

Table S1. Analysis of excipients safety in an analyzed sample of pediatric phytomucolytic syrups marketed in Ukraine (n=12)

Syrup Code	Excipients	E code	Comments and safety concerns
Syrup 01	Sucrose	–	Natural sweetener, risk of cariogenicity, high caloricity
	Glycerin	E 422	Solvent, preservative, in large doses – headache, thirst, nausea, and hyperglycemia
	Citric acid monohydrate	E 330	Antioxidant, safe
	Sodium benzoate	E 211	Preservative, safe
	Sodium methyl parahydroxybenzoate	E 219	Paraben, not approved by FDA IIG ¹ (not GRAS ²), GSFA ³
	Sodium propyl parahydroxybenzoate	E 217	Paraben, not approved by EMA, FDA IIG (not GRAS), GSFA
	Sorbic acid	E 200	Preservative, safe
	Brilliant blue FCF	E 133	Synthetic coloring agent, not approved by FDA IIG, not GRAS, risk of allergic reactions
Syrup 02	Sorbitol	E 420	Sweetener (laxative effect)
	Citric acid monohydrate	E 330	Antioxidant, safe
	Sodium citrate	E 331	Buffering agent, safe
	Potassium sorbate	E 202	Preservative, safe
	Cherry flavoring agent (solvent – Propylene glycol)	E 1520	Flavoring agent with propylene glycol as a solvent, risk of allergic and other negative reactions
	Xanthan gum	E 415	Viscosity-increasing agent, not approved by FDA IIG for oral syrups, not GRAS
Syrup 03	Sucrose	–	Sweetener, risk of cariogenicity, high caloricity
	Methyl parahydroxybenzoate	E 218	Paraben, not approved by GSFA
Syrup 04	Sucrose	–	Natural sweetener, risk of cariogenicity, high caloricity
	Ethanol 8 -11%		Solvent, preservative, safe but can be dangerous for young children and risk categories
Syrup 05	Sorbitol	E 420	Sweetener, laxative effect
	Glycerine	E 422	Solvent, preservative, in large doses – headache, thirst, nausea, and hyperglycemia
	Sodium benzoate	E 211	Preservative, safe
	Citric acid monohydrate	E 330	Antioxidant, safe
	Flavor balsam (based on Propylene Glycol and ethanol)	E 1520	Flavoring agent containing Propylene Glycol and ethanol (risk of allergic and other negative reactions)
Syrup 06	Sucrose	–	Natural sweetener, risk of cariogenicity, high caloricity
	Methyl parahydroxybenzoate	E 218	Paraben, not approved by GSFA
	Flavor	–	Flavoring agent
Syrup 07	Sucrose	–	Natural sweetener, risk of cariogenicity, high caloricity
	Methyl parahydroxybenzoate	E 218	Paraben, not approved by GSFA
Syrup 08	Sugar syrup	–	Natural sweetener,

	Methyl parahydroxybenzoate	E 218	risk of cariogenicity, high caloricity Paraben, not approved by GSFA)
	Propyl parahydroxybenzoate	E 216	Paraben, not approved by GSFA
Syrup 09	Sugar syrup	–	Natural sweetener, risk of cariogenicity, high caloricity
	Honey	–	Natural sweetener, risk of allergic reactions
	Potassium sorbate	E 202	Preservative, safe
	Mentha piperita essential oil	–	Flavor, safe
Syrup 10	Sorbitol	E 420	Sweetener, laxative effect
	Potassium sorbate	E 202	Preservative, safe
	Citric acid anhydrous	E 330	Antioxidant, safe
	Cherry flavoring agent	–	Flavoring agent
	Xanthan gum	E 415	Viscosity-increasing agent, not approved by FDA IIG for oral syrups, not GRAS
Syrup 11	Maltitol	E 965	Natural-based sweetener, safe
	Potassium sorbate	E 202	Preservative, safe
	Citric acid monohydrate,	E 330	Antioxidant, safe
	Hydroxypropyl betadex	–	Solubilizing agent, safe
	Ethanol 7%		Solvent, preservative, safe as it is contained in acceptable amounts
Syrup12	Xylitol	E 967	Sweetener, risk of a laxative effect
	Citric acid monohydrate	E 330	Antioxidant, safe
	Methyl parahydroxybenzoate	E 218	Paraben, not approved by GSFA
	Propyl parahydroxybenzoate	E 216	Paraben, not approved by GSFA
	Maltodextrine	–	Viscosity-increasing agent, safe
	Xanthan gum	E 415	Viscosity-increasing agent, not GRAS
	Acacia	E 414	Viscosity-increasing agent, safe
	Strawberry flavor	–	Flavoring agent
	Strawberry juice	–	Coloring agent

¹ IIG – Inactive Ingredient Guide

² GRAS – Substances generally recognized as safe in foods, FDA Food additives database

³ GSFA – Codex General Standard for Food Additives

Table S2. Analysis of excipients safety in an analyzed sample of pediatric phytomucolytic syrups marketed in Germany (n=12)

