

# What subspecies of Chaffinch *Fringilla coelebs* LINNAEUS, 1758 (Passeriformes: Fringillidae) occurs in South-East Bulgaria?

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**Abstract:** Chaffinches from the south districts of Bulgaria were earlier considered not to belong to the nominate subspecies *F. c. coelebs* but to the subspecies *F. c. solomkoi*. These subspecies radically differentiate by sounding of rain-calls. The analysis of chaffinches' rain-calls from South-East Bulgaria shows that they do not indeed belong to the nominate subspecies. However, by rain-call sounding (and by morphological indexes) they do not belong to the subspecies *F. c. solomkoi* either. Their rain-calls correspond to the calls which are characteristic for another subspecies – *F. c. caucasica* inhabiting Caucasus and Asia Minor. The comparison of rain-call sonograms of chaffinches from south-eastern part of Bulgaria and birds of all three subspecies shows that the region is inhabited by the subspecies *F. c. caucasica*.

**Key words:** chaffinch, subspecies, rain-call, sonogram, Bulgaria

## Introduction

It is accepted to consider that in Bulgaria, as well as in the greater part of Europe, chaffinches of the nominate subspecies – *F. c. coelebs* occur (PATEV 1950, CRAMP, PERRINS 1994). Based on the form and dimensions of a bill, PROSTOV (1963) pointed that chaffinches breeding in the extreme south-west part of Bulgaria belong to the Crimean-Caucasian race *F. c. solomkoi*, and other territory of Bulgaria is inhabited by birds of the nominate subspecies. According to the other research of this author (PROSTOV 1964), chaffinches inhabiting extreme south-east part of Bulgaria also must be considered as *F. c. solomkoi*, and birds of the nominate subspecies occur here only in winter period. The analysis of specimens in Sofia Zoological Museum shows that in western districts of Bulgaria in autumn and winter, along with chaffinches of the nominate subspecies, birds of the subspecies *F. c. solomkoi* are rarely registered (NOSKOV *et al.* 1975).

It was before accepted to consider (BOEHME 1954, VAURIE 1959) that chaffinches of the subspecies *F. c. solomkoi* are spread in Crimea and Caucasus. But in fact *F. c. solomkoi*, well distinguished by particularly massiveness of a bill, inhabits Crimean peninsula only. Smaller subspecies *F. c. caucasica* with less bill dimensions inhabits the greater part of Caucasus. Hybrid birds of *F. c. solomkoi* and *F. c. caucasica* occur only in the extreme north-western part of Caucasus where zone of intergradation between both subspecies has the place (TSVELYKH 2003). Dimensions of *F. c. caucasica* subspecies are substantially overlapped with those of *F. c. coelebs* (CRAMP, PERRINS 1994, TSVELYKH 2003); only some males of *F. c. caucasica* having the most massive bill can be identified exactly. However, it was revealed (TSVELYKH 2003) that all these subspecies radically differentiate by sounding of a rain-call – an anxious call, which is uttered by chaffinch males mainly in a

breeding period. A rain-call of the nominate chaffinch subspecies is usually represented by rhythmic short rattle trills. In birds of *F. c. solomkoi* subspecies this call always consists of short melodious whistles which reminds by sounding a whistle call of a Wood Warbler *Phylloscopus sibilatrix* (BECHST.) (KRATZIG 1943). In chaffinches of *F. c. caucasica* subspecies these calls are represented by series of loud, high tone sounds, very similar to anxious calls of a Thrush Nightingale *Luscinia luscinia* (L.) (TSVELYKH 2003). It is worth to mention that chaffinch populations of the nominate subspecies which inhabit some regions of North-Western Europe have whistle rain-calls also. However, sounding of such calls (KORBUT 1996, SORJONEN 2001) is absolutely different: their sonograms are radically distinctive from sonograms of *F. c. solomkoi* and *F. c. caucasica* rain-calls.

All this opens an opportunity to ascertain a subspecies of chaffinches of Bulgarian south districts, by features of their vocalization.

## Material and Methods

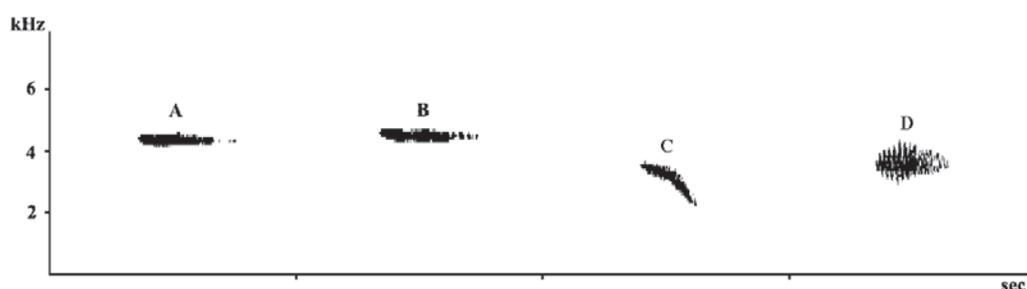
In June 2010 the author carried out observations over 212 males of chaffinches in the extreme south-east part of Bulgaria, at the wooded seashore side of Strandza Mountains (territory between villages of Ahtopol and Rezovo). Rain-calls were listened from 22 individuals. Their sounding was compared to sounding of chaffinches rain-calls listened by the author in Crimea, Caucasus, Asia Minor and Eastern Europe. Series of rain-calls from 12 individuals were recorded with a digital recorder US 550 PR Panasonic for comparative analysis. Syrinx 5.2s soft (BURT 1995-2005) was used for analyses of records.

