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**REDSTART BIRD (PASSERIFORMES, MUSCICAPIDAE)
WITH NON-TYPICAL PLUMAGE — INTERSPECIFIC HYBRID
OR EASTERN SUBSPECIES IN FAUNA OF UKRAINE**

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Redstart Bird (Passeriformes, Muscicapidae) with Non-typical Plumage — Interspecific Hybrid or Eastern Subspecies in Fauna of Ukraine. Fesenko, H. V., Shybanov, S. Yu. — A redstart male in plumage resembling that of the Common Redstart, *Phoenicurus phoenicurus* (Linnaeus, 1758), but with black throat extending downwards the central part of the breast was recorded in Dnipro City (Central Prydniprovya, i. e. Central Ukraine) in April, 2014. Song, calls and behavior of the male were typical of the Black Redstart, *Phoenicurus ochruros* (Gmelin 1774). The male was breeding with the Black Redstart female and successfully reared two nestlings. Both adults were captured and examined. The male with unusual colors of plumage exhibited strong resemblance to phenotype of males from the subspecies *phoenicuroides* of Black Redstart. Examination of specimens belonging to the subspecies in collection of Zoological Museum (NMHH of NAS of Ukraine) revealed that according to wingtip formula, the non-typical male is also similar to those of that race, in particular ones from Tyva (situated on border between the Upper Yenisei region and Mongolia). However, some plumage characters (signs of white color on emargination of outer web on some tertials and secondaries as trait of the subspecies *gibraltariensis* of the Black Redstart, as well as whitish belly and paler rufous color on lower breast and underparts as peculiarities of the Common Redstart) seem to indicate hybrid origin of the recorded male. The redstart male exhibiting both traits of the Common Redstart and Black Redstart was found for the first time in all period of expansion of *gibraltariensis* subspecies from west border of Ukraine eastwards and southwards.

Key words: Black Redstart, Common Redstart, hybridization, Ukraine.

Introduction

Exact identification of birds both up to species and subspecies is especially necessary in deep faunistic study, including analysis of spatial connections of regional fauna with other areas. Forming of these connections is very intensive when vast territory is rapidly occupied by new species such as the Black Redstart, *Phoenicurus ochruros* (Gmelin, 1774).

Particularly, urban communities of this mountainous species distributed across plain part of Poland in a hundred years appeared from west before middle of XIX century. It became numerous and breeding in the first third of XX century in Lviv (Ukraine) and nearby districts, as well as in the presently Ivano-Frankivsk Region (Dunajewski, 1934). In the same time Black Redstart was observed nesting in buildings, as part of fauna of Zakarpattia (Hrabar, 1997). In Kyiv the first breeding of the species was recorded in 1921 at Triokhsviatytska st. (Scharlemann, 1923). The bird appeared to be more numerous in the city after Second World War when its expansion eastwards became obvious (Voinstvensky, 1950). Later the species distributed towards central and southern regions of the country. According to published data, in the early 1990s the species was found to be breeding in Dnipro and Donetsk regions, for instance in Donetsk city in 1993 (Bulakhov, Hubkin, 1996; Taranenko et al., 1998). However, we observed Black Redstart male at its breeding site in Dnipro City in April, 1981 at location of Nyzhniodniprovsky pipe plant and in May of the year its nest was found on girder of bridge crane. In early XXI century Black Redstart's breeding area cover all of Ukraine, including the Crimea (Tsvelykh, Beskaravainy, 2007).

The western subspecies *gibraltariensis* of Black Redstart is distributed in urban habitat in most of Europe including Ukraine (Cramp, 1988; Dickinson, 2003). Burchak-Abramovych and Shepe (1937) concluded that the birds of the Black Redstart that began breeding in Ukraine, belonged to this subspecies. These investigators also reported that male of the nominative subspecies *ochruros* of the Black Redstart was recorded in Ukrainian south in Askania-Nova in April 7, 1929. The nominative race ranges over most of Turkey, Caucasus region and northern Iran (Stepanian, 1990).

