

**THE FAMOUS *STEPHANORHINUS KIRCHBERGENSIS* (JÄGER 1839)
“IRKUTSK SKULL” (MAMMALIA, RHINOCEROTIDAE) FROM EASTERN SIBERIA
BRIEFLY COMPARED WITH THOSE FROM KRAPINA AND WARSAW
(EASTERN EUROPE)**

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Abstract. The famous “Irkutsk skull” discovered in an unknown locality in the Irkutsk region (southwest of Eastern Siberia) – previously assigned to “*Rhinoceros Merckii* JÄGER, 1839” (sic) [recte *Stephanorhinus kirchbergensis* (JÄGER 1839)] both by CHERSKY and by BRANDT – represents one of the six skulls attributed to this taxon discovered until now in Eurasia (China excepted) and the only one recovered and existing on Russian territory. Preserved in the museum collections of the Zoological Institute of the Russian Academy of Sciences in St-Petersburg, it is briefly compared here with two other *S. kirchbergensis* skulls, those from Husnjakovo Brdo at Krapina (Zagreb, Croatia) and from Warsaw (Poland), which morphologically appear very close to the first one. Notes on *S. kirchbergensis* three other skulls (those from Daxlanden, Mosbach, Steinheim an der Murr) have been treated in a previous work by the author. The “skull from Bessarabia” – in illo tempore also ascribed to *S. kirchbergensis* by SIMIONESCU – on the basis of some of its morphological characters would seem to belong to *Coelodonta antiquitatis* (BLUMENBACH 1799). In any case, the famous sample is unfortunately unavailable at present. Despite its wide spread in Eurasia, the Middle Pleistocene “tandem-horned” Eurasian interglacial rhinoceros *S. kirchbergensis* – better known in Russia and in the ex Soviet Union, as “nosorog Merka” (literally, Merck’s rhinoceros) – seems to be rather rare on this wide territory, being reported from a limited number of localities only. The “Irkutsk skull” represents one of the two records of this species from Eastern Siberia and one of the very few from Russia. The skulls from Krapina and Warsaw testify two other records among the very scarce *S. kirchbergensis* finds attested in Eastern Europe.

Keywords: Irkutsk region, Siberia, Husnjakovo Brdo at Krapina, Warsaw, “nosorog Merka”.

Rezumat. Faimosul „craniu de la Irkuțk” de *Stephanorhinus kirchbergensis* (JÄGER 1839) (Mammalia, Rhinocerotidae) din Siberia de Est, comparat pe scurt cu cele de la Krapina și Varșovia (Europa de Est). Faimosul “craniu de la Irkutsk” descoperit într-o localitate necunoașcută din regiunea Irkuțk (sud vestul Siberiei de Est) – menționat anterior ca “Rinocerul Merckii JÄGER, 1839” (sic) [recte *Stephanorhinus kirchbergensis* (JÄGER 1839)] atât de CHERSKY, cât și de BRANDT – reprezintă unul dintre cele șase cranii atribuite acestui taxon, descoperite până în prezent în Eurasia (fără China) și singurul recuperat și prezent pe teritoriul rusesc. Păstrat în colecțiile muzeului Institutului Zoologic al Academiei Ruse de Științe din St-Petersburg, acesta este succint comparat cu alte două cranii de *S. kirchbergensis*, acelea de la Husnjakovo Brdo la Krapina (Zagreb, Croația) și de la Varșovia (Polonia), care, din punct de vedere morfologic, par a fi foarte apropiate de primul. Însemnări asupra celorlalte trei cranii de *S. kirchbergensis* (acelea de la Daxlanden, Mosbach, Steinheim an der Murr) au fost redată de autor într-o lucrare anterioară. “Craniul din Basarabia” – atribuit de asemenea, in illo tempore, la *S. kirchbergensis* de SIMIONESCU – pe baza unor caracteristici morfologice pare a aparține de *Coelodonta antiquitatis* (BLUMENBACH 1799). Oricum, foarte cunoscuta probă nu este din păcate disponibilă în prezent. În ciuda distribuției vaste în Eurasia, rinocerul cu două coarne din perioada interglaciară din Europa din Pleistocenul Mediu, *S. kirchbergensis*, mai bine cunoscut în Rusia și în fosta Uniune Sovietică ca “rinocerul Merka” (în sens literal, rinocerul lui Merck) – pare să fie relativ rar în cadrul acestui vast teritoriu, fiind menționat într-un număr redus de localități. “Craniul de la Irkutsk” reprezintă una dintre cele două mențiuni ale acestei specii din Siberia de Est și una dintre puținele din Rusia. Craniile de la Krapina și Varșovia reprezintă alte două înregistrări ale *S. kirchbergensis* atestate în Europa de Est.