Syrup Code	Excipients	E code	Comments and safety concerns
Syrup 11	Maltitol	E 965	Natural-based sweetener, safe
	Potassium sorbate	E 202	Preservative, safe
	Citric acid monohydrate,	E 330	Antioxidant, safe
	Hydroxypropyl betadex	–	Solubilizing agent, safe
	Ethanol 7 %		Solvent, preservative, safe as it is contained in acceptable amounts
Syrup 12	Xylitol	E 967	Sweetener, risk of laxative effect
	Citric acid monohydrate	E 330	Antioxidant, safe
	Methyl parahydroxybenzoate	E 218	Paraben, not approved by GSFA
	Propyl parahydroxybenzoate	E 216	Paraben, not approved by GSFA
	Maltodextrine	–	Viscosity-increasing agent, safe
	Xanthan gum	E 415	Viscosity-increasing agent, not approved by FDA IIG for oral syrups, not GRAS
	Acacia	E 414	Viscosity-increasing agent, safe
	Strawberry flavor	–	Flavoring agent
	Strawberry juice	–	Coloring agent
Syrup 13	Sucrose		Sweetener, risk of cariogenicity, high caloricity
	Methyl parahydroxybenzoate	E 218	Paraben, not approved by GSFA
	Propyl parahydroxybenzoate	E 216	Paraben, not approved by GSFA
	Ethanol 1,1 %		Solvent, preservative, safe as it is contained in acceptable amounts
Syrup 14	Sorbitol	E 420	Sweetener (laxative effect)
	Citric acid monohydrate	E 330	Antioxidant, safe
	Sodium citrate	E 331	Buffering agent, safe
	Potassium sorbate	E 202	Preservative, safe
	Cherry coloring agent (solvent – Propylene glycol)	E 1520	Coloring agent with propylene glycol as a solvent, risk of allergic and negative reactions
Syrup 15	Sucrose	–	Natural sweetener, risk of cariogenicity, high caloricity
	Ethanol		Solvent, preservative, safe as it is contained in acceptable amounts
Syrup 16	Sorbitol		Sweetener, laxative effect
	Sodium benzoate	E 211	Preservative, safe
	Ethanol		Solvent, preservative, safe as it is contained in acceptable amounts
Syrup 17	Macrogole glyceryl hydroxystearate (Polyoxyl 40 Hydrogenated Castor Oil)		Emulsifier, safe
	Anis essential oil		Flavor, safe
	Hydroxyethyl cellulose		Stabilizer, thickener, safe approved by GSFA and FDA IIG, not GRAS
	Sorbitol	E 420	Sweetener, laxative effect
	Propylene Glycol	E 1520	Solvent, risk of allergic reactions and other negative reactions
Syrup 18	Glycerine	E 422	Solvent, preservative, laxative effect
	Sucrose	–	Sweetener, risk of cariogenicity, high caloricity

	Propylene Glycol	E 1520	Solvent, risk of allergic and other negative reactions
	Sodium saccharin	E 954	Sweetener approved by GSFA and FDA IIG, not GRAS, risk of allergic reactions
	Ethanol		Solvent, preservative, safe but can be dangerous for young children and risk categories
Syrup 19	Maltitol	E 965	Natural-based sweetener, safe
	Potassium sorbate	E 202	Preservative, safe
	Citric acid anhydrous	E 330	Antioxidant, safe
	Hydroxyethyl cellulose		Stabilizer, thickener, safe
	Macrogole glyceryl hydroxystearate (Polyoxyl 40 Hydrogenated Castor Oil)		approved by GSFA and FDA IIG, not GRAS
	Propylene Glycol	E 1520	Emulsifier, safe
	Sucralose	E 955	Solvent, risk of allergic and negative reactions
	Honey flavor		Sweetener, approved by FDA IIG, not GRAS Flavor, safe
Syrup 20	Maltitol	E 965	Natural-based sweetener, safe
	Potassium sorbate	E 202	Preservative, safe
	Xanthan gum	E 415	Viscosity-increasing agent, not approved by FDA IIG for oral syrups, not GRAS
	Herbal essential oils mixture		Flavor, safe
Syrup 21	Sorbitol	E 420	Sweetener, laxative effect
	Ethanol		Solvent, preservative, safe as it is contained in acceptable amounts
Syrup 22	Sucrose	–	Natural sweetener, risk of cariogenicity, high caloricity
	Ethanol 8,1 %		Solvent, preservative, safe but can be dangerous for young children and risk categories
	Methyl parahydroxybenzoate	E 218	Paraben, not approved by GSFA
	Propyl parahydroxybenzoate	E 216	Paraben, not approved by GSFA
	Inverted sugar syrup		Natural sweetener, risk of cariogenicity, high caloricity

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² GRAS – Substances generally recognized as safe in foods, FDA Food additives database

³ GSFA – Codex General Standard for Food Additives