mild flavour to the product. It is considered safe for topical use in the oral cavity; however, individuals with sensitive mucosa or a predisposition to allergic reactions may experience mild effects, such as irritation.*

Furthermore, D-limonene is a natural terpenoid found in the peel of citrus fruits and certain plant species.[25] *With a pleasant odour and flavour, its main function in mouthwashes is sensory in nature, providing freshness and an aromatic olfactory experience to the product. Although generally well tolerated, it can cause allergic reactions or mild oral irritation in individuals with a history of hypersensitivity to citrus compounds. Cinnamaldehyde, a natural organic compound with the structural formula* $C_6H_5CH=CHCHO$,[26] *occurs predominantly in the trans isomeric form and is primarily responsible for the characteristic flavour and aroma of cinnamon. In addition to its sensory contribution, it has moderate antimicrobial activity, which can add benefits to the mouthwash formulation. However, in sensitive oral mucosa, cinnamaldehyde can cause irritation or allergic reactions, and its use with caution is recommended in products for continuous use by predisposed individuals.*

The presence of different alcohols in mouthwashes has well-defined technological, antimicrobial, and sensory purposes, such as ethanol (ethyl alcohol), which is the most widely used in pharmaceutical and cosmetic formulations. Ethanol is obtained primarily through the fermentation of sugars found in fruits, grains, and other vegetables. In mouthwashes, the ethanol concentration can vary, but is commonly between 20% and 30%. Within this range, ethanol acts as a potent antimicrobial agent, helping to reduce the bacterial load in the oral cavity. However, its use is associated with several adverse effects, including irritation and dryness of the oral mucosa, changes in taste, and possible negative impacts on oral health with prolonged use.[27] *Due to these risks, the use of ethanol-based mouthwashes is not recommended for children, individuals with sensitive mucosa, immunocompromised patients, or those with a history of oral diseases, especially inflammatory or oncological conditions.*[27] *Given these limitations, there is a growing trend toward formulating alcohol-free mouthwashes, which aim to maintain antimicrobial efficacy with a lower potential for side effects, offering a safer and better-tolerated alternative for sensitive audiences.*

Sorbitol, also known as glucitol, is a polysugar alcohol naturally found in fruits such as apples and pears, with the molecular formula $C_6H_{14}O_6$. *It is produced industrially through the hydrogenation of glucose and has a sweetening power approximately 50% lower than that of sucrose. In mouthwashes, sorbitol acts as a low-calorie sweetener and often as a texturising agent, contributing to the viscosity of the formulation. Furthermore, it acts as a flavour carrier, mitigating the burning sensation caused by "other components", which significantly improves the sensory experience of the product. It is a generally safe, non-toxic, and well-tolerated ingredient in oral applications.*[28] *Adverse effects are rare and, when they do occur, tend to be mild—such as irritation to sensitive mucous membranes—especially in cases of excessive use or accidental ingestion, which is more common among children. Due to its functional properties and safety profile, sorbitol is widely used in sugar-free formulations. It is especially recommended for people with diabetes or those at higher risk of developing cavities.*

Propylene glycol (PG), or 1,2-propanediol, is an organic compound with the molecular formula $C_3H_8O_2$ *and the chemical structure* $HO–CH_2–CHOH–CH_3$. *It is a substance widely used in pharmaceutical and cosmetic formulations due to its multifunctional properties. In mouthwashes, propylene glycol acts as a humectant, helping to retain moisture in the formulation, which contributes to the product's physical stability.*[29] *Its function as a solvent is essential for the effective solubilization of*

active ingredients, flavouring agents, and preservatives. Furthermore, it provides emollience and improves the sensation of smoothness during use, improving sensory acceptance. PG also plays an important role as a stabiliser and compatibiliser, promoting formulation homogeneity and ensuring compatibility between the various components in the mixture. It is considered safe and effective in most mouthwash formulations. However, its use can, in rare cases, trigger mild irritation or hypersensitivity reactions, especially in susceptible individuals. Therefore, caution is recommended when using it in products intended for children, people with sensitive oral mucosa, or immunocompromised patients.

Dipropylene glycol is a dihydroxylated alcohol structurally related to propylene glycol, but more complex, as it contains two linked propylene glycol units. This structure gives the compound greater viscosity, superior thermal stability, and differentiated physicochemical properties. In mouthwash formulations, dipropylene glycol is primarily used as a solvent, promoting the solubilization of lipophilic components and facilitating compatibility between substances that do not dissolve efficiently in water alone. Furthermore, its presence can influence the formulation's viscosity and its feel during use, providing a smoother texture in the oral cavity.[30] *It is considered a generally safe ingredient for use in oral hygiene products. However, in sensitive individuals, it can cause mild irritation of the oral mucosa or, more rarely, allergic reactions. As a precaution, it is recommended to avoid its use in paediatric formulations or in products intended for people with weakened oral mucosa or pre-existing lesions.*

