

A Corn Bunting (*Emberiza calandra*) imitating Yellowhammer (*Emberiza citrinella*) song

Strnad luční (Emberiza calandra) imitující zpěv strnada obecného (Emberiza citrinella)

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A Corn Bunting (*Emberiza calandra*) consistently performing the song of the Yellowhammer (*Emberiza citrinella*) was observed in Central Bohemia during the breeding seasons 2012 and 2013. As is normal for Yellowhammers, the bird used three variants of the opening phrase, while the endphrase, when sung fully, corresponded to the local Yellowhammer dialect. Imperfections in the imitation included rising pitch in the opening phrase and ticks and “srp” sounds at the beginning and the end. The bird also imitated long series of “dzip” and “tsp” sounds that belong to the normal Yellowhammer repertoire. We documented seven Yellowhammer territories in the direct neighbourhood of the bird’s territory, while no other Corn Buntings were present in the wider surroundings. Never-before published sonograms based on recordings by Antony Pearce reveal that a Corn Bunting in Pembrokeshire (Great Britain) imitated Yellowhammer in a similar way in 1978.

V průběhu hnízdních období 2012 a 2013 byl ve středních Čechách pozorován strnad luční (Emberiza calandra), který zpíval jako strnad obecný (Emberiza citrinella). Tento jedinec používal tři varianty úvodní fráze, jak je obvyklé pro strnady obecné, zatímco fráze závěrečná, pokud ji odzpíval celou, odpovídala místnímu dialektu strnada obecného. Nedostatky v nápodobě zahrnovaly stoupající výšku tónu v úvodní frázi a občasně tikání a vkládání zvuku „srp“ na začátek a konec fráze. Pták dále napodoboval dlouhé série zvuků „dzip“ a „tsp“, které také patří k obvyklému repertoáru strnada obecného. Zaznamenali jsme sedm teritorií strnada obecného v přímém sousedství teritoria tohoto strnada lučního. Žádní další strnadi luční v širším okolí přítomni nebyli. Dosud nepublikované sonogramy založené na nahrávkách Antonyho Pearce ukazují, že strnad luční v Pembrokeshire ve Velké Británii v roce 1978 napodoboval strnada obecného podobným způsobem.

Keywords: birdsong, dialect, mimicry, sonogram, territory

INTRODUCTION

The song of true songbirds (suborder Passeri) is thought to have both an inborn and a learned component. Learning to sing takes place in several phases. In the early weeks of a bird’s life, it learns

passively by listening to individuals of its own species. After an active learning phase in which the bird practises by singing “subsong”, its repertoire is either completely matured, or may still be fine-tuned at a later stage, when the

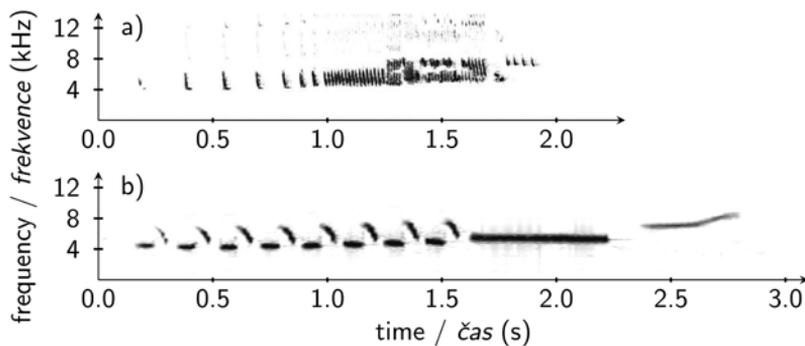


Fig. 1. Examples of normal songs of a) Corn Bunting (*Emberiza calandra*; sonogram based on Bělka 2008a) and b) Yellowhammer (*Emberiza citrinella*; Matusiak 2012).

Obr. 1. Příklady normálního zpěvu a) strnada lučního (*Emberiza calandra*; sonogram podle Bělka 2008a) a b) strnada obecného (*Emberiza citrinella*; Matusiak 2012).

adult bird already sings its full song and interacts with other birds of the same species living nearby (Catchpole & Slater 2008). Indeed, it seems that this sort of fine-tuning is an important driving force behind the formation of bird dialects, which have been observed in many species (Catchpole & Slater 2008).

Many species of songbirds may incorporate elements of the song of other species into their own song. In some species, such as the European Starling (*Sturnus vulgaris*), this may be considered normal behaviour (Hindmarsh 1984). In other species, this sort of mimicry is much rarer and only shown by isolated individuals or in areas where two species overlap (Helb et al. 1985). It has been suggested that this results from an individual accidentally learning to sing using another species as a template, in spite of the natural mechanisms that usually prevent this (Catchpole & Slater 2008).

