

LETTER

Occupational allergic bronchial asthma induced by Lallzyme EX-V, an enzymatic blend sourced from *Aspergillus niger* used as additive in the wine industry

Enzymes have been used widely as additives to improve industrial processes.¹⁻⁴ However, this use is increasing the prevalence of occupational hypersensitivity because enzymes behave as airborne sensitizers.⁵

Lallzyme EX-V (Scott Laboratories Petaluma, California, USA) is a powder blend of pectinase and hemicellulase sourced from *Aspergillus niger* fermentation, which is formulated to improve colour stability and enhance mouthfeel in red wines. The activity of Lallzyme contributes to the macerating action on the grape cell wall, allowing the liberation of polyphenols and tannin bound polysaccharides.

A 44-year-old woman who had worked in a wine cellar for at least 20 years, experienced episodes of persistent cough, dyspnoea and wheezing for 2 years in the autumn months, coinciding with the grape harvest season. She was in charge of all processes involved in winemaking and 3 years earlier had handled Lallzyme. She reported that her symptoms appeared 10 days after the start of the harvest, concurrent with the addition of Lallzyme to the crushed grapes. The symptoms continued for several weeks, while this process took place in the wine cellar. She was asymptomatic the rest of the year and on holidays and weekends, suggesting occupational exposure.

The patient (a non-smoker) had no history of asthma and had normal

respiratory function tests: forced vital capacity 4050 L (114.4%), forced expiratory volume in 1 s 3 L (98% predicted). The bronchodilator test was negative.

Skin prick tests (SPT; LETI, Madrid, Spain) were positive to *A. niger* (3×3 mm), *A. fumigatus* (8×8 mm) and *Penicillium notatum* (3×3 mm). Common pneumoallergens were negative. CAPs (Phadia, Uppsala, Sweden) to environmental and occupational allergens were negative. SPT with Lallzyme in saline solution (10 mg/mL) was positive (20×15 mm). A specific bronchial challenge test was positive with 0.002 g/mL of Lallzyme.

To identify the allergens involved in the patient's allergy, a Lallzyme extract (10% w/v) and the SPT extracts (*A. niger* and *A. fumigatus*, *Alternaria*, *Cladosporium*, *Penicillium* and α -amylase) were analysed by IgE immunoblotting.⁴ The patient's serum detected allergens around 64, 45 and 35 kDa from the Lallzyme extract. An IgE-immunoblotting-inhibition assay with *A. niger* extract showed that Lallzyme allergens were inhibited. Oxidation of carbohydrate structures by periodate treatment⁶ did not affect the initial detection of Lallzyme allergens, suggesting that IgE-binding was not due to carbohydrate determinants. In summary, the patient's serum detected allergens from *A. niger* in Lallzyme.

Currently, the patient is working without modifications in her workplace. She continues to be seasonally exposed to Lallzyme during each grape harvest, since it is essential for the production of wine. However, she now wears respiratory protection (personal mask 3M Aura 9322+) and is being treated with budesonide (160 µg)/formoterol (4.5 µg). Under these conditions she is asymptomatic.

To the best of our knowledge, this is the first reported case of occupational allergic bronchial asthma induced by

allergens from *A. niger* contained in Lallzyme EX-V.

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REFERENCES

- 1 Baur X, Budnik LT, von Kirchbach G. Allergic asthma caused by exposure to bacterial alpha-amylase Termamyl®. *Am J Ind Med* 2013;56:378–80.
- 2 Vanhanen M, Tuomi T, Hokkanen H, et al. Enzyme exposure and enzyme sensitisation in the baking industry. *Occup Environ Med* 1996;53:670–6.
- 3 Sen D, Wiley K, Williams JG. Occupational asthma in fruit salad processing. *Clin Exp Allergy* 1998;28:363–7.
- 4 Caballero ML, Gómez M, González-Muñoz M, et al. Occupational sensitization to fungal enzymes used in animal feed industry. *Int Arch Allergy Immunol* 2007;144:231–9.
- 5 Baur X. Enzymes as occupational and environmental respiratory sensitizers. *Int Arch Occup Environ Health* 2005;78:279–86.
- 6 Vieths S, Jankiewicz A, Wüthrich B, et al. Immunoblot study of IgE binding allergens in celery roots. *Ann Allergy Asthma Immunol* 1995;75:48–55.



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