

A hybrid *Parus ater* x *P. montanus* found in Finland

Olavi Hildén

On 28 September 1981, an obvious hybrid between the Coal Tit *Parus ater* and the Willow Tit *Parus montanus* was captured at the Hanko bird observatory on the SW coast of Finland by J. Nikander and J. Saari. The bird accompanied irrupting Willow Tits, of which 55 were ringed that day. It was collected and given to the Zoological Museum of Helsinki. As there seems to be no earlier records of such a hybrid, the specimen deserves a detailed description.

Description. Tone of the black cap between the glossy bluish black of *ater* and the dull sooty black of *montanus*. The white nape-patch smaller and less distinct, and the black bars on both its sides much narrower than in *ater*. Mantle intermediate between the bluish grey of *ater* and the brownish grey of *montanus*. Wing with two distinct bars, formed by the white tips of greater and median coverts, but the spots narrower and less rounded than in *ater* (c. 1.5 mm against 2–3 mm; in *montanus* wing-bars are very faint). The light outer webs of secondaries clearly visible but less marked than in *montanus*, in which they form a distinct light patch on the closed wing. The black chin patch as short (c. 12 mm) as in *montanus*, but the borders sharply defined and the lower part broad as in *ater*. Outer webs of tail-feathers edged whitish-grey (in *montanus* more broadly whitish-grey, in *ater* very narrowly blueish). Under-parts white, tinged buffish on flanks and under tail coverts, much closer to the coloration of *montanus* than *ater* (which has a stronger buff tinge). Apart from the last-mentioned character, the hybrid is completely intermediate between *ater* and *montanus* in its coloration (Figs. 1–2).

Measurements. Table 1 gives the most important measurements for the hybrid and for 20 randomly selected specimens of *ater* and *montanus* in the skin collection of the Zoological Museum of Helsinki. In both measurements in which there is a distinct difference between the two species (tail length, depth of bill), those of the hybrid occupy an intermediate position. This also holds for the tail/wing ratio, which is considered a reliable single criterion for specific identification in tits (Johnston 1971). The ratios in the above samples average 74.8 %

for *ater* and 88.5 % for *montanus*, but 81.0 % for the hybrid. Unfortunately, the specimen was not weighed.

The book by Gray (1958) on bird hybrids does not contain any cases of hybridization between *ater* and *montanus*. In fact, it does not mention any hybrids of *ater* which other tits and for *montanus* only two "presumed hybrids" with *crispatus* (reported by Pleske 1887, 1922). In the literature published since then, I have found a presumed hybrid *ater* x *crispatus* from France (Tricot 1967), six hybrid specimens *montanus* x *varius* from Japan (Mishima 1969) and a nesting mixed pair of *montanus* x *palustris* from Belgium (Dhont & Hublé 1969), but no *ater* x *montanus*. I also wrote to the British Museum of Natural History (I.C.J. Galbraith), British Trust for Ornithology (R. Hudson), Swedish Museum of Natural History (B.-O. Stolt), Zoological Museum of the University of Moscow (P. Tomkovich), as well as to individual experts on the genus *Parus* and on bird hybridization (S. Haftorn, Norway; H. Löhrl, West Germany; C. M. Perrins, England; K. H. Voous, Netherlands), inquiring about possible hybrids between *ater* and *montanus*, but the answers were negative.

Including the present case and excluding the reported hybrid *atricapillus* x *gambeli* (Suchetet 1897, Cockrum 1952, Gray 1958), which, after re-evaluation, was determined as an aberrant example of *atricapillus* (Banks 1970), at least 12 hybrids between *Parus* species have been described. However, interbreeding occurs rather commonly only between three pairs of species; these are *caeruleus* x *cyanus* in Europe (e.g. Pleske 1912, Vaurie 1957, Gray 1958), and *atricapillus* x *carolinensis* (Breuer 1963, Rising 1968, Johnston 1971) and *atricristatus* x *bicolor* in North America (Dixon 1955). In each of these pairs the species are very close relatives, both systematically and in their ecologies, and hold an intermediate status between subspecies and species rather than distinct species. Allopatry generally prevents interbreeding, but in areas of contact or limited sympatry hybridization occurs.

All other reported hybrids between species of *Parus* seem to be extremely rare. At most a few cases are

Table 1. Wing length, tail length, and length and depth of bill (in mm) for a hybrid *Parus ater* x *P. montanus* and 20 specimens of these two species in the collection of the Zoological Museum of Helsinki.

