

Stephanorhinus kirchbergensis (Jäger, 1839) (Mammalia, Rhinocerotidae) from European Russia: A new, detailed inventory of sites and referred material

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This paper presents a status review of the fossil remains discovered in European Russia and assigned to *Stephanorhinus kirchbergensis* (Jäger, 1839). Similarly to other areas, this taxon appears rare in European Russia, despite its wide distribution. Furthermore, a large part of the *S. kirchbergensis* material reported in literature is presently untraceable in the Russian museum collections. In fact, from a total of twenty-one sites, the material is physically available from only three of them. In addition, the remains from Podosinik, previously not mentioned in literature, are reported here. The available material has been studied using descriptive morphological characters. This study follows a previous treatment of the related sites and material from Siberian Russia by the same author. *Stephanorhinus* is considered here as a synonym of *Dicerorhinus*.

Key words: Pleistocene, European Russia, *Stephanorhinus kirchbergensis*

Introduction

A literature review reveals twenty-one European Russian localities where remains ascribed to *Stephanorhinus kirchbergensis* (Jäger, 1839) were found. Unfortunately, available *S. kirchbergensis* remains are presently known from three localities only: Samara [8], Kurilovka [13], and Cherny Yar (or Nizhnee Zaymishche) [18] (numbers in square brackets are those given in the list of localities, for ease of reference throughout this text). To this list, the fragmentary hemimandible from Podosinik (? Volgograd region) [17] (unpublished material) must be added.

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Two other localities – Mysy Layshevsky [20/bis] and Nikol'skoe [21] – yielded remains previously assigned to *S. kirchbergensis* which must be assigned to other rhinoceros species (*Coelodonta antiquitatis* [Blumenbach, 1799] and *Stephanorhinus* cf. *S. etruscus* [Falconer, 1868], respectively).

The material from sixteen other localities is untraceable in the Russian museum collections. Among them, two occurrences (“Samara region” [9] and Khoroshevsky Island [10]) are probably due to errors and/or misidentifications. In at least three other cases, the remains are permanently lost (those from Vysokoe [1] and the Girey Quarry [19] were lost during World War II; those from the Tungus Peninsula [7] were destroyed in a fire).

Synonymy, taxonomical position, general as well as odontological characters, reconstructions of the species (those made by Flerov – Flerov et al. 1955 – and by Kozhamkulova – Kozhamkulova and Kostenko 1984), dispersal areal, probable area of origin, rarity of the species, phylogeny, biotopes of the Pleistocene Eurasian interglacial rhinoceros *S. kirchbergensis* – better known in Russia as “nosorog Merka” (literally, Merck’s rhinoceros) – were discussed in detail in a previous work (Billia 2011). In the present paper, another reconstruction attempt (by Yu Chen 2010) is also proposed (Fig. 1). A preliminary, and not comprehensive, report on the *S. kirchbergensis* remains in Russian Federation has previously been presented by the author (Billia 2008a).



Fig. 1
Reconstruction of *Stephanorhinus kirchbergensis* (Jäger, 1839) after Yu Chen (2010, personal present; this illustration is used here through the courtesy of the artist, all rights reserved)

The genus *Stephanorhinus* was first introduced by Kretzoi (1942) in honor of King Stephen I, the first king of Hungary.

**LIST OF THE EUROPEAN RUSSIAN LOCALITIES CITED
IN THE TEXT**

(in alphabetical order; in brackets, their paragraph numbers used in the text)

Cheremukhova Krucha [16]
Cherny Yar [18]
Girey Quarry [19]
Klevenka-1 [11]
Klevenka-2 [12]
Khoroshevsky Island [10]
Khvalynsk (vide Khoroshevsky)
Kurilovka [13]
Malyutino [5]
Moscow-Volga Canal [3]
Mysy Layshevsky [20-20/bis]
Nicol'skoe [21]
Nizhnee Zaymishche (vide Cherny Yar)
Podol'sk [4]
Podosinik [17]
Rakhmanovka [14]
Rybinsk [2]
Samara City [8]
Samara Region [9]
Shchygry [6]
Tarasovka [15]
Tungus Peninsula [7]
Vysokoe [1]

Acronyms

AN KazSSR Academy of Sciences of Kazakh SSR, Alma-Ata (at present,
National Academy of Sciences of Kazakhstan, Almaty)
AN SSSR USSR Academy of Sciences (at present, Russian Academy of
Sciences [RAN])
GIN Institute of Geology, Russian Academy of Sciences, Moscow
GMM KGU Museum of Geology and Mineralogy, Kazan' State University,
Kazan'
MIS Marine Isotope Stage

PIN	“YU.A. Orlov” (at present, “A.A. Borissyak”) Paleontological Institute, Russian Academy of Sciences, Moscow
PMK	Regional Ethnographic Museum, Pugachev
RAN	Rossiiskaya Akademya Nauk [Russian Academy of Sciences]
SOIKM	Oblastnoy Istorichesky-Etnografichesky Muzey im. “P.V. Alabina” [“P.V. Alabin” Regional Historical-Ethnographic Museum], Samara
ZIN	Zoological Institute, Russian Academy of Sciences, St. Petersburg
ZMSU	Zoological Museum, Institute of Pedagogy, Smolensk State University, Smolensk

Abbreviation

n.n. unregistered specimen

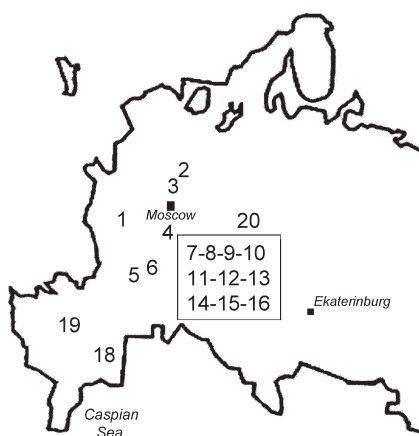


Fig. 2
Geographic localization of the sites on Russian-European territory where *S. kirchbergensis* (Jäger, 1839) remains have been found: 1. Vysokoe – 2. Rybinsk – 3. Moscow–Volga Canal – 4. Podol’sk – 5. Malyutino – 6. Shchygry – 7. Tungus Peninsula – 8. Samara City – 9. Samara Region – 10. Khoroshevsky Island (or Khvalynsk) – 11. Klevenka–1 – 12. Klevenka–2 – 13. Kurilovka – 14. Rakhmanovka – 15. Tarasovka – 16. Cheremukhova Krucha – 18. Cherny Yar (or Nizhnee Zaymishche) – 19. Girey Quarry – 20. Mysy Layshevsky

S. KIRCHBERGENSIS (JÄGER) IN EUROPEAN RUSSIA

Localities and material

Figs 2 and 3 show the geographic localization of the sites in European Russia where *S. kirchbergensis* remains were found. Tables 1 and 2 give an overview of the 22 sites and the fossil remains, their inventory numbers, references, as well as the diagnoses and the present whereabouts of available remains. Measurements of the available *S. kirchbergensis* remains from four European Russian localities are given in Tables 3, 4 and 5.

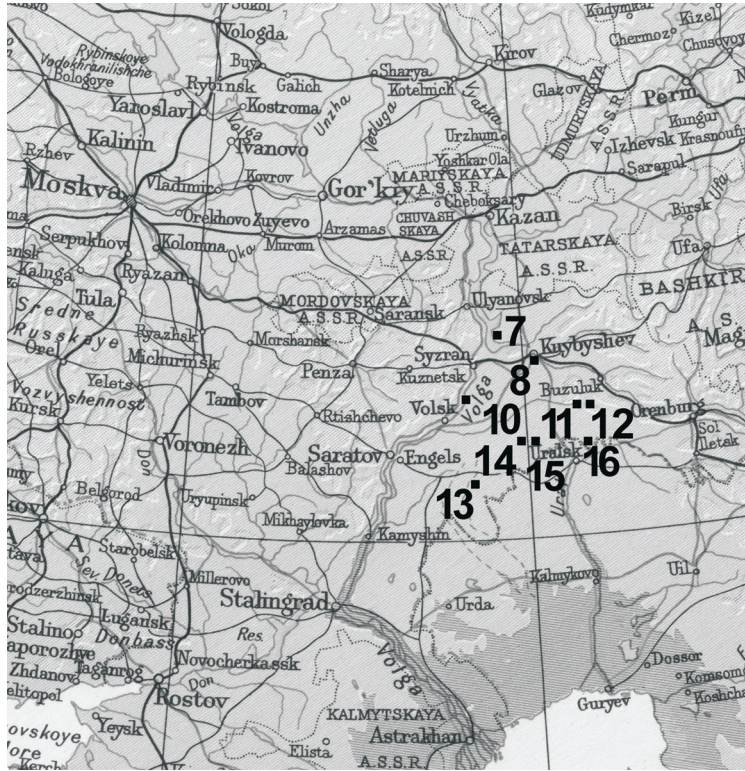


Fig. 3
Detail of the geographic localization of the Volga middle-lower course sites from 7 to 16 (within the rectangle in Fig. 2, except for the Site n. 9 [Samara Region]): 7. Tungus Peninsula – 8. Samara City – 10. Khoroshevsky Island (or Khvalynsk) – 11. Klevenka-1 – 12. Klevenka-2 – 13. Kurilovka – 14. Rakhmanovka – 15. Tarasovka – 16. Cheremukhova Krucha

