# Genomics study points to origins of pollen allergens

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A joint University of Adelaide-Shanghai Jiao Tong University study has provided the first broad picture of the evolution and possible functions in the plant of pollen allergens.

Published in the journal *Plant Physiology*, the researchers believe their work may help with medical research into the reduction or prevention of allergic diseases such as asthma and allergic rhinitis (hay fever).

"During the past four decades, allergic diseases have become a global health problem," says project leader Professor Dabing Zhang, who leads the University of Adelaide and Shanghai Jiao Tong University Joint Laboratory for Plant Science and Breeding.

"Studies have shown that more than 50% of patients with perennial allergic rhinitis are sensitised to pollen allergens, and the number of people affected by pollen allergy is on the increase worldwide.

"Unfortunately, pollen allergens are difficult to avoid because of the extremely small size and high prevalence of pollen.

"This is a serious health issue but very little is known about their evolutionary history and why plants have evolved these allergens."

The researchers, including postgraduate students Miaolin Chen at Shanghai Jiao Tong University and Deborah Devis at the University of Adelaide's Waite campus, performed a genome-wide analysis of

potential pollen allergens in two model plants, Arabidopsis thaliana (thale cress) and rice by comparing those results among 25 species of plants ranging from simple alga to complex flowering plants.

They used these findings to develop a model explaining how plants produced and maintained pollen allergens.

"This genetic and evolutionary insight our work has provided will be useful in terms of both future medical and plant-breeding research focused on preventing pollen allergies. For instance it may help in the development of a vaccine or in modifying crop plants by screening out allergens during plant breeding," says Professor Zhang.

The University of Adelaide and Shanghai Jiao Tong University Joint Laboratory for Plant Science and Breeding was established late last year as part of an overall joint Centre for Agriculture and Health.

The two universities are working together to contribute to the national food, water and health targets of their respective countries under four themes: agriculture and wine; land and water; food safety and quality; and health and nutrition.

**More information:** Miaolin Chen et al. Origin and Functional Prediction of Pollen Allergens in Plants, *Plant Physiology* (2016). DOI: 10.1104/pp.16.00625

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