# CONTRIBUTIONS TO THE ETIOLOGY OF THE ROCK BUNTING (EMBERIZA CIA)

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In spite of its characteristic exterior the rock bunting (Emberiza cia) is relatively little-known to the scientists of ornithology in Hungary. Beside its rarity this seems to be due to the bird's habitat being difficult to approach and especially to its hidden way of life. In Hungary nesting by the rock bunting was demonstrated first by DANDL (1955) in the environs of Jósvafő. Since then its hatching was confirmed also at other places of the central range of mountains in Hungary (SZABÓ, 1962; ARADI, 1975; HORVÁTH, 1975; DÉNES, 1978).

In recent years rock buntings are reported from more and more places in winter but in many instances, in the period of reproduction, too. Accordingly, this interesting bird species appears to be of more frequent occurrence in Hungary than earlier supposed.

## 1. Method of investigation, area

In 1978, systematic observations were conducted by the author during the hatching season. The area under examination was the ravine of Máriaremete situated near Budapest where the birds are habitually nesting long since. In the period from April 11 to June 7, author spent 46 hours on 19 observation days in wathching through a fieldglass the behaviour of rock buntings and taking photographs. The observations were carried out in all phases of the day and lasted 2.5 hours on average. Two hatching pairs were watched in the ravine for preserve formation, nesting and general behaviour pattern. Thus, the investigations conducted on a low of individuals, between narrow space and time limits do not afford opportunity for generalizations. Nevertheless, they well characterize the conditions prevailing at the given site and time, and may present a basis for further research and for elaborating the series of observations.

Habitat of the rock buntings was a steep rocky chain of hills towering round the Ördögárok. On an about 50 metre section of the rivulet suddenly rising walls are forming a ravine. Rocky hillsides covered with straggling plants as well as leafy forests, alternate with each other. On hills to the north, forests consisting mainly of maple and oak stands are to be found. On the barren parts karst scrub forests (Orno-Cotinion) and open dolomite-rock grassland (Stipo-Festucetum pallentis) type associations are to be found in a rather divided distribution. On the whole, the vegetation is difficult to characterize due to variable ecological conditions and to the effects of crop growing.

## 2. Biotope, movements

At the author's scene of observations, rocky hillsides overgrown with scattered shrubs and adjacent forest belts were the main places of abode of the rock buntings. They were flying ontop of trees inside of the forest only when there was a larger forest area on their way on their flight over rocky areas. They never penetrated into the interior of the leafy crown but usually chose salient points as guard- and singing posts. Peaks of rocks or extant branches of trees and shrubs suited best. They preferred short-stemmed shrubs for resting and instead of the upper branches they chose extant lateral ones. They mostly gathered their food consisting of tiny insects and weed seeds on the ground. Lurking in the vegetation and rummaging about on stony slopes overgrown with grass were the most characteristic forms of movement of the rock buntings.

They proved to the birds of cautious, concealed movement. It was almost impossible to catch sight of rock buntings ambling along the stony hillside and rummaging about. It was only their calling cry repeated in short intervals that supplied information on their whereabouts. Often it took quite a long time for the author to catch sight even of one of the birds that kept answering.

Often the rock buntings kept on searching for food on the ground for a long time (0.5 to 1.5 hours). Meanwhile, progressing slowly they checked an area of about 50 to 200 $m^2$. Sometimes they climbed up on flat stones being on their way for orientation. In case of danger or by the end of the feeding phase they took flight from the ground onto the nearest shrub. As depending on circumstances they spent here shorter or longer periods. The resting or guarding, singing rock buntings were mostly motionless. The two kinds of behaviour pattern were discernible all the same by the location of the chosen branch inside the plant, the view of the terrain afforded by it as well as by the frequency of the bird's orientating movements. The watching rock bunting more frequently turned its head round, furtheron, its bearing was straighter, more stretched than that of the resting bird.

Their flight was slightly undulating. To shorter distances they were flying low, following the features of the terrain. They were often flying over the distance between the two opposite walls of the ravine.