Here we report on one such case, of a Corn Bunting (*Emberiza calandra*) imitating the song of the Yellowhammer (*Emberiza citrinella*). A normal song strophe of a Corn Bunting consists of a fast series of high-pitched, rather

unmelodious sounds, sometimes compared to jingling keys (Fig. 1a). Although Gliemann (1973) considered it to be constant over its range, others (Duchrov 1959, McGregor 1980, 1986, Holland & McGregor 1996, McGregor et al. 1997, Osiejuk & Ratyńska 2003) have found evidence of local dialects. McGregor (1980) found that all individuals in an area may share the same two to three song types. Also Osiejuk & Ratyńska (2003) found that males usually have a repertoire consisting of two or three song types that are always sung in exactly the same way, except that they may be cut short before the end at certain well-defined points in the strophe. Dialects then consist of two to five song types that are shared between neighbours over distances up to 10 km. In Glutz von Blotzheim & Bauer (1997), three cases are reported of first-year males that initially sang a different dialect from the local population, but changed to the local dialect in the next year. Experiments with birds raised in isolation have shown that in adulthood, these individuals sing a song that is fairly similar to that of wild birds (Thorpe 1964).

A normal song strophe of the Yellowhammer is very different from that of the Corn Bunting. When sung fully, it consists of an opening phrase and an end phrase. The opening phrase consists of a series of fast, zitting sounds, sometimes described as “a-little-bit-of-bread-and”, while the end phrase consists of two slower, single notes “no-cheese” (Fig. 1b). In the opening phrase, a single “syllable” is repeated about 9–12 times, crescendoing in volume and more rarely also in pitch. Individuals have a repertoire of 2–3 (sometimes 1–4 or rarely 5) ways to sing the opening phrase, which differ in the element used. Some of these elements may be shared with other individuals in the same area but they tend to be very variable and highly individual (Caro et al. 2009). The end phrase, by contrast, is sung always in the same way by an individual and also tends to be the same over hundreds of km, giving rise to large-scale dialects (Hansen 1985, Petrusková et al. 2015). Dialects can be recognized only from the full song; often, shortened strophes are sung where the entire endphrase or its final element are left out. Diesselhorst (1971) reports that song learning in Yellowhammers has two sensitive periods: in their first summer, and then the next spring.

Buntings of the genus *Emberiza* do not normally incorporate song elements of other species into their songs. Isolated cases where Yellowhammers incorporated elements of the song of Redstarts (*Phoenicurus* sp.) or Corn Bunting into their song are reported in Rawsthorne & Rogers (1951) and Schulze (1991), while in Robel (1989) and Kaiser (1990), the same species is reported to completely imitate the song of the Cirl Bunting (*Emberiza cirlus*) and Ortolan Bunting (*Emberiza hortulana*). Imitation of the Eurasian Wren (*Troglodytes*

troglodytes) has been reported in Helb (2013). Cases of imitation by the Cirl Bunting and Yellow-breasted Bunting (*Emberiza aureola*) are reported in Helb et al. (1985) and Kreuzer (1979). Cases of abnormal song in Corn Buntings have also been reported (Bäsecke 1943, Berndt & Frieling 1944, Schumann 1956, Czikel 1980, Richards 1981, Donovan 1984), the last two imitated Yellowhammer.

Motivated by the question why this sort of behaviour happens, we study a new case of a Corn Bunting imitating Yellowhammer and also provide never-before published sonograms of the similar case reported on by Donovan (1984).

METHODS

The study area is a disused and overgrown slag heap at approximately 350 m a.s.l. near the village of Buštěhrad in the Central Bohemia region of the Czech Republic, coordinates 50°09'47"N, 14°11'00"E. After the initial discovery of a Corn Bunting on March 22, 2011, we visited the area during January–August 5 times in 2011, 12 times in 2012, 9 times in 2013, and 4 times in 2014. In addition, casual observations from the general neighbourhood of the study area, which is near our homes, were taken into account. On April 26, 2012, we made 34 min of sound recordings of the Corn Bunting with an Uher CR 240 AV cassette tape recorder using an AKG D140C microphone and a home-made parabolic microphone. Most of this was spontaneous song, partly in reaction to a Yellowhammer singing nearby, but we also used playback of recordings of the Corn Bunting itself to stimulate the song. On July 4, 22 min of recordings were obtained over a period of about one hour using a shotgun microphone.

All sonograms in this paper were

produced using the freely available software Avisoft-SASLab Lite (Avisoft Bioacoustics 2013). We produced sonograms of the full 34 + 22 min of recordings and visually classified the song elements and calls. Different variants of the opening phrase sound similar to the ear but are easily distinguished in the sonograms. In addition, we also visually classified sonograms of the recordings made by Antony Pearce of a Corn Bunting in Pembrokeshire (Great Britain) in 1978 (Donovan 1984, Bird Mimicry 2006). After classification, we compared the different sounds of our Corn Bunting and the bird in Pembrokeshire with sonograms of normally singing Corn Buntings and Yellowhammers from Cramp et al. (1994), Glutz von Blotzheim & Bauer (1997), and recordings on the Xeno-canto website (e.g., Åberg 2012). We also analysed Yellowhammer song in the background of our recordings.

