

A Modelling Framework for Conspecific Brood Parasitism

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A common phenomenon amongst bird populations is brood parasitism; that is the laying of eggs in the nest of another individual without taking part in the subsequent processes of incubation and/or caring for the hatchlings. This behaviour takes two forms. Obligate interspecific brood parasitism is where a species specialises in laying eggs in the nests of birds of another species; in this case the parasite birds do not build a nest and lay all their eggs parasitically. Conspecific (or intraspecific) brood parasitism is where the host is from the bird's own species, and in this case parasites will generally also form a nest themselves.. For an overview, see [2]. At the last count [3], conspecific brood parasitism has been recorded in 185 species.

Recently several papers that model conspecific brood parasitism have been published. The first of these models was by Lyon [4], and was followed by [5], [1] and [6]. Whilst these papers are concerned with answering different questions, they approach the problem in a similar way and have a lot of common features. In this presentation a framework will be introduced which unifies these models, in the sense that they all become special cases of a more general model. This is useful for two main reasons; firstly in order to aid clarity, in that the assumptions and conclusions of each of the models are easier to compare. Secondly it provides a base for further similar models to start from. The basic assumptions for this framework are outlined and a method for finding the ESSs of such models is introduced. In addition it will be shown in detail how each of the original papers fits into the framework.

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We show that there is not necessarily a unique ESS in our most general model, and it is not hard to produce a system with any specified number of ESSs. None of the earlier papers have non-unique ESSs, however, and it is shown for one important subclass that there is always a unique ESS.

References

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