	<i>P. ater</i>		Hybrid	<i>P. montanus</i>	
	Range	Mean ± SD		Range	Mean ± SD
Wing length ¹	58–63	61.00±1.38	63	60–68	63.80±1.70
Tail length ²	42–48	45.60±1.73	51	51–63	56.50±3.24
Length of bill ³	7.7–9.0	8.55±0.35	8.8	7.8–9.5	8.88±0.55
Depth of bill ²	3.1–3.6	3.36±0.17	3.5	3.5–4.5	3.93±0.28

¹Flattened wing (method 2, in Svensson 1970)

²As described in Svensson (1970)

³From the feathering to the tip of the bill

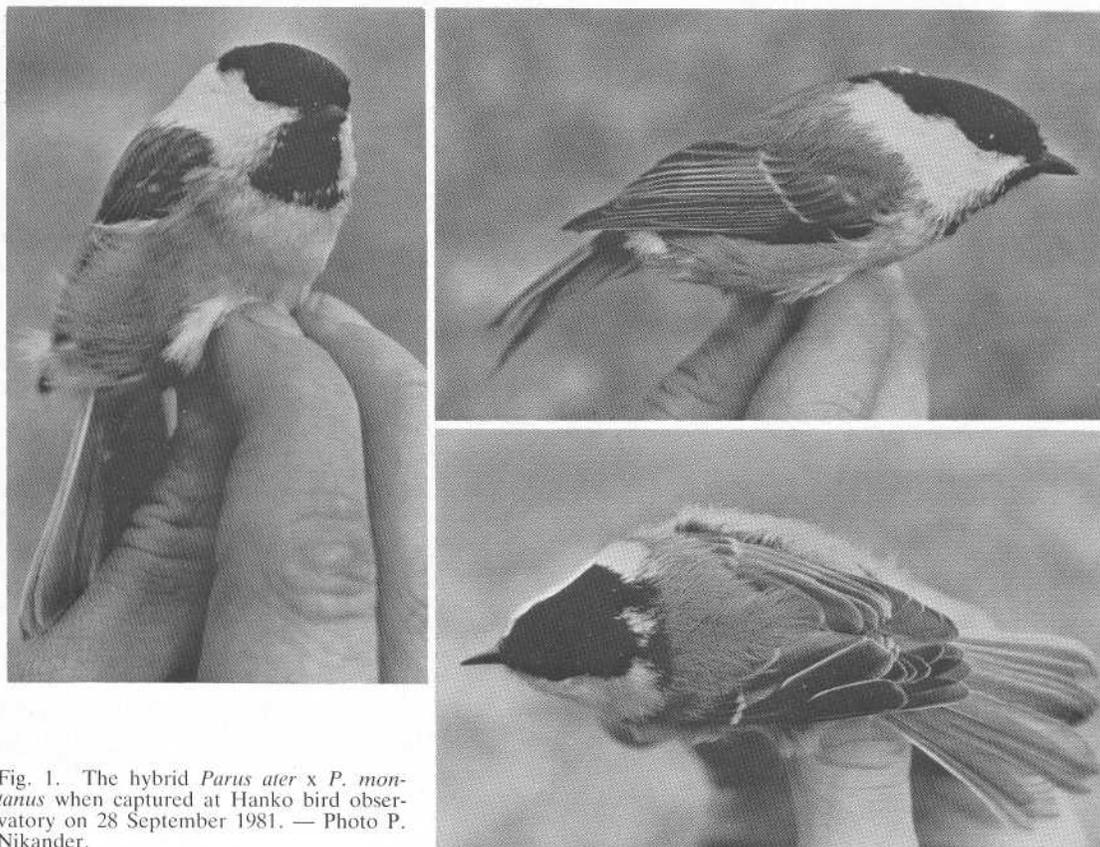


Fig. 1. The hybrid *Parus ater* x *P. montanus* when captured at Hanko bird observatory on 28 September 1981. — Photo P. Nikander.

known for each, and usually hybridization has been presumed only on the basis of intermediate plumage characters; indeed, some reports have been considered doubtful. Clearly, these rare hybrids must have a quite different origin to those mentioned earlier. How do they arise? Why does a Coal Tit, for instance, pair with a Willow Tit? Both are common birds in Finland and over large parts of Europe, and they are markedly different in their appearance, behaviour and ecology. Hence, formation of a mixed pair cannot be explained simply by closeness of relationship or by difficulties in finding a partner of their own species. The situation is the same for such occasional hybrids as *caeruleus* x *major*, *cristatus* x *montanus* and *ater* x *cristatus*.

I can see only two possibilities to explain the origin of such hybrids: either adaption of a brood (or a single young) by the parent birds of another species, or formation of mixed broods of two *Parus* species. In both cases the young are raised by foster parents and can be assumed to learn the song and calls of the foreign species and to become sexually imprinted on it. This, in turn, would make them prefer individuals of the foster species as sexual partners and thus lead to hybridization.