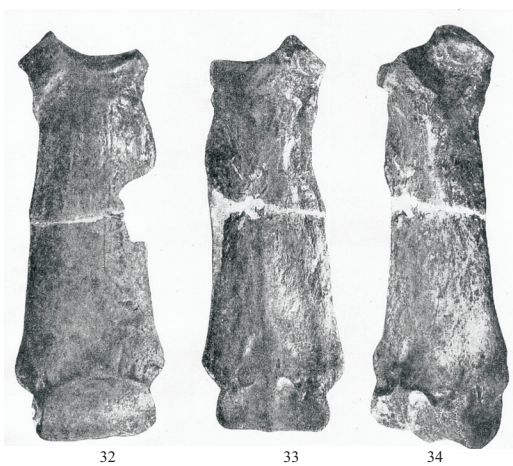


Fig. 4
Stephanorhinus cf. *S. kirchbergensis* (Jäger, 1839); Sheksna River near the “Trudovik” brick kiln (Rybinsk, Yaroslavl’ Region, European Russia); os metacarpale III, (32) cranial view, (33) caudal view, (34) latero-caudal view (ca 1/3 natural sizes) (after Belyaeva, 1939a)

Table 1
 Russian-European localities where remains assigned to *S. kirchbergensis* (Jäger, 1839) were found (available remains and their present preservations, in gray color)

T-N	Locality of the find	Material	ID. number	Diagnosis	ILL.	References	Conservation
1	Vysokoe, Dnepr river, Smolensk region	cranial and postcranial	–	<i>R. mercki</i>	no	Salov, 1957	previously at ZMSU, material lost in 1941
2	Rybinsk, Sheksna river, Yaroslavl' reg.	right forearm	PIN 113a	<i>R. cf. mercki</i>	yes	Belyaeva, 1939	unavailable material
3	Moskva–Volga canal, Moscow region	indet. remains	–	<i>R. mercki</i>	no	Belyaeva, 1940	unavailable material
4	Podol'sk, Moscow region	fragmentary maxillae w/ five teeth	PIN 326	<i>R. cf. mercki</i>	no	Belyaeva, 1940	unavailable material
5	Malyutino, Kursk, Kursk region	dental elements	–	<i>D. mercki</i>	no	Alekseeva, L.I., 1990	unavailable material
6	Shchigry, Kursk region	I upper molar	PIN 725	<i>R. cf. mercki</i>	no	Belyaeva, 1940	unavailable material
7	Tungus peninsula, Volga, Samara region	radius os carpale	PIN 131/293 PIN 131/27-28	<i>R. mercki</i> <i>R. mercki</i>	no no	Gromova, 1932–35 Belyaeva, 1939	material lost during a fire
8	Samara – uliza Pugachevskaya [Pugachev street], Samara region (ex Kuybishev region)	I upper premolar II upper molar III upper molar	SOIKM 5561/1 SOIKM 5561/2 SOIKM 5561/3	<i>R. mercki</i>	yes	Strizheva, 1991	SOIKM, Samara
9	Samara region (ex Kuybishev region) (1)	–	–	<i>R. mercki</i>	–	Gromova, 1932	–
10	Khoroshevsky, Volga, Saratov region (1)	isolated tooth	PIN 2212 ?	<i>R. mercki</i> (?)	no	Pavlova, 1933	unavailable material
11	Klevenka-1, Bol'shoy Igriz river, Saratov region	prox. epiph. of radius dx	n.n.	<i>R. mercki</i>	no	Belyaeva, 1935	unavailable material
12	Klevenka-2, Bol'shoy Igriz river, Saratov region	prox. epiph. of ulna dx	n.n.	<i>R. mercki</i>	no	Belyaeva, 1935	unavailable material
13	Kurilovka, Bol'shoy Uzen' river, Saratov region	mandibula	110 (attr. by the PMIK)	<i>R. mercki</i>	no	Belyaeva, 1935 Gromova, 1935	PIN RAN, Moscow

Table 1 (cont.)

T-N	Locality of the find	Material	ID. number	Diagnosis	ILL.	References	Conservation
14	Rozhmanovka, Kamelik river, Saratov region	magnum, Mc II, Mt III	n.n.	<i>R. mercki</i>	no	Belyaeva, 1935	unavailable material
15	Tarasovka, Kamelik river, region	trapezoidum, magnum unciforme	n.n. n.n. n.n.	<i>R. mercki</i>	n.n. no no	Belyaeva, 1935	unavailable material
16	Cheremukhova Krucha (Vyazova Krucha), Sestra river, Saratov region	Mc IV	n.n.	<i>R. mercki</i>	no	Belyaeva, 1935	unavailable material
17	Podosinik, Lower Volga, ? Volgograd reg.	hemimandibula frag.	GIN 839-3	<i>R. mercki</i>	yes	nihil	GIN RAN, Moscow
18	Cherny Yar (or Nizhnee Zaymishche), Volga river, Astrakhan' region	mandibula hemimandibula	ZIN 16948 ZIN 29854	<i>R. mercki</i>	yes	Gromova, 1932-35	ZIN RAN, St. Petersburg
19	"Giirey" quarry, Kuban' river, Krasnodar region	tooth+mandibular frag. –	–	<i>R. mercki</i>	no	Kolbutov, 1935-36	material lost during the war
20	Mysy Layshevsky, near the Kama river, Republic of Tatarstan	mandibular fragment	465	<i>R. mercki</i>	no	Chersky, 1891	MUOLE (? in which locality)

(1) probably, an error

T-N = tekst number; ID. NUMBER = collection identification number; ILL. = material illustrations in literature; DIAGN. A.Q. = diagnosis ante quem

GIN RAN Institute of Geology, Russian Academy of Sciences, Moscow

PIN RAN "A.A. Borissyak" (previously "Yu.A. Orlov") Museum, Palaeontological Institute, Russian Academy of Sciences, Moscow

PMK Regional Ethnographic Museum, Pugachev

SOJKM "P.V. Alabin" Regional Historical-Ethnographic Museum, Samara

ZIN RAN Zoological Institute, Russian Academy of Sciences, St. Petersburg

ZMSU Zoological Museum, Institute of Pedagogy, Smolensk State University, Smolensk

MUOLE Musey Ural'skogo Obshestva lyubitely estestvoznaniya" [Museum of Ural Lovers of (Natural) Science Association]

Table 2
Russian-European localities where remains previously assigned to *S. kirchbergensis* (Jäger, 1839) were found and later re-attributed to other rhinoceros species

T-N	Locality of the find	Material	ID. number	Diagn. A.Q.	Neodiagn.	References	Conservation
20/bis	Mysy Layshevsky, Kama and Mesha rivers, Republic of Tatarstan	mandibula	GMM KGU 1930	<i>R. mercki</i>	<i>C. antiquitatis</i> (Blum, 1799)	Gromova, 1932–35 Aleksееva, 1977	GMM KGU, Kazan' (Tatarstan)
21	Nikol'skoe, Volga, Astrakhan' region	fragmentary right hemimandibula	ZIN 16290	? <i>R. etruscus</i> ? <i>R. mercki</i>	<i>S. cf. S. etruscus</i> (Falc., 1868)	Gromova, 1932–35 w/ illustrations	previously at ZIN RAN, unavailable material

T-N = tekst number; ID. NUMBER = collection identification number; ILL. = material illustrations in literature; DIAGN. A.Q. = diagnosis ante quem
GMM KGU Museum of Geology and Mineralogy, Kazan' State University, Kazan'
ZIN RAN Zoological Institute, Russian Academy of Sciences, St. Petersburg

Table 3
Some dimensions (in mm) of two *S. kirchbergensis* (Jäger) available teeth from Samara, uliza Pugachevskaya (Samara region, European Russia)

N	SPECIMEN	COLL. ID. N.	BL	LL	MW	DW	CONSERVATION	REFERENCE
1	IV upper premolar	SOIKM 5561/1	52	43.5	65	56.5	"P.V. Alabin" Museum	Strizheva, 1991
2	II upper molar	SOIKM 5561/2	66	52.5	74.5	70.5		

COLL. ID. N. = collection identification number; BL = buccal length; LL = lingual length; MW = mesial width; DW = distal width

Table 4
Some dimensions (in mm) of the *S. kirchbergensis* (Jäger) available *mandibula juvenilis* N° 110 from the the Bol'shoy Uzen' river near Kurilovka (Saratov region, European Russia)

max length (1)	>520	left P ₄ -M ₁ max thickness (6)	56.1
max width (2)	341	right P ₂ -M ₂ length	218
max height (3)	219.5	right M ₂ labial length	53.6
M ₂ -M ₂ transversal diameter (4)	168.5	left M ₂ labial length	54.1
right P ₄ -M ₁ max thickness (5)	62.5		

- (1) antero-posterior diameter along the sagittal plane;
 (2) measured at the exterior rims of the articular condyles;
 (3) measured from the lower point of the ventral rim of the horizontal branch;
 (4) measured at the base of the labial walls (alveolar rim);
 (5) right transversal diameters of the horizontal branch;
 (6) (left transversal diameters of the horizontal branch

Table 5
Some dimensions (in mm) of the *S. kirchbergensis* (Jäger) available odonto-osteological material from two Russian-European localities

N	Specimen	Coll. Id. N.	ML	MW	MH	Locality of the find	Conservation	References
1	fr. hemimandibula	GIN 839-3	389	=	=	Podosinik, (?) Lower Volga, (?) Volgograd region	GIN RAN, Moscow	unpublished
2	mandibula	ZIN 16948	603	418	332	Volga (Ch. Yar-Nizhnee Zaym.), Astrakhan' region	ZIN RAN, St. Petersburg	Gromova, 1935
3	hemimandibula	ZIN 29854	581	=	=	Volga (Ch. Yar-Nizhnee Zaym.), Astrakhan' region	ZIN RAN, St. Petersburg	Gromova, 1935

COLL. ID. N. = collection identification number; ML = max length (in sagittal plane); MW = max width; MH = max height

1. Vysokoe

Locality: at the river, at a depth of about 11 m, along the right bank of the Dnepr near Vysokoe, about 15 km southeast of Smolensk (Smolensk Region).

