

## Information on Doctoral thesis of Fellows Mai Thi Dam Linh

1. Full name: Mai Thi Dam Linh
2. Sex: Female
3. Date of birth: January 19<sup>th</sup>, 1979
4. Place of birth: Thai Binh
5. Admission decision number: 2385/QĐ – SĐH date 27/6/2007 by the President of Vietnam National University.
6. Changes in academic process: No
7. Official thesis title: Study on Vietnamese plant lectins for specific agglutination with some common foodborne pathogenic bacteria
8. Major: Microbiology
9. Code: 62 42 40 01
10. Supervisors: Assoc.Prof.Dr. Bui Phuong Thuan  
Assoc.Prof.Dr. Kieu Huu Anh
11. Summary of the new findings of the thesis

Study on bacterial agglutination of 39 plant lectin extracts including:

Agglutination level of the lectins with *Salmonella* was 30%, *Shigella* was 10%, *E. coli* was 65% and *S. aureus* was 30%.

Identification of the lectins, which agglutinated strongly foodborne pathogenic bacteria, from *Typhonium flagelliforme* (Lodd) Bl., *Alpinia purpurata* (Vieill.) K Cchum., *Zingiber rubens* Roxb.

Purified and studied on biochemical characteristic of two lectins from *Pueraria phaseoloides* and *Haemanthus multiflorus* (Tratt.) Martyl):

Lectin from *Pueraria phaseoloides* was purified by pH precipitation and ion chromatography on CM – Sephadex. The purified lectin is 33 kDa of weight and purified lectin concentration was as high 10.4 times as that of crude lectin. The purified lectin was heat stable and could be stored at 4°C in at least 2 months. It has an optimal pH of 3.5 and specific binding to  $\alpha$ -D- galactose.

Lectin from *Haemanthus multiflorus* (Tratt.) Martyl was purified by ion chromatography on DE – 52 Cellulose. The purified lectin is 26 kDa of weight and its purity was 3.4 times higher than that of crude lectin. The purified lectin is heat stable with optimal activity at pH 8.0 – 9.0 and has specific binding to D- mannose.

Using lectins to detect of some foodborne pathogenic bacteria:

Three lectins from *Zingiber zerumbet* (L.) Sm, *Haemanthus multiflorus* (Tratt) Martym and *Languas galanga* (L.) Stuntz. could distinguish 4 bacteria isolates including *Salmonella*, *Shigella*, *E. coli*, *S. aureus*.

The lectin from *Pueraria phaseoloides* agglutinated specifically *E. coli* and the lectin from *Haemanthus multiflorus* (Tratt.) Martyl agglutinated only *Salmonella*.

12. Paratical applicability, if any: This study reports that the patterns of agglutination of 4 foodborne pathogenic bacteria by many plant lectin samples. In addition, panel of three lectins could distinguish between *Salmonella*, *Shigella*, *E. coli*, *S. aureus*. The lectin from *Pueraria phaseoloides* agglutinated specifically *E. coli* and the lectin from *Haemanthus multiflorus* (Tratt.) Martyl agglutinated only *Salmonella*. The agglutination profiles may form the basis of a new approach for foodborne pathogenic bacteria typing. Lectin typing may be of potential value for detecting of bacteria. Lectin kits can usefull for small clinical laboratories because of simple protocol, quick test and cheap price.

13. Further research directions, if any: Further investigation are needed to study the value of lectin typing, the bacterial specific agglutination of purified lectin samples.

14. Thesis-related publications:

[1] Mai Thi Dam Linh, Nguyen Thi Giang, Bui Phuong Thuan, Kieu Huu Anh (2008), "Isolation and identification of contaminated *Salmonella* in foods", *VNU Journal of Science, Natural Science and Technology*, 24(2S), pp. 367 – 371.

[2] Mai Thi Dam Linh, Vu Thi Thao, Bui Phuong Thuan (2008), "Research and isolation of *Shigella* from food in Hanoi", *Proceeding of 4th National scientific Conference on Biochemistry and Molecular Biology for Agriculture, Biology, Medicine and Food Industry*, pp 338 – 341.

[3] Mai Thi Dam Linh, Do Minh Phuong, Kieu Huu Anh (2010), "Characteristics of *Staphylococcus* strains isolation from some kinds of foods in Hanoi", *VNU Journal of Science, Natural Science and Technology*, 26(4S), pp. 587 - 591

[4] Mai Thi Dam Linh (2011), "Occurrence of pathogenic *Escherichia coli* in foodstuff in Hanoi ", *VNU Journal of Science, VNU Journal of Science, Natural Science and Technology*, 27(2S), pp. 206 – 210.

[5] Mai Thi Dam Linh, Bui Phuong Thuan (2014), "Interaction of Vietnamese plant lectins with *Salmonella* isolated", *VNU Journal of Science, Natural Science and Technology*, 30(2)