

Common Cuckoo parasitism in Europe: behavioural adaptations, arms race and the role of metapopulations

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The Common Cuckoo (*Cuculus canorus*) is the only widely spread brood parasite in Europe. It is a successful species in the sense that it has already parasited most (perhaps all?) of the suitable host species all over Europe. On the other hand parasitised hosts during the contact with the Cuckoo developed antiparasite defence against this brood parasite, in which discrimination of the foreign egg seems to be the most important and effective way in reducing the negative consequences ("costs") of parasitism on hosts' reproduction. In egg discrimination the cognitive process of egg recognition is followed by egg rejection with any of the available methods (e.g. egg burial, nest desertion, egg ejection). However, each of these rejection methods cannot be restricted to brood parasitism, they seem to be more general behaviours than simple antiparasite adaptations. E.g. egg burial is a continuation of nest-building behaviour, nest desertion may occur from several reasons, and egg ejection shows high similarity with nest cleaning, but the usage of these behavioural elements against the rejection of Cuckoo eggs seems to be highly effective. In the present paper the relationship between the Cuckoo and its European hosts is reviewed, in the light of the coevolutionary arms race hypothesis and its variants. Generally, a metapopulation structure of the host gives the chance for a longstanding coevolutionary process between a host species and the Cuckoo, especially when there is immigration from unparasitised, highly reproductive host populations ("sources") to parasitised host populations, where host's reproduction rate is low ("sinks"). However, there is a little knowledge on how the arms race comes to an end. Examples are shown for regular and unexpected ways of its termination.