American Latex Allergy Association

What are some of the similarities/differences between Guayule latex and natural rubber latex?

Answered by
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Natural rubber latex, as we usually think of it, is produced by the rubber tree, Hevea brailisiensis, and is primarily harvested from plantations in south-east Asia. However, Hevea is only one of at least 2,500 plant species that can produce this high performance polymer. Guayule (Parthenium argentatum) is one of these other rubber-producing plants and one that, like Hevea, produces natural rubber in the high molecular weights (long polymers) required for high performance. Unlike Hevea, guayule (pronounced ?why-YOU-lee?) does not make its rubber in the form of a tapable latex - if you cut into a guayule branch nothing visible happens and no milky rubber-containing latex emulsion bleeds from the bark. However, guayule does still make its rubber in the form of microscopic rubber particles floating in the water-based cytoplasm of the individual bark cells (Hevea makes its rubber in similar rubber particles in the water-based cytoplasm of the pipe-like latex vessels). Guayule latex can still be produced, however, not by labor-intensive tapping, but by mechanized extraction and purification. Simply put, the guayule shrub is homogenized (turned into a guayule ?milk-shake?) and then the lighter latex is purified from the plant components much as cream is purified from cow?s milk. Of course, although both starting materials are high in protein, unlike freshly tapped Hevea latex which is white, the starting guayule homogenate is strongly colored. This provides an inbuilt quality control - a high protein guayule latex would also be a brown/green color instead of a pale cream or white. High quality latex products can be made from guayule latex with required strength and impressive stretchiness and softness.

The most important differences between the two latices are from an allergy point of view - especially with respect to the protein-mediated Type I latex allergies. Antibody-protein interactions are often described using the analogy of a lock and a key. One key may look similar to another belonging to a particular lock, but if it is not identical to that key it cannot open that lock. Thus, if the allergy-causing epitope (or structural surface feature) on a protein is not identical to that on another protein the antibody to the first protein will not recognize the second protein, and the second protein will not induce an allergic response. Guayule is not remotely related to Hevea (they are in different Super-orders of the broad-leafed flowering plants) and extensive immunological testing from the early 1990?s to the present, using sera from hundreds of Type I allergic patients, including spina bifida children and adult healthcare workers, as well as skin prick tests, has failed to show a single instance of cross-reactivity between the two species.

Furthermore, guayule latex is naturally a very low protein material compared with Hevea latex. It has been shown, using standard protein tests employed by the latex industry, that guayule latex contains only 1.1% of the protein amount found in Hevea latex. In addition, all of this protein is hydrophobic, which means that it is firmly associated with the rubber phase of the latex product. The readily soluble proteins, such as were the primary cause of Type I latex allergy to Hevea latex products, were removed during the guayule latex purification process, at the same

time as the green and brown colorants. The protein level is a lot lower (

Q. What is the current status of Guayule as an alternative product?

A. Guayule latex is now being commercially produced by Yulex Corporation and distributed by Centrotrade, their distribution partner, under the tradename ?yulexï¿½?. Yulex Corporation and several different medical products companies are working to develop a range of products. It is reasonable to expect that the first products will make their appearance before the end of 2006. Yulex is actively working to expand their scale of production to supply the strong market demands for yulexï¿½ products. Although synthetic alternatives, containing no protein, are available for some products, industrial performance standards were lowered to permit their entry into the marketplace and natural rubber products still provide an unsurpassed level of performance and safety.

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