



The Northern Shrike *Lanius borealis sibiricus* Bogdanov, 1881 (Aves: Laniidae) in Ukraine: a taxonomic assessment¹

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Abstract. The taxonomy of Grey Shrikes (*Lanius excubitor* supraspecific complex) from the territory of Ukraine is discussed. The birds, known from Ukraine as rare autumnal and winter visitors, are identified as the Siberian Northern Shrikes (*Lanius borealis sibiricus*). Diagnostic characters distinguishing *Lanius borealis sibiricus* from *Lanius excubitor* are described on the basis of a study of museum specimens.

Key words. Systematics, taxonomy, Laniidae, *Lanius borealis sibiricus*, Northern Grey Shrike, Ukraine.

INTRODUCTION

The superspecies complex of large grey shrikes (*Lanius excubitor* and allied forms) is a rather heterogeneous group comprising various monotypic and polytypic species, as well as number of forms, the taxonomic status of which is under discussion (Bogdanov 1881, Portenko 1954, Panov 2008, Poelstra 2010). Many records of color forms are available for number of species across North and East Europe. These forms are considered by authors either as well-defined subspecies, or as signs of appearance of seasonal migrants, or even as color polymorphism within local breeding populations of birds. This paper attempts explaining the existence of rather distinguishable color variations of the Grey Shrikes in Ukraine in view of modern ideas about the morphology and phylogeography of this species complex.

Studies of the mitochondrial gene sequences demonstrated that the Grey Shrikes inhabiting Northern Eurasia belong (Fig. 1) to two major, phylogenetically distant complexes (Klassert et al. 2008, Olsson et al. 2010, Poelstra 2010, Brandsma 2014). One of them comprises the European population of the nominotypical subspecies (*excubitor*), the forest-steppe subspecies *leucopterus*, Asian desert forms *lahtora*, *pallidirostris*, *aucheri* and *buryi*, the Socotra Grey Shrike *L. uncinatus*, African forms *elegans*,

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leucopygos and *algeriensis* and the form *koenigi* from the Canary Islands. The second complex includes all other Asian and North American subspecies of the Grey Shrike, the Iberian dark-colored form *meridionalis*, the Chinese Grey Shrike *L. sphenocercus*, the Loggerhead Shrike *L. ludovicianus* and the Somali Fiscal Shrike *L. somalicus*. On the basis of clustering within the two complexes, several groups previously classified as forms of *L. excubitor* were re-considered as separate species (Fig. 1). In particular, the majority of this group being common in northern Eurasia should be subdivided into two polytypical species: *L. excubitor* Linnaeus, 1758 (inhabiting most of Europe, the Trans-Urals, as well as forest-steppe and steppe zones of the north of Western Siberia) and *L. borealis*. The latter includes the Eurasian subspecies *L. b. sibiricus* Bogdanov, 1881, *L. b. mollis* Eversmann, 1853, *L. b. funereus* Menzbir, 1894, *L. b. bianchii* E. Hartert, 1907, and the North American forms *L. b. borealis* Vieillot, 1808 and *L. b. invictus* Grinnell, 1900.

All forms of Northern Grey Shrike *Lanius borealis* Vieillot, 1808 share a number of common characters and are morphologically reliably different from the vast majority of the representatives of most other groups of the genus *Lanius* Linnaeus, 1758. Among the well-known characters of this group are the extent of brown and ocher colors on contour feathers in autumn plumage, well-marked transverse striations on the underside of the body, the presence of the only one white “patch” at the base of primaries, and relatively common black coloration on the bases of the inner vane of the outermost tail feather. The combination of these and other, less visible characters allows identifying precisely enough each individual specimens of this species (Tab. 1). However, the identification of individuals Northern Grey Shrike *Lanius borealis* occurring in Europe is somewhat problematic due to extremely wide plumage color polymorphism of *L. excubitor excubitor*. European populations of this species (Klassert et al. 2008, Olsson et al. 2010) are highly polymorphic and represent various color variants. For example, the European Grey Shrikes include very pale specimens of the phenotype “*homeyeri*” (previously considered as a separate subspecies), very dark forms, almost similar to *L. b. sibiricus*, as well as a great number of transition forms between these two. One of the pale-colored transient phenotypes has been described from the territory of Ukraine as a separate subspecies *L. excubitor stepensis* Gavrilenko, 1928 (Tajkova 2012).

MATERIAL AND METHODS

This work is based on the collections of the Zoological Museum of the National Museum of Natural History National Ukrainian Academy of Sciences, Kyiv, Ukraine (NMNH), V.N. Karazin Museum of Natural History, Kharkiv National University, Kharkiv, Ukraine (MNKHNU), Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (ZISP), Zoological Museum of M.V. Lomonosov State University, Moscow, Russia (ZMSU), K.A. Timirâzev State Biology Museum, Moscow, Russia (SBMT), as well as the Zoological Museum of Kirov city (KGZM). Only museum skins of adults and first-year birds which completed postjuvenile molting, of known sex, were used for comparisons. Overall, 515 collection specimens were studied, including 58 specimens of *L. b. sibiricus*,

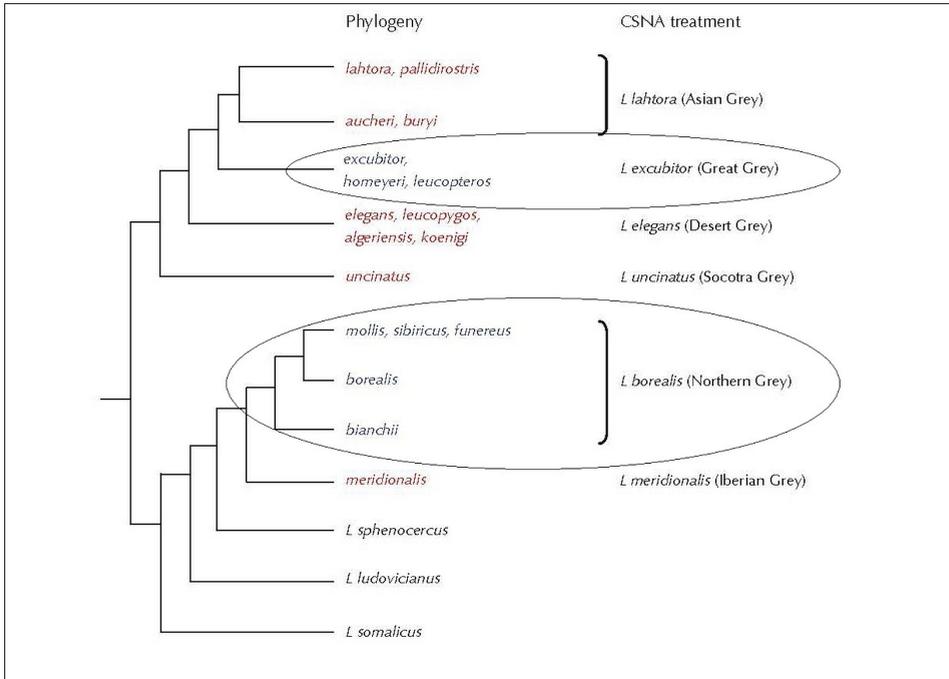


Fig.1 Formalized scheme of phylogenetic relationships between the forms of grey shrikes (*Lanius excubitor sensu lato*) and related species (from Olsson et al. 2010, Poelstra 2010). Groups of forms deserving species status are circled: 1 – *L. excubitor*, 2 – *L. borealis*.