The first alternative does not seem very likely. A number of cases are known, it is true, of passerines feeding young of another species. They generally concern parent birds, which have lost their own brood or have a nest of another species very close to their own. However, the young are usually fed by their own parents as well and are thus unlikely to be imprinted on the foreign species. Mixing of broods after fledging is, of

course, also possible, but not very probable in tits which have noisy, coherent broods. Anyway, I am not aware of any observations concerning adoption of foreign young after nest-leaving in tits.

In contrast, mixed clutches or broods of two *Parus* species are not especially rare. Löhr (1964, 1977), in particular, has investigated this problem. From his study area in Germany he lists mixed broods of the following species (the first-mentioned attending the brood): *major* and *caeruleus*, *major* and *ater*, *caeruleus* and *major*, *palustris* and *ater*, *cristatus* and *ater*. Especially *major* and *caeruleus* relatively often lay in the same nest (see also Diesselhorst 1961, Weinzierl 1961, Perrins 1979, Källander 1980, own observations).

According to Löhr (1964, 1977), mixed clutches come about in two different ways. Single eggs can be laid in foreign nests in case of need, if the female is prevented from laying in her own nest or if this has just been destroyed. Such cases are familiar to everyone working intensively with hole-nesting species. Alternatively, permanent occupation of a nest with eggs by a pair of another tit species may happen, if the pair has lost its own nest and there is lack of empty nest-holes in the vicinity. If the nest was lost immediately before or during egg-laying, the female may not have time to build a new nest but lays directly among the eggs in the occupied nest. Generally the former owner deserts the nest when the new occupant starts incubating the mixed clutch. In most cases, the young of the initial pair are raised and fledged successfully with the young of the occupant pair.

Nothing seems to be known about the destiny after fledging of such foster young, except that they may reach maturity (Källander 1980). But it is known that passerine young raised by another species easily adopt, partly or completely, the song repertoire of their foster parents, and may become sexually imprinted on their species (see e.g. the classic works by Immelmann 1969, 1972, 1979, 1983). The only record known to me suggesting that this may also occur in tits has been reported by Ludescher (1973). He observed three Willow Tits, which chiefly uttered calls of the Blue Tit, and supposed that they were hatched and raised by this species on which they had probably become imprinted. It seems to me that just such "misimprinted" individuals give rise to the occasional hybrids between tits. In a letter to me, Dr. Hans Löhrl shares this opinion.

It is striking that the Coal Tit has always been the looser in the reported cases of mixed broods of tits involving this species (Diesselhorst 1961, Löhrl 1964, 1977). This is understandable, as it is the smallest of the tits and thus easily driven away by the stronger species. In the present case it is thus to be assumed that a Willow Tit pair had occupied a Coal Tit nest and raised the mixed brood; the Coal Tit young had then been imprinted on and later paired with Willow Tits. This is also supported by the fact that the hybrid was captured in a flock of Willow Tits.

As far as is known, all the records of occasional *Parus* hybrids concern specimens showing intermediate plumage characters, except for a mixed pair (male *montanus* x female *palustris*) nesting together in two successive years (Dhont & Hublé 1969). The best way to prove the above hypothesis would be to study nesting tits in captivity. Some of the eggs of a pair nesting in an outdoor aviary could be exchanged with eggs of another species of tit, and the behaviour, calls, mate selection, etc. of the foster young carefully investigated until their first breeding attempt. This would seem a reasonably straightforward experiment.

In conclusion, it is worth mentioning that in some other groups of birds cross-fostering experiments in the wild have provided evidence supporting the role of imprinting in hybridization. Switching eggs of the Pied Flycatcher *Ficedula hypoleuca* and the Collared Flycatcher *F. albicollis* (Löhrl 1955), and those of the House Sparrow *Passer domesticus* and the Tree Sparrow *P. montanus* (Cheke 1969), gave rise to mixed pairs, the young from the experiment nests preferring the foster species as sexual partners. A large-scale experiment in which eggs of the Herring Gull *Larus argentatus* and the Lesser Black-backed Gull *L. fuscus* were interchanged, and almost 900 young were reared by the wrong species, resulted in common interbreeding between the species (Harris 1970). Experiments with captive birds have yielded similar results (e.g. Whitman 1919, Schutz 1965, Immelmann, op.c.). Among the ducks, sexual imprinting evidently plays a particularly important role in hybridization, considering the commonness of interspecific dump-nests and the strong attachment of the ducklings to their mother (cf. Bezzel 1963, 1969). This may well explain why duck hybrids are so common and may occur even between species of different genera (e.g. *Somateria* x *Mergus*, Tenovuo & Tenovuo 1983).

