The challenge of diagnosing buckwheat allergy

Tania Aidee Lopez Ramirez

Buckwheat is a crop that is mainly used in Asian countries, especially Japan and Korea for many types of food (soba noodles, dumplings); but its consumption has increased considerably in the rest of the world due to its health-promoting properties and because it can be used to substitute wheat for gluten-intolerant people. However, reports of buckwheat allergy have also increased as the crop has been spread in the world, the main symptoms include asthma, eczema and many cases of anaphylaxis.

Buckwheat allergy can currently be diagnosed through tests that measure the concentration of IgE, the antibody produced against certain proteins that trigger allergic responses. When an individual is allergic to one or various buckwheat proteins, the IgE levels increase and this can ultimately be correlated with the severity of symptoms that will derive from this allergy. However, the current diagnostic test is based on a whole buckwheat extract, including all the proteins of the crop. This makes it hard to determine what particular proteins are major allergens, which is important for giving an accurate diagnosis of how much of the allergen can be consumed or how severe would the symptoms be.

The aim of this project was to characterize the extract that is currently used for testing buckwheat allergy and determine what proteins are contained in it. At the same time, other extract was also characterized and compared and seven proteins could be identified altogether. Then, nine serum samples of buckwheat allergic individuals were analyzed and IgE specifically produced against buckwheat proteins was measured in order to identify possible allergens.

The results of this study will serve to optimize the IgE test for diagnosing buckwheat allergy as well as to have more information of the proteins contained in this plant and which of them could be considered as potential allergens.

Degree project in Biology, Master of Science (2 years), 2013
Examensarbete i biologi 30 hp till magisterexamen, Uppsala universitet, 2013
Biology Education Center and Thermo Fisher Scientific, Phadia AB
Supervisor: Sigrid Sjölander