On account of their particular habitat and way of life they came near other bird species relatively rarely. They showed indifference to the yellow hammers *(Emberiza citrinella)* and redstarts *(Phoenicurus ochruros)* feeding at 10 metres from the nest.

## 3. Cries

The cry of the rock bunting is a characteristic piping, a short "tse" sound. It resembles certain cries of the blue tit, redbreast and greenfich, with some practice, however, it can be easily distinguished. Sometimes it is a longer "tsee", "tsea" or "tseah" sound usually of sharper tonality. Short calling serves spontaneous signalling and is of importance in the birds' holding together. They produce it at equal intervals, usually every 5 (rarely 3 to 11) seconds. The longer calling calls attention of the species mates to a changed

intention of movement by the signalling bird. Certain movements (flying up or approaching of the nest) were signalled always separately. The birds informed each other that way about the appearance of changing environmental stimuli. With the aid of the signal, rock buntings pecking close to each other usually formed suspicion almost at once. The more frequently repeated variant of the short calling served similar funcion. While the pair kept answering the male in his excited state sometimes emitted quickly repeated calling-like sounds. These sounded like "tse-seesee" or "tseseeseeseesee". On similar occasion or when several birds were together a glib sound, something like "tserara" or "tserarararararara" was heard that also indicated the excited state (it was observed only with males).

The song of the male is a twitter consisting of simple short and piping sounds. It reminds of the song of the furizechat and the reed bunting. The two male rock buntings observed by the author were singing in a slightly different manner. The cry of one of them can be reproduced with the words "tse-pseepseetyoue-tse". The initial and final sounds are identical with the calling. Several slightly prolonged variants were observed by the author, too, e.g. "tse-hue-pseepseetyoue-tse-hecrecre" and "tse-hue-pseepseetyoue-tseveve". The song of the other male was longer: ,,tsha-pseetshatshahuetye-pszetsera-tse" and "tyepseelahhueue-psepsetyoue-tse-hacrecrecre-tyraty-rarrr". The songs lasted 1 to 3 seconds, as depending on their complicated character. After a short interval the signing was followed by a new verse. The break between two songs was for the shorter types on average 5 seconds (4—7), for the longer ones 7 seconds (6—8). Under conditions of calm the birds were singing on a site for 10 to 30 minutes. Author found that the intensity of singing was not influenced by the clouds but was reduced by strong wind.

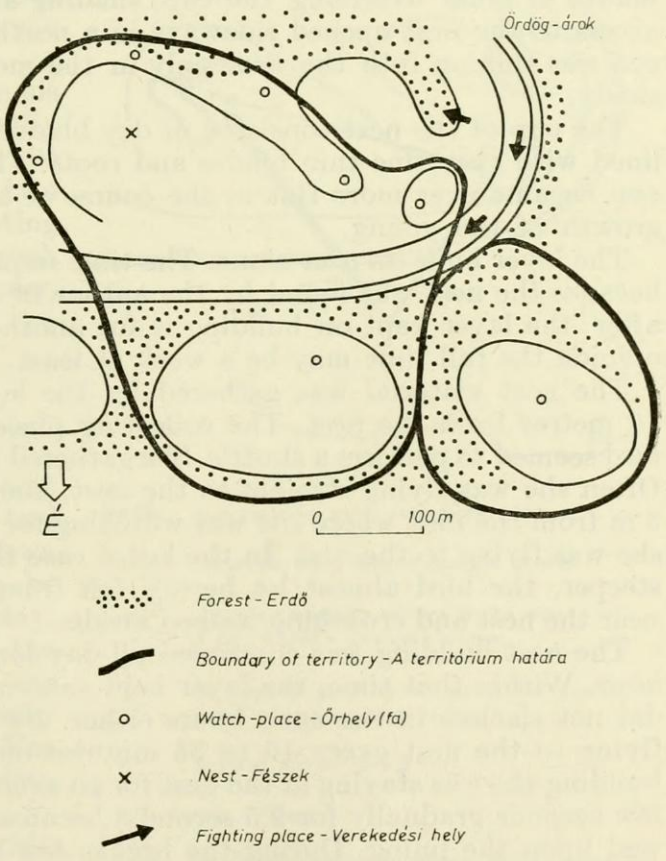


*Figure 12. Territories of the Rock Bunting pairs*
*12. ábra. A bajszossármány-párok területriumai*

