

Publication

Adult life spans of butterflies (Lepidoptera: Papilionoidea + Hesperioidea): broad-scale contingencies with adult and larval traits in multi-species comparisons

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Adult life spans of insects are part of supposedly adaptive life-history syndromes, which involve a variety of reproductive strategies with regard to mating, egg maturation and egg laying. Contingencies of life span with many other morphological, behavioural, and ecological traits are to be expected. We used a data-mining approach, incorporating controls for phylogeny, to uncover broad patterns of trait contingencies in a literature-derived data set of adult life spans for 350 butterfly species. We found that adult feeding habit has strong links with life spans, with pollen-feeders living longer than fruit feeders, which in turn live longer than nectar feeders. Furthermore, traits reducing susceptibility to predators (i.e. aposematism, eye-spots) are associated with longer life. Mudpuddling behaviour as a means of gaining access to minerals, and possibly nitrogen, was generally associated with a short life. We also found strong impacts of the region of occurrence of species (i.e. whether they were tropical or temperate taxa), but received conflicting results depending on whether we analysed field data (longer life in the tropics) or data from caged individuals (shorter life in the tropics). Adult longevity was associated with the growth form of larval host plants (higher on lianas as opposed to herbs, shrubs, or trees), whereas other larval host plant traits did not have strong links with species' life spans. We discuss the hypothetical evolutionary mechanisms explaining those patterns and suggest predictions that could be tested in further research.

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