Knemidokoptic mange in Chaffinches

J. W. Macdonald and G. H. Gush

INTRODUCTION

In June 1961 JWM examined a case of knemidokoptic mange* in a Chaffinch *Fringilla coelebs* from Somerset in which the causative mite was provisionally identified as *Knemidokoptes mutans* (Macdonald 1962); since then, however, further work by Professor A. Fain in Antwerp has shown this species to be restricted to the Galliformes. In Chaffinches, *Neocnemidocoptes passeris* (Frtsch, 1962) occurs in the feather follicles, while on the skin of the legs *K. jamaicensis* (Turk, 1950) is the species responsible for the mange (Fain and Elsen 1967).

From discussions with local ornithologists, it subsequently transpired that 'deformed feet' in Chaffinches had long been recognised as endemic in Somerset and east Devon. In 1971, as part of a study of the return of summer and winter migrants, including Chaffinches, GHG decided to ring as many as possible of the local population at Higher Metcombe, on the edge of the Venn Ottery Reserve of the Devon Trust for Nature Conservation, near Ottery St Mary.

RESULTS

The rules of the British ringing scheme lay down that, except in special circumstances which must be approved, no sick, injured or oiled birds may be ringed. At the reserve 500 healthy Chaffinches have now been ringed. When a bird which has borne a ring for more than six months is caught again, a retrap card is made out. Such cards are now available for 58 Chaffinches and, of these, eight birds (14%) have shown varying degrees of mange. As shown in table 1, no predilection for a particular sex emerged from this small sample.

The first evidence of the disease was invariably seen in winter or early spring. In two birds only the right leg was affected, and in two others both legs simultaneously; in the four remaining, the disease started in the right leg in two cases and in the left in the other two and eventually spread to affect both legs. Six of the birds were

*This is a skin disease of birds characterised by swellings, encrustations and lesions on the bare parts and caused by mites (Arachnida: Acari) which burrow beneath the skin. Papillomas (see page 105) are localised external growths or tumours of viral origin apparently restricted to Chaffinches. The pumice-stone-like lesions of mange affecting the tarsi and the cauliflower growth, involving the foot joint, of papillomas can be readily differentiated in the field; microscopic examination is necessary only for confirmation. Both conditions in Chaffinches are described and illustrated in the references listed on pages 106-107

### Table 1. Cases of knemidokoptic mange in eight Chaffinches Fringilla coelebs, Devon, 1971-74

<table>
<thead>
<tr>
<th>Month of ringing, ring no.</th>
<th>Sex</th>
<th>Age at ringing, presumed hatched in May (months)</th>
<th>— HANDLED, NORMAL —</th>
<th>Period spanned (months)</th>
<th>— HANDLED, AFFECTED —</th>
<th>Age when lesions first noted (months)</th>
<th>Known subsequent survival (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun 71 JC82591</td>
<td>♂</td>
<td>adult</td>
<td>Feb Mar Jul Oct Nov 72, Jan May Jun Oct Nov 73, Feb 74</td>
<td>24</td>
<td>Left Mar May 74, Right Jun Aug 74</td>
<td>—</td>
<td>6</td>
</tr>
<tr>
<td>Aug 71 JC82645</td>
<td>♂</td>
<td>4</td>
<td>Jun Oct 72, Feb Mar 73</td>
<td>10</td>
<td>Right Mar 73, Left May 73</td>
<td>23</td>
<td>3</td>
</tr>
<tr>
<td>Aug 71 JC82652</td>
<td>♂</td>
<td>4</td>
<td>Mar May Jun Sep 72, Mar Apr 73</td>
<td>14</td>
<td>Both Apr Sep Oct Nov 73, Mar Apr May Jun 74</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td>Mar 72 JE68444</td>
<td>♀</td>
<td>adult</td>
<td>Oct Dec 72</td>
<td>3</td>
<td>Right Jan Mar Apr May 73</td>
<td>—</td>
<td>5</td>
</tr>
<tr>
<td>May 72 JE68567</td>
<td>♀</td>
<td>pullus</td>
<td>Dec 72, Jan Jun 73</td>
<td>7</td>
<td>Left Mar 74, Both Sep 74</td>
<td>23</td>
<td>7</td>
</tr>
<tr>
<td>May 72 JE68569</td>
<td>♀</td>
<td>pullus</td>
<td>Oct Nov 72, Jan Feb Mar Apr Jul Oct Nov 73</td>
<td>14</td>
<td>Both Dec 73, Jan Feb Mar Apr Aug 74</td>
<td>20</td>
<td>9</td>
</tr>
<tr>
<td>Jun 72 JE68584</td>
<td>♂</td>
<td>14</td>
<td>—</td>
<td>—</td>
<td>Right Jan 73</td>
<td>20</td>
<td>—</td>
</tr>
<tr>
<td>Jun 73 JE69354</td>
<td>♂</td>
<td>2</td>
<td>Feb Mar 74</td>
<td>2</td>
<td>Right Apr 74, Left Aug 74</td>
<td>12</td>
<td>5</td>
</tr>
</tbody>
</table>
seen to be affected for periods of three to nine months and one for 15 months. One of the former, an adult female (JE68444) again referred to below, bred successfully in May 1973, having first shown evidence of disease in January of that year. This raised the question of whether nestlings could become infected from the brooding parent. Two nestlings of a brood of three ringed in May 1972 were both affected by the disease when retrapped in December 1973 and March 1974 respectively. In the former (JE68569) the disease, affecting both legs, was in its early stages in December and progressed to cause severe changes in March and April 1974; in the latter (JE68567) severe changes on the left leg only were noted when the bird was recaptured in March 1974 and both legs were found to be involved when it was trapped again in September. The possibility of infection from the parents is discussed below.