## 4. Territory

In the ravine at Máriaremete two pairs of rock bunting were living in the period examined. Late in April the four birds were often seen rummagingabout (one of the pairs had a nest in preparation at that time already). Chasing about oc-

curred among them, too. The fights for acquiring territory were concentrated on the rocky biotope offering vital conditions. On the skirts of the wooded preserves it did not come to a clash. The two territories were separated for good and all by the 1st of May. From this time on, the two pairs were moving solitarily.

The territory occupied a circle of about 300 m radius, with highly variable features of the terrain. The preserves of the two pairs were located on both sides of the ravine facing each other. Rock buntings injuring the territory were always chased out by the male or layer possessing the territory. The motion areas of the pairs are shown on Figure 12.

### 5. Nest building

The author's data on the reproduction of rock buntings are based on the observation of a single nesting pair. Consequently, they may be generalized only to a limited extent.

The nesting ground was on the northern side of a barren hillside with an angle of inclination of about 35 degrees. The rocky, stony soil was overgrown with grass and scattered young shoots. The nest built on the ground was hidden under a dried bottom bunch of grass. The rich verdant upper blades of grass overhung the cup, shading and covering it. Therefore, the access to the nest opened sideways in a north-east direction. That way the sun was shining into the nest only in the morning, in the afternoon it was shady.

The cup of the nest consisted of dry blades of grass. On the inside it was lined with very fine thin blades and roots. The originally well shaped deep cup became ever more flat in the course of hatching and especially during growth of the young.

The layer built its nest alone. The time required for making it is uncertain because the nest was found by the author in a nearly finished state. Thereafter, the layer kept on building it for another three days. In the author's opinion the full time may be a week at least.

The nest material was gathered by the layer usually not far, at about 10 metres from the nest. The collecting place was changed but rerely, the bird seemed to perform a shuttle. She gathered the grass blades on the ground. Often she was flying straight to the nest, another time to the rocks at 1 to 3 m from the nest where she was watching for 5 to 30 seconds and from here she was flying to the nest. In the latter case the curve of the nest flight was steeper, the bird almost let herself fall from above. She perched straight near the nest and croaching walked inside.

The nest building was continued all day long, for 10 to 30 minutes every hour. Within that time, the layer kept carrying the material in a pace that did not slacken in the noon hours either. By the time of finishing she was flying to the nest every 10 to 33 minutes only. With the advancement of building she was staying in the nest for an ever longer time (from the initially few seconds gradually for 2.5 seconds) because greater care had to be bestowed upon the lining. During the breaks the layer was rummaging close to the nest or was flying over to the opposite hillside.

In the course of nest building the male was in a constant close connection

with his mate although he did not take part in the work. When the layer was flying near the nest in search of material the male was flying close, likewise, even if formerly they have been far from each other. Cry signals played a part in the synchronization of movements. While the layer was building the nest the male was generally rummaging on the ground at 5 to 20 metres from the nest and emitted signalling sounds at equal intervals. The layer while gathering material was answering but rarely but having flown to the nest overtook the directing role in signalling. This was manifested in emitting sounds more frequently whereupon the male responded with sharper sounds. In a remarkable way both members of the pair constantly knew of the other's whereabouts and movements. The principal ways of movement are presented on Figure 13.

The nest was finished on the 2nd May. Thereafter, four days elapsed until of the first egg. In this period the mates were staying in the environs of the nesting ground. The guarding places of the male regularly used also later on, were formed at that time. The chosen smaller trees and shrubs surrounded the environs of the nest and being on a good location provided good view of the entire hillside. His movements did not follow amymore those of the layer but by calling cries the mates continued to be in touch furtheron as well. As a rule, the male was calling systematically and the layer only answered if beside signalling the male had a connection forming intention. She probably recognized this by some finer peculiarities of the cry.

While the male was singing on his guarding place the layer usually stayed on the hillside hiding the nest. Sometimes she was flying into the finished nest and tested it sitting with her head outwards. On such occassions the male was flying closer, too.

