

Feather lice (Mallophaga) of the Dipper *Cinclus cinclus* in Central Wales

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Ninety-three feather lice of two species were collected from 50 Dippers in central Wales. The dispersal of one species was in excellent agreement with a negative binomial model.

Spencer (1984) pointed out that ringers can make useful contributions to the study of bird ectoparasites, and Fowler & Cohen (1983) described a method for safely delousing batches of up to 20 birds during ringing. Parasitologists commonly seek to discover (a) host specificity, i.e. which species of parasite are associated with which species of host; (b) incidence rate, i.e. the proportion of hosts which are infested; and (c) infestation rate, i.e. the average number of parasites per host. Host specificity of the feather lice of most British bird species is well documented in museum collections (though surprises do still occur, e.g. Fowler & Furness 1987). Incidence and infestation rates are harder to determine. First, very wide variation in infestation between individual hosts (including an often large proportion of zero observations) means that large samples are required. Second, because of marked seasonal variation in these factors, data accumulated over long periods reflect only 'average' patterns which may bear little resemblance to the situation prevailing in any particular season (Ash 1960, Marshall 1981).

Opportunities to delouse large samples of birds in relatively short time periods may present themselves at colonies, roosts or when tape lures are employed. Alternatively, when the host quarry is thinly dispersed, an intensive effort by many specialist enthusiasts may help to provide a suitable number of birds to study. This note describes the feather lice (Mallophaga) obtained from a sample of 50 dippers *Cinclus cinclus* captured during such an intensive "Dipper Weekend" involving some 30 ringers in central Wales, 18-20 September, 1987.

METHODS

Dippers were captured by hand in roosts (e.g. under bridges) at night or by mist nets set across streams by day on various tributaries to the River Wye (Duhonw, Edw, Dulas, Irfon, Ithon and South Dulas) and River Severn (Arrow) in central Wales. Birds were aged and sexed before being deloused in modified 1 dm³ Kilner preserving jars using ethyl acetate as the insect anaesthetic, as described by Fowler & Cohen (1983). Lice were collected on filter paper cut to fit the base of the jars and preserved in 70% ethanol until mounted on microscope slides in Canada balsam for examination. They were identified by careful matching against reference specimens in the collection of the British Museum (Natural History).

RESULTS AND DISCUSSION

Of the 50 Dippers deloused, 27 (54%) yielded 93 lice (mean 1.86 lice per bird, range 0-17). Two species of lice were collected, Ischnocera: *Philopterus cincli* (Denny, 1842) and Amblycera: *Myrsidea franciscocoli* (Conci, 1942), Fig. 1. *P. cincli* was found on 31 Dippers and *M. franciscocoli* on 6; only 2 birds carried both lice. There were no significant differences in infestation between age or sex classes, or location of capture (chi-squared tests), so data were pooled for constructing frequency distributions. The frequency distribution of *M. franciscocoli* was: 0 lice: 4 birds; 1: 3; 2: 2; 3: 1; $\bar{x} = 0.26$, $s^2 = 0.89$. The frequency distribution of *P. cincli* is in excellent agreement with that predicted by a negative binomial model estimated from the sample statistics $\bar{x} = 1.6$, $s^2 = 9.76$, $k = 0.314 \pm 0.154$ (Fig. 2).

The two species of Mallophaga collected in this study are known ectoparasites of the Dipper. Their incidence is typical for small passerines in

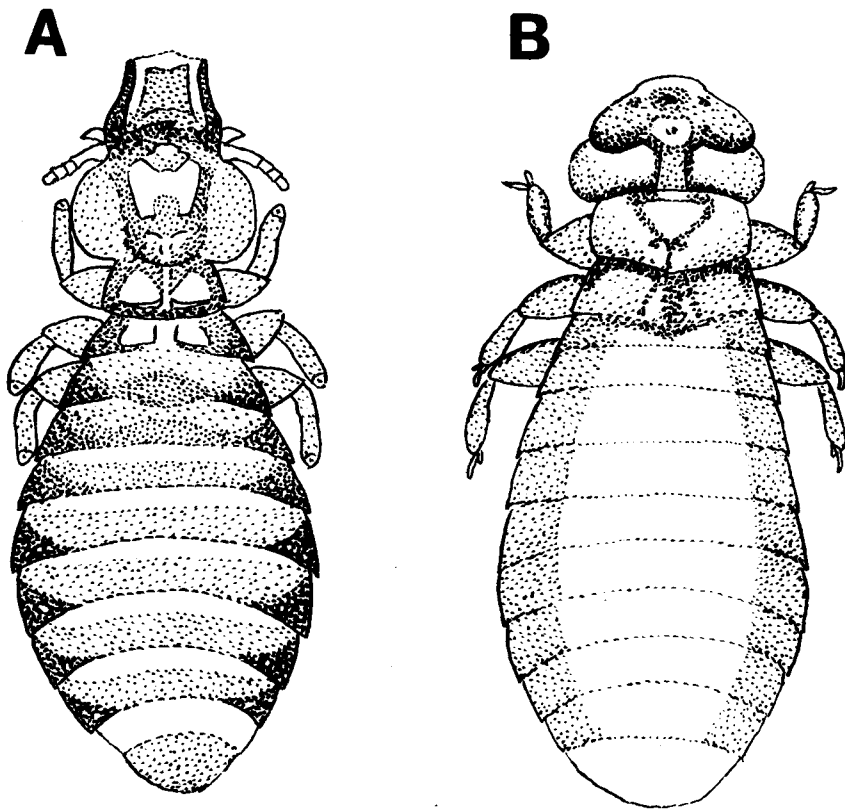


Figure 1. Drawings of feather lice found on Dippers (A) *Philopterus cincli*, (B) *Myrsidea franciscolori*.

Britain which usually bear fewer than ten lice, with numbers exceeding twenty being rare (Rothschild & Clay 1952). Ischnoceran lice are generally non-haematophagous, feeding principally on sloughed epidermis and feather debris. Amblycerans may be haematophagous and can cause irritations which may be aggravated by scratching, and become vulnerable to secondary infections. However, the presence of unusually large numbers of lice is considered to be a symptom of ill health, rather than a cause (Marshall 1981).

The agreement of the frequency distribution of *P. cincli* with the negative binomial conforms

with a growing number of bird-lice investigations (see Fowler & Price 1987). Nevertheless, the very good agreement observed in this study is among the best we have come across. Why the frequency distributions should conform mathematically so well with a negative binomial model, rather than some other model of contagiousness, is not clear, but Anderson & May (1978) postulate that the value of the binomial exponent, k , is a measure of the destabilising effect of the parasite on the host population, and is related to the relative reproductive rates of the parasite and host.

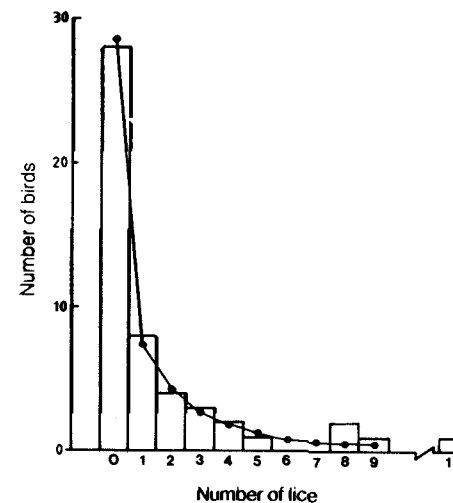


Figure 2. Frequency distribution of *Philopterus cincli* on 50 Dippers deloused in central Wales. Joined closed circles are the expected frequencies of a negative binomial distribution based on sample data. See text for details.

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