

Abstract

Polymorphism can be expected in warningly colored prey if the prey is protected from predation by nothing else but its coloration. On the contrary, in defended prey, polymorphism was only until recently considered a controversial phenomenon due to its longer and costly avoidance learning. Individual morphs can vary in different components of warning coloration: color, pattern, melanization degree, and internal and external contrast of colour patterns. This makes it difficult for predators to learn and remember warning signals of defended prey and avoid it in the future. Predator selection pressures and mechanisms leading to polymorphism differ between defended and undefended prey. For undefended prey, it is a negative frequency-dependent selection that supports rare morphs or the multiple models hypothesis for one mimetic species. For defended prey, the polymorphism can occur temporarily (i. e., be unstable) and it also can be allowed by spatial heterogeneity of morphs or, as for undefended prey, one species can mimic multiple models. Quasi-Batesian mimesis could also contribute to the existence of the polymorphism, due to mechanisms similar to those in unprotected prey. Apart from selection by predators, there are other factors, that contribute to the existence of polymorphism in prey warning signaling, such as thermoregulation, sexual selection and conflict of multiple selection pressures.

Keywords: polymorphism, aposematism, antipredatory strategies, warning coloration, antipredatory defences, Müllerian mimicry, Batesian mimicry, avoidance learning