Year of the find: 1926.

Approximate geographic co-ordinates: 54° 42' N – 32° 15' E.

References: Salov 1957; Gromova 1965.

Illustrations of the material: none.

Material: a skull [n.n.], two teeth [n.n.], a custula [n.n.], a scapula fragment [n.n.], and some other no better specified postcranial remains.

Preservation: at present, the material is unavailable. Previously housed at the Zoological Museum (Institute of Pedagogy) of the Smolensk State University [ZMSU], it was lost during the Nazi occupation in 1941 (Salov 1957:320–321; Gromova 1965:56).

Chronostratigraphy: unknown.

Previous attribution by Salov: *Rhinoceros mercki* Jaeger, 1839 (recte *S. kirchbergensis*).

Present attribution: impossible (material unavailable).

Accompanying fauna (biostratigraphy in the same level): none.

2. Rybinsk

Locality: at the depth of about 8 m, in clayey sands in moraine deposits along the right bank of the Sheksna River, near the “Trudovik” brick kiln, about 12 km from Rybinsk (Yaroslavl' Region).

Year of the find: 1934.

Approximate geographic co-ordinates: 58° 05' N – 38° 50' E.

Reference: Belyaeva 1939a.

Illustrations of the material: seven plates and a sketch in Belyaeva (1939a).

Material: a right forearm [PIN 113a] (radius, ulna, scaphoideum, lunatum, trapezoideum, magnum, hamatum, os metacarpale II, os metacarpale III, os metacarpale IV, nine phalanges, and three ossa sesamoidea). The forearm was recovered in anatomical connection.

Preservation: at present, the material (recovered by G. Lesovik) is untraceable. Until 1939, the remains were preserved in the collections of the Rybinsk Ethnographic Museum; then, they were transferred to the PIN in Moscow. In any case, the scapula was definitely been lost years ago (Belyaeva 1939a:69).

Chronostratigraphy: Mindel-Riss (according to Belyaeva); later, V.A. Novsky (Gromov 1948:449) proposed a Riss-Würm age.

Previous attribution by Belyaeva: *Rhinoceros* cf. *mercki* Jäger 1839 (recte *S. cf. S. kirchbergensis*).

Present attribution: impossible (material not available).

Accompanying fauna (biostratigraphy in the same level): none.

2.1. Note

On the basis of the III metacarpal morphology (vide plate V in Belyaeva 1939; Fig. 4 in this paper), the remains must dubiously be assigned to *S. kirchbergensis*. In fact – as a general rule – *S. kirchbergensis* III metacarpals are more elongate and massive, with a flatter diaphysis.

3. Moscow–Volga canal

Locality: close to the fourth lock of the Moscow–Volga canal, about 70 km north of the center of Moscow (Dmitrov District, Moscow Region).

Year of the find: unknown.

Approximate geographic co-ordinates: 56° 25' N – 37° 30' E.

References: Gromov 1939; Belyaeva 1940; Gromova 1965; Alekseeva 1977.

Illustrations of the material: plate XII (Figs 1–2) in Alekseeva (1977).

Material: according to Gromov (1939) and Belyaeva (1940:82), “nizhnyaya chelyust” [a mandibula] [n.n.], whereas according to Gromova (1965:56), “pars cranii et maxillae, dentes” [n.n.]. According to Alekseeva (1977), the remains consist of the right branch of the mandible GIN b/n.n. (Fig. 5 in this paper).



Fig. 5
Stephanorhinus kirchbergensis (Jäger, 1839); Moscow–Volga Canal (close to the fourth lock), about 70 km north of the center of Moscow (Dmitrov District, Moscow Region, European Russia); right branch of a mandible [GIN b/n.n.], occlusal (Fig. 1) and lateral (Fig. 2) views [after Alekseeva (1977), Pl. XII]

Preservation: at present, the material is untraceable.

Chronostratigraphy: Mindel-Riss, as suggested by the authors (Gromov 1939; Belyaeva 1940; Gromova 1965).

Previous attribution by Gromov: *Rhinoceros mercki* Jäger, 1839 (recte *S. kirchbergensis*).

Present attribution: impossible (material unavailable).

Accompanying fauna (biostratigraphy in the same level): none.

4. Podol'sk

Locality: in gravel, at the depth of about 4 m, in a clay quarry near Podol'sk, about 40 km south of the center of Moscow (Moscow Region).

Year of the find: spring of 1939.

Approximate geographic co-ordinates: 55° 30' N – 37° 30' E.

Reference: Belyaeva 1940.

Illustrations of the material: none.

Material: a maxilla fragment with five teeth [PIN 326].

Preservation: at present, the material is untraceable. Previously, it was in the collections of the PIN in Moscow, considering that in an old card-index of this Institution, under "*Rhinoceros mercki* (?)", I found one inscribed with "PIN 326 maxilla fragment found near Podol'sk".

Chronostratigraphy: Belyaeva (1940) referred the remains to the Russian Middle Pleistocene.

Previous Belyaeva attribution: *Rhinoceros* cf. *mercki* Jaeger, 1839 (recte *S.* cf. *S. kirchbergensis*).

Present attribution: impossible (material not available).

Accompanying fauna (biostratigraphy in the same level): a fragment of pelvis of *Elephas* sp. was also recovered, but it is not clearly indicated whether it was discovered in the same level where the *S. kirchbergensis* remains were found.

5. Malyutino

Locality: near Malyutino, about 30 km west of Kursk (Kursk Region).

Year of the find: unknown.

Approximate geographic co-ordinates: 51° 40' N – 35° 55' E.

Reference: Alekseeva L.I. 1990.

Illustrations of the material: none.

Material: some no better specified odontological remains.

Preservation: at present, the material is not traceable.

5.1. Note

Alekseeva (1990:25 and 65) briefly cited a discovery of "teeth attributed to *Dicerorhinus mercki* (Jaeger) found together with other faunal remains referred to *Bison priscus* Boj". No further information is available. This represents the only reference to this find in literature.

Chronostratigraphy: not available.

Previous Alekseeva attribution: *Dicerorhinus mercki* (Jaeger, 1839) (recte *S. kirchbergensis*).

Present attribution: impossible (material not available).

Accompanying fauna (biostratigraphy in the same level): it is not clearly testified whether the remains referred to *Bison priscus* Bojanus 1827 were found in the same level.

6. Shchigry

Locality: near the village of Shchigry, about 55 km northeast of Kursk (Kursk Region).

Year of the find: 1938.

Approximate geographic co-ordinates: 51° 50' N – 36° 50' E.

Reference: Belyaeva 1940.

Illustrations of the material: none.

Material: an isolated first upper molar [PIN 725].

Preservation: at present, the material is untraceable. Previously, it was in the collections of the PIN in Moscow, considering that in an old card-index of this Institution, under “*Rhinoceros mercki* (?)”, I found a reference to “PIN 725 tooth found near Shchigry”.

6.1. Note

Belyaeva (1940:82) briefly mentioned “verkhnechelystny zub nosoroga ne tipa *tichorhinus*, vozmozhno Merka ?...” [literally, “an upper tooth of non-*tichorhinus* (recte *C. antiquitatis*) type, possibly Merck ? (= *Rhinoceros mercki* Jaeger ?), recte *S. kirchbergensis* Jäger ?”] collected in 1938 with some other fossil skeletal remains (a tooth fragment of a juvenile *Elephas* sp. and an incisor of *Equus* sp.).

Chronostratigraphy: Belyaeva (1940) referred the remains to the Russian Middle Pleistocene.

Previous Belyaeva attribution: “*Rhinoceros mercki* Jaeger ?” (recte *S. kirchbergensis* ?).

Present attribution: impossible (material unavailable).

Accompanying fauna (biostratigraphy in the same level): it is not clearly testified whether the remains of *S. kirchbergensis* and those of *Elephas* sp. and *Equus* sp. came from the same level.

7. Tungus – Peninsula of

Locality: clayey land strip on the left bank of the Volga, about 11 km southwest of Khryashchevka and about 2 km southwest of the mouth of the Bol'shoy Cheremshan River (Tungus Peninsula, Samara Region). The Tungus Peninsula is situated between the towns of Sengiley and Novodevich'e, on the left bank of the Volga.

Year of the find: 1935.

Approximate geographic co-ordinates: 53° 30' N – 49° 05' E.