Cuvinte cheie: regiunea Irkutsk, Siberia, Husnjakovo Brdo at Krapina, Varșovia, “rinocerul Merka”.

INTRODUCTION

Three of the six skulls ascribed to the Middle Pleistocene “tandem-horned” Eurasian interglacial rhinoceros *Stephanorhinus kirchbergensis* (JÄGER 1839) discovered till now in the whole Eurasia (China excepted, v. in “Discussion”) are taken here into consideration.

De facto – the skull from Husnjakovo Brdo and that from Warsaw apart – there are some complex problems, which involved heated debates regarding the “Irkutsk skull”, as well as the remaining three other skulls from Daxlanden (LNK Op/650), Mosbach (NMM 1956/962), and Steinheim a.d. Murr (SMN 16275) (all the localities are in Germany), the attribution of which has been – and still is – decidedly controversial. Though subject of several systematic studies since some time, yet, so far, no agreement has been reached by palaeontologists as to their systematic positions.

The vexata quaestio concerning this subject has been treated in a previous work (BILLIA, 2008).

MATERIAL

The skull from the Irkutsk region

The ZIN 10718 skull (Pl. 1–Figs. a, b, c) comes from an unknown locality in the Irkutsk region (“der Fundort ... ist leider zwar unbekannt...”, just as in BRANDT, 1877: 96-97). Because of this lack, neither chrono- nor biostratigraphic data are consequently available. For this reason, this find may generically be referred to the Middle Pleistocene.

Formerly described and drawn (but never measured) both by CHERSKY (1874: 65-75; Pl. XXIV–Figs 1, 2, 3, 4) and by Brandt (1877; Pl. I, II–Figs 1, 2, 3) as “*Rhinoceros Merckii* JAEGER, 1839” (sic) [recte *Stephanorhinus kirchbergensis* (JÄGER, 1839)] – unfortunately, sine dentibus et sine mandibula – it represents the sole skull found and existing on Russian territory. At first, it was in the museum collections (inv. no. 26) of the Sibirskoe Otdelenie Russkogo Geograficheskogo Obshchestva (Siberian Branch of the Russian Geographical Survey) in Irkutsk. Later, for a long time, it has been untraceable. In 2004, the author found it in a vault of the Zoological Institute of the Russian Academy of Sciences in St-Petersburg provided with the wrong label “ZIN 10817”.

At present, both CHERSKY (1874) and BRANDT (1877) papers are extremely rare in libraries.

In European literature, the “Irkutsk skull” is rarely mentioned. Very few prominent palaeontologists apart (vide autem in BILLIA, 2008), none of the other specialists referred to this famous sample. Furthermore, Chersky’s name is never cited anywhere.

The skull from Husnjakovo Brdo at Krapina

Relatively little damaged and without mandible, the skull from Husnjakovo Brdo at Krapina (northwest of Zagreb, Croatia) (Pl. 2–Figs a, b, c) in illo tempore described as *Rhinoceros Mercki* var. *Krapinensis* by GORJANOVICH-KRAMBERGER (1913; Pl. I–Figs 1, 2, 3) – better known as the “Krapina skull” – shows on its right side a rather mild compression between the nasal aperture and the orbit. The middle portion of the right zygomatic arch is absent. The left second and third premolars are also absent.

The skull and the other *S. kirchbergensis* dental remains found altogether (GORJANOVICH-KRAMBERGER, 1913; Pls III, IV, V, VI, XI, XIII) may supposedly be referred to the Middle Pleistocene (collections: Quaternary Institute of the Croatian Academy of Sciences and Arts – HAZU – former Yugoslavian Academy of Sciences and Arts – JAZU – in Zagreb).

