**Optimization of electrotansformation conditions for probiotic lactobacilli by expression plasmids containing phytase enzyme and chenopodium pollen allergen (che a2) genes**

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**Introduction:** Lactobacilli may show improvement in their performance by genetic manipulation .A study was conducted to optimization of electroporation condition for probiotic lactobacilli using two plasmid that modify bacterial cells for production of phytase enzyme or as antigen delivery vehicles (chenopodium pollen allergen).

**Material and Methods:** Five probiotic lactobacilli strains from different source (chickens’ digestive tract, newborn fecal and, commercial source) were grew in Man Rogosa and Sharp (MRS) broth medium containing glycine or wave of glycine for evaluation of glycine effect on electroporation efficiency as a cell wall weakening agent. Sucrose- magnesium method was selected as a standard protocol for preparation of competent cells. A modified method was also designed by change of washing number and buffer resistance. Duration of pulses and concentration of plasmids were evaluated in each protocol. Electroporation parameters was 1.5kv, 600 Ω parallel resistance and, 10 µF capacitance.

**Results:** The modified method exhibited higher transformation efficiency than standard method (0.8×102 vs 1.6 ×102 transformants/µg plasmids) for *Lactobacillus crispatus* and *Lactobacillus salivarus* (from chickens’ digestive tract). Efficiency of transformation between the protocols was no different in other strains (*L.casei*, *L.acidophilus* and *L.plantarum*). The wave of glycine decreased the transformants in standard method. Long pulse (8ms) increased number of transformants and in short pulse (4ms) was observed no transformed cell for both methods. In this study, plasmid size was no effect on efficiency but high concentration of plasmid increased the transformed cells.

**Conclusions:** the modified method enabled to transform plasmid into the resistant lactobacilli against transformation. These bacteria have potential for bioengineering research to improve feed degradation enzymes or oral allergen vaccines.

**Keywords:** probiotic , lactobacilli, eletroporation, phytase, allergen