

應用恆溫氏圈環形核酸增幅法快速檢測 食品中花生成分

Development of loop-mediated isothermal
amplification (LAMP) assays for the rapid detection
of allergic peanut in processed food

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花生是重要的食品過敏原，如何有效檢測花生成分以確保消費者健康，為一重要研究課題。本研究設計專一引子對，應用恆溫式圈環形核酸增幅法(LAMP)檢測食品中花生成分。結果小事開發之LAMP方法具高專一性，和其他堅果類無交叉反應性，且偵測極限可達0.1%，樣品經水煮或高壓蒸煮後，仍可以此法測得花生成分，此方法可應用於市售產品花生成分之快速檢測。

Peanut is an important food allergen for causing anaphylactic reaction. To efficient detect is essential and required for consumer's health. A loop-mediated isothermal amplification (LAMP) assay was developed for the detection of allergic peanut using specifically designed primer sets. These LAMP primers sets showed high specificity for the identification of the peanut and had no cross-reaction to other species of nuts. Moreover, minimal 0.1% peanuts mixed with other nuts was detectable. Finally, genomic DNAs extracted from boiled and steamed peanut were used as templates; the detection of peanut by LAMP was not affected and reproducible. This assay will be useful and potential for the rapid detection of peanut in practical food markets.

<https://www.sciencedirect.com/science/article/pii/S0308814618303728?via%3Dihub>

表1、花生檢測之LAMP引子對

Table 1

Sequences of LAMP primers used for the detection of the peanut.

| DNA regions | Primers | Sequences |
|-------------|---------|---------------------------------------------------------|
| ITS1 | PEAF3 | 5' CGCGGAAAGCGCCAA 3' |
| | PEAB3 | 5' GCGTTCAAAGACTCGATGGT 3' |
| | PEAFIP | 3' TGGTCACTCGTCGCCCCGA- GGAAGCCAAACGTTTCTGCT 5' |
| | PEABIP | 3' TCGGCAACGGATATCTCGGCT-ACGGGATT CTGCAATTCACA 5' |
| Ara h1 | Ara1F3 | 5' ATCTTTCTAACAACCTTTGGGAA 3' |
| | Ara1B3 | 5' TACAGCCACGAGTTCAAG 3' |
| | Ara1FIP | 3' ACAGGTGAGCATCATGTCCAG- GTTATTTGAGGTGAAGCCAG 5' |
| | Ara1BIP | 3' AGAGATCAAAGAAGGAGCTTTGATG- CCAGTTCCTTTGTTGACGA 5' |

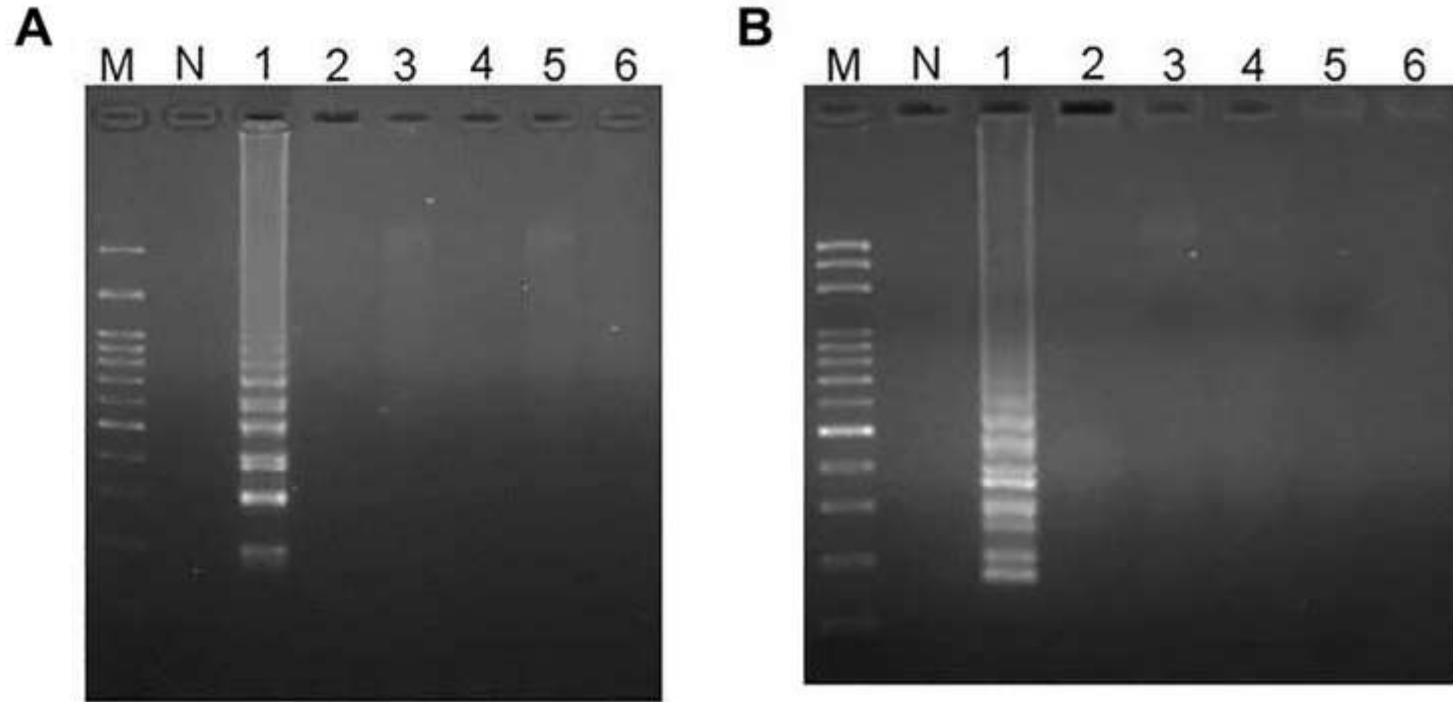


圖1、以LAMP分析法進行花生檢測之引子對專一性。

Fig. 1. Primer specificity of the LAMP assay for the identification of peanut. The specificity of ITS-based (A) and Ara h1-based (B) LAMP primers used for the detection of peanut. Purified peanut's genomic DNAs were used to perform LAMP. Lanes M and N represent 100 bp of DNA ladder and the negative control, respectively. Lanes 1–6 represent different DNAs: 1, peanut; 2, walnut; 3, hazelnut; 4, almond; 5, cashew; 6, macadamia nut.