References: Gromova 1932, 1935; Belyaeva 1939b.

Illustrations of the material: none.

Material: two upper teeth fragments [n.n.], a radius [PIN 131/293], and an os carpale [PIN 131/27–28].

7.1. Note 1

According to Belyaeva (1939b:86), only the two upper teeth fragments were discovered. Belyaeva ascribed the same to “*Rhinoceros mercki*” (recte *S. kirchbergensis*) considering them “different from the teeth of *Rhinoceros tichorhinus* (recte *C. antiquitatis*) and much alike to those of *Rhinoceros mercki*” [in Belyaeva (1939b:87): “Eti zuby po svoemu stroeniyu rezko otlichayutsya ot zubov *Rh. tichorhinus* i imeyut bol’shoe shodstvo s zubamy *Rh. mercki*”].

Preservation: the material is not available. The entire fossil collection was completely lost during a fire. The contents of this very collection is known only by the writings of P.A. Osokov.

Chronostratigraphy: Mindel-Riss or Riss-Würm (Belyaeva 1939b).

Previous Gromova attribution: *Rhinoceros mercki* Jaeger, 1839 (recte *S. kirchbergensis*).

Present attribution: impossible (material not available).

Accompanying fauna (biostratigraphy in the same level): unknown.

7.2. Note 2

Excavations begun in 1912 (by K.M. Kuz’minsky) were resumed in 1926, and carried on until 1936, showing a rich layer (1106 remains, about thirty species altogether) with presence of *Coelodonta antiquitatis* (Blumenbach 1799), *Equus hydruntinus* Regalia 1904, *Megaloceros giganteus* (Blum. 1803), *Cervus elaphus* L. 1758, *Camelus knoblochi* Nehring 1884 (= *Camelus knoblochi* Poljakov 1881), *Bison priscus* Bojanus 1827, *Saiga tatarica* L. 1758, and many others together with a calcaneum and two costulae assigned to *Homo sapiens* cf. *H. s. neanderthalensis* Schwalbe (recte *Homo* cf. *H. neanderthalensis* King 1864). The faunal complex covers both Russian Middle and Late Pleistocene.

In this area, *S. kirchbergensis* is included in the so-called “Khazarskaya Fauna” [Khazar Fauna] or “Khazarsky Terio-kompleks” [Khazar Therio-complex]. On the Khazar Fauna, see also Cheremukhova Krucha [16] and Cherny Yar (or Nizhnee Zaymishche) [18].

8. Samara – City of

Locality: Samara (ex Kuybishev), uliza Pugachevskaya [Pugachev street] (Samara region).

Year of the find: 1932.

Approximate geographic co-ordinates: 53° N – 50° E.

Reference: Strizheva 1991.

Illustrations of the material: none.

Material: an isolated fourth upper premolar [SOIKM 5561/1], an isolated second upper molar [SOIKM 5561/2], and a labial crown fragment of a third upper molar [SOIKM 5561/3].

8.1. Note

The remains were found in addition to five *C. antiquitatis* teeth during works under the uliza Pugachevskaya [Pugachev street]. Stratigraphic data are unavailable.

Preservation: “P.V. Alabin” Historical-Ethnographic Regional Museum, pr. Lenina 142, 443041 Samara.

Preservation status: damaged remains.

Chronostratigraphy: according to Strizheva (1991), Russian Middle Pleistocene.

Previous Strizheva attribution: *Dicerorhinus kirchbergensis* (Jäger 1839) (recte *S. kirchbergensis*).

Present attribution: confirmed, *S. kirchbergensis*.

Accompanying fauna: dubiously *C. antiquitatis*, but the precise level in which the five teeth belonging to this species were collected is unknown.

9. Samara – Region of

9.1. Note

Brandt (1877:9) and Gromova (1935:96, par. 4) generically reported on remains of *Rhinoceros mercki* Jaeger (recte *S. kirchbergensis*) found in the Samara region (ex Kuybishev region) by Goncharov without any indication of locality. According to Brandt (1877), the material was in the collections of the “G.V. Plekhanov” Gorny Institut [“G.V. Plekhanov” Institute of Mines] in St. Petersburg. Gromova (1935:96, par. 4) also wrote that she was unable to trace the remains in the 1930s. Further information is unavailable.

In terms of facts, there is no concrete relation to this report, as well as for the discoveries on Khoroshevsky Island [10].

10. Khoroshevsky – Island of (also Khvalynsk)

In toponymy, Khoroshevsky and Khvalynsk represent two different localities. In literature, they must be considered as synonyms indicating the same paleontological site.

10.1. Note

In 1914, on a bank – submerged by the Volga – of Khoroshevsky Island (52° 15' N – 48° 10' E) in front of the village of Alekseevka (about 23 km south of Khvalynsk and about 50 km northeast of Volzhsk, Khvalynsk district, Saratov region), a fossiliferous deposit was discovered. It yielded an extremely rich collection of Russian Middle and Late Pleistocene vertebrate remains (about 28 taxa, included a skull fragment showing some neanderthaloid characters). No stratigraphic data are available. Initially the fossil material was preserved at the Khvalinsk Ethnographic Museum. Later, it was transferred to the PIN in Moscow to perform a study on it.

According to some authors (Gromova 1935; Alekseeva, L.I. 1977, inter alios), Pavlova (1933) would refer to a “find of remains of *Rhinoceros mercki* Jaeger” (recte *S. kirchbergensis*). Moreover, in an old PIN card-index, under “*Rhinoceros mercki* (?)” (sic), I found one inscribed “PIN 2212 tooth possibly found at Khvalynsk, previously preserved in the Khvalinsk Ethnographic Museum collections, later transferred to the PIN”.

After an attentive analysis of the Pavlova’s paper, I did not find any reference to discoveries of *R. mercki*. On the contrary, only *R. tichorhinus* (recte *C. antiquitatis*) is listed. It is interesting to observe that – at that time – Gromova (1932:71–72) was perfectly aware of the discovery, so much so as to consider the rhinoceros material belonging to *R. tichorhinus*. This obviously represents another case of misidentification (as in the case of the discovery in the Samara Region [9]). However, the PIN 2212 isolated tooth is untraceable nor any illustrations of it are available.

11. Klevenka–1

Locality: on the steep left bank of the Bol’shoy Igriz River, about 1 km north of Klevenka (Ivanteevka District, Saratov Region).

Year of the find: between 1925 and 1930.

Approximate geographic co-ordinates: 52° 10' N – 49° 05' E.

Reference: Belyaeva 1935.

Illustrations of the material: none.

Material: a proximal epiphysis of radius dx [n.n.].

Preservation: at present, the material is not traceable. According to Belyaeva (1935:303), it was previously preserved at the Pugachev Ethnographic Museum

[PMK] in Pugachev (Saratov region). Later, it was probably transferred by Belyaeva to the PIN in Moscow.

Chronostratigraphy: on the basis of the geologic data provided by Gromov (1933), Belyaeva (1935:306) hypothesized a Mindel or a Mindel-Riss age.

Previous Belyaeva attribution: *Rhinoceros mercki* Jaeger, 1839 (recte *S. kirchbergensis*).

Present attribution: impossible (material not available).

Accompanying fauna (biostratigraphy in the same level): *Bison priscus*, *Mammuthus* sp.

11.1. Note

Belyaeva (1935) briefly described the steep left bank of the Bol'shoy Igriz where fossil skeletal remains belonging to *Rhinoceros mercki* (recte *S. kirchbergensis*), *Bison priscus*, *Mammuthus* sp. (Mindel-Riss, for the three species), *Ursus (Spelaearctos) spelaeus rossicus* Borisiak 1930 (recte *Ursus spelaeus rossicus* Borisiak 1930) (Riss II–Riss-Würm), *C. antiquitatis* and *Mammuthus* sp. (Riss-Würm, for the last two species) came to light.

The fossil material was recovered between 1925 and 1930 by K.I. Zhuravlev. Named Klevenka–1, the site is situated very near Klevenka–2 [12].

12. Klevenka–2

Locality: on the steep right bank of the Bol'shoy Igriz River, about 2.5 km north of Klevenka (Ivanteevka District, Saratov Region).

Year of the find: between 1925 and 1930.

Approximate geographic co-ordinates: 52° 10' N – 49° 05' E.

Reference: Belyaeva 1935.

Illustrations of the material: none.

Material: a proximal epiphysis of ulna dx [n.n.].

Preservation: at present, the material is untraceable. According to Belyaeva (1935:303), it was previously preserved at the Pugachev Ethnographic Museum [PMK] in Pugachev (Saratov region). Later, it was probably transferred by Belyaeva to the PIN in Moscow.

12.1. Note

According to Belyaeva (1935:304), the remains represent the sole fossil found (by K.I. Zhuravlev between 1925 and 1930) in this site. Named Klevenka–2, it is situated very near Klevenka–1 [11].

Chronostratigraphy: on the basis of the geologic data provided by Gromov (1933), Belyaeva (1935:306) hypothesized a Mindel or a Mindel-Riss age.
Previous Belyaeva attribution: *Rhinoceros mercki* Jaeger, 1839 (recte *S. kirchbergensis* [Jäger, 1839]).
Present attribution: impossible (material unavailable).

13. Kurilovka

Locality: on the steep right bank of the Bol'shoy Uzen' River, about 5 km north-east of Kurilovka (Novouzensk District, Saratov Region).

