

Effects of a honeybee lactic acid bacterial microbiome on human nasal symptoms, commensals, and biomarkers

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Background: Lactic acid bacteria (LAB) can restore commensal microbiomes and prevent infections. Arguably, nasal administrations of LAB may therefore be beneficial in chronic rhinosinusitis (CRS). Previous studies have examined effects of topical/nasal LAB in children with secretory otitis media, but little is as yet known about their effects on the human nasal airway. The aim of this pilot study was to examine effects on nasal symptoms and commensal bacteria in healthy subjects of nasal administration of a honeybee LAB microbiome; ie, a mixture of 9 *Lactobacillus* spp. and 4 *Bifidobacterium* spp. obtained from the honeybee *Apis mellifera*. Furthermore, we aimed to assess whether or not the honeybee LAB produced a local inflammatory response.

Methods: Twenty-two healthy subjects received a single administration of honeybee LAB in a sham-controlled, double-blinded, and crossover design. Using questionnaires, microbiological methods, and nasal lavages, they were assessed regarding symptoms, changes to commensal bacteria, and inflammatory products in nasal lavage fluids.

Results: The honeybee LAB did not produce any symptoms or other untoward effects. No changes were observed

of commensal bacteria by the honeybee LAB, and no inflammatory response was detected (compared to sham); ie, unaffected nasal lavage fluid levels of monocyte chemoattractant protein-1 (MCP-1), interleukin-8 (IL-8), monokine induced by interferon- γ (MIG), interleukin-15 (IL-15), epidermal growth factor (EGF), eotaxin, interferon gamma-induced protein-10 (IP-10), and interleukin-1 receptor antagonist (IL-1RA).

Conclusion: A single human nasal administration of a honeybee LAB microbiome is well tolerated. Specifically, it does not affect commensal bacteria and does not produce an inflammatory response. © 2016 ARS-AAOA, LLC.

Key Words:

bacterial interference; probiotics; lactobacillus; bifidobacteria; paranasal sinuses; SNOT-22; therapeutics; bacteriology

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Chronic rhinosinusitis (CRS) is a disease associated with impaired quality of life and substantial societal costs.¹ Though sometimes associated with other conditions, such as asthma, allergy, and nasal polyps,¹ many cases are presented without apparent comorbidities. Microbiological diagnostic procedures are frequently undertaken, but the results are often inconclusive.² Nevertheless, antibiotics are

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