

The effect of 35°C on the amino acid requirement of the brown planthopper, *Nilaparvata lugens*

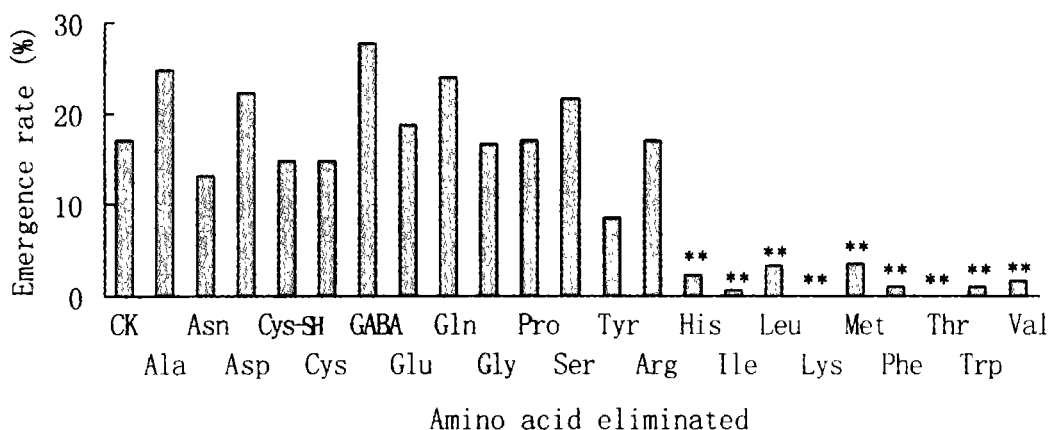
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The brown planthopper, *N. lugens*, is not able to develop well at 35°C. Previous investigation showed that 35°C-treated *N. lugens* harbored fewer symbionts than untreated ones, and it was suggested that symbiont played an important role in nutritional metabolism. Nevertheless, it is still unknown if 35°C treatment would influence the nutritional requirements. In this study, eggs of 2-3 d old were treated with 35°C for 3 d. After hatching, each 175-200 1st instar nymphae were reared at 27°C on the basic holidic diet D-97(CK) and 22 artificial diets, each lacking in an amino acid of D-97.

Results showed that the 1st instar nymphae could not grow to adult on the diets without lysine or threonine, and the emergence rate of nymphae was no more than 3.5%

on the diets lacking in one of the seven amino acids, i.e., histidine, isoleucine, leucine, methionine, phenylalanine, tryptophan, and valine (see figure).

It was obvious that the above 9 amino acids, all belonged to the 10 essential amino acids of most other insects. They were very important to the development of 35°C-treated nymphae. We also observed that the emergence of untreated nymphae was significantly inhibited by diets lacking in lysine or methionine (unpublished data). It was inferred that there was a close relationship between amino acid requirement and symbionts since fewer symbionts were counted in 35°C-treated nymphae, for which further studies are now in progress.



Emergence rate of 35°C-treated *N. lugens* on diets lacking in single amino acid.

**Differences between basic holidic diet (CK) and treatments of lacking in single amino acid were highly significant by t-test ($p < 0.001$).