Exploring ecological causes behind the Palaearctic radiation of the *Polyommatus* blues

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The *Polyommatinus* blues are a cosmopolitan group of lycaenid butterflies with more than 450 species, whose centre of diversity is the Palaearctic area. This successful group of insects displays among the highest known rates of diversification. For example, the monophyletic taxon *Agrodiaetus* diversified into ~120 species in 3.5 MY. Here we reconstruct the most robust phylogeny of the group to date, based on 8 genes and including all extant genera for a total of 109 taxa. We revise the systematics of the group, including the status of each genus. Interestingly, we detect a significant increase in diversification rate at the base of the Palaearctic lineage. Ehrlich and Raven’s (1964) model of coevolution predicts that host plant shifts can facilitate a burst of diversification. This phenomenon has recently been shown to be a major force behind radiations in other butterflies (Fordyce 2011). We thus tested whether host plant shifts correlate with diversification of Palaearctic genera. Our preliminary results suggest that this is not the case for the *Polyommatinus* blues. However, the characteristics of this group point to other plausible explanations that can be tested. We hypothesize that the adaptations allowing this group to perform diapause in cold or dry periods allowed them to colonize vast territories that were previously unsuitable: all the central and northern Palaearctic, mountainous and xeric habitats elsewhere, and the New World through Bering.