



LETTER TO THE EDITOR

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## Allergic rhinitis: therapeutic strategies update *Lactococcus lactis* Plasma and tranilast-roxithromycin combination

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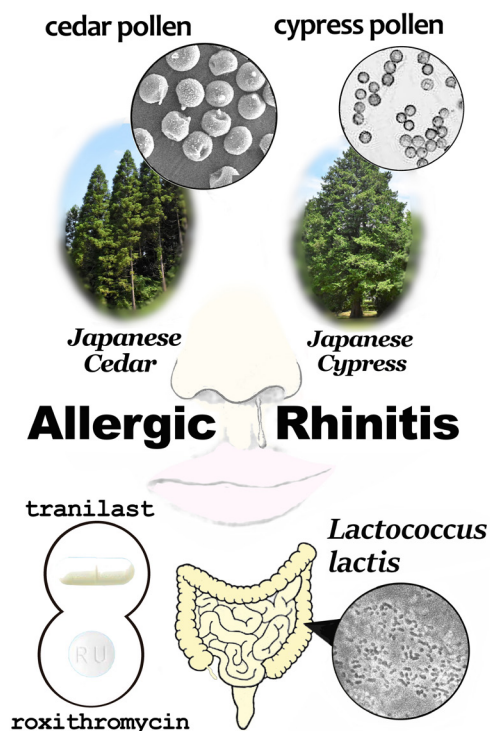
Received 3 October 2023; Accepted 26 December 2023  
Available online 1 March 2024

TO THE EDITOR,

In the treatment of allergic rhinitis (ARh), probiotics have begun to attract increasing attention, such as in the study conducted by Yan et al.<sup>1</sup> *Allergologia et Immunopathologia* published in 2022. The recent therapeutic findings, including *Lactococcus lactis* strain Plasma (LC-Plasma), presented by the author are introduced.<sup>2</sup>

Allergic rhinitis or hay fever is a major allergic manifestation characterized by reactions to airborne antigens, such as cedar pollen, and affects over 400 million people globally.<sup>3</sup> In Japan, the pollen season, lasting for several months, begins with cedar pollen, followed by cypress pollen in the spring (Figure 1).<sup>2</sup> Consequently, this occurrence has become an annual event of the spring, causing distress to many individuals. The recommended treatments include various antiallergic drugs, such as antihistamines.<sup>3</sup> Initiating the use of antiallergic drugs, such as epinastine, before onset of spring is common. Sometimes allergen-specific immunotherapy is selected;<sup>3</sup> however, no reliable treatment has yet been established. Consequently, patients are continually affected, regardless of the time and location. Their clinical manifestations include sneezing and nasal discharge, often accompanied by conjunctivitis with persistent itching.

Probiotics, contained in yogurt, are widely used for cultivating intestinal environment, improving immune health, relieving constipation, or avoiding the common cold, even if such claims are not supported by scientific



**Figure 1** Photos of Japanese cedar and cypress trees, their pollens, *Lactococcus lactis* bacillus, and combination drugs.

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<https://doi.org/10.15586/aei.v52i2.1010>

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evidence.<sup>1</sup> The author reports the successful therapeutic effect of *Lactococcus bacillus* and LC-Plasma to treat ARh.<sup>2</sup> Therefore, the treatment of ARh is entering a fundamentally new era. LC-Plasma, which appeared in the Japanese market in 2022, is a lactic acid bacterial supplement.<sup>2</sup> It has demonstrated the ability to induce plasmacytoid dendritic cells (pDCs) and suppress allergic responses, drawing significant attention to its immunostimulatory effects.<sup>2</sup> The author reported LC-Plasma to be effective in alleviating clinical manifestations and reducing the dose of antiallergic drugs in four patients with mild-to-moderate ARh.<sup>2</sup> Moreover, the aforementioned patients with ARh initiated the intake of LC-Plasma prior to the onset of the subsequent year's pollen season, thus adopting preseasonal and year-round usage. Consequently, the patient did not experience ARh manifestations, including facial erythema.<sup>2</sup> Moreover, it has been pointed out that the continuous intake of LC-Plasma increases T helper type 1 (Th1) cell responses by increasing antigen-specific T cell responses via activation of dendritic cells, suggesting the suppression of T helper type 2 (Th2) cells hypersensitivity conditions, such as ARh.<sup>2</sup> Thus far, this may support the idea that LC-Plasma has a basic inhibitory effect on ARh. Although the effect depends on the amount of scattered pollen, the response to LC-Plasma depends on the immune response of individual patient. Further analysis is required to investigate the role of pDC in regulating Th2-dominant states, including ARh.

The author highlighted the synergistic therapeutic effects of combination of tranilast, an antiallergic agent, and roxithromycin (RXM), a 14-member macrolide antibiotic, on atopic prurigo nodularis with their suppression of pruritus.<sup>4</sup> A 42-year-old patient with ARh and accompanying facial erythema was successfully treated with this combination therapy.<sup>5</sup> Tranilast is a long-term medication for treating allergies, and suppresses mast cell-derived allergic phenomena by inhibiting degranulation.<sup>4</sup> However, no consensus has been reached to make tranilast the first-choice treatment for ARh. RXM has demonstrated various immunomodulatory activities.<sup>4</sup> These activities have been shown to reduce chemokine receptor expression in Th2 cells, resulting in dual inhibitory effects on ligands and receptors.<sup>4</sup> So far, the inhibition of mast cell degranulation by tranilast in ARh might have contributed significantly to this combined effect with the addition of RXM. It is expected that the competitive effect of these two drugs will suppress the Th2 state of ARh.

In conclusion, a combination drug or LC-Plasma should be selected depending on the degree and severity of ARh. We do not have a definitive treatment option for ARh. We have presented a new therapeutic method for ARh that is expected to have definite effects. Both methods serve as investigational subjects in the pathophysiology and treatment of ARh, warranting further scrutiny. Additionally, both methods must be examined clinically on a larger scale in the future studies.

## Postscript

Subsequent case observations have suggested that tranilast-RXM combination therapy weakened the effect of the combination drug on rhinitis in patients with coexistence of rhinitis and atopic dermatitis. This phenomenon will be investigated in the future studies.

The patient who responded to this combination therapy had no history of atopic dermatitis and demonstrated a negative allergy antigen test for mites.

## Conflict of interest

The author had no conflict of interest to declare.

## Funding

This work received no specific grant from any funding agency.

## Author contributions

The author has contributed significantly to this manuscript.

## Data availability statement

Data sharing not applicable to this article as no datasets were used in the study.

## Acknowledgment

The author thanks Editage for English language editing.

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