Patterns of rain-calls of chaffinches of *F. c. solomkoi* and *F. c. caucasica* subspecies were taken from: Voices of birds of Russia (2007); a sonogram pattern of the nominate subspecies *F. c. coelebs*'s call is from my original record.

## Results and Discussion

The analysis of sounding of chaffinch rain-calls from the study region shows that birds do not vocalize by the type of the nominate subspecies: their calls are represented by whistles, but not trills. It confirms an opinion (PROSTOV 1964) that chaffinches from South-East Bulgaria do not indeed belong to the nominate subspecies. However, no one bird vocalized by *F. c. solomkoi* type. It shows that birds of this subspecies is also absent in the study region. This conclusion is confirmed by the morphological analysis of a breeding chaffinch female (a bird with a brooding patch) from the study region (environs of Sinemorets village, 22 May 2010), because belonging of a chaffinch to *F. c. solomkoi* subspecies is easily detected by the bill-size of any adult bird (TSVELYKH 2003, TSVELYKH, APPAK 2008). The height of a bill in this bird was 7.2 mm; that is far less than in smallest females of *F. c. solomkoi* subspecies – 8.1 mm (TSVELYKH, APPAK 2008). A former figure may be observed only in females of *F. c. caucasica* or *F. c. coelebs* (CRAMP, PERRINS 1994).

All birds listened in South-East Bulgaria vocalized exceptionally by the type of *F. c. caucasica*. The comparison of rain-call sonograms of chaffinches from this region and birds of subspecies *F. c. caucasica*, *F. c. solomkoi* and *F. c. coelebs* shows that sonograms of birds from South-East Bulgaria are



**Fig. 1.** Rain-call sonograms of chaffinches from South-East Bulgaria (A) and birds of subspecies *F. c. caucasica* (B), *F. c. solomkoi* (C) and *F. c. coelebs* (D).

identical to sonograms of birds of Caucasian subspecies and substantially differ from sonograms of birds of the Crimean and the nominate subspecies (Fig. 1). In addition, rain-calls of *F. c. caucasica*, as well as those of birds from South-East Bulgaria, are produced in a frequency range considerably exceeding 4 kHz level. In chaffinches of subspecies *F. c. solomkoi* and *F. c. coelebs* a frequency range is substantially lower (Fig. 1).

There are a lot of examples when different spe-

cies of animals and plants spread in Asia Minor and in Caucasus also occur in the adjacent regions of South-East Europe. E. g. the most demonstrative examples among birds are distribution of Chukar *Alectoris chukar* (J. E. GRAY) and Semi-collared Flycatcher *Ficedula semitorquata* Hom. in Europe. *F. c. caucasica* subspecies is spread not only in Caucasus, its range covers Asia Minor as well (CRAMP, PERRINS 1994). So presence of chaffinches of this subspecies in South-East Bulgaria was quite expected.

## References

- BOEHME L. B. 1954. Chaffinch. – In: Dementiev G.P., Gladkov N.A. (Eds.): Birds of Soviet Union. Moscow, Soviet Science, **5**: 286-291. (In Russian).
- BURT J. 1995-2005. Syrinx, Version 5.2s (<http://www.syrinxpc.com>).
- CRAMP S., C. M. PERRINS (Eds.). 1994. The birds of the Western Palearctic. VIII. Oxford University Press, 899 p.
- KORBUT V. V. 1996. Geographical distributing and structure of chaffinch (*Fringilla coelebs* L.) signal 'rumenie' on the north-west of Eastern Europe. – *Doklady Akademii nauk*, **343** (5): 711-714. (In Russian).
- KRATZIG H. 1943. Der Regenruf des Buchfinken auf der Krim. – *Ornithologische Monatsberichte*, **51** (3/4): 101.
- NOSKOV G. A., T. A. Rymkevich, A. A. Shibkov, D. N. Nankinov 1975. Notes about ecology of the Crimean Chaffinch (*Fringilla coelebs solomkoi* Menzb. et Suschk.). – *Vestnik Leningradskogo Universiteta. Biol. Seria*, **3** (1): 11-16. (In Russian).
- PATEV P. 1950. Birds of Bulgaria. Sofia. Bulgarian Academy of Sciences, 364 p. (In Bulgarian).
- PROSTOV A. 1963. Contribution to the study ornithofauna of Petrich (South-west Bulgaria). – *Izvestia na Zoologicheskia institut s musei*, **XIII**: 33-77. (In Bulgarian).
- PROSTOV A. 1964. Study of ornithofauna in Burgas district. – *Izvestia na Zoologicheskia institut s musei*, **XV**: 5-68. (In Bulgarian).
- SORJONEN J. 2001. Long-term constancy of two rain-call dialects of the Chaffinch *Fringilla coelebs* in Finnish and Russian Karelia: a consequence of site-fidelity? – *Ornis Fennica*, **78**: 73-82.
- TSVELYKH A. N. 2003. Comparative analysis and distribution of the Chaffinch *Fringilla coelebs* (Aves, Fringillidae) subspecies from the Crimea, Caucasus and Transcaspiian region. – *Zoologicheskij zhurnal*, **82** (10): 1250-1257. (In Russian).
- Tsvelykh A. N., B. A. Appak 2008. Seasonal changes of populations and dynamics of the chaffinch *Fringilla coelebs* (Fringillidae) number in Mountain Crimea. – *Zoologicheskij zhurnal*, **87** (9): 1100-1105. (In Russian).
- VAURIE C. 1959. The birds of the Palearctic fauna. Order Passeriformes. London, Heinemann, 762 p.
- Voices of birds of the Russia. 2007. Voice guide. 1: European Russia, Ural and Western Siberia. Ekaterinburg: Ural University Press. (In Russian).

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