282 specimens of *L. excubitor* from Europe, as well as 69 specimens of *L. e. leucopteros* from south-western Siberia and Kazakhstan. Color of fresh (autumn-winter) plumages was studied in 37 specimens of *L. b. sibiricus* and 198 specimens of *L. excubitor*. Also, the comparative collections of stuffed bird wings stored in ZMSU and KGZM, were used.

Seven specimens of *L. b. sibiricus* collected in the territory of Ukraine in 1911-1941 were found in the collections of NMNH, MNKHNU, ZISP, and SBMT. 13 dimensional characters were studied in all specimens (Tab. 2.1, 2.2), including wing length (measured without flattening it), wing width (the distance from the carpal bend to the tip of first secondaries (S1)), length of the first primaries (from carpal bend to the tip of the feather), total tail length and total length of the first tail feather (measured from the base of the central tail feather), bill length (measured from the rear edge of the rhamphotheca ridge), bill length (measured from the anterior margin of nostrils), bill depth and width (measured near the anterior margin of the nostrils), tarsus length, length of hind toe and its claw, width of the central tail feather (in its middle part), maximum length of the white patch on the primaries (from carpal bend and to the tips of greater primary coverts). In all specimens, relative arrangement of vertices primaries P3, P4 and P5 (counted from the distal edge of the carpus) was estimated (Tab. 3). The terminology of plumage coloration and morphometry follows Koblik & Mosalov (2006).

Tab. 1. Morphological characteristics of three grey shrikes forms (*Lanius borealis sibiricus*, *Lanius excubitor excubitor* and *Lanius excubitor leucopterus*).

Feature	<i>L. borealis sibiricus</i>	<i>L. excubitor excubitor</i>			<i>L. excubitor leucopterus</i>
		" <i>melanopterus</i> ", " <i>europaeus</i> "	" <i>excubitor</i> "	" <i>homoyeri</i> ", " <i>stepensis</i> "	
n	57	56	199	26	70
General color of the back	Brownish-grey, in fresh plumage with well-developed brownish ocher plaque on the tips of feathers	Dark grey or grey, generally without a brownish ocher plaque	Dark grey or grey, always without a brownish ocher plaque	Pale grey	Pale grey
Coloration of the pale background and the presence of a pattern at the ventral side	With a weak ocher-brown tint, a notable transverse striation is always present	Ash-grey with a weak transverse striation	Ash-grey with or without a weak transverse striation	Ash-grey or white, usually without a pattern	White, without a pattern
Coloration of scapulars	Brownish-grey, with weakly paler tips (if compared with the coloration of the back); with ash-grey tips in older birds	With ash-grey tips and grey bases, or entirely white	White with grey bases or entirely white	White	White
Maximum length of the white "patch" on the primaries (mm); range (M±m)	53.4-69.5 (61.9±0.40)	57.9-68.9 (62.9±0.31)	48.4-79.6 (66.9±0.25)	68.8-76.9 (72.9±0.51)	68.3-86.7 (76.9±0.48)
Maximum length of the white "patch" on the secondaries (mm); range (M±m)	—	—	40.9-70.6 (53.9±0.46)	51.8-70.8 (62.1±0.91)	56.1-79.3 (68.5±0.51)
Pigmentation of tail feathers	The black field on the first tail feather is always well traceable and occupies up to 1/2 of the entire feather's area	The black field on the first tail feather is always well traceable and occupies up to 1/3 of the entire feather's area	The black field may be traceable on the first tail feather, or present from the second pair of the outer tail feathers	The black field is present starting from the second or third pair of tail feathers	The black field appears at the fourth pair of tail feathers, the third pair is bearing usually a small dark spot

The species identity of the specimens collected in Ukraine was confirmed by discriminant analysis. The Mahalanobis distance (between centroids) was used as a measure of similarity (Türin et al. 2003).

All measurements were made by a digital caliper. Statistical data were processed using the software packages MS Excel 2000 and Statistica 7.0 by StatSoft, inc.

RESULTS AND DISCUSSION

Characteristics of the Northern Grey Shrike

The extreme confusion of the Grey Shrike nomenclature caused certain disagreement between the usage of the shrikes' names in the past and now. The Northern Grey Shrike was referred to as *L. excubitor major* Pallas, 1811 in old papers dealing with North Eurasian fauna as a whole (Bogdanov 1881), and with certain local faunas of Eastern Europe (Menzbir 1881-1883, Lorenz 1894, Ruzskij 1893, Vorob'ev 1925, Gavrilenko 1928, 1929, Voroncov 1935, 1967). In most cases, this form was reported as a rare autumnal migrant and, occasionally, a wintering species. The name "*Lanius major* Pallas, 1811" used for the shrikes in northern Siberia is preoccupied by *Lanius major* Gmelin, 1788, which is a junior synonym of the widespread European *L. excubitor* Linnaeus, 1758. Thus, following the Principle of Priority (ICZN 1999), the valid name for this form is *L. borealis sibiricus* Bogdanov, 1881 (with junior synonyms *L. borealis asiaticus* Bogdanov, 1881 and *Lanius seebohmi* Gadow, 1883).

As already mentioned above, all European populations of Grey Shrikes (excluding obviously distantly related South-West European *L. meridionalis* Temminck, 1820) belong to a well-defined, but polymorphic in color phylogenetic group (Dement'ev 1937, Portenko 1939, 1954, Salomonsen 1948-1949, Ptušenko & Inozemcev 1968, Sotnikov 2006, Panov 2008). The magnitude of phenotypic variability was so great within this group, so that some authors (Bogdanov 1881, Gavrilenko 1928, 1929, Dement'ev 1954) proposed to subdivide the European population into up to three subspecies, comprising two extreme and one intermediate color variants (Tab. 1). The most dark-colored birds with one "patch" on the wing were called *L. melanopterus* Brehm, 1860, *L. rapax* Brehm, 1854 and *L. borealis europaeus* Bogdanov, 1881, whereas the palest shrikes with two comparatively large "patches" on wing were referred to as *L. homeyeri* Cabanis, 1873 and *L. excubitor stepensis* Gavrilenko, 1928. All other transitory color forms have been included in the nominotypic subspecies.

A survey of the collections of *Lanius excubitor* and *Lanius borealis* in ZISP, ZMSU, NMNH, MNKHNU, SBMT has not revealed any geographical affiliation of the pale and dark color forms in Europe as a whole and in Ukraine in particular. The northern populations are as polymorphic as southern ones and no geographic forms can be recognized. However, the forms occurring in south-western Siberia and in the adjacent regions of Kazakhstan, i.e. in the region inhabited by the forest-steppe subspecies *L. excubitor leucopterus* Severcov, 1875 (= *L. przewalskii* Bogdanov, 1881) are monomorphic (Tab. 1). These shrikes are the most pale and have maximally developed white "patches" on the wing (Fig. 2-3). The name "*homeyeri*" cannot be applied to these populations (Vaurie

Tab. 2.1. Size of the adult males of the three discussed shrike forms (*Lanius borealis sibiricus*, *Lanius excubitor excubitor* and *Lanius excubitor leucopterus*). All measurements are in mm.

