

**Absence of cross-reactivity between natural rubber latex from production lots of *Hevea brasiliensis* (*Hev-b*) and *Parthenium argentatum* (Guayule)**

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## Abstract

Natural rubber is a valuable raw material that is important to industry, transportation, medicine, and defense. It is largely produced from *Hevea brasiliensis* (Hev-b) plantations in Southeast Asia. Alternative rubber-producing crops are desired to increase biodiversity, protect supplies, and provide a safe rubber alternative for individuals suffering from life-threatening Type I Hev-b latex allergy.

Guayule latex is currently under commercial development as a source of latex that is non-allergenic to Hev-b sensitized individuals. It was initially targeted for use in medical products, for which synthetic polymers with acceptable physical properties and cost have not been identified. Earlier research demonstrated that guayule latex is low in protein and that its proteins are not recognized by mouse, rabbit, and human antibodies specific for Hev-b latex proteins. However, as production scales up, it remains important to confirm that the guayule latex continues to be safe for use by Hev-b latex sensitive people.

No Hev-b cross-reactive proteins were detected by the ImmunoCAP Inhibition Assay in ammoniated guayule latex using either the adult and pediatric IgE anti-Hev-b latex serum pools. The degree of inhibition was not significantly different ( $P = \text{NS}$ , Student t-test) from the neoprene negative control extract ( $< 1 \text{ AU ml}^{-1}$ ). This indicated an absence of detectable cross-reactive allergenic protein in the ammoniated guayule preparations. In contrast, the Redline and Triflex (a 100-fold concentrate) powdered latex examination glove positive controls produced 1,812 and 1,283,900  $\text{AU ml}^{-1}$  of detectable allergen, respectively. A low level of IgE anti-Hev-b latex reactive protein ( $3.9 \pm 4.2 \text{ AU ml}^{-1}$ ) was, however, detected in the non-ammoniated guayule latex, but only using the pediatric IgE anti-Hev-b latex serum pool. These data indicate that any potentially Hev-b cross-reactive protein in guayule is denatured following treatment with ammonia. Moreover, these low levels of Hev-b cross-reactive protein in the non-ammoniated guayule latex contrast with the high levels of Hev-b

allergen that are extractable from finished powdered Hev-b latex examination gloves (600-1800 AU ml<sup>-1</sup>).

Moreover, the polyclonal rabbit IgG anti-guayule raised against non-ammoniated latex (buffered-washed, purified rubber particles) reacted strongly against non-ammoniated guayule latex and more weakly against proteins from ammoniated guayule latex. However, these antibodies detected no proteins on either the ammoniated or non-ammoniated Hev-b latex allergosorbent, further suggesting an absence of structural similarity between Hev-b latex and guayule latex proteins.

These results indicate that proteins present in production lots of ammoniated guayule latex are not detected by human IgE, and thus are not cross-reactive with Hev-b latex allergens. This suggests that devices manufactured from guayule latex as an alternative natural rubber source should be safe for use by Type I Hev-b latex allergic individuals.