There are five to seven subspecies of the Black Redstart (Cramp, 1988; Dickinson, 2003; commons.wikimedia.org/...; www.scientificlib.com/...; www.hbw.com/...). Apart from two races mentioned above, other subspecies are not recorded in Ukraine. Male hybrids between the Black Redstart and Common Redstart, *Phoenicurus phoenicurus*, sometimes strongly resemble some of the Asian Black Redstart subspecies. Their F1-hybrids and back-crosses are fertile and capable of producing viable and fertile progeny (Grosch, 2004; Petersson et al., 2014). For instance in Sweden the first cases of hybridization between these two species were reported in the later 1950s, and the first confirmed redstart hybrid safely determined was spotted in the later 1980s (Petersson et al., 2014). Recording non-typical redstart forms in the Ukrainian fauna can be difficult due to described peculiarities in relationship of the Common Redstart as aborigine species and the Black Redstart as invading.

Method approaches

During registration of spring arrival of birds a redstart male exhibited a plumage deviant from those of both redstart species of Ukraine. Observation was carried out to investigate the bird's pairing, nesting and result of breeding up to offspring residing within parents' site.

Both adults were captured and a few photos of them were taken. Particularly, shape of wingtip of both birds was photographed documenting morphological traits important for species identification as previously described by Ivanov and Stegmann (1978).

Eleven specimens of Black Redstarts were examined in collection of the Zoological Museum at National Museum of Natural History (National Academy of Sciences of Ukraine). Of these, six males are in plumage resembling that of the observed non-typical one. Others are females collected in the same areas as male specimens. Two of collected specimens are from Tyva (Tuva), one from Uzbekystan, another five from Tadzhykystan, and three from Kyrgyzstan. Eight of them were collected in breeding period, i. e. in the mid June. Female from Tyva and a male from Tadzhykystan were collected on autumn migration in September and specimen from Uzbekystan was obtained during spring passage in March. Special attention was paid to wingtip formula of examined specimens.

Results of investigation

Redstart male exhibiting plumage characters notably resembling those of the nominative subspecies *phoenicurus* of the Common Redstart (distributed over most of Ukraine, except the Crimea (Fesenko, Bokotei, 2002)) was found in mid April, 2014 within housing area Ihren in Dnipro city (Central Prydniprovya, i. e. Central Ukraine). Apart from dark grey back and crown, as well as rufous color of underparts, white bar merging into grey color of crown was visible on forehead behind black rim along base of upper mandible. White wing-patch characteristic of the subspecies *samamisticus* of the Common Redstart, distributed in the Crimea and Caucasus region (Stepanian, 1990; Jonsson, 1994; Mullarney et al., 2001), was absent. The observed male was drawing attention due to black color not only covering cheeks and throat like in males of the Common Redstart but extending downwards ending in bow across the central part of the breast (Plate I: fig. 1, 3rd page of the cover). The record was unusual also in that migration of the Common Redstart was not registered at the location in the last fifteen years as well as breeding of the species in the last fifty years.

The recorded male was observed at the location for two more weeks but its song was not heard. The bird was captured with mist net. Examination showed slight black suffusion on dark grey mantle and light rufous color of under wing-coverts. During next two weeks the individual was kept in cage where it did not vocalize.

After releasing the tricky male stayed in the same site and nearly at once issued vocals. Song was same as that of a Black Redstart consisting of a few whistles followed by a peculiar crackling sound. The bird sang at perches, usually chosen by Black Redstart males, particularly chimney, aerial wire, ventilation pipe. The contact calls were similar to those of that species also.

The male soon paired with a Black Redstart female that likewise was captured and examined. The birds nested under the roof ridge of one of the buildings. Two fledglings indistinguishable from those of a Black Redstart fled out of the nest in July 9, 2014. Family group was observed in nearby populated areas for some time.

