

Clutch Size in the Goldfinch

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There is little information available concerning the effect on clutch size and breeding seasons of birds introduced into areas differing greatly in climate and habitat from that of their native lands. Jourdain (1938) has recorded that the Little Owl, *Athene noctua*, in the United Kingdom, laid 4 or 5 eggs and sometimes 6 or 7 in 1902, but, in 1938, 3 to 5 were the commonest clutches. Moreau (1944), examining the clutch size of the Sparrow, *Passer domesticus*, in the United States of America, concluded that the clutch size did not differ there from that in Europe; however, the Starling, *Sturnus vulgaris*, had a slightly smaller clutch size than in Europe.

The Goldfinch, *Carduelis carduelis*, was introduced into Australia about 1860 and rapidly spread through most of the cultivated areas of the southern half of the continent. In Australia it frequents a similar type of country—orchards and rough pastures—to its habitat in the United Kingdom but, of course, the climate is very different.

The data on Australian clutch sizes in this paper were collected at Griffith, New South Wales, situate at latitude 34° 17' S and longitude 146° 03' E. It is 300 miles inland on an extensive arid plain; the climate is of a continental type with an average annual rainfall of 15 inches. Centred on Griffith is the Murrumbidgee Irrigation Area, a relatively-small area of irrigated orchards of citrus, deciduous fruits, and cereal crops. The Goldfinch was first reported in the district by McKeown (1923) and since then has become one of the commonest of the birds nesting in the orchards. The orchards at the C.S.I.R.O. Research Station, Griffith, were searched weekly in 1953 and less regularly in the other years between 1950 and 1956 to collect the clutch size data reported here.

Of the English records, 76 are from the British Trust for Ornithology nest record cards, and 13 from the diaries of A. Whitaker held at the Edward Grey Institute, Oxford. The records for Spain, Palestine, Corsica, and the Balearic Isles are from the manuscripts of F. Jourdain held at the same Institute. Of the Algerian records, 54 are from de Balsac (1952) and 15 from Jourdain. Three records for the Canary Isles from the diary of D. Bannerman are included for the sake of completeness.

The Table shows the mean clutch sizes in the different areas from which records are available. The means for Palestine and the Balearics, being based on only nine degrees of freedom, are not reliable, and the significance attached to differences involving them should be treated with great reserve.

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*Mean Clutch Size of the Goldfinch showing
Regional Variation*

Locality	Number of Clutches	Mean Clutch Size	Standard Error of Mean
England	89	5.0	0.08
Spain	28	4.0	0.21
Algeria	69	4.1	0.08
Corsica	28	4.1	0.20
Palestine	10	4.7	0.13
Balearic Is.	10	4.2	0.17
Australia	136	3.7	0.09
Canary Is.	3	2, 4, 4	—

Significant differences ($P = 0.05$)—

England > Spain, Algeria, Corsica, Australia
 Australia < England, Palestine
 Palestine > Algeria, Spain.

From the Table it can be seen that the Goldfinch in Europe shows the same regional trend in clutch size as has been shown for some other European passerines (Lack, 1947); that is an increase from south to north. Many passerines also show an increase in clutch size from west to east, but no records were available to investigate this for the Goldfinch. The clutch size in inland Australia is significantly smaller than in England but similar to that in North Africa.

Since the introduction of the Goldfinch into Australia less than 100 years ago, the clutch size of the species has decreased from the ancestral British figure of 5 to 3.7. Griffith, N.S.W., is on a latitude comparable with the north coast of Africa; and therefore the direct latitudinal effect, resulting in a shorter day length for food collecting which will reduce the average number of young that can be reared successfully, could well be a factor in the change in clutch size. However, difference in day length is only one of many factors in which the habitat of the Goldfinch in England and central New South Wales differs, and it is unlikely that the decrease in clutch size can be attributed to the difference in latitude alone.

REFERENCES

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The death has occurred of Mr. J. A. Ross. An obituary notice will be published shortly.