The skull from Warsaw

The almost complete MZ VIII Vm-450 *S. kirchbergensis* skull was found in 1970 – with mandibular fragments and without the left zygomatic arch – at the dept of 6-7 m in the alluvial deposits of the Wisla (Vistula) river bed (at the 517th km along the river course), in the Siekierki district of Warsaw. Only the right second premolar was lost. Exhaustively described as *Dicerorhinus mercki* (JÄGER, 1841) [recte *S. kirchbergensis* (JÄGER, 1839)] by BORSUK-BIALYNICKA & JAKUBOWSKI (1972; Pl. I-II-III-IV-V), it was recovered together with some other skeletal remains ascribed to *Equus caballus* L. 1758 (recte *Equus ferus* BODDEART, 1785), *Bos primigenius* BOJANUS 1827, *Rangifer tarandus* (L., 1758), *Cervus elaphus* L. 1758 (collections: Muzeum Ziemi [Museum of the Earth], Warsaw).

According to the above mentioned authors, “an accurate determination of the age of this find is impossible”.

Morphological comparative analysis of the “Irkutsk”, Krapina, and Warsaw skulls

A detailed morphological description of the skull from the Irkutsk region is given in a former work (BILLIA, 2008).

Differently from those from Krapina and Warsaw (as well as from those from Daxlanden and Mosbach), the “Irkutsk skull” is completely toothless. However, when compared with the other four, it shows remarkable morphological affinities and significant analogies, particularly vs those from Krapina and Warsaw. In detail:

norma lateralis

from this point of view, the nasal bone is high and robust; the length and the slope of the planum parietali is very similar; besides the open septum nasale, the peculiar morphology of the nasal aperture; the much marked processus lacrimalis; the massive characters of the processus postglenoideus and the processus paroccipitalis;

norma verticalis

from this point of view, the “Irkutsk skull” appears to be less slight and much enlarged in the zygomatic arches which are strikingly massive and end abruptly at a right angle towards the temporalia. As in the Krapina and Warsaw skulls, the nasal bone is very large, the orbits massive and very “chiselled” with a much pronounced anterior rim. The two rounded extremities of the occipital crest are much marked;

norma basalis

from this point of view, the morphology of the os incisivum and of the cavitas palatalis; the conspicuous space (max length = 310 mm) occupied by the dental alveoli (in the Krapina skull the length of the right dental range is 288 mm, while in that from Warsaw the length of the left dental range is about 275 mm);

norma occipitalis

from this point of view, the peculiar trapezium shape; the very massive crista occipitalis; the considerably pronounced of the tuberculus nuchalis, not found in any other species.

Some dimensions of the skulls from the “Irkutsk region”, from Krapina and from Warsaw are given in Table 1.

RESULTS

Among the three skulls, that from “Irkutsk” appears to be the largest one.

The nasal bone of that from Krapina is wider than those of the two other skulls. In comparison with the two other specimens, at the level of the zygomatic arches it appears the narrowest one. The occipital face of the same skull

(Fig. 1b) is somewhat less massive than that of the Siberian skull (Fig. 1a). The tuberculus nuchalis, as in the “Irkutsk” and Warsaw skulls, is very much pronounced.

The Warsaw skull is the shortest one; nevertheless, the width of its zygomatic arches is similar to that of the Siberian specimen. Its occipital face is less massive and much more stretched in comparison with those of the “Irkutsk” and “Krapina” skulls. The occipital crista shows a rather remarkable concavity. The tuberculus nuchalis is the most pronounced among the three skulls.

Both skulls from Krapina and from Warsaw show teeth of large dimensions, bulbously inflated, and other morphological traits suggestive of *S. kirchbergensis*.

DISCUSSIONS

Another well-known rhinoceros skull is mentioned in literature, that “from Bessarabia” (SIMIONESCU, 1939-40; Pl. I-p. 432). Without upper dentition and mandible it has been referred to *Rhinoceros mercki* (recte *S. kirchbergensis*) (“Nach den oben angeführter Einzelangaben glaube ich, dass der beschriebene Schädel mehr an *Rh. mercki* erinnert.” [SIMIONESCU, 1939-40:430]). Nevertheless, on the basis of some of its morphological characters, it seems to belong to *Coelodonta antiquitatis* (BLUMENBACH, 1799). However, the specimen – found in an unknown locality in Bucovina (at present, in Ukraine) – previously preserved in the collections of the Palaeontological Institute of the University of Bucharest appears to be unfortunately unavailable at present (Codrea, 2009, personal communication).