Possibility of belonging to a certain subspecies

Since the male exhibited black color on the upper part of breast, it does not belong to the subspecies of the Common Redstart mentioned above. Moreover, the bird is not related to

some subspecies of the Black Redstart, in particular to *gibraltariensis* that breeds in Ukraine and *aterrimus* distributed across the south of the Pyrenees to North Africa (Cramp, 1988). Males of the subspecies exhibit rufous color only at upper tail-coverts, vent and tail (Stepanian, 1990; Jonsson, 1994; Mullarney et al., 2001). Many taxonomists have doubts distinguishing these subspecies and others include the latter in the former (Cramp, 1988; www.scientificlib.com/...; www.hbw.com/...). In our case the nominative subspecies *ochruros* distributed over most of Turkey, Caucasus region and northern Iran must also be excluded as it resembles two previous subspecies though it has various tinges of rufous color extend on belly, under wing-coverts and part of rump (Stepanian, 1990; Mullarney et al., 2001).

Due to black and rufous colors of the breast and underparts, the observed male is similar to birds belonging to other subspecies of Black Redstart namely *semirufus* (distributed across the eastern Mediterranean region from Anatolia of Turkey eastwards to Syria and southwards to Egypt), *rufiventris* (distributed from Turkmenistan through Pamir eastwards to the Himalayas), *phoenicuroides* (distributed from Central Asia eastwards to Tyva and Mongolia), *xerophilus* (distributed in China) (Stepanian, 1990; Cramp, 1988; Jonsson, 1994; Mullarney et al., 2001). The subspecies *xerophilus* is sometimes considered to be a clinal race between *phoenicuroides* and *rufiventris* or part of the latter (www.scientificlib.com/...; www.hbw.com/...).

Breeding area of the subspecies *semirufus* is located nearest to territory of Ukraine. However, males of the race exhibit pale grey bar behind black rim on forehead while the bird from Central Prydnoprovia displayed the bar partly in white color. The observed male would be belonging to the subspecies *phoenicuroides* of Black Redstart owing to white color on forehead and black suffusion on dark grey mantle that are traits of the race (Stepanian, 1990). The subspecies *rufiventris* is similar to *semirufus* in male plumage but the former is larger, and males of *rufiventris* exhibit dark black color on back (www.scientificlib.com/...; www.hbw.com/...).

In northwestern Europe during autumn of 2011 there was an influx of Black Redstarts with plumages like those of a few subspecies distributed in Asia (Petersson et al., 2014). Analysis of mitochondrial DNA from two birds captured in Sweden and Great Britain, carried out by Lagerqvist (2013, cited by Petersson et al., 2014), revealed strong resemblance to genetic material from Black Redstarts collected near the border between Russia and Mongolia (where Tyva is situated), i. e. in range of the subspecies *phoenicuroides*. However, mitochondrial DNA unlike nuclear DNA is inherited from females only and hybridization on male line between the two redstart species is not completely impossible.

It is noted that at our studied location in autumn of 2011 there was an influx of Black Redstarts in comparison with previous and next years. All migrating and local birds were indistinguishable by phenotype from the subspecies *gibraltariensis*.

The popular study guide to birds of Northern Eurasia claims that one of morphological traits used to discriminate between the two redstart species is wingtip formula (Ivanov, Stegmann, 1978). Wingtip of the Black Redstart is formed of primaries 3–5 while that of Common Redstart consists of primaries 3–4. Thus wing of the former is rounder than that of the latter, as wing is more pointed when inner primaries of tip are shorter (Stegmann, 1961). Wing of the Common Redstart is distinguished by primary 5 shorter than the wing tip. Among taxonomically closely related forms, more pointed wing is characteristic of the race migrating on longer distance (Potapov, 1967; Tsvelykh, 1983). According to wingtip formula and in reality, Common Redstart migrates on long distance while Black Redstart covers short distance, at least the birds breeding in Ukraine. Winter areas of the subspecies *gibraltariensis* of Black Redstart are situated in southern Europe and Northern Africa and those of a Common Redstart are in Tropical Africa north of equator (Cramp, 1988).

Examination of the female that paired with the strange male showed that its wingtip formula was typical of Black Redstarts, consisting of primaries 3–5. Flight feathers of the male were abraded but tip could be restored on its right wing which was formed of the two primaries characterizing Common Redstarts. Unfortunately, examination of the male's sixth primary's emargination of outer web could not be carried out. This trait is important in identification of redstart species (Voinstvensky, Kistiakivsky, 1962).