Year of the find: 1929.

Approximate geographic co-ordinates: 50° 40' N – 48° 05' E.

References: Belyaeva 1935; Gromova 1935.

Illustrations of the material: none.

Material: a juvenile mandible [N° 110; identification number ab origine attributed by the Pugachev Ethnographic Museum] (Fig. 6 in this paper).



Fig. 6

Stephanorhinus kirchbergensis (Jäger, 1839); right bank of the Bol'shoy Uzen' River, about 5 km northwest of Kurilovka (Novouzensk District, Saratov Region, European Russia); juvenile mandible [PMK 110], occlusal view

Preservation: at present, "YU.A. Orlov" (at present, "A.A. Borissyak") PIN RAN Museum (Profsoyuznaya 123, 117997 Moscow). Initially it was preserved at the Pugachev Ethnographic Museum [PMK] in Pugachev (Saratov Region). Later, the mandible was given to Gromova to restore it (Belyaeva 1935:303, footnote 1; Gromova 1935:99). In future, the mandible will probably be returned to the Pugachev Ethnographic Museum (uliza Toporkova 25, 413720 Pugachev).

Preservation status: damaged remains.

13.1. Note

On the basis of the Pugachev Ethnographic Museum inventorial book, the mandible is the only remain found (by K.I. Zhuravlev) in this site and it would have been in the Pugachev Museum collections. The mandible had been officially considered lost for many years. I found it at the PIN RAN Museum in Moscow.

Chronostratigraphy: on the basis of the geologic data provided by Gromov (1933), Belyaeva (1935:306) hypothesized a Mindel or a Mindel-Riss age.

Previous Belyaeva and Gromova attributions: *Rhinoceros mercki* Jaeger, 1839 (recte *S. kirchbergensis*).

Present attribution: confirmed, *S. kirchbergensis*.

Accompanying fauna (biostratigraphy in the same level): none.

14. Rakhmanovka

Locality: on the steep left bank of the Kamelik River, about 2 km north of Rakhmanovka, at the border between the districts of Pugachev and Perelyub (Saratov Region).

Year of the find: July of 1928.

Approximate geographic co-ordinates: 51° 55' N – 49° 15' E.

Reference: Belyaeva 1935.

Illustrations of the material: none.

Material: an os magnum dx [n.n.], an os metatarsale II dx [n.n.], an os metatarsale III dx [n.n.], and a phalanx III3 [n.n.].

Preservation: at present, the material is not traceable. According to literature, it was formerly preserved at the Pugachev Ethnographic Museum [PMK] in Pugachev (Saratov Region). Later, it was probably transferred by Belyaeva to the PIN in Moscow.

14.1. Note

The material was recovered by K.I. Zhuravlev together with remains assigned to *Bison priscus longicornis* Gromova 1935 and *Megaloceros giganteus* (Blum 1803).

Chronostratigraphy: Belyaeva (1935:306) – on the basis of the geologic data provided by Gromov (1933) and considering the accompanying presence of *B. priscus longicornis* and *M. giganteus* – suggested a Mindel or a Mindel-Riss age.

Previous Belyaeva attribution: *Rhinoceros mercki* Jaeger, 1839 (recte *S. kirchbergensis*).

Present attribution: impossible (material not available).

Accompanying fauna (biostratigraphy in the same level): it is not clearly testified whether the remains of *S. kirchbergensis* and those of *B. priscus longicornis* and *M. giganteus* came from the same level.

15. Tarasovka

Locality: on the right bank of the Kamelik River, about 3 km north of Tarasovka (Pugachev District, Saratov Region).

Year of the find: unknown.

Approximate geographic co-ordinates: 52° 05' N – 49° 20' E.

Reference: Belyaeva 1935.

Illustrations of the material: none.

Material: an os magnum sx [n.n.], an os trapezoideum sx [n.n.], and an os unciforme sx [n.n.].

Preservation: at present, the material is untraceable. According to literature, it was formerly preserved at the Pugachev Ethnographic Museum [PMK] in Pugachev (Saratov Region). Later, it was probably transferred by Belyaeva to the PIN in Moscow.

15.1. Note

The material – found together with remains of *Mammuthus* sp. and *Vulpes* sp. and recovered by K.I. Zhuravlev – belongs to the same individual.

Chronostratigraphy: on the basis of the geologic data provided by Gromov (1933), Belyaeva (1935:306) hypothesized a Mindel or a Mindel-Riss age.

Previous Belyaeva attribution: *Rhinoceros mercki* Jaeger, 1839 (recte *S. kirchbergensis*).

Present attribution: impossible (material not available).

Accompanying fauna: it is not clearly indicated whether the remains of *S. kirchbergensis* and those of *Mammuthus* sp. and *Vulpes* sp. were found in the same level.

16. Cheremukhova Krucha

Locality: on the right bank of the Sestra River, at the village of Cheremukhova Krucha (Vyazova Krucha) (Perelyub District, Saratov Region).

Year of the find: between 1925 and 1930.

Approximate geographic co-ordinates: 52° 05' N – 49° 30' E.

Reference: Belyaeva 1935.

Illustrations of the material: none.

Material: an os metacarpale IV sx [n.n.].

16.1. Note

The material was found by K.I. Zhuravlev together with remains of *Elasmotherium sibiricum* Fischer v. Waldheim 1808. They are included here in the so-called “Khazarskaya Fauna” [Khazar Fauna] or “Khazarsky Terio-kompleks” [Khazar Therio-complex]. On the Khazar Fauna, see also the Tungus Peninsula [7] and Cherny Yar (or Nizhnee Zaymishche) [18].

Preservation: at present, the material is not traceable. According to literature it was formerly preserved at the Pugachev Ethnographic Museum [PMK] in Pugachev (Saratov Region). Later, it was probably transferred by Belyaeva to the PIN in Moscow.

Chronostratigraphy: on the basis of the geologic data provided by Gromov (1933), Belyaeva (1935:306) hypothesized a Mindel or a Mindel-Riss age.

Previous Belyaeva attribution: *Rhinoceros mercki* Jaeger, 1839 (recte *S. kirchbergensis*).

Present attribution: impossible (material not available).

Accompanying fauna (biostratigraphy in the same level): *E. sibiricum*.

17. Podosinik

Locality: Podosinik village, along the Volga (? Volgograd Region). No other information is available (locality not found in atlases, e.g. the atlas of the Russian Federal Geographical and Cartographic Survey, Moscow 1998) (Volgograd Region = ex Stalingrad Region).

Year of the find: 1937.

Approximate geographic co-ordinates: non determinable.

References: unpublished material.

Illustrations of the material: none.

Material: a fragmentary hemimandible [GIN 839-3].

Preservation: Laboratory of the Pleistocene Stratigraphy, Geological Institute [GIN RAN], Russian Academy of Sciences, Pyzhevsky per. 7, 109017 Moscow.

Preservation status: damaged remains.

17.1. Note

Fossil remains not reported in literature. Outwardly, on the horizontal branch, a singular hand-written inscription: “pravaya vetv’ nizhney chelyusti (kollekzya 839-3) naydena 9 Maya 1937 goda krestyaninom (Aleksandrom Krotkovym) v 25 shagakh na yug ot derevni Podosinik (reka Volga) – na doroge” [literally, “right branch of a lower maxilla (collection 839-3), found

on May 9, 1937 by a farmer (Aleksandr Krotkov) at 25 steps south of Podosinik village (Volga River) – on the way” (obviously, on the Aleksandr Krotkov way)].

No further information is available, such as the region where the village of Podosinik is situated. At present, the official Russian atlases do not report toponyms as “Podosinik”. We can make three suppositions: 1) throughout the years, this locality has changed its name (this is a very common situation, especially after Perestroika); 2) Podosinik village is a very small agglomeration along the Volga not reported on the maps; 3) a transcription error.

At present we may postulate that Podosinik is (or was) probably situated along the Middle-Lower Volga.

Chronostratigraphy: unknown.

Previous attribution (by ?): *Rhinoceros mercki* Jaeger, 1839 (recte *S. kirchbergensis*).

Present attribution: confirmed, *S. kirchbergensis*.

Accompanying fauna (biostratigraphy in the same level): none.

18. Cherny Yar (or Nizhnee Zaymishche)

In toponymy, Cherny Yar and Nizhnee Zaymishche represent two different localities. In literature, both localities may indiscriminately be cited. However, they must be considered as synonyms indicating the same paleontological site.

Geographic note: “Cherny Yar” [“steep black bank”] is a very common toponym of many villages in Russia. According to the official atlases, throughout Russian Federation territory there exist not less than 12 localities named “Cherny Yar”.

Locality: on the right bank of the lower course of the Volga, between the villages of Cherny Yar and Nizhnee Zaymishche (Astrakhan’ Region).

Year of the find: 1929.

Approximate geographic co-ordinates: 48° 05’ N – 46° 10’ E.

Reference: Gromova 1935.

Illustrations of the material: in Gromova 1935 (Pl. I–Figs 1, 2; Pl. II–Figs 5, 6; Pl. III–Figs 8, 9).

Material: a full mandible [ZIN 16948] and a right hemimandible [ZIN 29854].

