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Nesting habitat requirements and nestling diet in the Mediterranean populations of Crested Tits *Lophophanes cristatus*

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Abstract. Most bird species show specific habitat requirements for breeding and feeding. We studied the pattern of habitat occupation, nestling diet and breeding performance of Crested Tits *Lophophanes cristatus* in a "typical" (coniferous) and an "atypical" (Holm Oak *Quercus ilex*) forest in eastern Spain during 2005–2007. We aimed to determine which microhabitat characteristics in the Holm Oak forest could account for the presence of Crested Tits, and checked whether the nestling diet in the Holm Oak forest resembled that obtained in the pine forest. Vegetation maps were produced using GIS from observations made in the field (tree species, tree and shrub cover). Nestling diet was recorded through video surveillance. Crested Tits bred in mature, low-density areas in the pine forest. Those breeding in the Holm Oak forest built their nests in areas including pine trees and avoided densely forested areas. Birds breeding in the pine forest started laying by mid-April and the average clutch size was 5 eggs. In the Holm Oak forest, birds started laying by the end of April and average clutch size was also 5 eggs. Fledglings weighed around 12 g in both forests. Nestling diet, prey size and feeding frequency by the parents did not vary between the forests. The main prey types consumed were Lepidoptera larvae and Diptera.

Key words: *Lophophanes cristatus,* Crested Tit, nest site selection, habitat requirements, Holm Oak forest, nestling diet

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Foraging behaviour of White-backed Woodpeckers *Dendrocopos leucotos* in a primeval forest (Białowieża National Park, NE Poland): dependence on habitat resources and season

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Czeszczewik D. 2009. Foraging behaviour of White-backed Woodpeckers *Dendrocopos leucotos* in a primeval forest (Białowieża National Park, NE Poland): dependence on habitat resources and season. Acta Ornithol. 44: 109–118. DOI 10.3161/000164509X482687

Abstract. Detailed knowledge of the foraging behaviour of endangered species, especially in relation to available resources, may be useful in conservation management. I studied the year-round foraging behaviour of the White-backed Woodpecker in broadleaved, primeval Białowieża Forest (NE Poland), and investigated how foraging time was divided among various substrates and foraging techniques. Of the 13 tree species used for foraging, woodpeckers were most frequently recorded utilising the three most common tree species: hornbeam *Carpinus betulus*, lime *Tilia cordata* and spruce *Picea abies* (totalling 61–68% of observed time), and the proportional use of tree species did not change seasonally. Observations of birds foraging on snags increased and foraging on fallen trees decreased from spring to winter. Foraging was most frequently recorded on dead substrates (72–85%), usually those covered with bark. Mean time of foraging on an individual tree increased significantly from spring to winter. The foraging techniques most often used by woodpeckers were bark-pecking (29–41%) and superficial wood-pecking (12–27%). During winter, foraging techniques did not change significantly in relation to weather. These results suggest that forest stand composition is less important to this species than tree condition. Most broadleaved tree species and, under some conditions, spruce can be utilised for foraging by this woodpecker if they provide dead or dying substrates.

Key words: White-backed Woodpecker, *Dendrocopos leucotos*, foraging substrate, foraging technique, seasonal variation

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Factors affecting plumage oiling levels in a Kentish Plover *Charadrius alexandrinus* population after a major oil spill

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Domínguez J., Vidal M. 2009. Factors affecting plumage oiling levels in a Kentish Plover *Charadrius alexandrinus* population after a major oil spill. Acta Ornithol. 44: 119–126. DOI 10.3161/000164509X482696

Abstract. The oil tanker Prestige, with a 77 000-tonne cargo of heavy fuel oil, was badly damaged on 13 November 2002 off the Galician coast (NW Spain), where it leaked about 63 000 tonnes of oil. During the winter of 2002 and spring of 2003, we studied the degree of oil contamination in the plumage of the Kentish Plover *Charadrius alexandrinus*. Using the Generalized Estimated Equations (GEE), we evaluated the hypothesis that the presence of oiled birds in the breeding period could be influenced by 1) the location of the beach (estuarine versus non-estuarine), 2) the presence of an intertidal area in the lagoon associated with the beach, 3) the distance from the initial spill location and 4) the month. The worst affected body parts were the abdomen, and, to a lesser extent, the breast. The location of the beach was the only predictor included in the final model. The beaches with the highest average scores of oiled birds were those located on the non-estuarine coast. The other two predictors with significant parameters in the univariate analysis were the distance from the initial spill location and the month.