Since investigation indicated the possibility that observed male belonged to the subspecies *phoenicuroides* of Black Redstart and migration on long distance between breeding and wintering areas of the subspecies could have formed a comparatively more pointed wing, specimens of this subspecies were examined in museum collection. Birds of this subspecies, in particular from the Upper Yenisei region including territory of Tyva, migrate for the longest distance as they winter in northeastern Africa, as well as in southwestern, southern and central Asia (Dickinson, 2003; www.hbw.com/...). In comparison, individuals of the subspecies *semirufus* are sedentary and those of the subspecies *rufiventris* winter in southwestern and southern Asia, i. e. migration distance of the latter is shorter than that of the subspecies *phoenicuroides*.

Taking into account description of breeding areas of the Black Redstart subspecies (Stepanian, 1990), it can be supposed that museum specimens from Uzbekystan, Tadzhykystan and Kyrgyzstan were collected in territories of contact of the subspecies *phoenicuroides* and *rufiventris*. One specimen's wingtip was made up of primaries 3–5 on both wings. The same formula was revealed on left wing of one other and shape of right wing could not be determined due to a broken feather. Tip was formed of primaries 4–5 on both wings of yet another bird. Asymmetry was found in another specimen, whose right wingtip was made up of primaries 3–4 and left wingtip was formed of primaries 4–5. One bird had wingtips consisting of primary 4. Two others had tips formed of primaries 3–4 on both wings. Lastly, wingtips of two other were also made up of primaries 3–4 on intact left wings only (their right wings were damaged).

Wingtip formula of male and female from Tyva was of interest because the specimens were without doubt collected in breeding area of the subspecies *phoenicuroides*. Their wingtips were formed of primaries 3–4 but in the male specimen only right wing was intact. Thus it can be supposed that difference in wingtip formula between the two redstart species is not real in the subspecies *phoenicuroides* of Black Redstart. Pointed wing of the male observed in Central Prydniprovia indicated very likely its belonging to the subspecies *phoenicuroides*. According to Potapov (1967), wing of subspecies migrating on essentially longer distance is more pointed in comparison with that of others. This is shown in specimens from Tyva.

Birds of the subspecies *phoenicuroides* are able to migrate northeast from winter areas to breeding range but deviation is possible during their departure from northeastern Africa. A deviated to north migrant can arrive at the meridian that coincides with the Dnipro river valley. For instance, a bird of Menetries's Warbler (*Sylvia mystacea*) was captured on Tarkhankut peninsula situated near Prydniprovia across sea gulf (Popenko et al., 2006). The warbler breeds in area from Caucasus region eastwards to Central Asia and can winter in northeastern Africa (Cramp, 1988), i. e. breeding and winter ranges of the warbler and the subspecies *phoenicuroides* of Black Redstart overlap to some degree.

Possibility of belonging to hybrid forms

Though it is feasible that subspecies *phoenicuroides* occurs in Ukraine it does not exclude possible recording of hybrids between the two redstart species. For more than 50 years, our colleagues from Western Europe documented hybridization between the species when a tricky bird was initially reported as male of the subspecies *phoenicuroides* but a few years later it was re-examined and assessed a hybrid (Pettersson et al., 2014). In addition to color plumage traits of non-typical individuals attention was paid to determination of possible morphological differences both between the Common and Black Redstarts and their hybrids.

Ratio of the exact distances between primaries 5/6 and 6/7 was used to determine the species and subspecies differences (Svensson, 1992). The relative distances in the nominative form *phoenicurus* of Common Redstart vary from 1 : 0.41–1 : 1.17, not overlapping with those of some subspecies of Black Redstart, particularly ratio of *gibraltariensis* (1 : 2.0–1 : 2.5) and *phoenicuroides* (1 : 1.57–1 : 3.0) (Pettersson et al., 2014). In hybrid *Ph. phoenicurus* x *Ph. ochruros* the relative distances vary from 1 : 0.94–1 : 2.14 overlapping with those

of both Common Redstart and the two subspecies of Black Redstart. Thus, in Europe the hybrids were not always identified by the relative distances.