	<i>Lanius borealis sibiricus</i>			<i>Lanius excubitor excubitor</i>			<i>Lanius excubitor leucopterus</i>		
	n	M±m	Range	n	M±m	Range	n	M±m	Range
♂♂ Bill length (exposed)	20	16.8±0.13	15.8-17.8	101	16.8±0.09	14.9-19.9	32	17.7±0.12	16.3-19.5
Bill length (from nostrils)	20	13.3±0.09	12.4-14.0	103	13.5±0.06	11.3-14.9	32	14.5±0.12	13.6-16.3
Bill depth	20	9.0±0.08	8.2-9.6	88	9.4±0.05	8.5-10.7	32	9.5±0.04	9.1-10.2
Bill width	20	6.06±0.09	5.6-7.0	103	6.3±0.06	4.9-7.5	32	5.9±0.1	4.8-7.2
Wing length	20	114.4±0.69	108.6-122.5	106	114.1±0.23	105.3-119.5	32	117.8±0.39	112.8-122.8
Wing width	20	89.2±0.48	85.8-93.6	106	87.2±0.30	69.5-94.1	32	90.1±0.41	85.9-93.8
Length of the first primary	20	70.9±0.55	65.6-75.7	106	70.5±0.20	64.7-77.2	32	72.5±0.29	68.5-75.5
Tail length	20	110.0±0.86	103.2-117.7	106	109.2±0.45	98.4-121.5	32	113.3±0.65	107.1-121.2
Length of the first tail feather	20	88.5±0.71	80.7-95.9	105	85.0±0.48	71.5-99.3	32	88.6±0.53	81.3-95.2
Width of the central tail feather	20	14.7±0.26	13.1-16.7	51	14.6±0.15	11.8-17.7	32	14.8±0.18	12.1-17.2
Tarsus length	20	26.3±0.38	24.4-31.8	106	27.4±0.14	21.8-32.4	32	28.7±0.16	27.3-31.4
Length of hind claw	20	8.8±0.13	7.4-9.8	105	9.3±0.06	7.6-10.7	32	10.1±0.15	8.2-12.5
Length of hind toe	20	11.01±0.15	9.7-12.5	51	11.7±0.14	9.4-13.5	32	12.4±0.14	10.5-14.2

Tab. 2.2. Dimensions of the adult females of the three discussed shrike forms (*Lanius borealis sibiricus*, *Lanius excubitor excubitor* and *Lanius excubitor leucopterus*).

	<i>Lanius borealis sibiricus</i>			<i>Lanius excubitor excubitor</i>			<i>Lanius excubitor leucopterus</i>		
	n	M±m	Range	n	M±m	Range	n	M±m	Range
♀ Bill length (exposed)	14	16.7±0.21	15.4-18.1	82	16.4±0.08	15.1-18.9	14	17.5±0.17	16.6-18.9
Bill length (from nostrils)	14	13.2±0.18	12.3-14.7	82	13.2±0.06	11.9-15.1	14	14.1±0.16	13.6-15.7
Bill depth	13	9.1±0.11	8.2-9.6	66	9.2±0.06	8.2-11.1	14	9.6±0.09	9.2-10.2
Bill width	14	6.1±0.15	4.9-7.0	82	6.3±0.07	4.9-7.6	16	6.3±0.14	5.4-7.1
Wing length	14	112.7±0.57	109.5-116.0	84	112.7±0.28	107.5-117.8	16	117.3±0.82	110.6-123.2
Wing width	14	87.5±0.39	84.3-90.1	82	86.1±0.28	80.5-92.8	16	89.9±0.69	85.3-95.4
Length of the first primary	14	70.7±0.56	67.3-74.5	84	70.0±0.25	63.7-77.6	16	72.9±0.77	67.9-79.3
Tail length	14	106.6±1.20	100.8-113.5	82	106.7±0.44	97.0-114.4	16	111.3±1.14	102.2-118.8
Length of the first tail feather	14	85.4±1.21	77.1-91.7	81	82.8±0.46	69.0-89.8	15	89.1±1.19	79.0-96.6
Width of the central tail feather	13	14.5±0.23	13.2-15.9	39	14.4±0.16	12.4-17.2	15	16.0±0.65	13.5-24.7
Tarsus length	14	26.4±0.16	25.9-27.7	83	27.4±0.16	22.4-31.2	16	28.4±0.30	26.3-31.2
Length of hind claw	14	9.1±0.18	7.6-10.3	84	9.3±0.07	7.9-10.8	16	9.9±0.15	8.9-11.2
Length of hind toe	14	10.8±0.22	9.0-12.0	40	11.5±0.15	9.8-13.1	15	12.2±0.24	10.6-13.9

Tab. 3. Wing formula of *Lanius borealis sibiricus*, *Lanius excubitor excubitor* and *Lanius excubitor leucopterus*.

Species/Subspecies	Primaries projection					
	n	4>3>5	n	4=3>5	n	3>4>5
<i>Lanius borealis sibiricus</i>	26	70.3%	6	16.2%	5	13.5%
<i>Lanius excubitor excubitor</i>	84	43.1%	52	26.7%	59	30.2%
<i>Lanius excubitor leucopterus</i>	33	47.2%	15	21.4%	22	31.4%

Tab. 4. *Lanius borealis sibiricus*, *Lanius excubitor excubitor* and *Lanius excubitor leucopterus*: dimensions (mm) and variability limits of the wing's white "patch" measured from the tips of primary coverts in males (top) and females (bottom).

Sex	<i>L. borealis sibiricus</i>			<i>L. excubitor excubitor</i>			<i>L. excubitor leucopterus</i>		
	n	M±m	Range	n	M±m	Range	n	M±m	Range
♂♂	20	62,6±0,7	58,4-69,5	106	67,2±0,43	48,4-76,9	32	77,6±0,79	68,3-86,7
♀♀	14	60,7±1,02	53,4-67,7	84	65,6±0,39	57,9-79,6	16	75,5±0,85	69,8-83,5

1959, Panov 2008), although many authors did it (e.g. Dement'ev 1937, Portenko 1939, 1954, Stepanân 2003).

This is also confirmed by our study of the extensive set of museum specimens (ZISP, MSU, NMNH). We found that the white-winged shrikes from West Siberia have not been recorded in the area of the type locality of "*L. homeyeri* Cabanis, 1873", i.e. at Sarepta on the Volga River (now in the city of Volgograd, Russia), because they do not go east of the Ural Mountains even during their migrations. The grey shrikes from the Volga region are not different phenotypically from those inhabiting more western and northern regions of Europe.

Thus, only two subspecies can be recognized in *L. excubitor* in its current concept: the polymorphic *L. excubitor excubitor* (common in most of Europe north-east to the lower reaches of the Ob River and south-east to Trans-Urals) and the monomorphic forest-steppe subspecies *L. excubitor leucopterus* (breeding in southern Siberia approximately between the Tobol and Yenisei river valleys, as well as in the adjacent parts of northern Kazakhstan).

