

## Intraspecific nest parasitism in the Great Tit *Parus major* and in the Blue Tit *Parus caeruleus*

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Intraspecific parasitism among birds is not very well known (Yom-Tov 1980a); among the Passerines of the West Palearctic only three species practice it: the Starling *Sturnus vulgaris* (Yom-Tov *et al.* 1974), the Dead Sea Sparrow *Passer moabiticus* (Yom-Tov 1980b) and the Swallow *Hirundo rustica* (Moller 1987). Many cases of interspecific parasitism have been observed in the Great Tit *Parus major* and Blue Tit *Parus caeruleus* both between them (Amann 1949, Weinzierl 1955, Chappuis 1970, Buxant 1974, Harms 1975, van Noorden 1977, Perrins 1979) and with other species (Arn 1955, Possert 1955, Schmidt 1956, 1957, Syha 1968, Perrins 1979). We have collected indirect evidence that suggests the hypothesis that intraspecific parasitism occurs in Great Tit and in Blue Tit.

**MATERIALS AND METHODS** - From 1983 to 1988 we collected data on the breeding biology of the Great Tit and Blue Tit through nestboxes situated in the WWF "Bosco di Palo" Natural Oasis at Ladispoli (41°56'N-12°05'E, Rome). The study area consists of a 40 year-old Turkey Oak *Quercus cerris* wood (see Fraticelli & Sarrocco 1984). The nests were checked every week and the measurements of the eggs were taken with calipers to 0.1 mm. The volume of the eggs was calculated with the following formula:  $V = 0.042 + 0.4672 \times \text{length} \times \text{width}$  (Ojanen *et al.* 1978).

**RESULTS** - For the 163 Great Tit nests checked we found 5 nests (3.1%) where we believe that more than one female laid eggs:

- 1) one nest with 8 eggs laid within 7 days, clutch-size of 10 eggs, all successful;
- 2) one nest with 10 eggs, 2 of which were remarkably different from the others, both in colour pattern and in size (volume  $\text{cm}^3$  1.35 and 1.45, range of the other eggs 1.53-1.67), all the eggs hatched but two chicks died during rearing;
- 3) one nest with 4 eggs, after 8 days there were 6 eggs and an incubating female, after other 6 days there were 7 eggs, after 8 days 12 eggs, 5 of which were smaller and clearer, 5 chicks hatched;
- 4) one nest with 7 eggs laid in 6 days, clutch-size of 8 eggs, the nest was successively preyed upon;
- 5) one nest with 6 eggs laid in 5 days, clutch-size of 11 eggs, the female was successively preyed upon;

For the 7 Blue Tit nests checked we found 2 parasitized nests (28.6%):

- 6) 7 eggs laid within 6 days, 1 egg was broken during the incubation, 1 was sterile,

5 young fledged;

7) 10 eggs laid within 7 days, all hatched.

Moreover we observed a case of interspecific parasitism: in one nest there were 4 Great Tit eggs and 2 Blue Tit eggs, the nest was later abandoned.

**DISCUSSION** - Kluyver (1951) and Lack (1955) have emphasized that is possible to reckon the date the first egg was laid on the premise that the female lays one egg per day.

Exceptions to this rule (more than one egg per day) were observed by Perrins (1979) and Michelland (1980). Van Thienhoven (1983) however has found that birds can lay a maximum of one egg per day.

In cases number 1, 4, 5, 6 and 7 there is evidence for more than one egg being laid per day and we believe this is due to two or more females inlaying the same nest. The 11 eggs laid in case 5 are remarkable as this clutch-size had never been observed. Case number 2 is likely to be an example of intraspecific parasitism because of the presence of three different factors: the high number of eggs (a clutch with 10 eggs has a percentage of recurrence of 1.8%) and the remarkable difference in dimensions and colour between two eggs and the others. In case number 3 more than one female laid eggs inside the same nest either simultaneously or within a small lapse of time. This case together with two observations of Great Tit laying inside nests containing abandoned eggs, demonstrates that the presence of eggs inside a nest does not prevent a new laying.

Examples of a high number of eggs inside a Blue Tit nest are reported in the literature (Hyltén-Cavallus 1951, Sugai 1977) and they could be compared to one of the cases we reported.

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**RIASSUNTO** - Parassitismo intraspecifico in Cinciallegra *Parus major* ed in Cinciarella *Parus caeruleus*.

Cinque nidiate su 163 di Cinciallegra e 2 su 7 di Cinciarella mostravano indizi di un parassitismo intraspecifico. Si ipotizza l'esistenza di tale comportamento, che non era stato fino ad ora evidenziato in queste due specie.

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