Key words: *Charadrius alexandrinus*, Kentish Plover, NW Spain, Prestige oil spill, plumage oiling

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Functional characterization of begging calls in Thin-billed Prions *Pachyptila belcheri* chicks

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Duckworth A., Masello J. F., Mundry R., Quillfeldt P. 2009. Functional characterization of begging calls in Thin-billed Prions *Pachyptila belcheri* chicks. Acta Ornithol. 44: 127–137. DOI 10.3161/000164509X482704

Abstract. Chicks beg to solicit food and care from their parents. Previous studies of nocturnally feeding Thin-billed Prions (*Pachyptila belcheri*) showed that chicks convey information about their condition to their parents by means of begging calls. However, those studies used tape-recorders with a limited recording duration, which precluded the recording of complete nights, so only the first begging sessions per night were analysed. Here we present data on begging call intensities and the acoustic parameters of begging elements obtained using digital voice recorders, which enabled complete nights to be recorded. Chicks used from one to five begging sessions per night. We found that the parameters of the first calling sessions did not reflect body condition, whereas the duration of begging sessions and the number of begging calls over the whole night was correlated with the chicks' body condition and the sizes of the meals delivered by the parents. The acoustic parameters of begging call elements were not correlated with body condition. Chicks did not change call frequencies according to their state of nutrition. All call parameters, including the acoustic parameters of chick begging calls, were highly chick-specific. We further tested for age effects and found strong correlations between call features and the age of chicks. The results of the present study show that some begging parameters, e.g. the duration of begging sessions and the number of begging calls over the whole night, are connected with condition, while others, such as acoustic parameters, are linked with individual chick recognition.

Key words: Parent-offspring communication, signaling, provisioning, *Pachyptila belcheri*, seabirds, begging, nestling condition

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Relationships between territory quality and carotenoid-based plumage colour, cell-mediated immune response, and body mass in Great Tit *Parus major* nestlings

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Galván I., Díaz L., Sanz J. J. 2009. Relationships between territory quality and carotenoid-based plumage colour, cell-mediated immune response, and body mass in Great Tit *Parus major* nestlings. Acta Ornithol. 44: 139–150. DOI 10.3161/000164509X482722

Abstract. Plumage colour is classified as pigmentary or structural, depending on whether it is caused by pigments or by feather microstructure. However, recent findings indicate that carotenoid-based plumage colouration also reflects at UV-blue wavelengths and that the underlying structure is related to the reflectance properties of the yellow feathers. Thus, yellow plumage is based on interactions between structural and pigmentary components. This study investigated the relationships among the vegetation structure of breeding territories, both components of plumage colour, T-cell-mediated immune response and body mass of nestling Great Tits *Parus major*. By using a model of avian visual perception, we found that, while plumage yellowness was associated with mature vegetation, plumage brightness and UV-blue reflectance were related to immature habitats in territories. We noted considerable variability in the development of carotenoid-based colour components under different environmental conditions, as plumage yellowness, but not brightness or UV-blue reflectance, depends on the availability of carotenoids, which is assumed to be high in mature territories with high food abundance. Territorial features denoting mature territories were also related to high body mass and immune response in nestlings, but none of the colour components were related to these variables of the vegetation structure, suggesting that habitat quality is related to nestling body mass and immune response through mechanisms different from those through which it is related to colour.