Glycerol, also known as glycerin, is a trivalent organic compound with the molecular formula $C_3H_8O_3$, composed of a chain of three carbon atoms, each bonded to a hydroxyl group (-OH). This structure gives glycerol hygroscopic and solvent-like properties, making it widely used in cosmetic and pharmaceutical formulations. In mouthwashes, glycerol performs multiple functions. It acts as a humectant, helping to maintain oral tissue moisture and prevent dryness caused by "other components" in the formulation. It contributes to a smooth, fluid texture without making the product sticky, and also functions as a vehicle for the even distribution of aromas, flavourings, and preservatives. Its moderate viscosity improves the mouthwash's body sensation during use, promoting a more pleasant sensory experience. It also helps stabilise the taste over time, promoting product acceptance.[31] *Glycerol is considered safe, effective, and well-tolerated in oral formulations. Adverse effects are rare and generally mild, limited to a possible residual sensation in the mouth or, in cases of accidental ingestion of large quantities, mild gastrointestinal effects. Due to its safety profile, glycerol is widely used in paediatric formulas, alcohol-free products, and mouthwashes for people with sensitive oral mucosa.*

Levomenthol is a monohydroxylated alcohol with a terpenoid structure, characterised by the presence of a hydroxyl group (-OH) in a cyclic chain with aromatic properties. It is an isomer of menthol, found naturally in plants of the Mentha genus, such as mint, and is widely used in cosmetic, food, and pharmaceutical formulations.[32] *In mouthwashes, levomenthol performs multiple functions, notably for its refreshing and mild analgesic properties. Its mild local anaesthetic effect can temporarily reduce oral mucosa sensitivity, helping to relieve minor discomfort and promoting a prolonged sensation of freshness, highly valued in oral hygiene products.*[32,33] *It is considered a safe and effective ingredient, provided it is used in appropriate concentrations, in accordance with regulatory guidelines. However, in sensitive individuals or young children, it can cause local irritation, hypersensitivity reactions, or discomfort, especially when present in high concentrations. Therefore, the incorporation of levomenthol into mouthwashes should always adhere to the recommended usage limits to ensure its sensory efficacy without compromising the product's tolerability.*

Benzyl alcohol is an aromatic organic compound frequently used in mouthwashes for its functional properties. It acts primarily as a solvent and vehicle, facilitating the solubilization of lipophilic substances and promoting the homogenization of the formulation. Additionally, benzyl alcohol can exert a mild preservative and stabilising effect, helping to prevent microbial growth and, consequently, extending the shelf life of the mouthwash.[34] *Although considered safe in controlled concentrations, its use should be carefully evaluated, as it can cause irritation or allergic reactions in the oral mucosa, especially in sensitive individuals or in formulations for continuous use.*

Used as a pharmacological alternative to traditional mechanical oral hygiene measures, mouthwashes are effective tools for chemically controlling the oral microbiota and promoting oral health. These solutions are formulated to promote oral health by reducing the microbiological load, controlling dental biofilm, and preventing oral diseases. They are an adjunct to brushing and flossing. Therefore, zinc chloride is considered a functional ingredient commonly used in mouthwashes due to its antiseptic, antimicrobial, and astringent properties.[35,36] *It acts to reduce the formation of oral biofilm and control pathogenic microorganisms, contributing to a prolonged feeling of cleanliness and helping to maintain oral health. In addition to its antimicrobial effect, zinc chloride can alleviate mild irritations and, in some formulations, acts as a preservative, aiding in physical and chemical stability and, potentially, controlling the product's viscosity or density.*[35,36] *Although generally well tolerated, its use can cause adverse effects in individuals with sensitive oral mucosa or pre-existing lesions, including stinging, burning, and redness. A transient metallic or bitter taste is relatively common, which can cause discomfort during use. In rare cases, hypersensitivity reactions may occur, with symptoms such as inflammation, swelling, and intense burning. When used topically, systemic absorption through the oral mucosa is minimal, which reinforces its safety profile in well-balanced formulations.*

Chlorhexidine[3] is an antiseptic widely used in dental practice because it has antifungal and bacteriostatic properties, inhibiting bacterial growth. In higher concentrations, it also exerts a bactericidal effect, being effective against gram-positive and gram-negative microorganisms.[3,37] Cetylpyridinium chloride, a cationic quaternary ammonium compound, is present in the formulation of certain mouthwashes and contributes to the reduction of gingivitis. This action is due to its ability to prevent the formation of dental plaque, acting as an effective antimicrobial agent.[3] Triclosan, belonging to the class of polychlorinated phenoxyphenols, has a recognised antimicrobial action, inhibiting the formation of bacterial plaque. Therefore, it is present in the composition of several oral hygiene products and acts as an adjunct in reducing gingival inflammation, being useful in periodontal treatments.[3] Its effectiveness can be enhanced by its combination with gantrez, an alternating copolymer of vinyl methyl ether and maleic anhydride, which promotes controlled release and greater retention of the active ingredient in the oral cavity. Essential oils, especially thymol, eucalyptol, menthol, and methyl salicylate, are natural substances with antiseptic and antiplaque properties that contribute to maintaining oral health. They primarily clean tooth surfaces and interdental spaces, providing a complementary effect to mechanical hygiene. Thus, povidone-iodine, present in certain mouthwash formulations, stands out for its ability to reduce viral load in the oral cavity, including the coronavirus. It is a water-soluble chemical complex consisting of iodine and polyvinylpyrrolidone (PVP), with potent antiseptic action.[3,38]