## 6. Hatching

The first egg was laid into the nest on the 6th of May. The layer laid daily one egg in the early dawn hours. The brood of five eggs be came complete by the 10th of May. In the period of egg laying the layer spent but little time in the vicinity of the nest, she was mostly seen on the opposite hillside. The male invariably used his guarding places.

The eggs were scarlet grayish-white in colour with black spots and lines. They were placed in the

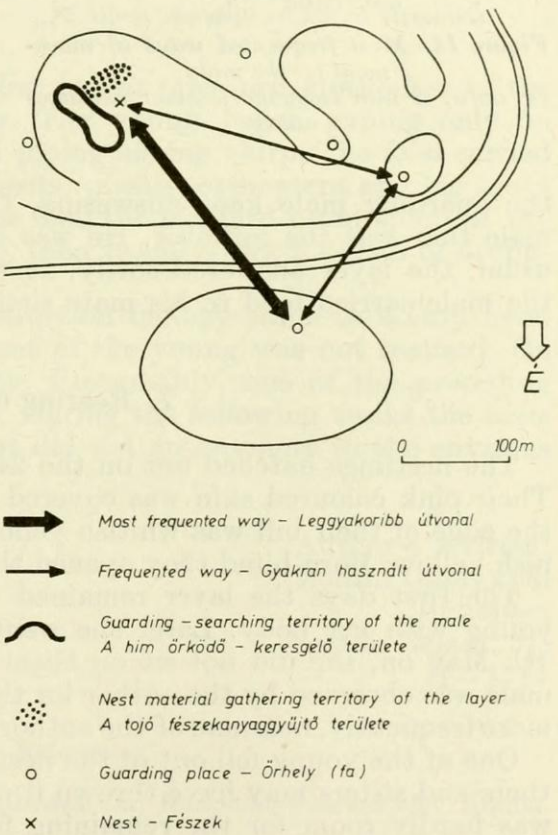


*Figure 13. Main moving places at the time of nest-building*
*13. ábra. Fő mozgási helyek a fészeképítés idején*

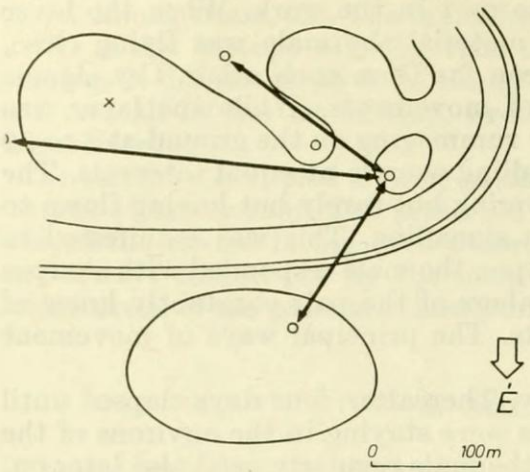


*Figure 14. Most frequented ways of movement for the male*
*14. ábra. A hím leggyakoribb mozgási útvonalai*

nest in a definite order, three in one row and two fitting into the gaps inbetween. Systematic hatching was begun after the brood has become complete. Meanwhile, all the eggs slipped to one or the other edge of the nest. Then the layer readjusted them by movements of her belly.

Hatching was performed by the layer, the male was singing during most of the day on his guarding places (Figure 14). The layer left the nest but rarely and for a short while (maximum 20 minutes). Motioned away from the nest she was first flying a few metres and waited for some seconds. Thereafter, she was flying to a rock at about 20 m distance, on further disturbance to the hillside facing the nest. When flying to the nest the layer was always calling sharply. Meanwhile the male did not sing but replied her. Only after arrival of the layer to the nest did the male continue his territory-marking song. It occurred that the layer sitting on the nest and the guarding male kept answering. On such occasions it was always the male that was the initiator. He was calling more loudly and sharply than usual, the layer answered softly. It was noticed once by the author that the male carried food to his mate sitting on the nest.