Key words: carotenoids, phenotypic plasticity, plumage colour, T-cell immune response, territory quality

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Nest defence against conspecific intruders in the Common Pochard *Aythya ferina*: natural observations and an experimental test

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Honza M., Piálková R., Albrecht T., Neužilová Š. 2009. Nest defence against conspecific intruders in the Common Pochard *Aythya ferina*: natural observations and an experimental test. Acta Ornithol. 44: 151–158. DOI 10.3161/000164509X482713

Abstract. The reproductive behaviour of brood parasitic birds has been of long-standing interest to evolutionary biologists, but some key features of this breeding tactic are largely unknown in particular species. Here we investigated anti-parasitic tactics in ground nesting Common Pochard *Aythya ferina* females towards intraspecific brood parasitism. Using a conspecific female dummy we experimentally simulated a situation where a female returning to her own nest is confronted with a conspecific parasite. The behaviour of the tested females towards the experimental dummy was compared with their responses towards the stuffed female Ring-necked Pheasant *Phasianus colchicus* used as a control. The reactions towards both dummies were similar: Pochard females typically swam silently around their nests and observed the dummy. The lack of differences between the measured parameters recorded in the experiments with conspecific and pheasant dummies may indicate that female Pochards do not recognize the conspecific intruder as a specific threat. In addition, the responses of the incubating female towards the conspecific female on her nest were studied using continuous video recordings. The defence was not sufficient, since the intruders were never expelled from the nest. The only rejection technique recorded was that of the parasitic egg being removed from the nest with the aid of the bill. The data indicate that active sophisticated anti-parasitic tactics have not evolved in Pochards, although there is some level of defence towards intruding conspecific parasites.

Key words: waterfowl, brood parasitism, intraspecific parasitism, breeding strategy, egg rejection

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The wintering distribution of Great Grey Shrike *Lanius excubitor* in Poland: predictions from a large-scale historical survey

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Kuczyński L., Rzępała M., Goławski A., Tryjanowski P. 2009. The wintering distribution of Great Grey Shrike *Lanius excubitor* in Poland: predictions from a large-scale historical survey. Acta Ornithologica 44: 159–166. DOI 10.3161/000164509X482731

Abstract. The wintering Great Grey Shrike *Lanius excubitor* was censused in Poland more than two decades ago (during the winters of 1988/89 and 1989/90). Single censuses were made during each winter on sample plots varying from 4.1 to 35.1 km^2 (mean: 16.4 km^2). Altogether, data from 404 plots, covering in total more than 6.6 thousands km^2 were used for the analysis. Based on this data and environmental information gathered in GIS databases (Corine land cover "CLC1990" database, digital elevation model "GTOPO30" dataset) we modelled habitat- and spatial-related variation in shrike distribution. Birds were recorded on 45% of study plots. The mean density was 4.8 individuals/100 km^2. In both seasons density in meadows was roughly two times higher than in arable fields. We modelled spatial distribution of wintering birds using combination of GLM and three-dimensional local regression. Models were cross-validated to check their temporal consistency. Repeatable spatial pattern of population distribution allowed to make predictive distribution maps. As a general rule, wintering shrikes avoid regions with severe, continental climate and prefer lowlands dominated by agriculture. On the basis of our models, population of the Great Grey Shrike wintering in Poland during late 1980s can be roughly estimated at about 7.7 thousands of individuals.

Key words: predictive distribution modelling, farmland, habitat selection, wintering

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Brood provisioning rate and food allocation rules according to nestling begging in a clutch-adjusting species, the Rufous-tailed Scrub-robin *Cercotrichas galactotes*

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Moreno-Rueda G., Soler M., Martín-Vivaldi M., Palomino J. J. 2009. Brood provisioning rate and food allocation rules according to nestling begging in a clutch-adjusting species, the Rufous-tailed Scrub-robin *Cercotrichas galactotes*. Acta Ornithol. 44: 167–175. DOI 10.3161/000164509X482740

