

Two mixed clutches of Blue Tits *Parus caeruleus* and Collared Flycatchers *Ficedula albicollis*

JUHA MERILÄ

Mixed clutches occur when two or more species lay their eggs in the same nest. Among passerines, mixed clutches have often been recorded in hole nesting species, especially among tits *Parus* (e.g. Weinzierl 1958, Löhrl 1964, Källander 1980, Shy 1982, Baucells 1990). Cases of mixed clutches between tits and flycatchers (*Ficedula*) have been reported less often. However, Curry-Lindahl (1963) reported a case where Great Tits *Parus major* raised nestlings of Pied Flycatchers *Ficedula hypoleuca* together with their own offspring while Schmidt (1956) witnessed a case where Pied Flycatchers incubated eggs and reared Great Tit young together with their own eggs and offspring. However, I am not aware of any report of Blue Tits rearing broods containing flycatcher young. This note describes two cases of mixed broods of Blue Tits *Parus caeruleus* and Collared Flycatchers *Ficedula albicollis*.

During regular inspections of nest boxes (32 mm entrance) in 1993-94 on southern Gotland (about 57°10'N, 18°10'E), off the Swedish east coast, I have on eight occasions encountered mixed clutches of different hole nesting passerines. In five of these cases (63%), the mixed layings either did not produce any young or only the eggs of one species hatched. On two occasions, one in 1993 (0.7% or 1/146 of all completed Blue Tit clutches) and one in 1994 (0.7% or 1/136 of all completed Blue Tit clutches), Blue Tit parents successfully reared Collared Flycatcher young to fledging together with their own young.

In the first case (1993), the pair of Blue Tits completed nest building before 6 May, but no eggs had appeared by 15 May when Collared Flycatcher nest material was observed in the box. On the next visit (21 May), the nest contained three flycatcher eggs, and five days later, three eggs of each of the two species. After this, the female Blue Tit laid another 3 eggs and started incubation. All 9 eggs hatched (the flycatcher's about two days before the tit's), and one Collared Flycatcher and five Blue Tit young fledged successfully. The single Collared Flycatcher left the nest before the tit young and was seen begging food from its Blue Tit foster-parents

outside the nest box while the Blue Tit young were still in the nest.

In the second case (1994), the Collared Flycatcher pair completed nest building before 12 May, but no eggs were laid before 18 May. Four days later, the box contained four Collared Flycatcher eggs which were covered with Blue Tit nest material. Blue Tits took over the nest and laid nine eggs which together with two flycatcher eggs (two were buried under the tit nest) were incubated by the female Blue Tit. The flycatcher eggs hatched 2-3 days before the Blue Tit eggs (of which two did not hatch) and both the flycatcher young and all Blue Tit young fledged successfully. Again, the flycatcher young left the nest before the Blue Tit young.

During the same two years, only one case (0.4% of all completed Blue Tit clutches) of a successfully reared mixed clutch of Blue Tits and Great Tits was recorded (one Great Tit young raised with 12 Blue Tit young).

As a result of mixed laying, the Blue Tit has previously been recorded hosting Robin *Erithacus rubecula* (Lack 1953), Redstart *Phoenicurus phoenicurus* (Amann 1949), Marsh Tit *Parus palustris* (Amann 1949), Coal Tit *Parus ater* (Baucells 1990), and Great Tit *Parus major* (Arn 1955, Mackenzie 1950, Löhrl 1964, Källander 1980) young. This list is now extended to cover the Collared Flycatcher; I am not aware of any case of mixed laying among Blue Tits and Pied Flycatchers *Ficedula hypoleuca*.

Both described mixed clutches were probably caused by competition for nest holes and do not represent true interspecific brood parasitism, as both species were observed to build a nest in the same box. Competition for nest holes among tits and flycatchers is intensive (e.g. Slagsvold 1975), and the occurrence of mixed clutches is probably facilitated by frequent absences of tit and flycatcher parents from the vicinity of the nest box during the pre-laying and egg-laying phase (Löhrl 1950, own observations). The reason for the latter phenomenon is presumably the high foraging activity of females during egg-formation which forces them to leave the nest unguarded during the egg laying period. Males are likely to follow their female to avoid becoming cuckolded because female fertility peaks at this time (Birkhead & Møller 1992), and therefore males are unable to guard the nest. As in the two cases described here, tits usually win interspecific contests with flycatchers and successful take-overs of Blue Tit nests by Collared Flycatchers are probably rare as Blue Tits are known to kill Collared Flycatchers entering their nests (Merilä & Wiggins, in press).