Foreign researchers point out some differences of wing length between the redstart subspecies, namely in the nominative form *phoenicurus* of Common Redstart from 77–84 mm, in the subspecies *gibraltariensis* of Black Redstart from 85–91 mm, in the subspecies *phoenicuroides* from 80–85 mm, in hybrid *Ph. phoenicurus* x *Ph. ochruros* from 80–85 mm (Petersson et al., 2014). The data on wing length of males can be defined more precisely, i. e. in *Ph. phoenicurus* from 76–85 mm, *Ph. ochruros* from 79–90 mm (Vinogradova et al., 1978). Wing length of the male recorded in Central Prydniprovya is 80 mm corresponding to both those of the subspecies *phoenicuroides* of Black Redstart and Redstart hybrids.

Colleagues from Sweden assessed one male that exhibited non-typical plumage a hybrid initially taking into account three color traits such as remaining white color on outer web of innermost tertial, paler rufous color on lower breast and underparts and scattered white feathers on belly, rump and under tail-coverts, as well as two morphological characters namely absence of emargination of outer web on the sixth primary and wingtip made up of primaries 3–5. The conclusion was confirmed with the relative distances of wingtip formula 1 : 1 (Petersson et al., 2014). This male hybrid bred at the same location of south-eastern Sweden for 2009–2012 and was aged at least five years. Also, at least ten records of hybrid males have been reported from the country since mid 1990s.

Unfortunately, absence or existence of emargination of outer web on the sixth primary could not be used to identify our male. Moreover wingtip formula is not sufficient to distinguish between the two redstart species as explained above.

The atypical male from Central Prydniprovya exhibited pale rufous color on lower breast and underparts, and whitish belly usual for Common Redstarts (Plate I: fig. 2, 3rd page of the cover). Deep rufous underparts characteristic of the subspecies *phoenicuroides* of Black Redstart (Stepanian, 1990) are not seen in the observed male. Color of underparts of the redstart specimens of this subspecies examined in museum collection was rather deep rufous.

Also, signs of white color can be simultaneously seen on wing feathers of our male, namely on emargination of outer web on some tertials and secondaries which is peculiar of the subspecies *gibraltariensis* of Black Redstart (Plate I: fig. 3, 3rd page of the cover).

Recorded atypical male bred in populated area which also seems to indicate its relation to the subspecies *gibraltariensis* that shows clear tendency to urbanized biotopes unlike eastern subspecies of Black Redstart in Asia. Birds of the subspecies *phoenicuroides* breed only in natural habitats such as mountains, among rocky areas with shrubbery (Gladkov, 1954).

According to data of Swedish colleagues (Petersson et al., 2014), male hybrids sing like Black Redstarts, similar to what we observed in Central Prydniprovya, or like a mixture between the two species. Male hybrids singing as Black Redstarts are able to utter the contact calls resembling those of a Common Redstart and have been enticed by those of both species. Due to these vocal traits, song and contact calls of male hybrids are not sufficient for identification of their taxonomic status.

Conclusion

Since beginning of enlarging Black Redstart range from western border of Ukraine to the east and south, a male bird is seen for the first time exhibiting traits of the eastern subspecies of Black Redstart, but some of the peculiarities are also found in Common Redstart. It is not impossible to assume that the recorded male is a hybrid between the two redstart species. However, color plumage traits alone are not sufficient to include with all confidence non-typical individuals either in group of hybrids or any subspecies of Redstarts. Registration of the tricky male is seemingly connected with appearance of similar birds in Western Europe several years before the observation in Central Prydniprovya.

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Fig. 1. White color on forehead, pale rufous color of under wing-coverts and extend of black on upper part of the breast, details more or less intermediate between the two redstart species.



Fig. 2. Whitish belly and paler rufous color on lower breast and underparts as characters of Common Redstarts.



Fig. 3. Signs of white color on emargination of outer web on some tertials and secondaries as trait of the subspecies *gibraltariensis* of Black Redstart.