The exceptionally long 15-month infestation occurred in a first-year male (JC82652) ringed in August 1971. It was retrapped at frequent intervals without showing evidence of disease until April 1973 when slight infection was noted on both legs which persisted throughout the year. In March 1974 the changes were severe and the right foot necrotic. No worsening was noted through April and May, but retrapping in June resulted in the right foot sloughing off and falling into the mist-net; numerous mites were found in the skin of this foot. Local field observations have shown a number of birds persisting with a missing foot, but they must be at a disadvantage in the struggle for survival.

In July 1974 an unringed adult male Chaffinch was found dead, probably as a result of flying into a window-pane. Both legs were found to be severely affected with mange and, in addition, a virus papilloma (Macdonald 1965, Lina 1971) was present on the left foot. The adult female (JE68444) which later bred successfully (see above), having been ringed in March 1972, showed symptoms of mange on the right leg in January 1973; no further change was detected when the bird was recaptured in March and April of that year, but in the following month, when she was breeding, a papilloma of the foot was seen to have developed in the already parasitised limb.

**DISCUSSION**

Although the parents of nestlings JE68567 and JE68569 (see above) were not visibly affected with mange, the disease can remain latent for up to five years (Fain and Elsen 1967) and apparently normal parents could be healthy carriers of the mite, transferring it to their offspring in the nest. The simultaneous appearance of the lesions in each nestling suggests that they were exposed to infection at the same time, and this could have occurred in the nest. The prepatent period of the disease would thus be about 19 months. Support for
this postulate comes from the fact that, with the exception of JP60354, all the birds whose age at ringing was known first showed lesions at the remarkable constant age of 20-24 months. In 'scaly face' in Budgerigars Melopsittacus undulatus caused by K. pilae, a similar disease pattern of parent-to-nestling infection prevails, whereas spread in fledged birds, despite close contact in aviaries, is extremely rare (Wichmann and Vincent 1958).

Kirmse (1966) showed that the disease increased in severity following mechanical irritation caused by scraping the skin of diseased birds to obtain material for transmission studies. He suggested that natural injuries could result in more rapid development of the lesions. He suggested also that a warm environment may facilitate transmission of the mites. The mild climate of the south-western peninsula of England may be a factor determining the geographical distribution of the disease. In outdoor sheep, parasitic infestations with keds (Diptera: Hippoboscidae), lice (Phthiraptera) and mites are most severe in early spring when winter malnutrition is thought to favour the manifestations of disease; a similar mechanism might be responsible for the seasonal incidence noted in the Chaffinches.

The concurrent appearance of knemidokoptic mange and virus papillomas in two individuals appears to be more than coincidental. No Chaffinch so far has recovered from or shown any remission of symptoms of either disease. In August 1974 permission was obtained to ring birds affected with either condition, and further studies will be pursued to determine if there is any relationship between the mite and the virus affecting their ability to cause disease.

ACKNOWLEDGEMENTS

We are grateful to Professor A. Fain for identification of the mite and to K. H. Hyatt of the British Museum (Natural History) for his comments.

SUMMARY

A ringing study of a local population of Chaffinches Fringilla coelebs in Devon showed 14% to be affected with knemidokoptic mange. The seasonal incidence and progress of the disease are described. Most of the affected birds first showed signs of mange at about 20 months of age, and evidence suggesting transmission of the disease from parent to nestling is put forward. A possible relationship between the mite and virus papilloma of Chaffinches is described.

REFERENCES

The papers in square brackets are not referred to in the text but are included here as useful sources of information. The photographs marked with an asterisk show Chaffinches affected with knemidokoptic mange or papillomas.


Mange in Chaffinches


Lina, P. H. C. 1969. ‘Tumours and wart-like excrescences on feet and legs of some wild birds’. *Ardea*, 57: 64-66, plates 3-4 (3a-b*).


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