Potential immune reactions associated with exposure to ingredients of Ukrainian-made contact hygiene products

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Wet wipes and wet toilet paper are popular contact hygiene products, as evidenced by their increasing number on the global market every year (Ramya & Amutha, 2021). However, these hygiene products can be dangerous to human health, as they may contain: 1) pathogenic microorganisms (Chong, 2016; Kang et al., 2023); 2) toxic compounds (Tkachuk & Zelena, 2023; Tkachuk & Hrytsenko, 2025); 3) immunosensitizing compounds (Warshaw et al., 2017; Warshaw & Aschenbeck, 2017). The aim of this study was to theoretically assess potential immune reactions associated with exposure to wet wipes and wet toilet paper of Ukrainian production, based on the analysis of their ingredient composition.

The study analyzed literature sources on the development of immune reactions under the influence of ingredients contained in wet wipes and wet toilet paper of Ukrainian production, freely available in the retail network. The composition of wet wipes (19 variants) and wet toilet paper (4 variants) was analyzed according to the manufacturer's information provided on the packaging.

It was found that all studied variants of the specified hygiene products contain at least one compound with allergen properties, namely: methylisothiazolinone, methylchloroisothiazolinone, ethylparaben, phenoxyethanol, benzalkonium chloride, cocamidopropyl betaine, 2-bromo-2-nitropropane-1,3-diol (bronopol), linalool, geraniol, coumarin, limonene, amylcinnamal, benzyl alcohol, benzyl salicylate. Information on the reactions of the immune system to the specified compounds is summarized in Table 1.

Table 1

Possible immune-mediated reactions to certain ingredients of wet wipes and wet toilet paper of Ukrainian production

Ingredient	Hygiene products, containing ingredient, %	Immune system reaction that may occur to an ingredient	References
1	2	3	4
Methylisothiazolinone	9	Allergic contact dermatitis	Burnett et al., 2010
Methylchloroisothiazolinone	4	Allergic contact dermatitis	Kazan et al., 2023
Parabens (ethylparaben)	22	Allergic contact dermatitis	Cordeiro et al., 2022
Phenoxyethanol	61	Allergic contact dermatitis	Kolodziej et al., 2022

Continuation of Table 1

1	2	3	4
Benzalkonium chloride	61	Sensitization; allergic contact dermatitis	Killian et al., 2016; Caron et al., 2025; Zhang et al., 2025
Cocamidopropyl betaine	91	Allergic contact dermatitis	de Groot et al., 1995; Yepes-Nuñez et al., 2012
2-Bromo-2-Nitropropane-1,3-Diol (Bronopol)	22	Allergic contact dermatitis	Storrs & Bell, 1983; ATAMAN Chemicals, n.d.).
Linalool	9	Allergic contact dermatitis	Sukakul et al., 2024
Geraniol	4	Allergic contact dermatitis	Aristizabal-Torres et al., 2025
Coumarin	4	Allergic contact dermatitis	Ng et al., 2025
Amyl Cinnamal	4	Sensitization	de Groot, 2020
Benzyl alcohol	9	Allergic contact dermatitis; contact urticaria	Shaw, 1999
Benzyl salicylate	4	Allergic contact dermatitis	de Frutos, 2018

Therefore, according to the results of the analysis of literary sources, the most likely, but not frequent, reaction of the immune system to individual ingredients of wet wipes and wet toilet paper is allergic contact dermatitis. Children and people with damaged skin are especially sensitive. Given the presence of these compounds in the composition of the studied hygiene products, it is possible to assume their potential contribution to the development of allergic reactions among the population of Ukraine.

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