During three visits in 2012 (on May 15, 20 and 24), 1–1.5 h each, an attempt was made to map the territories of Yellowhammers in the immediate vicinity of our bird. The aim was both to establish the local density of Yellowhammers as a possible factor contributing to the aberrant song of our Corn Bunting, and also to assess the effectiveness of its song in keeping Yellowhammers out of its territory. We used a simplified version of a mapping technique used widely in the Netherlands and known as the BMP method (see Sovon 2015). Usually, during one visit, most places on the map were visited twice. All observations of male buntings were marked on a map together with information about territorial behaviour, movement of the same birds, or concurrent observations of certainly different birds, etc. These observations were then grouped into tentative territories, mainly on the basis of mutually exclusive observations of

two or three birds at the same time, in the most economical way.

In an attempt to provoke our bird into producing normal Corn Bunting song, on July 5, 6 and 10, 2012, we played normal Corn Bunting song to our bird. The same 52-second-long recording (Bělka 2008b) was used on each occasion and played intermittently over half an hour from a portable radio and mp3-player held by the observer. The observer tried to hide himself out of direct view under and behind bushes and small trees.

RESULTS

Observations

On March 22, 2011, J. S. discovered a normally singing Corn Bunting in the study area. Apparently the same bird was present on March 31, April 3 and 10, and May 12, still singing normally. On the latter date it was observed chasing a Yellowhammer.

After this, the location was not visited till March 23 of the next year (2012), when an abnormally singing Corn Bunting was observed on precisely the same location, using in part the same songposts. It showed all field characteristics of its species, including large size, strong light-coloured bill, and a typical fluttering flight with hanging feet when approaching a songpost. Its song, however, consisted of a pretty convincing, though not absolutely perfect, imitation of Yellowhammer song. This bird, always singing in the same manner, was observed 12 times between March 23 and July 10, 2012. In August 6, buntings had stopped singing and the bird could not be found. On December 13 and 25, a single Corn Bunting was observed in a very large group of Yellowhammers (estimated 200 birds) at 1 km resp. 500 m from the

place where our bird held its territory in summer.

In 2013, the study area was visited nine times between January 2 and August 1. The abnormally singing Corn Bunting was present and singing on each occasion, except on March 13 and August 1. To the ear, its way of singing had not changed. It made “dzip” sounds on three occasions in March. Once, this was apparently in interaction with a Yellowhammer that also produced “dzip” sounds. During the visits in January–March, the Corn Bunting was frequently observed chasing male Yellowhammers. On March 5, a second Corn Bunting was briefly observed quietly sitting about 2 m from our bird, with no obvious interaction between the two.

Early in 2013, wild roses in and near the territory of our Corn Bunting seemed to be used for roosting by Yellowhammers. Due to an unusually cold spring, Yellowhammers continued to spend the day in winter flocks until early April and could be found in the study area only in the early morning and just before dusk, when there were up to 12 males present in the study area. On March 22, a single Corn Bunting was observed in a group of Yellowhammers about 1000 m from the study area.

In 2014, the study area was visited four times between January 6 and June 11 but we failed to locate any Corn Buntings and concluded our bird was gone.

Sound recordings

During the recording on April 26, the Corn Bunting made three general types of sounds, that we classified as follows: 1. imitation of Yellowhammer song, 2. “srp” sounds and dry ticking sounds, and 3. “dzip” and “tsp” sounds.

The most usual imitation of Yellowhammer song consisted of an

opening phrase followed by the first element of the end phrase. Sometimes, only the opening phrase was sung. More rarely, the full song including both elements of the end phrase was sung (Fig. 2a), corresponding to the Yellowhammer dialect BE (in the classification of Hansen 1985) recorded also in at least one Yellowhammer neighbouring our bird. Our bird had a repertoire of three different variants of the opening phrase (Fig. 2b–d). Since the visual classification of sonograms is inevitably subjective to some degree, in Fig. 2a, 2b, we have included two examples of opening phrases that we consider to be the same. The opening phrase was rising in pitch. In variant 1 of the opening phrase, the repeated element changes quite a bit during the phrase, more than is usual for normal Yellowhammer song.

Sometimes, before the opening phrase, the Corn Bunting produced one or two (rarely more) dry ticking sounds. Also, after the end phrase, sometimes one, or more rarely two “srp” sounds were made (Fig. 2c). Occasionally, “srp” sounds were also made on their own, not linked to imitated Yellowhammer song (Fig. 2e). We have not been able to assign these sounds with certainty to sounds in the normal repertoire of either Corn Buntings or Yellowhammers. On three occasions, the Corn Bunting made a series of “dzip” and “tsp” sounds, alternated in a more or less regular fashion and lasting half a minute till one minute (Fig. 2f,g).

