

Genetic diversity and differentiation of *Lepidoglyphus destructor* (Acari: Glycyphagidae) inferred from inter-simple sequence repeat (ISSR) fingerprinting

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Abstract

Lepidoglyphus destructor (Schrank) is a prominent and world-wide pest of stored grain. Currently, genetic diversity of *L. destructor* is still little known due to the limited number of studies. The objective of this investigation was to assess genetic diversity and differentiation of four populations of *L. destructor* from four geographic locations in China using inter-simple sequence repeat (ISSR) fingerprinting. A total of 58 DNA bands were tested, 47 of which were polymorphic and the percentage of polymorphic bands (PPB) was 81.03%. Nei's gene diversity (H_e) and Shannon's Information index (I) revealed that the genetic diversity was high. Further, the value of G_{st} was 0.5680, indicating a median level of genetic differentiation in these populations. At the same time, analysis of molecular variation (AMOVA) showed that 45.93% of variation can be identified within populations. The level of gene flow (Nm) was moderate. Cluster analysis suggested that genotypes isolated from the same locations displayed a higher genetic similarity than those from different ones, forming a specific clade according to their geographic locations. Nevertheless, there was no significant correlation between the genetic distance and geographic distance.

Key words: *Lepidoglyphus destructor*; genetic diversity; genetic differentiation; geographic distribution; ISSR fingerprinting

Introduction

Storage mites are economically important pests, which frequently occur in stored grain, seed, cereal-based and other food and feed stored commodities mainly in areas with humid climates (Thind & Clarke 2001; Zhang 2003; Athanassiou *et al.* 2005; Palyvos *et al.* 2008). These mites negatively influence the quality of stored commodities, which are also one of the most important agents of allergic reactions. In particular, *Lepidoglyphus destructor* (Schrank 1781), is a common species of storage mite in stored grain (Leskinen and Klen 1986; Fernández-Caldas 1997; Mehl 1998; Athanassiou *et al.* 2001). It is becoming an important environmental allergen and occupational exposure, being responsible for contact allergies associated with farmers, bakers, and grain workers (Marx *et al.* 1993; Tee *et al.* 1992; Armentia *et al.* 1997). It is time to develop an effective management strategy of the prevention and control for *L. destructor*. The mites are wingless and usually rely on crawling for their dispersal, but they may also be carried for long distance by human activities. The complex dispersal mechanisms of *L. destructor* rendered the complex genetic diversity and differentiation among populations. However, it must be taken into account when aiming for pest management (Sabine *et al.* 2007). As a consequence, reliable estimate of genetic diversity and differentiation of *L. destructor* isolates are crucial to decision-making in pest