

Study of temperature-growth interactions of entomopathogenic fungi isolated from chalk grassland in the UK

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The majority of studies on the regulation of insect populations by entomopathogenic fungi have been in the context of pest control, whereas there has been little research into how they may impact on natural populations of insects. The Adonis Blue (*Polyommatus bellargus*) and Chalkhill Blue (*Polyommatus coridon*) butterflies are species of Lepidoptera with particular conservation interest in the UK. Both of these species exist on the most northern edge of their climatic range in populations that are restricted to fragmented chalk grassland habitats in the South of England. Larvae of both butterflies feed on the same single host plant species (*Hippocrepis comosa*) and can be found in the soil during their development. It is therefore reasonable to assume that larvae will be exposed to soil entomopathogenic fungi. *Polyommatus bellargus* are bivoltine, and the distribution of early season larvae is very closely linked to warmer temperatures in sheltered microhabitats. The use of turf height and shelter category can accurately predict the occupancy of sites across a landscape for *P. bellargus* and define optimal and sub-optimal habitats, and it is thought a similar relationship exists for *P. coridon*. A combination of host- and habitat- selection could result in local adaptation of entomopathogenic fungi. Because shelter category is a proxy for temperature, it is possible that one of the driving selectors is the ability of fungi to operate at certain temperatures. Soil was collected from these habitats and turf height and shelter category was recorded. A total of 130 entomopathogenic fungi were extracted from 144 soil samples using *Galleria melonella* as bait. The *in vitro* growth of 40 of these isolates was investigated at a range of four different temperatures between 10 and 25°C. The *in vitro* growth of a number of selected isolates was then profiled at a wider range of temperatures.