The recordings from July 4 are similar to those obtained on April 26. All three variants of the opening phrase were still in use, usually only the first element of the end phrase was sung, sometimes none at all, and sometimes the full song was sung according to the Yellowhammer dialect BE. Sometimes,

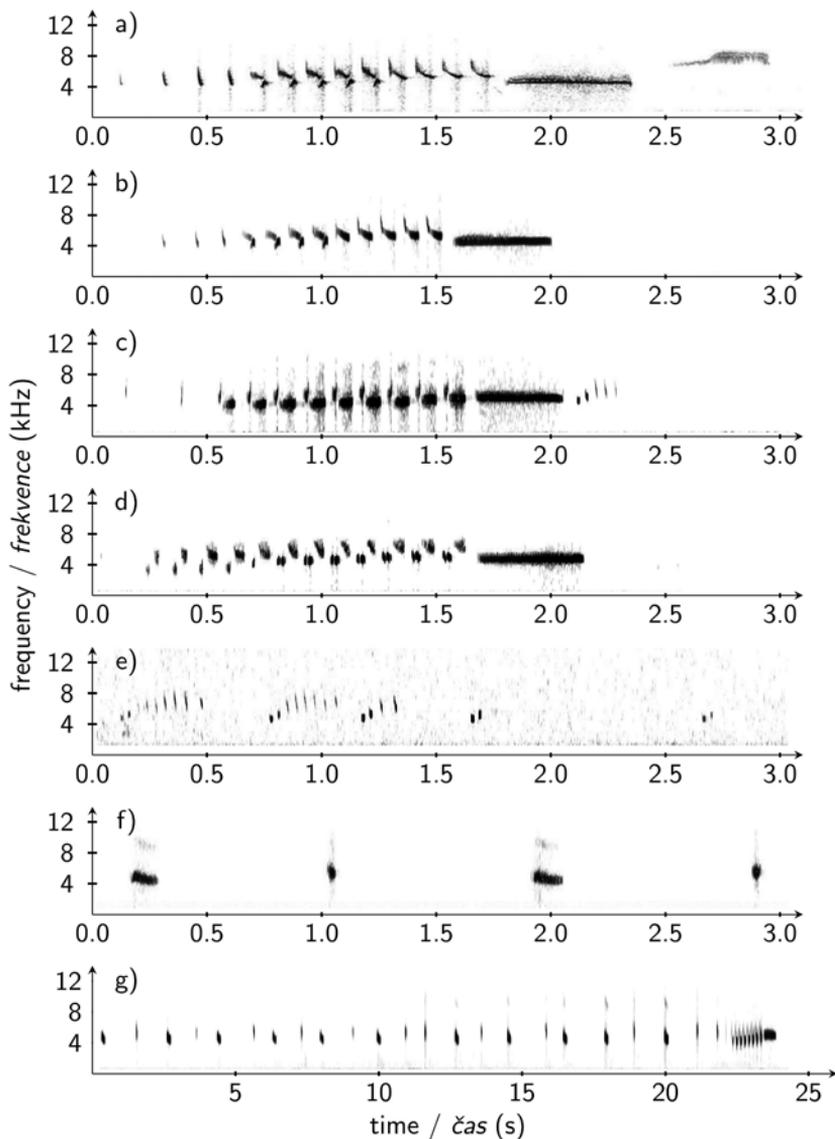


Fig. 2. Various sounds of the Buštěhrad Corn Bunting: a) a strophe with a complete end phrase, b) a strophe with the first variant of the opening phrase and a shortened end phrase, c) a strophe with the second variant of the opening phrase and two ticks at the start and “srp” at the end, d) a strophe with the third variant of the opening phrase, e) “srp” sounds, f) “dzip” and “tsp” sounds, g) series of “dzip” and “tsp” sounds with song at the end. The opening phrases in a) and b) were visually classified as belonging to the same variant. Note the different time-scale in sonogram g).

Obr. 2. Různé hlasy „buštěhradského“ strnada lučního: a) strofa s kompletní závěrečnou frází, b) strofa s první variantou úvodní fráze a zkrácenou závěrečnou frází, c) strofa s druhou variantou úvodní fráze a dvojitým tikáním na začátku a zvukem „srp“ na konci, d) strofa s třetí variantou úvodní fráze, e) zvuky „srp“, f) „dzip“ a „tsp“, g) série zvuků „dzip“ a „tsp“ se zpěvem na závěr. Úvodní fráze v případech a) a b) byly vizuálně vyhodnoceny jako stejné. Pozor na odlišné měřítko osy x u sonogramu g).

