Entomology-2013

OMICS Group Conferences
Accelerating Scientific Discovery

International Conference on
Entomology

September 4-6, 2013 Orlando-Florida, USA

Adaptation and speciation patterns in the saw-toothed grain beetle *Oryzaephilus surinamensis* (Linnaeus, 1758), (Coleoptera: Cucujidae)

Kamal Sharaf[1,2], Tomas Pavliicek[2], Eviatar Nevo [2]

[1]*Graduate Studies Authority, University of Haifa, Israel.*

[2]*Institute of Evolution, University of Haifa, Israel.*

kamalshrf8@gmail.com

Abstract

The main objective of this study was to unfold patterns adaptation and speciation population differentiation in the wild and by human influence in direct cultivation in a silo. The relationship between pest populations adapted to human-made habitats and their counterparts adapted to natural habitats is not well understood. We studied genetic, morphological, and reproduction differentiation between natural and human-made habitats in the beetle *Oryzaephilus surinamensis* (L.). Natural habitats were represented by a “European forested, north-facing slope ("ES") separated by 100 meters at the valley bottom and by an "African savannah-like" south-facing slope ("AS") of the lower Nahal Oren Mount Carmel. The human-made habitat was represented by a grain silo ("SIL"), with temperatures inside ranging between 22°C-26°C and by relative humidity as low as 14%, and was located 26 km apart from the "ES" and "AS". Our results indicate: a) Genetic separation (by AFLP and genome size) between analyzed populations accompanied by the highest genetic diversity present at the "AS"; b) Loss of genetic variability in mitochondrial COX-1 and 16Rrna genes; c) Increases in body size in the direction "SIL"<"AS"<"ES", d) Differences between inter- and intrapopulation crossings of *O. surinamensis*: Incipient sympatric speciation; e) Horns present in males at "AS"+"ES" (43%) but not in "SIL". In this study evidence for the local interslope genetic, morphological, and behavioral adaptive divergence of *O. surinamensis* along the sharp ecological gradient in “EC” was reported, indicating sharp adaptive evolution and incipient sympatric ecological speciation. Genomic and genetic diversity decrease as follows: AS>ES>Silo; likewise, incipient speciation is indicated by intra and inter slope crosses at EC, the later indicating inferiority in fertility.