18.1. Note 1: on the identification numbers of the remains

In Gromova (1935:98–101), the ZIN 16948 mandible is correctly reported, whereas in literature it is erroneously cited as GIN 16948. The ZIN 29854 hemimandible is reported by Gromova (1935:99–101), without identification number.

18.2. Note 2: on the ZIN 16948 mandible

Gromova (1935:98 and followings – Pl. I–Fig. 1; Pl. II–Fig. 5; Pl. III–Fig. 8) shortly referred to a full mandible (ZIN 16948) – by the same author attributed to “*Rhinoceros mercki* Jaeger, – coming from the lower course of the Volga near Cherny Yar”, without further information.

In the old ZIN collection card ledgers, the mandible is indicated by the number “399-1932” as well as in a ZIN card-index under “*Rhinoceros merckii* Jaeg.”. Both sources also give the date of the discovery – “30.IX.1929” – and that the specimen “formerly preserved at the Astrakhan’ Ethnographic Museum, was transferred to the ZIN by P.A. Pravoslavlev”.

18.3. Note 3: on the ZIN 29854 hemimandible

In literature, only Gromova (1935:98 and following – Pl. I–Fig. 2; Pl. II–Fig. 6; Pl. III–Fig. 9) briefly reported on a right hemimandible – without identification number – ascribed by the same author to *Rhinoceros mercki* Jaeger “coming from the lower course of the Volga near Cherny Yar and preserved at the Geologicheskoy Kabinety Leningradskoy Universitety [Geologic Laboratory of the Leningrad State University]”.

In the old ZIN collection card ledgers I found a reference to a hemimandible (ZIN 29854; N° 179-1971) assigned to *Rhinoceros mercki* and unearthed “on 2.X.1929 along the lower course of the Volga near Cherny Yar”. As far as facts are concerned, this reference is concrete proof within the ZIN RAN Museum collections. When comparing the ZIN 29854 remains with the Gromova (1935) illustrations (see above), we may easily conclude that the ZIN 29854 hemimandible is the same reported by Gromova.

Preservation: formerly, both remains [ZIN 16948 and ZIN 29854] were in the Astrakhan’ Ethnographic Museum collections. At present, they are at the ZIN RAN (Laboratory of Theriology, History of the Fauna Branch, Universitetskaya Naberezhnaya 1, 199034 St. Petersburg).

Preservation status: damaged remains.

Chronostratigraphy: Mindel-Riss (according to Gromova 1935).

Previous Gromova attribution: *Rhinoceros mercki* (recte *S. kirchbergensis*) in both the cases.

Present attribution: confirmed, *S. kirchbergensis* in both the cases.

Accompanying fauna (biostratigraphy in the same level): unknown.

18.4. Note 4: on the paleontological site

It was very rich in fauna. From 1929 until 1931, remains belonging to 27 mammalian species – *Homo* sp. included (an ulna and a tibia) – were col-

lected. Svitoch and Yanina (1997) provided new data on the basis of which fourteen different levels (from Q_{IV} to Q_I^b [= NP_{IV} to NP_I^b]) are recognized in this site. The faunal complex here covers all of the Pleistocene.

S. kirchbergensis is included here in the so-called “Khazarskaya Fauna” [Khazar Fauna] or “Khazarsky Terio-kompleks” [Khazar Therio-complex]. On the Khazar Fauna, see also the Tungus Peninsula [7] and Cheremukhova Krucha [16].

The site is situated about 40 km northwest of Nikol'skoe [21].

18.5. Note 5: on a new find from Cherny Yar

Recently (2012), a Mc IV apparently very close to those belonging to *S. kirchbergensis* has been found (the remains have not yet been published).

19. “Girey” Quarry

Locality: “Girey” Quarry, on a Kuban' River terrace, near the village of Girey and the Kavkaz railway station, not far from the town of Kropotkin (Kuban' River Basin, Krasnodar Region, Northern Caucasus).

Year of the find: 1935–36.

Approximate geographic co-ordinates: 45° 05' N – 38° 30' E.

References: Kolbutov 1935–36; Gromov 1948; Vereshchagin 1959.

Illustrations of the material: none.

Material: a molar on a mandibular fragment [n.n.].

Preservation: material not available. According to literature, the remains (collected by A.D. Kolbutov) would have been in the osteological collections of the Kropotkin Regional Museum.

19.1. Note

Gromov (1948:50–52) pro parte refers to the Kolbutov (1935–36) report. Furthermore, Gromov (1948:448–449) also briefly reports on “*Rhinoceros mercki* Jaeger and on its scarce presence on USSR territory” (as well as in Belyaeva [1935:306], in Alekseeva, E.V. [1980:58], inter alios). Only Vereshchagin (1959:92, footnote 1) states that “the isolated lower molar of *Rhinoceros mercki* (recte *S. kirchbergensis*) and the fossil remains assigned to *Rhinoceros antiquitatis* (recte *C. antiquitatis*), *Elephas wüsti* Pavlova, 1914 (recte *Mammuthus trogontherii* [Pohlig, 1885]), *Elephas primigenius* (recte *Mammuthus primigenius* [Blum.]), *Bison priscus* cf. *B. p. longicornis*, *Bison priscus deminutus*, and *Megaloceros* sp. have been lost [literature original text, “byli utracheny”] during World War II.

Chronostratigraphy: according to the authors, Mindel or Mindel-Riss age.

Previous Kolbutov (?) attribution: *Rhinoceros mercki* Jaeger (recte *S. kirchbergensis*).

Present attribution: impossible (material unavailable).

Accompanying fauna: it is not clearly testified whether the remains of *S. kirchbergensis* and those of *R. antiquitatis* (recte *C. antiquitatis*), *E. wüsti* (recte *M. trogontherii*), *E. primigenius* (recte *M. primigenius*), *B. p. deminutus*, *B. p.* cf. *B. p. longicornis*, and *Megaloceros* sp., were found in the same level.

20. Mysy Layshevsky

Locality: village of Mysy near the Kama River (Layshev District, Republic of Tatarstan).

Year of the find: 1890.

Approximate geographic co-ordinates: 55° 45' N – 51° 30' E.

References: Chersky 1891:607; Gromova 1935:97; Aver'yanov et al. 1992:68.

Illustrations of the material: none.

Material: a mandibular fragment [N° 465].

Preservation: at that time, "Musey Ural'skogo Obshchestva lyubiteley estestvoznanya" [Museum of Ural Lovers of (natural) science Association], without any indication of the locality (Chersky 1891; Gromova 1935; Aver'yanov et al. 1992).

Previous Chersky attribution: *Rhinoceros mercki* Jaeger (recte *S. kirchbergensis*).

Present attribution: impossible (material not found).

No further data are available.

From the following two other Russian-European localities comes material previously erroneously assigned to *S. kirchbergensis*, afterwards re-attributed to other Pleistocene rhinoceros species, respectively, *C. antiquitatis* and *Stephanorhinus* cf. *S. etruscus* (Falconer 1868).

20/bis. Mysy Layshevsky

Locality: on the right bank of the Kama River, between the mouths of the Kama and Mesha Rivers, near the village of Mysy Layshevsky (Layshev District, Republic of Tatarstan).

Year of the find: not indicated.

Approximate geographic co-ordinates: 55° 45' N – 51° 30' E.

References: Gromova 1932, 1935; Alekseeva, L.I. 1977; Aver'yanov et al. 1992:67.

Illustrations of the material: none.

Material: a mandible [GMM KGU 1930].

Preservation: Museum of Geology and Mineralogy, Institute of Geology and Paleontology, Kazan' State University [GMM KGU] (uliza Kremleva 18, 420007 Kazan', Republic of Tatarstan).

Preservation status: a very well-preserved specimen.

Previous authors attribution: *Rhinoceros mercki* Jaeger by Gromova and *Dicerorhinus mercki* (Jäger, 1839) by Alekseeva (in both cases, recte *S. kirchbergensis*).

Present attribution (new diagnosis by Billia): the dental morphological characteristics shown by the teeth of the well-preserved mandible GMM KGU 1930 – erroneously referred to as *R. mercki* by Gromova (1932, 1935) and as *Dicerorhinus mercki* by Alekseeva (1977) – are peculiar of *C. antiquitatis*. For this reason, it must be attributed to this last taxon.

21. Nikol'skoe

Locality: on the right bank of the lower course of the Volga, near the village of Nikol'skoe, about 170 km southeast of Volgograd (ex Stalingrad) and about 200 km northwest of Astrakhan' (Astrakhan' Region, European Russia).

Year of the find: summer of 1930.

Approximate geographic co-ordinates: 47° 50' N – 46° 15' E.

References: Gromova 1932, 1935.

Illustrations of the material: Gromova (1932, Pl. V–Figs 1, 2).

Material: a juvenile right fragmentary hemimandible [previously NGI 84, later ZIN 16290] with a third and a fourth deciduous molar (D₃, D₄), a first and a second permanent molar (M₁, M₂).

21.1. Note 1: on the specimen

In Gromova (1932:153, 155, 183), the specimen is cited as NGI 84, while in Gromova (1935:98, 99, and 102), the same is reported as ZIN 16290 (just as later in Avakyan 1959:33). In the relatively copious literature of the 20th century the hemimandible is erroneously reported as GIN 16290 or GIN 16948. It is necessary to bear in mind that very frequently in literature the GIN 16948 inventorial number was erroneously identified with the mandible coming from Cherny Yar (or Nizhnee Zaymishche [18]).

