

Morphological variation among Iranian populations of the Carob Moth, *Ectomyelois ceratoniae* (Zeller, 1839) (Lepidoptera: Pyralidae)

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Abstract. The Carob moth (*Ectomyelois ceratoniae*) is the most important pest of pomegranates in Iran. In order to evaluate the morphological variation of the pest among different geographic populations, the larvae were collected from infested pomegranates at 14 localities in Iran and reared to adult. Using the landmark-based geometric morphometrics method, variation in wing shape and size and allometric relationships were documented. Mantel tests showed a general correlation between geographic and morphological distances. Some morphological distances with the greatest deviation from this correlation were detected using regression fitted line, and the probable causal factors (e.g. reduced gene flow, isolation) on morphological distances are discussed.

Kurzfassung. Die Johannisbrotmotte, *Ectomyelois ceratoniae*, ist der wichtigste Schädling des Granatapfels. Um subtile morphologische Unterschiede zwischen verschiedenen Populationen im Iran nachzuweisen, wurden an 14 Stellen die Larven von befallenden Granatäpfeln gesammelt und bis zum Imago aufgezogen. Mit der Landmark-Technik, einer geometrisch-morphologischen Analyse-Methode, wurde die Variation der Flügelform und -größe sowie allometrische Verhältnisse dokumentiert. Durch Mantel-Tests konnte eine generelle Korrelation zwischen der geographischen und der morphologischen Distanz gefunden werden. Einige morphologische Distanzen, die von der Korrelation am stärksten abwichen, wurden anhand von Regressionsanalysen identifiziert und die Faktoren, die diese Abweichungen vermutlich verursachten (z.B. verminderter Genfluß, Isolation), werden diskutiert.

Key words. Carob moth, geometric morphometrics, geographic variation, *Ectomyelois ceratoniae*.

Introduction

The distribution of individual organisms is determined by their success in securing their nutritional, physiological and behavioural needs within local habitats, which are affected by geographic variation in climate and topography (MAURER & TAPER 2002). It is believed that geographic barriers between widespread populations may prevent gene flow between populations (MAYR & ASHLOCK 1991). In the absence of gene flow, different geographic areas may give rise to separate processes of variation for any isolated population. A review of the literature shows various examples of divergence in ecological, physiological and morphological characters which occurs among geographic populations. Examples of variation in morphological traits include geographic variation in the wing shape of *Drosophila serrata* (HOFFMAN & SHRIFFS 2002), the wing geometry of *Triatoma infestans* (Hem.: Reduviidae)