If one definitively assumes that *Rhinoceros sinensis* OWEN, 1870 and *Dicerorhinus choukoutienensis* (WANG, 1931) must be considered as synonyms of *S. kirchbergensis* (TONG & WU, 2010, inter alios), the four other skulls found on Chinese territory must be ascribed to *S. kirchbergensis*. Two of them (VM 555 and V2682) – formerly ascribed to *R. cf. sinensis* and later to *D. choukoutienensis* – come from Choukoutien (= Zhoukoudjan) (CKT-1 and CKT-20) (WANG, 1931; CHOW, 1963, Pl. I; CHOW, 1979, Pl. I, inter alios). The juvenile VM 555 skull is unavailable nowadays. The third one (the damaged juvenile LA 7701-x skull) comes from Anping (Liaoning province) (XU, 1986; the skull is not figured). The last one (the H36 fragmentary juvenile skull) – previously referred to *R. sinensis* by WU (1998) – comes from Xiniudong (Hubei Province) (TONG & WU, 2010, Fig. 1).

At present, on the basis of its fossil evidence, *S. kirchbergensis* seems to be barely represented on the vast Eurasian landmass being reported from a relatively limited number of localities only (BILLIA, 2008a). Moreover, very often neither chrono- nor biostratigraphic data are available.

Together with *Palaeloxodon antiquus* (FALCONER & CAUTLEY, 1847), *S. kirchbergensis* (= *Rhinoceros mercki* JÄGER, 1839 = *Dicerorhinus mercki* [JÄGER, 1839] = *Dicerorhinus kirchbergensis* [JÄGER, 1839] – better known in Russia and in all the former Soviet Union as “nosorog Merka” (literally, Merck’s rhinoceros) – was one of the most characteristic members of the West-European late Middle Pleistocene interglacial fauna (CZYZEWSKA, 1962).

As far as Eastern Siberia is concerned – besides the “Irkutsk skull” – only two teeth assigned to *S. kirchbergensis* were found in 1951 along the Vilyuy river, in Yakutya (Sakha Republic) (DUBROVO, 1957). Until now, because of its extraordinary latitude (close to 64° N), this represents the northernmost *S. kirchbergensis* record in the whole of Eurasia.

On both Russian-European and West-Siberian territories, some other *S. kirchbergensis* remains are recorded, but in few other localities only (BILLIA, 2007, 2008a, 2008b).

A very rare *S. kirchbergensis* reconstruction, the one made by Flerov – in author’s opinion probably close to reality – is available in FLEROV et al. (1955) (vide autem in BILLIA, 2008a).

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PLATE 1 / PLANȘA 1



Stephanorhinus kirchbergensis (JÄGER, 1839); Irkutsk region (Southwest Eastern Siberia); skull (ZIN 10718); Figure 1a – lateral view; Figure 1b – vertical view; Figure 1c – basal view.

Scale bar for all the figures = 10 cm

Stephanorhinus kirchbergensis (JÄGER, 1839); regiunea Irkutsk (Sud-vestul Siberiei Orientale); craniu (ZIN 10718); Figura 1a – vedere laterală; Figura 1b – vedere verticală; Figura 1c – vedere bazală.

Scara pentru toate figurile = 10 cm

PLATE 2 / PLANȘA 2



1



2



3

Stephanorhinus kirchbergensis (JÄGER, 1839); Husnjakovo Brdo at Krapina (Zagreb, Croatia); skull (cast, Dpt. of Biology and Evolution, Ferrara University); Figure 2a – lateral view; Figure 2b – vertical view; Figure 2c – basal view.

Scale bar for all the figures = 10 cm

Stephanorhinus kirchbergensis (JÄGER, 1839); Husnjakovo Brdo at Krapina (Zagreb, Croatia); craniu (mulaj, Dpt. de Biologie și Evoluție, Universitatea Ferrara); Figura 2a – vedere laterală; Figura 2b – vedere verticală; Figura 2c – vedere bazală.