The wide individual color variability of European populations may be easiest explained as a consequence of the wide interspecific hybridization between *L. excubitor* and *L. borealis*. This hybridization probably occurred in the past and was accompanied by unilateral substitution of mitochondrial haplotypes. The mechanism of the formation of the polymorphic European population was probably as follows. At first, the populations

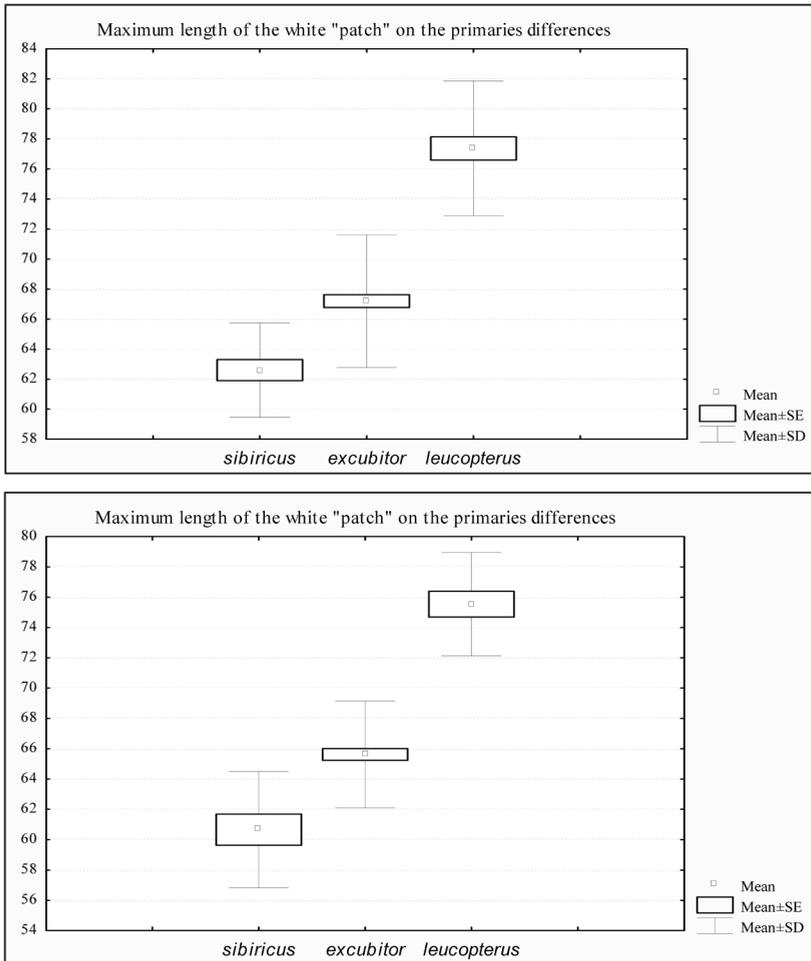


Fig. 2. *Lanius borealis sibiricus*, *Lanius excubitor excubitor* and *Lanius excubitor leucopterus*: dimensions (mm) and variability limits of the white "patch" on wing measured from the tips of primary coverts in males (top) and females (bottom). For data see Tab. 4.

of *L. borealis*, morphologically corresponding with the subspecies *L. b. sibiricus*, inhabited the whole of northern Europe: its tundra zone and bogs. The forest-steppe zone and, apparently, the open space of peat bogs in southern and central Eastern Europe, were inhabited by *L. excubitor*, namely the form which was morphologically and genetically related to the extant *L. excubitor leucopterus*. The forest areas of Europe have long been more or less reliable barrier between these two species. However, due to the disturbance of the forest area in Europe by humans (e.g. agriculture and deforestation) the formerly continuous forest zone turned into a mosaic landscape, what allowed an intensive expansion of the southern grey shrikes to the north, where they met with populations of *L. borealis*. The outbreak of hybridization between these forms, as well as the

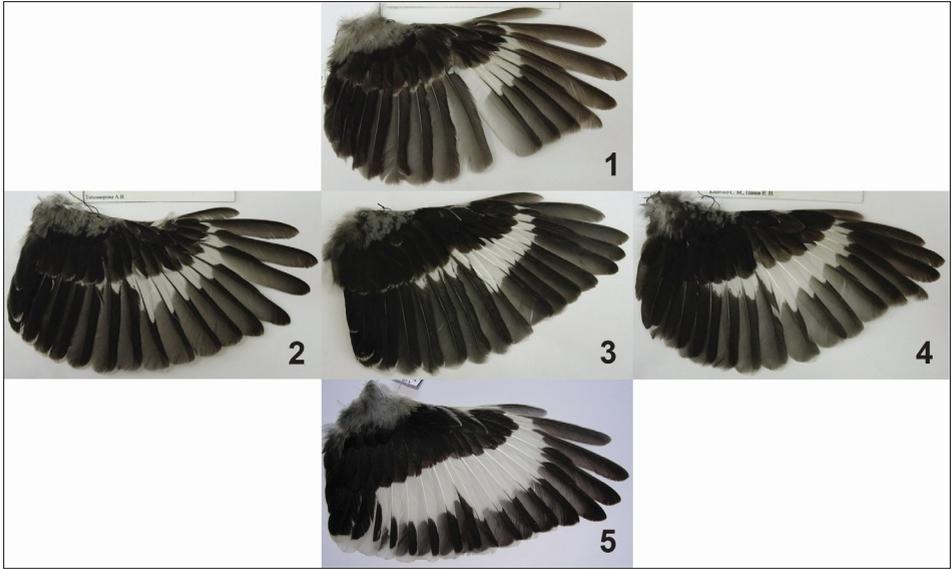


Fig. 3. Unfolded wings of adults of *Lanius* forms. 1 – *Lanius borealis sibiricus*; 2-4 – *Lanius excubitor excubitor*; 5 – *Lanius excubitor leucopterus*.

continuing expansion of *L. excubitor* northwards, led ultimately to the disappearance of phenotypically and genetically pure populations of *L. borealis sibiricus* in Europe. Also, the original form of the mitochondrial genome was displaced, on the one hand, and the dark color variants (single “patch” and dark colored tip) appeared widespread in Europe (south) with the other hand.

It is remarkable, that this case is completely analogous to that described for the nordic and eastern European populations of the Yellow Wagtail *Motacilla flava* Linnaeus, 1758 (Red’kin 2001a,b, Pavlova et al. 2003, Sotnikov 2006). In *M. flava*, the polymorphism (presence of the males characterized by the phenotypes “*flava*” and “*thunbergi*” and numerous forms transitory between them) is a result of the interspecific hybridization between *M. flava flava* and the Siberian subspecies *M. tschutschensis plexa* Thayer & Bangs, 1914, accompanied by the displacement of the mitochondrial genome of the eastern form. In addition, an example of the borrowing of mitochondrial genome in one of the two hybridizing species was examined in detail in Yellowhammer (*Emberiza citrinella* Linnaeus, 1758) and Pine Bunting (*E. leucocephalos* S.G Gmelin, 1771) (Irwin et al. 2009).

