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Phenotypes of juvenile offspring of a mixed pair consisting of a male House Sparrow and a female Tree Sparrow *Passer* spp.

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Introduction

Intermediate phenotypes between the House Sparrow *Passer domesticus* and Tree Sparrow *Passer montanus* are often reported in the wild (Summers-Smith 1988; see also Nyholm 1966, Tricot 1968, Persson 1985). According to phenotypical characteristics, they seem to be hybrid birds in postjuvenile plumage.

Silver (1911) and Meise (1951) have presented some information on juvenile cage-bred hybrids but the published information is insufficient for identification of the hybrids.

Here I describe the plumage patterns and measurements of juvenile hybrid phenotypes from a pair consisting of a male House Sparrow and a female Tree Sparrow breeding in the wild, stressing characters useful for hybrid identification.

Material and methods

Hybrids and two Tree Sparrow phenotypes 13–14 days old were removed from three successive broods in a nestbox occupied by a pair consisting of a male House Sparrow and a female Tree Sparrow in the wild (Prat de Llobregat, Barcelona, Spain) (Cordero in press). The hand reared birds died at between one and five months old, before or during their first moulting.

Plumage characteristics were described when the hybrids were 30–40 days old (three males and five females alive) and during moulting, when they were 3–5 months old (two male and three female skins). I used the Munsell color chart (Munsell 1954) for comparison and colour names of the principal characters investigated, which were examined by the method used by Sibley (1954). In this method scores rating from 0 (pure House Sparrow) to 4 (pure Tree Sparrow) were established. As five characters were registered, each hybrid specimen fell on the 0–20 scale between pure parent phenotypes. Other characters like the presence of a whitish spot behind the eye, a pale arched line from base of bill to eye, and the presence of a double wing bar were also checked.

Control juvenile House Sparrows and Tree Sparrows from the area were skinned and used as a reference for colour and measurement comparisons. In addition, during the breeding season of 1989, about 200 young of each species were inspected in order to record variation in the colour characters investigated.

Linear measurements (culmen, tarsus and maximum length of wing) were taken with calipers and wing rule according to Svensson (1984) and only from skins. Weight was the highest value obtained in the course of several measurements (accuracy 1 g) taken from the date of capture to the death of the birds. Values are given as means and standard deviations.

Results and discussion

The hybrids were either House Sparrow-like (5 females) or intermediate between the parental species (3 males). A possible explanation for the presence of pure Tree Sparrow phenotypes (2 females) is based on polypaternity (see Cheke 1969, Cordero in press).

The variation of the colour characters investigated in juvenile (premoulting) House Sparrows, hybrids and Tree Sparrows is as follows:

Crown

House Sparrow. Dark brown, brown, olive brown, light olive brown, greyish brown (uniform).
Hybrid male. Dark brown. Reddish brown on sides and / or forehead tinged with light brownish grey. Character rating 1–2, (1.3±0.5).
Hybrid female. Dark brown, greyish brown or dark greyish brown (uniform). Character rating 0–1, (0.2±0.4).
Tree Sparrow. Dark reddish brown, dark reddish grey, greyish brown. Usually tinged with reddish brown on sides and tipped wlth small blackish spots.

Postocular stripe

House Sparrow. Pale brown, very pale brown, yellowish brown, strong brown.
Hybrid male. Reddish brown but paler than Tree Sparrow. Sometimes tinged with pale brown. Character rating 3, (3.0±0.0).
Hybrid female. Pale brown, yellowish brown. Character rating 0, (0.0±0.0).
Tree Sparrow. Reddish brown. Sometimes tinged with strong brown.

Nape, rear and sides of neck

House Sparrow. As crown. No collar design on sides of neck.
Hybrid male. As crown but tinged with reddish brown. Illdefined whitish collar design. Character rating 2, (2.0±0.0) .
Hybrid female. As crown. Sometimes tinged with pale brown on sides of neck. No reddish hue. Very ill-defined whitish collar design. Character rating 1, (1.0±0.0).
Tree Sparrow. Reddish brown. Whitish collar design on sides of neck.

Ear coverts

House Sparrow. Very pale brown, pale brown. Sometimes tinged with brown, light brown or even a greyish difused patch.
Hybrid male. Grey or very dark grey ill-defined ear patch. Character rating 3, (3.0±0.0).
Hybrid female. Similar to House Sparrow. Sometimes a very ill-defined brownish or light grey ear patch. Character rating 0–1 (0.6±0.5).
Tree Sparrow. Black, very dark grey defined ear patch. Rest white.

Chin and throat

House Sparrow. White, very light grey, light grey. Pattern usually limited to chin.
Hybrid male. As Tree Sparrow. Character rating 4 (4.0±0.0).
Hybrid female. As House Sparrow. Character rating 0, (0.0±0.0).
Tree Sparrow. Grey, dark grey, very dark grey.

The index of hybridization for these five characters came to 13.3±0.5 for males and 1.8±0.8 for females. All correlations between these characters were positive at the level of $P<0.01$.