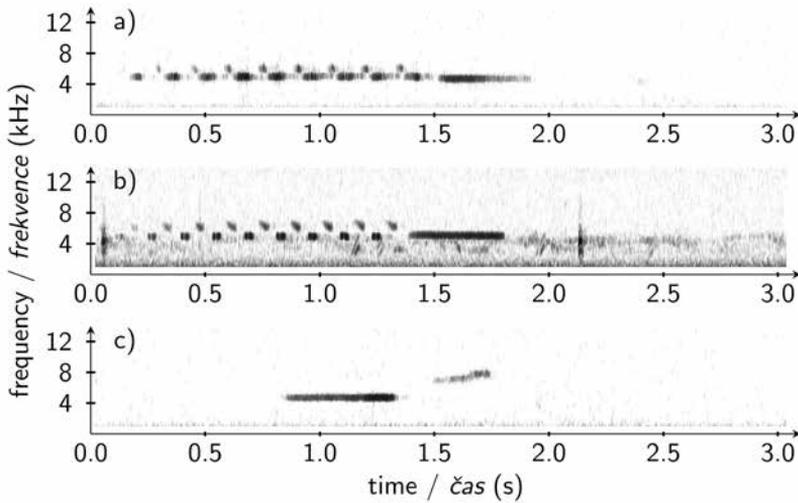


Fig. 3. Yellowhammer singing against the Corn Bunting (background recording): a, b) strophes with two variants of the opening phrase, roughly similar to variants 2 and 3 used by the Buštěhrad Corn Bunting (see Fig. 2c,d), c) a strophe lacking the opening phrase.

Obr. 3. *Strnad obecný zpívající v blízkosti strnada lučního (slyšitelný v pozadí nahrávky strnada lučního): a, b) strofy se dvěma variantami úvodní fráze podobnými variantám 2 a 3, které používal „buštěhradský“ strnad luční (viz obr. 2c,d), c) strofa bez úvodní fráze.*

the song started with one or two dry ticks and sometimes it ended with one or two “srp” sounds. Only the series of “dzip” and “tsp” sounds were not recorded on this occasion.

On April 26, 2012, some local Yellowhammer song was recorded accidentally in the background. Sonograms (Fig. 3a,b) show opening phrases broadly similar to variants 2 and 3 of our Corn Bunting. This Yellowhammer had the habit of sometimes leaving out the opening phrase and singing only the end phrase, according to the dialect BE (Fig. 3c). This song was also heard during other visits, always on the same place at the southern end of the territory of our Corn Bunting.

Some of our sound recordings have been published on the Xeno-canto website (Zavadil 2015). The following sonograms are part of the following recordings: Fig. 2a: XC246735, Fig. 2c: XC246737, Fig. 2d: XC246738, Fig. 2e:

XC246736, Fig. 2f,g: XC246734, Fig. 3c: XC246739.

Mapping of territories

We found evidence of seven Yellowhammer territories within 100 m from the territory of the Corn Bunting (Fig. 4). Four remaining observations of Yellowhammers could not clearly be attributed to one of the seven presumed territories. These may either belong to one of the seven presumed territories or possibly comprise an eighth one.

The territories of Yellowhammers partially overlapped with each other and with the territory of the Corn Bunting. The degree to which Yellowhammer territories overlapped with each other may have been underestimated since we had no way of distinguishing individual birds. The favourite songposts of the Corn Bunting and perhaps also the boundaries of its territory varied somewhat over time. In 2011 (assuming

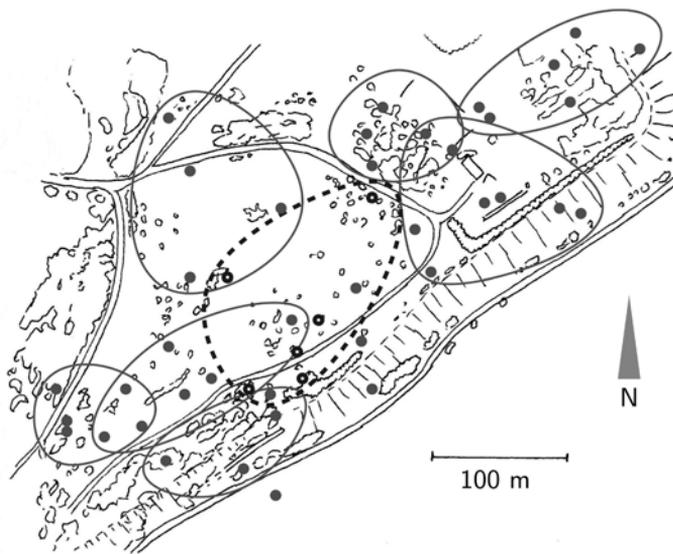


Fig. 4. Territories of Yellowhammers (gray solid lines and dots) and Corn Bunting (black dashed line and open circles) in the study area in 2012. Individual observations of males are marked with a dot/circle. Four Yellowhammer observations in the lower central part of the picture may belong to an eighth territory. The slope of the slag heap, below on the map, is about 20 m high.

Obr. 4. Teritoria strnadiů obecných (šedé plné čáry a body) a strnada lučního (černá přerušovaná čára a prázdné body) na studované lokalitě v roce 2012. Jednotlivá místa, kde byli pozorováni samci, jsou označena body. Čtyři pozorování strnada obecného ve střední a dolní části obrázku by mohla tvořit osmé teritorium. Svah haldy ve spodní části obrázku má převýšení od okolního terénu přibližně 20 m.

this was the same bird) and also in the early spring of 2012, the Corn Bunting was more often found at the northern end of its territory shown in Fig. 4. It again returned there later in 2012 and used songposts up to 50 m north of the depicted boundary.