Main morphological characters that distinguish *L. borealis sibiricus* from various color variants of *L. excubitor* are shown in Table 1. We focus on the differences in coloration of fresh plumage of these birds, because Northern Shrikes are found in Eastern Europe almost exclusively in autumn and in winter, and because the differences are expressed most clearly in this plumage. Both in museum collections and in the field, contour

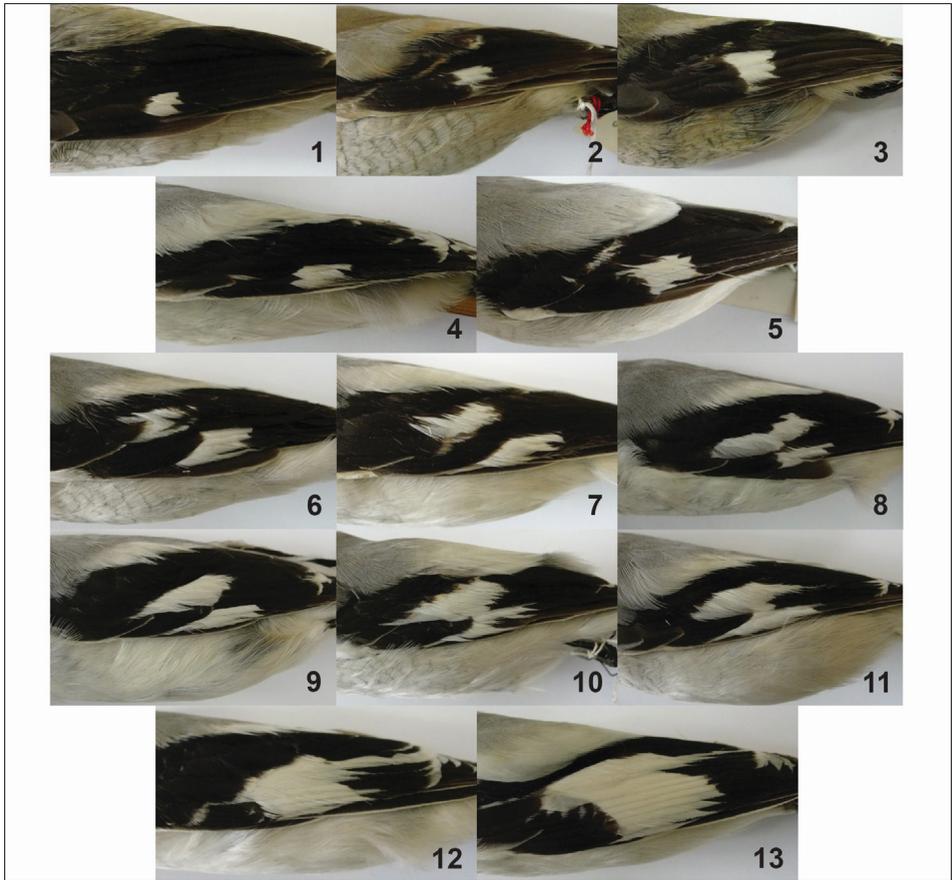


Fig. 4. The shape and dimensions of the depigmented areas on the folded wings of *Lanius* forms. 1-3 – *Lanius borealis sibiricus*; 4-11 – *Lanius excubitor excubitor* (4-5 “*melanopterus*”, “*europaeus*”; 6-8 – “*excubitor*”; 9-11 “*homeyeri*”, “*stepensis*”); 12-13 – *Lanius excubitor leucopterus*.

feathers of *L. b. sibiricus* appear to have more brownish ocher shade, due to the presence of phaeomelanin in the upper parts of these feathers. Brownish ocher or brownish tint is most clearly expressed on the dorsal side, and on the ventral side (especially on the sides). The intensity of the brown or brown plaque varies considerably among individuals, reaching its maximal degree in the first-year birds. A well-marked brown hue is absent from *L. excubitor*, even from the darkest specimens of the “*melanopterus - europaeus*” type, which makes it one of the best distinguishing character of Northern Shrikes in fresh plumage. The second most important character in the coloration of *L. b. sibiricus* is the well pronounced brownish transverse striations on the body underside; most specimens have many of them on the sides of throat, breast, ventral side and sides of belly. Only in oldest Northern Shrikes this striations may be somewhat reduced on the belly and become

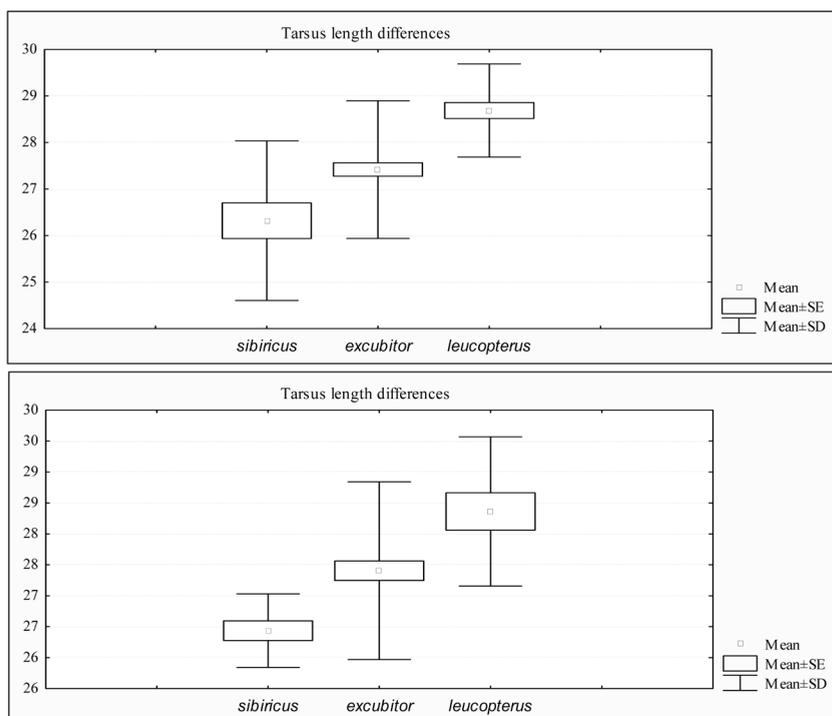


Fig. 5. *Lanius borealis sibiricus*, *Lanius excubitor excubitor* and *Lanius excubitor leucopterus*: variation of the tarsus length in males (top) and females (bottom).

slightly thinner on the breast, but they are always well expressed in all specimens. In most specimens of *L. excubitor*, these striations are faint, present as narrow ash-gray brackets on the chest, or missing. Only in the most dark-colored specimens of the “*melanopterus - europaesus*” type, the transverse striations on the ventral side resemble that in *L. borealis sibiricus*, although the streaks appear more gray, not brown.

The size of the white “patches” on the primaries, secondaries, tail feathers and feathers scapulars constitute a separate group. The length of the non-pigmented areas on the primaries in the Northern Shrike is smaller than in *L. excubitor* on average (Fig. 2). White fields extend beyond the upper wing coverts only on primaries (Fig. 3), forming on the folded wing only one white “patch” (Fig. 4). A similar pattern occurs also in the dark specimens of *L. excubitor*, but these cases are rather rare.