All hybrids but one female showed a conspicuous whitish or pale arched line above the lores, from the base of the bill to the eye (Fig. 1); this character was absent in the Tree Sparrow but almost all young House Sparrows examined had it. A minute whitish spot above and behind the eye was present in all hybrid specimens; it was whiter and more visible in males, being present in most juvenile House Sparrows examined and rare in the Tree Sparrow (a very pale and faint spot above and behind the eye was found in 4 of 200 juvenile studied in this species).

Juvenile hybrids between the male House Sparrow and female Tree Sparrow were dimorphic in the sense of Silver (1911): hybrid males

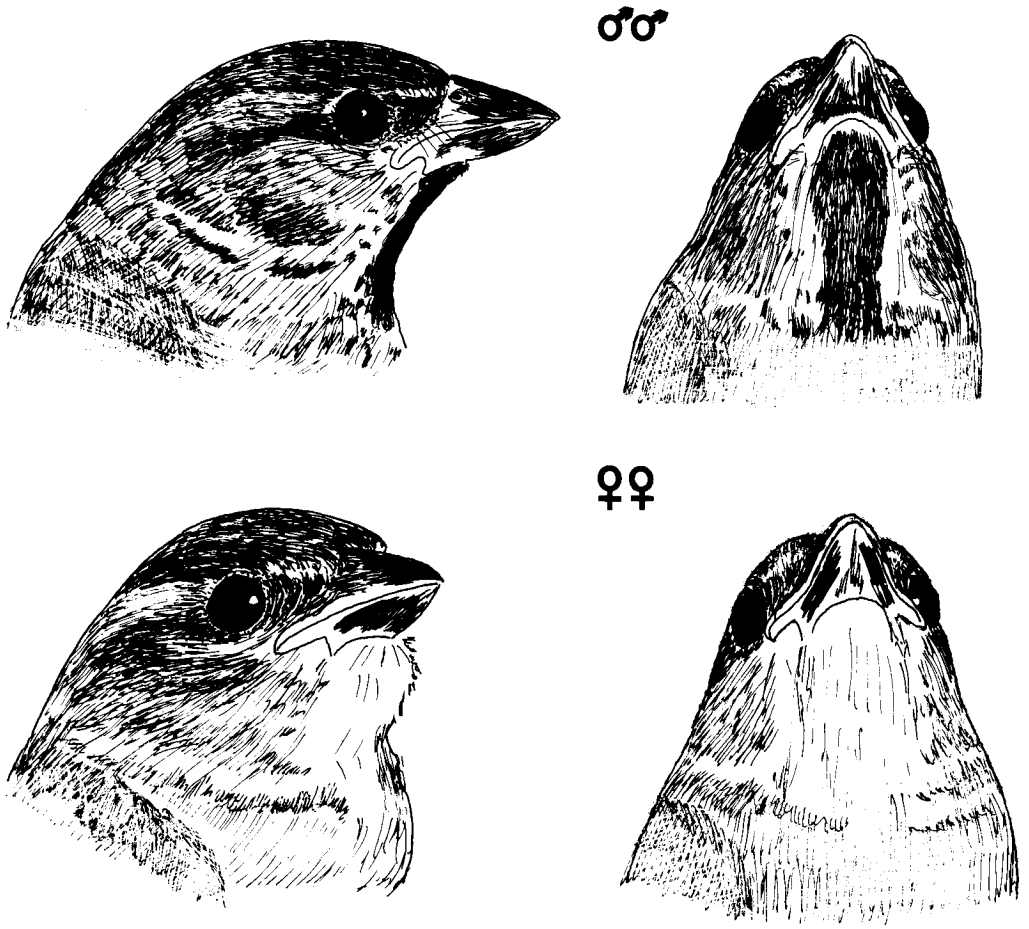

Fig. 1. Male (above) and female (below) juvenile hybrids 30–40 days old.

were intermediate between the pure species, rather similar to, but slightly larger than the Tree Sparrow; they all exhibited a whitish line above the lores that was absent in the Tree Sparrows sampled. Hybrid females resembled juvenile House Sparrows but they were slightly smaller, the plumage was neater, darker in the head and upper-parts, cleaner and paler in the under-parts. An ill-defined white stripe on the sides of the neck, was also present. Hybrid females were difficult to separate from certain plumage types of the juvenile House Sparrow (e.g. Nichols 1935).

During moulting, the differences between the sexes diminished. In both sexes the chin and throat turned black or very dark grey, the bib patch longer in males than in females. Their reddish brown hue increased on the nape, rear and sides of the neck and sprinkled the crown in males. Reddish brown extended along the postocular stripe and sides of the neck in females. At this stage, a faint double whitish wing bar was not useful for hybrid identification and some females were very similar to a first moult male House Sparrow.

Table 1. Measurements (mean±SD, ranges in parenthesis) from random samples (N) of juvenile (well developed premoulting) House Sparrows, Tree Sparrows and hybrids 110.8±23.9 days old. *=P<0.05; **=P<0.01; ***=P<0.001.

