

Climate change and butterfly flight design

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It is well documented that for a wide range of species climate change has resulted in altered patterns of occurrence in time and space. However, examination of the causal and mechanistic reasons behind these patterns has received less attention and few studies have examined the impact of climate change on other aspects of life history, including adult phenotype development. We address the issue of adult phenotype development in our model system, the speckled wood butterfly (*Pararge aegeria*). In this species seasonal variation and landscape-related differences have been shown previously. Here we provide baseline data on flight morphology of a Swedish woodland population that was not affected by habitat fragmentation (during 1990-1999). This allowed us to explore to what extent *P. aegeria* is able to buffer its morphology or, alternatively, to conform its flight design based on the climatic conditions of development. As different seasonal cohorts correspond to different developmental pathways, we analysed these morphological time series relative to developmental pathway. The response of adult phenotype development to changes in weather conditions was pathway-specific and the exact environment-sensitive period varied between seasonal cohorts. We discuss the functional significance of the differences and argue for the need to test directly the functional significance of flight morphology in different behavioural contexts.