The vast majority of *L. excubitor excubitor* possess a white patch extending beyond the wing coverts and secondaries, forming a second white “patch” (Fig. 3-4). This “patch” on the tip of the folded wing is usually much smaller in size than the lower one, but quite distinct even during field observations (Fig. 4). Eventually, the white field on the primaries reaches its maximum development in the brightest West Siberian *L. excubitor leucopterus* (Fig. 3-4) so that the top and bottom mirrors almost merge with each other.

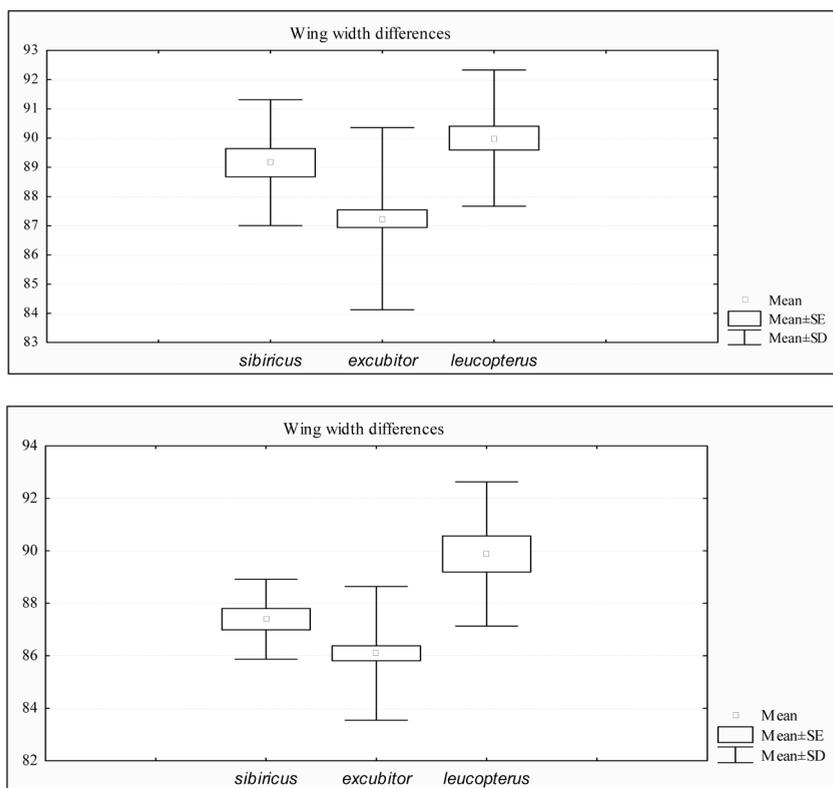


Fig. 6. *Lanius borealis sibiricus*, *Lanius excubitor excubitor* and *Lanius excubitor leucopterus*: variation of the wing width in males (top) and females (bottom).

The coloration of the tail feathers is a subject to considerable individual variability in *L. excubitor*, but it is more constant in the Northern Shrike. In most individuals of *L. borealis sibiricus*, the inner vane and the surrounding end portion of the stem of the central pair of tail feathers bear broad black bars, which cover up to the half of the length of each feather. Similar pattern often occurs also in *L. excubitor excubitor*, but the dark field is smaller on average. Furthermore, the central base pairs of tail feathers of the Northern Shrikes are completely black in most specimens, whereas in the Gray Shrike they are often white.

The scapulars of the Northern Shrike are paler if compared with the color of the mantle, but are usually not as pure white as in most *L. excubitor*. Other coloration characters mentioned earlier by Dement'ev (1937), Portenko (1939) and Stepanân (2003) vary so considerably that they hardly may be used to identify individual specimens of these species.

One can conclude, that *L. b. sibiricus* is characterized only by: (1) marked brownish ocher plaque shade; (2) easily visible striations at underside of the body; and (3) a smaller area covered by the fields of white plumage.

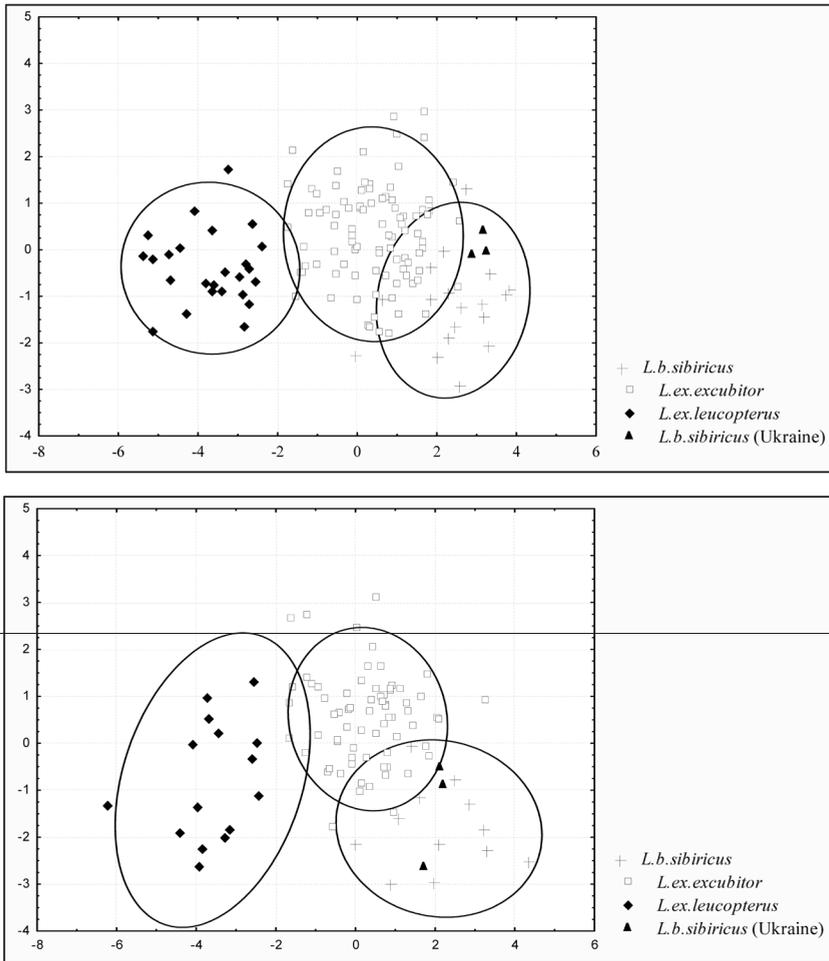


Fig. 7. *Lanius borealis sibiricus*, *Lanius excubitor excubitor* and *Lanius excubitor leucopterus*: specimen distribution on the first and second canonical axes (10 morphometric characters) in males (top) and females (bottom).

Among the quantitative characters (Tab. 2.1, 2.2), the more or less marked differences between *L. borealis sibiricus* and *L. excubitor excubitor* concern the tarsus length, which is shorter on average in *L. borealis sibiricus* (Fig. 5), and wing width, which is on average greater in *L. borealis sibiricus* (Fig. 6). However, the combination of all quantitative characters allows identifying *L. borealis sibiricus*, despite the higher individual variability in this species (Fig. 7).

The minute differences between the wing formula of *L. borealis sibiricus* and *L. excubitor excubitor* (Tab. 3) concern the 4th primary, which is longer than the 3rd in vast

majority of specimens (> 70%), whereas the 3rd is longer than or equal to the 4th in the majority of *L. ex. excubitor* (> 55 %).