It is interesting that tits do not discriminate between their own and foreign eggs, or between own and foreign nestlings. By raising non-related offspring they gain no fitness benefits, but waste resources which could enhance their own lifetime reproductive success or that of their offspring. One possible explanation for this seemingly maladaptive behaviour is that mixed laying (less than 1% mixed clutches in this study) and interspecific brood parasitism are too rare to exert any significant selection pressure for discriminatory behaviour to evolve. If so, this raises an interesting question: what would explain the absence of interspecific brood parasitism among flycatchers and tits? One possible explanation is that even though tits can raise flycatcher young to fledging (in both cases described above the young were normally developed), the post fledging survival of these young is poor (but see Källander 1980). Similarly, time constraints during the short breeding season coupled with differences in breeding time and natural nesting habits (Löhrl 1977, van Balen et al. 1982) might act as strong barriers against the evolution of interspecific brood parasitism in flycatchers. However, if tits cannot discriminate between their own young and flycatcher young, it is highly unlikely that they could detect intraspecific brood parasitism either. Hence, although it is not known whether intra-specific brood parasitism occurs in Blue Tits, my observations suggest that parents would not be able to discriminate between their own and foreign young.

Acknowledgements

I thank Marie Björklund, Petri Clusius, Janne Kumpulainen, Jessica Lindström, Robert Pryzbylo and David Wiggins for taking part with the field work, and Hans Källander and Ben Sheldon for several improving suggestions on this note.

References

- Amann, F. 1949. Junge Kohl- und Blaumeisen im gleichen Nest. *Orn. Beob.* 46: 187–190.
- Arn, H. 1955. Mischbruten von Kohlmeisen, Blaumeisen und Kleiber. *Orn. Beob.* 52: 129.
- Balen H. van, Booy, C. J. H., van Franeker, J. A. & Osiek, E. R. 1982. Studies on hole-nesting birds in natural sites. I. Availability and occupation of natural nest sites. *Ardea* 70: 1–24.
- Baucells, J. 1990. Frequency of mixed clutches in the genus *Parus*. (In Spanish with English summary). *Butll. GCA* 7: 13–17.
- Birkhead, T. R. & Møller, A. P. 1992. *Sperm Competition in Birds. Evolutionary Causes and Consequences*. Academic Press, London.
- Curry-Lindahl, K. 1963. *Våra fåglar i Norden IV*. Natur och Kultur, Stockholm.
- Källander, H. 1980. Talgoxungar ur blåmeskull när vuxen ålder. *Vår Fågelvärld* 39: 43–44.
- Lack, D. 1953. *The life of the Robin*. Penguin Books, London.
- Löhrl, H. 1950. Zur "Verdrängung" von Meisen durch Fliegenschmäpper. *Vogelwelt* 71: 39–41.
- Löhrl, H. 1964. Mischlege, Doppellege und verlegte Eier bei Höhlenbrütern (Gattung *Parus*, *Ficedula*). *Vogelwelt* 85: 182–188.
- Löhrl, H. 1977. Nistökologische und ethologische Anpassungserscheinungen bei Höhlenbrütern. *Vogelwarte* 29: 92–101.
- Mackenzie, J. M. D. 1950. Competition for nest sites among hole breeding species. *Brit. Birds.* 43: 184–185.
- Merilä, J. & Wiggins, D. A. 1995. Interspecific competition for nest holes causes adult mortality in the Collared Flycatcher, *Ficedula albicollis*. *Condor* 96, in press.
- Schmidt, F. 1956. Mischgelege von Kohlmeise (*Parus major*) und Trauerschnäpper (*Muscicapa hypoleuca*). *Orn. Mitt.* 8: 35.
- Shy, M. M. 1982. Interspecific feeding among birds: A review. *J. Field. Ornithol.* 53: 370–393.
- Slagsvold, T. 1975. Competition between the Great Tit *Parus major* and the Pied Flycatcher *Ficedula hypoleuca* in the breeding season. *Orn. Scand.* 6: 179–190.
- Weinzierl, H. 1958. Zwei weitere Fälle von Mischbruten der Kohl- und Blaumeise. *Orn. Mitt.* 10: 31.

Sammanfattning

Två blandkullar mellan blåmes och halsbandsflugsnappare

Blandade kullar där ungar av en art matas av föräldrar till en annan art bredvid sina egna har ofta rapporterats, speciellt hos hålhäckande fåglar. Blandkullar med olika mesarter verkar vara vanligare än blandkullar med mesar och flugsnappare. Trots tidigare rapporter om blåmes som matat rödhake- och rödstjärtungar finns i litteraturen inget fall där blandkullar mellan blåmes och flugsnappare har konstaterats.

Denna notis beskriver två fall av blandade kullar mellan blåmes och halsbandsflugsnappare. I båda fallen ruvade blåmeshonan och kläckte båda arternas ägg samt lyckades få ut sina egna ungar plus halsbandsflugsnapparungarna. Detta visar att blåmesföräldrar inte känner igen sina egna ungar. Möjliga orsaker och konsekvenser av oförmågan att känna igen sin egen avkomma diskuteras.

Juha Merilä, Department of Zoology, Uppsala University, Villavägen 9, S-752 36 Uppsala, Sweden. E-mail: juha@pax.uu.se