Playback experiment

During our playback experiments, the reaction of the Corn Bunting to conspecific song varied. On July 5, it quickly became interested and tried to approach the sound, all the while singing its Yellowhammer imitation, with quite a bit of ticking and “srp” sounds. On July 6, the reaction was similar, but the bird seemed less interested. On July 10, it just

continued singing the Yellowhammer imitation without an obvious reaction to the playback.

The Pembrokeshire bird

In 1978, Antony Pearce made recordings of the Corn Bunting in Pembrokeshire described in Donovan (1984), although that paper does not mention the recordings, which were subsequently published in the CD Bird Mimicry (2006) but whose sonograms are published and analysed for the first time in our present paper.

Two variants of the opening phrase can be discerned, both different from the ones sung by our bird (Fig. 5a-c). The end phrases imitate the dialect XIb which

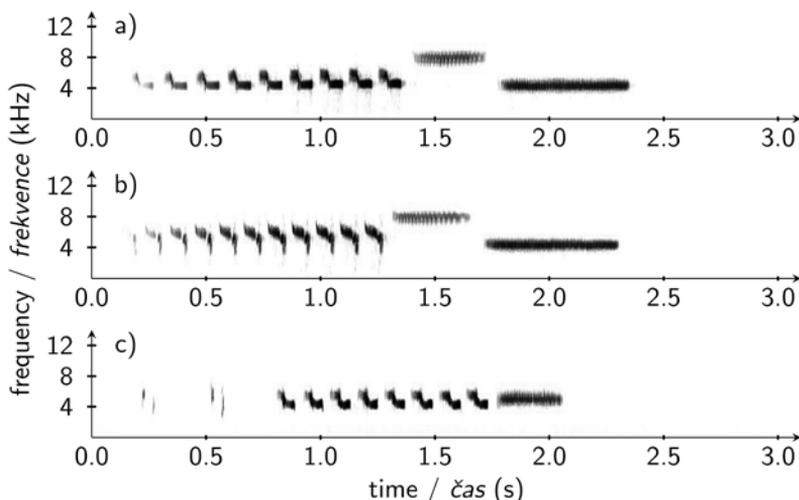


Fig. 5. Song of the Pembroke Corn Bunting: strophes with a) the first and b) the second variant of the opening phrase, c) two “trp” sounds at the start and a shortened end phrase. The opening phrases in sonograms a) and c) were visually classified as belonging to the same variant.

Obr. 5. Zpěv strnada lučního z Pembroke: a) strofa s první variantou úvodní fráze, b) strofa s druhou variantou úvodní fráze, c) dva zvuky „trp“ na začátku a zkrácená závěrečná fráze. Úvodní fráze v případech a) a c) byly vizuálně vyhodnoceny jako stejné.

is the usual dialect in this part of Britain (Pipek & Diblíková 2014). The opening phrases are not or almost not rising in pitch, in contrast to those of our bird. In the third sonogram (Fig. 5c), two “trp” sounds are made before the beginning of the song, not unlike (though different from) the dry ticking sounds sometimes made by our bird.

DISCUSSION

A Corn Bunting was observed consistently performing the song of the Yellowhammer. The imitation was good enough to fool any but the most observant birdwatcher. In fact, had we not visually observed the bird, we would very likely have misidentified it. When sung fully, the song corresponded to the Yellowhammer dialect BE (in the classification of Hansen 1985), which is known to occur in this area (Pipek

& Diblíková 2014, Petrusková et al. 2015). Imperfections in the imitation included a rising pitch in the opening phrase and ticks and “srp” sounds at the beginning and the end. The rising pitch is reminiscent of Corn Bunting song, but very unusual for Yellowhammer in the Czech Republic (T. Petrusková, pers. comm.), although sonograms B and D in Figure 292 of Glutz von Blotzheim & Bauer (1997) show that this can sometimes happen in true Yellowhammer song as well. The dry ticks may be interpreted as roughly similar to Corn Bunting song. Perhaps the same is true of the “srp” sounds but these are also similar to calls made by Yellowhammers in winter flocks as shown in sonogram IX of the Yellowhammer in Cramp et al. (1994).

