

Development of the analytical approach for mango allergen detection based on infrared spectroscopy

1. **Developing Staff Members**: Development of the analytical approach for mango allergen detection based on infrared spectroscopy

2. **Developing Staff Members**

Department	Name	Position
Food Science	Hsu-Sheng Yu	Associate professor

3. **Development Idea**

At present, ELISA is the most common method used to detect allergens. The principle is to use the binding properties of antigens and antibodies, and then use reagents to color the liquid, and cooperate with ELISA reader to analyze the color depth between samples, but this method is expensive. The operation is complicated and time-consuming. The analysis technology of mango allergen content established by this project uses the characteristics of Fourier transform infrared spectrometer to generate specific signals based on the structural differences contained in the substances, and then combines the model established by multivariate analysis for quantitative analysis. The pretreatment and analysis time is greatly reduced, which will provide easier operation, and at the same time, the allergen content

can be quickly detected, and the cost of reagents and solvents can also be reduced.

4. **Technological Competition and**

Industrial Application

The analysis technology for detecting mango allergen content established in this project not only shortens the analysis time and can detect mango allergen content, but also simplifies the operation steps due to the characteristics of the instrument itself, while reducing the amount of reagents and reducing The time spent on sample preprocessing can help improve assay performance. In the future, the model can be further optimized, or the quantitative model of mango allergens of other varieties can be developed to make the quantitative model more diverse, improve the quality and efficiency of the test, and also increase the opportunities for industry-university cooperation. In the future, this program can assist the food testing industry to quickly determine mango allergens, greatly improving the testing capacity. In addition, it can also assist the food processing industry to detect whether products contain mango allergens, and implement the food allergen

labeling system.

5. Merchandise Statement of Achievement

The experimental operation of this technology is simple and the detection time is short, and it is a new method for the rapid quantification of mango allergens in food. Each sample can be measured in about 10 minutes. Compared with other common detection methods, this technology improves the disadvantage of complicated pre-processing operations, and can analyze a larger number of samples in a short time, greatly improving the timeliness of the detection work.

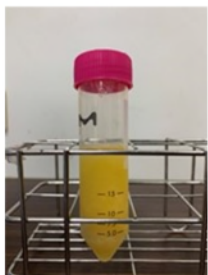


Fig 1 : Mango protein extract.

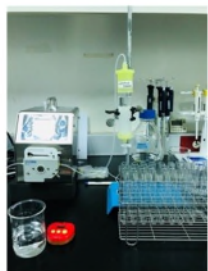


Fig 2 : Allergen purification.

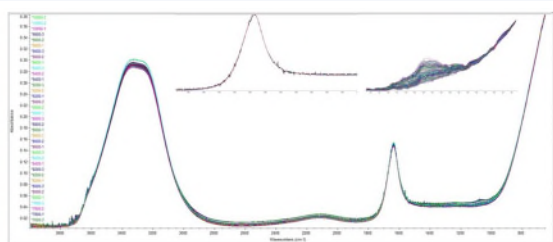


Fig 3 : Development of analytical method.

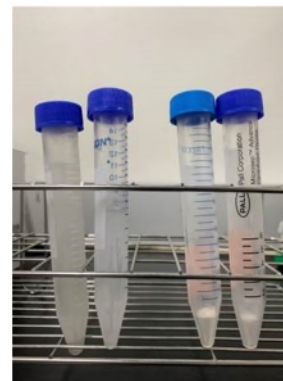


Fig 4 : Standard of allergen powder.



Fig 5 : Sample detection.

困難標品	蛋白質含量 (mg/g)	過敏原含量 (mg/g)
市售芒果乾	36.32 ± 0.24	6.93 ± 0.40
市售凍乾 芒果丁	423.22 ± 0.01	37.65 ± 0.18
市售芒果青果乾	64.21 ± 0.32	16.59 ± 0.04
液態標品	蛋白質含量 (mg/mL)	Man i 1含量 (mg/mL)
市售芒果汁	13.83 ± 0.89	3.96 ± 0.12
市售芒果冰沙	4.81 ± 0.02	0.96 ± 0.06

Fig 6 : Result of commercial products.