In general, precise identification of each single specimen of *L. b. sibiricus* from Eastern Europe is possible. However, it must be based on a combination of all the external morphological characters.

The Northern Shrike in Ukraine

Apparently, meeting Northern Shrike in Ukraine is not as rare as it seems at first glance. Now as far as can be judged from museum specimens (Fig. 8), this form was known already to Gavrilenko (1928, 1929) and Šarleman' (1938). Furthermore, there are collected specimens of *L. borealis sibiricus* from the adjacent regions of Russia, in particular from the Kursk region (ZMSU). The Northern Shrike is found also far more to the west in different regions of Europe (<http://www.tarsiger.com/gallery/>).

Gavrilenko (1928, 1929) mentioned the Siberian Shrike, which he called "*L. excubitor major* Pall.", as a winter visitor to the Poltava region, even suggesting that it does not concede in numbers to *L. excubitor excubitor*. Šarleman' (1938) mentioned the Siberian Shrike, referred to as *L. excubitor rapax* Brehm, as a migrant occurring in autumn, spring and winter.

Seven specimens undoubtedly belonging to *L. borealis sibiricus* were found in the collections studied. The specimens originated from Kyiv, Cherkasy, Sumy, Poltava, Kharkiv and Kherson regions, as well as from the southern coast of the Crimea. Four of them were collected in November, three were collected in winter.

MNHKNU 12938: ♂, collected by N. Gavrilenko on 18 November 1921 at Ternovschina Dalnaya, Poltava reg. Description: brown back, lower body with a well-defined transverse striations, rump grayish white, tail feather with central base black, black at the extreme tail takes "patch" third feather, length of the first primary is 68.5 mm, one small "patch" (59.8 mm). Wing formula 4>3>5, 2<6.

MNHKNU 12960 ♀, collected by N. Gavrilenko on 2 January 1918 in the vicinity of Romney, Sumy reg. (label data). Description: back brownish-gray, lower body with a well-defined transverse striations, rump gray, black at the extreme tail takes 2/3 of the feather, the length of the first primary is 68.1 mm, one small "patch" (59.0 mm). Wing formula 4>3>5, 2<6.

MNHKNU 18543: ♂, collected by A. Lisetsky and Volchanetsky on 2 February 1941 in the vicinity of Izium, Kharkiv reg. (label data). Description: Morphology: back is dark gray with brown marks on the head and shoulders, lower body with a well-defined transverse striations, rump gray, black at the extreme tail takes third feather, length of the first primary is 71.2 mm, one small "patch" (58.7 mm). Wing formula 3>4>5, 2>6.

MNMH 7323/36: ♀, collected by N. Šarleman' on 14 February 1911 at Kurenivka, Kiev, Kiev reg. (label data). Description: back is dark gray with a slight brownish patina, lower body with a well-defined transverse striations, rump gray, black at the extreme

tail occupies one third of the feather, the length of the first primary is 69.5 mm, one small “patch” (58.8 mm). Wing formula 4>3>5, 2<6.

SMBT OF-3452/457: unsexed, collected by E. Spangenberg on 7 November 1935 in the vicinity of Alushta, Crimea (label data). Description: the lower part of the body with a well-defined transverse striations, rump gray, black at the extreme tail takes third feather, length of the first primary is 70.6 mm, one small “patch” (61.2 mm). Wing formula 4>3>5, 2<6.

ZISP 162047-425-974: ♂, collected by L. Portenko on 27 November 1927 at Pocapintsy, Lysyansky dis., Cherkasy reg. Description: back deep gray, black at the extreme tail takes half feather length of the first primary is 72.5 mm., two “patches” (“patch” on secondaries visible only on one wing 57.8 mm) for primaries (“patch” 62.2 mm). Wing formula 3>4>5, 2=6.

NMNH 11979/48: ♀, collected by an unknown collector on 20 November 1898 in the Kherson Province (label data; specimen badly damaged). Description: back brownish-gray, lower body with a well-defined transverse striations, rump gray, black at the extreme tail takes third feather, length of the first primary is 66.6 mm, one small “patch” (61.1 mm). Wing formula 4=3>5, 2=6.

All these birds are “typical” *L. borealis sibiricus*, being markedly different from the dark variants of *L. excubitor excubitor* of the forms “*melanopterus*, *europaeus*”. The fact that all mentioned specimens were collected at the end of the 19th – first half of the 20th centuries, is probably associated with the more intensive collecting activities during this period, which has declined remarkably in the second half of the 20th century. It should be noted that such a feature as a wide autumn dispersal in different directions during the early post-breeding migrations (peculiar chiefly to the young birds), is very characteristic for the species complexes of the Grey Shrikes. Naturally, this behavior is more typical for North-Siberian populations, which winter under very continental climate conditions (extreme in some years) and thus are forced to move for very large distances, not only southwards but also in the south-western and western directions.

CONCLUSION

In summary, we can conclude that Grey Shrikes recorded in the territory of Ukraine and in adjacent regions belong to the Northern Shrike *Lanius borealis*, in particular its North Siberian form (race, subspecies) *L. borealis sibiricus*. This bird occurs here as a rare, irregular winter visitor. The specimens of *L. borealis sibiricus* can be identified on the basis of a combination of characters listed above. The most important of them, allowing identification of these birds in the field, are as follows: the presence of brownish or brownish-ocher tint on the contour feathers, being most distinct on the upper side of the body and on the sides of the chest (on the dorsal side and on the ventral side); well-defined dark transverse striations on the underside of the body, stretching from the sides of the throat to the front part and the sides of the ventral; the presence of only one small white “patch” on folded wing, as well as significantly expressed black coloring at the outer tail feathers.



Figure 8. Males of grey shrikes from the collection of N.I. Gavrilenko (MNXHNU) with author's labels: 1 – *Lanius borealis sibiricus*, 2-4 – *Lanius excubitor excubitor* (2 – “*melanopterus/europaeus*”, identified as “*L. excubitor excubitor*”; 3 – specimen identified as “*L. excubitor stepensis*”; 4 – specimen identified as “*L. excubitor homeyeri*”).

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REFERENCES

- Bogdanov M.N., 1881: Sorokoputy russkoj fauny i ih sorodičy [Shrikes of the Russian fauna and their relatives]. – Zapiski Imperatorskoj Akademii Nauk 39, Supplement.1.:i-xii, 1-220. [In Russian.]
- Brandsma M., 2014: Grey Shrike complex. – URL: www.martinbrandsma.nl/grey-shrikes-complex/
- Dement'ev G.P., 1937: Polnyj opredelitel' ptic SSSR. [A complete key to the birds of the USSR]. Vol. 4. Vorob'inye [Passerines]. – Moskva: KOIZ, 334 pp. [In Russian.]
- Dement'ev G.P., 1954: Semejstvo sorokoputovye Laniidae [Family Laniidae]. – In: Dement'ev G.P. & Gladkov N.A. (eds.): Pticy Sovetskogo Soúza [Birds of the Soviet Union]. Vol. 6: 5-57. Moskva: Sovetskaâ Nauka. [In Russian.]