21.2. Note 2: on the paleontological site

The hemimandible was recovered during work carried out – along that part of the Volga – by the Neftyaný Geologo-Razvedochny Institut [NGI] [Petroleum Geologic Investigation Institute]. Together with the hemimandible, abundant fossil skeletal material ascribed to many mammalian species was collected. Later (between 1960 and 1983) other systematic excavations were

carried out at this site, allowing recognition of six different levels in stratigraphic succession (from Q_{IV} to Q_I [= from NP_{IV} to NP_I]).

The site lies about 40 km southeast of Cherny Yar (or Nizhnee Zaymishche [18]).

Preservation: at present, the material is untraceable. Previously preserved at the NGI (here identified as NGI 84), later it was entrusted by Gromova (Gromova 1932:69) to the ZIN in St. Petersburg. Here, in an old card-index, under “*Rhinoceros merckii*”, I found a card concerning this hemimandible correctly identified by the ZIN 16290 identification number.

Chronostratigraphy: Mindel age, according to Gromova (1932:170).

Previous authors attribution: “*Rhinoceros* sp.? (*Mercki* Jaeg. aut *etruscus* Falc.)” [= *Rhinoceros* sp.? (*S. kirchbergensis* Jäg. aut *S. etruscus* Falc.)] (Gromova 1932:74 and 153–156), whereas later Gromova (1935:98–99, 102) dubiously ascribed the hemimandible to “*Mercki* Jäg”.

Present attribution (new diagnosis by Billia): on the basis of the morphology of the first molar (M₁) (Pl. V, Figs 1, 2 in Gromova 1932), the hemimandible would have to be attributed to *Stephanorhinus* cf. *S. etruscus* (Falconer, 1868) (= *Rhinoceros* cf. *R. etruscus* Falconer, 1868).

Remarks

On the basis of the fossil evidence, *S. kirchbergensis* – though widely spread throughout Eurasia – seems to be decidedly rare on Russian territory (just as in the rest of Eurasia). On the other hand, some authors (Gromova 1932, 1935, 1965; Belyaeva 1935, 1940; Gromov 1948; Alekseeva 1980) pointed out the scarce presence of *S. kirchbergensis* in Russia. Furthermore – as a general rule – all the Dicerorhinae appear to be rare in Russia.

In the present paper, often neither chrono- nor biostratigraphic data are available because of the lack of reliable data.

As to the *S. kirchbergensis* Russian European distribution, the Middle-Lower Volga area represents one of the few “concentrations” of the discoveries of remains ascribed to this species.

The few other *S. kirchbergensis* remains from Asian Russia (Western Siberia) have been described in previous papers in detail (Billia 2007; Shpansky and Billia 2012). During a study of the material housed at the Kemerovo Regional Ethnographic Museum, I verified that the KKM 70 remains – found in Novokuznetsk (ex Stalinsk) (Kemerovo Region, southeast Western Siberia) – reported by Alekseeva (1980:58) as a “*Dicerorhinus kirchbergensis* hemimandible” actually corresponds to an *Elephas* sp. hemimandible.

As to Eastern Siberia, to date the most noteworthy Russian record (quite rarely mentioned in European literature) concerns the ZIN 10718 skull from the Irkutsk region (Chersky 1874; Brandt 1877; Billia 2008b, 2010), while the northernmost

one (because of its extraordinary latitude close to 64° N) is represented by the two teeth (PIN 750/139–140) from the Vilyuy River (Sakha Republic/Yakutya) (Dubrovo 1957). So far these are the only two records from Eastern Siberia.

Some authors (Schrenck 1880:2; Freidel 1880:353–359; Woodward 1881:90) reported on “a body of a large Rhinoceros ... found [in 1877] on the bank of a small tributary to the Yana River [Verkhoyansk District, Yakutya, Northeastern Siberia] ... remarkably well-preserved ... and covered by long hair ...”. Considering the “body covered by long hair”, we may confidently assign these remains to *C. antiquitatis*.

Finally, in the Russian European museum collections, few other *S. kirchbergensis* specimens – even if recovered elsewhere than Russia – are also available. They come from Poland and Kazakhstan (Pusch 1836; Brandt 1877:97, Pl. III–Figs 2, 3, 4; Chersky 1891:519–520; Gromova 1935:95 and 102, Pl. I–Fig. 3, Pl. II–Fig. 7, Pl. III–Fig. 10; Khisarova 1963–Pl. II–III; vide autem in Billia 2011).

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References

- Alekseeva, E.V. 1980: Mlekopitayushchie pleystozena Yugo-Vostoka Zapadnoy Sibiri (Hishchnye, Khotbotnye, Kopytnye) (Pleistocene mammals from southeast Western Siberia) (in Russian). – Akademya Nauk SSSR, Dal'nevostochny Nauchny Zentr Biologii (Pochv. Institut), Izd-vo "Nauka", Moskva, 187 pp.
- Alekseeva, L.I. 1977: Teriofauna rannego antropogena Vostochnoy Evropy (Early anthropogene theriofauna of Eastern Europe) (in Russian). – Trudy Geologicheskogo Instituta, Akademya Nauk SSSR, Izd-vo "Nauka", 300, Moskva, pp. 1–214.
- Alekseeva, L.I. 1990: Teriofauna Verkhnego Pleystozena Vostochnoy Evropy (Krupnye Mlekopitayushchie) (Late Pleistocene theriofauna of Eastern Europe [Large mammals]) (in Russian, English abstract). – Akademya Nauk SSSR (Geologicheskyy Institut), Izd-vo "Nauka", Moskva, 109 pp.
- Avakyan, L.A. 1959: Chetvertichnye iskopaemye mlekopitayushchie Armenii (Quaternary fossil mammals of Armenia) (in Russian). – Izd-vo Akademya Nauk Armyanskooy SSR, Erevan, pp. 31–34.
- Aver'yanov, A.O., G.F. Baryshnikov, V.E. Garutt, N.V. Garutt, L.N. Fomicheva 1992: Volzhskaya fauna pleystozenovykh mlekopitayushchikh v kollekcii Geologo-Mineralogicheskogo Muzeya Kazanskogo Gosudarstvennogo Universiteta (Volga fauna in the collections of the Geological-Mineralogical Museum of the Kazan' State University) (in Russian). – Izd-vo Kazanskogo Gosudarstvennogo Un-ta, Kazan', 163 pp.
- Belyaeva, E.I. 1935: Nekotorye dannye o chetvertichnykh mlekopitayuscikh iz Nizhnevolzhskogo kraya po materialam muzeya g. Pugach. Zemlya (Some data on the Quaternary mammals from the area of the lower Volga based on the material housed in the Pugachev Regional Museum) (in Russian, German abstract). – In: Trudy Komissii po Izuchenyu Chetvertichnogo Perioda, IV, (2), pp. 303–308, Akademya Nauk SSSR, Izd-vo AN SSSR, Moskva – Leningrad.
- Belyaeva, E.I. 1939a: Ob ostatkakh iskopaemogo nosoroga iz okrestnostey g. Rybinska (On fossil rhinoceros remains from the environs of Rybinsk). – In: Voprosy Stratigrafii Chetvertichnykh Otlozhenii i ee Paleontologicheskoe Obosnovanie (in Russian). – Byulleten' Komissii po Izuchenyu Chetvertichnogo Perioda, 5, pp. 69–90, Izd-vo Akademya Nauk SSSR, Moskva – Leningrad.
- Belyaeva, E.I. 1939b: Zametki ob ostatkakh mlekopitayushchikh poluostrova Tunguz (On the mammalian remains from the Tunguz Peninsula) (in Russian). – Byulleten' Moskovskogo obshchestva ispytateley prirody (Otdel geologicheskyy), 17(6), pp. 76–79, Moskva.
- Belyaeva, E.I. 1940: Novye nakhodki ostatkov nosoroga Merka na territorii SSSR (New finds of Merck's rhinoceros remains on the Soviet Union territory) (in Russian). – Priroda (Paleozoology), 8, p. 82, Izd-vo Akademya Nauk SSSR, Moskva/Leningrad.
- Billia, E.M.E. 2007: First records of *Stephanorhinus kirchbergensis* (Jäger, 1839) (Mammalia, Rhinocerotidae) from the Kuznetsk Basin (Kemerovo region, Kuzbass area, South-East of Western Siberia). – Bollettino della Società Paleontologica Italiana, 46(2–3), pp. 95–100, Modena.