The series of “dzip” and “tsp” sounds produced by our Corn bunting seem to be a rather precise imitation of those of the Yellowhammer – see sonograms A–G

of Figure 295 in Glutz von Blotzheim & Bauer (1997), sonograms VI and VII of the Yellowhammer in Cramp et al. (1994), and also compare Åberg (2012). Similar to what can be heard in the latter recording, our bird alternated the “dzip” and “tsp” sounds often in a more or less regular fashion. This fits with the claim in Cramp et al. (1994) that so-called “zit” calls are usually delivered at a measured rate and often alternated with so-called “see” calls without perceptible cause. In our experience, male Yellowhammers commonly produce long series of these calls while engaged in no other obvious activity, often later in the morning or in the afternoon when the normal song activity has ended. Strangely enough, it is difficult to find confirmation in the literature that these calls are usually given by males only. The only reference we have found is Diesselhorst (1950), cited in Glutz von Blotzheim & Bauer (1997), who describes a territorial call that is only rarely given by females and whose description “tze” seems to fit well with our impression of these calls. The fact that these calls were imitated by our Corn Bunting suggests that they have a territorial function.

On a sidenote, we reported a Yellowhammer shortening its song by leaving out the opening phrase. This way of singing seems to be unusual, although a recording of Sołowiej (2014) is similar.

Cases of abnormal song in Corn Buntings have been reported before. An odd dialect reminiscent of the song of the Wryneck (*Jynx torquilla*) was apparently once common around Göttingen (Berndt & Frieling 1944). Corn Buntings mixing the song of the Ortolan Bunting (at that time still widespread in Central Europe) into their song were described in Bäsecke (1943) and Schumann (1956). An interesting case

of a Corn Bunting sitting on the roof of a house and performing an aberrant song, perhaps imitation of the Black Redstart (*Phoenicurus ochruros*) or House Sparrow (*Passer domesticus*), was reported in Czikeli (1980). Imitation of Yellowhammer song has been reported from a bird in Dorset (Great Britain) by Richards (1981) and from the already mentioned bird in Pembrokeshire by Donovan (1984). In the first case, the song of the Corn Bunting consisted either of an almost indistinguishable imitation of Yellowhammer song, or started like the latter, but ended like Corn Bunting’s song. The second case, observed by Jack Donovan at Martin’s Head, Pembrokeshire, Wales, shows the greatest similarity to our bird. Here, a Corn Bunting first appeared in 1977 and reappeared each following spring till at least 1981. It is claimed that in 1977 and 1978, the bird first gave typical Corn Bunting song, but later in those springs changed its song to that of Yellowhammer. In later years, it gave only Yellowhammer song. In 1977, it was paying some attention to female Yellowhammers, but as far as known there was no mixed brood (Donovan 1984).

We do not know how Jack Donovan determined that the Corn Bunting he observed giving typical Corn Bunting song and the abnormally singing bird were the same individual. However, this particular Corn Bunting was likely the last of its species in a large surrounding area, as the species was locally in the process of dying out (Donovan & Rees 1994). In contrast to the situation in Wales in the late 1970s, Corn Buntings in the Czech Republic are presently increasing in numbers. Their present distribution is concentrated in the northern lowlands around the Ohře and Elbe rivers, and in the southeast of the country (Štastný et

al. 2006, ČSO 2015a). The nearest places of regular occurrence from our study area are some 18 km to the northeast behind the Vltava river and some 20 km to the northwest between the towns of Slaný and Louny. In addition, a single bird was observed some 12 km to the southeast in June 2010 (ČSO 2015b) and on May 28, 2012, a pair of Corn Buntings was observed in an apparently suitable nesting habitat just 9 km to the east of our bird. A single male was seen on the same place in 2013 and as many as three Corn Buntings (one silent, two singing normally) were observed less than 6 km to the east of our study area on April 24, 2014. In many years prior to 2011, in spite of frequent birdwatching trips, we never observed Corn Buntings anywhere near the study area.

The following facts point to the tentative conclusion that the bird we observed in 2011 was the same individual as in 2012 and 2013: 1) it held almost exactly the same territory using in part the same song posts, 2) in spite of frequent visits, we observed no other Corn Buntings on this location in many years before 2011 or in 2014, and 3) the above discussed general scarcity of the species in the wider surroundings. This interpretation is consistent with the claim in Donovan (1984) that the Corn Bunting there switched from normal song to Yellowhammer imitation during the first and second year that it held its territory, and also with three cases reported in Hegelbach (1984, 1986) of Corn Buntings that sang a different dialect from the local population in their second calendar year, but changed to the local dialect in the next year. Although our case would have been stronger if we had marked our bird, our observations lend some extra weight to the proposition that Corn Buntings may still change their way of singing in their

second and third calendar years and that the rare cases of imitation that have been reported for this species result from the accidental use of another species as a template in song learning.

Exactly why this happens remains unclear. We may speculate that the absence of other male Corn Buntings and the local abundance of Yellowhammers have both played a role. Our territory mapping shows that the density of Yellowhammers around our bird was high. Early in the year, when this area was used for roosting by Yellowhammers from the surroundings, as many as 12 males could be present. Also in the case of the Pembrokeshire bird, Yellowhammers were likely common in the area (J. Hughes, pers. comm.), as they still were in the late 1980s (Donovan & Rees 1994).