- Gavrilenko N., 1928: Žulany i bol'shie serye sorokoputy Poltavšiny [Red-backed Shrikes and Great Grey Shrikes of the government of Poltava]. – Zbirnik prisvâčenij 35-ričču muzej. [Almanach dedicated to the 35-th Anniversary of the Museum] 1: 271-272, 275 [In Russian.]
- Gavrilenko N.I., 1929: Pticy Poltavšiny [The birds of the government of Poltava]. – Poltava: Poltavskij Soûz ohotnikov, 133 pp. [In Russian.]
- ICZN, 1999: International code of zoological nomenclature. 4th ed. London: The International Trust for Zoological Nomenclature, xxix + 306 pp.
- Irwin D.E., Rubtsov A.S. & Panov E.N., 2009: Mitochondrial introgression and replacement between yellowhammers (*Emberiza citrinella*) and pine buntings (*Emberiza leucocephalos*) (Aves: Passeriformes). – Biological Journal of the Linnean Society 98: 422-438.
- Klassert T.E., Hernández M.A., Campos F., Infante O., Almeida T., Suárez N.M., Pestano J., Hernández M., 2008: Mitochondrial DNA points to *Lanius meridionalis* as a polyphyletic species. – Molecular Phylogenetics and Evolution 47: 1227-1231.
- Koblik E.A. & Mosalov A.A., 2006: Okraska opereniâ ptic: tipologizaciâ i evolûciâ [Bird plumage colour: Typologization and evolution]. – Zoologičeskij Žurnal 85: 266-282. [In Russian.]
- Lorenz T., 1894: Die Vögel des Moskauer Gouvernements. – Bulletin de la Société Impériale des Naturalistes de Moscou 8: 325-350.
- Menzbier M., 1883: Revue comparative de la faune ornithologique des gouvernements de Moscou et de Toulâ. – Bulletin de la Société des Naturalistes de Moscou 58 (1): 109-144.
- Olsson U., Alström P., Svensson L., Aliabadian M. & Sundberg P., 2010. The *Lanius excubitor* (Aves, Passeriformes) conundrum – Taxonomic dilemma when molecular and non-molecular data tell different stories. – Molecular Phylogenetics and Evolution 55: 347-357.
- Panov E.N., 2008: Sorokoputy (semejstvo Laniidae) mirovoi fauny: èkologiâ, povedenie, èvolûciâ [Shrikes (family Laniidae) of the world fauna. Ecology, behavior, evolution]. – Moskva: Tovarišestvo naučnyh izdaniy KMK, 284 pp. [In Russian.]
- Pavlova A., Zink R., Drovetski S.V., Red'kin Y.A & Rohwer S.A., 2003: Phylogeographic patterns in *Motacilla flava* and *Motacilla citreola*: species limits and populations history. – Auk 120: 744-758.
- Poelstra J., 2010: Trends in systematics – Speciation in shades of grey: the great grey shrike complex. Dutch Birding 32 (4): 258-264.
- Portenko L.A., 1939: Fauna Anadyr'skogo kraâ. Pticy. Čast' I [The fauna of the Anadyr Region. Birds. Part 1]. – Leningrad: Izdatel'stvo Glavsevmorputi, 209 pp. [In Russian.]
- Portenko L.A., 1954: Pticy SSSR [Birds of the USSR]. – Moskva: Izdatel'stvo Akademii nauk SSSR, 255 pp. [In Russian.]
- Ptušenko E.S., Inozemcev A.A., 1968: Biologiâ i hozâjstvennoe značenie ptic Moskovskoj oblasti i sopredel'nyh territorij [Biology and economic value of birds of the Moscow region and adjacent territories]. – Moskva: Izdatel'stvo MGU, 461 pp. [In Russian.]
- Red'kin Â.A., 2001: Novye predstavleniâ o taksonomičeskoj strukture gruppy «želtyh trâsogruzok» [New ideas on the taxonomic structure of the “Yellow Wagtails” complex]. – In: Kuročkin E.N. & Rahimov I.I. (eds.): Dostiženiâ i problemy ornitologii Severnoj Evrazii na rubeže vekov: 150-165. Kazan': Magarif. [In Russian.]
- Red'kin Â.A., 2001: O izmenčivosti nekotoryh morfoloģičeskikh priznakov v gruppe «želtyh trâsogruzok» [On the variability of certain morphological characters in the “Yellow Wagtails” complex]. – In: Aktual'nye problemy izučenâ i ohrany ptic Vostočnoj Evropy i Severnoj Azii: 523-524. Kazan'. [In Russian.]
- Ruzskij M.D., 1893: Materialy k izučenîu ptic Kazanskoj gubernii [Materials for the study of birds Kazan Province]. – Trudy Obščestva Estestvoispytatelej pri Kazanskom Gosudarstvennom Universitete 25 (6): 1-394. [In Russian.]

- Salomonsen F., 1949: The European hybrid population of the Grey Great Shrike (*Lanius excubitor*). – Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i København 111: 149-161.
- Šarleman' M.V., 1938: Ptahi URSS [Birds of the Ukrainian SSR]. – Kiev: Vidanictvo AN URSS, 266 pp. [In Ukrainian.]
- Sotnikov V.N., 2006: Pticy Kirovskoj oblasti i sopredel'nyh territorij. Vorob'inoobraznye [Birds of the Kirov Region and adjacent territories. Passeriformes]. Vol. 1. – Kirov: OOO «Triada», 448 pp. [In Russian.]
- Stepanân L.S., 2003: Konspekt ornitologičeskoj fauny Rossii i sopredel'nyh territorij [Synopsis of the ornithological fauna of Russia and adjacent territories (within the USSR as a historic region)]. Moskva: Akademkniga, 808 pp. [In Russian.]
- Tajkova S.U., 2012. Type specimens and taxonomic identity of *Lanius excubitor stepensis* Gavrilenko, 1928 (Aves: Laniidae). – Journal of the National Museum (Prague), Natural History Series 181: 73-93.
- Tûrin V.V., Morev I.A., Volčkov Ū.A., 2002: Diskriminantnyj analiz v selekcionno-genetičeskih issledovaniâh [Discriminant analysis in breeding and genetic studies]. – Krasnodar: Izdatel'stvo Kubanskogo Gosudarstvennogo Universiteta, 23 pp. [In Russian.]
- Vaurie C., 1959: The birds of the Palearctic fauna. Passeriformes. – London: H.F. & G. Witherby, 762 pp.
- Vorob'ev K.A., 1925: Ornitologičeskie issledovaniâ v Moskovskoj gubernii [Ornithological studies in the Moscow Province]. – Trudy Gosudarstvennogo Muzeâ Central'no-Promyšlennoj Oblasti 1: 1-24. [In Russian.]
- Voroncov E.M., 1967: Pticy Gorkovskoj oblasti [Birds the Gorkij Region]. – Gorkij: Volgo-Vâtskoe knižnoe izdatel'stvo, 167 pp. [In Russian.]
- Voroncov E.M., 1936 [“1935”]: Materialy po ornitofaune Nižegorodskogo kraâ. Pticy b. Vetlužskogo uezda [Materials on the avifauna of the Nižnij Novgorod Region. Birds of the former Vetlužskij County]. – Učenyje Zapiski Gorkovskogo Universiteta 1: 229-268. [In Russian.]