Finally, although fluoride has been proven to act as an active ingredient, it is commonly found in mouthwash formulations, both alone and in combination with antiseptic agents, and is often listed among the "other components" on the labels of these products. Its importance is related to its essential role in preventing tooth decay, since the fluoride ion diffuses even into the remnants of dental biofilm, becoming bioavailable. In this condition, it directly interferes with the demineralisation and remineralisation processes of tooth enamel, contributing to the inhibition of the development of carious lesions, which is enhanced by the persistence of this element in the oral environment. [39,40,41]

Like zinc chloride, chlorhexidine, cetylpyridinium chloride, and essential oils are often listed among the "other components" of Mouthwash formulations. It is worth highlighting the possibility of a cumulative pharmacological effect, since these substances, already present as active ingredients that underlie the product's therapeutic indication, may be reincorporated under another classification, enhancing their effects and raising questions about redundancy in the formulation.

All mouthwash constituents—whether active ingredients or excipients—are dissolved in purified water, which has undergone specific purification processes, such as filtration, distillation, or reverse osmosis. These methods aim to eliminate impurities, microorganisms, and unwanted substances, resulting in a highly pure liquid compatible with pharmaceutical, cosmetic, and chemical requirements. In contrast to drinking water, purified water meets more stringent quality criteria, presenting low levels of chlorides, heavy metals, endotoxins, and organic matter.[42] In mouthwash formulations, purified water acts as a solution carrier, playing an essential role in solubilising the active ingredients and maintaining their stability. Physical chemistry of the final product.[42]

Frequently associated with this aqueous matrix, sodium chloride is a widely used component in formulations and is considered safe when used in appropriate concentrations. Its main function is to help maintain the osmolarity of the solution, making it compatible with the tissues of the oral mucosa and, therefore, better tolerated by the user. Furthermore, sodium chloride favours the solubilization of other ingredients, contributes to organoleptic balance (especially flavour), and acts as a general stabilisation agent in the formulation, playing a role this is a relevant technique in oral products. However, when used in high concentrations or with frequent and prolonged use, sodium chloride can cause adverse effects, such as irritation, burning, or discomfort, particularly in individuals with sensitive oral mucosa.

As discussed so far, all mouthwashes contain important active ingredients, in addition to a variety of other relevant substances grouped under the generic designation of "other components". Although these formulations are generally considered to have low toxicity, it is important to recognise that such substances can cause adverse effects, such as allergic or inflammatory reactions. Regulatory agencies, in turn, establish maximum daily intake (ADI) limits, which are considered safe. However, repeated exposure or exposure to high concentrations can exceed these limits, increasing the risk of toxicity. In this context, both healthcare professionals and patients must be aware of the composition of mouthwashes and the possible side effects associated with their use, especially those not justified from a therapeutic standpoint.

In the research under discussion, when analysing the composition of mouthwashes for the presence of antiseptics, it was observed that cetylpyridinium chloride was the most prevalent agent, regardless of the concentration used, being present in approximately 63% of the formulations evaluated. The remaining 37% corresponded to other antiseptic active ingredients. Cetylpyridinium chloride certainly stands out for its proven antimicrobial efficacy, combined with a favourable clinical safety profile.[3] It has a low incidence of adverse effects, such as tooth staining and taste alterations, factors that limit the use of other substances, such as triclosan, povidone-iodine, and chlorhexidine, for example, whose indication is aimed at pathologies with more serious oral manifestations. Despite its moderate substantivity, cetylpyridinium chloride exhibits a broad spectrum of action, acting on bacteria, fungi, and enveloped viruses, which justifies its indication

for long-term use in oral health maintenance protocols, with minimal risk of side effects.

Similar concerns apply to the fluoride ion, whose presence is almost constant among the "other components" of mouthwash formulations, even when it is already listed as an active ingredient at average concentrations of around 225 ppm—a parameter that, in itself, justifies its therapeutic indication. The addition of fluoride outside of the declared active ingredient formulation raises a relevant issue from a toxicological perspective: the risk of cumulative exposure. Although individual concentrations are generally within the limits considered safe by regulatory authorities, the combination of multiple sources can increase total intake above the acceptable daily intake, especially in more susceptible groups, such as children. This scenario demands a thorough analysis of the complete product formulation, both by manufacturers and healthcare professionals, in order to mitigate potential adverse effects related to excessive fluoride exposure in everyday products. Particular attention should be paid to mouthwashes intended for pediatric' patients, as the combination of fluoride and antiseptic agents is not always necessary or recommended for this age group and may pose an avoidable risk.

Conclusion

It is concluded that the indiscriminate increase in the use of mouthwashes and their constituents—especially the active ingredients and "other components" of the formulation—beyond justified clinical indications is not recommended. Such a practice, especially when lacking scientific support, can pose unnecessary health risks, contradicting the principles of therapeutic rationality and safety in the use of oral care products.

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