Abstract. Brood reduction may be a strategy by which, when food is scarce, parents provision chicks differentially — this usually leads to the death of the smaller nestlings. In contrast, in species where brood reduction does not normally occur, parents may allocate food equally among nestlings. The Rufous-tailed Scrub-robin *Cercotrichas galactotes* is a species in which brood reduction does not occur (it is a clutch adjuster), so that all nestlings usually fledge. This study analysed the food allocation rules in this species. As predicted, begging behaviour in nestlings seems to indicate their need for food, because once fed, they reduced their begging levels. Parents provisioning the nest allocated food according to begging by nestlings. Those nestlings that got fed begged nearer the parents, with lower latency and higher intensity, and stretched up to a greater height while begging. Moreover, the feeding rate was higher when more nestlings begged in the nest. There were slight differences between males and females with respect to prey type brought to the nest. Bigger nestlings got a larger proportion of food because they begged more intensely, but there was no evidence of parental favouritism towards bigger chicks.

Key words: Rufous-tailed Scrub-robin, *Cercotrichas galactotes*, begging, breeding strategies, brood reduction, food allocation rules, parental investment.

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The use of sympatric Reed Warblers *Acrocephalus scirpaceus* and Marsh Warblers *Acrocephalus palustris* as breeding hosts: parasitism rates and breeding success of Common Cuckoos *Cuculus canorus*

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Sklepowicz B., Halupka L. 2009. The use of sympatric Reed Warblers *Acrocephalus scirpaceus* and Marsh Warblers *Acrocephalus palustris* as breeding hosts: parasitism rates and breeding success of Common Cuckoos *Cuculus canorus*. Acta Ornithol. 44: 177–184. DOI 10.3161/000164509X482759

Abstract. We investigated the level of parasitism, rejection rates and breeding success of the Common Cuckoo *Cuculus canorus* parasitising two sympatric species of *Acrocephalus* warblers breeding in western Poland. In both hosts the frequency of Cuckoo parasitism was fairly constant throughout the breeding season. The parasitism rate (defined as the proportion of nests parasitised by the Cuckoo) was significantly higher in Reed Warblers *Acrocephalus scirpaceus* (12%) than in Marsh Warblers *Acrocephalus palustris* (4.6%). The rejection rate in Reed Warblers (7.4%) was the lowest ever reported for this species, while Marsh Warblers rejected 57.1% of Cuckoo eggs. As a result, the hatching success of the Cuckoo in Reed Warbler nests was higher than in Marsh Warbler nests (74.1% and 28.6%, respectively). The fledging success of Cuckoo chicks in the nests of the two host species was similar. Nest survival was significantly lower in parasitised nests than in non-parasitised ones. The breeding success of the Cuckoo (proportion of fledged young to the total number of eggs laid) was higher in the nests of Reed Warblers (29.6%) than in those of Marsh Warblers (7.1%), but the difference was not statistically significant. In 2001–2003 both host species were parasitised at a similar rate, but in 2004–2008 the level of parasitism dropped dramatically in Marsh Warblers. We discuss possible explanations for this phenomenon.

Key words: Cuckoo, *Cuculus canorus*, parasitism, egg rejection, brood parasite, breeding success, Reed Warbler, *Acrocephalus scirpaceus*, Marsh Warbler, *Acrocephalus palustris*

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Nest composition adjustments by Chinese Bulbuls *Pycnonotus sinensis* in an urbanized landscape of Hangzhou (E China)

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Wang Y., Chen S., Blair R. B., Jiang P., Ding P. 2009. Nest composition adjustments by Chinese Bulbuls *Pycnonotus sinensis* in an urbanized landscape of Hangzhou (E China). Acta Ornithol. 44: 185–192. DOI 10.3161/000164509X482768

Abstract. Urbanization changes the abundance and type of resources upon which birds depend, including the type and availability of nesting materials. Although more and more bird species worldwide are colonizing and adapting to urban environments, the ecological processes underlying the responses to urbanization and the relevant resource changes remain unclear. Here we examined the responses of the Chinese Bulbul *Pycnonotus sinensis* to urbanization by assessing nest composition and available nesting materials at five land-use categories (mountains, farmlands, riparians, urban parks, strips of street trees) of intensifying development in Hangzhou, China. In each land-use category, we classified used and available nesting materials as anthropogenic (e.g. plastics, paper pieces, cloth pieces, nylon particles, threads) or natural materials (e.g. plant culms, roots, leaves). We found that the proportion of anthropogenic nesting materials used by Chinese Bulbuls differed significantly across land-use categories, and it increased significantly with urbanization. Additionally, the increasing amount of anthropogenic nesting materials with urbanization can be attributed to an increase in the availability of anthropogenic nesting materials toward the urban core. Our results indicate that Chinese Bulbuls can adjust the composition of their nests in response to urbanization.