Acknowledgements. I am most grateful to Hans van Balen, Peter Evans, Klaus Immelmann, Hans Källander and Hans Löhrl, who kindly read the first draft and made valuable suggestions for its improvement. I also thank all the persons mentioned on p. 58 for replying to my inquiry.

Selostus: Kuusitiaisen ja hömötiaisen risteytymä tavattu Suomessa

Hangon lintuasemalla saatiin verkosta 28.9.1981 ilmeinen kuusi- ja hömötiaisen risteytymä, joka tallennettiin Helsingin yliopiston eläinmuseon kokoelmiin. Sekä ulkonäöltään että mitoiltaan lintu on tarkoin molempien lajien keskiväiltä (kuva 1, taul. 1).

Aikaisempia tietoja tällaisesta risteytymästä ei ole, mutta kaikkiaan tunnetaan 12 eri *Parus*-lajien hybridiä. Vain kolmen lajiparin kesken (*caeruleus* x *cyaneus* Euroopassa, *atricapillus* x *carolinensis* ja *atricristatus* x *bicolor* Pohjois-Amerikassa) ne ovat melko tavallisia, kaikki muut ovat äärimmäisen harvinaisia.

Selitykseksi satunnaisiin tiaisteytymiin esitetään sekapeseytää. Melko usein kaksi tiaislajia munii samaan pesään, ja vain toinen parista jää huolehtimaan haudonnasta ja poikasten ruokinnasta. Sekapeseystä varttuneet vieraat poikaset omaksuvat kasvatusvanhempiansa äännet ja leimautuvat tähän lajiin. Tämä voi myöhemmin johtaa sekaparin syntymiseen.

Esitetty teoria saa tukea monista häkkilinnuilla ja eräistä luonnonoloissa tehdyistä vaihtokokeista, jotka ovat johtaneet sekaparien muodostumiseen. Lajiristeytymien yleisyys nimenomaan sorsilla johtunee lajienvälisten sekapeseyneiden runsaudesta ja poikasten tiukasta leimautumisesta emoansa.

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Author's address: Department of Zoology, University of Helsinki, P. Rautatiekatu 13, SF-00100 Helsinki 10, Finland

A mixed pair of Collared *Streptopelia decaocto* and Turtle Doves *S. turtur* in Kokkola, W Finland, in 1978—79

Harri Hongell & Lennart Saari

Hybrids between the Collared Dove *Streptopelia decaocto* and other *Streptopelia* species are common, whereas those between *S. decaocto* and *Columba* species are rare (Glutz von Blotzheim & Bauer 1980). Earlier observations of hybrids between *S. decaocto* and the Turtle Dove *S. turtur* include that of Voous (1963) and the record from Finland by Lehtikoinen (1977).

To our knowledge no report on the behaviour of such a mixed pair in the wild exists and therefore these field observations deserve to be published. The observations were made by Hongell, and the report was written by Saari.

On 26 May 1978 one single male *turtur* arrived in the Länsipuisto park in Kokkola (63°51'N, 23°07'E), where it joined three local pairs of *decaocto* and was observed up to 27 June, Turtle Dove courted a *decaocto* female and one copulation was observed.

26 May 19.30 hrs: A female (!) *decaocto* repeatedly approached the *turtur* male perched on a birch branch 8 m above the ground in the centre of the park. The female approached nodding and tripping. Finally both birds were sitting silently next to each other.

3 June 04.40—05.20 hrs: At 04.40 the male performed an aerial chase. Both birds alighted on a birch branch and the female crouched almost immediately, to which

the male responded by an attempt to copulate. It was interrupted by a fieldfare *Turdus pilaris* defending its nest. The male was attacked and fell off the back of the female.

A new attempt was accompanied by fluffing of neck feathers, nodding and continuous cooing. This time it was successful, although the smaller *turtur* male had obvious difficulty in copulating with the bigger *decaocto* female. The tail of the male scarcely reached low enough. This behaviour lasted for only a few seconds. Somewhat later, the female was seen preening perched on a branch of a nearby birch and the male approached with fluffed feathers, strong pumping movements and cooings.

At 05.15 hrs both birds alighted on a TV aerial on a nearby house. The male approached the female, flew a circle in the air and continued to court the female. Finally at 05.20 hrs both birds flushed and an "extra" *decaocto*, probably a male, joined the company and flew away with the female. The *turtur* male returned to the aerial and was observed there at 12.30 hrs, cooing eagerly.

As a curiosity, it is worth mentioning that both the mixed pair and an incubating *decaocto* female were attracted to the observer through imitation.