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Book of Abstracts

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populations. The speed and strength of adaptation may be facilitated by several mechanisms including a large effective population size and strong selective pressures imposed by host plants.

Abstract ID: 1436

Developmental plasticity and the potential of host shift in the seed beetle

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Diverse aspects of insects' behaviour, physiology, and the relationship between life-history traits are challenged when insects try to expand their host range, exploit alternative food sources and specialise on them. Process that enables phytophagous insects to utilise new food sources, known as host shift, is tightly associated with developmental plasticity and is seldom studied in laboratory settings. Using an experimental evolution approach we simulated the host shift process and observed the evolution of plasticity in seed beetle (*Acanthoscelides obtectus*) laboratory populations that evolved on optimal (common beans) and suboptimal (chickpea) plant hosts for more than 35 years. We have looked into: 1) life-history traits and how the long-term exposure to different hosts affects them; 2) the consequences when insects are exposed to short-term (in a single generation) change of the host plant, and 3) what happens when the host plant is altered each generation, that is, we observed the process of the selection for increased plasticity in a laboratory setting. Prior to life-history assays, populations were in the experiment for 13 generations. We found that long-term host shift to chickpeas decreased plasticity levels for preadult traits compared to bean adapted populations. Simultaneously, fecundity evolved a more plastic response. Groups that were evolving in conditions where plant hosts were alternated each generation had the same plasticity patterns as their ancestral populations, suggesting the need for more time for plastic response to evolve. This research illustrates the importance of phenotypic plasticity in maintaining populations under changing feeding conditions.

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Environmental response in gene expression and DNA methylation reveals factors influencing adaptation

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