Key words: Chinese Bulbul, *Pycnonotus sinensis*, nest composition, breeding, anthropogenic nesting material, land use, urbanization, adaptation

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SHORT NOTES

Natal dispersal and recruitment of two Bonelli's Eagles *Aquila fasciata*: a four-year satellite tracking study

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Cadahía L., López-López P., Urios V., Soutullo Á., Negro J. J. 2009. Natal dispersal and recruitment of two Bonelli's Eagles *Aquila fasciata*: a four-year satellite tracking study. Acta Ornithol. 44: 193–198. DOI 10.3161/000164509X482777

Abstract. To study natal dispersal and recruitment to the breeding population in Bonelli's Eagle, two nestlings were tagged with satellite transmitters in the Iberian Peninsula in 2002. Their monthly ranges and distances were computed and fitted to regression models to describe their general trend. One bird, a female, dispersed and settled rapidly in an area which she explored intensively during four years and which finally became her first breeding site. The natal dispersal distance was 441 km, and the bird cannot therefore be considered philopatric. The other bird, a male, alternated between long travelling episodes and settlement in particular areas, exploring different regions both distant from and close to his natal territory, but no breeding attempt could be confirmed after four years of tracking. The large distances we recorded confirm the potential for gene flow among populations but, in comparison with our results from previous studies, they suggest that Bonelli's Eagles may show high variation in their natal dispersal distances and use different dispersal strategies.

Key words: *Aquila fasciata*, Bonelli's Eagle, Argos satellite telemetry, natal dispersal, philopatry, PTT, recruitment, time series analysis

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SHORT NOTES

The key role of a Ring Ouzel *Turdus torquatus* wintering population in seed dispersal of the endangered endemic *Juniperus cedrus* in an insular environment

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Rumeu B., Padilla D. P., Nogales M. 2009. The key role of a Ring Ouzel *Turdus torquatus* wintering population in seed dispersal of the endangered endemic *Juniperus cedrus* in an insular environment. Acta Ornithol. 44: 199–204. DOI 10.3161/000164509X482786

Abstract. Although the Ring Ouzel has been considered accidental in the Canary Islands, it has been observed for the last five years in the high mountain zone of Tenerife (Canary Islands), showing it to be a regular winter visitor. Its interaction with female *Juniperus cedrus* cones and seeds was studied by analysing its wintering diet during January–April 2008. This juniper is endemic to the Canaries and Madeira and is classified as endangered by the IUCN. Previously, its sole long-distance disperser was known to be the Raven *Corvus corax*, which is unfortunately now extinct in the distribution range of *J. cedrus*. The results show that the diet of *T. torquatus* in Tenerife consists mostly of female *J. cedrus* cones (95% of the biomass consumed). Due to the large amount of seeds dispersed by Ring Ouzels and the effectiveness in seed germination, this winter visitor constitutes an important vector in the dispersal of *J. cedrus* that appears to have gone undetected in the past. This passerine plays a key role in its seed dispersal system, being able to move seeds over long distances, thus connecting fragmented populations of this plant. The present work is one of the few cases described in which a plant endemic to an oceanic island is so dependent on a winter visitor, and highlights the importance of insular environments in the wintering range of the Ring Ouzel. Owing to the absence of native long-distance seed dispersers, the future fate of this conifer is now probably dependent on the wintering population of this thrush.

Key words: Ring Ouzel, *Turdus torquatus*, frugivorous diet, seed dispersal, *Juniperus cedrus*, high mountain shrub, Tenerife, Canary Islands

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