Scara pentru toate figurile = 10 cm

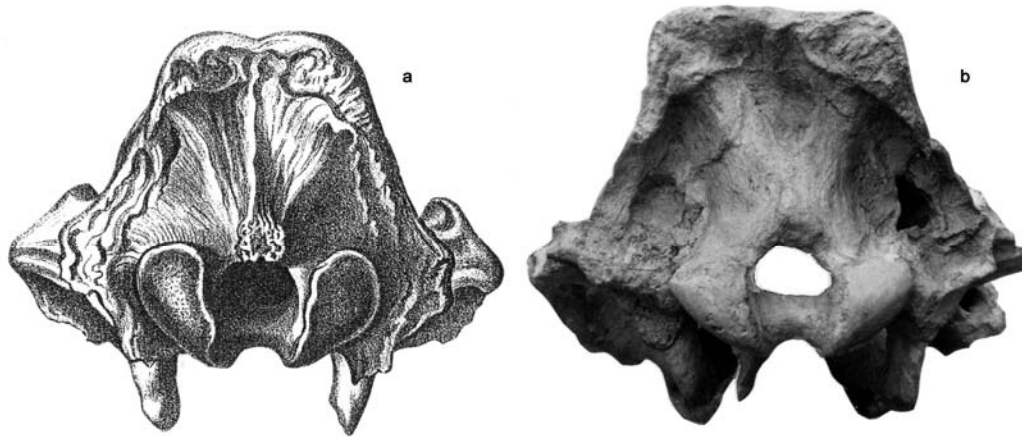


Figure 1. *Stephanorhinus kirchbergensis* (JÄGER, 1839); (a) Irkutsk region (Southwest Eastern Siberia); skull (ZIN 10718), occipital view (after Brandt, 1877; Pl. II-fig. 2) – (b) Husnjakovo Brdo at Krapina (Zagreb, Croatia) (cast, Dpt. of Biology and Evolution, Ferrara University), occipital view.

Scale bar for both figures = 10 cm

Figura 1. *Stephanorhinus kirchbergensis* (JÄGER, 1839); (a) Irkutsk region (Southwest Eastern Siberia); craniu (ZIN 10718), vedere occipitală (după BRANDT, 1877; Pl. II-fig. 2) – (b) Husnjakovo Brdo at Krapina (Zagreb, Croația) (mulaj, Dpt. de Biologie și Evoluție, Universitatea Ferrara), vedere occipitală.

Scara pentru ambele figure = 10cm

Table 1. Dimensions (in mm) of the *S. kirchbergensis* skulls from “Irkutsk” (southwest Eastern Siberia) (ZIN 10718) (IRK), from Husnjakovo Brdo at Krapina (Zagreb, Croatia) (n.n.) (HB), and from Warsaw (Poland) (MZ VIII Vm-450) (WAR).

Tabel 1. Dimensiunile (mm) craniilor de *S. kirchbergensis* de la “Irkutsk” (sud-vestul Siberiei Orientale) (ZIN 10718) (IRK), de la Husnjakovo Brdo at Krapina (Zagreb, Croația) (n.n.) (HB), și de la Varșovia (Polonia) (MZ VIII Vm-450) (WAR).

		IRK	HB	WAR*
1	max length rhinion–condili occipitales	832	750	748
2	max length rhinion–crista occipitalis (a)	798	728	723
3	max length of the nasal aperture	260 (dx≅sx)	220 (dx only)	–
4	min length nasal aperture–orbita ocularis	135	118	–
5	max breadth of the nasal bone	168	176	164
6	max breadth of the frontal bone	242	249	255
7	min transversal diameter at the costritio post-orbitaria	119	122	–
8	max width of the arcus zygomatici	391	364	390
9	min distance between the parietal crests	64	55	52
10	transversal diameter of the processus lacrimalis	71	65	–
11	length anterior rim of the processus lacrimalis–crista occipitalis	436	349	400
12	min width of the faces occipitalis (b)	204	156	170
13	max width of the faces occipitalis (c)	273	275	264
14	height of the faces occipitalis	251	212	239
15	external max transversal diameter of the condili occipitales	154	151	–
16	height of the condili occipitales	66	60	–
17	max transversal diameter of the foramen magnum	49	46	58
18	max vertical diameter of the foramen magnum	39	30.5	45
19	external diameter between the postglenoid processes	174	179	–
20	internal diameter between the postglenoid processes	107	108.5	–
21	length anterior rim of the P ² –condili occipitales	–	603	–
22	length anterior rim of the P ² –foramen magnum	–	574	–

(*) after BORSUK-BIALYNICKA & JAKUBOWSKI (1972); (a) horizontally measured, along the sagittal plane (rhinion/crista occipitalis); (b) measured at the exterior rims of the crista occipitalis; (c) measured outwardly at the mastoid apophyses.

(*) după BORSUK-BIALYNICKA & JAKUBOWSKI (1972); (a) măsurat pe orizontală, de-a lungul planului sagital (rhinion/crista occipitalis); (b) măsurat la exteriorul marginilor crestei occipitalis; (c) măsurat la exteriorul apofizelor mastoide.

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