- Billia, E.M.E. 2008a: Revision of the fossil material attributed to *Stephanorhinus kirchbergensis* (Jäger, 1839) (Mammalia, Rhinocerotidae) preserved in the museum collections of the Russian Federation. *Quaternary International*, 179, pp. 25–37.
- Billia, E.M.E. 2008b: The skull of *Stephanorhinus kirchbergensis* (Jäger, 1839) (Mammalia, Rhinocerotidae) from the Irkutsk region (Southwest Eastern Siberia). – *Quaternary International*, 179, pp. 20–24.
- Billia, E.M.E. 2010: The famous *Stephanorhinus kirchbergensis* (Jäger, 1839) “Irkutsk skull” (Mammalia, Rhinocerotidae) from southwest Eastern Siberia briefly compared with those from Krapina and Warsaw (Eastern Europe). – *Studii și comunicări. Științele Naturii*, 26(1), pp. 296–302, Muzeul Olteniei, Craiova.
- Billia, E.M.E. 2011: Occurrences of *Stephanorhinus kirchbergensis* (Jäger, 1839) (Mammalia, Rhinocerotidae) in Eurasia. An account. – *Acta Palaeontologica Romaniae*, 7, pp. 17–40.
- Brandt, J.F. 1877: Versuch einer Monographie der Tichorhinen Nashörner nebst Bemerkungen über *Rhinoceros leptorhinus* Cuvier u.s.w. – *Mémoires de l'Académie Impériale des Sciences de St.-Petersbourg*, s. 7, XXIV(4), pp. 1–135, Sankt Peterburg.
- Chersky, I.D. 1874: Opisanie cherepa nosoroga, razlichnago ot' *Rhinoceros tichorhinus* (Description of a rhinoceros skull different from *Rhinoceros tichorhinus*) (in Russian). – *Zapiski Imperatorskoy Akademii Nauk*, XXV, pp. 65–75, Sankt Peterburg.
- Chersky, I.D. 1891: Opisanie kollekzii posletretichnykh” mlekopitayushchikh” zhivotnykh”, sobrannykh” Novo-Sibirskoyu Ekspediziyu 1885–1886 g. (Description of the post-tertiary mammals collected by the new Siberian expedition in 1885–1886) (in Russian). – *Prilozhenie k LXV-mu Tomu, Zapisok” Imperatorskoy Akademii Nauk*, 65(1), pp. 1–706, Sankt Petersburg.
- Dubrovo, I.A. 1957: Ob ostatkakh *Parelephas wüsti* (M. Pavl.) i *Rhinoceros mercki* Jaeger iz Yakutii (On remains of *Parelephas wüsti* [M. Pavl.] and *Rhinoceros mercki* Jaeger from Yakutya) (in Russian). – *Byulleten’ Komissii po Izuchenyu Chetvertichnogo Perioda*, 21, pp. 97–104, Izd-vo AN SSSR, Moskva/Leningrad.
- Flerov, K.K., B.A. Trominov, N.M. Yanoskaya 1955: Istoriya fauny mlekopitayushchikh v chetvertichnom periode (History of mammalian fauna in the Quaternary period) (in Russian). – *Akademya Nauk SSSR (Geologicheskyy Muzey)*, 40 pp, 37 figs, Moskva.
- Freidel, E. 1880: Ein Leichnam von *Rhinoceros merckii* aus Sibirien. – *Der Zoologische Garten*, Jhg 21, pp. 353–359, Frankfurt/M.
- Gromov, V.I. 1933: Izuchenie chetvertichnoy fauny Severnogo Kavkaza (Study of the Quaternary fauna of Northern Caucasus) (in Russian). – *Vestnik Akademii Nauk SSSR*, 4, Moskva – Leningrad.
- Gromov, V.I. 1939: Kratky sistematiichesky i stratigrafichesky obzor chetvertichnykh mlekopitayushchikh (Brief systematic and stratigraphic review of the Quaternary mammals) (in Russian). – *Vyp. 2*, pp. 163–223, Sankt Peterburg.
- Gromov, V.I. 1948: Paleontologicheskoe i arheologicheskoe obosnavanie stratigrafii kontinental'nykh otlozheny chetvertichnogo perioda na territorii SSSR (Palaeontological and archaeological background for the stratigraphy of the continental Quaternary deposits on USSR territory) (in Russian). – *Trudy Instituta Geologicheskoy Nauk AN SSSR (ser. Geologiya)*, 64(17), pp. 1–524, Akademya Nauk SSSR, Moskva.
- Gromova, V.I. 1932: Novye materialy po chetvertichnoy faune Povolzh'ya i po istorii mlekopitayushchikh Vostochnoy Evropy i Severnoy Azii voobshche (S prediesloviem prof. P.A. Pravoslavleva) (New material on the Quaternary fauna from Lower Volga and history of the mammals of Eastern Europe and Northern Asia in general [with a prologue by Prof. P.A. Pravoslavlev]) (in Russian, German abstract). – *Trudy Komissii po Izuchenyu Chetvertichnogo Perioda*, II, pp. 69–184, Izd-vo Akademii Nauk SSSR, Leningrad.
- Gromova, V.I. 1935: Ob ostatkakh nosoroga Mercka (*Rhinoceros mercki* Jaeg.) s Nizhney Volgi (Über die Reste des Merckschen Nashorn [*Rhinoceros mercki* Jaeg.] von der unteren Wolga) (in Russian, German abstract). – *Trudy Paleozoologicheskogo Instituta AN SSSR*, IV, pp. 91–136, Izd-vo Akademii Nauk SSSR, Moskva.
- Gromova, V.I. 1965: Kratky obzor chetvertichnykh mlekopitayushchikh Evropy (Opyt sopostavleniya) (Brief review of the Tertiary mammals of Europe) (in Russian). – *Komissia po Izuchenyu Chetvertichnogo Perioda, Akademya Nauk SSSR, Izd-vo “Nauka”*, Moskva, 143 pp.

- Khisarova, G.D. 1963: Iskopaemye kosti mlekopitayushchikh iz Koshkurganskogo grifona (Yuzhny Kazakhstan) (Mammalian osteological fossil remains from the Koshkurgan locality [Southern Kazakhstan]). – In: Materialy po Istorii Fauny i Flory Kazahstana (in Russian). Akademya Nauk Kazakhskoy SSR (Institut Zoologii), Izd-vo “Nauka” KazSSR, 4, pp. 42–43, 48–51, Alma-Ata.
- Kolbutov, A.D. 1935–1936: Geologicheskie nablyudeniya v bassejne r. Kubani letom 1935 g. (Geological observations in the Kuban’ river basin in summer 1935) (in Russian). – Institut Geologicheskoy Nauk, Akademya Nauk SSSR, Moskva, 137 pp.
- Kozhamkulova, B.S., N.N. Kostenko 1984: Vymershie zhyvotnye Kazahstana (Extinct animals of Kazakhstan). – In: Paleogeografiya Pozdnego Kaynozoya (in Russian). Akademya Nauk Kazakhskoy SSR (Zoologicheskogo Instituta), Izd-vo “Nauka” KazSSR, Alma-Ata, p. 54.
- Kretzoi, M. 1942: Präokkupierte und durch ältere zu ersetzende Säugetiernamen. – Földtani Közlöny, 72(4–12), pp. 345–349, Budapest.
- McKenna, M.C., S.K. Bell 1997: Classification of Mammals above the Species Level. – Columbia University Press, New York, 631 pp.
- Pavlova, M.V. 1933: Fauna mlekopitayushchikh sobrannykh v b. Saratovskoy gub., bliz g. Khvalynska na beregu r. Volgi (Faune des mammifères fossiles trouvés dans l’ancien gouvernement de Saratov près de la ville de Khvalinsk au bord du Volga) (in Russian). – Trudy Komissii po Izuchenyu Chetvertichnogo Perioda, 3(1), pp. 171–172, Leningrad.
- Pusch, G.G. 1836: Geognostische Beschreibung von Polen sowie der übrigen Nordkarpathen-Länder. – Stuttgart – Tübingen, Bd. II, 695 pp.
- Salov, I.N. 1957: Nakhodki iskopaemoy chetvertichnoy fauny v Smolenskoj oblasti (Finds of fossil Quaternary fauna in the Smolensk region) (in Russian). – Smolensky Oblastnoy Kraevedchesky Muzey, 2, pp. 311–333, Smolensk Knizhnoe Izd-vo, Smolensk.
- Schrenck, L. v. 1880: Der erste Fund einer Leiche von *Rhinoceros merckii*. – Zapiski Imperatorskoj Akademii Nauk, s. 7, 28(7), pp. 1–55, Sankt Peterburg.
- Shpansky, A.V., E.M.E. Billia 2012: Records of *Stephanorhinus kirchbergensis* (Jäger, 1839) (Mammalia, Rhinocerotidae) from the Ob’ River at Krasny Yar (Tomsk region, southeast of Western Siberia) (with Russian abstract). – Russian Journal of Theriology, 11(1), pp. 47–55, Moskva.
- Strizheva, I.M. 1991: Kostnye ostatki krupnykh mlekopitayushchikh v rayone Samarskoy Luki (Osteological remains of large mammals from the Samara Luka district) (in Russian). – Samarskaya Luka, 2, pp. 197–205, Samara.
- Svitoch, A.A., T.A. Yanina 1997: Chetvertichnye otlozheniya poberezhnyy Kaspiyskogo Morya (Quaternary deposits on the Caspian sea banks) (in Russian). – Izd-vo Moskovskogo Gosuniversiteta, Moskva, 268 pp.
- Vereshchagin, N.K. 1959: Mlekopitayushchie Kavkaza – Istoriya Formirovaniya Fauny (Mammals of Caucasus – History of the Faunal Formation) (in Russian). – Akademya Nauk Azerbayjanskoy SSR, Izd-vo Akademya Nauk SSSR, Moskva – Leningrad, 703 pp.
- Woodward, H.M. 1881: A fossil rhinoceros in the flesh. – Geological Magazine, (2), 8, p. 96, London.