	N	Weight (g)	Culmen (mm)	Wing (mm)	Tarsus (mm)
House Sparrow	10	26.5±1.4 (24.0–28.5)	12.6±0.5 (11.6–13.2)	73.3±2.1 (69.0–77.0)	18.7±0.7 (17.2–19.6)
t test (15 df)		5.16 ***	0.98 NS	3.28 **	2.15 *
Hybrids	7	21.9±2.10 (18.0–24.0)	12.4±0.2 (12.0–12.8)	69.3±2.6 (66.0–73.0)	17.9±0.9 (16.7–19.3)
t test (12 df)		3.02 *	9.41 ***	3.29 ***	3.42 **
Tree Sparrow	7	18.6±1.24 (16.5–20.5)	10.9±0.3 (10.6–11.5)	64.7±2.3 (60.0–67.0)	16.6±0.3 (16.1±17.0)

In general, hybrid measurements were intermediate between these of the parental species: smaller than the House Sparrow but larger than the Tree Sparrow (Table 1).

A House Sparrow-like phenotype resembling either of the above female hybrid descriptions should be especially checked and measured as measurements may be decisive for identification.

The lack of juvenile hybrid records between the House and Tree Sparrow is apparently based on failure to identify them. Furthermore, hybrids could be eliminated during the first two months of life when mortality rates are highest in these species (Summers-Smith 1959, Pinowski 1968).

Exhaustive morphological studies on the juvenile populations of the House Sparrow and Tree Sparrow would assess the real importance of hybridization in habitats permanently modified by man, where they may coexist and where hybridization could be stimulated (e.g. Anderson 1971).

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Selostus: **Varpusen ja pikkuvarpusen risteymäjälkeläisten ulkonäöstä**

Kirjoituksessa kuvataan varpusen ja pikkuvarpusen risteymäpoikasten väriominaisuuksia, jotka ovat käyttökelpoisia risteymien määrittämisessä. Barcelonassa Espanjassa yhdessä pesineiden varpuskoiraan ja pikkuvarpusnaaraan kolmen peräkkäisen pesyeen poikaset kasvatettiin häkissä kaksiviikkoisista 1–5 kuukauden ikäisiksi. Höyhenpuku kuvattiin 30–40 vrk:n sekä 3–5 kuukauden iässä.

Naaraspoikaset (5) muistuttivat varpusta, koiraspoikaset (3) olivat intermediäärisiä kantalajien suhteen. Koiraiden päälaki oli tumman ruskea mutta sivuilta punaruskea. Niska oli punaruskeasävyisen tumma, kaulassa valkeahko, epäselvä rengas. Poskilaikku oli epäselvä ja harmaa, kun se pikkuvarpusella on selvä ja hyvin tumma. Leuka ja kurkku sen sijaan olivat tummia kuten pikkuvarpusellakin.

Naaraspoikasilla oli epäselvä valkeahko kaularengas toisin kuin varpusella. Parilla yksilöllä oli hyvin epäselvä poskilaikun aihe. Pään seutu ja selkäpuoli olivat hieman tummemmat, alapuoli vaaleampi kuin varpusella. Sekä koiras- että naaraspoikasilla oli pikkuvarpusesta poiketen vaalea juova nokan tyven ja silmän välillä. Sulkasadon jälkeen naaraiden ja koiraiden väliset erot vähenivät ja naaraat alkoivat muistuttaa enemmän pikkuvarpusta mm. pään punaruskean värin vuoksi. Kooltaan hybridijälkeläiset olivat pienempiä kuin varpunen mutta suurempia kuin pikkuvarpunen.

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Breeding habitat distribution in a population of the Herring Gull *Larus argentatus* on the Finnish west coast

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Introduction

Kilpi (1988) called the Herring Gull *Larus argentatus* "one of the winners among Holarctic birds in this century". This statement is clearly supported by data on the population growth in Finland: in the 1930s there were a few hundred Herring Gull pairs in the Gulf of Finland; in 1980 there were at least 11 000 pairs (e.g. Bergman 1939, Kilpi et al. 1980, Kilpi 1983). Nowadays, the Archipelago Sea also harbours several thousand Herring Gull pairs (Kilpi 1988).

On the other hand, the population along the Finnish west coast is still sparse; for instance, in the archipelago of southern Ostrobothnia in 1985–87 there were only about 500 pairs in a coastal stretch measuring about 100 km (Kilpi 1988). At Valsörarna/Valassaaret the Herring Gull population increased at least tenfold in 1960–1978, but the absolute numbers are small (about 70 pairs in 1978) (Hildén et al. 1978).

The future development of the Herring Gull population on the Finnish west coast will depend on several factors, such as the habitat and food availability, local productivity, immigration and changes in mortality (see Kilpi 1988). In this study, I present some data regarding the habitat distribution of a Herring Gull population that is probably in the initial stage of population increase, my aim being to discover whether the generalist nature of the bird is also reflected in the habitat distribution of a sparse population in an area that is geomorphologically clearly different from the Finnish south coast.