Butll. GCA 9: 19-23, 1992

Mixed breeding pairs of European Starling *Sturnus vulgaris* and Spotless Starling *Sturnus unicolor* in the north-east of Spain

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Ten observations of interspecific pairing of the European Starling and the Spotless Starling have been recorded in a sympatric area located in north-east Spain. Five of the cases refer to copulations and five are well-established mixed pairs. At least two of these pairs have produced full-grown chicks. In 70 % of the total cases and 80 % of the well-established pairs the male was a Spotless Starling and the female a European Starling. These data show that hybridization is possible in nature and that it occurs with some frequency.

Key words: European Starling, *Sturnus vulgaris*, Spotless Starling, *Sturnus unicolor*, hybridization, sympatry.

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Rebut: 01.03.93; Acceptat: 23.03.93

INTRODUCTION

During this century the European Starling *Sturnus vulgaris* and the Spotless Starling *Sturnus unicolor* have both undergone very important expansions in their breeding ranges (Bernis 1960, Delvingt 1961, Berthold 1968, and others). The first sympatric areas were not formed until the 1970's in the north of Spain (Motis et al. 1983, Peris et al. 1987, Ferrer et al. 1991) and more recently new sympatric areas have been found in south-east France (Cambrony 1990, Kayser & Rousseau 1992).

The two species are closely related, and because of this several attempts at mixed breeding in captivity have been made. Berthold (1971) obtained hybrids but they died before fledging, possibly due to congenital defects. In contrast, more recently Eens et al. (1992) obtained two fledglings from two mixed broods. Now, the co-existence of the two species makes it possible to check if interbreeding exits under natural conditions.

This article presents some data about the discovery of mixed breeding pairs obtained in one of the sympatric areas.

MATERIAL AND METHODS

Observations were recorded from studies made in several years (1982-86 and 1988) of the biology of the two species in the largest area of sympatry, located in Catalonia (north-east Spain) (Ferrer et al. 1991). In this area, where sympatry started to occur in 1977 (Mestre 1978), the starlings nest in large colonies mainly in the roofs of buildings, and colonies with the two species are frequent (Motis 1986).

Species identification was carried out using Leitz 10x40 binoculars and a Kowa 20-60x60 telescope and according to Hiraldo & Herrera (1974), Svensson (1975) and Motis (1984). Apart from the occasional observation of copulations, in the other cases (nest-building, feeding chicks, etc.), the period of observation lasted as long as necessary, sometimes for several hours or two different days, in order to check that it corresponded with a well-established pair, breeding in the same nest.

RESULTS

Five of the observations correspond to well-established pairs (Table 1). In one of the cases, (Sarroca/9.5.82) a pair with at least four full-grown chicks (19-21 days old) was observed. One of the chicks was captured and lived in captivity for three months with no signs of abnormality until its death. This young hybrid died, extremely thin, after several days of bad feeding conditions.

The pair of Maials/20.4.86 was observed later on in the season. On 10.5.86 one full-grown chick remained in the nest. It was fed by a female European Starling, and a male Spotless Starling was present close to the nest for a few moments during the observation period which lasted seven hours.

Taking all the observations into consideration, in 70 % of the cases the pairs were formed by male Spotless Starling and a female European Starling. Of the five cases of well-established pairs, in only one case was the male a European Starling.

Of the 790 starling pairs investigated for species composition during the entire study period, four were mixed. This represents a total of 0.5 % of all pairs in the population studied.

DISCUSSION

These data show the existence of cases of mate misidentification of females, and also, that isolating mechanisms during pair formation do not prevent interbreeding between the two species. In at least five cases interspecific pairing has occurred, and in two of the cases mixed pairs produced full-grown chicks. Also, in Leucate-Plage (south-east France), a mixed pair formed of a male Spotless Starling and a female European Starling was found in 1992, although it was not known whether breeding was successful or not (Kayser & Rousseau 1992). Therefore, we can conclude that hybridization between the two species under natural conditions occurs to a certain degree in the sympatric areas.

In contrast to the results obtained by Berthold (1971), the observation of fledged chicks, and especially the case of the captured chick which died three months later, suggest that hybridization may produce viable individuals, as has also been found by Eens et al. (1992), who obtained a young hybrid that died accidentally when it was three and a half months old.

It is interesting to note that in most cases the male is a Spotless Starling. Similarly, Eens et al. (1992) found in the two captive mixed broods that male Spotless Starlings attracted European Starlings females, even when unmated males of European Starlings were present. Likewise, Spotless Starling dominance has been proved in the sympatric area where this species wins in 69.7 % of the

DATE	PLACE	PAIR COMPOSITION	ACTIVITY
9.5.82	Sarroca 41.27N 00.34E	male SS - female ES	feeding full-grown chicks
22.4.83	Llardecans 41.22N 00.33E	male ES - female SS	copulating
11.5.83	Llardecans 41.22N 00.33E	male ES - female SS	building nest
18.5.83	El Cogul 41.28N 00.41E	male SS - female ES	copulating*
29.4/1.5.84	Sarroca 41.27N 00.34E	male SS - female ES	male singing female in the nest
2.5.84	Castelldans 41.30N 00.46E	male ES - female SS	copulating
10.4.86	Aspa 41.30N 00.41E	male SS - female ES	copulating**
10.4.86	Aspa 41.30N 00.41E	male SS - female ES	copulating**
20/21.4.86	Maials 41.22N 00.30E	male SS - female ES	building nest
11.3.88	Aspa 41.30N 00.41E	male SS - female ES	building nest

*: Both of these birds were independently paired with individuals of their own species.
**: The male is the same in both cases, the females are different.

Table 1. Records of mixed breeding pairs of European and Spotless Starlings (SS: Sturnus unicolor; ES: Sturnus vulgaris).

Taula 1. Observacions de parelles mixtes entre estornell vulgar i estornell negre.

agonistic encounters between males (unpublished data). This dominance is probably related to the body size, which is slightly larger in the Spotless Starling (Motis 1987).

From now on it will be necessary to examine the occurrence of hybridization between the two species very thoroughly in all the sympatric areas, as mixed breeding could be even more common than the aforementioned data reveals. Moreover, some individuals are difficult to identify due to their intermediate plumage. In the breeding population studied, 0.49 % (n=607 birds observed) and 1.02 % (n=98 birds captured) had intermediate plumage characteristics (unpublished data); it is likely that they could have been hybrids.•

RESUM

Parelles mixtes d'Estornell vulgar Sturnus vulgaris *i Estornell negre* Sturnus unicolor *al nord-est d'Espanya.*

S'han obtingut deu observacions d'aparellaments interespecífics entre l'estornell vulgar Sturnus vulgaris *i l'estornell negre* Sturnus unicolor *a l'àrea de simpatria situada al nord-est de la Península Ibèrica. Cinc observacions són de còpules i cinc corresponen a parelles mixtes ben establertes. Almenys dues d'aquestes parelles mixtes van produir polls volanders. En el 70% del total dels casos i el 80% de les parelles ben establertes el mascle fou un estornell negre i la femella un estornell vulgar. Aquestes dades mostren que la hibridació entre les dues espècies és possible en condicions naturals i que es dóna amb certa freqüència.*

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