

On the function of intra and interspecific territoriality.

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Concerning territoriality, the role of food storage and partitioning has often been stressed. The hypothesis, that food constraints produce territoriality, or territoriality only lowers nest predation by providing lower prey densities was investigated in a mainly two dimensional habitat.

Food supply, abundance and seasonal distribution were compared in five species of Reed warblers and related to the sexual and parental behavior of the males. The Great reed warbler (GRW), the only facultative polygynous species, inhabits the best and largest territories with the most heterogenous resources. The territories of the Sedge warbler (SW) show the second highest food abundance. This species has been shown to be opportunistically polygynous (see Kelsey and Leisler in this paper). In contrast, the strictly monogamous Moustached warbler (MOW) and the Reed warbler (RW), are inhabiting the poorest sites. In addition, males of these species show the greatest amount of parental investment, in terms of feeding and incubating offspring.

Food abundance differs between different vegetation types thus birds can use habitat cues like vegetation density or type of vegetation to estimate food abundance and territorial quality. In general, food increases with the season but it is available very late in GRW and RW territories (but when food is needed at most). Differences in food abundance also increase between territories of an individual species with time (especially in the GRW).

Food dispersion is different in the five species too and thus the predictability of food is very high (regular dispersion) for the MOW and SW and very low (contagious dispersion) for the GRW.

But actually our results also show that when food is needed most, conspecific or congeneric individuals, although subordinated, can invade other territories, and at least three species (GRW, SW and MW) forage to a great extent outside of their territories. Thus the role of food should be less important for territoriality.

The high rate of nest predators and the two dimensional habitat structure force birds to nest more or less in the same height. The results show that nest predation is density dependent and follows the rules of the apparent competition hypothesis. Therefore, to lower nest mortality, birds should space their nests uniformly over a given area. The RW and the GRW show a random dispersions over their inhabited area whereas the MOW is actually regularly dispersed. Finally, examining interspecific spatial distribution of all three species together shows a strictly regular distribution pattern. So the function of spacing to avoid nest predation seems to be adaptive and perhaps more important than the protection of nutritive resources.

The incidence of polygyny in Marsh and Sedge Warbler.

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A population of Marsh and Sedge Warblers were studied over three successive summers in the West-Midlands of England. The two species were sympatric and their territories showed some interspecific overlap but little intraspecific overlap. Interspecific chases were mainly initiated by the Sedge Warbler, the first of the species pair to arrive.

Some males of both species showed polyterritorial behaviour, producing song outside their primary territories during the early part of the breeding season. In Marsh Warblers this occurred mainly during the incubation phase. Polyterritorial males in Marsh Warblers were quicker to pair than non polyterritorial and suffered fewer first nest failures.

In the study, no proven cases of polygyny were found in Marsh Warblers but there was a real shortage of females in this small, isolated and declining population. One case occurred with Sedge Warblers. Examination of polygyny cases described elsewhere suggests polyterritorial behaviour is the principal strategy to achieve this. Because of this, the true extent of polygyny may be different to determine.

Population dynamics and breeding biology of Blyth's Reed Warbler *Acrocephalus dumetorum*.

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I have studied population dynamics and breeding biology of Blyth's Reed Warbler in Lappeenranta, SE Finland, from 1978 to 1985. Data on fluctuation of the same population, however, are available since 1962.

Blyth's Reed Warbler has rapidly increased in numbers both in the study area and in the whole Finland since the very first record in 1930 up to the 1970's, but the expansion has levelled off during the last decade.

In addition to breeding pairs, there were unpaired males every summer (on average 40%). There seems to be an excess of males. Blyth's Reed Warbler hybridizes regularly with the closely related Marsh Warbler *A. palustris* in the study area (every year 1-3 mixed pairs, or about 5-10% of the total number of Blyth's Reed Warbler pairs). Some males were polyterritorial polygynous; three males paired with both *A. dumetorum* and *palustris* female at the same time.

The general breeding biology of Blyth's Reed Warbler resembles very much that of the Marsh Warbler. The species is single-brooded with the most frequent clutch size of 6 eggs, but a replacement clutch is often laid even though a brood has been lost close to fledging. On average, 65% of the eggs laid produce a fledged young. The breeding success is fairly high compared to most other open-nesting small passerines. This factor possibly partly explains the recent expansion of the species towards northwest and west in Northern Europe.

I'm going to continue my work on Blyth's Reed Warbler special problems with include, for example the interspecific relationships between Blyth's Reed Warbler and Marsh Warbler. I will also try to solve some problems dealing with conservation biology by using *Acrocephalus* Warblers as a model species of patchy habitats.

***Acrocephalus* mating systems: A comparative approach**

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A comparative survey of mating systems in six European *Acrocephalus* species revealed that two of the species can be classified as polygynous and four as monogamous.

Several correlations were then found between mating system and various aspects of behaviour, ecology and morphology.

Males of polygynous species invested little or nothing in parental care, whereas males of monogamous species shared it equally with females.

Males of polygynous species defended large resource based territories in high productive marshland ecotones rich in arthropod food. Monogamous males defended smaller territories in less productive marshland.

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Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [BFB-Bericht \(Biologisches Forschungsinstitut für Burgenland, Illmitz 1](#)

Jahr/Year: 1990

Band/Volume: [75](#)

Autor(en)/Author(s): Kelsey M.

Artikel/Article: [The incidence of polygyny in Marsh and Sedge Warbler 13-14](#)