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SHORT NOTE

# Sexing Corn Buntings *Miliaria calandra* by discriminant function: a comment

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A recent paper on sexing Corn Buntings *Miliaria calandra* by discriminant function (Campos *et al* 2005) quotes wing lengths exceeding 100 mm for five of 51 females sexed by molecular methods.

The occurrence of wings this long is noted by the authors as unusual, whereas they are in fact unprecedented. Cramp & Perrins (1994) detail wing lengths of more than 200 females taken over the species' range (excluding Britain and Ireland where birds are known to be smaller) and the largest of these is 98 mm. Based on these data, the probability of obtaining even one female Corn Bunting whose wing exceeds 100 mm is extremely small.

Campos *et al* (2005) discount the possibility that measurement error was involved, but do not say explicitly how this conclusion was arrived at. A common explanation for data showing marked outliers is systematic error. The type most likely to explain the long-winged female Corn Buntings is 'observer distraction' (Morgan 2004) where the measurer quotes a 'true' length ± 10 mm. The cause is distraction by a prominent scale marking (personal observation, Redfern & Clark 2001). This is almost invariably upwards – probably because within any centimetre decade the folded wing will cover the lower value marking, but the greater will remain visible.

To test the possibility of such an error, the female Corn Bunting wing lengths of Campos *et al* (2005) – after rounding half-millimetre measurements to whole millimetres (Morgan 2004) – were entered into computer program Bmod (Morgan 2005). Despite the paucity of data, there was a low probability that the data were normally distributed [G = 31.76, 7 df, $P < 0.001$], while a two-component model having a close fit [D fit (Morgan 2005) = 0.38] was found.

To examine the data further, identifiable outliers were removed one by one – largest through smallest – and Bmod (Morgan 2005) was run on the reduced amount of data. This procedure demonstrated a low probability for a normal distribution when three outliers were removed (G = 25.01, 8 df, $P < 0.005$; G = 19.5, 7 df, $P < 0.01$) but an increasing probability of normality resulted as the remaining two were deleted (G = 15.67, 7 df, $0.05 > P > 0.025$; G = 4.93, 5 df, $P > 0.1$).

A two-component model – with upper proportion fixed at 9.5% and upper/lower standard deviations linked to make them co-vary – fitted the data [Dfit (Morgan 2005) < 0.54] and was significantly better than a normal distribution (G = 18.5, 1 df, $P < 0.001$). This result is interpreted as showing that the wing lengths of the female Corn Buntings measured by Campos *et al* (2005) form a heterogeneous data set.

The parameters estimated by the program matched the hypothesis that observer distraction was involved, the difference between the means of the two components being close to 10 mm (11.9). Rather unfortunately, this is about the same as between males and females, though 5% error in the molecular sexing can probably be discounted.

If these five outliers – or even the four most extreme – are removed from the data set, it is clear from Fig 1 in Campos *et al* (2005) that a discriminant can be found which will sex all the birds in this sample. The same is true if the points in question are adjusted by subtracting 10 mm from the wing length, the cause suggested here for their extreme size.

## REFERENCES

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