Since imitation of other buntings by Corn Buntings is so rare, it may be considered as accidental and lacking any evolutionary advantage. Nevertheless, it is conceivable that the use of Yellowhammer song made it easier for our bird to defend its territory against that species. On April 26, 2012, the Corn Bunting was recorded counter-singing with a Yellowhammer, each bird apparently reacting to the other's song. Our mapping of bunting territories also suggests that our bird was moderately successful in keeping Yellowhammers out of its territory.

The Corn Bunting initially reacted to the playback of conspecific song but did not change its way of singing and on the third day no longer showed interest. This experiment may have suffered from a poor set-up. We did not play the song of other species (an experimental control) for comparison. Also, it is conceivable that the reaction would have been stronger if we had used different recordings of Corn Buntings

on each occasion (as recommended by T. Petrusková, pers. comm.) instead of reusing the same 52-s piece. It has often been observed that the reaction of birds to repeated playback of the same song decreases in time (Dong & Clayton 2009). In any case, we have not found evidence that our bird was still capable of producing normal Corn Bunting song after its (presumed) switch to the Yellowhammer song.

While studies of a single aberrant bird, like our Corn Bunting giving Yellowhammer song, cannot provide definitive answers about the origin of this sort of behaviour or about song learning in general, we hope that a detailed study may nevertheless help raise the right questions and find hypotheses.

SOUHRN

Samec strnada lučního (*Emberiza calandra*) u Buštěhradu ve středních Čechách zpíval dva roky po sobě prakticky stejně jako strnad obecný (*Emberiza citrinella*). V práci porovnáváme sonogramy jeho zpěvu s normálním zpěvem strnada lučního (obr. 1a) a strnada obecného (obr. 1b). Imitace byla dosti věrná na to, aby bez přímého pozorování ptáka vedla k mylnému určení druhu (obr. 2a, srovnej s obr. 1b). Jedinec používal tři varianty úvodní fráze podobně jako strnad obecný (obr. 2b–d). Závěrečná fráze, pokud ji strnad luční odzpíval celou, odpovídala místnímu dialektu BE podle klasifikace Hansena (1985), ale často byla zkrácena (obr. 2b–d), nebo celá vynechána, opět v souladu s normálním zpěvem strnada obecného. Imitace zpěvu „buštěhradského“ strnada lučního měla i své nedostatky. Jednalo se např. o stoupající výšku tónu v úvodní frázi (takto zpíval pták pokaždé) či o občasně tikání a vkládání zvuku „srp“ na začátek a na konec strofy (obr. 2c).

Vedle zpěvu vydával strnad luční také dlouhé série někdy pravidelně, jindy méně pravidelně se střídajících zvuků „dzip“ a „tsp“ (obr. 2f,g). Tyto hlasové projevy patří rovněž k běžnému repertoáru strnada obecného, takže strnad luční jej i v tomto případě napodoboval. Mohly by odpovídat zvuku „tze“, o kterém Diesselhorst (1950) tvrdí, že jej vydávají téměř výlučně samci strnadů obecných a který by mohl mít funkci teritoriálního hlasu. Výběr z nahrávek zpěvu a dalších zvuků „buštěhradského“ strnada lučního byl zveřejněn na stránkách *Xeno-canto* (Zavadil 2015).

Nahráli jsme také, jak strnad obecný zpíval střídavě s „buštěhradským“ strnadem lučním relativně blízko sebe. Tento strnad obecný zpíval úvodní frázi dosti podobně dvěma variantám úvodní fráze, které používal popisovaný strnad luční (obr. 3a,b). Týž strnad obecný občas zkracoval zpěv tak, že úvodní frázi vynechával (obr. 3c). V blízkosti teritoria „buštěhradského“ strnada lučního se nacházelo 7–8 teritorií strnada obecného (obr. 4). Vůči strnadům obecným projevoval strnad luční agresivní chování a často je vyháněl ze svého teritoria.

„Buštěhradský“ strnad luční na přehrávku normálního zpěvu svého druhu poprvé reagoval tím, že se přiblížil, přičemž stále zpíval jako strnad obecný s občasným tikáním and zvuky „srp“. Podobně, i když slaběji, reagoval druhého dne a o několik dní později už nereagoval vůbec. Na lokalitě, kde jsme prováděli svá pozorování, pobýval normálně zpívající strnad luční již rok předtím, než se zde objevil strnad luční s atypickým zpěvem. Na základě nepřímých důkazů by se mohlo jednat o stejného ptáka. To by mohlo nasvědčovat zjištění i jiných autorů (Donovan 1984, Hegelbach 1984, 1986), že strnad luční se může doučovat zpěv i v druhém, případně i v třetím kalendářním roce.

Velmi podobným způsobem napodoboval strnad luční strnada obecného v Pembrokešhire ve Velké Británii v roce 1978, jak ukazují dosud nepublikované sonogramy (obr. 5) na základě nahrávek Antony Pearce, které byly publikovány na CD *Bird Mimicry* (2006).

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