## 7. Rearing of the young

The nestlings hatched out on the 24th May after a fortnight of hatching. Their pink coloured skin was covered with about 15 mm light green down, the edge of their bill was whitish yellow, throat orange-red, feet light brownish yellow. Born blind they opened their eyes at 5 to 6 days of age.

The first days the layer remained in the nest for long warming up her young with her body. Later she went for food more frequently, from the 4th May on, she did not sit on them anymore. Thereafter, feeding by the male was observed by the author for the first time. The male kept on feeding more frequently, nearness of the author was disturbing him less than the layer.

One of the young fell out of the nest at five days of age and died. Its brothers and sisters may have thrown it out from the narrow place where there was hardly room for the remaining four young birds. By that time, they began developing pin-feathers, first on the back and wing. They hardly responded to the touching or fanning of the nest and only one or two were gaping sometimes.

According to the author's observations the parents kept carrying food every half hour, on the average. This remarkably long interval was probably due to the closeness of the author. Under fully undisturbed conditions they were certainly feeding more frequently. The male and the layer carried the food independently of one another but constantly signalled their whereabouts with a calling cry. They were never flying straight to the nest but perched first usually on a fallen tree-trunk at 15 m distance from the nest. From here they were prying about and when finding the environs of the nest quiet they were flying on the ground at 1 to 2 metres from the nest. They did the remaining way hiding in the grass. They did not approach the entrance front-wise but always sideways. For a few seconds the feeding parent remained motionless at the opening and bent in only thereafter. The young began gaping only on this effect. They emitted meanwhile a piping hissing chirp. The food carried to the nest consisted exclusively of insects, mostly orthoptera and big green caterpillars. After handing over of the food the old bird often stood at the entrance of the nest for a short while, then usually with a bunch of droppings in its beak, left flying.

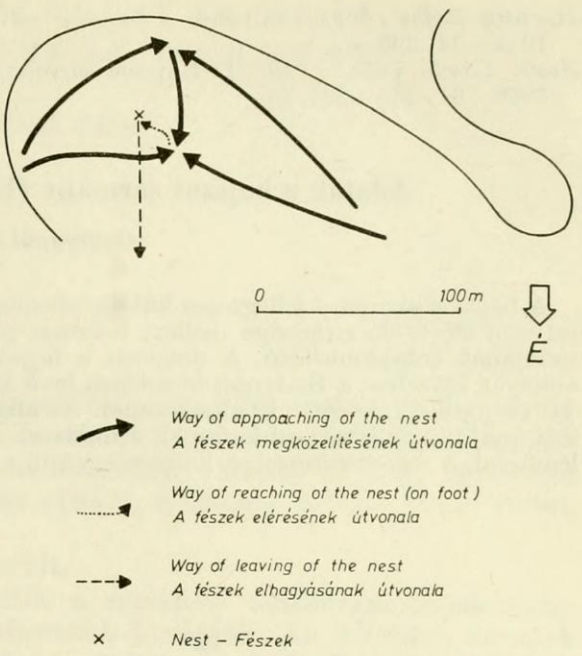


*Figure 15. Most frequented ways of the feeding parents*
*15. ábra. Az etető szülők fő útvonalai*

The author's observations on reproduction biology came to a stop here. Unfortunately, the successful flying out of the young was not realized. On June 5, author found the nest empty. Presumably, one of the preceding days it was plucked by a jay or man. During the following weeks the male was singing on his guarding places but did not go anymore to the environs of the nest.

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## Adatok a bajszos sármány (Emberiza cia) életmódjához

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A bajszos sármány jellegzetes külseje ellenére viszonylag ismeretlen a hazai madártan mívelői előtt. Ez ritkasága mellett nehezen megközelíthető élőhelyének és rejtett életmódjának tulajdonítható. A dolgozat e fajjal kapcsolatos vizsgálataimat mutatja be, amelyet 1978-ban a Budapest közelében levő Máriaremetei-szurdokban végeztem, április 11. és június 7. között, 19 alkalommal. Az angol szöveg a dolgozat módszertanát ismerteti, majd foglalkozik a biotóppal, a madarak mozgásával, hangjával, territórium-problémáival, a fészeképítéssel, a költéssel, végül a fiókák felnevelésével.